# SOUTHWEST LOUISIANA RIVER BASIN STUDY

The Calcasieu, Mermentau,
and
Teche-Vermilion River Basins

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ECONOMIC RESEARCH SERVICE
FOREST SERVICE
*In cooperation with other federal and state agencies*
*Alexandria, Louisiana, August 1974*

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# SOUTHWEST LOUISIANA RIVER BASIN STUDY

The Calcasieu, Mermentau,
and Teche-Vermilion River Basins

Louisiana



Prepared by

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Economic Research Service
Forest Service

Sponsored by

Louisiana Department of Public Works
Louisiana State Soil and Water Conservation Committee

Alexandria, Louisiana August 1974

4-31721 2-74

SOUTHWEST LOUISIANA COMPREHENSIVE
BASIN STUDY

The Calcasieu, Mermentau,
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CONTENTS

SUMMARY



INTRODUCTION



DESCRIPTION OF THE STUDY AREA



4-31721 2-74

CONTENTS (CONTINUED)



4-31721 2-74

CONTENTS (CONTINUED)

CONTENTS (CONTINUED)



4-31721 2-74

CONTENTS (CONTINUED)



4-31721 2-74

CONTENTS (CONTINUED)



## APPENDIX
FISH AND WILDLIFE DATA

## TABLES



4-31721 2-74

CONTENTS (CONTINUED)



4-31721 2-74

CONTENTS (CONTINUED)



4-31721 2-74

CONTENTS (CONTINUED)



## FIGURES

Number

CONTENTS (CONTINUED)



## EXHIBITS

Number



4-31721 2-74

## SUMMARY

### GENERAL

The primary objective of the Study is to facilitate the orderly conservation, development, utilization, and management of the water and related land resources of the Basin. This Study was made by the U. S. Department of Agriculture (USDA) under authority of Section 6 of the Watershed Protection and Flood Prevention Act of the 83rd Congress (Public Law 566, as amended). Sponsors of the Study were the Louisiana Department of Public Works and the Louisiana State Soil and Water Conservation Committee.

Investigations in the Southwest Louisiana River Basin Study Area were made by the Soil Conservation Service, Forest Service, and Economic Research Service of the U. S. Department of Agriculture. The purposes of the investigations were to: (1) identify water and related land resource problems; (2) prepare a potential plan for water and related land resource development that could be accomplished under USDA programs; (3) prepare agricultural and forestry data for use of cooperating agencies in planning water and related land resource projects under their programs; and (4) compile engineering, economic, and related data that local organizations could use for developing water and related land resources. All investigations were coordinated with investigations of other cooperating agencies.

The Study Area encompasses all the drainage area of the Calcasieu, Mermentau, and Teche-Vermilion Rivers - a drainage area of about 11,452 square miles. In addition, it includes about 384 square miles in Louisiana of the Lower Sabine River Basin. The combined drainage area of 11,836 square miles amounts to about one-fourth the drainage area of the State. It includes all or parts of 17 parishes. Mean sea level elevations range from below sea level to 460 feet. The drainage pattern consists of 68 Conservation Needs Inventory (CNI) watersheds within 7 tributary basins. Total land and water area is about 7,575,000 acres. For study purposes, this figure was broken down into inventory area (6,483,900 acres), non-inventory area (744,500 acres), and large water area (346,700 acres). The inventory area (6,483,900 acres) contains about 2,323,400 acres of Cropland (36%), 2,361,100 acres of Forest Land (36%), 534,400 acres of Pastureland (8%), and about 886,300 acres of Other Land (14%). The non-inventory area includes about 404,600 acres of Federal Land, 236,100 acres of Urban and Built-Up Land, and about 103,800 acres of small water areas.

The average annual rainfall over the Basin is about 59 inches and average annual mean temperature is about 68 degrees Fahrenheit.

The Basin Area includes five major Land Resource Areas (LRA's) -- The Southern Mississippi Valley Alluvium (LRA-131), 14 percent; The

4-31721 2-74

Southern Coastal Plain (LRA-133), 31 percent; The Southern Mississippi Valley Silty Upland (LRA-134), 12 percent; The Gulf Coast Prairies (LRA-150), 21 percent; and The Gulf Coast Marsh (LRA-151), 22 percent.

## ECONOMIC ACTIVITY

The 1966 population was about 639,000 or about 54 persons per square mile. About 89 percent of the population live in urban areas and 11 percent on farms. Farm population decline began in 1930 and is continuing. The Study Area included about 20,800 farms in 1967 with an average size of 180 acres. Farm numbers are decreasing and farm sizes are increasing.

From the period 1929 to 1967, non-farm earnings in the Basin increased from about 62 percent of total earnings to about 92 percent. Total employment during the period 1940 to 1967 increased from about 143 thousand to 207 thousand. During this same period, employment in agriculture decreased from about 63 thousand to about 22 thousand.

Urban and built-up land currently occupy about 236,000 acres (3.2% of the total land and water area). Projected future population increases will expand the future area required for this type use - 298,000 acres by 1985 (3.7%), 345,000 acres by 2000 (4.5%), and 436,000 acres by 2020 (5.7%).

## PROBLEMS AND NEEDS

Population projections and projections of economic activity were made to provide a basis for determining needs for additional water and related land resource development. Projections indicate that deficits in water needs allocated to the Study Area can be expected by 1985, and will increase by 2020. Additional water and related land resource development would provide opportunities to meet these needs. Watershed project developments are needed to meet projected needs for land treatment, flood prevention, drainage, recreation, fish and wildlife, saltwater intrusion control, and rural area redevelopment by 1985 and in subsequent periods.

Of the 6.5 million acres of land in the Basin, about 2.3 million acres (35%) had adequate conservation treatment in 1967. The remaining 4.2 million acres (65%) needed conservation treatment. Major land use of the land needing treatment (4.2 million acres) is distributed as follows: cropland, 1.4 million acres; pasture, 317 thousand acres; range, 179 thousand acres; forest, 1.5 million acres; and other land, 765 thousand acres.

If present and predicted trends in forest management continue, the demand for forest products will exceed the supply by about 4.7 cubic feet per acre per year in 1980. This trend would increase the deficit to about 25.6 cubic feet per acre per year in 2020. The current rate of growth should be increased to provide an additional 61 million cubic feet of timber by 2020.

4-31721 2-74

Major problems stem from flooding and impaired drainage. Total annual floodwater damages occur on about 2,612,000 acres of land; about 2,580,000 acres of agricultural land, and 32,000 acres of urban land. About 1,327,000 acres of the agricultural land (2,612,000 acres) also receive damage by impaired drainage. Total annual floodwater damages amount to about $4,625,000. Of this, about $4,443,000 is crop and pasture damage and about $41,000 is urban damage.

Based on CNI data, about 3,493,000 acres have a flood and drainage problem. Of this amount, about 1,901,000 acres are cropland and pasture; about 574,000 acres have adequate drainage systems installed and about 1,327,000 acres need drainage improvements. Damages from impaired drainage computed on 1,327,000 acres amount to about $2,282,000 annually.

By 1985, outdoor recreational facilities or resources will be needed for most types of outdoor recreation. Needs have been identified for swimming, camping, picnicking, fishing, trails, and hunting. Also by 1985, new surface water areas will be needed for boating, water skiing, and swimming.

Water supplies will be needed for irrigation; municipal and industrial uses; rural domestic, fish farming, and livestock; and water quality control. But there are no practicable opportunities by Public Law 566 type reservoirs to supply this water. Rural water and municipal water can be supplied more efficiently by wells.

The CNI data indicates that about one-fourth of the lands in the Basin are subject to an erosion hazard. This occurs mostly in the Southern Coastal Plains Land Resource Area (LRA). However, erosion is not a serious problem in the Basin. Sediment, a product of erosion, is not a serious problem; but a reduction in sediment rates would reduce turbidity in streams, thereby improving water quality, and decreasing maintenance costs of channels.

Saltwater from the gulf intrudes into the waterways of the Gulf Coast Marsh LRA through the interconnected chain of drainage canals, navigation canals, natural channels, and lakes. The normal depth of water in these waterways ranges from 2 to 8 feet. The farmers pump water from these waterways into their ricefields for irrigation. During dry periods when stream water levels are low and pumpage is heavy, saltwater is drawn in from the gulf. Severe problems with saltwater occur on the average of about 3 out of each 5 years. When this happens and the water is used for irrigating rice, up to 50 percent loss in yield results.

## EXISTING PROGRAMS AND DEVELOPMENT

On irrigated land, the principal practices have been the improvement of irrigation systems. On non-irrigated land, the primary practices in the bottom land (LRA-131) have been installing and improving drainage systems; in the upland (LRA's 133 and 134), the primary practices include those that reduce erosion and increase infiltration. On pasture, the treatment has been the same as non-irrigated cropland. On range, the practices applied on upland (LRA-133) have been to prevent overgrazing; and in the marsh (LRA-151), to distribute grazing. On forest land, the primary practices have been to increase timber production. Some erosion control practices have been applied in LRA's 133, 134, and 150. On other land, the practices have been for erosion control, and to a limited extent, drainage.

Existing water and related land resource development includes 15 watershed projects authorized for Public Law 566 operations, 13 U. S. Army Engineers water resource projects, and 488 recreational sites located on Federal, State, parish, municipal, and private lands. These projects had been authorized for operations before December 31, 1971, and include flood prevention, drainage, municipal water supply, pollution abatement, fish and wildlife, irrigational and recreational purposes.

## POTENTIAL FOR DEVELOPMENT

The physical potential for development in the Basin is good. Almost all needs identified could be met by some type of future development, either Federal, State, or private.

By 1985, about 2.7 million acres (41%) of the inventory land will have been adequately treated with conservation practices. The remaining 3.8 million acres (59%) would benefit from conservation treatment. Installation costs of this remaining treatment would amount to about $132 million; $120 million to the farmers and $12 million to USDA agencies involved.

If the need arises, about 1.7 million acres could be converted to cropland. About 0.4 million acres are in LRA 131 and about 1.2 million acres are in LRA 133. This land is presently in forest. The remaining 0.1 million acres in LRA 151, the marsh, could be drained with pumps.

Forest land has the growth potential to satisfy future demands. This can be done through regeneration on poorly stocked areas and timber stand improvement on moderately stocked areas.

Reservoir site development opportunities are available to help meet projected needs for water quality control, recreation, municipal and industrial water supply, and irrigation. Reservoir storage sites are abundant in LRA 133, but it is not practicable at this time for Public Law 566 type reservoirs to help fulfill these needs.

## SOLUTIONS THROUGH USDA PROGRAMS

The USDA has opportunity through several agency programs to fulfill needs in the Basin. Conservation treatment is needed on all major land uses. Better management practices are needed on cropland, pasture, range, and forest land. Twenty-six CNI watersheds were selected for early-action

4-31721 2-74

development (within the next 10 to 15 years), and seven CNI watersheds were selected for long-range development (beyond the next 10 to 15 years). Watershed projects include land treatment and structural measures for watershed protection, drainage, flood prevention, and saltwater intrusion control purposes.

About 38 percent of the Study Area is included in the early-action plan. About 490,000 acres will require an accelerated land treatment program. Technical assistance costs for installation of this program amount to about $1,613,500. An additional 1,690,900 acres in the watershed areas would be treated under the going program at a technical assistance cost of about $1,859,300. The total installation cost of this program including $29,879,600 for on-farm installation cost amounts to about $33,352,400. This would fulfill about 53 percent of the total land treatment needs in the Study Area.

Structural measures in early-action watersheds include about 2,750 miles of channel work with appurtenant structures for fish and wildlife enhancement, and six structures for control of saltwater intrusion.

The estimated installation costs of structural measures are $48,208,000. Of this cost, about $28,911,000 would be Federal funds and about $19,297,000 would be non-Federal funds. The installation cost (1970 price base) was amortized for 50 years at 5½-percent interest for a total of $2,512,340; plus a project administration cost of $337,830 which amounts to $2,850,170. The operation and maintenance cost using adjusted normalized prices amounts to $800,030. The total annual cost is $3,650,200.

The estimated total annual benefits from structural measures are $6,918,600. Of this amount, $2,435,800 are flood damage reduction benefits, $262,100 are more intensive land use, $2,723,100 are agricultural management benefits derived from increased efficiency, irrigation, and saltwater control, $296,200 are redevelopment benefits, and $1,201,400 are secondary benefits. The total average annual costs of structural measures, including operation and maintenance, are about $3,650,200. The benefit-cost ratio for all projects is 1.9:1.

Structural measures in the long-range plan consists of about 600 miles of channel work with appurtenant water control structures for channel stabilization and fish and wildlife enhancement. Project cost and benefit data were not developed.

The forestry needs of the Basin can be met with the application of a management program beginning in 1980 and continuing until the year 2000. Four alternatives have been suggested. Each alternative would contribute an additional 61 million cubic feet of timber to meet projected needs.

## IMPACTS OF USDA PROGRAMS

### Land Use and Economic Effects

The most obvious impact of potential project development is to decrease land requirements for the Basin's food and fiber production. Specified cropland requirements are expected to decline from the base year by over 7 percent, while the acreage requirements without proposed development would increase about 8 percent. The developed condition is expected to require 83,000 acres less than the without-development condition in 1985; by 2000, 143,000 acres less; and by 2020, 189,000 acres less.

Without development, about 40,000 acres of forest land in the Southern Mississippi Valley Silty Uplands will be converted to cropland by 2020; with development, no conversion is expected. The aggregate effect of proposed development is expected to reduce forest conversion 38,000 acres by 1985 and 104,000 acres by 2020.

Estimates of crop productivity efficiencies expected to evolve from proposed water and land resource development were all positive and the context was one of sufficient land availability. Though productivity gains were evident in the without-development condition at each time frame, the productivity gains in soil productivity groups benefited by development were greater. If the early-action program were completed, annual net national gains by 1985 expressed in terms of reduced cost of production resulting from the proposed resource development would be about $9 million. By 2000, the annual gains will be about $15.7 million; and by 2020, with both early-action and long-range projects completed, annual gains will have increased to about $28.8 million.

Four alternative land treatment programs have been suggested to help meet timber demands. Each program if implemented, would increase timber production about 61 million cubic feet by 2020. Each would provide a more productive forest land base and maintain a better supply-demand relationship for wood and wood products in the Basin.

## Environmental Effects of Early-Action Watershed Projects

All watershed projects include a land treatment program, and channel work with appurtenant erosion control, water control, and wildlife management structures. Two projects in the coastal area have structures to prevent saltwater intrusion.

Installation and maintenance of land treatment practices are essential to sustained, profitable agricultural production. Additionally, they have proved effective in reducting erosion and sediment and in enhancing wildlife habitat. Estimates indicate the early-action program would reduce gross erosion about 6 percent and reduce annual sediment yield about 17 percent.

Planned early-action structural measures would improve wildlife habitat. Several low-level weirs and dams planned in association with channel work will establish or improve waterfowl areas by providing "green-tree reservoirs". These reservoirs provide for waterfowl shallow water areas for feeding and resting from October through January. Additionally, these measures will improve the stream fishery.

Channel construction procedures are designed to minimize adverse effects on fish and wildlife and natural beauty. Spoil and berm areas, where possible, will be seeded with food and cover for wildlife. Excavation in many instances, would be from one side of the channel only. This will maintain shade beneficial to stream fishery and conserve natural beauty.

About 2,750 miles of channel work is included in the early-action plan. About 500 miles of channel would pass through narrow strips (less than 2 miles wide) of forested flood plain; about 100 miles would pass through large forested tracts; and about 2,150 miles would pass through open land and marsh. In the forested strips, about 2,050 acres would be lost; about 320 acres occupied by channel areas and about 1,730 acres occupied by berm areas and spoil placement. In the large forested tracts, about 500 acres would be lost; about 80 acres occupied by channel areas and about 420 acres occupied by berm areas and spoil placement. Thus, the total acreage of forested bottom land lost to channel, berm, and spoil areas amounts to 2,550 acres. Additionally, in the open lands and marsh, another 1,500 acres would be lost; 1,440 acres lost to channel areas in the open lands where the spoil is spread (no land needed for spoil and berm areas), and 60 acres lost to spoil and berm areas in open marsh where no new channel areas are needed. In summary, a total of 4,050 acres of land would be required for channel, berm, and spoil areas of channel work included in the early-action plan.

Of the 2.4 million acres of wetlands found in the Basin, about 16,250 acres could be physically altered by project installation. The actual acreage would be less than this, however, because opportunities exist where planned spoil placement and water control structures would prevent much land from being drained. In some cases, wetland areas that had been drained previously could be restored.

Installation of the early-action plan would not disturb any known historical or archaeological sites, or unique scenic beauty areas. However, detailed channel locations in each project area will be checked with the Curator of Anthropology, Louisiana State University, and the Louisiana Historical Preservation and Cultural Commission before any excavation begins.

# INTRODUCTION

## NEED FOR STUDY

The Southwest Louisiana River Basin's major land and water problems are flooding of agricultural lands, inadequate drainage, saltwater intrusion, and lack of adequate recreational and fish and wildlife developments. Problems of slightly less magnitude are associated with urban flooding and inadequate water supplies for irrigation.

Seasonal storms and occasional gulf tropical disturbances magnify local rainfall and runoff conditions. In the upland watershed, floods occur on an average of three to five times during the growing season. This has resulted in considerable damages to crops and pastures that remain in flood plains. In the southern watersheds, frequent high intensity rains and tropical storms produce excessive runoff and high tides that cause extensive damage. Lake and gulf shoreline erosion result from these storms. Approximately 2.4 million acres of agricultural lands and 32,000 acres of urban development suffer annually from floodwater and sediment damages. Erosion damages occur on about 41,000 acres.

Complex drainage problems exist along the coastal areas where drainage outlets for developed land are inadequate or difficult to obtain because land elevations in relation to the gulf level are low. These problems are becoming more difficult because large areas are being urbanized rapidly. Flooding and drainage problems exist on about 3.5 million acres.

Although the average annual precipitation is high, its untimely distribution greatly increases the risks involved in agricultural production. A more dependable yield could be assured on over 170,000 acres of land by developing potentials for existing irrigation. To fully develop these potentials, about 340,000 acre-feet of water would be required.

Saltwater intrusion is a problem common to low-lying lands in each of the four sub-basins. The extensive system of interconnected drainage and navigational channels allows inland movement of saltwater from the gulf, bays, and lakes during periods of low flows in the inland streams. This problem is compounded when periods of high wind tides coincide with periods of low flow. Irrigational and municipal water supplies from surface sources suffer damage from this saline pollution.

A serious water shortage exists in parts of the Basin and is rapidly spreading to other parts of the Basin. Total water needs are expected to increase 140 percent by 1985, 210 percent by 2000, and 300 percent by the year 2020.

Demands for food and fiber, fish and wildlife habitat, and recreation are increasing rapidly as a result of population increases in

4-31721 2-74

the State and Nation. These activities as well as urban and industrial development compete for land and water resources. Consequently, many of the resource problems are broad in scope and will require community effort to solve them. Technical and financial assistance is needed in solving problems and in meeting the demands upon the available land and water resources. Needs for satisfying other demands that are related to water and land can be fulfilled only by making full use of these two resources. Only by wise planning can conflicts of interest be minimized.

## AUTHORITY FOR STUDY

The Study was made under the authority of Section 6 of the Watershed and Flood Prevention Act of the 83rd Congress (Public Law 566, as amended). The Secretary of Agriculture is authorized to cooperate with Federal, State, and local agencies in their investigations of watersheds, rivers, and other waterways to develop coordinated programs. The Study was under the supervision of a Field Advisory Committee as provided in a Memorandum of Understanding, dated May 6, 1968, between the Soil Conservation Service, Forest Service, and Economic Research Service.

## OBJECTIVES AND NATURE OF THE STUDY

The objectives of the Basin Study are to facilitate and coordinate the orderly conservation, development, utilization, and management of water and related land resources. The Study will:

1. Provide a guide to the best use or combination of uses of water and related land resources to meet foreseeable short and long term needs in the Basin.

2. Provide for the timely development and management of land and water resources to aid in the economic development and growth of the area.

3. Preserve these resources in appropriate instances to insure that they will be available for their best use as needed.

4. Provide broad scale analyses of water and related land resource problems.

5. Furnish general appraisals of the probable nature, extent, and timing of measures for solutions to water and related land resource problems.

6. Establish priorities for more detailed studies for action programs needed in the near future.

7. Coordinate the activities and recommendations of the various Federal, State, and local agencies.

4-31721 2-74

The patterns of water and land use estimated to be the most appropriate to meet needs projected for 1985, 2000, and 2020 were studied; and specific watershed projects necessary to meet social and economic needs were described. The consequences of alternative patterns and schedules of development were evaluated. Information developed was used to coordinate the department's project-type water and related land resource conservation and development programs with the Louisiana State Water and Related Land Resources Plan, and plans of other agencies. Information and data obtained were compiled in such a manner that it may be used in planning Public Law 566 watershed projects, resource conservation and development projects, programs for the development and management of the national forests, and other action programs for water and land resources.

Investigations were made in the fields of flood control, erosion and sedimentation, water supply, drainage, irrigation, recreation, salt-water intrusion, and fish and wildlife. The Louisiana Department of Public Works requested participation of all agencies and other related interests to insure that all facets of water and related land resource development were considered. The studies were of sufficient detail to identify projects needed by 1985.

Development of the economic base study included projections of the Basin's primary economic indicators. National and regional trends in food and fiber needs were considered in projecting agricultural and related activities. Only that information required for actual planning purposes (by USDA, State or other Federal agencies) was collected.

## HISTORY OF STUDIES IN THE BASIN

Numberous surveys, reviews, and special reports have been submitted for areas within the Southwest Basin. However, in the interest of clarity and brevity, only those reports dealing with major portions of the Basin or those that have had a significant impact on the Basin as a whole are discussed below.

### Corps of Engineers

The River and Harbor Act (R&H) of July 24, 1946, Senate Document 242, 79th Congress, 2nd Session, and prior R&H Acts, provide for the Gulf Intracoastal Waterway (GIWW), a waterway about 300 miles long, 12 feet deep, and 125 feet wide at mean low gulf from the Sabine River, Louisiana, and Texas, across the lower southwest basin to Mississippi River at New Orleans. The main stem is presently complete. Enlargement of the GIWW was authorized October 23, 1962, House Document 556, 87th Congress, 2nd Session. This work was 68 percent complete as of June 30, 1968.

The R&H Act of July 24, 1946, House Document 190, 79th Congress, 2nd Session, and prior R&H Acts, provide for a waterway 35 feet deep by 250 feet wide from Lake Charles south through Calcasieu Lake to the Gulf of Mexico. Obstruction clearing was included from the Port of Lake Charles north to Phillips Bluff. The R&H Act of July 14, 1960, House

Document 436, 86th Congress, 2nd Session, provides for a saltwater barrier structure and 40 feet gates in a new by-pass channel to reduce saltwater intrusion. This work had been completed by 1968; however, maintenance dredging of the channel will continue as well as revetment construction on some channel banks.

Work on the Mermentau River, Bayous Nezpique and Des Cannes was authorized under the River and Habor Act of 1892 and modified in 1916 and 1919. House Document 36, 72nd Congress, August 30, 1935, and House Document 239, 89th Congress, July 13, 1965, provided additional work. Work consists of removing obstructions in the entire Mermentau River, dredging the channel in Lower Mud Lake, constructing a navigational channel from the GIWW up the Mermentau River and both Bayous Nezpique and Des Cannes to Interstate Highway 10, and removing obstructions in Bayou Nezpique from I-10 to mile 25 and in Bayou Des Cannes from I-10 to mile 8.5. Under the early authorizations, obstruction removals were completed in 1917 and a navigational channel was completed in 1935. Construction work under the July 13, 1965, Act has not yet begun.

The R&H Act of July 13, 1892, provided for a 5.5 feet navigational channel on the Vermilion River from Vermilion Bay to the Southern Pacific Railroad bridge at Lafayette, a distance of about 51 miles. A navigational channel 8 feet deep by 80 feet wide from Vermilion Bay to the GIWW and 9 feet deep by 100 feet wide from GIWW to Lafayette, Louisiana, has been provided under authority of the Flood Control Act of August 18, 1941. All this work has been completed.

The R&H Act June 26, 1934, and prior R&H Acts provided for dredging a navigational channel 8 by 80 feet from the mouth of Bayou Teche near Morgan City to New Iberia; thence 6 by 60 feet to Keystone Lock; thence 6 by 50 feet to Arnaudville. Keystone Lock and Dam was completed in 1913. The Arnaudville to Keystone Lock channel was completed in 1916. The 8 by 80 foot channel from New Iberia to near Morgan City is essentially complete.

The Flood Control Act of August 18, 1941, also provided for channel enlargement above Arnaudville to Port Barre, Louisiana, by way of Bayou Fuselier to Bayou Teche.

The R&H Act of July 3, 1958, House Document 37, 85th Congress, 1st Session, as amended by Act of October 23, 1962, Public Law 87-874, 87th Congress, 2nd Session and Public Law 89-298, 89th Congress, 2nd Session authorized a comprehensive project to provide for control and progressive eradication of obnoxious aquatic plant growths from navigable waters, tributary streams, and connecting channels.

Louisiana Department of Public Works

The responsibility for water resource work for the State of Louisiana rests with the Department of Public Works (DPW). They, continually, are planning and constructing projects having significant impact on the Basin.

"The Louisiana Intracoastal Seaway Preliminary Survey and Economic Report", dated March 1963, was made to determine the feasibility of a freshwater channel and deepwater industrial seaway across southern Louisiana from the Sabine River near Orange, Texas, to Bayou Lafourche near Houma, Louisiana. The most feasible route for the seaway is along the present route of the GIWW with some deviations. It is tentatively planned to provide a channel 40 feet in depth with a bottom width of 300 feet.

In compliance with Act. No. 557 of the 1952 Louisiana Legislature, "Report and Recommendations on Southwest Louisiana Water Supply Problems" was published. The report recommended construction of Calcasieu Lake Reservoir, a low dam and drainage improvement in east Lake Charles, a reservoir for water storage on upper Calcasieu River above Lake Charles, Cocodrie Reservoir near Lecompte, pumping stations at Hamburg and Washington, two closures on Vermilion Bay to maintain freshwater, and other projects. Some of the recommendations in this report have been accomplished using alternative methods.

In 1964, the Water Resources Study Commission was established by the Louisiana Legislature and was given the charge to study the water policy of the State, the need for revisions of the policy, and the manner in which the revised policy should be administered. Subsequently in 1966, the DPW was given the responsibility for developing a comprehensive water and related land resources plan for the State. This study was set up for three phases - (1) inventories, (2) projections, and (3) recommended actions and solutions. Three reports have been completed as a part of the first phase, "Present Municipal Water Use in Louisiana", October 1969; "Present Agricultural Water Use in Louisiana", February 1970; and "Present Industrial Water Use in Louisiana", June 1970. Two reports have been completed as a part of the second phase, "Present and Projected Water Requirements for Louisiana", August 1971; and "Ground Water Resources and Requirements for Louisiana", October 1971. A third report for the phase, "Surface Water Resources and Requirements", is scheduled for completion early in 1974.

The DPW "Biennial Report" lists proposed and accomplished water resource works of improvements within southwest Louisiana. Many have, or will have, significant effects on the Basin.

In 1952, the Louisiana Legislature by Act 557 directed the DPW to investigate the water supply problems of southwest Louisiana. In the subsequent report released in 1954, the principal recommendation was the diversion of water to problem areas by pumping a portion of the flow of the Atchafalaya River to provide surface water requirements. This report, "Proposed Plan for Supplementing Low Flows in Bayou Teche and Vermilion River", contains a description of proposed plans and estimated cost.

## Texas Water Development Board

The Texas Water Plan is a $10 billion water plan for the next 50 years' water needs for Texas. It proposes the transfer of water from the Mississippi River by way of two routes - the west Texas Canal across northern Louisiana and the 420 miles Coastal Canal across southern Louisiana.

Department of Agriculture

The U. S. Department of Agriculture has provided or is in the process of providing assistance in planning 22 Public Law 566 watersheds within the Basin. Their status as of December 31, 1971, is as follows:

Applications Received - no action taken - 5
Approved for Planning - 2
Work Plan Approved for Operations - 11
Project Completed - 4

## ORGANIZATION AND ADMINISTRATION OF STUDY

The Soil Conservation Service, the Economic Research Service, and the Forest Service are the United States Department of Agriculture participants in the Study. The sponsoring State agencies are the Louisiana Department of Public Works and the State Soil and Water Conservation Committee.

A Field Advisory Committee was established to facilitate participation by the Department of Agriculture agencies in the Study. Membership of the committee was as follows: Soil Conservation Service, chairman; Economic Research Service, member; and Forest Service, member. The Field Advisory Committee had overall managerial control of the Study and provided guidance on outlining the details of the Study. They provided a means for close coordination of views throughout the Study, assisted in the resolution of Study problems, and made periodic reviews of progress.

Coordination of USDA studies with studies of other agencies was accomplished under the general direction of the Field Advisory Committee through the Louisiana Department of Public Works. The Louisiana Department of Public Works is the State agency designated to represent Louisiana in the State's water resource development.

## GENERAL PROCEDURES FOR CONDUCT OF STUDY

The sources of primary data included interviews with agricultural workers and field surveys. The sources of secondary data were U. S. Census data, CNI data, Forest Survey data, and other publications.

Projections were made to determine the availability and demand for Basin resources. Projection techniques included linear programming analysis, trend analysis, step-down procedures for projections of larger areas, and the judgment of professional planners.

4-31721 2-74

The projected present rate of development was compared with projected demands to identify the demands that cannot be satisfied with the present rate of development. These unsatisfied demands (residual needs) were met wholly or partially by accelerated development.

Field studies, both field examinations and watershed investigations, were coordinated with cooperating agencies to define the nature, location, and extent of local problems and needs. Maximum use was made of available data. Problems related to floodwater, erosion, sedimentation, drainage, water pollution (including saltwater intrusion) as well as needs related to recreation, irrigation, water supply, land treatment, and fish and wildlife were identified.

Field examination studies were conducted in all CNI watersheds not previously examined. Field data on watershed problems were obtained from on-site observations, local agricultural leaders, community officials, and other residents familiar with local conditions. On-site observations were supplemented with studies of aerial photographs and maps, and results were recorded on field examination summary work sheets. A procedural guide for the conduct of field examination studies was developed by the Basin planning staff to standardize investigation procedures and expedite work completion. Results of the field examination studies were used to classify CNI watersheds as potentially feasible or not potentially feasible for development under existing authority. Feasible watersheds with acute problems or pressing needs were selected for early-action development and those with less pressing problems or needs were categorized for long-range development.

Watershed investigation studies, studies more detailed than field examination studies, were conducted on six watersheds after completion of field examination studies. These watersheds were selected by the Field Advisory Committee and sponsoring organizations.

Field surveys for watershed investigation studies were scheduled to provide minimum information necessary for structural design, planning coordination, and economic evaluation. Valley and channel cross-sections were surveyed only as necessary at intervals along main streams. Quadrangle maps or field surveys were used to determine reservoir storage and design data. Soil borings were taken at selected reservoir and channel locations.

The planning staff analyzed field data using procedures standard for watershed work plan development. They utilized current electronic computer programs to compute flood routings and draft-storage frequency curves; developed reservoir rating curves from either survey or representative data; interpreted soil borings and made suggestions for relocations or special construction methods in final design; determined the adequacy of outlets for proposed channel improvement; made cost allocations to purposes; and computed benefits and benefit-cost ratios.

4-31721 2-74

Investigations were made to determine methods of meeting recreational, irrigational, municipal and industrial, quality control, and fish and wildlife water needs. Recreational needs information was obtained from the Louisiana State Parks and Recreation Commission, water quality and municipal and industrial water needs information from the Louisiana Department of Public Works, and fish and wildlife needs from the Louisiana Wild Life and Fisheries Commission. Specific needs for saltwater intrusion control were obtained from the Corps of Engineers, the Department of Public Works, and local inquiry.

Based on analyses of field information, the planning staff selected potential watershed projects for future development.

Alternative solutions, as determined by field investigations, were appraised individually and in combination to determine their contribution toward solving problems and meeting needs in the areas. Activity analysis was a technique for appraising the present and future productive capacity of the Basin's resources and the primary impacts of alternative water resource programs.

Basin project formulation was accomplished through a plan formulation group. This group consisted of the USDA and the sponsoring State agencies.

The USDA prepared reports as work progressed. The ERS prepared reports on the economic base, outdoor recreation, agricultural land use, and resource development. The Soil Conservation Service prepared Watershed Investigation Reports for six watersheds. The USDA collaborated with the Sponsors in the preparation of the comprehensive report.

## ACKNOWLEDGEMENTS

Cooperation, data, and assistance for the Study were provided by the following State and Federal agencies:

U. S. Agricultural Stabilization and Conservation Service
U. S. Army Corps of Engineers, New Orleans District
U. S. Bureau of Census
U. S. Bureau of Mines
U. S. Bureau of Outdoor Recreation
U. S. Fish and Wildlife Service
U. S. Geological Survey
U. S. Weather Bureau
Federal Power Commission
Environmental Protection Agency
Public Health Service
Louisiana Agricultural Experiment Station
Louisiana Cooperative Extension Service
Louisiana Department of Conservation
Louisiana Department of Highways
Louisiana Department of Public Works

4-31721 2-74

Louisiana Forestry Commission
Louisiana Geological Survey
Louisiana State Parks and Recreation Commission
Louisiana Wild Life and Fisheries Commission

Close contact was maintained with, and special assistance was obtained from, soil and water conservation districts, drainage districts, levee boards, police juries, other local governmental entities, private firms, and individuals.

4-31721 74

# DESCRIPTION OF THE STUDY AREA

## LOCATION AND SIZE

The Southwest Louisiana River Basin comprises an area of about 11,836 square miles--about a quarter of the entire State--and is located in the southwestern part of Louisiana with its base along the coast of the Gulf of Mexico (figure 1). The Basin is bounded on the north and east by the Red River and West Atchafalaya Basin Protection Levees, and on the west by the watershed divide between the Calcasieu and Sabine River Basins. The Study Area is made up of about 11,132 square miles of land and about 704 square miles of surface water.

The three major sub-basins in the Study Area and their drainage areas are the Calcasieu - 4,085 square miles, the Mermentau - 3,896 square miles, and the Teche-Vermilion Rivers - 2,014 square miles. In addition, it includes about 1,457 square miles of the Atchafalaya River Basin and about 384 square miles of the Sabine River Basin. The combined drainage area of the Basin amounts to about 25 percent of the area of the State of Louisiana. All or parts of 17 parishes are included in the Basin Study Area.

## CLIMATE

The average annual rainfall over the Basin ranges from about 58 inches along the coastal area to about 60 inches in the northern part near Woodworth. Near Woodworth, May is the wettest month and September is the driest. Along the coast, July is the wettest and October is the driest. For the entire Basin, slightly over 50 percent of the rainfall occurs during the six month period April through September.

The average annual temperature is about 68 degrees fahrenheit and does not vary significantly throughout the Basin. July and August are the hottest months with a mean temperature of about 83 degrees, and December and January are the coldest months with a mean temperature of about 54 degrees. Extreme high temperatures of about 105 degrees have been recorded in nearly all parts of the Basin, but extreme low temperatures range from about 6 degrees in the northern part to about 13 degrees near the coast. See figure 2 for monthly distributions of mean rainfall and average temperature.

The average length of the frost-free season ranges from about 262 days in the coastal area to about 247 days near Woodworth. Near the coast, the average date of the last killing frost in the spring occurs the first week in March and that of the first killing frost in the fall occurs the second week in November. Near Woodworth, the frost-free season usually extends from the second week in March to the first week in November.

4-31721 2-74

The average annual snowfall is about 1 inch. This amount usually occurs in January or February and it seldom stays on the ground for more than a day.

The average annual gross lake evaporation ranges from about 45 inches near the coast to about 51 inches near Woodworth.

## PHYSIOGRAPHY AND GEOLOGY

Southwestern Louisiana lies within the West Gulf Coastal Plain physiographic region. The area comprises parts of three physiographic belts which roughly parallel the Gulf Coast and a fourth belt transverse to them, the western margin of the Mississippi Valley. Distinguishing surface features of these belts are the degree of stream dissection and the regional slope of the land surface.

The general slope of the region is gulfward. The northernmost topographic belt rises highest above gulf level and has the greatest relief and the steepest slope gulfward. Its surface ranges from gently undulating to local hilly areas and it can be described as an upland plain. The gulf-marginal belt, on the other hand, is a marshland of low relief only slightly above gulf level and gently slopes gulfward. Between the two is a broad, nearly flat prairie.

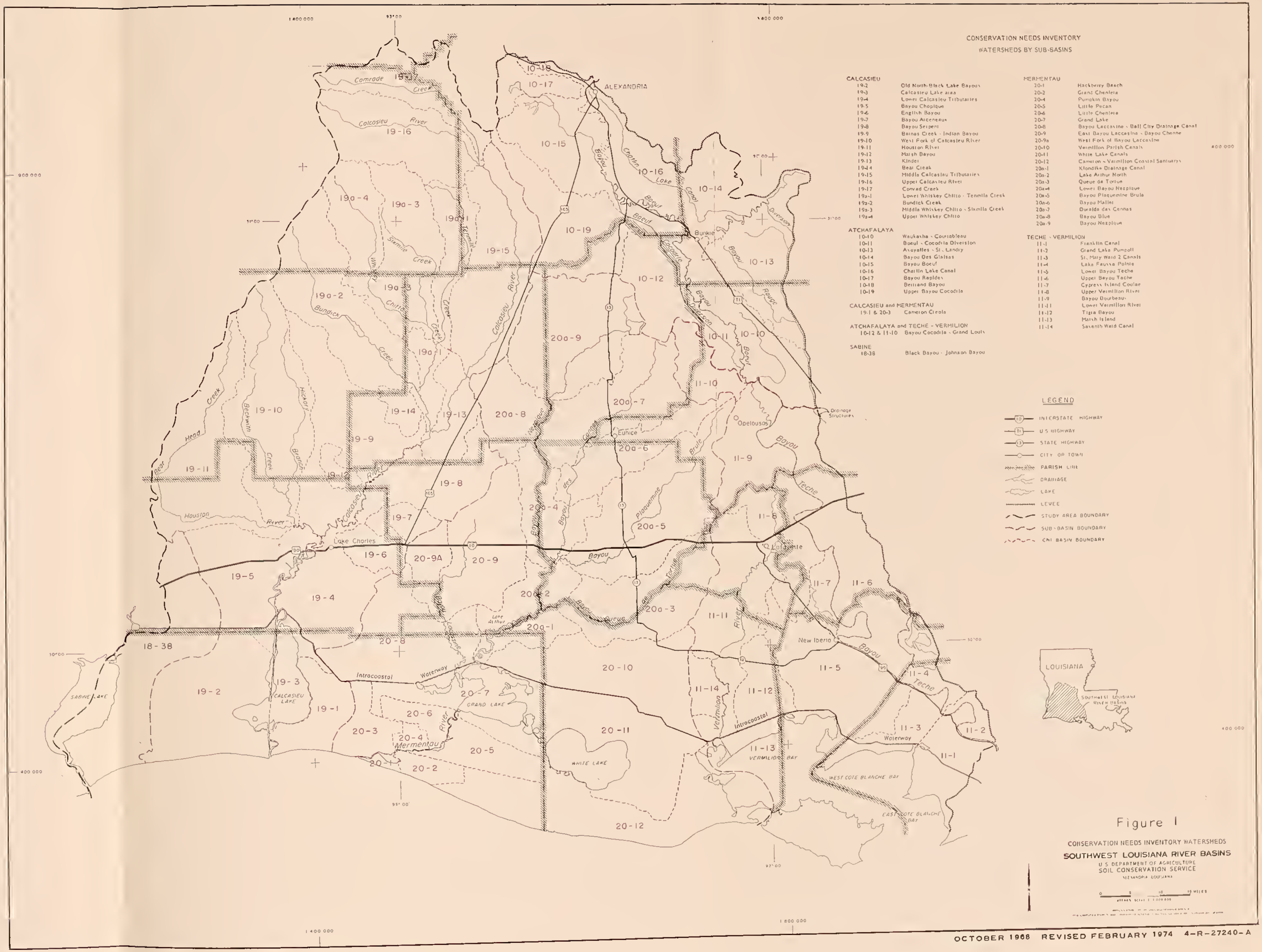
The prairie belt includes nearly all the cultivated lands. It extends almost without a break from the Bayou Teche-Cocodrie drainage system on the east to the Calcasieu-Sabine Rivers drainage divide on the west. Its northern and eastern boundaries generally are marked by a low escarpment or line of hills, whereas its gulfward margin grades almost imperceptibly into marshland.

The altitude of land surface in the marshland is generally less than 5 feet above gulf level. Only narrow beach ridges of sand and shell rise higher to altitudes of about 20 to 25 feet. The prairie ranges in altitude from about 5 feet to about 40 feet. The upland-plains area slopes steeply and rises from altitudes of about 40 feet in northwestern Calcasieu Parish to slightly more than 300 feet in eastern Vernon and southcentral Natchitoches Parishes.

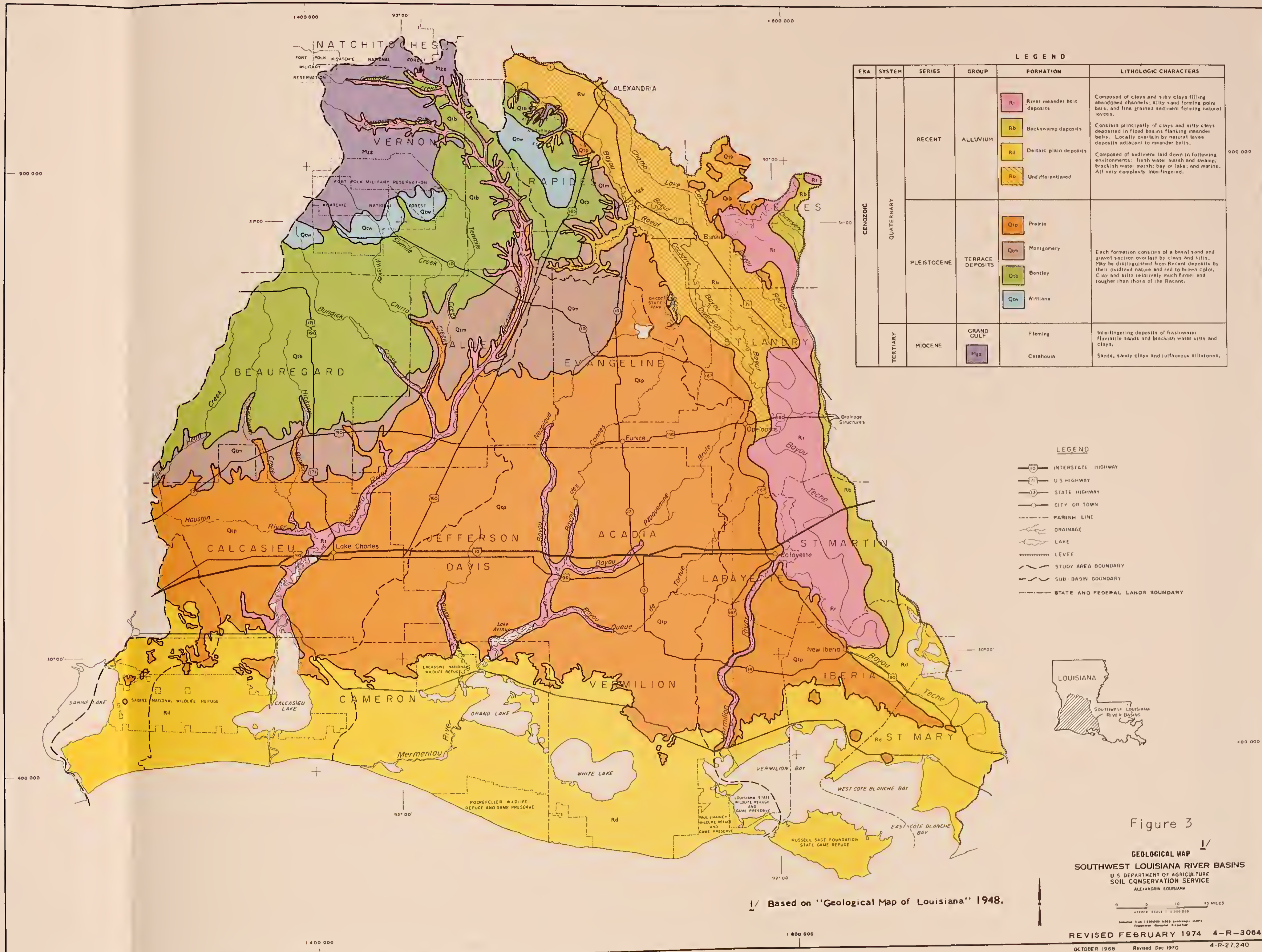
Because deposits older than the Fleming Formation of Miocene age are of little importance for purposes of this report, such deposits are not discussed. The accompanying stratigraphic column (table 1) presents the geologic sequence of occurrence of deposits important to water and land resources. Figure 3 shows the surface geology of the area.

The oldest sediments of significance are in the Grand Gulf Group of Miocene age which contains the Fleming Formation. This group consists of interbedded and alternating, and fluviatile and marine facies with varying quantities of pyroclastic material. Nearly all the sediments are poorly indurated, but resistant beds of silty clays and sands shape the topography of the Miocene terrain. The top of the

4-31721 2-74


CONSERVATION NEEDS INVENTORY
WATERSHEDS BY SUB-BASINS
CALCASIEU
19-2 Old North-Black Lake Bayous
19-3 Calcasieu Lake area
19-4 Lower Calcasieu Tributaries
19-5 Bayou Choupique
19-6 English Bayou
19-7 Bayou Arceneaux
19-8 Bayou Serpent
19-9 Barnes Creek - Indian Bayou
19-10 West Fork of Calcasieu River
19-11 Houston River
19-12 Marsh Bayou
19-13 Kinder
19-14 Bear Creek
19-15 Middle Calcasieu Tributaries
19-16 Upper Calcasieu River
19-17 Comrad Creek
19a-1 Lower Whiskey Chitto - Tenmile Creek
19a-2 Bundick Creek
19a-3 Middle Whiskey Chitto - Sixmile Creek
19a-4 Upper Whiskey Chitto
ATCHAFALAYA
10-10 Waukasha - Courtableau
10-11 Boeuf - Cocodrie Diversion
10-13 Avoyelles - St. Landry
10-14 Bayou Des Glaises
10-15 Bayou Boeuf
10-16 Chatlin Lake Canal
10-17 Bayou Rapides
10-18 Bertrand Bayou
10-19 Upper Bayou Cocodrie
CALCASIEU and MERMENTAU
19-1 & 20-3 Cameron Creole
ATCHAFALAYA and TECHE - VERMILION
10-12 & 11-10 Bayou Cocodrie - Grand Louis
SABINE
18-38 Black Bayou - Johnson Bayou
MERMENTAU
20-1 Hackberry Beach
20-2 Grand Chenier
20-4 Pumpkin Bayou
20-5 Little Pecan
20-6 Little Chenier
20-7 Grand Lake
20-8 Bayou Lacassine - Bell City Drainage Canal
20-9 East Bayou Lacassine - Bayou Chene
20-9a West Fork of Bayou Lacassine
20-10 Vermilion Parish Canals
20-11 White Lake Canals
20-12 Cameron - Vermilion Coastal Sanctuary
20a-1 Klondike Drainage Canal
20a-2 Lake Arthur North
20a-3 Queue de Tortue
20a-4 Lower Bayou Nezpique
20a-5 Bayou Plaquemine Brule
20a-6 Bayou Mallet
20a-7 Ouralde des Cannes
20a-8 Bayou Blue
20a-9 Bayou Nezpique
TECHE - VERMILION
11-1 Franklin Canal
11-2 Grand Lake Pumpoff
11-3 St. Mary Ward 2 Canals
11-4 Lake Fausse Pointe
11-5 Lower Bayou Teche
11-6 Upper Bayou Teche
11-7 Cypress Island Coulee
11-8 Upper Vermilion River
11-9 Bayou Bourbeaux
11-11 Lower Vermilion River
11-12 Tigre Bayou
11-13 Marsh Island
11-14 Seventh Ward Canal
LEGEND
INTERSTATE HIGHWAY
U.S. HIGHWAY
STATE HIGHWAY
CITY OR TOWN
PARISH LINE
DRAINAGE
LAKE
LEVEE
STUDY AREA BOUNDARY
SUB-BASIN BOUNDARY
CNI BASIN BOUNDARY
LOUISIANA
SOUTHWEST LOUISIANA RIVER BASINS
ALEXANDRIA
Bunkie
Opelousas
Eunice
Lake Charles
Lafayette
New Iberia
Figure 1
CONSERVATION NEEDS INVENTORY WATERSHEDS
SOUTHWEST LOUISIANA RIVER BASINS
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
OCTOBER 1968 REVISED FEBRUARY 1974 4-R-27240-A


MEAN RAINFALL — INCHES
AVERAGE TEMPERATURE
LAKE CHARLES
LAFAYETTE
CLIMATE

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Miocene strata dips from its outcrop in the northwestern section of the area to more than 3,000 feet below gulf level in the southern area. It has a thickness in excess of 3,500 feet.

Table 1 - Stratigraphic Column, Southwest Louisiana River Basin

| System | Series | Group | Formation |
|---|---|---|---|
| QUATERNARY | Recent | Alluvium | River meander belt deposits<br>Backswamp deposits<br>Deltaic plain deposits<br>Undifferentiated |
| | Pleistocene | Terrace Deposits | Prairie<br>Montgomery<br>Bentley<br>Williana |
| TERTIARY | Pliocene | | Foley |
| | Miocene | Grand Gulf | Fleming |

The Foley Formation of Pliocene age does not outcrop in the Study Area. It is similar to the underlying Fleming Formation except that the deposits are thinner bedded and the proportion of sand is generally greater. Foley deposits thicken to more than 2,500 feet down-dip from its shallowest position in the northern part of the area.

A group name has not been assigned to the thick mass of Pleistocene age sediments. These deposits thicken from their outcrop, trending east and west through the central part of the area, to more than 2,000 feet along the Gulf Coast.

The Pleistocene terraces are, from oldest to youngest, the Williana, Bentley, Montgomery, and Prairie formations. The outcrops of these formations form more or less continuous bands across the upper two-thirds of the area. Each unit consists generally of a coarse basal phase of lenticular masses of sands and gravels; a central, sandy phase with local lenses of gravels; and an upper, silty clay phase with local sand lenses.

Extensive deposits of Recent age lie in southwestern Louisiana, but the thickest deposits lie in the southeastern part of the Study Area. The gulfward margin of this material has been under wave attack for thousands of years and it is the detrital material derived from it that has been carried along the gulf shoreline and redeposited in the coastal marshland. The deposits are characterized in four environments: (1) river meander belts composed of clays and silty clays filling abandoned channels, silty sand forming point bars, and fine grained sediment forming natural levees; (2) backswamp deposits composed principally of clays and silty clays deposited in floodbasins flanking meander belts and locally overlain by natural levee deposits; (3) deltaic plain deposits laid down in freshwater marsh and swamps, brackish water marsh, bays, lakes, or in saltwater; and (4) undifferentiated, complexly intermixed deposits of the other three types.

Contained within the area are numerous shallow natural lakes including Lake Fausse Pointe, White Lake, Grand Lake, Upper and Lower Mud Lake, Calcasieu Lake, a part of Sabine Lake, and smaller natural lakes such as river cutoffs and intermittent flood overflow lakes. Several other lakes have been constructed by State or private groups with Federal assistance. Freshwater marsh, saltwater marsh, and estuaries occupy about 22 percent of the area in a belt approximately 20 miles wide along the Gulf of Mexico. This area is rich in wildlife and fish and includes several wildlife refuges. Controls have been installed to maintain a freshwater marsh basin between Vermilion Bay and Calcasieu Lake.

Oil and natural gas are produced in every parish except Vernon. Although many of the wells are depleted, the overall production is still quite high.

Generally, sand and gravel are not mined in the Basin although Vernon Parish has several large mines. Other areas have small mines which are worked sporadically. Sand is pumped from the Calcasieu River near Lake Charles.

Sulphur deposits are worked in Calcasieu Parish near Starks. These deposits were formed in conjunction with the formation of a salt dome.

Salt is produced primarily in Cameron, Iberia, and St. Mary Parish from five islands--Jefferson Island, Avery Island, Weeks Island, Cote Blanche Island, and Belle Isle. These islands are piercement-type salt domes. Avery Island is the largest salt mine in the world.

## LAND RESOURCES

### Conservation Needs Inventory

Land and water areas are based on Louisiana data developed for the 1967 National Inventory of Soil and Water Conservation Needs (CNI). The data for Louisiana were developed in accordance with the objectives, policies, and procedures established for the National Inventory.

Areal measurements were made of both the total area and large water areas on the latest quadrangle maps. Areal measurements from aerial

4-31721 2-74

photographs were used to check measurements from the quadrangle maps. Published acreages for the permanent pool surfaces were used as the water areas for constructed lakes. (There were no lakes under construction.) Large water areas include lakes over 40 acres in size and streams more than one-eighth mile wide; small water areas include ponds under 40 acres in size and streams less than one-eights mile wide.

The following tabulation, rounded to the nearest 100 acres, represents existing condition in 1967:

| Land Area | Large Water Area | Small Water Area | Total Land and Water Area |
|---|---|---|---|
| acres | | | |
| 7,124,600 | 346,700 | 103,800 | 7,575,100 |

For USDA study purposes, the total land and water area was divided into inventory, non-inventory, and large water areas. The non-inventory acreage includes: (1) land owned by the Federal Government except agricultural land operated under lease or permit, (2) urban and built-up areas, and (3) small water areas. The following tabulation, rounded to the nearest 100 acres, shows the USDA breakdown for study purposes:

| Inventory Area | Non-Inventory Area | | | Large Water Area | Total Land and Water Area |
|---|---|---|---|---|---|
| | Federal Land (Non-Cropland) | Urban and Built-Up | Small Water Area | | |
| | acres | | | | |
| 6,483,900 | 404,600 | 236,100 | 103,800 | 346,700 | 7,575,100 |

Federal land acreages were obtained from the agencies involved. Urban and built-up acreage and small water acreage were determined by parish CNI committees from records, planimetric measurements, and areal estimates. The inventory acreage was determined by deducting all non-inventory acreage from the total land and small water acreage.

The CNI large water figure of 346,700 acres does not include the area of Vermilion Bay, East Cote Blanche Bay, and West Cote Blanche Bay. Since the areas of these bays are important to fish and wildlife, they have been included as water areas for fish and wildlife in this report. Thus, a total of 650,000 surface acres of large and small water areas has been used for fish and wildlife purposes.

## Farming Regions

The major farming regions are closely related to the land resources on which they are found. Rice farming, the Study Area's major agricultural activity, is found in the southern half of the area predominantly on the flat coast prairies. It is found also on bottom land alluvials, silty uplands, and converted marshland. In the southeast portion where the majority of this continent's sugarcane is

4-31721 2-74

grown, rice farming blends with sugarcane farming. Along the eastern half of the Basin, soybean production has become a major and expanding farming activity in the fertile bottom lands as well as in uplands. The upper two-thirds of this portion of the Basin has long produced corn, cotton, and sweet potatoes; but in recent years, these acreages have declined while soybeans, grain sorghum, rice, and sugarcane have increased. Much of this part of the Basin has a potential for sugarcane production. The northwestern quarter of the Basin is dominantly forest. Except for small areas of farming, this area will probably remain in forest.

## Land Resource Areas

Major Land Resource Areas (LRA's) are composed of soil series having similar origin and characteristics. The Study Area contains five LRA's as delineated in figure 4. Table 2 shows land use by inventoried acreage and total non-inventoried acreage and both by LRA's.

### Southern Mississippi Valley Alluvium (LRA 131)

This area includes the nearly level bottom land soils derived from sediments of the Red and Mississippi Rivers. The soils are fertile and productive but many need flood protection and improved drainage. Because of differences in climate, processing facilities, soils, flood control, and drainage needs, the area is divided into three parts--Northern, Central, and Southern--for discussion.

Northern Area - The loamy Norwood and Gallion soils occupy the higher elevations along Red River, Bayous Rapides, Roberts, Boeuf, Latanier, Rouge, and des Glaises. Cotton, corn, sugarcane, and truck crops are the principal crops grown on these soils. These soils offer the most desirable building sites and nearly all the urban and built-up areas occupy this land.

Table 2 - Land Use 1/ by Land Resource Areas and Inventory and Non-Inventory Acreage
Southwest Louisiana River Basin, 1972

| Land Resource Area 2/ | Inventory | | | | | | Non-Inventory | | | | Large Water | Total Inventory, Non-Inventory, and Large Water Areas |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cropland | Pasture | Range | Forest | Other | Total | Federal | Urban and Built-up | Small Water | Total | | |
| | acres | | | | | | | | | | | |
| 131 | 349 200 | 166,500 | 0 | 406,512 | 27,300 | 949,512 | 2,232 | 29,587 | 12,275 | 44,094 | 27,094 | 1,020,700 |
| 133 | 205,305 | 96,228 | 1,425 | 1,725,490 | 16,336 | 2,044,784 | 268,515 | 21,100 | 18,481 | 308,096 | 1,930 | 2,354,810 |
| 134 | 550 975 | 125,552 | 0 | 105,381 | 45,300 | 827,208 | 5,587 | 73,349 | 5,525 | 84,461 | 21,635 | 933,304 |
| 150 | 1,175,916 | 142,107 | 0 | 74,809 | 51,537 | 1,444,369 | 0 | 106,068 | 12,495 | 118,563 | 2,388 | 1,565,320 |
| 151 | 42,000 | 4,000 | 377,277 | 48,895 | 745,832 | 1,218,004 | 128,241 | 6,053 | 55,034 | 189,328 | 293,618 | 1,700,950 |
| Total | 2,323,396 | 534,387 | 378,702 | 2,361,087 | 886,305 | 6,483,877 | 404,575 | 236,157 | 103,810 | 744,542 | 346,665 | 7,575,084 |

1/ Land use descriptions begin on page 166.
2/ LRA; 131 - Southern Mississippi Valley Alluvium, 133 - Southern Coastal Plains, 134 - Southern Mississippi Valley Silty Uplands, 150 - Gulf Coast Prairies, 151 - Gulf Coast Marsh

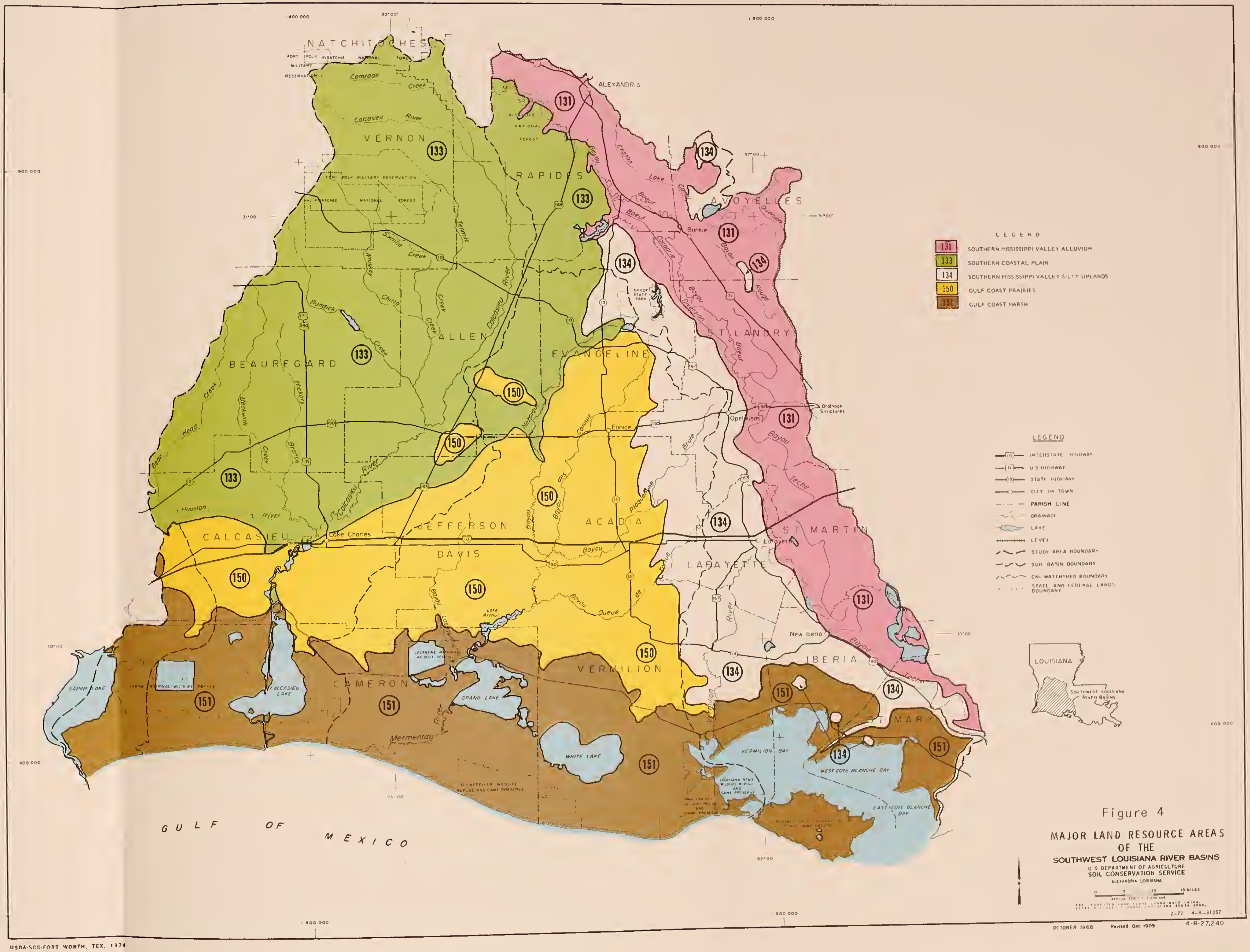


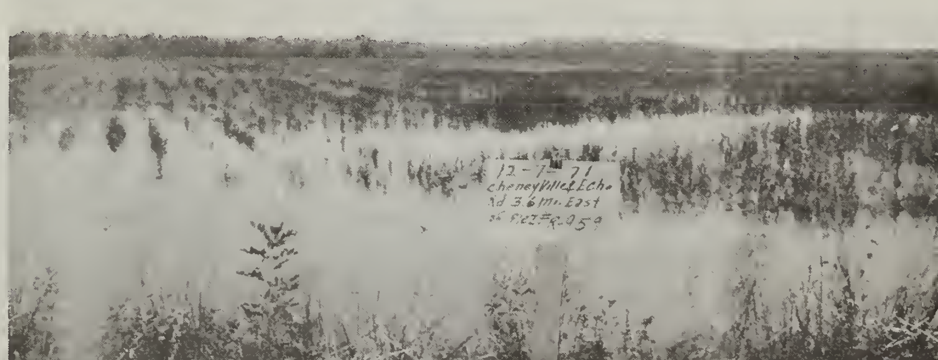

Figure 4
MAJOR LAND RESOURCE AREAS OF THE SOUTHWEST LOUISIANA RIVER BASINS
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ALEXANDRIA, LOUISIANA

This is skip row cotton on soils in Capability Class 1 and 2w (foreground). Other crops such as soybeans, corn, and pasture are generally relegated to Capability Classes 2w, 3w, and 4w as appears beyond the cotton. The forest in the far background would generally be on soils in Capability Classes 4w and 5w. Many acres of these forest lands have been cleared for soybean production.

Typical Bottom Land Landscape in Northern and North Central Area (LRA 131)

In descending order of elevation are the clayey Latanier, Moreland, and Perry soils which occupy areas below and between the natural levees of the Norwood and Gallion soils and receive runoff water from them. Prior to 1960, almost all these lands produced hardwood timber and pasture. When it was found that soybeans could be profitably grown between late spring and early fall, usually without extensive damage from flooding, large acreages of hardwoods were converted to soybeans. In many cases, this was done without regard to elevation. Almost all the northern area is badly in need of flood control and drainage.

Central Area - The loamy Gallion soils occupy the higher elevations or natural levees of lower Bayou Boeuf, Bayou Courtableau, Bayou Wauksha, and upper Bayou Teche. These natural levees are not broad and a large portion of the area is in urban and built-up use. Sugarcane is not generally grown in the central area except in the southern portion. Cotton, corn, and truck crops are the principal crops grown on these soils.



Typical Bottom Land in Central Area (LRA 131). Almost all the Central Area is badly in need of flood control and drainage.

4-31721 2-74

In descending order of elevation are the loamy Galvez soils and the clayey Baldwin and Sharkey soils of the Old Mississippi River flood plain. Cotton, corn, soybeans, and truck crops are the principal crops grown on the Galvez and Baldwin soils; however, cotton has rapidly diminished in the southern portion. Although flooding is a major problem, large areas of Sharkey clay have been cleared of hardwoods and planted to soybeans and rice. Nearly all the central area is badly in need of flood control and drainage.

Southern Area - Gallion, Baldwin, and Galvez soils occupy the natural levee positions along Bayou Teche and are mostly in urban and built-up uses. The Southern Mississippi Valley Silty Uplands LRA is to the south of these natural levees. The Baldwin, Iberia, and Sharkey soils in descending order of elevation are to the north immediately adjacent to the natural levees. The lowest elevations are forested. Sugarcane is the principal crop grown on these soils with soybeans, rice, and corn following in that order. Almost all low-lying Sharkey soils, except where leveed and pumped, are producing hardwood timber.

Sugarcane being covered after planting. Note that rows are wide and high; and the remnant of quarter drain in front of tractor hauling cane to be planted. Good drainage is essential for high yields.

Typical Bottom Land in Southern Area (LRA 131)

Southern Coastal Plain (LRA 133)

This area includes some rolling hills; but nearly level areas in Allen, Beauregard, and Calcasieu Parishes are referred to as "flatwoods". Cadeville, Shubuta, and Ruston fine sandy loams are major soils in the sloping areas. Caddo and Beauregard silt loams are dominant in the nearly level "flatwoods". Soil fertility is low. Natural soil drainage is good in most places. The sloping soils erode easily when used for cultivated crops or cleared for replanting of forest. In many places the early settlers cleared this land to grow crops but because yields were low, it is now forested. Small areas are still used for cropland and pasture.

4-31721 2-74

This picture illustrates change in land use. The land in the "flatwoods" section of the Southern Coastal Plain was nearly clear-cut leaving few seed trees. As a result, this land was used only for range for many years. This land has been seeded to longleaf pine, and is now productive forest. Large acreages have been similarly seeded or planted to forest in recent years. Almost all the forests are grazed. (LRA 133).

Southern Mississippi Valley Silty Upland (LRA 134)

This area includes the nearly level to gently sloping loess-mantled stream terraces that border the Southern Mississippi Valley Alluvium. Cotton, corn, truck crops, and in the southern portion sugarcane, are the principal crops. Pasture and woodland are other principal land uses. The soils are moderately productive. Drainage or erosion control is used to improve crop yields.

The major soils are Coteau, Calhoun, Jeanerette, Patoutville, Memphis, and Loring. Memphis soils are well drained and the major problem is erosion control. Loring soils are moderately well drained and occur on gentle slopes, and erosion control is a minor problem. The other soils are moderately to poorly drained and drainage is the major problem.

Sweet potatoes grown on sloping, well-drained Memphis soils. Note that rows curve as they are on the contour. (LRA 134).

4-31721 2-74

Gulf Coast Prairies (LRA 150)

This area includes the nearly level, poorly drained portion of southwest Louisiana. Rice, soybeans, and pasture are major crops. The native vegetation was prairie grasses and there were only a few acres of forest along streams in this area. Fertility level is moderate. Crowley silt loam, Midland silty clay loam, Mowata silt loam, Morey, and Beaumont silty and clayey soils are dominant soil types.

Young rice on drained and land levelled field. Note absence of the usual many rice levees. The young rice was not damaged by heavy rains which occurred previous to the date of this picture. (LRA 150).

Gulf Coast Marsh (LRA 151)

This area borders the Gulf of Mexico. Almost all the marsh overlies a buried Pleistocene terrace. Originally, almost all this area was freshwater marsh suitable for range and wildlife; now about one-half is freshwater marsh and the remainder is saltwater marsh that is affected periodically by tides. The few sandy ridges in this area are called cheniers. In some areas, the mineral soil materials are overlain by layers of organic material. Soils that are firm enough for cattle to walk on are used for range and wildlife.

4-31721 2-74

Water management in the marsh is needed to provide favorable water levels and salinity control. Excessive flooding, excessive drying, and excessive salinity are detrimental to the growth of desirable vegetation.

Typical Gulf Coast Marsh Range Suitable for Both Range and Wildlife. (LRA 151).

Soil Productivity Groups

For purposes of this Study, soil productivity groups (SPG) were formed by grouping land capability units which have similar productive quality. Each group has a dominant land resource area relationship which may be traced to an area or areas of the Basin. A description of these SPG's, their related components, and the acreage in each group are shown in table 3. Most soils with a wetness problem are included in SPG's 10 through 16 and 18 through 22. The severity of the wetness problem varies from subclass 8w soils in SPG 22 which are not suited to crops or grazing to the subclass 2w soils which have mild drainage problems. The most common soil subclass in the Basin is 3w with over 2.5 million acres. The 7w soils are convertible to 4w by effective drainage and levee development. SPG 16 reflects about 48 thousand acres of this land which is located along the edge of the Coastal Marsh.

Table 3 - Soil Productivity Groups Described, Expressed as Land Capability Units, Dominant Land Resource Area and Total Acreage in Southwest Louisiana River Basin

| Number | Soil Productivity Group Description | LCU[1/] | LRA[2/] | Total Acres |
|---|---|---|---|---|
| 1. | Somewhat poorly-drained to well-drained bottom land soils on the natural levees (frontlands) of the Red and Mississippi Rivers. They have silt loam surfaces and silty clay loam subsoils. These soils are moderate to high in natural fertility. Slopes range from 0 to 3 percent. Erosion is a minor problem on the 1 to 3 percent slopes. Drainage may be needed on some areas where slopes are less than 1 percent. Principal soil series are Norwood, Gallion, Severn, and Commerce. | 1 01<br>1 02<br>2e01<br>2e02 | 131 | 109,756 |
| 2. | Well-drained upland soils that are dominantly in the northwestern part of the basin. They have silt loam or fine sandy loam surfaces, and silty clay loam to sandy clay loam subsoils. These soils are low in natural fertility but respond well to fertilizers. Slopes range from 0 to 3 percent. Erosion is a problem on the 1 to 3 percent slopes when land is cleaned tilled. Principal soil series are Ruston, Cahaba, and Kirvin. | 1 03<br>1 05<br>2e03<br>2e04<br>2e07<br>2e08 | 133 | 331,128 |
| 3. | Well-drained upland soils that are dominantly in the northwestern part of the basin. They have silt loam or fine sandy loam surfaces, and silty clay loam to sandy clay subsoils. They are low in natural fertility but respond well to fertilizers. Slopes range from 1 to 8 percent. Erosion is a major problem when the land is clean tilled. Principal soil series are McLaurin, Bowie, and Kalmia. | 3e03<br>3e05<br>3e07<br>3e08 | 133 | 235,606 |
| 4. | Well-drained upland soils that are dominantly in the northwestern part of the basin. They have silt loam or fine sandy loam surfaces, and silty clay loam to sandy clay subsoils. They are low in natural fertility. Slopes range from 5 to 12 percent. Erosion is a severe problem when land is clean tilled. Principal soil series are Ruston, Kirvin, and Bowie. | 4e01<br>4e04 | 133 | 13,216 |
| 5. | Well-drained upland soils that are dominantly in the northwestern part of the basin. They have silt loam or fine sandy loam surfaces and clay subsoils. They are low in natural fertility and generally give poor response to fertilizer. Slopes range from 1 to 5 percent. Erosion is a severe problem when land is clean tilled. Principal soil series are Gore, McKamie, and Shubuta. | 4e03 | 133 | 48,636 |
| 6. | Somewhat poorly-drained upland soils principally in the central part of the basin. These soils have a silt loam surface and a clay subsoil. They are low in natural fertility and give fair response to fertilizers. Slopes range from 1 to 3 percent. Erosion is a major problem when the land is clean tilled. Principal soil series are Acadia and Crowley. | 3e10 | 133<br>150 | 105,710 |
| 7. | Poorly-drained clayey bottom land soils of the Red and Mississippi Rivers. They have clay or silty clay loam surfaces and clay subsoils. These soils are moderate to high in natural fertility. Slopes range from 1 to 5 percent. Erosion is a problem when the land is clean tilled. Principal soil series are Moreland, Sharkey, and Perry. | 3e01<br>3e02 | 131 | 14,665 |
| 8. | Somewhat poorly-drained upland soils that are dominantly in the central part of the basin. They have silt loam surfaces and silty clay loam or clay subsoils. These soils are low in natural fertility and give fair response to fertilizers. Slopes range from 1 to 3 percent. Erosion is a problem when the land is clean tilled. Principal soil series are Angie, Susquehanna, and Boswell. | 2e06<br>3e04<br>3w13 | 133 | 406,960 |
| 9. | Somewhat excessively-drained upland soils that occur dominantly in the northwest corner of the basin. They have loamy-fine sand surface and loamy-fine sand subsoil. These soils are droughty and are low in natural fertility. The response to fertilizers is fair to poor. Slopes range from 1 to 5 percent. Low available moisture is a major problem. Principal soil series are Lucy, Eustis, and Alaga. | 3s01<br>3s03<br>3s04<br>4s05<br>2s01 | 133<br>151 | 51,294 |
| 10. | Somewhat poorly-drained bottom land soils of the Red and Mississippi Rivers. They have a silty clay loam surface and subsoil. These soils are moderate to high in natural fertility. Slopes range from 0 to 1 percent. Drainage is needed for cropland and pasture. Principal soil series are Commerce, Norwood, and Mhoon. | 2w02<br>2w03<br>2w04 | 131 | 61,354 |
| 11. | Somewhat poorly-drained upland soils that are dominantly in the central part of the basin. They have silt loam surfaces and silty clay loam subsoils. These soils are low in natural fertility but give fairly good response to fertilizers. Slopes range from 0 to 1 percent. Drainage is sometimes needed for cropland. Principal soil series are Coteau, Calloway, and Patoutville. | 2w06<br>2w07<br>2w08<br>2w09<br>2w12 | 134<br>150 | 421,281 |

4-31721 2-74

Table 3 - Continued

| Soil Productivity Group Number: | Description | LCU[1/] | LRA[2/] | Total Acres |
|---|---|---|---|---|
| 12. | Poorly-drained clayey soils of the Red and Mississippi River bottom land and Gulf Coastal Prairies. These soils have clay or silty clay loam surfaces and clay subsoils. These soils are moderate to high in natural fertility. Most slopes range from 0 to 1 percent but undulating phases range from 0 to 3 percent. Drainage is a major problem when used for cultivated crops and pasture. Principal soil series are Iberia, Baldwin, and Beaumont. | 3w01<br>3w02<br>3w03<br>3w04<br>3w09 | 131<br>150 | 938,318 |
| 13. | Poorly-drained upland soils that occur dominantly in the south central part of the basin. They have silt loam surfaces and silty clay loam subsoils. These soils are low in natural fertility and give fairly poor response to fertilizers. Slopes range from 0 to 1 percent. Drainage is a major problem when used for cropland and pasture. Principal soil series are Caddo, Guyton, and Morey. | 3w10<br>3w12<br>3w05 | 133<br>150 | 998,996 |
| 14. | Poorly-drained upland soils that dominantly occur in the central part of the basin. They have a silt loam surface and a clay or silty clay subsoil. These soils are low in natural fertility and give poor response to fertilizers. Slopes range from 0 to 1 percent. Drainage is a major problem for cropland and pasture. Principal soil series are Wrightsville, Midland, and Mowata. | 4w01<br>4w03 | 133<br>150 | 333,357 |
| 15. | Somewhat poorly-drained upland soils that are dominantly in the south central part of the basin. They have a silt loam surface and a silty clay subsoil. These soils are low in natural fertility and give a fair response to fertilizers. Slopes range from 0 to 1 percent. Drainage is a problem for cropland and pasture. Principal soil series are Crowley and Vidrine. | 3w14<br>3w15 | 150 | 614,674 |
| 16. | Poorly-drained marshland soil that is protected by pumpoff systems. This soil is clay throughout. Slopes range from 0 to 1/4 percent. This soil is moderate in natural fertility and is generally high in nitrogen. Drainage is a major problem for cropland and pasture. Principal soil series is Harris. | 4w02 | 151 | 48,436 |
| 17. | Well-drained, strongly sloping or severely eroded soils of the uplands in the northwestern part of the basin. Slope and erosion preclude use for cropland. Principal soil series are Ruston, Kirvin, and Shubuta. | 6e01<br>6e02<br>6e03 | 133 | 125,092 |
| 18. | Soils of the Coastal Marshlands that are stable enough for livestock grazing. Principal soil series are Placedo, Andry, and Harris. | 5s01<br>7w02<br>7w03 | 151 | 318,539 |
| 19. | Soils of the swamplands that is flooded nearly all the time. Principal soil series are Barbary, Maurepa, and Fausse. | 7w01 | 131 | 114,413 |
| 20. | Soils of the Red and Mississippi River bottom lands on the unprotected side of the levee system. This soil is subject to hazardous overflows. Principal soil series are Yahola, Crevasse, and Bruno. | 5w02 | 131 | 0 |
| 21. | Soils of the bottom lands and drainageway in the uplands that are subject to frequent flooding. Principal soil series are Guyton, Iuka, and Ochlockonee. | 5w01<br>5w03<br>5w04 | 133 | 449,023 |
| 22. | Soils of the marshland that are not stable enough for livestock grazing; however, they are suitable for a variety of wildlife. Principal soil series are Lafitte, Scatlake, and Delcomb. | 8w01<br>8w02 | 151 | 680,373 |

1/ Land Capability units used in Conservation Needs Inventory.
2/ Land Resource Areas: 131 - Southern Mississippi Valley Alluvium, 133 - Southern Coastal Plain, 134 - Southern Mississippi Valley Silty Upland, 150 - Gulf Coast Prairies; 151 - Gulf Coast Marshes.

4-31721 2-74

## Land Use and Management

The following tabulation rounded to the nearest 100 acres shows the land use distribution of the inventory acreage which does not include Federal non-cropland:

| Cropland | Pasture | Range | Forest | Other Land | Total |
|---|---|---|---|---|---|
| acres | | | | | |
| 2,323,400 | 534,400 | 378,700 | 2,361,100 | 886,300 | 6,483,900 |

### Cropland Management Practices

Because the cropland is located mostly on flat topography, drainage and flood protection are of prime importance on much of the acreage. In addition to drainage channels, land smoothing and land leveling for water management are important conservation practices. On gently sloping lands, crop residue management, grasses and legumes in rotation, and water control structures are practices effective in increasing infiltration and preventing splash erosion and erosion of field drains and laterals. A small acreage of rolling topography which occurs along the eastern boundary of the Southern Mississippi Valley Silty Uplands LRA and in the Southern Coastal Plain LRA requires practices such as terraces, contour cultivation, and strip cropping to prevent erosion.

### Pasture Management Practices

In the flat lowland areas, the primary pasture management practice is drainage. Reestablishment is needed on areas formerly poorly drained, on eroded uplands, and on land converted from other uses. Improved management is needed to prevent overgrazing and raising the fertility level by fertilizing is needed to provide sufficient growth for soil cover and profitable return.

### Range Management Practices

The most important management practice on upland and marsh range is proper grazing. Often, many areas are overgrazed while other areas receive little use. Range acreage in the upland is being converted to forest, and range acreage in the marsh is being diminished by saltwater intrusion. Cattle walkways are used to distribute grazing over the marsh. Water management in the marsh greatly enhances both grazing and wildlife uses.

### Forest Management Practices

Establishment and reinforcement, timber stand improvement, proper harvesting, and proper grazing are the primary management practices

4-31721 2-74

beneficial to forest production in the uplands. Grazing management is a primary bottom land hardwood practice needed to prevent destruction of seedlings on 77,000 acres of bottom land hardwood forest.

Other Land Management Practices

Critical area plantings and water diversions are primary management practices on construction locations and roadbanks. In many cases, structures can be effective in controlling water levels in the marsh to improve wildlife habitat.

## Forest Land

Forest land occupies 2,603,000 acres, or about 40 percent of the total land area. Major forest timber types (figure 5) include loblolly-shortleaf pine, longleaf-slash pine, oak-pine, and oak-gum-cypress. The pine types are predominantly in the uplands of the Southern Coastal Plain LRA and to a lesser extent in the Gulf Coast Prairie LRA. Oak-pine forest type is scattered along the bottom lands of the Southern Coastal Plain LRA. The oak-gum-cypress forest type is distributed throughout the flood plains of the rivers in the Southern Mississippi Valley Alluvium and Southern Mississippi Valley Silty Uplands LRA's. Loblolly shortleaf pine and longleaf-slash pine occupy extensive and continuous areas in the Southern Coastal Plain LRA. Many of these areas have reverted from agriculture since the 1930's. Oak-pine forest type has reverted more recently along the narrow bottom lands of this LRA. As agriculture has expanded in the Southern Mississippi Valley Alluvium LRA, the bottom land hardwood resources have been reduced from large continuous forests to small, fragmented blocks mainly in the wet areas.

# WATER RESOURCES

Southwestern Louisiana has large quantities of water available for agricultural, municipal, industrial, and domestic purposes. Large volumes of surface water run off during floods, and vast underground deposits of sand and gravel yield very large quantities of water to wells. Even so, this area is not without problems associated with flooding, drainage, and water-supply deficiencies.

## Surface Water

Availability

The total average annual runoff from the Southwest Louisiana Basin is about 6.8 million acre-feet. This is divided about 3 million acre-feet in the Calcasieu River above Lake Charles, about

2 millon acre-feet in the Mermentau freshwater basin above Catfish Point Control Structure, about 500,000 acre-feet in the Vermilion River above Vermilion Bay, and about 1.3 million acre-feet in the Teche River above the Charenton Canal (see figure 6).

A large part of the area in each basin is not gaged. About 55 percent of the Calcasieu Basin above Lake Charles is gaged, only 25 percent of the Mermentau Basin is above principal gages, and about 9 percent of the Vermilion Basin is gaged. The figures shown in table 4 are estimates of natural yield based on available stream gage records.

Table 4 - Analytical System Water Yield Estimates to be Equaled or Exceeded on the Average for the Percent Chance Indicated, Southwest Louisiana River Basin

| Basin | Growing Season (April thru October) | Winter Season (November thru March) | Annual |
|---|---|---|---|
| | --------------------inches | ------------------------- | ------ |
| Calcasieu | | | |
| Percent Chance | | | |
| 50 | 7.0 | 10.3 | 17.9 |
| 90 | 3.2 | 6.2 | 10.9 |
| 95 | 2.5 | 5.4 | 9.3 |
| 98 | 1.9 | 4.6 | 8.0 |
| Mermentau | | | |
| Percent Chance | | | |
| 50 | 7.4 | 10.4 | 20.0 |
| 90 | 3.3 | 6.5 | 12.0 |
| 95 | 2.6 | 5.7 | 10.4 |
| 98 | 2.0 | 4.9 | 8.9 |
| Teche-Vermilion | | | |
| Percent Chance | | | |
| 50 | 6.1 | 10.0 | 16.6 |
| 90 | 2.6 | 6.0 | 10.5 |
| 95 | 2.0 | 5.1 | 9.2 |
| 98 | 1.6 | 4.4 | 7.9 |

Minimum monthly discharges for selected streams are shown in table 5. The discharges are based on the period of record for the gage.

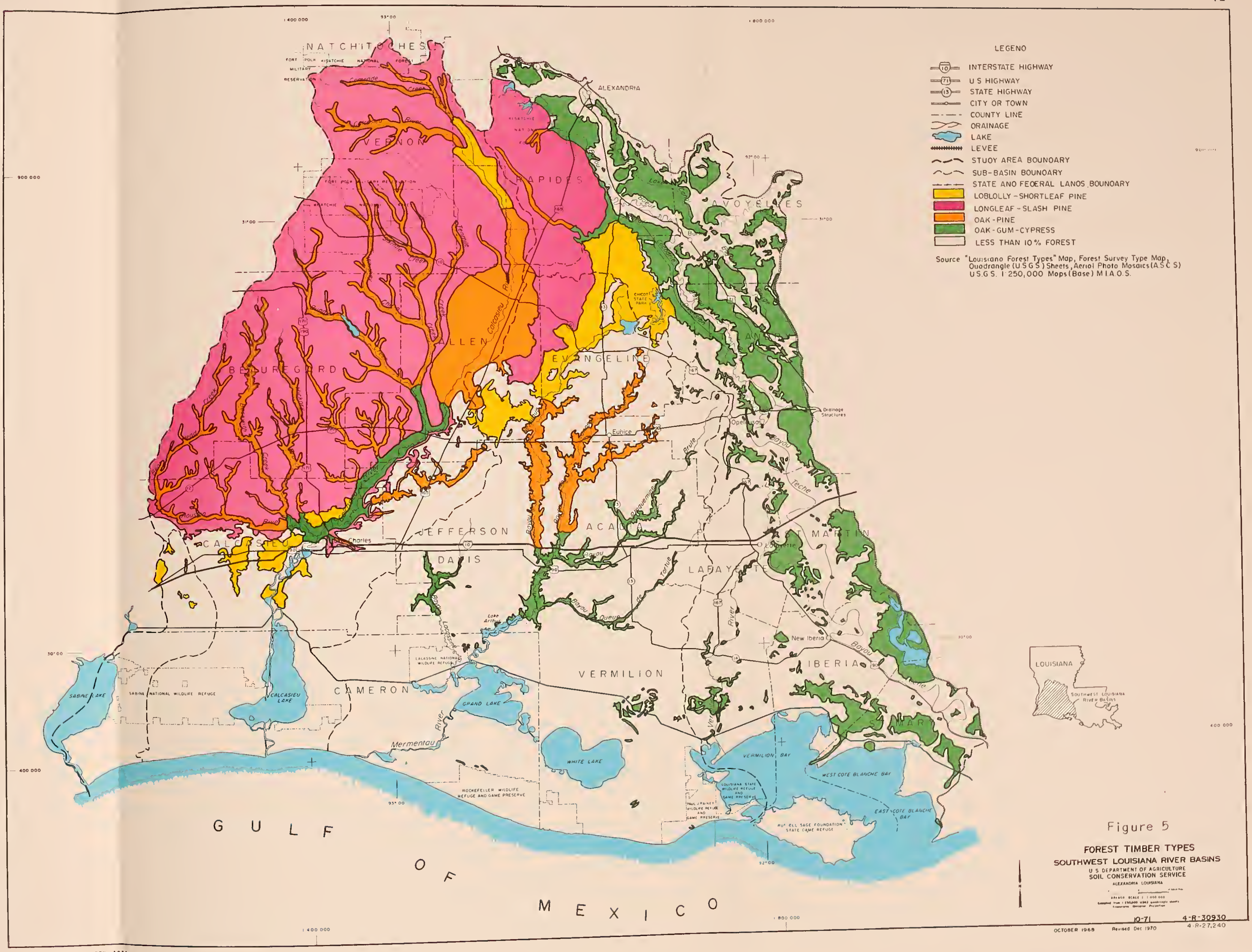



Figure 5

FOREST TIMBER TYPES
SOUTHWEST LOUISIANA RIVER BASINS
U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ALEXANDRIA LOUISIANA

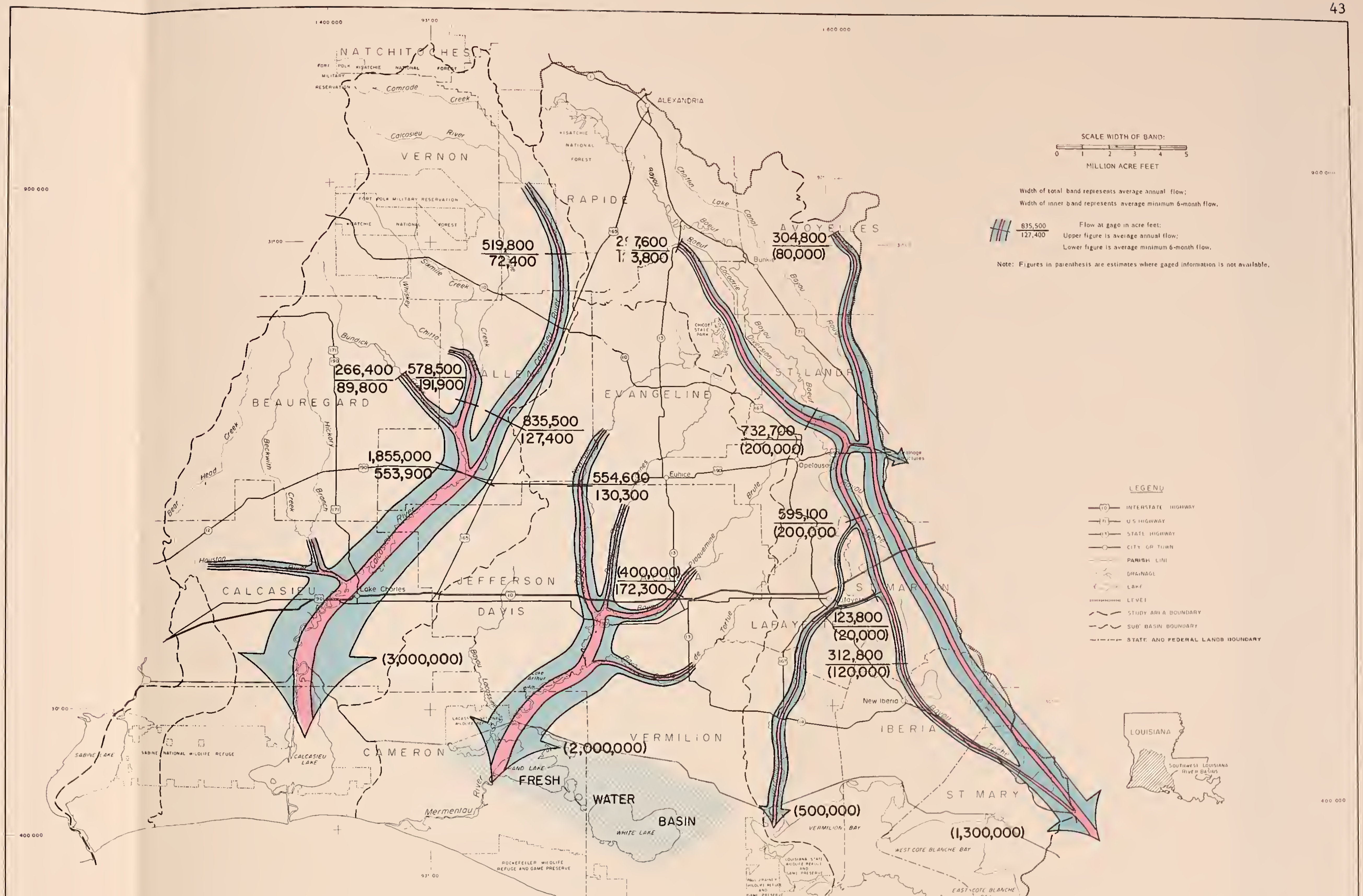



Figure 6

**AVERAGE STREAM FLOW**
SOUTHWEST LOUISIANA RIVER BASINS
U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ALEXANDRIA LOUISIANA

7-71 4-R-30640

OCTOBER 1968 Revised Dec 1970 4-R-27,240

USDA-SCS-FORT WORTH, TEX. 1974

Table 5 - Analytical System Monthly Discharge Estimates at Selected Stations to be Equaled or Exceeded on the Average for the Percent Chance Indicated Southwest Louisiana River Basin

| Station | J | F | M | A | M | J | J | A | S | O | N | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | cubic feet per second | | | | | | | | | | | |
| 50 PERCENT CHANCE | | | | | | | | | | | | |
| Bayou Teche @ Arnaudville | 1050 | 1130 | 1120 | 1105 | 1070 | 825 | 660 | 495 | 370 | 350 | 380 | 865 |
| Bayou Des Cannes near Eunice | 100 | 125 | 26 | 16 | 22 | 35 | 62 | 61 | 41 | 8 | 17 | 55 |
| Bayou Nezpique near Basile | 740 | 1020 | 310 | 185 | 69 | 48 | 120 | 105 | 99 | 18 | 48 | 265 |
| Calcasieu River near Glenmora | 815 | 1030 | 750 | 375 | 180 | 73 | 60 | 41 | 40 | 38 | 58 | 308 |
| Calcasieu River near Oberlin | 1400 | 1700 | 1500 | 905 | 355 | 175 | 150 | 100 | 98 | 75 | 102 | 450 |
| Calcasieu River near Kinder | 2690 | 3195 | 2470 | 1780 | 1200 | 675 | 570 | 452 | 485 | 398 | 500 | 1250 |
| Whiskey Chitto Crk nr Oberlin | 670 | 795 | 630 | 505 | 370 | 275 | 245 | 215 | 207 | 184 | 232 | 475 |
| Beckwith Crk nr DeQuincy | 156 | 158 | 61 | 47 | 15 | 7 | 6 | 6 | 9 | 7 | 10 | 58 |
| 90 PERCENT CHANCE | | | | | | | | | | | | |
| Bayou Teche @ Arnaudville | 575 | 780 | 755 | 805 | 620 | 260 | 205 | 148 | 155 | 125 | 180 | 265 |
| Bayou Des Cannes near Eunice | 7 | 9 | 4 | 2 | 1 | 2 | 4 | 16 | 10 | 1 | 3 | 4 |
| Bayou Nezpique near Basile | 33 | 49 | 25 | 10 | 4 | 2 | 11 | 26 | 22 | 3 | 3 | 8 |
| Calcasieu River near Glenmora | 128 | 256 | 174 | 100 | 51 | 34 | 27 | 22 | 21 | 19 | 25 | 46 |
| Calcasieu River near Oberlin | 218 | 420 | 305 | 185 | 99 | 69 | 58 | 49 | 48 | 43 | 50 | 70 |
| Calcasieu River near Kinder | 785 | 1055 | 850 | 685 | 415 | 328 | 280 | 242 | 278 | 255 | 306 | 370 |
| Whiskey Chitto crk nr Oberlin | 308 | 345 | 305 | 264 | 210 | 177 | 157 | 135 | 128 | 121 | 146 | 186 |
| Beckwith Crk nr DeQuincy | 25 | 35 | 25 | 10 | 4 | 3 | 2 | 2 | 1 | 1 | 2 | 8 |
| 95 PERCENT CHANCE | | | | | | | | | | | | |
| Bayou Teche @ Arnaudville | 525 | 615 | 545 | 710 | 500 | 200 | 190 | 115 | 120 | 115 | 155 | 230 |
| Bayou Des Cannes near Eunice | 3 | 5 | 2 | 1 | 0 | 0 | 1 | 7 | 6 | 8 | 1 | 2 |
| Bayou Nezpique near Basile | 15 | 31 | 16 | 6 | 2 | 1 | 4 | 16 | 16 | 2 | 2 | 5 |
| Calcasieu River near Glenmora | 88 | 186 | 114 | 77 | 42 | 32 | 25 | 22 | 17 | 17 | 22 | 28 |
| Calcasieu River near Oberlin | 142 | 289 | 194 | 149 | 80 | 61 | 54 | 46 | 42 | 35 | 46 | 56 |
| Calcasieu River near Kinder | 592 | 828 | 651 | 587 | 348 | 295 | 250 | 219 | 244 | 239 | 266 | 311 |
| Whiskey Chitto Crk nr Oberlin | 263 | 295 | 266 | 230 | 195 | 162 | 147 | 125 | 114 | 115 | 127 | 144 |
| Beckwith Crk nr DeQuincy | 20 | 31 | 22 | 6 | 4 | 2 | 2 | 1 | 1 | 1 | 1 | 6 |
| 98 PERCENT CHANCE | | | | | | | | | | | | |
| Bayou Teche @ Arnaudville | 460 | 545 | 435 | 540 | 390 | 165 | 155 | 100 | 100 | 110 | 125 | 160 |
| Bayou Des Cannes near Eunice | 1 | 4 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Bayou Nezpique near Basile | 7 | 17 | 9 | 4 | 1 | 0 | 1 | 6 | 11 | 1 | 1 | 2 |
| Calcasieu River near Glenmora | 60 | 115 | 91 | 57 | 38 | 29 | 24 | 18 | 16 | 15 | 19 | 25 |
| Calcasieu River near Oberlin | 103 | 186 | 158 | 119 | 65 | 53 | 50 | 44 | 37 | 33 | 40 | 50 |
| Calcasieu River near Kinder | 470 | 685 | 580 | 489 | 328 | 263 | 215 | 197 | 228 | 229 | 239 | 265 |
| Whiskey Chitto Crk nr Oberlin | 207 | 257 | 239 | 196 | 180 | 147 | 140 | 119 | 106 | 98 | 118 | 124 |
| Beckwith Crk nr DeQuincy | 14 | 25 | 16 | 4 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |

Source: Data developed by the Louisiana Department of Public Works

## Quality

Generally, the quality of natural stream runoff in the basins is suitable for all uses. Records indicate that the chemical analyses vary at sampling dates and stream locations, but overall, the unaltered quality is good for most agricultural, industrial, and municipal purposes.

The suitability of water for rice irrigation is governed by factors such as the chemical components of the water, the nature of the soil, and the stage of growth of rice. In southwest Louisiana, most damage to rice crops from irrigation water stems from excess salinity. Thus, the primary measure of water suitable for this purpose is chloride concentration. Also, it is generally agreed that 600 parts per million of sodium chloride or 35 grains per gallon, is not harmful to rice at any stage of growth. The data in table 6 was taken from published records. It can be used to determine the suitability of the water for irrigating rice based on salinity.

In the Calcasieu Basin, records indicate that the Calcasieu River water above Lake Charles can be used for most purposes. Below Lake Charles, however, the river is contaminated by industrial pollution. Also, below Lake Charles, saltwater is a problem. In 1967, a saltwater barrier was constructed in Calcasieu River about 1 mile upstream from U.S. Highway 90.

In the Mermentau Basin, a large part of the water pumped for irrigation is derived from storage in the freshwater basin below Lake Arthur. This storage is interconnected with the Intracoastal Canal system which is used for navigation. It is closed from the gulf by four locks. The locks are operated for navigation and to hold the water level within the basin at an elevation of 2.0 feet mean low gulf. During dry years when irrigation pumpage is heavy, the water level within the basin is drawn down below the 2.0 foot level. At these times, the locks are opened to permit entry of gulf water. When this happens, operators of the pumping plants must make frequent salinity analyses in order to control salinity on the rice. As can be seen from table 6, salinity within this freshwater basin has been as high as 11,500 parts per million. Above Lake Arthur, the quality of Mermentau River water usually is suitable for all uses. At times in the past, however, there have been instances of local contamination from oilfield operations.

Hurricane tides, depending on their magnitude, may cause measurable increases in salinity for short periods of time in the freshwater basin. Usually, hurricanes are accompanied by large volumes of freshwater runoff which tend to offset salinity increases caused by the tides. The highest salinity concentrations occur during prolonged periods of extreme drought.

In the Teche Basin, the water in Bayou Teche below Keystone Lock and Dam is sometimes degraded by saltwater and industrial pollution. This problem is more severe during low flow periods on Bayou Teche. However, as shown in table 6, the extreme salinity recorded at Charenton occurred in 1960 when the salinity reached 400 parts per million. Above the Keystone Lock and Dam, the quality of Bayou Teche water is not suitable for municipal use without treatment, but is suitable for most other purposes without treatment.

In the Vermilion Basin, there is extensive industrial contamination in the Vermilion River below Lafayette. Also in this reach, saltwater intrusion occurs when heavy irrigation withdrawals exceed streamflow. At these times, saltwater is drawn up the river from Vermilion Bay.

4-31721 2-74

Table 6 - Salinity Measurements for the Period Indicated
Southwest Louisiana River Basin

| Basin and Location | Year | Number of Measurements | Chlorides Concentration Low | Average | High |
|---|---|---|---|---|---|
| | | | ----parts per million---- | | |
| CALCASIEU | | | | | |
| Glenmora | 1952 | 1 | - | 8.2 | - |
| | 1953 | 3 | 3.5 | 5.0 | 5.2 |
| | 1967 | 1 | - | 5.9 | - |
| | 1968 | 1 | - | 1.5 | - |
| | 1969 | 1 | - | 7.6 | - |
| Oberlin | 1967 | 1 | - | 8.0 | - |
| | 1968 | 1 | - | 6.8 | - |
| Kinder | 1967 | 1 | - | 8.6 | - |
| | 1968 | 1 | - | 4.6 | - |
| | 1969 | 1 | - | 7.1 | - |
| MERMENTAU | | | | | |
| Basile | 1959 | 2 | 7 | 16 | 25 |
| Crowley | 1969 | 1 | - | 49 | - |
| Lake Arthur | 1952 | 18 | 8 | 218 | 1960 |
| | 1953 | 81 | 4 | 20 | 38 |
| | 1954 | 62 | 8 | 85 | 352 |
| | 1955 | 33 | 6 | 20 | 33 |
| | 1956 | 35 | 14 | 48 | 129 |
| | 1957 | 31 | 8 | 26 | 130 |
| | 1958 | 22 | 2 | 20 | 35 |
| | 1959 | 23 | 10 | 22 | 52 |
| | 1960 | 17 | 3 | 62 | 170 |
| | 1962 | 25 | 12 | 44 | 132 |
| | 1963 | 27 | 26 | 65 | 325 |
| | 1964 | 24 | 8 | 35 | 86 |
| | 1965 | 24 | 13 | 45 | 82 |
| | 1967 | 25 | 13 | 35 | 66 |
| | 1968 | 17 | 7 | 30 | 47 |
| | 1969 | 15 | 2 | 20 | 52 |
| White Lake (Freshwater basin) | 1952 | 41 | 190 | 425 | 900 |
| | 1953 | 32 | 30 | 148 | 600 |
| | 1954 | 22 | 130 | 355 | 530 |
| | 1960 | 16 | 330 | 1100 | 3100 |
| | 1961 | 19 | 100 | 178 | 260 |
| Catfish Point (Freshwater basin) | 1952 | 108 | 50 | 364 | 2250 |
| | 1953 | 99 | 10 | 198 | 1050 |
| | 1954 | 102 | 140 | 3524 | 9500 |
| | 1955 | 90 | 30 | 84 | 320 |
| | 1956 | 109 | 60 | 1781 | 5900 |

Continued-

Table 6 - Continued

| Basin and Location | Year | Number of Measurements | Chlorides Concentration Low | Average | High |
|---|---|---|---|---|---|
| | | | ----parts per million---- | | |
| Catfish Point | 1957 | 101 | 20 | 1180 | 5700 |
| (Freshwater basin) | 1958 | 105 | 50 | 604 | 2650 |
| cont. | 1959 | 143 | 30 | 169 | 800 |
| | 1960 | 152 | 70 | 4350 | 11500 |
| | 1961 | 153 | 30 | 150 | 700 |
| Lacassine Refuge | 1952 | 108 | 10 | 53 | 100 |
| (Freshwater basin) | 1953 | 106 | 10 | 32 | 70 |
| | 1954 | 109 | 20 | 216 | 560 |
| | 1955 | 104 | 10 | 30 | 70 |
| | 1956 | 105 | 20 | 110 | 270 |
| | 1957 | 83 | 10 | 36 | 70 |
| | 1958 | 104 | 10 | 53 | 130 |
| TECHE | | | | | |
| Arnaudville | 1959 | 5 | 7 | 16 | 26 |
| | 1960 | 5 | 11 | 17 | 22 |
| | 1961 | 1 | - | 19 | - |
| Charenton | 1958 | 152 | 20 | 100 | 310 |
| | 1959 | 148 | 50 | 90 | 230 |
| | 1960 | 153 | 40 | 140 | 400 |
| | 1961 | 153 | 10 | 80 | 170 |
| Franklin | 1958 | 153 | 20 | 40 | 60 |
| | 1959 | 151 | 20 | 60 | 100 |
| | 1960 | 152 | 20 | 70 | 120 |
| | 1961 | 98 | 10 | 40 | 80 |
| VERMILION | | | | | |
| Lafayette | 1959 | 5 | 29 | 70 | 160 |
| | 1960 | 5 | 28 | 50 | 120 |
| | 1969 | 3 | 7 | 23 | 56 |
| Perry | 1967 | 5 | 19 | 34 | 44 |
| | 1968 | 5 | 22 | 30 | 43 |
| | 1969 | 4 | 15 | 42 | 260 |
| Bancker's Ferry | 1952 | 20 | 13 | 243 | 2070 |
| | 1953 | 98 | 5 | 40 | 92 |
| | 1954 | 85 | 13 | 1030 | 3740 |
| | 1955 | 31 | 6 | 50 | 136 |
| | 1956 | 57 | 17 | 910 | 4460 |
| | 1957 | 46 | 7 | 50 | 118 |
| | 1958 | 26 | 12 | 70 | 174 |
| | 1959 | 29 | 12 | 80 | 280 |
| | 1960 | 21 | 13 | 125 | 821 |

Source: U. S. Geological Survey and U. S. Army Engineers Published Data

4-31721 2-74

## Ground Water

### Supply

Southwestern Louisiana is underlain by vast deposits of sand and gravel which yield very large quantities of water to wells. The best aquifers (water-bearing formations) generally range in thickness from 200 to 600 feet, but one massive aquifer in south-central Acadia Parish is more than 800 feet thick. The aquifers, which slope gently gulfward, are overlain by a widespread deposit of clay except for the sandy Pleistocene hilly deposits in the northern section. Recharge is accomplished from rainfall in the hills and broad rolling uplands and through stream-carried runoff.

The four principal ground water reservoirs of southwestern Louisiana, from oldest to youngest in geologic age, are the Miocene sands, and the Evangeline, Chicot, and Atchafalaya reservoirs. These reservoirs are formed by the Fleming Formation of Miocene age, the Foley Formation of Pliocene age, the Williana, Bentley, Montgomery, and Prairie Formations of Pleistocene age, and the LeMoyen Formation of Recent age, respectively.

The Miocene sands, some of which are referred to as the Jasper aquifer system, are important as aquifers in Vernon and Rapides Parishes. These beds contain thick sandy intervals alternating with thinner clayey intervals. Significant freshwater-bearing sand beds range in thickness from 10 to 230 feet with an average thickness of 45 feet. Domestic wells, yielding from 10 to 50 gallons per minute (gpm), range from 100 to 500 feet deep. Municipal and industrial wells are as deep as 1,300 feet and yield from 50 to 600 gpm.

The Evangeline reservoir is important in Beauregard, Allen, and Evangeline Parishes. It contains a system of freshwater aquifers in the Foley Formation of Pliocene age. The aquifers are a series of beds of medium to fine grained sand, clay, and silt. Although individual aquifers in places are more than 75 feet thick, they are generally much less. The average sand thickness ranges from 10 to 27 feet. Well yields vary from very small quantities to 1,000 gpm. Relatively few wells have been completed in the Evangeline reservoir; mainly because depths range from 200 feet to 900 feet, and large quantities of water are available from the overlying Chicot reservoir.

The name Chicot reservoir is assigned to the system of aquifers formed by massive sand and gravel deposits of Pleistocene age. It is the most important ground water source in southwestern Louisiana. The massive water-bearing bed is the principal aquifer and is generally less than 200 feet below the surface in the central part of the Basin, but in areas down-dip the top may be below 700 feet. Some aquifers of the Chicot are among the thickest uniformly permeable granular water-bearing beds in the United States. The thickness of individual beds ranges from a few feet to about 800 feet, the thickest beds occurring in southern Acadia and northern Vermilion Parishes.

4-31721 2-74

Elsewhere, aquifer thickness of 200 to 400 feet are commonplace. Any aquifer in the system suitable for development of wells will provide moderate to large perennial supplies because the aquifer has great areal continuity and effective hydraulic interconnection with other aquifers of the reservoir. Yields of wells generally are large; the largest is about 6,000 gpm from a rice irrigation well. The average well yields are about 1,800 gpm.

The Atchafalaya reservoir is composed of the graveliferous aquifer formed by sediments of the LeMoyen Formation that partly fill the pre-Recent scour trenches of the Mississippi River and its western tributaries. Although the highly permeable deposit of gravel and sand only partly fills the scour trenches, it constitutes an important freshwater aquifer in Lafayette and Vermilion Parishes. Along much of their length, trenches of the reservoir lie in direct contact with aquifers of the Chicot reservoir. The hydraulic continuity established by this contact is a factor of major importance because it provides an excellent opportunity for recharge waters to move from the Atchafalaya River through the Atchafalaya reservoir into the Chicot reservoir. Because of its origin as a channel-fill deposit, the Atchafalaya reservoir varies in thickness. Along the axis of a scour trench, its thickness (about 250 feet) is rather constant; but transverse to the trench, the thickness decreases rapidly in either direction. Yields of large diameter wells in this reservoir are similar to yields in the Chicot reservoir.

Quality

Fresh ground water occurs throughout the Basin. In only two localities is the chloride content high enough in existing wells to make the water unsuitable for irrigation. One location is in the lower reach of the Vermilion River where the aquifer is in contact with frequently salt-contaminated river water; the other is a few miles southeast of Lake Charles.

## Water Use

The data presented for water use was taken from reports prepared by the Louisiana Department of Public Works (DPW). The reports provide the basis for the Comprehensive Water and Related Land Resources Plan for the State of Louisiana.

The basis for estimating irrigation water usage was a survey which included farms that irrigated crops in the base year 1967. The survey was coordinated by the Department of Public Works through the Technical Action Panel (now known as the Rural Development Committee) which includes the Soil Conservation Service, the Louisiana Extension Service, the Agricultural Stabilization and Conservation Service, and the Farmers Home Administration.

4-31721 2-74

The municipal water use data is based primarily on information obtained from the United States Geological Survey (USGS). The USGS data were supplemented when necessary with information from an "Inventory of Water Utilities", prepared by Public Service Research, Incorporated. A report titled "Municipal Water Facilities", compiled by the Louisiana State Board of Health and published by the Federal Public Health Service, was also used.

The industrial water use study was based primarily on returns from an industrial water usage survey mailed to approximately 2,250 industries in Louisiana. About 60 percent of these industries returned completed questionnaries, representing approximately 80 percent of the total industrial water of the State.

The Department of Public Works reports presented data by Water Resource Planning Areas, one of which corresponded roughly with the Southwest Louisiana River Basin Study Area. Where conflicts occurred, the data were adjusted to match the Southwest River Basin.

## Agricultural

In 1967, approximately 1,725,000 acre-feet of water was used for agricultural purposes in the Southwest Louisiana River Basin. See table 7.

Table 7 - Total Agricultural Water Use in 1967 by Months
Southwest Louisiana River Basin

| Month | Irrigation | | Fish Farming | | Livestock & Poultry | | Total Agricultural Use | |
|---|---|---|---|---|---|---|---|---|
| | Rice | Other | Catfish | Crawfish | Livestock | Poultry | | |
| | acre feet | | | | | | | (mil. gallons) |
| January | 0 | 0 | 1,731 | 1,829 | 682 | 5 | 4,247 | 1,384 |
| February | 0 | 0 | 1,615 | 1,677 | 615 | 5 | 3,912 | 1,275 |
| March | 0 | 0 | 288 | 305 | 682 | 5 | 1,280 | 417 |
| April | 230,373 | 15 | 173 | 1,372 | 660 | 5 | 232,598 | 75,792 |
| May | 479,380 | 108 | 404 | 3,049 | 682 | 5 | 483,628 | 157,591 |
| June | 652,160 | 309 | 115 | 3,658 | 660 | 5 | 656,907 | 214,054 |
| July | 255,782 | 325 | 577 | 1,982 | 682 | 5 | 259,353 | 84,510 |
| August | 76,226 | 355 | 692 | 1,219 | 682 | 5 | 79,179 | 25,801 |
| September | 0 | 247 | 173 | 152 | 660 | 5 | 1,237 | 403 |
| October | 0 | 186 | 0 | 0 | 682 | 5 | 873 | 285 |
| November | 0 | 0 | 0 | 0 | 660 | 5 | 665 | 217 |
| December | 0 | 0 | 0 | 0 | 682 | 5 | 687 | 224 |
| TOTAL | 1,693,921 | 1,545 | 5,768 | 15,243 | 8,029 | 60 | 1,724,566 | 561,953 |

Source: Gulf South Research Institute

This amounts to 93.3 percent of the total agricultural water use in the State of Louisiana. This extremely heavy usage is due entirely to the extensive cultivation of rice in the region; therefore, it is of critical importance to future planning.

Table 8 shows usage by category and emphasizes the vast difference between water used for irrigation and that used for other agricultural purposes. Irrigation of crops other than rice is one of the least significant of all agricultural water use categories.

Table 8 - Agricultural Water Use in 1967
Southwest Louisiana River Basin

| Water Use | Amount | |
|---|---|---|
| | acre-feet | percent |
| Crops | | |
| Rice | 1,693,921 | 98.2 |
| Other | 1,545 | < 0.1 |
| Total Crops | 1,695,466 | 98.3 |
| Fish Farming | | |
| Catfish | 5,768 | 0.3 |
| Crawfish | 15,243 | 0.9 |
| Total Fish | 21,011 | 1.2 |
| Livestock and Poultry | | |
| Livestock | 8,029 | 0.5 |
| Poultry | 60 | <0.1 |
| Total Livestock & Poultry | 8,089 | 0. |
| GRAND TOTAL | 1,724,566 | 100.0 |

Source: Gulf South Research Institute

Table 9 shows acres irrigated, water use per acre, and sources of supply for the Southwest Louisiana River Basin. The rice irrigation season generally extends from April through September and, because of the huge amounts of water used in these months, constitutes the period of heaviest agricultural water usage.

A study of Table 9 reveals that surface sources accounted for 28 percent of irrigation water, ground water supplied 34.4 percent, and water companies supplied 37.6 percent. However, when it is considered that water companies derive 94.3 percent of their water from surface sources, the ratio between ground and surface water changes substantially.

Then, surface sources supply over 63 percent of the total irrigation water used. All water furnished by irrigation companies is used for rice irrigation.

Table 9 - Acres Irrigated, Total Water Use Per Acre and Sources of Supply in 1967, Southwest Louisiana River Basin

| Crop | Source of Supply (Acre-Feet Supplied): Water Companies | Self Supplied: Surface | Self Supplied: Wells | Total Acre-Feet Used | Acres Irrigated | Coefficient 1/ Per Acre Irrigated |
|---|---|---|---|---|---|---|
| Rice | 638,281 | 473,685 | 581,955 | 1,693,921 | 542,700 | 3.12 |
| Other | 0 | 1,097 | 448 | 1,545 | 1,992 | 0.78 |
| Total | 638,281 | 474,782 | 582,403 | 1,695,466 | 544,692 | 3.11 |

1/ Includes on-farm distribution and canal losses.

Source: Gulf South Research Institute

Table 10 lists streams which furnish water to self-supplied individuals. The Intracoastal Waterway and associated freshwater Basin is the principal source, supplying about 114,926 acre-feet in 1967. Surface sources furnished a total of about 474,782 acre-feet of water to self-supplied individuals in 1967.

Table 11 lists streams which supply water companies and the volume pumped in 1967. Water companies drew a total of 601,644 acre-feet from surface sources; and a total of 36,639 acre-feet from ground sources.

A study of Tables 10 and 11 shows that the Vermilion River furnished about 173,968 acre-feet of water to both types of users in 1967; about 111,921 acre-feet to water companies and about 62,047 acre-feet to self-supplied individuals.

Table 12 lists the major water companies which were active in the Southwest Basin during 1967 and the amount of water they supplied rice farmers.

Rice irrigation coefficients vary substantially according to the source of supply whether the water is self-supplied or purchased from a water company. The coefficient for water companies is much higher at 5.67 acre-feet per acre than the self-supplied coefficient at 2.49. Canal losses by water companies account for much of this difference.

4-31721 2-74

Table 10 - Principal Supplying Streams for Self-Supplied Individuals (1967)
Southwest Louisiana River Basin

| Stream | Surface Source (acre-feet) |
|---|---|
| Intracoastal Waterway | 114,926 |
| Bayou Queue de Tortue | 69,192 |
| Vermilion River | 62,047 |
| Mermentau River | 30,900 |
| Bayou Plaquemine-Brule | 20,103 |
| Bayou Lacassine | 19,662 |
| Bayou Des Cannes | 17,676 |
| Bayou Teche | 16,752 |
| Lake Arthur | 14,908 |
| Bayou Chene | 10,902 |
| Bayou Mallet | 9,833 |
| Duson Canal | 9,625 |
| Bayou Nezpique | 9,199 |
| White Lake | 7,308 |
| Calcasieu River | 6,825 |
| English Bayou | 6,013 |
| Bayou Choupique | 4,980 |
| Bayou Wikoff | 4,537 |
| Bayou Boeuf | 3,186 |
| Indian Bayou | 2,830 |
| Whiskey Chitto Bayou | 2,777 |
| Grand Coulee | 2,487 |
| Old Intracoastal Waterway | 2,446 |
| Bayou Cocodrie | 2,424 |
| Marsh Bayou | 1,861 |
| Bayou Serpent | 1,598 |
| Lake Peigneur | 1,243 |
| Calcasieu Lake | 1,065 |
| Bayou Courtableau | 1,054 |
| Sweet Lake | 855 |
| Grand Lake | 692 |
| Houston River | 647 |
| Reservoirs | 563 |
| Bayou Parcperdue | 524 |
| Vinton Waterway | 455 |
| Little Bayou | 327 |
| Bayou Carencro | 321 |
| Catahoula Coulee | 237 |
| Bayou Grand Marais | 192 |
| Barnes Creek | 127 |
| Kenny's Coulee | 117 |
| Bayou Portage | 113 |
| Beckwith Creek | 110 |
| Bayou Rapides | 64 |
| Bayou Carron | 47 |
| Turkey Creek | 45 |
| Long Lake | 30 |
| Cypress Creek | 26 |
| Undetermined | 10,931 |
| TOTAL | 474,782 |

Source: Gulf South Research Institute

4-31721 2-74

Table 11 - Water Sources for Irrigation Companies (1967)
Southwest Louisiana River Basin

| Surface Sources | Acre-Feet Supplied | Percent of Total |
|---|---|---|
| Vermilion River | 111,921 | 18.60 |
| Bayou Nezpique | 75,757 | 12.59 |
| English Bayou | 48,502 | 8.06 |
| Gum Slough | 47,890 | 7.96 |
| Bayou Plaquemine-Brule | 42,872 | 7.13 |
| Bayou Des Cannes | 40,208 | 6.68 |
| Old River of Sabine | 29,560 | 4.91 |
| Bayou Serpent | 25,755 | 4.28 |
| Lacassine Bayou | 25,755 | 4.28 |
| Sweet Lake | 25,755 | 4.28 |
| Calcasieu River | 24,290 | 4.04 |
| Bayou Queue de Tortue | 21,744 | 3.61 |
| Bayou Choupique | 5,105 | .85 |
| Houston River | 1,232 | .21 |
| Undetermined | 75,298 | 12.52 |
| Total Surface Sources | 601,644 | 94.26 1/ |
| Total Ground Sources | 36,639 | 5.74 |
| Total | 638,283 | 100.00 |

1/ Percent of Surface Sources

Source: Gulf South Research Institute

Table 12 - Irrigation Water Supplied by Water Companies (1967)
Southwest Louisiana River Basin

| Water Companies | Acre-Feet Supplied | Percent Of Total | Cumulative Total (percent) |
|---|---|---|---|
| Louisiana Irrigation and Milling Company | 121,842 | 19.09 | 19.09 |
| Acadia-Vermilion Rice Irrigation | 111,921 | 17.54 | 36.63 |
| Sweetlake Oil Company and Louisiana Irrigation Co. | 88,505 | 13.87 | 50.50 |
| Farmers Land and Canal Company | 53,891 | 8.44 | 58.94 |
| Sabine Irrigation Company, Inc. | 47,890 | 7.50 | 66.44 |
| Krause and Managan | 30,792 | 4.82 | 71.26 |
| Edgerly Rice Dryer | 25,527 | 4.00 | 75.26 |
| Bazile Canal Company | 19,854 | 3.11 | 78.37 |
| Kinder Canal Company | 19,287 | 3.02 | 81.39 |
| Riverside Irrigation Company | 13,614 | 2.13 | 83.52 |
| Riviana Foods, Inc. | 13,047 | 2.04 | 85.56 |
| Frankel Farm and Irrigation Company | 6,319 | .99 | 86.55 |
| Stansel Canal Company | 5,905 | .93 | 87.48 |
| Others 1/ | 79,887 | 12.52 | 100.00 |
| Total | 638,281 | | |

1/ Contribution of approximately 237 other companies that sold irrigation water in 1967

Source: Agricultural Water Company Survey: Data published in Department of Public Works report, "Present Agricultural Water Use in Louisiana", 1970.

## Municipal

In 1967, public water utilities supplied 547,925 persons with 19,972.8 million gallons of water. Ground water supplied 100 percent of this water. This usage includes all water supplied by public water utilities for residential, industrial, commercial, and public unaccounted usage. Public unaccounted usage includes non-revenue producing usage and leakage.

Table 13 indicates the water uses through public utilities by parishes, the number of persons served, and the daily consumption rate. Also, it gives an indication of municipal water prices.

The Southwest Basin had a consumption rate of about 100 gallons per capita per day (gpcd); the State average was 132, both well below the national rate of 157 gpcd. Between 1954 and 1967, however, the State's per capita usage rate increased faster than that of the national rate.

Table 13 - Municipal Water Uses (1967)
Southwest Louisiana River Basin

| Parish | Average 1/ Daily Pumpage (mil. gal.) | Number Persons Served | Consumption (Gallons per Capita per Day) | Weighted Price 3/ (Dollars per 10,000 Gallons per Month) |
|---|---|---|---|---|
| Acadia | 3.084 | 36,379 | 85 | 4.01 |
| Allen | 0.999 | 13,971 | 72 | 6.06 |
| Avoyelles 2/ | 1.314 | 21,820 | 60 | 7.14 |
| Beauregard 2/ | 1.613 | 12,525 | 129 | 5.94 |
| Calcasieu 2/ | 13.018 | 114,077 | 114 | 4.84 |
| Cameron | 0.680 | 2,840 | 239 | 9.00 |
| Evangeline | 1.525 | 16,633 | 92 | 3.37 |
| Iberia 2/ | 4.344 | 44,383 | 98 | 7.01 |
| Jefferson Davis | 1.906 | 26,275 | 79 | 4.29 |
| Lafayette | 7.799 | 88,069 | 89 | 4.02 |
| Natchitoches 2/ | - | - | - | - |
| Rapides 2/ | 8.545 | 72,135 | 118 | 6.84 |
| St. Landry 2/ | 4.795 | 40,827 | 117 | 5.01 |
| St. Martin 2/ | 1.070 | 12,109 | 88 | 5.26 |
| St. Mary 2/ | 1.480 | 16,222 | 91 | 4.93 |
| Vermilion | 2.508 | 28,960 | 87 | 2.86 |
| Vernon 2/ | 0.040 | 700 | 57 | 5.73 |
| TOTALS | 54.720 | 547,925 | 100 | 4.60 |

1/ All water taken from ground water sources
2/ Parish only partially in Southwest Louisiana River Basin
3/ Price weighted by population served by utilities where data were available

Source: Gulf South Research Institute

4-31721 2-74

In addition to the 548,000 persons served by public utilities, there were approximately 305,000 rural self-supplied persons in 1967, all from ground water sources. The rural self-supplied population is approximately 35 percent of the total Southwest Louisiana River Basin population.

## Industrial

The Southwest Basin had an industrial water intake of over 190 billion gallons during 1967. This figure can be compared with an intake of 20 billion gallons for municipalities and 562 billion gallons for agriculture during the same year. Table 14 shows industrial water use by months. It also shows that industrial water intake did not vary significantly during the year. The difference between the month of minimum intake (February) and the month of maximum intake (August) was only 4 billion gallons.

The Southwest Basin used nearly all its water (75 percent) for cooling purposes. Its consumptive rate was 6.9 percent (13 billion gallons). See table 14. This compares to a national consumption rate of 7 percent.

Table 14 - Total Monthly Distribution of Industrial Water Use (1967)
Southwest Louisiana River Basin

| Month | Intake | Consumption | Return Flow |
|---|---|---|---|
| | million gallons | | |
| January | 14,288 | 1,012 | 13,276 |
| February | 13,410 | 976 | 12,434 |
| March | 14,820 | 1,039 | 13,781 |
| April | 15,300 | 1,051 | 14,249 |
| May | 15,309 | 1,069 | 14,240 |
| June | 16,324 | 1,103 | 15,221 |
| July | 16,803 | 1,130 | 15,673 |
| August | 17,483 | 1,159 | 16,324 |
| September | 16,924 | 1,148 | 15,776 |
| October | 16,552 | 1,142 | 15,410 |
| November | 16,462 | 1,123 | 15,339 |
| December | 16,819 | 1,121 | 15,698 |
| TOTAL | 190,494 | 13,073 | 177,421 |

Source: Gulf South Research Institute

4-31721 2-74

Table 15 indicates the amount of industrial water drawn from ground and surface sources and the amount of water purchased. The region depended heavily on ground water for its industrial water, which reflects the influence of the petroleum industry. The Petroleum Refining and Related Industries, together with the Chemicals and Allied Products industry group, accounted for 90 percent of the total intake in this Basin.

Table 15 - Industrial Intake Sources by Two Digit Industry Groups (1967)
Southwest Louisiana River Basin

| Industry | SIC 1/ | Surface | Ground | Purchased | Total |
|---|---|---|---|---|---|
| | million gallons | | | | |
| Food and Kindred Products | 20 | 7,347 | 1,594 | 175 | 9,116 |
| Lumber and Wood Products (Except Furniture) | 24 | 0 | 1,564 | 2,274 | 3,838 |
| Paper and Allied Products | 26 | 0 | 4,700 | 0 | 4,700 |
| Chemicals and Allied Products | 28 | 51,568 | 30,079 | 0 | 81,647 |
| Petroleum Refining and Related Industries | 29 | 0 | 90,013 | 0 | 90,013 |
| Stone, Clay, Glass, and Concrete Products | 32 | 715 | 37 | 189 | 941 |
| Other | - | 152 | 2 | 85 | 239 |
| Total | - | 59,782 | 127,989 | 2,723 | 190,494 |

1/ SIC - Standard Industrial Classification System developed by the U. S. Department of Commerce

Source: Gulf South Research Institute

Of the approximately 60 billion gallons supplied by surface sources, approximately 32 billion were supplied by six streams of the Southwest Basin See table 16. The streams are listed in descending order.

Table 16 - Industrial Surface Water Sources (1967)
Southwest Louisiana River Basin

| Stream | Intake |
|---|---|
| | --million gallons-- |
| Bayou Cocodrie | 12,649 |
| Intracoastal Waterway | 11,951 |
| Bayou Teche | 6,565 |
| Bayou Lacassine | 780 |
| Castor Creek | 17 |
| Vermilion River | 8 |
| Total | 31,970 |

Source: Gulf South Research Institute

## RECREATIONAL RESOURCES

In the south, water-based recreational developments are of primary importance. Although the Southwest Basin Area affords a wide variety of water-based outdoor recreational opportunities, relatively minor development of the recreational resources have taken place in the past. However, the mushrooming demand for outdoor recreation, the new and increasing desire of the public for contact with nature, and the awakening of public and private organizations and interests to the needs in outdoor recreation will surely advance the growth of recreational developments in the Basin Area.

The geographic environment of the Basin changes substantially from northwest to southeast and thereby affects outdoor recreational development. The southeastern portion of the Basin is comprised of four major land resource areas - the Gulf Coast Prairies, Gulf Coast Marsh, Southern Mississippi Valley Alluvium, and Southern Mississippi Valley Silty Uplands (see figure 4). It is generally characterized by extensive marsh, large acreages of farmland, sluggish bayous and rivers, natural water bodies of various sizes, and bays and estuaries along the coast. Except for the forested portions of the Southern Mississippi Valley Alluvium and Silty Uplands LRA's, forest land is sparse, consisting mainly of narrow strips of trees along waterways and chenieres and scattered tracts in low-lying areas. Large tracts of timber conducive to conventional resource-oriented outdoor recreational developments are notably absent in the coastal prairie and marsh and those that are present in the river bottom land are generally not suitable for this type of recreational use.

Conversely, the marsh and waterways in the lower Basin Area are receiving attention from the standpoint of their potential for unique parks and recreational developments drawing upon the resources peculiar to the area. In the southeastern section of the Basin, the forested

4-31721 2-74

portion of the Southern Mississippi Valley Silty Uplands LRA offers significant opportunities for resource-oriented outdoor recreational activities. However, the outdoor recreational pursuits for which this area is famous is the wide variety of fishing, both saltwater and freshwater, and many forms of hunting activities, especially waterfowl. To a lesser extent, there are presently opportunities for boating and water skiing on some of the oxbow and natural lakes in the area and sightseeing by car and boat. Local parks and swimming pools provide some opportunity for day-use type activities. The only easily accessible public beaches on the Gulf of Mexico in the Basin are found in Cameron Parish.

Public and private golf courses are present around population centers in the Basin. Fishing and hunting camps and vacation type cabins line the banks of some of the major streams and bayous and along accessible beaches on the gulf in Cameron Parish.

Major resource-oriented outdoor recreational developments in the Basin have taken place in the forested portions of the Southern Mississippi Valley Silty Uplands and the Southern Coastal Plain LRA's in the northwestern section of the Basin. The reason, of course, is the excellent natural setting for resource-oriented outdoor recreational developments in these areas, i.e. mixed pine-hardwood forested landscape, rolling topography, a varied agriculture, abundant wildlife, many scenic vistas, and numerous lakes, ponds, reservoirs, and streams as well as impoundment sites. Located in this portion of the Basin are two major State parks, three developed recreational areas in the Kisatchie National Forest with another large development under construction, two PL-566 watershed recreational developments--one planned and one under construction--and a number of private developments of various sizes and types. These areas provide opportunities for essentially all types of outdoor recreational activities.

The forested areas are owned or operated in relatively small tracts by private individuals (76.9%), and in larger tracts by forest industries (12.2%), and by Federal, State, and other government units (10.9%). Almost all large tracts in company, State, and Federal holdings are open to public use for dispersed type activities which include hunting, sightseeing, primitive camping, fishing on streams and bayous, and nature study. By present day standards in the South, some areas are "wild" in nature. That is, they have been influenced by man to a lesser extent than most lands in the State. Although these areas are limited in size, they have the potential for providing relatively primitive experiences for recreationists if properly protected from future influences of man.

Water-based outdoor recreational opportunities are provided by numerous lakes, ponds, reservoirs, and streams in the northwestern portion of the Study Area. Although large waterbodies attractive to waterfowl are not generally present, Devil's Swamp Green Tree Reservoir on the Kisatchie Ranger District seems to be a natural for this type use.

4-31721 2-74

Camping and picnicking are favorite family pastimes.

In 1967, there were 37,163 surface acres of water and 358,064 land acres on 488 sites devoted to outdoor recreation (other than hunting and fishing) in the Southwest Basin. This includes all Federal, State, parish, municipal, commercial, and non-profit areas open to the public for outdoor recreational use.

## FISH AND WILDLIFE RESOURCES

General information on fish and wildlife resources are presented in this section. A more detailed inventory is included as the appendix to this report.

The opportunities for hunting and fishing within the Southwest Basin are good. Many acres of private and public land and water are open for hunting and fishing without permission. Many more acres are leased for hunting or fishing for a fee. Some areas, mostly refuges or parts of refuges, are closed to hunting but open for fishing, bird-watching, crabbing, or crawfishing at some time in the year. Figure 7 shows wildlife refuges, game management areas, water areas, and general wildlife cover types.

Private lands open to public use for hunting and fishing are usually forest lands. When considering landownership of 1,000 acres or more, the following percentage of land in these parishes within the river basin boundary are open for hunting or fishing:

| | | |
|---|---|---|
| Allen | 50.8% | 252,117 ac. |
| Beauregard | 60.6% | 356,743 ac. |
| Calcasieu | 13.9% | 86,325 ac. |
| Evangeline | 26.3% | 114,055 ac. |
| Jefferson Davis | 4.0% | 17,106 ac. |
| Rapides | 30.9% | 181,562 ac. |
| St. Martin | 67.7% | 133,496 ac. |
| St. Mary | 21.1% | 41,588 ac. |
| Vernon | 91.9% | 450,996 ac. |

The other parishes within this Basin do not have any large tracts of forest, farmland, or marsh that are open to public hunting or fishing.

Federal and State lands open to hunting or fishing within the Basin are administered by the Louisiana Wild Life and Fisheries Commission, Louisiana State Parks and Recreation Commission, U. S. Forest Service, and U. S. Fish and Wildlife Service. Data on these areas are discussed in "Existing Development" section of this report.

Wildlife wetlands in the Basin have national importance by furnishing wintering grounds for an estimated 2 million ducks and 300,000 geese. In addition, wetlands are habitat for numerous shore birds, furbearers, and estuarine forms of life. Wetlands in the Basin total about 2,430,500 acres. See table 17. This total figure was compiled by wetland types described in U. S. Department of Interior Circular No. 39.

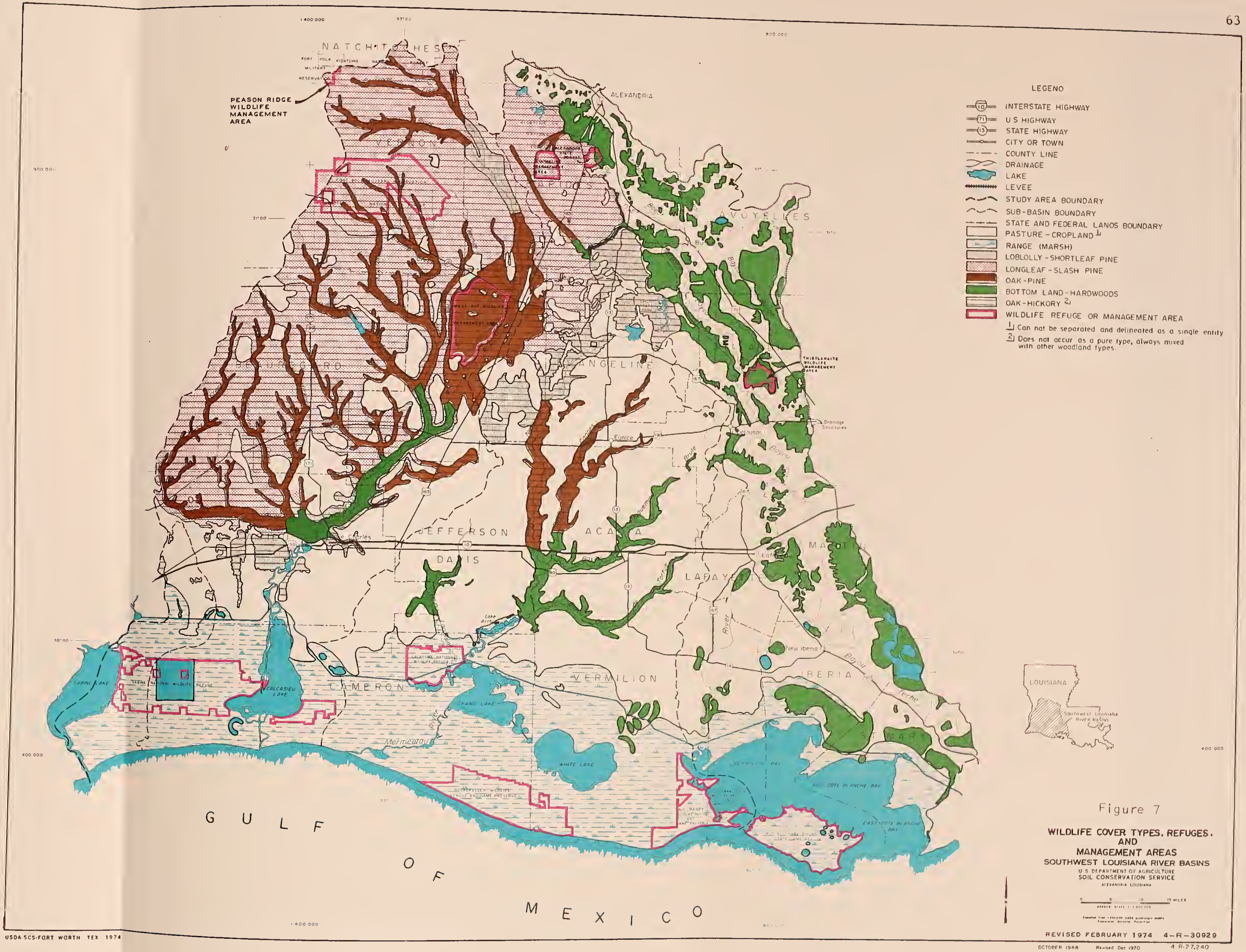



Figure 7

**WILDLIFE COVER TYPES, REFUGES, AND MANAGEMENT AREAS**
**SOUTHWEST LOUISIANA RIVER BASINS**
U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ALEXANDRIA LOUISIANA

REVISED FEBRUARY 1974 4-R-30929

OCTOBER 1968 Revised Dec 1970 4 R-27,240

Table 17 - Type, Description, and Acreage of Wetlands
Southwest Louisiana River Basin

| Wetland Type 1/ | Description | Area |
|---|---|---|
| | | acres |
| 1 | Seasonally flooded basins or flats | 600,000 |
| 3 | Inland shallow fresh marshes | 1,750 |
| 4 | Inland deep fresh marshes | 2,000 |
| 5 | Inland open freshwater | 10,000 |
| 7 | Wooded swamps | 375,000 |
| 12 | Coastal shallow fresh marshes | 190,000 |
| 13 | Coastal deep fresh marshes | 60,000 |
| 14 | Coastal open fresh water | 133,500 |
| 16 | Coastal salt meadows | 105,750 |
| 17 | Irregularly flooded salt marshes | 635,000 |
| 18 | Regularly flooded salt marshes | 317,500 |
| Total | | 2,430,500 |

1/ From Bureau of Sport Fisheries and Wildlife, Circular No. 39

Almost all Basin lands support many species of wildlife, depending on vegetative cover, available water, and other habitat factors. Although species vary from location to location, the species of game represented within the River Basin are bobwhite quail, common snipe, deer, doves, ducks, geese, rabbits, rails, squirrels, turkey, and wood cock.

The bobwhite quail, mourning dove, and cottontail rabbit are considered upland or farm wildlife. These animals are well distributed over the area, and are found primarily associated with farmland. Annual populations vary from year to year, depending on weather conditions during the breeding season and the food and cover supply. Over most of this area, the populations of these game birds and animals are generally good.

Deer, squirrel, turkey, and swamp rabbits are primarily forest animals. Deer are present in much of the forest, but there are still areas where they are not present because of illegal hunting and free-ranging dogs. A population of deer lives in the marshes. These animals work out into the marsh from wooded swamps and spoil piles, retreating to the forest when hard pressed.

Squirrels are present in most forested areas that have not been overcut. Two species of squirrels are present, the gray or cat squirrel and the fox squirrel. The former are found primarily in bottom lands and the latter are found primarily in the uplands. Both are dependent on the mast-bearing trees for their food and their populations vary with these crops.

4-31721 2-74

Although turkeys are not numerous yet, they have been stocked in seven parishes in this Basin. With proper protection, they should soon present huntable populations.

The swamp rabbit is present in all bottom land forests and, usually, the poorer the forest treatment the higher the population of these animals.

The lower reaches of the Southwest Basin have one of the highest concentrations of wintering waterfowl in the Nation. Ducks and geese from both the Mississippi and Central Flyways winter in this area. The marshes are an attraction to these waterfowl, and the nearby rice-fields of the prairie area are heavily used by them. Mostly, these vast flocks of ducks and geese are migrants from the North, but mixed in with them are some native ducks. The mottle duck breeds over the marsh country, the wood duck breeds in the swamps and river bottoms, and the fulvous tree duck reproduces in the ricefields and marshes.

These flocks of ducks and geese not only afford a valuable source of recreation, but also provide an additional source of income to landowners in the form of hunting leases and guide services.

The common snipe, rails, and woodcock complete the list of game species within this Basin. All three are under-hunted and under-harvested. The snipe prefer open marsh or flooded field situations where they feed. The rails, King rail around ricefields and fresh marsh and the Clapper rail in the salt marsh, are elusive and not easily flushed, but are relatively abundant. The woodcock is an inhabitant of brushy, wet woodlands, and is seldom seen except by quail or rabbit hunters. Although Louisiana winters 60 percent of the continental woodcock population, the annual harvest is small.

The furbearers--muskrat, nutria, mink, otter, and raccoon--are abundant within this area. The marshes provide habitat for all these animals, but the mink and raccon are found also along the numerous water courses of this Basin.

Non-game birds and animals are present over the Basin Area in varying populations, depending on species and local habitat.

The fisheries of the Southwest Basin Area range from the freshwater species inhabiting the clear, small streams of the rolling forested coastal plains to the saltwater species inhabiting the saline sounds and bays of the coast. These bodies of water include the rapidly flowing water of the uplands, the sluggish bayous and rivers of the alluvial bottom land and prairie areas, lakes and impoundments of various sizes, and the salty sounds of the coast.

Data provided by the Louisiana Wild Life and Fisheries Commission lists the following species to be present in these various bodies of water:

4-31721 2-74

Freshwater

| Sports Fish | Commercial Fish |
| --- | --- |
| Pickerel | Gar |
| Flier | Paddlefish |
| Warmouth | Bowfin |
| Redear sunfishes | Carp |
| Other sunfishes | Buffalos |
| Bluegill | Catfish |
| Spotted bass | Bullheads |
| Largemouth bass | Eel |
| Black crappie | Drum |
| White crappie | Sturgeon |
| Yellow bass | Suckers |
| White bass | |

Saltwater

| Sports Fish* | Commercial Fish* |
| --- | --- |
| Atlantic croaker | Mullet |
| Southern flounder | Eel |
| Weak fish | Butterfish |
| Spot | Sea catfish |
| Southern Kingfish | Menhaden |
| Spotted sea trout | White shrimp |
| | Brown shrimp |
| | Sheephead |
| | Gaff Topsail catfish |

*In saltwater, sport fish and commercial fish are interchangeable and not delineated by law.

Within the boundaries of this Study Area, there are 304 streams, rivers, and bayous which total about 2,500 miles and about 16,000 surface acres. They produce an average standing crop of 31 pounds per acre with a range from 3 to 150 pounds per acre. The water quality flowing in these channels ranges from pure, clear water to those carrying heavy silt loads and pollution from urban sewage, industrial wastes, oil well production, and agricultural sources.

Water courses of the coast vary in salinity from none to almost sea strength, depending on the flow of outgoing water, wind, and tidal action. It is in these areas that the freshwater species and the saltwater forms mingle. These areas and their adjoining marshes are important nursery grounds for many forms of saltwater fish, crustaceans, and shellfish such as menhaden, shrimp, and oysters.

Many of the larger channels carrying the drainage from the uplands are generally turbid, and at times of prolonged precipitations, carry heavy silt loads to detriment of the fish present.

4-31721 2-74

The lakes of this River Basin vary in size from farm ponds to the 56,800 acre Calcasieu Lake. Three bays--Vermilion Bay, East Cote Blanche Bay, and West Cote Blanche Bay--were not included in the CNI large surface water acreage (346,700 acres), but were included as surface area for fish and wildlife habitat. For fish and wildlife habitat purposes, the total acreage of lakes and bays is about 634,000 acres. Fish species composition of the freshwater areas is typical of those mentioned previously. The standing crops for these lakes and bays range from 20 to 325 pounds per acre.

The saline lakes would carry species typical of the ones previously mentioned, and like the coastal streams, rivers and bayous contain a mixed population of freshwater and saltwater species, depending on salinity. Also, these saline lakes and associated marshes, like the flowing waters, are important nursery areas for various forms of saltwater fish, shellfish, and crustaceans.

The turbidity and pollution of these lakes vary greatly and range from none to heavy. The turbidity in most instances, is not as severe as those bodies of flowing water, and the pollution is primarily dependent on the water source for the particular lake.

Considering both flowing water and lakes, the water quality of this River Basin is good, with few exceptions. The biggest pollution factor for these waters is suspended silts and clays, with oilfield wastes, industrial pollution and agricultural pesticides being lesser factors.

In addition to the lakes previously mentioned, there are 166 ponds having 626 acres of water devoted to the production of channel catfish. These ponds, if managed properly, can produce an average growth of 1,700 lbs. per acre per year.

Another aquatic crop grown within this River Basin is the crawfish. Both the red and white crawfish are produced. Many of these fields are quite large, but the surface water is not permanent because of the nature of production methods used to grow these crustaceans. At the present, there are 58 ponds constructed specifically for crawfish production. These ponds have a surface area of 3,088 acres. In addition to these commercial fields, a natural crop of crawfish is produced in thousands of acres of swamps, overflow bottom land hardwoods, marshes, ditches, and other wet areas. Estimates of the acreage or production from these areas are not available.

## NATURAL ENVIRONMENT

The Southwest Louisiana River Basin encompasses a quite unique and varied geography, plant and animal life, and human culture. Contrasting topographical features vary from the fields and pine-hardwood forests in the rolling hills of the northern portion of the Basin to the extensive farm and marshland in the southern section.

4-31721 2-74

The beauty of the Area is that of field and forest, rolling hills and flat prairies, large live oak trees draped with Spanish moss, tree-lined streams and bayous, industries, and cities.

Interlacing the Basin are hundreds of miles of bayous, rivers, streams, and canals. About 3,000 miles of streams were inventoried. (See Inventory of Streams in the Appendix.) Numerous lakes, natural and manmade, are interspersed throughout this region. Many oxbow lakes have been created by the successive reworking of the flood plains by meandering streams. These lakes are present in all stages of retrogression. Most of the waterways and water bodies in the bottom lands and lower reaches of the Study Area are turbid. A few clear running, perennial streams exist in the northwestern portion of the area.

The countryside reflects the beauty usually associated with a rural setting. In the hills and flatwoods of the northern and western portions of the Study Area, the landscape is dominated by extensive pine-hardwood forest interrupted occasionally by pasture or field. Agriculturally, this section of the Basin is devoted primarily to the production of forest products and cattle. Aesthetically, this area is pleasing with its woodland, streams, and small farms.

In the southern and eastern portions of the Project Area, the scene rapidly changes. Here the landscape is that of a productive agricultural area. Almost all the woodland has been cleared from arable sites, leaving scattered tracts in low-lying areas and along waterways. Much clearing has occurred in recent years. In this area, upland game are largely confined to the wooded areas. However, waterfowl abound in the ricefields of the rice-producing section and in the many waterways and water bodies in the Basin Area.

The broad expanse of marshes and estuaries along the gulf coast is probably the most unique and complex area in the State. It occupies about 22 percent of the Study Area. Extending several miles inland, this area of tidal marshland, shallow embayments, and beaches act as a barrier to much of the Louisiana coastline. In this area travel becomes difficult, usually requiring special vehicles adapted to travel on land, water, and mud. The scenery is characterized by vast treeless expanses of marsh grass, sandy ridges, bays, and lakes. The estuary is where saline and freshwaters meet, providing a setting for one of the most productive wildlife and fisheries habitats in the Nation. This region literally teems with wildlife and fish of many and varied descriptions. However, in recent years, this important resource area has been seriously affected by industrial and mining activities. One of the most serious problems in the marsh is saltwater intrusion which adversely affects both plant and animal life. This problem has been greatly increased in recent years by access to oil well locations.

Major industries other than agriculture include the production and processing of salt, sulphur, natural gas, oil, seashells, sand, and gravel. Large industries feeding upon the wealth of minerals found in

4-31721 2-74

the Study Area have sprung up. The largest concentration of these complexes is found in the Lake Charles area where extensive petroleum, petrochemical, and related industries provide employment for thousands of workers. Other industries include shrimp and seafood harvesting and processing facilities, packing plants, sugar mills, rice mills, pepper and food processing plants, canneries, pulp and paper mills, dimension wood processing plants, ship and boat repair and building yards, cotton processing plants, and several minor plants, factories, and mills.

Items of significant historic and scenic values include the massive salt domes called Avery, Jefferson, Weeks, Cote Blanche, and Belle Isle Islands located in the southeastern portion of the Study Area. On two of these islands, Jefferson and Avery, interesting and attractive gardens have been developed. There are also several old plantation homes located in the area as well as other miscellaneous sites of national, regional, State, and local interest.

There are some detracting characteristics of the climatic environment. Temperature extremes vary from below zero degrees Fahrenheit some winters to occasional high temperatures of over 100 degrees Fahrenheit in the summer. Percent of relative humidity often hovers in the 80's and 90's, especially during the summer months, adding to the personal discomfort caused by high temperatures. Rains are often of high intensity causing erosion damage and flooding of lowlands. This area has experienced occasional tornadoes and severe hurricanes. These storms cause some destruction of crops and buildings. Frequent low stream flows in tributary streams result in limited recreation use.

## HISTORICAL, ARCHAEOLOGICAL, AND UNIQUE SCENIC AREAS

An inventory of historical, archaeological, and unique scenic areas was made using information from the National Register of Historic Places, the Louisiana Historical Preservation and Cultural Commission, Louisiana State University Department of Geography and Anthropology, Louisiana State Parks and Recreation Commission, Gulf South Research Institute, and the State Rural Development Committee. Information provided by the State Rural Development Committee was made as part of the Appraisal of Potential for Outdoor Recreation Developments conducted under the auspices of the National Association of Conservation Districts (NACD). Because inventory information is voluminous, only a summary is presented in this report.

The Basin has four sites listed in the National Register of Historic Places: (1) the Kent Plantation House on Bayou Rapides just west of Alexandria, (2) the Shadows-on-the-Teche Plantation House in New Iberia, (3) the St. Martin of Tours Catholic Church in St. Martinville, and (4) the U. S. Post Office corner of Main and Port Streets in St. Martinville. Numerous other sites in the Basin have State and local significance.

4-31721 2-74

There are three salt domes in the coastal area that have significance as historical, archaeological, and unique scenic areas. These are Avery, Weeks, and Jefferson Islands.

About 150 historical sites have been listed by the Louisiana Historical Preservation and Cultural Commission. A few of these have regional or national significance. Some of the more important sites include Evangeline Oak and Monument near St. Martinville, and three plantation houses--The Shadows in New Iberia, and Kent House and Lloyd's Hall near Alexandria. In addition, there are several Civil Water Battle sites, scattered old unique towns and villages, and many old, fabled Deep-South homes.

Over 400 archaeological sites are catalogued by the Curator of Anthropology, Louisiana State University. Each site has been identified by name and number. They range from obscure locations to the popularly known Indian Mounds and the Salt Domes.

Significant scenic and natural areas that have been located, identified, and described number about 150. These areas are important for what they contribute to the natural beauty. Attractiveness ranges from clear, free-flowing streams to placid bayous; and from rolling hills and woodlands to serene swamps and marsh. Scenic rivers designated by State law include Whiskey Chitto Creek, Six Mile Creek, Ten Mile Creek, Mill Creek, Spring Creek, and Bayou Cocodrie.

4-31721 2-74

# PRESENT AND PROJECTED ECONOMIC DEVELOPMENT

## GENERAL DESCRIPTION OF THE ECONOMY

### Population and Population Characteristics

#### History

Southwest Louisiana shares a unique and interesting heritage with the rest of Louisiana. The many different groups of people who originally inhabited the area or came to settle the area have contributed religions, languages, and customs different than those in other regions of the United States. Indian ancestry is still identifiable and has contributed to the culture of the area. Their customs were long preserved, but inter-marriage and dispersement has reduced their influence. The largest groups who have settled in this area and influenced its development and culture have been the French, Spanish, German, Italian, and Negro. The French nationality has been the dominant cultural influence through the years, particularly by way of the Creoles and Acadians. At the time of statehood admittance, most of Louisiana was so different and so foreign to the culture of the rest of the United States that considerable debate ensued as to their place in the American society.

The flavor and customs of a unique mixture of nationalities and environment still linger today. The legends of the bayous are numerous. French and "Cajun" are still spoken by some groups and you may still hear news report broadcasts in French as well as English. Some still live to themselves in the isolated areas of forests and streams, while others have joined the changing society. The majority of the population in southwest Louisiana, however, take part in a growing and increasingly integrated society.

#### Historical and Projected Trends

Southwest Louisiana population is predominantly urban. This area, however, has remained rurally oriented to a great extent. One important reason is that the area has an active agricultural industry which is supported by many urban dwelling services personnel. Another reason for this orientation may be the abundance of wildlife habitat and the interest of its people in wild game sport.

Though the area is about 25 percent of the State's land area, it had only about 20 percent of the people during the 1940's and early 1950's. Since then, its percentage share of the State population has declined to about 18 percent. During the decade of the 1950's, the United States' population increased 19.0 percent and the State of Louisiana experienced a 21.3 percent growth, but the Southwest Louisiana

4-31721 2-74

River Basin area had an increase of only 4.8 percent. During the first 6 years of the 1960's, Louisiana's population growth rate has been greater than the nation as a whole, but this Basin's growth has been about 2 percent less than the national rate.

Census data for 1966 indicated a total population of 639.2 thousand people inhabited the area, with 72.0 thousand in the farm dwelling category, and 567.2 thousand in the non-farm category. Analyzing the information in table 18, it will be noted that total population increased 53 percent from 1930 to 1966 for an average increase of 1.4 percent. Meanwhile, farm population decreased from 196.7 thousand people in 1930 to 72.0 thousand in 1966. This 63 percent loss occurred after 1940 when many left the farms for the war cause. The declining trend continued at an even higher rate during the 1950's. During that period, farm population decreased by about 74.6 thousand, and non-farm population increased 102.2 thousand. Since 1960, however, farm population losses have been slight.

Table 18 - Total Farm and Non-Farm Population in the Southwest Louisiana River Basin, Selected Years 1930-1967 and Projected 1985, 2000, and 2020

| Year | Population | | |
|---|---|---|---|
| | Farm | Non-farm | Total |
| | thousand | | |
| 1930 | 196.5 | 221.4 | 417.9 |
| 1940 | 199.7 | 288.8 | 488.5 |
| 1950 | 147.7 | 418.3 | 566.0 |
| 1960 | 73.1 | 520.5 | 593.6 |
| 1966 1/ | 72.0 | 567.2 | 639.2 |
| 1967 2/ | 71.8 | 574.9 | 646.7 |
| 1985 | 65.0 | 755.0 | 820.0 |
| 2000 | 71.5 | 878.5 | 950.0 |
| 2020 | 75.0 | 1,125.0 | 1,200.0 |

1/ 1966 Census Bureau population estimates.
2/ 1967 data derived from Statisitical Abstract of Louisiana, 1969, Louisiana State University at New Orleans.

Though specific historical occurrences have had direct bearing on movement of these people, the general causes for farm population losses in this area are probably about the same as those found throughout the Nation. Substitution of capital for labor, increases in farm efficiency, and attractive off-farm employment opportunities have developed an outflow of farm operators and labor to the urban and industrial sectors.

Population projections (table 18) reflect a continued upward trend similar to the Water Resources Council's "C" population projections which maintain a 1.3 percent annual growth rate. From 1966 to 2020, it is estimated that there will be an 87.7 percent increase in the total Basin population. Farm population is expected to remain about the same.

## Urban Centers and Their Influence

Out-migration has been experienced by many parishes of the area with the northwestern sector experiencing the greater losses. Parishes with the larger cities, however, have experienced a slight in-migration.

Standard Metropolitan Statistical Areas (SMSA's) are expected to continue their growth and increase their percentage of total Basin population. Areas such as these are not totally urban or non-farm statistically but represent a clustering of population about a dominant population center. The trends reflected in table 19 indicate that 61.5 percent of the Basin population now live in an SMSA, but by 2020, 78.5 percent is expected to be concentrated about these centers.

Table 19 - Current and Projected Populations of Southwest Louisiana River Basin Standard Metropolitan Statistical Areas

| Standard Metropolitan Statistical Areas | 1967 | 1985 | 2000 | 2020 |
|---|---|---|---|---|
| | -------- | -------- | thousand | -------- |
| Alexandria | 125.8 | 159.4 | 190.9 | 244.7 |
| Lake Charles | 170.8 | 244.5 | 336.0 | 458.0 |
| Lafayette | 101.4 | 138.2 | 174.0 | 239.8 |
| Total | 398.0 | 542.1 | 700.9 | 942.5 |

## Major Categories of Economic Activity

Basin economic activity can be placed in perspective by reviewing the percentages of total earnings attributed to broad industrial sectors in the Basin and location quotients for the sectors in the Basin. Tables 20 and 21 present these relationships at intervals from 1929 to 1967 for an area including whole parish boundaries rather than the hydrologic boundaries of this Study. Non-farm earnings have increased from about 62 percent of total earnings to about 92 percent. The private non-farm sector increased its earnings from 55 percent to 66 percent, and government earnings increased from 7 percent to 26 percent. Meanwhile, the farm sectors' share of total earnings decreased from 38 percent to only 8 percent. The government earning share is somewhat misleading, however, since a large part of this represents a Federal military establishment which is located just outside the hydrologic boundary of this Study Area.

4-31721 2-74

Table 20 - Percentage of Total Earnings by Broad Industrial Sector in the Southwest Louisiana River Basin [1/]

| Industrial Sector | 1929 | 1940 | 1950 | 1959 | 1965 | 1966 | 1967 |
|---|---|---|---|---|---|---|---|
| | percent | | | | | | |
| Total earnings | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Farm earnings | 38.42 | 23.48 | 21.35 | 10.30 | 8.77 | 8.94 | 8.45 |
| Total nonfarm earnings | 61.58 | 76.52 | 78.65 | 89.70 | 91.23 | 91.06 | 91.55 |
| Government earnings | 6.99 | 15.66 | 10.71 | 18.99 | 23.73 | 25.31 | 25.78 |
| Total federal | 1.67 | 7.76 | 3.07 | 8.54 | 12.23 | 13.79 | 14.14 |
| Federal civilian | 1.60 | 7.64 | 2.35 | 2.40 | 3.03 | 2.58 | 2.57 |
| Military | .07 | .13 | .72 | 6.14 | 9.20 | 11.21 | 11.57 |
| State and local | 5.32 | 7.90 | 7.64 | 10.45 | 11.50 | 11.52 | 11.63 |
| Private nonfarm earnings | 54.59 | 60.86 | 67.94 | 70.71 | 67.50 | 65.75 | 65.77 |
| Manufacturing | 11.70 | 10.43 | 14.86 | 12.49 | 12.22 | 11.71 | 12.15 |
| Mining | 1.12 | 6.07 | 7.49 | 10.73 | 10.22 | 9.68 | 9.26 |
| Contract construction | 2.03 | 3.57 | 5.92 | 7.56 | 6.88 | 7.88 | 8.48 |
| Trans., comm., pub., util. | 9.84 | 6.73 | 6.51 | 7.50 | 7.01 | 6.35 | 6.34 |
| Wholesale, retail trade | 12.55 | 17.72 | 18.56 | 17.20 | 16.13 | 15.74 | 15.21 |
| Fin., ins., real estate | 2.62 | 2.29 | 2.13 | 3.11 | 3.04 | 2.87 | 2.78 |
| Services | 13.22 | 12.54 | 11.24 | 11.34 | 11.23 | 10.78 | 10.85 |
| Other | 1.50 | 1.21 | 1.24 | .79 | .77 | .72 | .69 |

[1/] Office of Business Economics, Regional Economics Information System. Data represents whole parish boundaries.

The location quotient is a ratio reflecting the relationship of an industrial sector's earnings within the Basin to the sector's share of earnings in the Nation as a whole. The 1929 location quotient for total earnings indicates that, in relation to the rest of the Nation, this Basin had a disproportionately large share of farm earnings and "Other" private non-farm earnings. The total private non-farm earnings' share was below the national average. In 1967, however, the farm earnings' share was closer to the national average though still 2.5 times greater. The private non-farm earnings' quotient increased from .67 to .82. Within this category, the Basin mining industry share changed dramatically from about half of the Nation ratio to about 9 times the national ratio.

4-31721 2-74

Table 21 - Location Quotient for Total Earnings by Broad Industrial Sector in the Southwest Louisiana River Basin 1/

| Industrial Sector | 1929 | 1940 | 1950 | 1959 | 1965 | 1966 | 1967 |
|---|---|---|---|---|---|---|---|
| | location quotient 2/ | | | | | | |
| Total earnings | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Farm earnings | 3.40 | 2.71 | 2.45 | 2.30 | 2.16 | 2.24 | 2.48 |
| Total nonfarm earnings | .69 | .84 | .86 | .94 | .95 | .95 | .95 |
| Government earnings | .94 | 1.19 | .94 | 1.34 | 1.52 | 1.58 | 1.55 |
| Total federal | .83 | 1.24 | .53 | 1.26 | 1.82 | 1.98 | 1.97 |
| Federal civilian | .99 | 1.39 | .65 | .60 | .71 | .60 | .59 |
| Military | .18 | .16 | .33 | 2.22 | 3.74 | 4.14 | 4.09 |
| State and local | .99 | 1.14 | 1.37 | 1.42 | 1.29 | 1.27 | 1.22 |
| Private nonfarm earnings | .67 | .78 | .85 | .87 | .84 | .82 | .82 |
| Manufacturing | .46 | .40 | .51 | .41 | .41 | .39 | .41 |
| Mining | .46 | 2.80 | 3.76 | 7.40 | 9.04 | 8.96 | 8.99 |
| Contract construction | .36 | 1.00 | .99 | 1.23 | 1.12 | 1.29 | 1.41 |
| Trans., comm., publ, util. | .98 | .76 | .80 | .97 | .98 | .90 | .90 |
| Wholesale, retail trade | .67 | .88 | .97 | .96 | .95 | .94 | .91 |
| Fin., ins., real estate | .45 | .49 | .50 | .61 | .60 | .58 | .54 |
| Services | 1.02 | 1.00 | 1.01 | .89 | .81 | .79 | .76 |
| Other | 5.56 | 4.48 | 3.18 | 2.55 | 2.48 | 2.40 | 2.38 |

1/ Office of Business Economics, Regional Economics Information System. Data represents whole parish boundaries.

2/ A ratio of two ratios. The relationship of an industrial sector earnings within an area to that sectors share in the nation as a whole.

## Employment

Those groups of people that made up Louisiana's unique social and cultural background also set the tone for occupational patterns in the State. The kind of people that it required to endure the hardships of this primitive wilderness ranged from traders to farmers, fishermen, trappers, and those who simply and independently lived off of the land. Southwest Louisiana provided the site for an agriculturally-oriented society as well as forest products and a wide variety of wild game. Later, subterranean mineral deposits of salt, oil, gas, and sulphur were discovered, forming the basis for mining and refining industries on the coast. Historically, however, southwest Louisiana employment has been principally in agriculture.

4-31721 2-74

Total employment in the area has increased from 143 thousand in 1940 to 178 thousand in 1960 as shown in table 22. This trend has continued until the present, with about 207 thousand employed during 1967. However, the employment participation rate has not increased with the rest of the Nation. In 1940, this area's participation rate was 4.8 percent less than that of the Nation; and by 1960, the difference had grown to 7.0 percent. During this time, its participation ratio remained at about 30 percent.

In 1940, agricultural employment was 63 thousand, but since has declined to about 22 thousand persons in 1967. Agriculture's share of total employment has declined from 44 percent to about 10.7 percent compared to U. S. agricultural employment shares of 18 percent and 5 percent at the same time periods. Such reductions do not imply a less significant or productive industry, but rather a lower labor requirement per unit of production.

Table 22 - Employment by Major Category in the Southwest Louisiana River Basin Area, and Comparative United States and Study Area Labor Participation Rates, 1940-1967

| Category | 1940 | 1950 | 1960 | 1967 |
|---|---|---|---|---|
| | --------thousand-------- | | | |
| Agriculture | 63.3 | 46.2 | 21.9 | 22.2 |
| Forestry & Fisheries | 1.6 | 2.0 | 1.1 | 1.4 |
| Mining | 4.4 | 7.1 | 9.6 | 12.1 |
| Manufacturing | 17.9 | 34.3 | 34.7 | 40.4 |
| Major water using | 11.1 | 15.4 | 12.4 | 13.8 |
| Other | 6.8 | 18.9 | 22.3 | 26.6 |
| Service & Other | 55.4 | 86.0 | 110.8 | 130.8 |
| Total | 142.6 | 175.6 | 178.1 | 206.9 |
| | --------percent-------- | | | |
| Labor participation rate | | | | |
| Southwest Louisiana | | | | |
| RB Area | 29.2 | 31 | 30 | 32 |
| United States | 34 | 38 | 37 | 39 |

Mining industries, located predominantly in the southern portion of the Basin, more than doubled their employment between 1940 and 1960. It still remains a small percentage of total employment, but continues to trend upward.

Manufacturing employment increased from about 13 percent in 1940 to 19 percent in 1950, and has maintained about that share of total employment until the present time. The geometric population increases are expected to uphold the demand for products and employment in this industry segment.

Major water-using manufacturers have tended to increase employment over the years, but in themselves have not been the major direct contributor of employment increases. Manufacturers included in this category are: (1) food and kindred products, (2) textile mill production, (3) lumber, wood products, and furniture, (4) printing and publishing, and (5) chemicals and allied products. In 1940, these manufacturers employed almost two-thirds of the employees in the manufacturing category, but by 1967 they employed closer to one-third. "Other than water-oriented manufacturing" firms have been the big employment increasing source during the past quarter century.

Southwest Louisiana has changed from a predominantly agricultural employment in 1940 to a predominantly service and other employment. Since then, mining, manufacturing, and service and other have contributed significant increases to the area employment, while agriculture, forestry, and fisheries employment have decreased. This trend, much like that of the United States and the State of Louisiana, is expected to continue. New efficiencies, through automation and increased scientific knowledge, have reduced the numbers required for production processes; so, as volume increases and population increases, a larger percentage of persons are employed in the service sector of our economy.

Total employment projections are based on historical percentages of population that were employed and changed in percentages as projected by Water Resources Council for this Economic Area. Though the employment participation rate for the area has been low in the past, the improvements in transportation, communication, and education, as well as industrial expansion and a viable agriculture, invited the use of a higher long-run labor participation rate.

Employment projections (table 23) for agriculture reflect an assumption of continued decline through 2000. Then, a slight increase will be evidenced due to the vastness of total population food production requirements. Forestry and fisheries employment is expected to increase 250 percent to 3.5 thousand but will still remain a small percent of total employment. Mining is expected to continue at a reduced historical trend of increasing employment through the period of projection, reaching 24.8 thousand in 2020.

Manufacturing employment projections assume that this industry will retain approximately 19 percent of total employment in the future, attaining a high 82 thousand in 2020. The majority of its 80 percent increase originates in the "Other Manufacturing" industry sub-category as noted in table 22.

Services and other category of employment projections reflect historical trends and their relationship to the total labor force and manufacturing. This category of employment is expected to reach 420 thousand by year 2020.

4-31721 2-74

Table 23 - Employment by Major Category in the Southwest Louisiana River Basin, and Comparative United States and Study Area Labor Participation Rates, Projected 1985-2020

| Category | 1985 | 2000 | 2020 |
|---|---|---|---|
| | thousand | | |
| Agriculture | 12.8 | 12.1 | 13.1 |
| Forestry & Fisheries | 3.0 | 3.2 | 3.5 |
| Mining | 19.8 | 22.5 | 24.8 |
| Manufacturing | 54.4 | 63.9 | 81.9 |
| Major water using | 17.0 | 19.0 | 21.6 |
| Other | 37.4 | 44.9 | 60.3 |
| Service & Other | 188.8 | 226.1 | 296.7 |
| Basin Total | 278.8 | 327.8 | 420.0 |
| | percent | | |
| Labor participation rate | | | |
| United States | 40 | 40 | 40 |
| Southwest Louisiana RB Area | 34 | 34.5 | 35 |

## Income

Per capita income of the Southwest Louisiana River Basin has historically been lower than the national average and is currently below that norm. However, per capita income of this area has made significant gains in the past quarter century. Table 24 shows how the per capita income has changed in this area and in the United States over the last 27 years. In 1940, this area's per capita income was only 41 percent of the national average, but by 1967, it had increased its relative standing to 71 percent. This relative gain of income standing is in keeping with the income gains of the State as a whole, but still 15 percent lower than the State level.

Low income problems of the area have been somewhat compounded by an income distribution problem. Figure 8 shows how the net cash income (NCI) of households was distributed in the Basin Area during 1960 and 1967. During 1960, one-third of the Basin households had an NCI of less than $2,500, and 6 percent had an NCI of $10,000 or more. Fifty-eight percent had NCI under $4,000. In 1967, the percentage of the population in the lowest income group had not changed while the percentage of the people in the highest had significantly increased. The information presented here is not sufficient to indicate definite trends, but it is noteworthy that the changes during this time were counter to the goals of the American economy. These data show an income distribution throughout the population that tends to be

4-31721 2-74

preserving a large low income group, dissipating a middle income group, and increasing the size of the upper income group.

Table 24 - Average Per Capita Incomes in the United States, Louisiana, and the Southwest Louisiana River Basin, Selected Years 1/

| Time Period | Southwest Louisiana River Basin Area | Louisiana | United States |
|---|---|---|---|
| | --------dollars-------- | | |
| 1940 | 243 | 363 | 595 |
| 1950 | 852 | 1,120 | 1,496 |
| 1960 | 1,318 | 1,655 | 2,215 |
| 1967 | 2,266 | 2,465 | 3,159 |

1/ Extracted or derived from Statistical Abstract of Louisiana 1969, Louisiana State University at New Orleans, Louisiana and Preliminary Report on Economic Projections for Selected Geographic Areas, 1929 to 2020, U. S. Water Resources Council, March 1968.

There is significant variation between per capita income levels of SMSA parishes and non-SMSA parishes. In 1965, the SMSA parishes averaged $2,313 per capita income while non-SMSA's averaged $1,822. By 1967, these averages had increased to $2,493 and $1,956, respectively. The non-SMSA parishes of Cameron and St. Mary were exceptions, averaging slightly more than the SMSA parishes.

Projections of income for the area have been based on the assumption that the area income will continue to compare more favorably with the national average. The historical and projected total personal income and per capita income for the Nation as well as this Basin Area is shown in table 25 in terms of 1958 constant dollars. National projections, based on assumptions of Water Resource Council population Projection "C" infers a 1.3 percent average annual growth and a 4 percent average annual growth in Gross Nation Product. Under these assumptions, national per capita income in 2020 is projected to be $12,411. The Southwest Louisiana River Basin per capita income is expected to rise to 78 percent of the national level by this time with per capita income of $9,681.

The projections of national per capita income reflect significant increases over those levels previously projected by the Water Resources Council. A basic reason for this difference is that a lower rate of population growth has been used while maintaining the same rate of Gross National Product growth.

4-31721 2-74

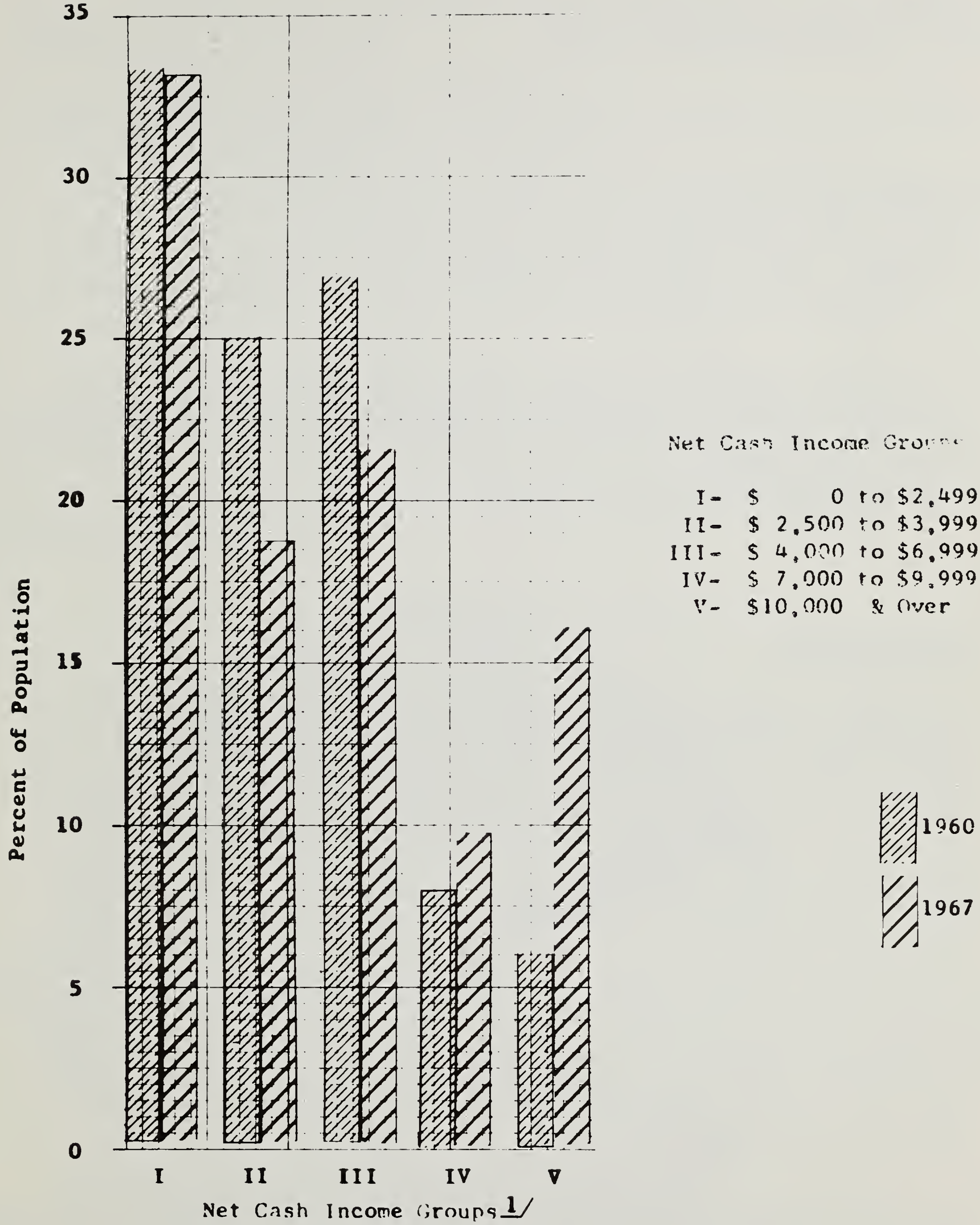



Figure 8 - Percent of the Population of Families in Southwest Louisiana River Basins Parishes Which were in Specified Net Cash Income Groups, 1960 and 1967.

1/ Sales Management, May 10, 1961 and June 15, 1968.

Table 25 - Historical and Projected Personal Income and Per Capita Income of the United States and the Southwest Louisiana River Basin

| Region | Units | Historical 1940 | 1950 | 1960 | Projected 1985 | 2000 | 2020 |
|---|---|---|---|---|---|---|---|
| | | --dollars[1/]-- | | | | | |
| Total Personal | | | | | | | |
| United States [2/] | Billion | 171.1 | 274.1 | 389.7 | 1,202.5 | 2,196.7 | 4,934.1 |
| SW Louisiana | Million | 258.4 | 581.3 | 768.1 | 2,792.1 | 5,102.5 | 11,617.2 |
| Per Capita | | | | | | | |
| United States [2/] | Dollars | 1,296 | 1,805 | 2,175 | 4,729 | 7,161 | 12,411 |
| SW Louisiana | Dollars | 529 | 1,027 | 1,294 | 3,405 | 5,371 | 9,681 |
| Basin' Percent of United States | Percent | 40.9 | 56.9 | 59.5 | 72 | 75 | 78 |

1/ Constant dollars, 1958.

2/ United States Water Resources Council Projections by Office of Business Economics, March 1968.

## Transportation

Highway transportation in southwest Louisiana is an expensive undertaking because of the numerous streams to be bridged and poorly drained areas to be built-up. This factor probably contributed greatly to a historically slow economic growth and retention of local cultures. But with the construction of some major bridges, southwest Louisiana was opened for inland trade and transportation. Principal cities of this area are adequately serviced by U. S. highways. Alexandria, on the northern-most edge of the Basin, is located at the junction of three U. S. highways and several State highways, serving as a mid-State crossroads from all corners of the State. Lake Charles and Lafayette are located on an interstate highway which spans the southern portion of the Basin, providing expressway transportation with Texas and other potential intracoastal points. This route connects with access into the State capitol at Baton Rouge, the trade center of New Orleans, and another serviceable route from mid-Basin to northeast Louisiana. This Basin Area, however, does not have the advantage of a major north-south expressway.

The Intracoastal Waterway is important to industrial activity along the entire lower portion of the Basin. This facility provides more efficiency and protected access for water transport.

Inland lakes, bayous, and rivers were the first highways in Louisiana, and even today afford the only access to remote swamp areas. This River Basin Area has limited access to much of the State's 4,794 miles of navigable water, including the Red, Mississippi, Atchafalaya, and the Sabine Rivers. These routes represent current or potential water transportation for this area.

## Non-Agricultural Uses of Land

Federally-owned land and urban and built-up land have been excluded from the inventory of land which is being studied in this Basin. About 5.3 percent or 404.6 thousand acres of Federal land in the Basin which is used by the government for the Kisatchie National Forest, the Fort Polk Military Reservation in the northwestern sector, and wildlife refuges in the southern sector.

Urban and built-up uses currently occupy 3.2 percent or 236.2 thousand acres. Increasing demands for this type of use are expected to reduce the agricultural and forest areas in the future. Space requirements, due to future population increases, are projected to be 298 thousand acres by 1985, 345 thousand in 2000, and 436 thousand in 2020. Figure 9 shows how these various categories of use are proportioned in the Basin.

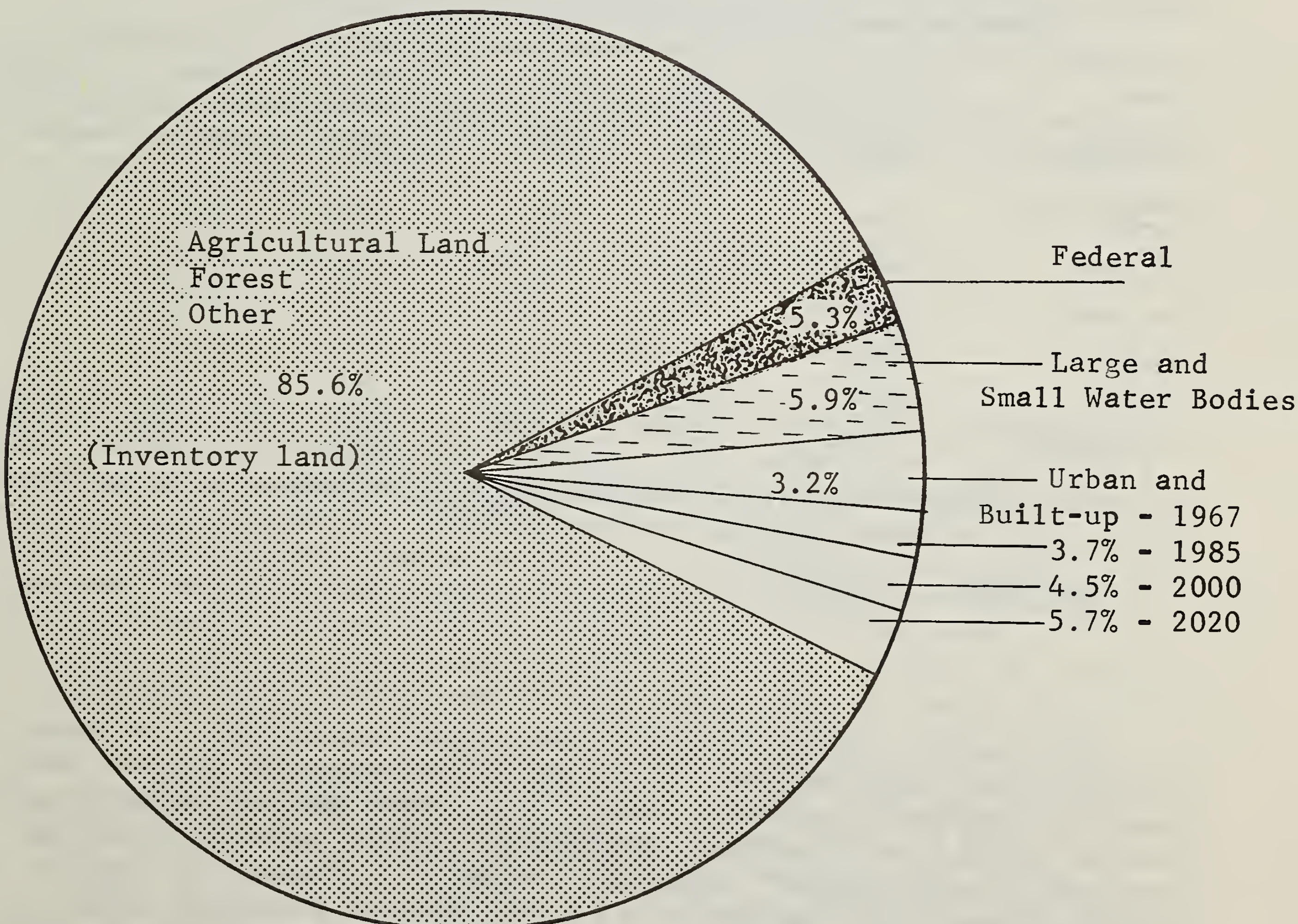



Figure 9 - Categories of Land in the Southwest Louisiana River Basin Area and Expected Changes Through 2020

## GENERAL FARM CHARACTERISTICS

### Farm Numbers, Size, and Tenure

Farming in the Basin follows the national trend of increasing production, fewer farmers, and larger farm firms. Since 1949, over 50 percent of the farms in this area have discontinued operations or have been reclassified (table 26). Many small farm operators have gone out of business, but often the land has been sold or leased to another firm which operates on the equivalent of several old size farms. Average farm size has increased from 86 acres to about 181 acres during this period of time. Plant breeding, insect control, weed control, water management, fertilization, and mechanical improvements have also made it possible for an operator to produce more per acre and manage more acres. Fixed costs are distributed over more acres, thus fostering further expansion in farm size. The conversion of fertile forest lands to cropland, often done in large tracts, is at least partially due to the availability of better clearing machinery. Clearing accounts for some of the larger farm firms in the Basin.

Table 26 - Farm Numbers, Size and Percentage Distribution of Farm Operators in the Southwest Louisiana River Basins by Tenure Categories, 1949-1967 1/

| Tenure | Unit | 1949 | 1954 | 1959 | 1964 | 1967 2/ |
|---|---|---|---|---|---|---|
| Farm Numbers | Number | 41,598 | 37,531 | 27,454 | 22,991 | 20,771 |
| Average size of farms | Acres | 86 | 100 | 133 | 165 | 181 |
| Full owners | Percent | 47.2 | 48.9 | 52.5 | 52.8 | 53.7 |
| Part owners | Percent | 11.4 | 13.7 | 17.5 | 22.7 | 25.0 |
| Managers | Percent | 0.4 | 0.3 | 0.4 | 0.2 | 0.2 |
| Tenants | Percent | 41.0 | 37.1 | 29.6 | 24.3 | 23.1 |
| Total operators | Percent | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

1/ Derived from U. S. Census of Agriculture.

2/ Projected estimation from census data.

Farm tenure characteristics have changed since 1949. As shown in table 26, the trend has been to a larger percentage of full or part ownership and away from full tenancy. The farm owners category increased from 59 percent to 75 percent during this period, with the greatest increase in part owners. Meanwhile, tenancy decreased its share of the existing farms by 40 percent. The major factors affecting trends in tenure appear to be the cost-price relationships of the industry and increasing capital requirements to compete. The growing number of part-owners reduces the problem of small and inefficiently operated farms.

4-31721 2-74

Inventory land use (table 27) shows that the majority of the Basin cropland is in soil productivity groups 11 through 15, with substantial amounts in 1 and 2. The geographical and resource areas of these groups may be determined by reference to table 3. About 65 percent, or 1.5 million acres, of this cropland has either an active or inactive irrigation system on it. Since 97 percent of the State's rice production is in this River Basin Area, it follows that about 95 percent of the irrigation water is used there too. Almost all the irrigation system land has been located in the lower half of the Basin, but there has been increasing system development in the eastern and northeastern sectors.

Table 27 - Inventory Acreage[1/] in 1967 by General Agricultural Use Category and Soil Productivity Group, Southwest Louisiana River Basin

| Use Category | Total | Soil Productivity Group[2/] | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| | acres (1,000) | | | | | | | | | | | | | | | | | | | | | |
| Total cropland | 2,323 | 79 | 102 | 33 | 0 | 0 | 17 | 9 | 39 | 10 | 36 | 249 | 477 | 580 | 138 | 512 | 37 | 0 | 0 | 0 | 4 | 0 |
| No irrigation system | 808 | 76 | 86 | 33 | 0 | 0 | 9 | 9 | 18 | 2 | 27 | 165 | 225 | 116 | 21 | 18 | 0 | 0 | 0 | 0 | 4 | 0 |
| With irrigation system | 1,515 | 3 | 16 | 0 | 0 | 0 | 8 | 0 | 21 | 8 | 9 | 84 | 252 | 464 | 117 | 494 | 37 | 0 | 0 | 0 | 1 | 0 |
| Pasture and range | 913 | 18 | 49 | 20 | 1 | 2 | 5 | 2 | 23 | 19 | 14 | 108 | 127 | 97 | 8 | 44 | 11 | 5 | 348 | 8 | 5 | 0 |
| Forest | 2,361 | 2 | 169 | 182 | 12 | 47 | 81 | 1 | 344 | 20 | 6 | 51 | 323 | 295 | 184 | 44 | 0 | 117 | 0 | 47 | 436 | 0 |
| Other | 886 | 11 | 11 | 1 | 0 | 0 | 3 | 3 | 1 | 2 | 5 | 13 | 12 | 27 | 3 | 15 | 0 | 3 | 33 | 59 | 3 | 680 |
| Total inventory land | 6,483 | 110 | 331 | 236 | 13 | 49 | 106 | 15 | 407 | 51 | 61 | 421 | 939 | 999 | 333 | 615 | 48 | 125 | 381 | 114 | 449 | 680 |

1/ Consistent with Louisiana Conservation Needs Inventory, 1969.

2/ Identified in Description of the Study Area Section.

Over half-a-million acres of pastureland is distributed throughout the Basin in most soil productivity groups. The majority of the pastureland is on soils suitable for cropland (capability subclasses 2e, 3e, and 3w). Practically all the 378,702 acres of rangeland is in the Coastal Marshlands and designated as SPG 18. Thousands of acres of this type land have been converted to productive riceland by drainage and levee development. With this development, the soil acquires a classification of 4w and qualifies for Soil Productivity Group 16. More of this rangeland may be converted for rice production in the future.

Forest land is concentrated in the northwest sector of the Basin and in the bottom lands throughout the Basin. Almost 2 million acres are on upland soils and over 400 thousand on bottom lands. Large acreages of forest land have been cleared in the eastern part of the Basin in recent years and the practice is continuing. This cleared land is being used mostly for soybean production, which has been increasing at a rapid rate in recent years.

The conversion of forest lands to cropland during the 1960's has been another significant factor in the changing pattern of resource use and agricultural production. Especially since 1964, this process has affected hundreds of thousands of acres throughout the State. Forest Service estimates of clearing in the Basin parishes from 1962 to 1969 indicate that about 276.5 thousand acres have been cleared. During this same time, about 110 thousand acres were planted, so the net loss to the forest industry has been about 166,000.

Approximately 200 thousand acres of the forest land cleared was within the hydrologic boundary of this Basin. The majority of this land conversion has occurred in oak-gum-cypress forest cover type of the Southern Mississippi Valley Alluvium, the Southern Mississippi Valley Silty Uplands LRA's, and on the transitional edges of the Gulf Coast Prairies LRA.

Other lands are primarily subclass 8w soils found in the Coastal Marshes. A major portion of the 886 thousand acres in this category are not suitable for cattle grazing or any other currently recognized agricultural pursuit. The remaining portion of this acreage includes farm homesteads, rights-of-way, and sundry uses.

## Farmland Use Changes

Table 28 shows trends in the use of land in farms. Total cropland has not changed much, but pasture other than cropland increased from 390 thousand to 717 thousand. Some of the changes are due to changes in census definition.

Table 28 - Land Use Distribution of Farmland in the Southwest Louisiana River Basin, Selected Years 1/

| Land Use | 1949 | 1954 | 1959 | 1964 |
|---|---|---|---|---|
| | acres (1,000) | | | |
| Cropland | 2,230 | 2,243 | 2,097 | 2,130 |
| Harvested | 1,236 | 1,259 | 1,009 | 1,051 |
| Pastured | 830 | 837 | 971 | 907 |
| Idle | 164 | 146 | 117 | 172 |
| Pasture | 390 | 511 | 642 | 718 |
| Forest | 734 | 808 | 688 | 713 |
| Other Farmland | 222 | 187 | 213 | 230 |
| Total Land in Farms | 3,576 | 3,749 | 3,640 | 3,791 |

1/ Derived from U. S. Census of Agriculture

4-31721 2-74

## Cropland

A detailed account of crop acreage, production, and Basin shares of the State totals at 5-year intervals from 1949 to 1964 is in table 29. Cropland changes occurring during this time were not related to the total quantity of cropland and have not changed as much as location. Marginal farmland is reverting to native tree cover. Small farm operations with relative costs are being economically squeezed out of the industry in favor of areas where larger scale operations are feasible. In the longer run, development of the more productive soils has influenced production patterns within the area.

Table 29 - Acreage and Production of Major Crops in the Southwest Louisiana River Basin and Their Percentage of Louisiana State Totals in Selected Years [1/]

| Crops | Unit | Study Area 1949 | Study Area 1954 | Study Area 1959 | Study Area 1964 | Share of Louisiana State Totals 1949 | Share 1954 | Share 1959 | Share 1964 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | percent | | | |
| Corn harvested for grain | Acres | 198,538 | 174,132 | 124,151 | 79,176 | 28.74 | 34.24 | 31.24 | 41.79 |
| Production | Bu. | 3,562,123 | 3,255,875 | 3,610,452 | 2,351,278 | 27.34 | 32.54 | 30.16 | 40.31 |
| Oats | Acres | 6,859 | 10,306 | 9,683 | 6,514 | 14.08 | 17.10 | 9.66 | 17.39 |
| Production | Bu. | 149,320 | 273,216 | 317,270 | 247,491 | 12.18 | 17.20 | 7.75 | 16.33 |
| Rice | Acres | 553,238 | 647,337 | 452,979 | 498,475 | 98.35 | 97.10 | 97.26 | 97.06 |
| Production | Cwt. | 10,411,908 | 15,885,129 | 13,211,921 | 17,014,472 | 98.04 | 97.39 | 97.24 | 96.94 |
| Soybeans for beans | Acres | 3,767 | 3,427 | 23,553 | 59,808 | 16.15 | 12.46 | 4.79 | 13.39 |
| Production | Bu. | 28,533 | 31,936 | 476,146 | 1,372,574 | 9.41 | 11.01 | 2.74 | 15.35 |
| Legume and Legume mix hay | Acres | 7,059 | 27,185 | 15,680 | 28,297 | 21.33 | 20.95 | 19.25 | 31.00 |
| Production | Tons | 8,819 | 30,202 | 23,119 | 47,227 | 19.99 | 20.32 | 15.75 | 33.10 |
| Small grains for hay | Acres | 1,696 | 6,770 | 5,015 | 5,585 | 19.61 | 21.32 | 12.20 | 21.58 |
| Production | Tons | 1,974 | 6,178 | 6,412 | 7,703 | 21.71 | 21.42 | 11.00 | 20.36 |
| Lespedeza hay | Acres | 17,786 | 24,768 | 36,747 | 20,311 | 20.33 | 63.70 | 42.69 | 70.25 |
| Production | Tons | 24,304 | 29,537 | 56,836 | 35,991 | 21.30 | 64.45 | 45.67 | 72.86 |
| Other hay cut [2/] | Acres | 38,915 | 49,225 | 63,159 | 73,067 | 33.14 | 28.53 | 27.50 | 26.24 |
| Production | Tons | 47,045 | 51,109 | 87,461 | 119,689 | 33.36 | 28.09 | 25.78 | 26.63 |
| Sweet potatoes [3/] | Acres | 66,224 | 69,734 | 47,808 | 18,628 | 75.59 | 79.29 | 83.83 | 70.08 |
| Production | Cwt. | 2,717,248 | 2,418,981 | 1,800,585 | 1,039,682 | 75.79 | 71.04 | 79.35 | 63.31 |
| Cotton | Acres | 206,277 | 160,932 | 114,889 | 113,019 | 22.52 | 23.87 | 23.95 | 22.11 |
| Production | Bales | 140,545 | 163,360 | 107,691 | 107,258 | 23.15 | 22.47 | 30.28 | 18.79 |
| Sugarcane for sugar | Acres | 102,266 | 80,783 | 89,593 | 111,961 | 36.19 | 35.65 | 34.00 | 35.19 |
| Production | Tons | 1,748,030 | 1,551,928 | 1,925,550 | 2,490,939 | 33.79 | 35.52 | 30.24 | 33.64 |
| Vegetables harvested for sale | Acres | 5,493 | 8,829 | 5,328 | 4,117 | 17.30 | 26.69 | 25.28 | 24.46 |
| Land in orchards | Acres | 8,472 | 6,230 | 9,740 | 9,158 | 13.57 | 19.97 | 10.71 | 18.26 |

1/ Derived from U. S. Census of Agriculture.
2/ Census definition of Other hay; does not mean all other hay.
3/ Sold at market.

Cropland Utilization - Table 30 summarizes the use of cropland utilization during the base year of the Study, 1967. Detailed land use by soil productivity groups is shown in exhibit 1.

Rice is a major agricultural product of the State of Louisiana and practically all of it is produced in this Basin Area. Production of this totally irrigated crop has continued to increase over time even though it is regulated by allotments. Yields will continue to increase as a higher percentage of farmers improve their management and if second cropping increases. Rice was grown on 547 thousand acres in 1967, and much more would be produced if acreage were not restricted by allotments. Thousands of acres of land with developed irrigation systems are being used otherwise for lack of a rice allotment. About half-a-million acres of this land could be used for rice production if market and institutional conditions become more favorable.

Table 30 - Cropland Uses in the Southwest Louisiana River Basin, 1967 1/

| Use | No Irrigation System | Irrigation System | Total |
|---|---|---|---|
| | ----------acres (1,000)---------- | | |
| Rice | 0.0 | 547.0 | 547.0 |
| Soybeans | 253.4 | 124.0 | 377.4 |
| Sugarcane | 107.6 | 0.0 | 107.6 |
| Corn, all purposes | 92.3 | 3.1 | 95.4 |
| Cotton | 71.1 | 0.0 | 71.0 |
| Sweet Potatoes | 36.5 | 0.0 | 36.5 |
| Sorghum, all purposes | 6.2 | 0.0 | 6.2 |
| Close Grown | 45.1 | 5.3 | 50.4 |
| Rotation hay/pasture | 24.2 | 798.7 | 822.9 |
| Hay | 19.2 | 3.2 | 22.4 |
| Other Vegetables and Miscellaneous | 23.5 | 5.0 | 28.5 |
| Orchard - Vineyard | 3.1 | 0.0 | 3.1 |
| Conservation | 80.5 | 2.0 | 82.5 |
| Temporary Idle | 35.8 | 27.0 | 62.8 |
| Open, formerly cropped | 9.8 | 0.0 | 9.8 |

1/ Consistent with Louisiana Conservation Needs Inventory, 1969

Soybeans have been grown increasingly on land with an irrigation system. This does not mean that they are irrigated. They are being grown on land developed for rice production. Sometimes soybeans and rice are grown in rotation. In 1967, 377.4 thousand acres of soybeans were harvested in the area, and production was more than 10 million bushels. Soybean acreage has increased by 24 percent or more each year for the past 6 years. This area is not the leading soybean producing area of the Nation, but production has increased faster than the national rate of increase in the last 5 years.

Sugarcane requires a more unique set of environmental conditions than most crops, and a part of this Basin Area is well suited to the crop. In 1967, 107.6 thousand acres produced over 3 million tons of sugarcane, about one-third of the State's sugarcane, and about 11.4 percent of National production or about 24 percent of continental U. S. production.

Corn production and acreage have been declining in this area; production at a slower rate than acreage. Corn acreage in the State has

4-31721 2-74

declined practically every year since the 1930's. Table 30 shows that 95.4 thousand acres were harvested in 1967, of which approximately 14.6 percent was for silage. The Basin's share of national production of this crop is becoming progressively smaller.

Grain sorghum, in very recent years, has experienced rather rapid gains. In 1964, only 649 acres of sorghum were harvested for grain, while in 1967 there were 6.2 thousand acres producing over 200 thousand bushels. Grain sorghum production has spread into the rice country where it is possible that new potentials are developing for a second major crop in the Gulf Coast Prairies LRA.

In 1967, cotton production used 71.1 thousand acres. Increasing yields have helped to maintain production. The quality of cotton produced here is higher than in some other areas, such as the High Plains of Texas. Cotton production has declined less in this area than it has for the Nation as a whole.

Sweet potatoes were grown on 36.5 thousand acres in 1967, a substantially higher acreage than that reported in the 1964 Census of Agriculture. Production levels have been maintained during the 1960's even though acreage has tended to decrease over time. This crop, in comparison, has not maintained its per capita consumption level as populations and incomes have increased.

The above crops account for about 98 percent of the value of crop production and for approximately 80 percent of all farm sales in the Basin. With regard to acreage, these crops comprise about 90 percent of actual cropland other than rotational hay-pasture, which is a transitional category in rice rotation.

Relatively small amounts of oats, vegetables, orchards, alfalfa, and small grains for hay are grown. In 1964, the legume and legume mix hay and lespedeza hay (or other forages of similar species) in this area amounted to approximately 33 and 72 percent respectively of the State's production, while other hay was about 27 percent of the State's production. The majority of hay harvested in both the State and this Basin has been grasses.

## Livestock

The numbers of livestock and principal livestock products of the area are shown in table 31. Other than chickens, there are more cattle than any other type of livestock in the area. Cattle numbers increased from 462 thousand in 1949 to 643 thousand in 1954 and 657 thousand in 1964, an increase of over 40 percent and steady enough to maintain a 35 percent share of total State numbers. Swine numbers decreased from 250 thousand to 77 thousand during this same period. Sheep, chickens, and turkeys also decreased in numbers over the period of 1949 to 1964.

Cattle experienced gains in all categories indicating a broad based advantage in the area rather than specialty operations such as

4-31721 2-74

feeders. Cattle are used extensively as a rotation enterprise on rice-land, forest pasture, and marshland. The growing demand for beef and the relatively low labor requirements for beef production have encouraged brood cow operations as well as stocker-feeder grazing. Large scale and specialized feeding operations require a large supply of feeder stock and brood-cow herds to produce their inputs. Southwest Louisiana has been a source of forage for the cow-calf operations and for the production of stockers.

Table 31 - Numbers of Livestock on Farms and Principal Livestock Products Sold in the Southwest Louisiana River Basin, Selected Years[1]

| Production Sector | Study Area | | | | Share of Louisiana State Totals | | | |
|---|---|---|---|---|---|---|---|---|
| | 1949 | 1954 | 1959 | 1964 | 1949 | 1954 | 1959 | 1964 |
| | number | | | | percent | | | |
| Livestock on Farms: | | | | | | | | |
| Cattle and calves | 462,624 | 643,200 | 593,102 | 657,020 | 36.01 | 34.76 | 35.82 | 35.21 |
| Cows including heifers | 276,633 | 391,728 | 377,134 | 418,213 | 37.26 | 35.72 | 37.33 | 36.55 |
| Heifers and heifer calves | 73,883 | 167,949 | 144,968 | 157,062 | 34.76 | 34.44 | 34.84 | 33.62 |
| Steers and bulls | 34,205 | 83,524 | 71,000 | 81,902 | 30.54 | 31.38 | 30.93 | 32.07 |
| Hogs and pigs | 250,031 | 166,700 | 142,420 | 77,556 | 39.79 | 41.58 | 40.38 | 42.93 |
| Sheep and lambs | 65,285 | 73,162 | 57,868 | 30,359 | 72.12 | 66.50 | 61.13 | 69.97 |
| Ewes | 35,800 | 44,522 | 38,291 | 18,665 | 72.98 | 65.50 | 62.56 | 71.03 |
| Chickens 4 months old & older | 1,438,444 | 1,297,575 | 1,140,610 | 1,133,276 | 38.61 | 37.64 | 31.48 | 29.31 |
| Turkeys | 23,222 | 37,332 | 14,941 | 6,880 | 38.72 | 36.99 | 25.40 | 39.33 |
| Principal Livestock Products Sold: | | | | | | | | |
| Whole milk (lbs.) | 66,348,302 | 90,233,769 | 118,050,517 | 167,718,829 | 19.51 | 19.22 | 21.40 | 21.26 |
| Cream as butterfat (lbs.) | 34,729 | 39,533 | 4,547 | 57 | 16.89 | 22.71 | 17.18 | 61.65 |
| Chicken eggs (doz.) | 2,546,683 | 2,375,164 | 5,722,240 | 10,401,360 | 43.40 | 28.78 | 25.42 | 25.64 |
| Wool (lbs.) | 175,238 | 195,603 | 183,623 | 99,541 | 75.43 | 61.04 | 54.03 | 66.81 |

1/ Derived from U. S. Census of Agriculture.

## Farm Sales

The sale of all farm products by various classes are shown (1957-1959 = 100) at 5-year intervals in table 32. Total farm product sales increased from $96 million in 1949 to over $150 million in 1964, representing a 70 percent increase in 15 years. Farm product sales for this area have been about 38 percent of farm products sales for the State since 1949.

Field crops sales amounted to 78 percent of the area's farm products sales and 98 percent of total crop sales at the beginning and end of the period though there have been fluctuations during this time.

State and area sales of vegetables have decreased significantly. However, sales of vegetables in this area have not decreased as rapidly as for the State as a whole. Forest and horticultural products sold

4-31721 2-74

from farms more than doubled from 1949 to 1964, but these, along with vegetables, fruits, and nuts, comprised a minor share of total crop sales in the area.

Table 32 - Value of All Farm Products Sold by Enterprise Groups, and Percentages of State Totals in the Southwest Louisiana River Basin for Selected Years[1/]

| Items Sold | Study Area | | | | Share of Louisiana State Totals | | | |
|---|---|---|---|---|---|---|---|---|
| | 1949 | 1954 | 1959 | 1964 | 1949 | 1954 | 1959 | 1964 |
| | --thousand dollars[2/]-- | | | | --percent-- | | | |
| Field crops | 77.391 | 118,604 | 92,446 | 118,677 | 42.8 | 50.7 | 46.2 | 45.4 |
| Vegetables | .530 | 627 | 437 | 287 | 15.8 | 20.1 | 22.6 | 26.4 |
| Fruits and nuts | 177 | 112 | 242 | 164 | 2.9 | 2.4 | 4.9 | 3.1 |
| Forest & horticultural products [3/] | 785 | 1,170 | 1,374 | 1,699 | 19.6 | 23.2 | 19.5 | 23.1 |
| Total crops | 78,883 | 120,513 | 94,499 | 120,827 | 40.7 | 45.9 | 44.2 | 43.8 |
| Poultry & poultry products | 1.123 | 2,029 | 2,849 | 4,560 | 27.5 | 20.3 | 16.1 | 15.8 |
| Dairy products | 4,225 | 5,134 | 6,540 | 9,743 | 20.6 | 19.9 | 22.8 | 21.1 |
| All other livestock and livestock products | 12,622 | 10,439 | 23,213 | 14,890 | 34.4 | 31.3 | 32.7 | 32.8 |
| Total livestock & livestock products | 17,970 | 17,602 | 32.602 | 29,193 | 29.3 | 25.4 | 27.8 | 24.3 |
| Total all farm products | 96,853 | 138,115 | 127,101 | 150,020 | 38.0 | 43.7 | 38.4 | 37.9 |

1/ Derived from U. S. Census of Agriculture.

2/ Constant dollars, 1957 - 1959 = 100.

3/ Includes forest products sold from farms only.

Sale of all livestock and livestock products constituted 17.7 to 19.3 percent of all farm sales and increased in total by 70 percent during the period 1949-1964. The highest percentage increases were in poultry and dairy products, but the major livestock product continued to be livestock. Livestock is more important in this area than in the rest of the State. The majority of sales were from cattle which grazed rice rotation land, pasture, forest, or marsh.

## Projections of Demand

Projections of agricultural production for the Southwest Louisiana River Basin's area are made without explicit consideration of total productive capacity nor land and water development, except in as much as they have influenced historical production. Projections of future agricultural production are primarily a function of production trends at the national, regional, State, and area levels, independently and in relation to one another. Land and water development needs can then be analyzed with respect to this projection base.

National projections of food and fiber requirements have been developed through analysis and projection of domestic consumption, industrial use, and expected exports and imports.1/ An economic determination of what a region's production would ideally be based on the relative efficiencies of all competing regions. However, different conclusions may result yet when demands for other social and economic goods are incorporated into a more comprehensive analysis.

The preliminary projections incorporated into this Study are based on trends. Such projections of demands should provide a guide by which productive capacity can be measured. Assuming that the area maintains a relatively competitive position in the future and the resources exist in the area for the assumed levels of demand, then the prescribed activities will be indicators of future production.

Cotton, rice, sweet potatoes, sugarcane, soybeans, corn, and sorghum have been projected (table 33). The common base from which projections were made was the 1959-1961 period. However, soybeans and sorghum production has expanded so much in the last decade that the base year of this Study, 1967, was used as a projection base.

Table 33 - Production of Major Agricultural Crops in the Southwest Louisiana River Basin Base Period, 1959-1961, 1967, and Projected 1985, 2000, and 2020

| Crop | Unit | Base 1959-61 | 1967 | 1985 | 2000 | 2020 |
|---|---|---|---|---|---|---|
| | | thousand | | | | |
| Cotton | Bales | 108 | 69 | 84 | 90 | 97 |
| Rice | Cwt. | 13,972 | 21,374 | 26,494 | 29,900 | 35,587 |
| Sweet potatoes | Cwt. | 2,200 | 2,717 | 2,210 | 2,271 | 2,847 |
| Sugar cane | Ton | 2,040 | 3,039 | 5,161 | 7,069 | 10,231 |
| Soybeans | Bu. | 655 1/ | 10,139 | 14,499 | 17,845 | 20,917 |
| Corn | Bu. | 3,358 | 2,425 | 596 | 100 | 0 |
| Sorghum | Bu. | - - 1/ | 201 | 1,035 | 1,365 | 1,966 |

1/ 1967 base is used for this crop. Unrepresentative production base in 1959-61 and increases have been significant since that time.

Even though "other vegetable crops" production is not anticipated to be a significant use of cropland in this area, some acreage will

1/ "Preliminary Projections of Economic Activity in the Agricultural Forestry and Related Economic Sectors of the United States and Its Water Resource Regions, 1980, 2000, and 2020." Prepared by Economic Research Service and Forest Service, USDA, August 1967 (Rev. March 8, 1968) for use by Water Resources Council and Cooperating Agencies.

4-31721 2-74

continue to be required and it has been accounted for in projecting future land use.

Livestock is expected to increase in this area less than nationally. Numbers of livestock and production per animal unit are expected to increase. A higher level of management should result in greater livestock production per head, but major crops may pre-empt the use of high quality land for larger numbers of livestock.

Forage production will continue to be a residual land use in the basins, though absolute amount will be significant. Except for possible institutional constraints on land use, field crops, fiber, oil, and intensive vegetable production will tend to dominate the allocation of resources. Forages which are intensively cultivated or managed will be the exception.

## FOREST RESOURCES AND RELATED ECONOMIC ACTIVITY

### Contribution to Economy

Historically, growth of forest industry, both in the State and in the Basin have been impressive. Pulp and softwood plywood manufacturers were the leading performers. Pulping capacity for the State and the Basin has increased more than threefold since 1946. Softwood plywood plants have shown steady and continuous growth since 1965; one of the State's ten plants is located within the Basin. Hardwood lumber and veneer-log output has declined with a loss of hardwood acreage base to agriculture. However, softwood lumber output has risen slowly since 1961, following declines during the 1950's.

These output increases were accompanied by rapidly rising productivity. As a result, forest industry employment has declined steadily from 1946 to 1970. Employment in pulpwood and paper increased slightly, while employment in lumber and furniture manufacture fell drastically. The forest industry's share of State manufacturing employment fell from 34 percent in 1946 to 18 percent in 1967. The share of value added dropped from 27 percent to 13 percent, partly due to growth of the State's oil, gas, and petrochemical industries.

In 1971, Louisiana was the third leading State in output of softwood plywood, third in pulp production, and third in paper and paperboard[2]. About 10 percent of the State's sawmill and pine plywood production is located in the Basin.

In 1969, approximately 4,500 employees in forest industries in the Basin earned about $36 million, and payments to stumpage growers totaled almost $7 million. Thus, the forest industry directly contributed $43 million to

2/ Louisiana's Forest Industries - 1946-1971 - Loyd C. Irland the Basin economy in payments to timber sellers and workers. An added $20 million in new capital expenditures raises the annual contribution to the Basin economy to $63 million. When wage earners and stumpage sellers spend this income, additional jobs and incomes are created. The total economic activity generated by timber is about 22 times the stumpage value.

In 1971, the stumpage sales amounted to about $9 million. This stumpage value was divided about $1 million to hardwood pulp, about $1.5 million to pine pulp, and about $6.5 million to pine sawtimber (see figure 11).

$ - Million Dollars

| | |
|---|---|
| Hardwood Pulpwood | $ |
| Pine Pulpwood | $ $ |
| Pine Sawtimber | $ $ $ $ $ $ $ |
| Total | $ $ $ $ $ $ $ $ $ |

Million Dollars

Figure 11 - Stumpage Value in 1971 of Timber in Southwest Louisiana River Basin

In 1971, the stumpage sales of $9 million generated economic activity exceeding $198 million (figure 12).

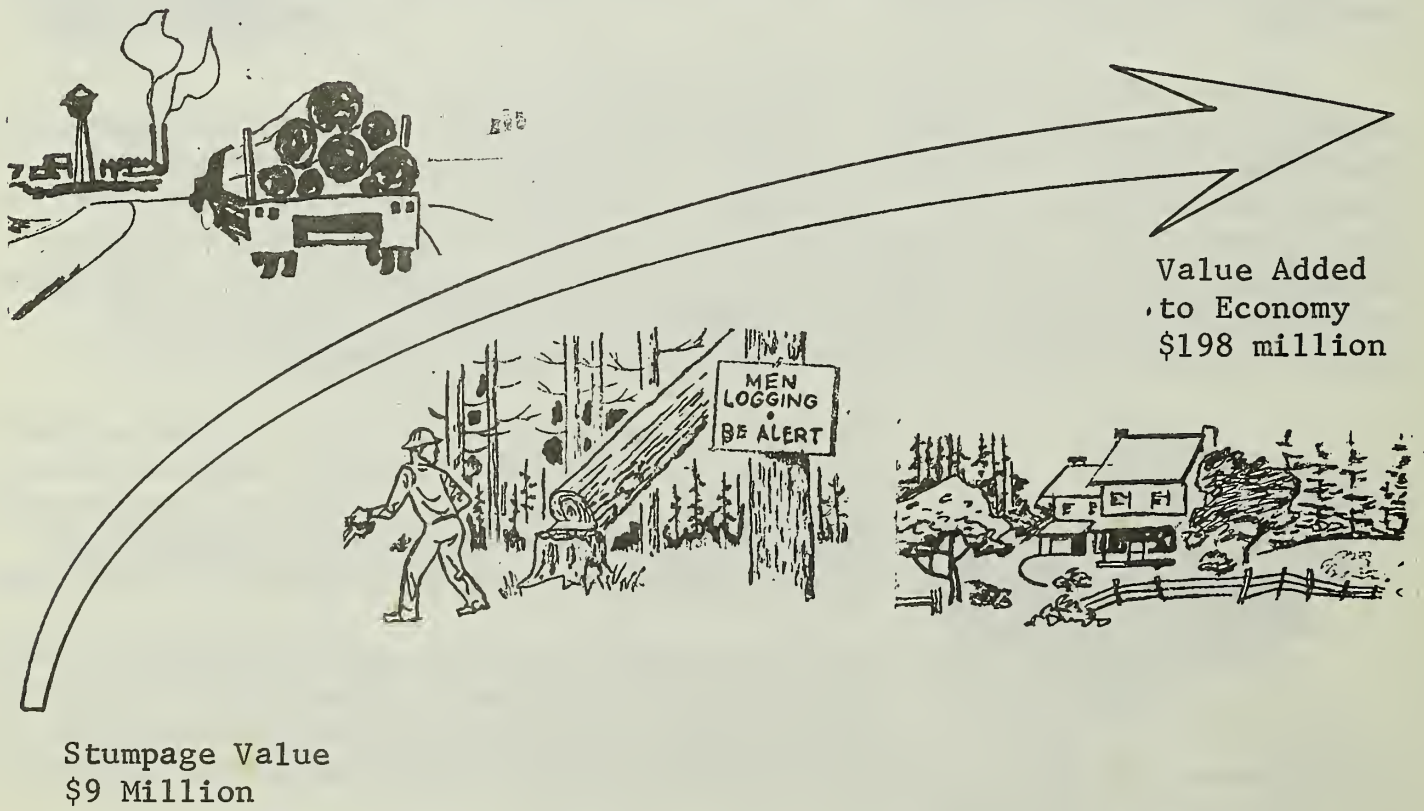



Figure 12 - Value Added to Forest Products Using 1971 Stumpage Sales, Southwest Louisiana River Basin

4-31721 2-74

Stocking, Condition, and Ownership

Of the total 2,603,000 acres of forest land within the Basin, 1,271,000 acres (49%) is 70 percent, or better, stocked with growing trees. This is the best stocking that can be expected through natural growth. An additional 925,000 acres (36%) is 40 to 70 percent stocked with growing trees, which is adequate to produce a commercial crop of forest products. The remaining 406,000 acres (15%) is less than 40 percent stocked, which is not producing a commercial crop.

Forest conditions indicate that only 764,000 acres (30%) of forest lands is 70 percent or more stocked with desirable trees, 1,025,000 acres (39%) is 40 to 70 percent stocked with desirable trees, and the remaining 814,000 acres (31%) is less than 40 percent stocked with desirable trees (figure 13).

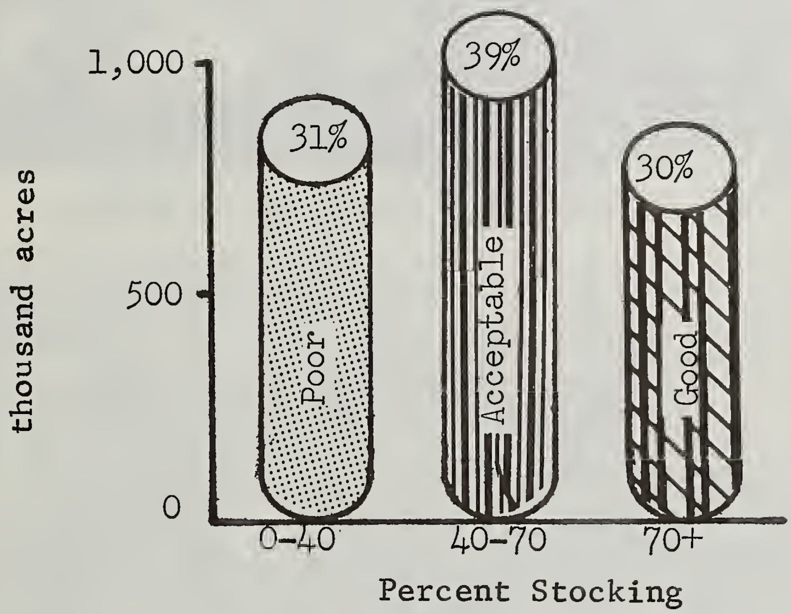



Figure 13 - Area and Percent Stocking With Desirable Trees, 1963, Southwest Louisiana River Basin

Stocking alone does not give a true picture of the forest resources. Since not all trees have commercial value, the condition of the stocking must also be analyzed. The desirable stocking for forest products depends upon stocking with commercial species.

Forest industry and public forest lands contain a higher percentage of growing stock volumes than farmer and miscellaneous private forest lands. Three-fourths of the growing stock volume on public lands is in sawtimber-sized stands that cover two-thirds of the area (figure 14).

The longer rotations and larger build-up of growing stock on public lands, especially the national forest, is necessary because management objectives are to produce a broad choice of forest products and provide a wider range of services to the public.

To analyze the forestry situation, about 1,271,000 acres are fully stocked, and only 764,000 acres of this area are stocked with desirable

Managed well stocked stands are producing at maximum.

Poorly stocked stands are producing much less than potential.

4-31721 2-74

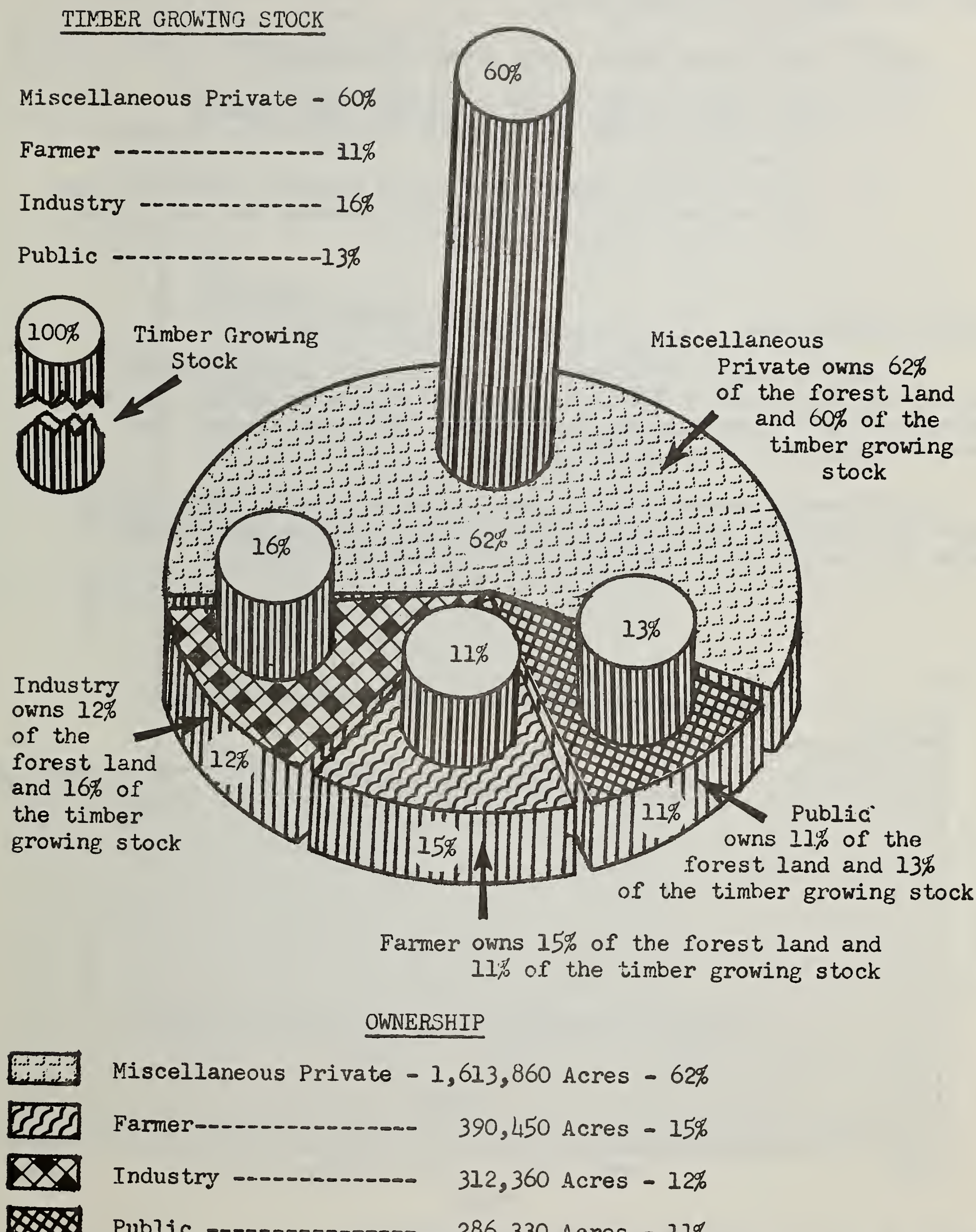



Figure 14 - Percent of Total Forest Acres and Timber Growing Stock Volume by Ownership Class, 1963, Southwest Louisiana River Basin

trees. The greatest difference is in the area of unsatisfactory stocking. Although only 307,000 acres in the Basin is unsatisfactorily stocked with growing trees, when desirability of species is considered, this area more than doubles to 814,000 acres.

Several conclusions can be drawn from this analysis:

1. Only half of the forest stands are well-stocked.
2. Undesirable trees occupy about a third of the forests' growing space.
3. To meet future demands for forest products, both the total and desirable stocking must be increased, and the resource must be more fully utilized.

## Forest Land Acreage

The forest acreage of 2,603,000 acres in 1963 is projected to decline 248,000 acres by 2020. The general decline in forest land is approximately 0.9 percent (see figure 15). This land acreage will revert primarily to crops and pasture.

The Economic Research Service has projected that by 2020, 582,000 acres will probably shift from forest land to cropland, and 606,000 acres will revert from cropland to forest land or pasture.

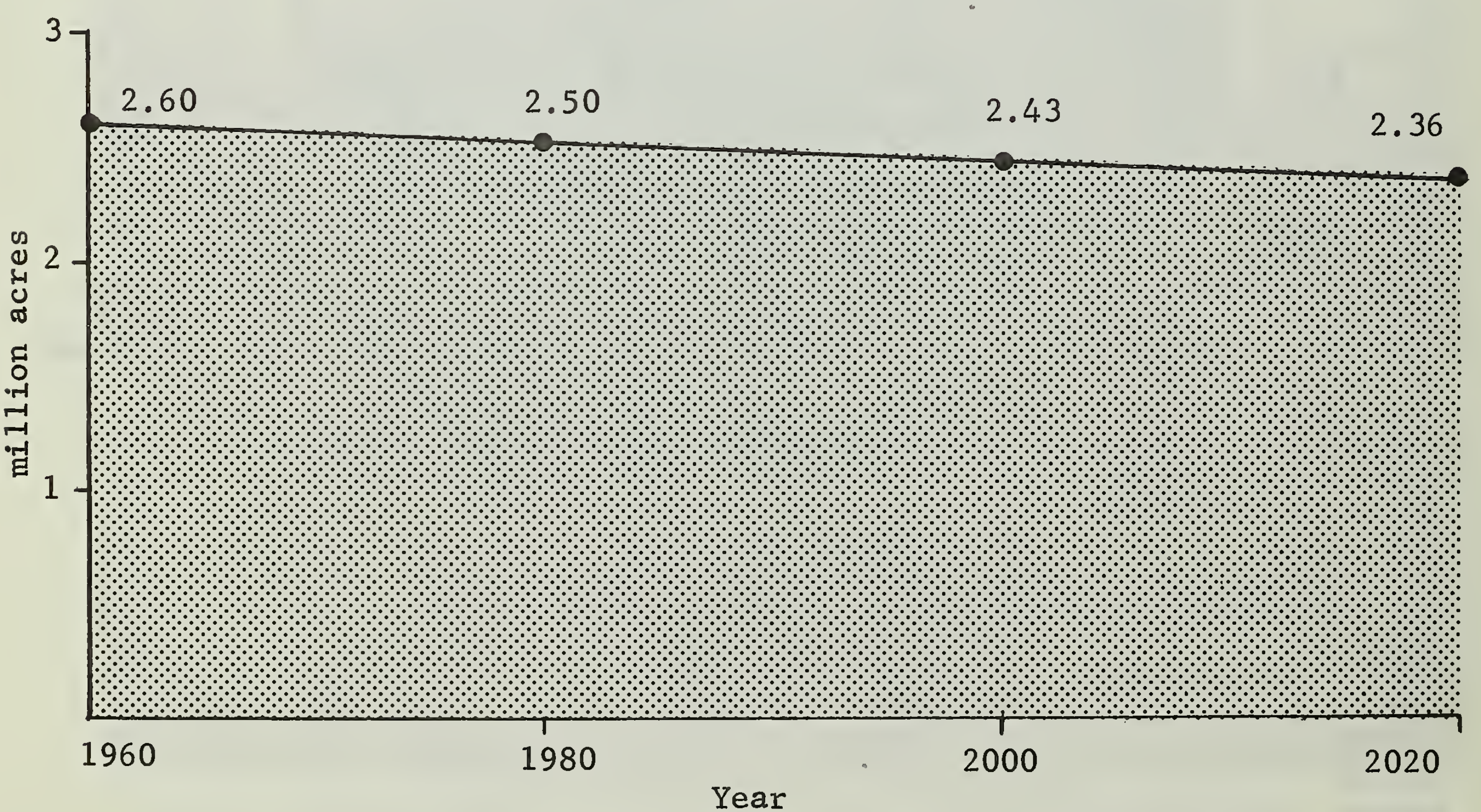



Figure 15 - Projections of Forest Land Acreage in Southwest Louisiana River Basin

4-31721 2-74

<u>Grazing</u>

According to historical projections, there will be a gradual decline in the use of forest lands as a grazing resource in the Southwest Louisiana River Basin between now and 2020. In 1970, there were 381,000 acres of forest land pastured out of a total 1,931,000 acres available. This indicates only 22 percent of the grazing resource is being used. This use is projected to decline to 350,000 acres in 1980, 343,000 acres in 2000, and 336,000 acres in the year 2020. (figure 16).

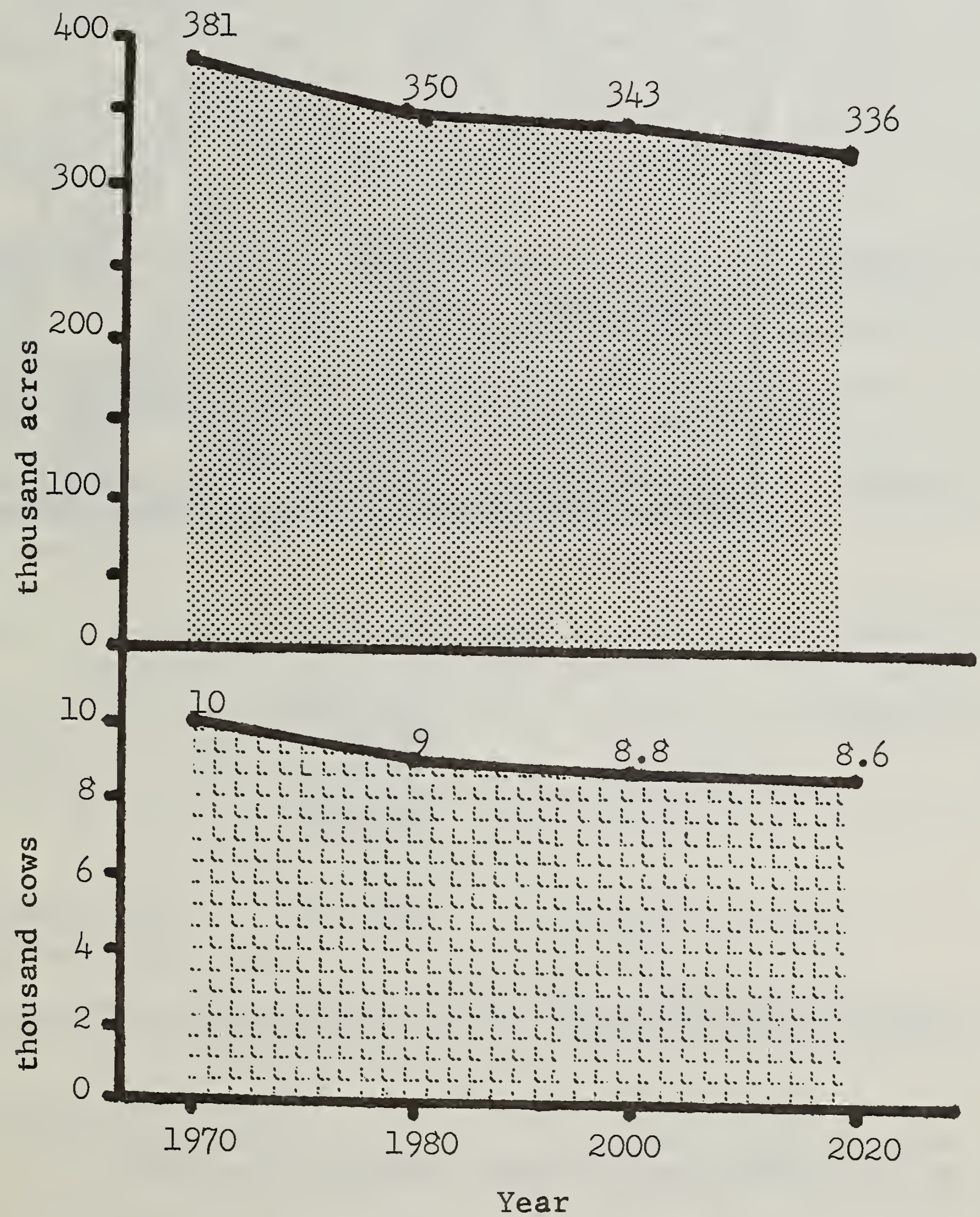



Figure 16 - Projected Acreage and Use of Pastured Forest Land in Southwest Louisiana River Basin

4-31721 2-74

The present use is about 10,000[3] animal units per year. This will decline to 9,000 animal units in 1980, and decrease only slightly thereafter. The expected use is 8,800 animal units in 2000 and 8,600 animal units in 2020. (figure 16).

## Comparison of Forest Product Returns with Other Crops

When annual net returns per acre for forestry are compared to annual net returns per acre for other agricultural crops on the same lands, it is obvious that forestry does not compete favorably for investment money (see table 34). The net annual return for forest products is about $19.00 per acre at high levels of management.[4] Proprietors of good stands must compare these expectations on soils of comparable capability bottom land hardwood to about $62.00 for sugarcane, $13.00 as compared to $52.00 for rice, and $13.00 compared to $30.00 for soybeans; on upland stands, $11.00[5] as compared to $19.00 for permanent pasture.

Table 34 - Comparison of Annual Net Dollar Return Per Acre for Forest Products to Other Agricultural Crops on the Same Type of Land, Southwest Louisiana River Basin

| Type of Land | Forestry | | Other Agricultural | |
|---|---|---|---|---|
| | Product | Return/Acre | Crop | Return/Acre |
| | | dollars | | dollars |
| Bottom land Hardwood | Sawlogs and Pulpwood | 19 | Sugarcane | 62 |
| " | " | 13 | Rice | 52 |
| " | " | 13 | Soybeans | 30 |
| Upland, Hardwood & Pine | " | 11 | Pasture | 19 |

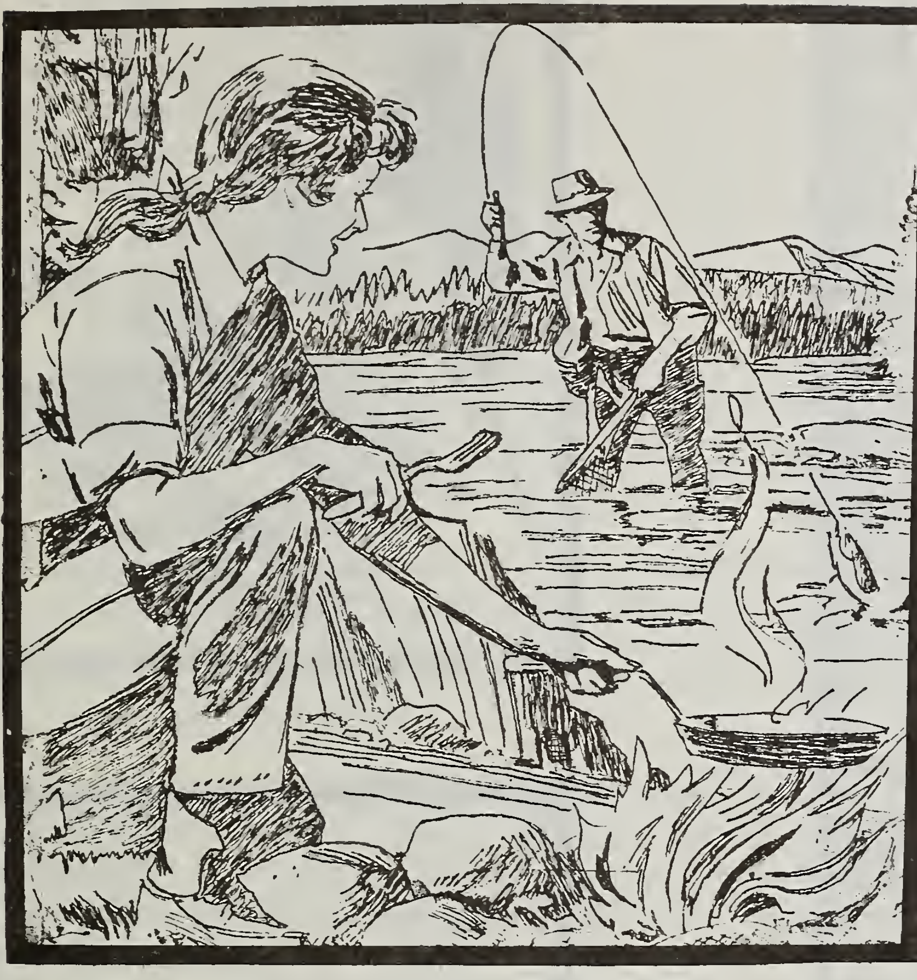
3/ Animal unit is one mature cow, or steer grazing 12 months.

4/ Includes cost of land and establishment amortized over 50 years based on 1970 stumpage prices; does not include appreciation through processing.

5/ Includes cost of land and establishment amortized over 30 years based on 1970 stumpage prices; does not include appreciation through processing.

4-31721 2-74

Recreation, Fish, and Wildlife



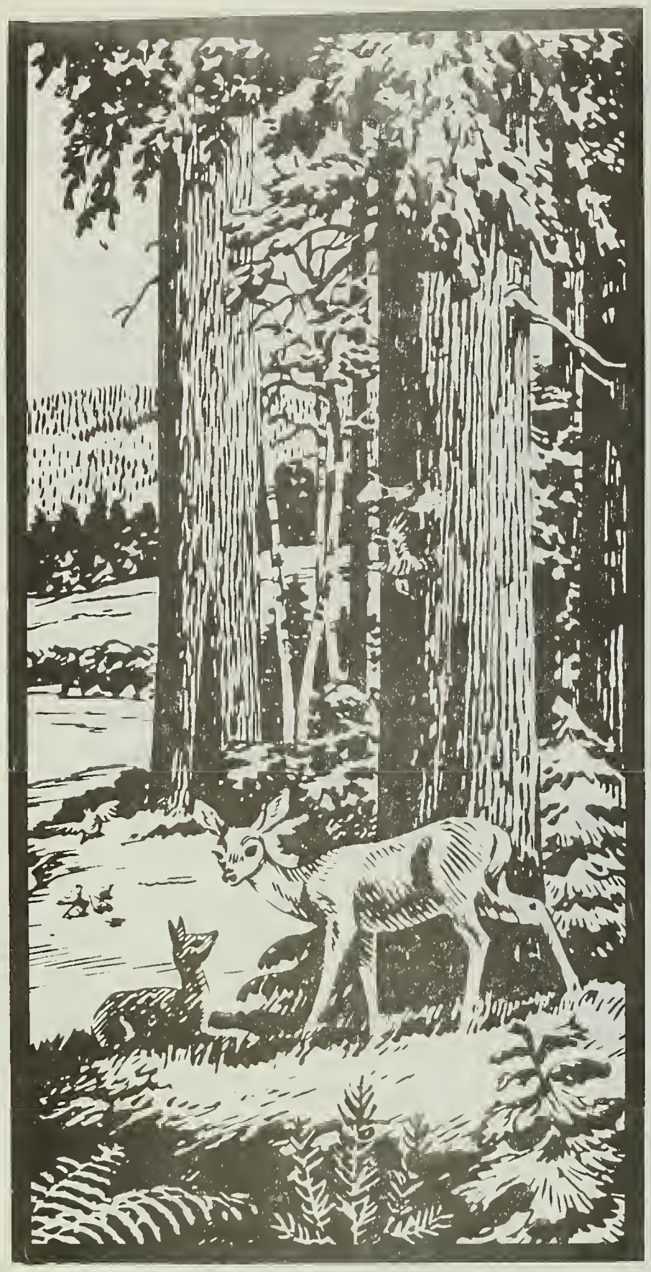
There are about 37,163 surface acres of water, and nearly 360,000 acres of land dedicated to recreation within the Basin. This area supports 488 recreation sites. Major recreation lands on forest land are listed in table 35.

There are values to forest lands other than timber production. Some of the values are watershed protection, recreation, wildlife habitat, scenic values, forage production, and nature study (see figure 17).

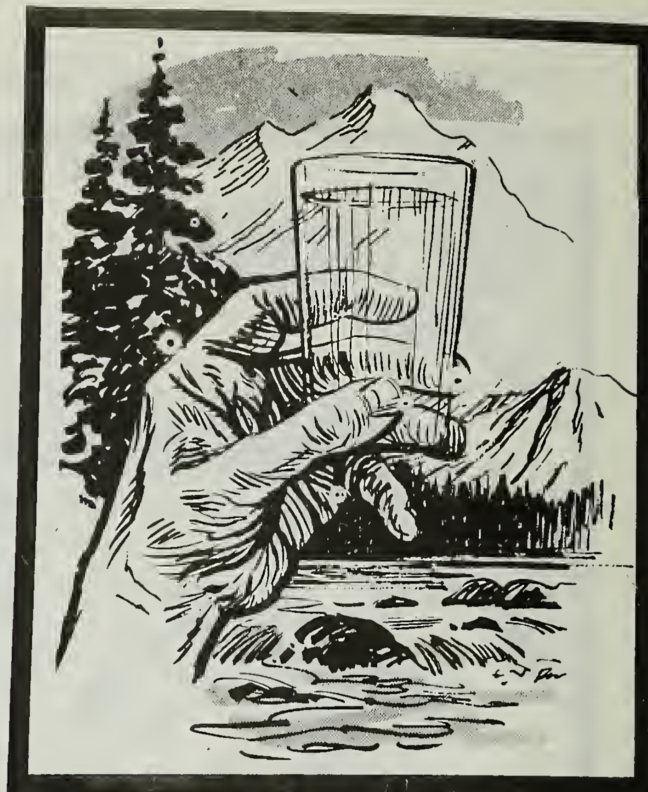
Table 35 - Recreation on Forest Land in 1970, Southwest Louisiana River Basin

| Type of Recreation | Developed Sites | Ownership | Area |
|---|---|---|---|
| | no. | | acres |
| 1. Camping, picnicking, swimming, etc. | 3 | La. State Parks & Recreation Comm. | 7,625 |
| " | 3 | U. S. Forest Service | 390 |
| 2. Hunting, fishing, hiking, bird watching, etc. | 7 | La. Wild Life & Fisheries Comm. | 346,775 1/ |
| " | 3 | U. S. Forest Service | 85,000 1/ |
| " | 2 2/ | U. S. Forest Service | 120 |

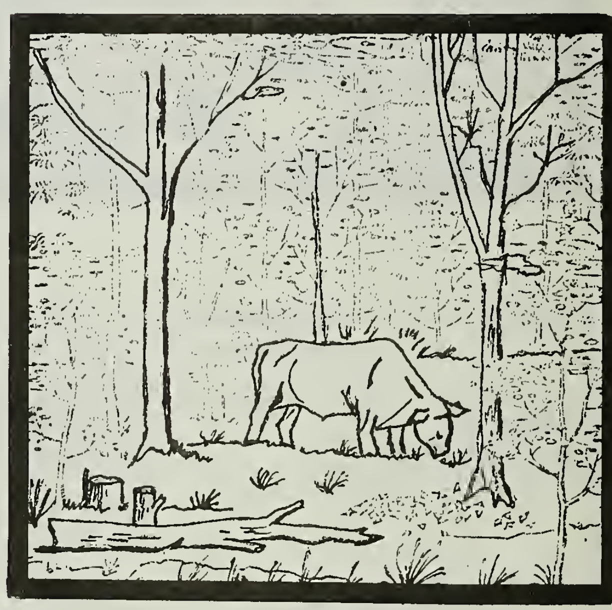
1/ Acreages are duplicated where State Wildlife Management Areas occur on National Forest System lands.
2/ Dedicated Scenic Areas.



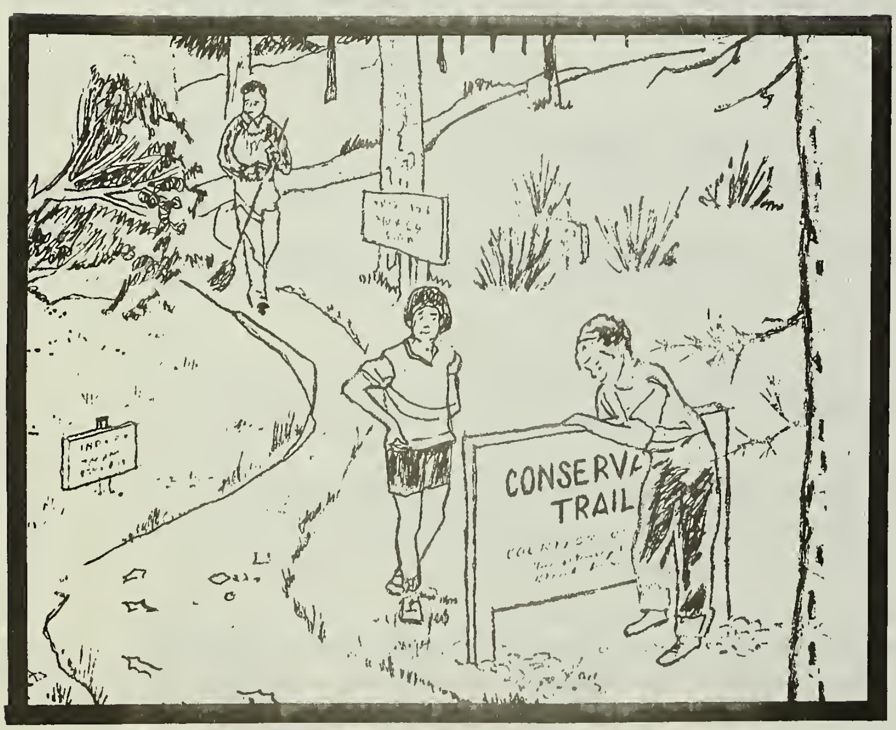
Scenic & Wildlife



Water Quality



Forage Production




Nature Study

Figure 17 - Intangible Benefits of the Forest, Southwest Louisiana River Basin

4-31721 2-74

These values are difficult to assess in monetary terms. The private landowner is seldom ever compensated for any of them, nor can he afford to provide these benefits to the general public at his own expense. For example, a recent study in the southeastern area of the United States indicated that nature lovers and sportsmen would have to be compensated at a rate of $10.00 to give up one day of animal watching, and an average rate of $23.00 to give up one day of hunting. These values can be directly related to forest lands. Greater emphasis on these intangible values of forest lands will lead to an effort to take many acres out of production for forest products and preserve them for other uses.

Freshwater lakes support average standing fish crops of 75 lbs. per acre. The 2,500 miles of streams (16,000 surface acres) contain over 900 miles suitable for high quality recreation. These streams support over 77,500 lbs. of fish.

The waterfowl resource is tremendous because the Basin provides the bulk of the wintering grounds for millions of ducks and geese which travel the famed Mississippi Flyway. The oak-gum-cypress forest type (816,000 acres - Wetland Type 7) provides essential mast supplies for these migrating species.

Other major game species include white-tailed deer, turkey, quail, dove, and rabbit. These species depend largely on bottom land, (816,000 acres) and upland, (573,000 acres) hardwood forest type for quality habitat. Projections of recreational activity for deer and squirrel are shown in figure 18.

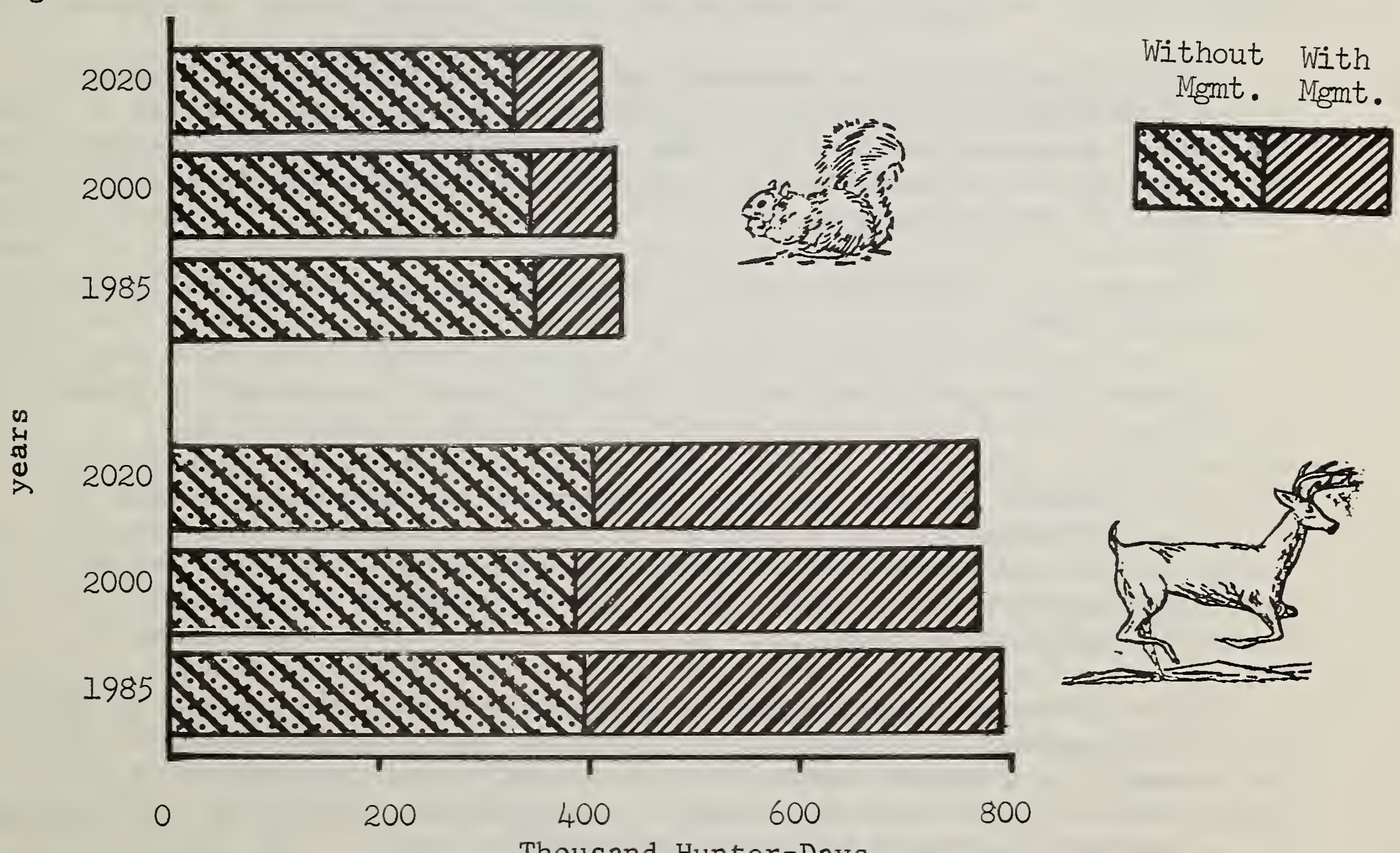



Figure 18 - Projections of Recreational Activity for Deer and Squirrel, With and Without Habitat Management, Southwest Louisiana River Basin.

About 1,600,000 acres are open to public hunting within the Basin. Most of the private acreage open to public use is on forest land.

## OUTDOOR RECREATION DEMANDS

### Planning Concepts

The approach to outdoor recreation demand estimates and projections in this Basin is based on several tenets which form a general concept for planning. Briefly states, these tenets are: (1) people want to participate or have the advantage of outdoor recreation, (2) outdoor recreation is desirable and meaningful as a planning goal, (3) land and water resource development will facilitate this planning goal even while improving the aesthetic environment, and (4) water and related land resource programs should endeavor to satisfy these human needs and desires.

The following are definitions of basic terminology used in this Study:

Activity Occasion - is the participation by a person in one activity during a day. If a person participated in three activities during one day, it is counted as three activity occasions.

Participation Rate - is the average number of times one person engages in a particular outdoor recreation activity per $1,000 of per capita income during a given period of time.

Recreation Day - is a standard unit of use consisting of a visit by one individual to an outdoor recreation development or area for recreation purposes during all or any reasonable portion of a 24-hour day. The period is measured from midnight to midnight and is assumed to equal 1.5 activity occasions.

Summer - is considered to be 13 weeks during the months of June, July, and August.

Demand for Outdoor Recreation - is the annual or periodic participation that occurs with given conditions of price, leisure time, accessibility, capacity, quality, and other socio-economic characteristics. The term "demand" is used loosely. Prices and corresponding levels of activity schedules that identify demand are not available. Per capita income levels and known participation rates were used instead. Participation is expressed in activity occasions per unit of time, e.g., annually, seasonally, or daily.

Average Summer Sunday Demand - is the average amount of participation in a given outdoor recreation activity on a typical summer Sunday. It is calculated on a 13-week summer basis assuming that 2.88 percent of all summer recreation occurs on a Sunday. Seventy-five percent of all camping is assumed to occur on a Saturday and Sunday.

4-31721 2-74

Current and Projected Demand

The outdoor Recreation Market Area of the Southwest Louisiana River Basin is that area from which essentially all of the one-day outing or weekend (overnight) facility users originate. This area includes three SMSA areas within the Basin and six SMSA's outside of the Basin. Population data of this Study were coordinated with other over-lapping studies as much as possible. Those population shares from the various area designations utilized in this Study were derived from population center participation zone estimates and data shown in exhibit 2.

The activities which are significant to this Study were identified and grouped where participation rates were low or resource requirement was common to all. Participation rates were derived basically from the Louisiana State Comprehensive Outdoor Recreation Plan (SCORP). The recreation participation reported in that study is shown in the activity format of this Study in exhibit 3.

Outdoor recreational activities included in this Study and the associated per capita participation rates in 1967 are shown for the whole year, the summer season, and an average summer Sunday in table 36.

A very high percentage of the designated activities occur during the summer months. In fact, 91 percent of all swimming, and approximately 75 percent of the camping and picnicking occurs during this period of the year. The remaining activities are of a lesser, but still significant, percentage during summer months, except for hunting.

Figure 19 shows the distribution of the total outdoor recreational demand as it is related to water resources on an annual basis and on a summer season basis. Recreational activity is more heavily concentrated about water resources during the summer as might be expected. The annual share of outdoor recreation oriented to water is 44 percent, while in the summer, it is about 55 percent. Water enhanced activities are also about 2 percent higher in the summer. Aesthetic activities such as pleasure driving and sightseeing are not necessarily water dependent, but they are quite often enhanced by water. For this reason, aesthetic activities' percentages of the total, 29 and 25 percent, are shown as a separate segment.

The 1967 total demand for these outdoor activities, as shown in table 37, was estimated to be about 21.7 million activity occasions or almost 14.5 million recreation days per year in the recreation market area for the Southwest Louisiana River Basin. Approximately 64 percent of this demand occurred during the summer months. Due to the effect of increasing population, time, and means to recreate, total demand is expected to trend upward through the entire time period under study. By 1985, it is estimated that total demand will increase by 92 percent to 27.3 million recreation days, with the same relative proportion of summer demand. The year 2020 is expected to bring an increase of approximately 550 percent over 1967. These projections include no restraints due to resource limitation. A perspective including wildlife management and resource restraints is developed under Basin fish and wildlife needs.

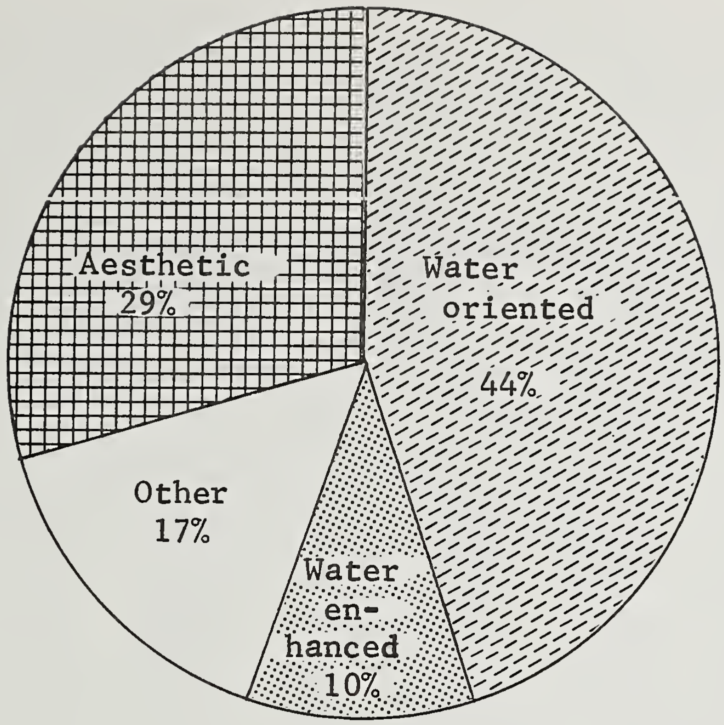
Table 36 - Participation Rate for Specified Outdoor Recreational Activities by All Persons in Louisiana During 1967 1/

| Activity | | Activity Occasions Annual | Summer | | Average summer Sunday |
|---|---|---|---|---|---|
| | | average per person | | | |
| Swimming | | 7.970 | 7.273 | | .210 |
| Pool | | 5.276 | 4.644 | | .134 |
| Beach | | 2.694 | 2.629 | | .076 |
| Camping | | 1.700 | 1.245 | | .036 |
| Tent | | .669 | .520 | | .015 |
| Trailer | | 1.031 | .725 | | .020 |
| Picnicking | | 2.136 | 1.663 | | .048 |
| Fishing | | 6.604 | 4.124 | | .119 |
| Salt | | 2.025 | 1.393 | | .040 |
| Fresh | | 4.579 | 2.731 | | .079 |
| Other water sports | | 3.140 | 2.350 | | .068 |
| Trails | | 4.041 | 1.979 | | .057 |
| Aesthetics | | 11.435 | 6.103 | | .176 |
| Pleasure driving | | 7.738 | 3.855 | | .111 |
| Sightseeing | | 3.697 | 2.248 | | .065 |
| Hunting | 2/ | 1.542 | - | 3/ | .040 |
| Waterfowl | 2/ | .293 | - | 3/ | .008 |
| Upland | 2/ | 1.249 | - | 3/ | .032 |

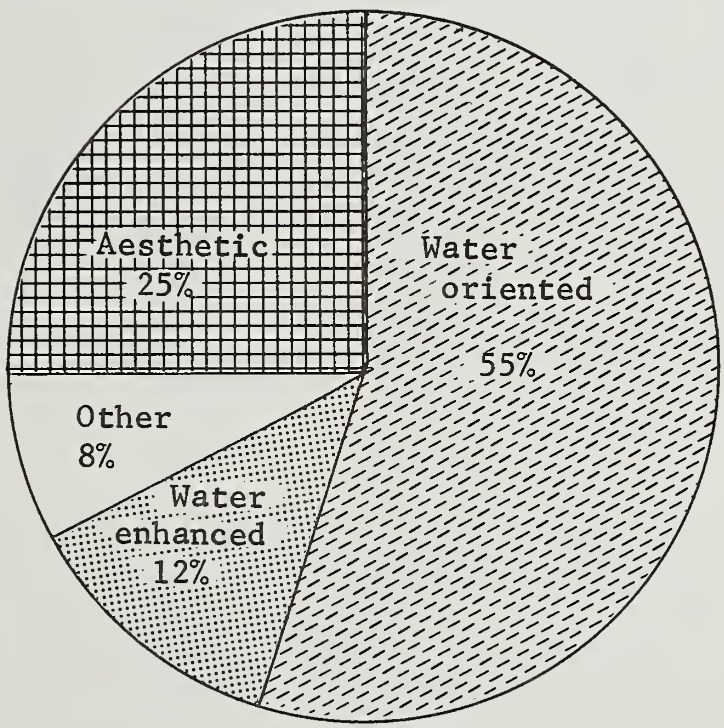
1/ Basic data extracted from State Comprehensive Outdoor Recreation Plan, and adjusted to full population. Includes assumption of those under 6 years requiring facilities and participation at one-half the rate of those above 6 years.

2/ Due to the large amount of habitat, concentration of wild game and known high rate of hunting participation, residents of the Basin were represented with an income and Basin-adjusted participation rate.

3/ Extrapolations of the average summer Sunday concept.




Annual




Summer

Figure 19 - Annual and Summer Season Outdoor Recreation Demand Expressed as Percentage Dependent on Water Resources

4-31721 2-74

Table 37 - Total Outdoor Recreational Demand of Specified Activities in the Recreation Market Area for 1967, 1985, 2000, and 2020, Southwest Louisiana River Basin

| Activity | 1967 | | 1985 | | 2000 | | 2020 | |
|---|---|---|---|---|---|---|---|---|
| | Annual | Summer | Annual | Summer | Annual | Summer | Annual | Summer |
| | activity occasions (1,000) | | | | | | | |
| Swimming | 5,054.5 | 4,612.5 | 8,315.5 | 7,588.2 | 13,338.8 | 12,616.7 | 22,377.0 | 20,420.3 |
| Pool | 3,346.1 | 2,945.4 | 5,504.6 | 4,845.7 | 9,152.1 | 8,056.8 | 14,813.7 | 13,040.0 |
| Beach | 1,708.1 | 1,667.0 | 2,810.6 | 2,742.5 | 4,673.2 | 4,559.9 | 7,563.3 | 7,380.3 |
| Camping | 1,078.0 | 789.5 | 1,773.3 | 1,298.8 | 2,948.6 | 2,158.9 | 4,772.3 | 3,494.3 |
| Tent | 424.3 | 329. | 697.5 | 542.7 | 1,159.9 | 902.1 | 1,877.7 | 1,460.4 |
| Trailer | 654.2 | 459. | 1,075.9 | 756.2 | 1,788.7 | 1,256.4 | 2,895.0 | 2,034.0 |
| Picnicking | 1,355.0 | 1,054. | 2,228.9 | 1,734.7 | 3,706.2 | 2,884.5 | 5,998.3 | 4,668.3 |
| Fishing | 4,188.6 | 2,615.5 | 6,890.7 | 4,303.1 | 11,456.9 | 7,154.6 | 18,543.0 | 11,579.6 |
| Salt | 1,284.3 | 883.5 | 2,112.7 | 1,453.6 | 3,512.5 | 2,416.6 | 5,685.4 | 3,911.0 |
| Fresh | 2,904.4 | 1,731.9 | 4,778.1 | 2,849.2 | 7,944.4 | 4,737.2 | 12,857.6 | 7,667.3 |
| Other water sports | 1,991.2 | 1,490.3 | 3,275.7 | 2,451.9 | 5,446.4 | 4,076.4 | 8,815.0 | 6,598.0 |
| Trails | 2,562.6 | 1,254.9 | 4,215.7 | 2,064.2 | 7,009.4 | 3,432.0 | 11,317.6 | 5,555.0 |
| Aesthetic | 7,235.1 | 3,800.6 | 11,930.3 | 6,367.0 | 19,836.3 | 10,586.7 | 32,104.6 | 17,134.7 |
| Pleasure driving | 4,932.8 | 2,400.7 | 8,072.9 | 4,021.9 | 13,422.8 | 6,686.7 | 21,724.6 | 10,823.0 |
| Sightseeing | 2,302.3 | 1,399.9 | 3,856.9 | 2,345.1 | 6,413.5 | 3,899.1 | 10,380.0 | 6,311.0 |
| Hunting | 1,407.1 | - | 2,600.4 | - | 4,187.3 | - | 6,135.1 | - |
| Waterfowl | 288.5 | - | 533.1 | - | 858.4 | - | 1,257.7 | - |
| Upland | 1,118.6 | - | 2,067.3 | - | 3,328.9 | - | 4,877.4 | - |

The average summer Sunday is a common planning unit, which is particularly useful in computing demands for days of frequently high participation, and thereby, arrives at an estimate of facility requirements for days of peak demand. This planning unit also serves well for the measurement of hunting activities since it represents high participation days. This unit serves as a guide rather than a goal, however, because development of facilities for these peak days would create a large surplus for the remainder of the summer weekdays and a much larger surplus for the remainder of the year. This surplus of facilities may become more evident and the scale of development more challenging over time. Projection of average summer Sunday demand for each outdoor activity is shown in table 38. These are the numbers of activity occasions that will be planned for if the average summer Sunday demand is satisfied in the future.

The general geographic pattern of demand origin for this recreation market area is not expected to show significant shifts over time. The population shares indicate that most of the contributing population centers are located in the lower half of the recreation market area.

4-31721 2-74

Table 38 - Total Outdoor Recreation Demand of Specified Activities in the Recreation Market Area for 1967, 1985, 2000, and 2020 Southwest Louisiana River Basin

| Activity | 1967 Average Summer Sunday | 1985 Average Summer Sunday | 2000 Average Summer Sunday | 2020 Average Summer Sunday |
|---|---|---|---|---|
| | activity occasions (1,000) | | | |
| Swimming | 132.8 | 219.0 | 364.0 | 589.3 |
| Pool | 84.8 | 139.7 | 231.9 | 375.8 |
| Beach | 48.0 | 79.1 | 132.2 | 214.2 |
| Camping | 22.7 | 37.3 | 62.8 | 101.7 |
| Tent | 9.5 | 15.5 | 25.9 | 41.6 |
| Trailer | 13.2 | 21.4 | 35.6 | 57.6 |
| Picnicking | 30.4 | 50.2 | 83.8 | 135.8 |
| Fishing | 75.3 | 123.9 | 206.5 | 334.1 |
| Salt | 25.4 | 41.8 | 69.4 | 112.1 |
| Fresh | 49.9 | 82.0 | 137.1 | 221.6 |
| Other water sports | 42.9 | 70.6 | 117.8 | 190.4 |
| Trails | 36.1 | 58.9 | 98.6 | 159.2 |
| Aesthetic | 109.4 | 183.1 | 304.5 | 492.7 |
| Pleasure driving | 69.1 | 116.2 | 193.7 | 313.4 |
| Sightseeing | 40.3 | 67.6 | 112.4 | 182.4 |
| Hunting | 36.1 | 67.5 | 108.7 | 159.0 |
| Waterfowl | 7.4 | 13.8 | 22.3 | 32.6 |
| Upland | 28.7 | 53.7 | 86.4 | 126.4 |

Their effect is further accentuated by larger size and closer proximity to the Basin Area. Where populations are such that stress is placed on natural resource-oriented facilities, parks and recreation areas of user orientation become more important, and compromises are made which deviate from the standards used for resource-oriented facilities. This emphasis on population origin does not pre-empt all planning for further distances, however, because many outdoor recreationists will drive to the natural environmental conditions that they value the most. This will be further encouraged in the future by improved transportation facilities. Likewise, the more distant and rural areas will continue to be the preferred locations for those recreating for more than a day or a weekend.

Hunting activity in southwest Louisiana is noteworthy, simply because the area possesses abundant habitat and has a history of hunting interest. The entire State takes pride in its slogan "Sportsman's Paradise" and much of the paradise is located in this Basin.

Table 39 shows the approximate percentage shares of predominant game-hunting activity occasions in the area with associated projected demands. Waterfowl constitutes only about 20 percent of the hunting activity in this Basin, but over half of the waterfowl hunting in the entire State. Louisiana Wild Life and Fisheries Commission data indicate that approximately 80 percent of the Louisiana goose kill has been in this area.

There were approximately 1.4 million hunting activity occasions in the Basin Area during 1967 with an estimated increase in demand of 4.7 million by year 2020. The assumption of continued hunting popularity underlying the estimate of increased total demand may force extensive revision of wildlife management and regulation of hunter participation. If this is not done, the demand for these sports may experience much less increase than is projected.

Table 39 - Current and Projected Annual Hunting Activity Demand Expressed as Game Type Shares in Southwest Louisiana River Basin 1/

| Game | Share | Activity Occasions 1967 | 1985 | 2000 | 2020 |
|---|---|---|---|---|---|
| | percent | ----------------thousand---------------- | | | |
| Deer | 5.5 | 77.4 | 143.0 | 230.3 | 337.4 |
| Squirrel | 25.0 | 351.8 | 650.1 | 1,046.8 | 1,533.8 |
| Rabbit | 24.0 | 337.7 | 624.1 | 1,005.0 | 1,472.4 |
| Upland fowl | 23.5 | 330.7 | 611.1 | 984.0 | 1,441.7 |
| Waterfowl | 20.5 | 288.5 | 533.1 | 858.4 | 1,257.7 |
| Other | 1.5 | 21.1 | 39.0 | 62.8 | 73.2 |

1/ Derived from consultation with Louisiana Wild Life and Fisheries Commission.

4-31721 2-74

## Physical Requirement Projections

Following the assumption that enough natural resources will be reserved and enough facilities will be developed to satisfy the demand on an average summer Sunday, the future of recreation planning and development will certainly be dynamic. If facilities are developed to satisfy these units, they should be adequate for the needs throughout the year except for those peak holiday occasions which are greater than the average summer Sunday. It is possible, however, to relieve pressures for new developments by more intensive management of existing resources and facilities.

Acreages of land required to furnish recreation in the specified activities are primarily oriented to prepared site or developed land. Physical unit size and number of units required per participant on an average summer Sunday are shown in table 40.

For activities such as camping and picnicking, an additional undeveloped land area is usually associated with the recreational development. Variation in the type of natural setting to be developed results in dissimilar physical requirements as is noted in picnicking activity. Wilderness sites will not accommodate nearly as many participants, but the special quality of the setting may be violated with closer spacing.

Aesthetic activities, i.e., pleasure driving and sightseeing, as defined in SCORP and adopted for this Study, include more than the natural environment as an object of appreciation. This category also includes such views as interesting towns, historic sites, construction, and agricultural settings. This preliminary Study does not place a physical requirement on aesthetic activities.

Facilities and resources required to satisfy the current and projected outdoor recreation activities on an average summer Sunday are presented in table 41. These data are based on the estimated number of activity occasions on the average summer Sunday in southwest Louisiana and the accepted daily capacity of specified facility units. Included are assumptions of space per visitor, facility spacing, and visitor turnovers per day, which are inherent to the physical requirement rates and are principally based on SCORP.

Hunting activity currently requires large acreages of resources for both game habitat and for reasons of hunter safety. The projected acreage requirements, assuming current rates of participation per thousand dollar income and resource use factors persist, indicate that by 1985 almost twice as much land would be required, and by 2020, five times as much as the current demand. (See table 41.) Table 42 shows current and projected populations and harvests of specified game. Projections are based on Louisiana Wild Life and Fisheries Commission current ratios and projected population increases. Deer population and harvests are shown reflecting both current and potential management. It is interesting to note that an early adaptation of "potential" level management practices would require less deer population in 1985 than we currently have in the Basin, while a continuation of current management is projected to require about 80 percent more. The turkey populations and harvests

4-31721 2-74

Table 40 - Outdoor Recreation Facility Physical Requirements Specifications as Applied to Requirements Analysis in the Southwest Louisiana River Basin

| Activities | Units | Size of Site | Average Summer Sunday Units Required Per Activity Occasions |
|---|---|---|---|
| Swimming | | | |
| Pool | | | |
| Pool | Sq. ft. | 5,000 | 4.48 |
| Supporting land | Acres | 2 | - |
| Beach | | | |
| Beach | Sq. ft. | 90,000 | 37.25 |
| Water | Sq. ft. | 60,000 | 24.83 |
| Supporting land | Sq. ft. | 180,000 | 74.50 |
| | Acres | 4 | |
| Camping | | | |
| Tent | Sites | 1 | .25 |
| | Acres | .14 | .036 |
| Trailer | Sites | 1 | .25 |
| | Acres | .10 | .025 |
| Additional undeveloped land | Acres | 5 | |
| Picnicking | | | |
| Prepared site | Tables | 1 | .07 |
| | Acres | .14 | .01 |
| Wilderness site | Tables | 1 | .10 |
| | Acres | .5 | .05 |
| Additional undeveloped land | Acres | 5 | .35 |
| Fishing | | | |
| Salt | | | |
| Land | Acres | 1 | .012 |
| Water | Surface Acres | 104 | 1.21 |
| Fresh | | | |
| Land | Acres | 1 | .012 |
| Water | Surface Acres | 104 | 1.21 |
| Other water sports | | | |
| Land | Acres | 1 | .008 |
| Water | Acres | 260 | 2.56 |
| Supporting land | Acres | 2 | - |
| Trails | Miles | 4 | .03 |
| | Acres | 92 | 2.6 |
| Hunting | | | |
| Waterfowl | Acres | 26 | 26 |
| Upland | Acres | 26 | 26 |

Table 41 - Outdoor Facilities or Resources Required to Satisfy Estimated Outdoor Recreation Demand for the Market Area on an Average Summer Sunday in 1967, 1985, 2000, and 2020, Southwest Louisiana River Basin

| Activity | Unit | Average Summer Sunday | | | |
|---|---|---|---|---|---|
| | | 1967 | 1985 | 2000 | 2020 |
| | | thousands | | | |
| Swimming | | | | | |
| Pool | | | | | |
| Pool | Sq. ft. | 379.0 | 625.9 | 1,038.9 | 1,683.6 |
| Supporting land | Acres | .15 | .25 | .42 | .67 |
| Beach | | | | | |
| Beach | Sq. ft. | 1,786.6 | 2,923.3 | 4,885.6 | 7,916.1 |
| Water | Sq. ft. | 1,200.30 | 1,964.1 | 3,282.5 | 5,318.6 |
| Supporting land | Acres | .08 | .13 | .22 | .35 |
| Camping | | | | | |
| Tent | Sites | 2.4 | 3.9 | 6.5 | 10.4 |
| | Acres | .4 | .6 | .9 | 1.5 |
| Trailer | Sites | 3.3 | 5.4 | 8.9 | 14.4 |
| | Acres | .4 | .5 | .9 | 1.4 |
| Additional undeveloped land | Acres | 3.5 | 5.5 | 9.0 | 14.0 |
| Picnicking | | | | | |
| Prepared site | Tables | 2.1 | 3.5 | 5.9 | 9.5 |
| | Acres | .4 | .5 | .8 | 1.4 |
| Wilderness site | Tables | 3.0 | 5.0 | 8.4 | 13.6 |
| | Acres | 1.5 | 2.5 | 4.2 | 6.8 |
| Additional undeveloped land | Acres | 1.7 | 2.5 | 4.0 | 7.0 |
| Fishing | | | | | |
| Salt | | | | | |
| Land | Acres | .9 | 1.5 | 2.5 | 4.0 |
| Water | Surface Acres | 30.5 | 50.6 | 84.0 | 135.6 |
| Fresh | | | | | |
| Land | Acres | .6 | 1.0 | 1.6 | 2.7 |
| Water | Surface Acres | 60.3 | 99.2 | 165.9 | 268.1 |
| Other water sports | | | | | |
| Land | Acres | .4 | .6 | .9 | 1.5 |
| Water | Surface Acres | 110.1 | 180.7 | 301.6 | 487.4 |
| Supporting land | Acres | .8 | 1.4 | 2.3 | 3.7 |
| Trails | Miles | 1.0 | 1.8 | 3.0 | 4.8 |
| | Acres | 2.7 | 4.7 | 7.8 | 12.5 |
| Hunting | Acres | 938.6 | 1,755.0 | 2,826.2 | 4,134.0 |
| Waterfowl | Acres | 192.4 | 359.8 | 579.4 | 847.5 |
| Upland | Acres | 746.2 | 1,396.2 | 2,246.8 | 3,686.5 |

reflect the Louisiana Wild Life and Fisheries Commission potential and expectations for the future, but the rate at which turkey management will be implemented is yet to be seen.

Table 42 - Current and Projected Game Populations and Harvest Level Requirements, Assuming Current Rates of Hunting Recreation and Game Population-Harvest Ratios in the Southwest Louisiana River Basin 1/

| Game | 1967 | | 1985 | | 2000 | | 2020 | |
|---|---|---|---|---|---|---|---|---|
| | Population | Harvest | Population | Harvest | Population | Harvest | Population | Harvest |
| | thousands | | | | | | | |
| Deer current management | 21.2 | 2.9 | 37.4 | 5.1 | 60.1 | 8.2 | 88.1 | 12.1 |
| Deer potential management 2/ | - | - | 15.4 | 5.1 | 24.8 | 8.2 | 36.4 | 12.1 |
| Upland fowl | 5,410.5 | 1,197.2 | 9,871.7 | 2,153.0 | 15,142.8 | 3,313.9 | 22,186.5 | 4,855.4 |
| Rabbit | 1,437.5 | 594.2 | 2,466.3 | 1,023.4 | 3,972.1 | 1,648.2 | 5,819.5 | 2,414.7 |
| Squirrel | 2,560.5 | 647.0 | 4,673.6 | 1,183.2 | 7,525.5 | 1,905.2 | 11,026.4 | 2,791.5 |
| Waterfowl | 2,887.0 | 576.8 | 5,312.0 | 1,061.3 | 8,499.0 | 1,698.1 | 12,408.5 | 2,479.2 |
| Turkey 3/ | - | - | 43.3 | 10.8 | 43.3 | 10.8 | 43.3 | 10.8 |
| Other | 183.9 | 46.8 | 342.0 | 86.6 | 550.7 | 139.4 | 641.9 | 162.5 |

1/ Assumptions include (1) current and projected demands for hunting in activity occasions units which assumes current hunting demands will persist, (2) current rate of harvest per recreational activity occasion, and (3) current ratio of harvested game to game population.

2/ Potential increases in game populations by means of improved management were estimated by Louisiana Wildlife and Fisheries Commission. This entry assumes improvements are in effect as early as 1985.

3/ Louisiana Wildlife and Fisheries Commission estimates a potential wild turkey population and harvest in this area. This entre assumes development of the potential as early as 1985.

## A Broader View of Outdoor Recreation and Environment

There is not doubt that the quality of our lives is directly related to the quality of our environment. Our environment in turn is challenged by the pressure of ever-increasing population, increasing mobility, careless affluence and lack of recognition of ecological balances. As a result, it has become more important for resource planners and developers to adopt a broader view so that a host of needs are not totally ignored while a particular group of needs is efficiently accomodated.

In addition to those outdoor activities, which have been examined in the preceding pages, it must be noted that there are a number of other outdoor activities that have high participation rates. Casual activities, such as walking for pleasure and bicycling, and organized activities, such as golf and outdoor games, are those to which reference is made. These have not been included as activities significant to the foregoing projections because of their primarily local or institutionalized nature.

4-31721 2-74

However, they are activities which are participated in out-of-doors and are, therefore, subject to the general, as well as the local, environmental quality. If the aesthetic activities participation is included with these, a burgeoning accumulation of participation is noted. These activities and their demands are shown in table 43. Planning the conservation and development of our resources so the environment is suitable for this wide range of outdoor activity participation requires effort at State and regional levels, as well as local levels. Even within population centers there are serious problems of localized deteriorating environment.

Table 43 - Current and Projected Activity Occasions of Casual and Organized Game Outdoor Activities Participated in by People of the Southwest Louisiana River Basin

| Activities | 1967 | | 1985 | | 2000 | | 2020 | |
|---|---|---|---|---|---|---|---|---|
| | Annual | Summer | Annual | Summer | Annual | Summer | Annual | Summer |
| | activity occasions (1,000) | | | | | | | |
| Walking | 3,460.1 | 1,744.8 | 5,605.5 | 2,820.8 | 9,278.7 | 4,674.0 | 18,900.0 | 9,518.4 |
| Bicycle riding | 8,002.5 | 3,850.3 | 12,964.2 | 6,240.2 | 21,451.0 | 10,334.1 | 43,701.6 | 21,048.0 |
| Outdoor games | 4,925.2 | 2,436.8 | 7,983.5 | 3,944.2 | 13,214.5 | 6,532.2 | 26,916.0 | 13,305.6 |
| Golf | 596.3 | 279.8 | 971.4 | 455.1 | 1,605.5 | 753.7 | 3,274.8 | 1,534.8 |
| Pleasure driving | 4,932.8 | 2,400.7 | 8,072.9 | 4,021.9 | 13,422.8 | 6,686.7 | 21,724.6 | 10,823.0 |
| Sightseeing | 2,302.3 | 1,399.9 | 3,856.9 | 2,345.9 | 6,413.5 | 3,899.1 | 10,380.0 | 6,311.0 |

Decisions regarding the adequacy of the environment or facilities are not all determined by the market. They are determined by the willingness and ability of communities to make public expenditures for such facilities and programs. They are also dependent on the policies and goals of broader bases, such as State, regional, and national.

## RELATIONSHIP OF ECONOMIC AND WATER RESOURCES DEVELOPMENT

The relationship of economic development and water resource development has been historically intertwined in this Basin. Due to its natural setting of stream confluence, coastal prairie transition to the Gulf of Mexico, and relatively high rainfall, productive activities require an induced reduction of risk to operate profitably. Water resource development to control saltwater intrusion, agricultural land flooding, urban and industrial area flooding, and more efficient drainage of areas has played an important role in making economic development possible or improving its possibilities. If channel, levee, and floodway maintenance were discontinued, it would only be a matter of time before population centers would be endangered, much of the fertile agricultural croplands would be inundated and much of the area would revert to unproductive and

4-31721 2-74

inhabitant-endangering conditions. Future water resource development must continue to safeguard the quality of the stream, the productivity of agricultural lands, and effects on ecological balance.

# WATER AND RELATED LAND RESOURCE PROBLEMS

The diversity of soils, topography, land use, annual rainfall, types of agriculture, and distribution of population are some of the factors related to various problems that were considered in this comprehensive study.

## LAND MANAGEMENT

Several problems in the Basin stem from improper land management. Erosion control through proper land use, terraces, contour farming, stripcropping, crop rotation, grass waterways, cover crops, and crop residue management would decrease sediment, maintain soil productivity, and decrease production costs. Sediment from uncontrolled erosion ultimately clogs drainage field ditches and pipe drops which usually are components of an expensive drainage system. In some cases, erosion has damaged fields that have been leveled or smoothed to the extent that the entire job must be redone. Often, farm drainage systems are not maintained adequately. This impedes drainage and increases the risk from flooding. In turn, this reduces crop yield and increases production costs.

## EROSION DAMAGE

Erosion is occurring on agricultural lands, on streambanks and construction sites, and along shorelines and roadside ditches. Sheet and rill erosion, occurring mostly when agricultural land is being prepared for planting and row crops are immature, cause slight erosion damage. Roadside ditches and construction sites where soils are inherently erosive are sources of scattered damages. According to the National Assessment of Streambank Erosion, about 125 miles of streambanks are eroding; but damage intensity is very low. Streambank erosion is occurring mainly in the Southern Coastal Plain LRA although some is occurring in the Southern Mississippi Valley Silty Uplands LRA. Presently, the Corps of Engineers is studying this problem. Significant shoreline erosion is occurring on Calcasieu Lake, Vermilion Bay, East and West Cote Blanche Bays, and all except about 40 miles of the Gulf Coast. Shoreline erosion is occurring at an approximate rate of 10 feet per year. This rate was established for the east shore of Calcasieu Lake by aerial photographs and was confirmed as being representative of the gulf shoreline by the Louisiana Coastal Studies Institute. The Corps is now studying shoreline erosion in the "Louisiana Coastal Area Study".

The Conservation Needs Inventory indicates that approximately one-fourth of the lands in the Basin Area are subject to an erosion hazard. As shown in table 44, the highest percentage of these soils are in Land Resource Area (LRA) 133 and the lowest in LRA 151. This occurs, primarily, because LRA 133 has steeper slopes.

4-31721 2-74

Table 44 - Soils with Erosion Hazard on Inventoried Acreage
Southwest Louisiana River Basin

| Land Resource Area | Land Use | Land in LRA | Soils With Erosion Hazard | |
|---|---|---|---|---|
| | | ------------acres | -------- | percent |
| 131 | Cropland | 349,200 | 6,364 | 1.8 |
| | Pasture | 166,500 | 36,130 | 21.7 |
| | Forest | 406,512 | 48,460 | 11.9 |
| | Other | 27,300 | 4,865 | 17.8 |
| | Total | 949,512 | 95,819 | 10.1 |
| 133 | Cropland | 205,305 | 61,769 | 30.1 |
| | Pasture; Range | 97,653 | 57,724 | 59.1 |
| | Forest | 1,725,490 | 1,139,629 | 66.0 |
| | Other | 16,336 | 12,709 | 77.7 |
| | Total | 2,044,784 | 1,271,831 | 62.2 |
| 134 | Cropland | 550,975 | 65,760 | 11.9 |
| | Pasture | 125,552 | 21,339 | 17.0 |
| | Forest | 105,381 | 80,731 | 76.6 |
| | Other | 45,300 | 8,675 | 19.2 |
| | Total | 827,208 | 176,505 | 21.3 |
| 150 | Cropland | 1,175,916 | 4,611 | 0.4 |
| | Pasture | 142,107 | 6,245 | 4.4 |
| | Forest | 74,809 | 7,154 | 9.6 |
| | Other | 51,537 | 1,074 | 20.8 |
| | Total | 1,444,369 | 19,084 | 1.3 |
| 151 | Cropland | 42,000 | 1,463 | 3.5 |
| | Pasture; Range | 381,277 | 5,029 | 1.3 |
| | Forest | 48,895 | 3,407 | 7.0 |
| | Other | 745,832 | 0 | 0 |
| | Total | 1,218,004 | 9,899 | 0.8 |
| GRAND TOTAL | | 6,483,877 | 1,573,138 | 22.1 |

4-31721 2-74

## SEDIMENT DAMAGE

Sediment is an end product of erosion. As land is eroded, the loosened soil is transported, generally by water, sometimes by wind, to its ultimate destination. The aggregate of this sediment over a given period of time is the sediment yield. Although sheet erosion from open land is the primary source of sediment, local areas such as road banks, shorelines, streambanks, and construction sites also produce sediment in relatively large amounts.

Sediment can produce multiple detrimental effects in addition to the agricultural damages associated with flooding. Channel filling increases maintenance costs. Water pollution caused by sediment in stream transport is a significant expense in water quality control for municipal and industrial users. Concentrations of sediment in water bodies can cause damage to fish populations. Muddy water is damaging to water-related recreational facilities because of the clean-up job and the unattractiveness of the discolored water.

Also, sediment acts as a carrier of insecticides, fertilizers, and herbicides. These agricultural chemicals can cause fish kills and contamination of the fish food chain. In lakes and stillwater bodies, it can accelerate eutrophication.

Sediment yields are relatively low. Yields were developed by LRA's during the planning of watershed projects As shown in table 45, they range from a high of 460 tons per square mile per year in LRA 133 to a low of 170 tons per square mile per year in LRA 151. The highest yield amounts to less than three-fourths of a ton of sediment per acre per year. Even so, a reduction in these yields would improve the water quality of streams, enhance the aesthetics of the areas, and decrease maintenance costs of the channels.

Table 45 - Average Sediment Yield by Land Resource Areas
Southwest Louisiana River Basin

| Land Resource Area | Sediment Yield (tons/sq. mi./yr.) |
|---|---|
| 131 | 190 |
| 133 | 460 |
| 134 | 240 |
| 150 | 290 |
| 151 | 170 |

Residences, businesses, roads, bridges, and recreation areas are subject to floodwater damage.

4-31721 2-74

## FLOODWATER DAMAGE

Flooding is a major problem in the Southwest Louisiana Basin. The principal floodwater damages are to agricultural land although roads, bridges, residences, businesses, and industrial property are subject to floodwater damages. The total area having floodwater problems is about 2,612,000 acres (see table 46). A large part of this area also has problems from impaired drainage; but floodwater problems occur on about 2,580,000 acres of agricultural land and about 32,000 acres of urban land.

Table 46 - Area Having Floodwater Problems
Southwest Louisiana River Basin

| Sub-Basin | Area Having Floodwater Problems: Agricultural | Urban | Total |
|---|---|---|---|
| | ----------acres---------- | | |
| Atchafalaya (10) | 402,000 | 1,000 | 403,000 |
| Teche-Vermilion (11) | 650,000 | 16,000 | 666,000 |
| Sabine (18) | 161,000 | - | 161,000 |
| Calcasieu (19) | 496,000 | 11,000 | 507,000 |
| Whiskey Chitto (19a) | 58,000 | - | 58,000 |
| Mermentau (20) | 475,000 | - | 475,000 |
| Bayou Nezpique (20a) | 338,000 | 4,000 | 342,000 |
| Total | 2,580,000 | 32,000 | 2,612,000 |

The flooding of about 2,580,000 acres of agricultural land causes extensive damage to crops and pastures. The primary crops subject to floodwater damage are rice, soybeans, sugarcane, corn, grain sorghums, cotton, and sweet potatoes.

Much of the Basin, especially the southern portion, is characterized by flat topography which makes the problems of flooding and inadequate drainage inseparable. Damaging, out-of-bank flows in the flatland portions of the Basin occur three or four times yearly. These frequent out-of-bank flows cause landowners to use additional cultural practices in production and additional equipment and labor in harvesting to obtain normal yields. The quality and quantity of agricultural crops is adversely affected when normal harvesting is delayed. Relatively little land preparation can be accomplished in the winter and spring because of frequent flooding. Consequently, crops are planted late, production costs are increased, and yields are reduced.

Seasonal storms and occasional gulf tropical disturbances magnify local rainfall and runoff conditions. In the upland watersheds, floods occur on the average of three to five times annually during the growing season. This has resulted in lands being used less intensively and in

4-31721 2-74

considerable damages to crops and pastures that remain in flood plain lands. In the southern watersheds, frequent, high intensity rains and tropical storms produce excessive runoff and high tides that cause extensive damage to the area.

Flooding of the marsh areas in the southern portion of the Basin causes landowners and operators to restrict their stocking rate and move their livestock to the ridges or uplands in other areas. Losses in the form of additional feeding, moving livestock, weight loss, and increased mortality in the herds are associated with the flooding.

Total annual floodwater damages in 1970 are estimated to be about $4,625,000 (see table 47). This occurred on about 2,580,000 acres of agricultural land. A portion of this land, about 1,327,000 acres, also was damaged by impaired drainage. Because the topography in the damaged area is essentially flat, floodwater damage and impaired drainage losses could not be separated physically by evaluation procedures. Therefore, computed damages were divided equally.

Table 47 - Estimated Average Annual Flood Damages for 1970, 1985, 2000, and 2020
Southwest Louisiana River Basin

| Sub-Basin | Estimated Flood Damages | | | | | |
|---|---|---|---|---|---|---|
| | Crop and Pasture | Other Agricultural | Other Non-Agricultural | Urban | Indirect | Total |
| | dollars | | | | | |
| Atchafalaya | 433,000 | - | - | - | - | 433,000 |
| Teche-Vermilion | 1,315,000 | - | - | - | - | 1,315,000 |
| Sabine | 68,000 | - | - | - | - | 68,000 |
| Calcasieu | 775,000 | 18,000 | 36,000 | 31,000 | 40,000 | 900,000 |
| Whiskey Chitto | 80,000 | 10,000 | 11,000 | - | 9,000 | 110,000 |
| Mermentau | 575,000 | - | - | - | - | 575,000 |
| Bayou Nezpique | 1,197,000 | 3,000 | 11,000 | 10,000 | 3,000 | 1,224,000 |
| Total - 1970 | 4,443,000 | 31,000 | 58,000 | 41,000 | 52,000 | 4,625,000 |
| Projected Total - 1985 | 5,590,000 | 39,000 | 95,000 | 68,000 | 88,000 | 5,880,000 |
| Projected Total - 2000 | 6,310,000 | 44,000 | 150,000 | 110,000 | 140,000 | 6,754,000 |
| Projected Total - 2020 | 7,033,000 | 50,000 | 273,000 | 197,000 | 253,000 | 7,806,000 |

As shown in table 47, total annual floodwater damages to crops and pastures in 1970 are about $4,443,000. Projected to the year 2020, they amount to about $7,033,000. Other agricultural damages in 1970, about $31,000, are considered minor. These include damages to fences, farm equipment, and farm buildings.

Urban flood damages amounted to about $41,000 in 1970. These damages, scattered throughout the Basin, occurred to residences, business establishments, industrial buildings, schools, churches, and other public facilities. Although they accounted for about 1 percent of the total annual damages in 1970, they are projected to account for less than 3 percent ($197,000) of the total annual damages in 2020.

Floodwater damages to roads and bridges are confined mainly to rural and secondary roads. Additional annual maintenance is required due to the severity of the flooding. Farming operations, school bus schedules, and commuting workers are inconvenienced. Extra gravel, fill material, equipment, time, and labor are needed to keep roads open and passable.

Indirect damages are based on loss of wages, rerouting of traffic, and loss of income by businesses and inhabitants in the Basin.

## IMPAIRED DRAINAGE

On flatland, drainage and flood problems are inseparable. Many factors are involved when considering the causes of these problems. The fact that the land is flat or nearly flat causes a problem, the problem being that gravity flow cannot remove surface runoff readily. The physical properties of the soils affect the flood and drainage problems. Some soils are rather permeable and some are not. These problems are compounded when slowly permeable soils occur on flat slopes.

Uneven land surface with pockets or ridges prevent or retard surface runoff. Existing channel disposal systems in problem areas are inadequate. Runoff water is removed so slowly that high water levels in the channels result. This causes ponding on adjacent lands for damaging periods.

The land along the southern edge of the Gulf Coast Prairies and the Southern Mississippi Valley Silty Uplands LRA's is affected by tidal influence and by stage fluctuations inside the Mermentau freshwater basin. Land that floods more often than 2 years out of 5 on the average during the growing season is generally considered to have drainage outlets inadequate for profitable agricultural production.

Subsurface drainage problems arise from several causes. Large areas of flatland soils are inherently wet. That is, the subsoil is very slowly permeable. Other areas not slowly permeable may remain wet from seepage or a high water table.

Improper maintenance on existing channel systems and poor land management practices aggravate drainage and flood problems. Many channel systems function ineffectively because sediment has filled the channels and reduced their capacity. In coastal areas, tidal influences reduce the effectiveness of gravity drainage systems.

The purpose of investigations relating to drainage and flood prevention on flatlands is to identify problem areas within the Basin. The CNI data prepared in 1967 were used as a source to tabulate flatland soil with a drainage and flood problem (see table 48). These data

Table 48 - Soil with a Drainage and Flood Problem, by Sub-Basin
Southwest Louisiana River Basin

| CNI Watershed Number | Land with Drainage and Flood Problem | | | Total |
|---|---|---|---|---|
| | Crop | Pasture | Other | |
| | ---acres--- | | | |
| | Atchafalaya | | | |
| 10-10 | 40,300 | 18,800 | 75,200 | 134,300 |
| 10-11 | 12,250 | 3,300 | 17,550 | 33,100 |
| 10-13 | 21,950 | 12,550 | 70,000 | 104,500 |
| 10-14 | 10,900 | 14,700 | 21,900 | 47,500 |
| 10-15 | 2,350 | 13,950 | 30,200 | 46,500 |
| 10-16 | 3,250 | 19,450 | 42,100 | 64,800 |
| 10-17 | 1,100 | 6,400 | 14,500 | 22,000 |
| 10-18 | 600 | 3,500 | 7,900 | 12,000 |
| 10-19 | - | - | 7,500 | 7,500 |
| | Teche-Vermilion | | | |
| 11-1 | 15,700 | 1,600 | 35,200 | 52,500 |
| 11-2 | 9,650 | 500 | 3,050 | 13,200 |
| 11-3 | 9,600 | 1,800 | 24,200 | 35,600 |
| 11-4 | 6,900 | 200 | 16,600 | 23,700 |
| 11-5 | 67,200 | 20,800 | 72,000 | 160,000 |
| 11-6 | 90,700 | 22,200 | 72,200 | 185,100 |
| 11-7 | 18,300 | 7,900 | 2,900 | 29,100 |
| 11-8 | 29,500 | 11,800 | 24,200 | 65,500 |
| 11-9 | 34,300 | 9,800 | 4,900 | 49,000 |
| 11-11 | 67,300 | 33,200 | - | 100,500 |
| 11-12 | 10,400 | 10,400 | - | 20,800 |
| 11-13 | - | - | 81,900 | 81,900 |
| 11-14 | 12,800 | 3,200 | - | 16,000 |
| | Calcasieu | | | |
| 19-2 | 1,800 | 3,650 | 177,350 | 182,800 |
| 19-3 | 4,050 | 9,450 | - | 13,500 |
| 19-4 | 70,450 | 10,650 | 800 | 81,900 |
| 19-5 | 40,000 | 40,000 | - | 80,000 |
| 19-6 | 29,600 | 1,600 | - | 31,200 |
| 19-7 | 10,400 | 1,200 | 1,400 | 13,000 |
| 19-8 | 39,350 | 2,600 | 1,750 | 43,700 |
| 19-9 | 1,500 | 1,300 | 15,600 | 18,400 |
| 19-10 | 1,650 | 7,900 | 23,450 | 33,000 |
| 19-11 | 4,000 | 300 | 26,700 | 31,000 |
| 19-12 | 400 | 800 | - | 1,200 |
| 19-13 | 8,200 | 900 | 36,500 | 45,600 |

Continued-

Table 48 - Continued

| CNI Watershed Number | Land with Drainage and Flood Problem: Crop | Pasture | Other | Total |
|---|---|---|---|---|
| | acres | | | |
| | Calcasieu cont. | | | |
| 19-14 | 2,900 | 400 | 1,500 | 4,800 |
| 19-15 | 2,400 | 7,200 | - | 9,600 |
| 19-16 | - | - | - | - |
| 19-17 | - | - | - | - |
| 19a-1 | 2,000 | 500 | 1,000 | 3,500 |
| 19a-2 | - | - | - | - |
| 19a-3 | - | - | - | - |
| 19a-4 | - | - | - | - |
| | Mermentau | | | |
| 20-1 | - | - | 4,400 | 4,400 |
| 20-2 | 300 | 500 | 25,400 | 26,200 |
| 20-4 | - | - | 4,900 | 4,900 |
| 20-5 | 600 | 8,150 | 53,350 | 62,100 |
| 20-6 | 300 | 1,300 | 30,600 | 32,200 |
| 20-7 | - | - | 79,900 | 79,900 |
| 20-8 | 91,400 | 9,800 | 39,400 | 140,600 |
| 20-9 | 39,600 | 1,600 | - | 41,200 |
| 20-9A | 10,300 | 200 | - | 10,500 |
| 20-10 | 48,500 | 17,700 | 10,800 | 77,000 |
| 20-11 | 6,500 | 3,500 | - | 10,000 |
| 20-12 | 250 | 1,250 | 3,500 | 5,000 |
| 20a-1 | 15,600 | 3,800 | 2,900 | 22,300 |
| 20a-2 | 18,600 | 900 | 3,500 | 23,000 |
| 20a-3 | 74,450 | 15,500 | 13,450 | 103,400 |
| 20a-4 | 31,700 | 1,700 | 9,400 | 42,800 |
| 20a-5 | 127,300 | 12,200 | 34,900 | 174,400 |
| 20a-6 | 57,450 | 8,650 | 12,600 | 78,700 |
| 20a-7 | 104,900 | 17,500 | 36,600 | 159,000 |
| 20a-8 | 34,500 | 3,300 | 28,500 | 66,300 |
| 20a-9 | 44,600 | 9,400 | 18,000 | 72,000 |
| | Atchafalaya and Teche-Vermilion | | | |
| 10-12 | 13,900 | 3,000 | 3,200 | 20,100 |
| 11-10 | 22,600 | 6,500 | 3,200 | 32,300 |
| | Calcasieu and Mermentau | | | |
| 19-1 | 700 | 6,600 | 59,100 | 66,400 |
| 20-3 | 500 | 4,800 | 42,500 | 47,800 |
| | Sabine | | | |
| 18-38 | 25,000 | 5,800 | 161,500 | 192,300 |
| Total | 1,453,300 | 448,150 | 1,591,650 | 3,493,100 |

**Flooding and inadequate drainage of agricultural land reduces crop yields and increases production costs.**

4-31721 2-74

were checked by Soil Conservation Service field personnel and adjusted so that problem areas in each CNI watershed were identified. Soils with drainage and flood problems identified in the CNI data are those in land capability subclass "w". The "w" indicates that excess water is the dominant problem. It should be noted that this classification disregards whether the use of the soil would or would not require drainage and flood prevention.

As shown in table 48, about 3,493,000 acres have a drainage and flood problem. This includes the 2,612,000 acres considered to have floodwater problems (table 46). Of the 3,493,000 acres, about 1,901,000 acres are cropland and pasture, about 574,000 acres have adequate drainage systems installed, and about 1,327,000 acres need drainage improvements. Damages from impaired drainage computed on 1,327,000 acres amount to about $2,282,000 annually.

SALTWATER INTRUSION

Throughout the southern region of the Southwest Louisiana River Basin, drainage canals, lakes, navigation canals, and natural channels connect cultivated areas with the Gulf of Mexico. In so doing, these canals pass through the Gulf Coast Marsh LRA which comprises approximately one-fifth of the Basin area. Except for Cheniers, the elevations of this marsh range from below sea level to 1½ feet above sea level. The canals, due to the extremely low elevations, maintain a normal depth of water ranging from 2 to 8 feet. The farmers pump water from these canals into their ricefields thereby utilizing the canal for the multiple purposes of flood prevention, drainage, and irrigation. The water surface elevation in the major streams and canals is low during dry periods. Since the area is subject to tidal action, the water often becomes salty due to the influx of seawater. This contaminates the freshwater needed for irrigation of rice.

During high lunar or wind tides, saltwater from the gulf flows through the many connecting waterways and causes sheet flooding throughout many areas of the Gulf Coast Marsh. Desirable vegetation that is tolerant to freshwater is damaged severely when inundated by saltwater. These more desirable types of vegetation are being replaced by less desirable vegetation that is tolerant to both freshwater and saltwater. In many areas, large open spaces develop that are void of vegetation of any type. The saltwater intrusion has reduced the stocking rate of marsh range and is damaging to wildlife habitat.

The waterways and marshes adjacent to the Gulf of Mexico constitute a part of the coastal nursery areas for marine species. This segment of the Basin is, therefore, important to the gulf fishery. When saltwater invades these areas, the delicate ecological balance is disturbed.

Saltwater intrudes into the Basin at many locations. Some of the areas with more severe problems are as follows:

1. The Calcasieu Ship Channel below Lake Charles - Saltwater intrudes into Calcasieu Lake and on into numerous smaller streams. The Intracoastal Waterway has a barrier near the

Calcasieu River in the form of the Calcasieu Locks. They provide some protection from saltwater intrusion, but are inadequate. The locks are opened many times each day and have leakage.

2. Saltwater moves up the Vermilion River during periods of low flow. Water from the Vermilion River is used extensively for irrigational and industrial purposes. When river flows are reduced by this pumpage, saltwater intrudes from the Gulf of Mexico.
3. There are no locks on the Intracoastal Waterway east of the Vermilion River, therefore, saltwater intrudes into Basin channels from the Gulf of Mexico via the Intracoastal Waterway.
4. Due to its low elevation and lack of natural barriers, the Gulf Coast Marsh areas south of the Intracoastal Waterway are subject to saltwater intrusion during abnormal high tides.

Severe problems of saltwater intrusion occur on the average of about 3 out of each 5 years. When this happens and the water is used for rice irrigation, up to 50 percent loss in yield results. Rice farmers are reluctant to use this saline water because without sufficient leaching, salt will accumulate in the soil.

## FOREST MANAGEMENT AND DEVELOPMENT

### Supply-Demand of Forest Products

The greatest problem relating to the forest resource is the fact that under present trends of management, the demand for forest products will exceed the supply by 2020. This situation is illustrated in Figure 20.

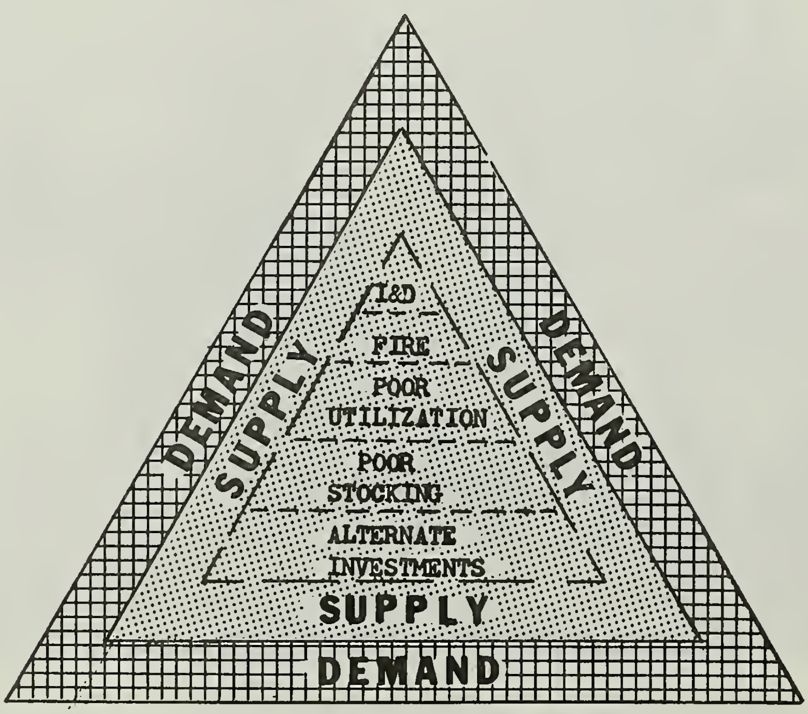



Figure 20 - Demand will Exceed Supply; the Forest Resource Picture Projected to the Year 2020
Southwest Louisiana River Basin

In 1963, timber growth was about two and one-half times the harvest. However, in 1970, the harvest increased to about 93 percent of the growth (see figure 21). The increase in harvest is attributed to increased demand and the influence of two new pulpmills.


Figure 21 - A Comparison of the Growth and Harvest of Timber in 1963 and 1970
Southwest Louisiana River Basin

4-31721 2-74

Assuming that growth and cut are nearly equal in 1970, it is important to note that any further increases in the cut will deplete the growing stock. This will eliminate any sustained yield for the future.

If present and predicted trends in forest management continue, by 1980 the demand for forest products will exceed supply by 12 percent, or 4.7 cubic feet per acre. This trend will create by 2020 a demand-supply deficit of 65 percent, or 25.6 cubic feet per acre (see figure 22). Although the demand exceeds the supply for these periods, the allocated roundwood demands for the Basin can be met because the growth potential (figure 22) at all times exceeds the demand. This can be accomplished by increasing the present levels and trends of stocking.

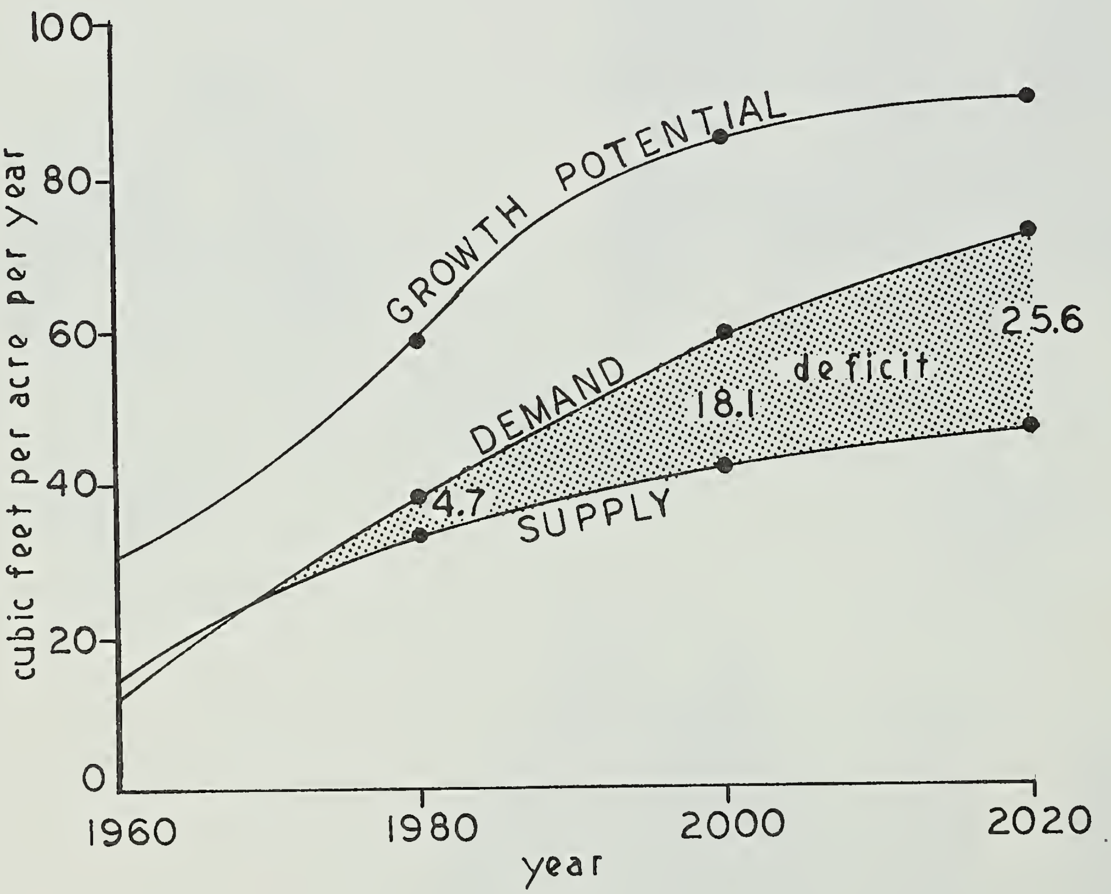



Figure 22 - Timber Supply-Demand and Growth Potential Relationship[1/]
Southwest Louisiana River Basin

1/ Figure 22 - Supply-demand relationship was developed from OBERS data. The growth potential curve assumes that growth (cubic feet per year) for the Basin is a maximum.

## Poor Stocking

Forest lands as a whole are not well-enough stocked with merchantable and desirable trees, and present trends of management will not attain sufficient stocking in time to meet the growing demands. This is indicated in figure 21.

When the present trends of management are examined, it is found that most intensive forest management is practiced on public land and lands owned by forest industries. National Forests and other public landowners practice forest management to provide a mix of forest products and other desired services to the general public. The general public pays for management of these forests through taxes. Forest industries practice intensive management on their lands because they provide raw material for a manufactured product. Most of the profit to the industry is provided by sale of the manufactured product, rather than the raw material.

## Forest Erosion

Forested lands characteristically have low erosion rates. However, in harvest areas or other areas where the forest and vegetative cover are disturbed, the erosion rates are accelerated. Because stream channels are few and far removed from impact areas of little or topographic relief, sediment yields are negligible.

All the forest land of the Study Area is experiencing a geologic or natural erosion at the average rate of .078 tons per acre per year. This rate of erosion takes place with a forest cover to protect the soil. The average rates of erosion from disturbances listed in table 49 are accelerated rates and additive to the natural erosion rates. For example, an area that is logged is experiencing an accelerated rate of .126 plus the natural rate of .078 for a total of .204 tons per acre per year. The average erosion rates in tons per acre per year by causes, in descending order, are 36.6 on log landings, 20.0 on logging spur roads, 17.6 on artillery impact areas of Fort Polk, and 12.3 on logging skid trails.

Volume of erosion in tons per year is different by causes from the rates of erosion. The only exception is the artillery impact areas on Fort Polk which contribute 766,600 tons per year from 43,420 acres. This is almost one-half the total volume of erosion. Military officials recognize that these impact areas are sources of erosion and are trying to hold soil losses to a minimum. Other causes in descending order are natural erosion of 204,560 tons per year from 2,603,000 acres; burning causing 132,530 tons per year from 272,690 acres; logging skid trails causing 96,190 tons per year from 7,830 acres; and log landings causing 86,710 tons per year from 2,370 acres.

The average degree of erosion, considering both hazardous and non-hazardous erosive soils, on all forest land by causes in the Study Area is shown in table 49.

Table 49 - Average Erosion Rates on All Forest Land
Southwest Louisiana River Basin

| Cause of Erosion | Annual Erosion | Area | Percent of Total Volume Erosion | Average Erosion Rate |
|---|---|---|---|---|
| | tons | acres | percent | (tons/ac./yr.) |
| Natural | 204,560 | 2,603,000 | 14.6 | 0.078 |
| Logging | 19,930 | 158,140 | 1.4 | 0.126 |
| Grazing | 9,140 | 348,480 | 0.7 | 0.026 |
| Burning | 132,530 | 272,690 | 9.5 | 0.486 |
| Skid Trails | 96,190 | 7,830 | 6.9 | 12.284 |
| Spur Roads | 57,320 | 2,860 | 4.1 | 20.042 |
| Landings | 86,710 | 2,370 | 6.2 | 36.586 |
| Artillery Impact Areas | 766,600 | 43,420 | 54.8 | 17.655 |
| Stream Scour | 18,480 | 1,610 | 1.3 | 11.478 |
| Firelines | 7,340 | 4,670 | 0.5 | 1.572 |
| Total | 1,398,800 | 3,445,070 | 100.0 | 0.537 |

## Waste and Poor Utilization


Losses from poor utilization are not fully measurable. These losses result from utilizing high grade logs for log grade uses, that is veneer logs for lumber or sawlogs for pulpwood; leaving marketable material in the woods through poor cutting practices; and not utilizing trees in land clearing operations. Since it is easier to push and pile standing trees than it is stumps, trees are not generally harvested before land is cleared. Once the trees are piled, it is not economical to salvage the merchantable timber from the piles. Usually the piled trees are burned.

The Louisiana Forestry Commission and the U. S. Forest Service have wood utilization specialists who provide, upon request, recommendations for marketing timber products.

4-31721 2-74

Merchantable hardwood timber is not utilized when wind-rowed with dozer and burned.

Demand for timber increases as forest land base diminishes.

Alternative Investments

The lands receiving the least amount of forest management are farm forests and miscellaneous private lands. This is where the greatest deficiency in stocking exists. Some reasons for this condition are: (1) The supply of the farmers' investment money is limited. (2) The landowner will invest his money on the land use that gives him the best and quickest return (see Comparison of Annual Net Dollar Returns in table 34). (3) Little or no money is left to invest on land uses with lower rates of return such as forest products. The Forestry Incentive Program (FIP) is now available under the Rural Environmental Conservation Program (RECP). This program provides cost-sharing assistance to the landowner for improving timber production.

Insects and Diseases

A Southern Pine Beetle infestation of approximately 40 square miles in the West Bay area of Allen Parish occurred in the fall of 1963. Continuous control by cutting and spraying checked the spread. In the spring of 1965, another infestation occurred in the Sulphur-Nibletts Bluff Area of Calcasieu Parish. It covered approximately 33 square miles. Again, control and salvage operations helped check the spread. Although the areal extent of Southern Pine Beetle infested areas increased up to 1969, the severity of infestation declined appreciably. By the summer of that year, the epidemic condition was removed. However, the 1972 growing season resulted in a dramatic explosion as the worst recorded outbreak in Louisiana since 1910-11. Heavy salvage and control operations continued into 1973. Build-up cycles for this beetle appear unpredictable.

Losses from insects and diseases are small if the trees are salvaged while they are still marketable. Losses in the Basin from unsalvaged timber average about 1 million cubic feet per year. However, if insect populations should build to epidemic proportions and salvage operations are not conducted, the losses would be over 5 million cubic feet per year.

The State of Louisiana in cooperation with the U. S. Forest Service has an ongoing program to control epidemic outbreaks of the Southern Pine Beetle. As a result of this program, losses from insects and diseases have been held in check.

Fire Losses

The losses in the Basin from fire are moderate, about 2 million cubic feet per year. The fact that losses are not higher can be attributed

to effective fire control programs by the State of Louisiana, industrial landowners, and the U. S. Forest Service. Although the greater damage from wildfire is the outright mortality of merchantable trees, the loss of young stands in the seedling and sapling size class is not small. This growth loss is equivalent to over a thousand forest acres not producing forest products. Thus, each year, some 900 thousand cubic feet fails to accrue to the growing stock inventory because of wildfire.

The Louisiana Forestry Commission, in cooperation with industry and the U. S. Forest Service, has a going program to prevent and suppress forest fires.

### Grazing

Overgrazing occurs when forage grasses are grazed so severely that there is not enough cover left to protect the soil from erosion. It also reduces the quantity and quality of desirable forage vegetation. This in turn, reduces the number of livestock an acre will carry safely. Presently, about 1,930,900 acres of forest land are being grazed. Of this, about 525,800 acres need use adjustment to improve forage production.

Not all forest land is suited for grazing. Some forest areas, mainly bottom land hardwoods, need to have grazing eliminated. In 1967, there were about 297,100 acres that needed grazing reduced or eliminated.

## WATER SHORTAGES

### Agricultural

Supplemental irrigation is desirable to eliminate risk of loss of agricultural production and to improve the quality of production. The uneven distribution of precipitation greatly adds to the risks involved in agricultural production and makes supplemental irrigation desirable.

Although studies indicate that national needs do not justify proposing large areas for irrigation by early-action programs, other factors are involved. Many farmers have installed irrigational equipment to increase their yields and to provide crop insurance. One project (Bayou Rapides Watershed), which includes about 10,500 acres for irrigation, was authorized prior to 1963. Another (Bayou Boeuf Watershed) provides a source of water for supplemental irrigation to some 20,000 acres of cropland and pasture.

4-31721 2-74

Demands for higher yields and greater quality control in vegetables, sweet potatoes, sugarcane, and other specialty crops will increase irrigational development needs. With agriculture becoming increasingly competitive, it is anticipated that a real potential for increased supplemental irrigation exists.

There are approximately 547,000 acres of rice presently irrigated each year. This requires about 1,700,000 acre-feet of water. Ground water supplied 37 percent of the total and surface sources supplied the remaining 63 percent. Water companies supplied 37.6 percent of the total water used with 94.3 percent of their water coming from surface sources. Water purchased from water companies was used at the rate of 5.67 acre-feet per acre, whereas, self-supplied water was used at the rate of 2.49 acre-feet per acre. Canal losses on the part of water companies account for much of this difference.

The above facts emphasize the need for more efficient distribution systems, better water management, and more even distribution. Municipal and industrial demands may pre-empt the use of ground water for irrigation, furthering the need for more efficient surface water distribution systems.

There are no serious shortages of water for livestock, fish farming, or rural domestic purposes. The source of water for livestock is generally farm ponds, natural streams, or bayous. Only during a long extended drought period is the supply limited. Fish farming water supplies are from surface and ground water sources. Wells are the source of water supply for rural domestic use and only isolated cases of shortages are noticed. These isolated cases are generally caused by faulty pumping equipment or wells that are too shallow.

## Non-Agricultural

Water shortages for non-agricultural purposes have been identified in the Department of Public Works study. Water is needed for municipal and industrial, recreational, fish and wildlife, and water quality control purposes.

According to Department of Public Works data, the Southwest Water Resources Planning Area (WRPA), which approximates this Basin, in 1967 had a use rate of 101 gallons per capita day (gpcd). This compares with a State average of 132 gpcd and a national average of 157 gpcd. About 92 percent of municipal water is obtained from wells and about 8 percent from surface sources. In the Southwest WRPA, industry relies more on ground water sources than surface water sources; about 70 percent from ground water and about 30 percent from surface water. The large withdrawals from ground water supplies have caused general and local declines in ground water levels. In some coastal areas, the decline of the freshwater aquifer has permitted saltwater to move into the aquifer through the underground water-bearing sands.

4-31721 2-74

Water areas are needed for recreational development. Population increases have over-taxed existing developments and new developments have not kept pace with the population growth. Population increases expected in the future will intensify the need for recreational developments. Generally, existing water areas are sufficient along the coastal part of the Study Area to fulfill recreational needs. However, facilities and access must be provided. In other parts of the Study Area, new water areas with accompaning recreational facilities are needed.

Particularly in summer months, the natural low flows are insufficient to keep the streams flushed. The Environmental Protection Agency has determined that dilution flows to meet acceptable quality standards are required in the Calcasieu, Mermentau, Vermilion, and Teche Rivers.

Turbidity and sediment are the major problems in the fisheries resources of the Basin. Constant turbid conditions in streams and lakes lower fish reproduction and lower the carrying capacity. Some of the turbidity is caused by erosion of topsoil from open lands without sufficient vegetative cover, construction sites, and exposed road banks, gullies, etc.

Various pollutants limit fish production in some of the major streams. This is evident primarily on streams adjacent to the larger cities. Better enforcement of existing laws should alleviate this problem.

Undesirable fish populations consisting of too many trash and forage species are common in many lakes and streams. Undesirable aquatic vegetation is evident in the older lakes. Lack of understanding of fish management techniques such as annual water level fluctuations on the older lakes limits fish production.

Lack of access to the larger, better fishing streams limits use on them in certain areas. Lack of public boat launching facilities is a problem on both streams and lakes.

Wildlife resources also have problems. Changes in land use and farming practices affects nearly all species within the Basin. All wildlife species require food and cover plants year-round. Lack of these two conditions in the Basin Area is especially prevalent during winter months.

The clearing of bottom land hardwoods is a major problem. This practice is decreasing habitat for deer, turkeys, squirrels, and swamp rabbits. Illegal hunting and harrassment by dogs has kept the deerherd below carrying capacity on a large portion of the Basin Study Area. Better coordination between forestry and wildlife groups is needed in carrying out sound forestry management that also improves wildlife habitat.

4-31721 2-74

Short stopping of waterfowl by our neighboring states to the north is getting more serious each year. For example, Louisiana wintered more Canadian geese than any other state in the Mississippi Flyway prior to 1944. According to the 1967 midwinter survey reports, only 6,000 Canadian geese wintered in the State. This reduction in numbers is also occurring in other species.

Another major problem is lack of management of the wildlife resources on private land. There is lack of monetary return to motivate landowners to manage land and water for wildlife resources. Also, private landowners often suffer losses resulting from vandalism and carelessness by users of this resource.

## POLLUTION

Agricultural pollution has not caused extensive problems. Probably, the most serious problems occurred in the sugarcane region when the pesticide endrin caused some fish kills in receiving streams. Other localized but not serious problems have resulted from dairying operations and land leveling practices. In these cases, animal wastes from the dairy lot and increased turbidity from the leveling operations contaminated short reaches of minor tributaries. Although the modern agriculture of the area relies heavily on chemicals and fertilizers, major problems resulting from their use have not been encountered.

The following pollution problems related to municipal and industrial sources were taken from a preliminary report[1/] completed in 1967 by the Federal Water Pollution Control Administration (FWPCA), working with the Louisiana Stream Control Commission. Presently, the Environmental Protection Agency (the FWPCA became a part of EPA in 1969), is working with State and local officials in executing an action program for eliminating or reducing pollution of all stream waters and improving the sanitary conditions of both surface and underground waters.

In the coastal marshes and estuaries, pollution problems are widespread. Oil spillage from wells, barges, pipelines, and pumping installations are a constant threat to the aquatic biota and aesthetic value of the area. Oil spills cause off-flavors in fish and shellfish and damage the propagation grounds of game and commercial species of fish. Pipeline and access canals constructed by drilling companies increase saltwater intrusion, interfere with water interchange, destroy fisheries habitat, and increase turbidities. Subsequently, these conditions damage fish and wildlife resources in marsh and estuary areas.

Construction of several major water control projects for navigation and flood control in the coastal areas has affected the fish and wildlife

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1/ "Immediate Water Pollution Control Needs, Louisiana Coastal Waters", USDI, Federal Water Pollution Control Administration, South Region, Dallas, Texas; April 1967

4-31721 2-74

and recreational resources. In general, these projects alter marsh ecology and reduce natural habitat quality. The extensive vessel traffic accompanying navigational improvements contribute significant quantities of sanitary wastes to the water. These are potential health hazards for water contact sports, water uses, and consumers of fish and shellfish.

Contamination from upstream sources is a threat to some oyster growing areas. The Louisiana Health Department has closed some areas to oyster harvesting because the coliform counts exceed the public health standards.

In the Calcasieu Basin, the Calcasieu River, some of its tributaries, and the estuarine areas have been plagued by oxygen depletion and high bacterial counts resulting from inadequate municipal treatment facilities. This pollution has caused the closure of some oyster beds in Calcasieu Lake although nearly all the lake has been conditionally approved for oyster harvesting since 1962. Periodically, following heavy rainfalls, Lake Charles and Lake Prien are contaminated by harmful bacteria sources originating primarily from the Goosport area. This condition will improve when adequate sewage treatment facilities for this community are provided.

The most pressing pollution problems in the Calcasieu Basin are caused by the petrochemical companies and oil refineries in the Lake Charles - Westlake area. These industries discharge into Calcasieu waters complex wastes which should be adequately treated or impounded. These wastes produce off-flavors in fish and shellfish and damage the recreational and aesthetic value of the water. Also, they are the source of chemicals known to be toxic to all forms of life.

Also in the Calcasieu Basin, the papermill near Elizabeth, Louisiana, contributes sulfates, sulfites, and color to Mill Creek causing fish kills and aesthetic damage. Larger impoundments and better waste treatment facilities are needed. Near Cameron, Louisiana, three fish processing companies periodically discharge high B.O.D. wastes and solids into the waterway. These companies should provide better screening, recycling of pumping water, and chlorination facilities.

In the Mermentau Basin, the principal problems are associated with oil and gas fields and related operations although several communities need new or expanded waste treatment facilities. Surface pollution of oil and brines damages the biota of the streams, it reduces stream value as an irrigation water source for rice, and it destroys stream aesthetic and recreational values. These problems are localized and are found principally above Lake Arthur.

In the Teche-Vermilion Basin, pollution problems stem primarily from industrial wastes, domestic sewage, and low flows. Waste discharges from raw sugar mills, food processing plants, and municipalities contribute B.O.D., bacteria, and a variety of chemical constituents to Bayou Teche. The problem is intensified when low flows are insufficient to prevent septic conditions in lower Bayou Teche. Installation of an authorized project by the Corps of Engineers to supplement low flows in the Bayou Teche system will improve these conditions.

4-31721 2-74

## ENVIRONMENTAL QUALITY

The natural environment is altered by land and water resource development. As areas are made more suitable for human habitat, the natural setting must be changed in some way or ways. Oftentimes, developments for human habitat are brought about at the expense or loss of some natural environmental values. In the past, when land area seemed plentiful, developers gave little heed to the natural values sacrificed in favor of economic gains. Now, in the face of a serious national shortage of environmental values that man cannot replace, wise planning dictates that we give particular attention to those natural values remaining.

Clearing of the land for agricultural use has removed much wildlife habitat. Drainage of bottom land flood plains has induced clearing of bottom land hardwoods, a natural habitat for wildlife; damaged stream fisheries; and influenced ecological changes by lowering the water tables. Fertilizers, herbicides, pesticides and sediment from farming operations degrade stream water quality in some instances.

Industrial development, while utilizing many natural resources and upgrading economic welfare, has contributed to environmental pollution by discharging wastes into both the water and air. This action seriously damages or destroys the aesthetic, recreational, and commercial value of many natural resources in the areas.

Municipal development, a product of population growth, also has contributed to environmental pollution. Many towns and communities contaminate receiving streams by discharging inadequately treated sewage into them. Also, several towns maintain open trash dumps where burning is a common practice. This practice not only despoils the natural beauty of an area but also contaminates the atmosphere.

Several parishes in the Basin are eligible for assistance under the Public Works and Economic Development Act of 1965. Historically, the per capita income of the Study Area has been below the norm and is currently below the norm. These low income problems are somewhat compounded by an income distribution problem. (Income problems are discussed in another section of this report - GENERAL DESCRIPTION OF ECONOMY). A general improvement in environmental quality can be brought about by an improved economic status. That is, an improved economic status would foster conditions for better housing, schools, hospitals, playgrounds, etc.

4-31721 2-74

# PRESENT AND FUTURE NEEDS FOR WATER AND RELATED LAND RESOURCE DEVELOPMENT

Present and future needs were estimated to facilitiate development of a comprehensive plan for comprehensive development and utilization of Basin resources. These needs include watershed protection and management, improved standards of living, flood prevention, improved drainage, irrigation, recreation, fish and wildlife, and water supplies.

## WATERSHED PROTECTION AND MANAGEMENT

Application and maintenance of land treatment measures in combination with adjustments in land use are needed for the sound conservation, utilization, and development of water and related land resources. This includes application of appropriate soil conserving practices and improved timber management.

### Land Treatment Needs

Based on 1967 data, there is a need for conservation practices on 64 percent or 4,145,209 acres of the 6,483,877 acres of inventory land in the Basin (table 50). Cropland constituted 2,323,396 acres or 36 percent of the total acreage. Of the total cropland, 898,200 acres was adequately treated leaving 1,425,196 acres or 61 percent needing treatment. Pasture made up 8 percent or 534,387 acres of the total acreage. Forty-one percent or 217,286 acres was treated adequately and the remaining 317,101 acres needed treatment. There was 378,702 acres or 6 percent of the total land used for range. Of this, 199,268 acres or 53 percent was adequately treated, leaving 179,434 acres inadequately treated. Thirty-six percent or 2,361,087 acres of the total acreage was used for forest. Thirty-eight percent or 902,991 acres was adequately treated and the remaining 1,458,096 acres needing treatment. Eighty-two percent or 1,930,862 acres of the total land used for forest was suited to grazing as an alternative practice (except bottom land hardwoods) and in cases where practices did not conflict, as an additional practice. Other land, which includes farmsteads, farm roads, feedlots, marshland not used for pasture, range cropland, or forest, made up the remaining 14 percent or 886,305 acres. Of the total inventory land, 14 percent or 120,923 acres was treated adequately leaving 765,382 acres needing treatment. Treatment for other land includes practices such as critical area plantings, wildlife wetland habitat management, and ditch bank stabilization.

Most cropland and pastureland need more than one conservation practice. For each practice, the total number of acres needing treatment was developed. To show the total number of acres needing each practice would result in an excess of acres above the computed inventory acreages. To avoid duplication, the most pressing need for each

Table 50 - Conservation Treatment Needs Based on Data for 1967, Southwest Louisiana River Basin

| Practice or Activity | Treatment Adequate 1/ | Treatment Inadequate 2/ | Total |
|---|---|---|---|
| | acres | | |
| CROPLAND | | | |
| Residue and annual cover | 3/ | 62,882 (60,511)4/ | 62,882 (60,511)4/ |
| Grasses and Legumes in rotation | 3/ | 2,191 (17,243)4/ | 2,191 (17,243)4/ |
| Contouring only | 3/ | 9,360 | 9,360 |
| Strip cropping, terracing, and diversion | 3/ | 8,200 | 8,200 |
| Permanent cover | 3/ | 3,784 | 3,784 |
| Drainage | 3/ | 291,852 (436,668)4/ | 291,852 (436,668)4/ |
| Total non-irrigated | | 378,269 | 1,276,469 |
| Improved irrigational system | 3/ | 1,046,927 5/ | 1,046,927 5/ |
| Total Cropland Area | 898,200 | 1,425,196 | 2,323,396 (514,422)4/ |
| PASTURE | | | |
| Needs protection only | 3/ | 94,226 | 94,226 |
| Needs improvement only | 3/ | 78,717 | 78,717 |
| Brush control and improvement | 3/ | 1,218 | 1,218 |
| Reestablishment of vegetative cover | 3/ | 141,509 | 141,509 |
| Reestablishment with brush control | 3/ | 1,431 | 1,431 |
| Drainage | 3/ | (108,540)4/ | (108,540)4/ |
| Total Pasture Area | 217,286 | 317,101 (108,540)4/ | 534,387 (108,540)4/ |
| RANGE | | | |
| Needs protection only | 3/ | 87,615 | 87,615 |
| Needs improvement only | 3/ | 55,943 | 55,943 |
| Brush control and improvement | 3/ | 35,163 | 35,163 |
| Reestablishment of vegetative cover | 3/ | 713 | 713 |
| Total Range Area | 199,268 | 179,434 | 378,702 |

Continued -

Table 50 - Continued

| Practice or Activity | Treatment Adequate 1/ | Treatment Inadequate 2/ | Total |
|---|---|---|---|
| | ----------acres---------- | | |
| FOREST | | | |
| Commercial forest land | | | |
| Establishment and reinforcement | 3/ | 722,918 | 722,918 |
| Timber stand improvement | 3/ | 735,178 | 735,178 |
| Total Forest Area | 902,991 | 1,458,096 | 2,361,087 |
| Forest land grazed 6/ | | | |
| Needs to improve forage | 3/ | 525,757 | 525,757 |
| Grazing reduction or elimination | 3/ | 297,126 | 297,126 |
| Total Forest Land Grazed | 1,107,979 | 822,883 | 1,930,862 |
| OTHER LAND | | | |
| Total Other Land | 120,923 | 765,382 | 886,305 |
| GRAND TOTAL | 2,338,668 | 4,145,209 | 6,483,877<br>(622,962) 4/ |

1/ Includes irrigated and non-irrigated acreage.
2/ Non-irrigated acreage except as shown for cropland.
3/ Data not developed.
4/ Needs additional to these shown.
5/ Irrigated acreage.
6/ An alternative use of forest land. Does not include 430,225 acres of forest land not grazed.

Good hunting is a product of multiple-use land management.

4-31721 2-74

acre is shown and balanced with the computed land use total. The additional acreage needing treatment is listed in parenthesis (table 50).

In addition to the needed land treatment, over 66,000 acres of land in SPG's 1 and 2 are presently devoted to pasture and range and should be converted to cropland (exhibit 1). Over 32,000 acres of land in SPG's 3 and 4 now used for cropland should be converted to pasture and range.

Forest Management Needs

In order for the forest lands to meet their share of producing the national fibre needs, it is apparent that the production of forest products must increase. Basically, two forest management alternatives can meet the future projected demands for forest products. These are:

A. Cut what is demanded with no concern for the maintenance of growing stock volume or sustained yields of forest products. The demand can be met by dipping into the growing stock. Both stocking and growth rates would eventually diminish to the point where the forest contribution to economic and environmental needs would be nihil. The consequences of this measure are displayed in figure 23.

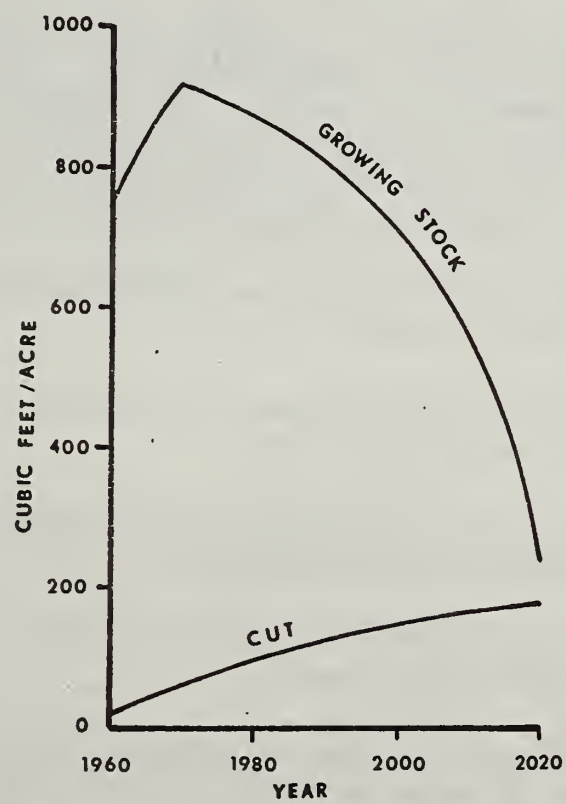


Figure 23 - Illustration Depicting the Consequences of Meeting Future Timber Demands by Harvesting Growing Stock, Southwest Louisiana River Basin

B. Treat and manage every forest acre to its maximum producing capacity of about 90 cubic feet per acre per year. By 2020, this production would equal 214 million cubic feet per year - almost double the projected demands for that year. But nature and man rarely attain 100 percent production and perfection.

A more realistic method would be to increase the growth rate to the maximum on enough acres to boost the average growth rate of the Basin's forest to the level necessary to meet the projected demands; i.e., 38 cubic feet per acre per year in 1980, 58 cubic feet per acre per year in 2000, and 73 cubic feet per acre per year in 2020.

The small share of forest holdings of forest industry and the public forests would provide less than a third of the production necessary. The obvious emphasis of intensified forest management must be placed on the privately-owned, non-industrial forest lands. This is where the greatest opportunity for future production increases lies.

The most practicable way to achieve the necessary stocking, and to reach the required growth rates is to reforest those better site areas that are poorly stocked and improve the stocking (TSI) on those areas that are moderately stocked.

## Forest Fire Protection Needs

Beauregard, Allen, and Rapides Parishes account for the highest fire occurrence in the State (see exhibit 4). About 94 percent of the wildfires are of incendiary origin. The primary reasons behind these incendiary fires are believed to be burning for grazing and juvenile delinquency. This area has a long history of woods burning dating back for decades. A new fire protection plan for this area should include:

1. Expand aerial detection sufficiently to cover area when fire conditions exist.

2. Dispatch fire equipment as needed from adjacent districts when fire conditions exist.

3. Step up fire prevention and organizing of community volunteers, landowners, and companies.

4. Plan for another forester to assist the District Forester in fire protection work.

Special efforts of law enforcement and contacts have not reduced the fire losses and damages to within permissible levels. In 1972, the Louisiana Forestry Commission selected an individual for contact work in Beauregard Parish and made available a crew to prescribe burn at the peoples' request. This pilot program has produced excellent results. Plans are to employ this program in the other "hot" parishes as funds are made available.

4-31721 2-74

## FLOOD PREVENTION

Frequent flooding in the Basin Area has resulted in extensive damages to crops and pastures. About 2,580,000 acres of agricultural land are subject to flooding. Also, roads, bridges, residences, businesses, and industrial property are subject to floodwater damage. It is, therefore, of major concern to people living in the Basin that they have adequate protection to both life and property from floodwaters.

The level of flood protection needed for agricultural areas varies according to cropping intensity and value. Flood protection 2 years out of 3 on the average is economically satisfactory for most field crops. For truck crops or other high value crops, the level needed would be higher.

For towns, cities, urban, and built-up areas, flood protection usually is needed against a 100-year frequency storm. Of course, protection against a storm of this magnitude is not always possible or practicable; particularily in flatland areas. In these cases, protection should be provided for the highest practicable level up to but not exceeding the 100-year level.

The watersheds within the Basin Area where significant flood damages occur do not have reservoir sites to provide adequate flood control. Channel improvement is the most practicable solution to provide for the disposal of storm runoff and thus reduce extensive floodwater damages. However, complete flood protection may require levees, pumps, and flood plain zoning.

Several watersheds within the Basin already have sections of some channels improved to reduce the frequency of flooding; however, little regard has been given to the downstream effects of these improvements. A comprehensive plan for channel improvement in the Basin is needed to fully consider all beneficial and adverse effects. Some agricultural lands should be retained for non-agricultural purposes such as forest, wildlife, and recreation. These uses would be compatible with existing levels of flooding and would help keep flood damages to a minimum.

## LAND STABILIZATION

### Open Land

The combined efforts of Federal, State, and local agricultural organizations have played a major role in treating soil problems. It is estimated that conservation measures, consisting of land use conversions and soil and water conservation practices, have been applied to about 898,200 acres of open land, leaving a total of about 1,425,200 acres needing conservation treatment (see table 50). Conservation measures that have been applied and those needed include practices that provide for establishment of good vegetative cover and for improved hydrologic soil conditions.

Modern equipment has increased productivity in forest industry.

Rubber-tired logging equipment creates less disturbance of forest floor.

4-31721 2-74

Forest Land

Forest land is called on to produce greater quantities of goods and services. This increased use, generally, will bring about greater disturbances at more frequent intervals. Therefore, the techniques in applying forest land treatment measures are significantly important to minimize amounts of erosion.

Timber-sale areas should be planned for logging and skid trail layout on contour as much as possible to prevent heavy concentrations of runoff on bare and disturbed areas. Properly constructed water bars and turn-outs into undisturbed areas will break up flow concentrations with suspended sediment. Establishing a vegetative cover on bare soil areas after sale completion will reduce the effects of erosion. After-sale closure of logging roads for access will hasten vegetative establishment and provide continuing protection. Log-landing areas, which create concentrated activity, should be located with an adequate filter zone to the nearest stream.

Regeneration, the beginning of a new stand of timber, should be practiced with equipment which results in the least disturbance of litter and humus on the forest floor. Using non-raking and rubber-tired tractors would eliminate scarifying and exposure of mineral soil.

Streambank

Treatment is needed on about 125 miles of streambanks as identified in the National Assessment of Streambank Erosion made in 1969. However, the diversity of the land damages and the non-contiguous location of these damaged areas will require detailed studies before methods of treatment can be developed. Presently, the Corps of Engineers is studying this.

Shoreline

Shoreline erosion control or prevention is needed on about 75 percent of the gulf shore, on all the bay shores and all the shore of Calcasieu Lake. Many methods of treatment can be used; however, detailed studies would be required to determine the best method for each area. Expensive protective measures have been used in special instances such as the Holly Beach highway area. However, most of the shoreline is bordered by undeveloped, low-lying marsh, and structural measures are not economically justified. Other methods would need to be studied, such as establishment of vegetative cover, proper management, and zoning. Studies that may be required in the near future could be incorporated in the "Louisiana Coastal Area Study" now underway in which several Federal and State agencies are participating.

4-31721 2-74

## SEDIMENT CONTROL

Programs for land treatment, flood prevention, and drainage have considerable effect in preventing and controlling sediment problems. Over the past 35 years, establishment of conservation practices and the increase in tree seedling plantings have greatly reduced erosion and corresponding sediment loads. Individual landowners and operators have applied measures for conserving, utilizing, and improving various types of land uses. Continuation and selective acceleration of going programs would provide effective sediment control.

Of the 1,425,196 acres of cropland needing treatment, approximately 490,000 acres are in watershed areas where opportunities exist for early development of structural measures to improve the water and related land resources. One of the first, and necessary, increments of the project plan would be acceleration of the installation of conservation treatment included in the plan. The remaining treatment needs on other areas would be handled by going programs for this purpose.

## DRAINAGE IMPROVEMENT

About 1,453,300 acres of cropland and about 448,150 acres of pasture are classified as soils with a drainage and flood problem (table 48). However, project-type drainage systems will benefit additional areas. Presently, there are needs for project-type drainage systems on approximately 1,533,000 acres of cropland and 488,500 acres of pasture. Channel work is needed to provide outlets for field drainage systems. Installation and maintenance costs of drainage practices are usually profitable investments to the farmer who benefits by increased crop and pasture yields and more efficiency in use of farm machinery.

Drainage or water management is needed in all Land Resource Areas of the Basin except the Southern Coastal Plain (133). LRA's needing drainage or water management are flatlands. Due to the flat topography, flood detention reservoirs cannot be used. In flatlands, the problems of inadequate drainage are considered inseparable from problems of flooding. Thus, the acreage with drainage problems is considered to have a combined problem of inadequate drainage and flooding. Most inseparable drainage and flood problems on flatlands are caused by heavy precipitation.

In the past, many efforts have been made toward channel work but in most cases, the channels function properly for only short periods, depending upon the adequacy of the maintenance programs.

Most channels have since experienced great loss of efficiency. A more effective maintenance program is required to maintain channel efficiencies.

Drainage improvements will continue to be needed. More land clearing and more urbanization will increase runoff rates. More efficient water management to meet greater yield demands will require better planning of drainage systems. Many channels now adequate will need enlargement to dispose of additional runoff. This situation will be compounded by the increasing difficulty and cost of obtaining drainage land rights.

## IRRIGATION

The average annual rainfall for the Study Area is 59 inches. However, this rainfall is not distributed uniformly throughout the growing season. Lack of sufficient soil moisture during parts of the growing season reduces yields and sometimes causes crop failures. Evapotranspiration requirements are greater during the hot months of the crop growing season. This often gives rise to drought conditions at the very time when plants are most in need of water. Table 51 gives at different levels of probability, the number of drought days each month for soils with different available water capacity. The available moisture storage capacity for soils of the Southwest Louisiana River Basin ranges from 1.0 inches to 2.8 inches, with an average of 2.0 inches per foot depth of soil. Thus, if the root zone of a crop has only 2 inches of available water storage capacity, table 51 indicates that in 5 out of 10 years soil moisture will be deficient 14 days during the month of June. As can be seen from the table, droughts are most severe during the summer.

Table 51 - Minimum Number of Drought-Days in the Southwest Louisiana River Basin for 5 Basis Amounts of Soil-Moisture Storage Capacity and 4 Levels of Probability by Months

| Month and Probability Level | Moisture Storage Capacity: 1-inch Basis | 2-inch Basis | 3-inch Basis | 4-inch Basis | 5-inch Basis |
|---|---|---|---|---|---|
| | days | | | | |
| March: | | | | | |
| 1 out of 10 | 10 | 0 | 0 | 0 | 0 |
| 2 out of 10 | 7 | 0 | 0 | 0 | 0 |
| 3 out of 10 | 5 | 0 | 0 | 0 | 0 |
| 5 out of 10 | 2 | 0 | 0 | 0 | 0 |
| April: | | | | | |
| 1 out of 10 | 20 | 13 | 1 | 0 | 0 |
| 2 out of 10 | 17 | 9 | 0 | 0 | 0 |
| 3 out of 10 | 14 | 6 | 0 | 0 | 0 |
| 5 out of 10 | 10 | 1 | 0 | 0 | 0 |
| May: | | | | | |
| 1 out of 10 | 22 | 18 | 14 | 7 | 1 |
| 2 out of 10 | 19 | 15 | 9 | 1 | 0 |
| 3 out of 10 | 17 | 12 | 5 | 0 | 0 |
| 5 out of 10 | 14 | 7 | 0 | 0 | 0 |

Continued -

Table 51 - Continued

| Month and Probability Level | Moisture Storage Capacity 1-inch Basis | 2-inch Basis | 3-inch Basis | 4-inch Basis | 5-inch Basis |
|---|---|---|---|---|---|
| | days | | | | |
| June: | | | | | |
| 1 out of 10 | 28 | 25 | 24 | 23 | 18 |
| 2 out of 10 | 24 | 21 | 18 | 16 | 11 |
| 3 out of 10 | 22 | 18 | 15 | 11 | 5 |
| 5 out of 10 | 18 | 14 | 8 | 3 | 0 |
| July: | | | | | |
| 1 out of 10 | 22 | 21 | 20 | 19 | 18 |
| 2 out of 10 | 19 | 17 | 15 | 14 | 13 |
| 3 out of 10 | 17 | 14 | 12 | 11 | 9 |
| 5 out of 10 | 14 | 10 | 7 | 6 | 3 |
| August: | | | | | |
| 1 out of 10 | 22 | 19 | 18 | 17 | 16 |
| 2 out of 10 | 19 | 15 | 14 | 12 | 11 |
| 3 out of 10 | 17 | 13 | 11 | 8 | 4 |
| 5 out of 10 | 14 | 9 | 7 | 3 | 0 |
| September: | | | | | |
| 1 out of 10 | 22 | 21 | 20 | 18 | 16 |
| 2 out of 10 | 19 | 18 | 17 | 14 | 12 |
| 3 out of 10 | 17 | 15 | 14 | 11 | 8 |
| 5 out of 10 | 12 | 6 | 2 | 0 | 0 |
| October: | | | | | |
| 1 out of 10 | 30 | 27 | 27 | 26 | 24 |
| 2 out of 10 | 24 | 20 | 18 | 17 | 15 |
| 3 out of 10 | 20 | 15 | 11 | 10 | 8 |
| 5 out of 10 | 13 | 7 | 2 | 0 | 0 |
| November: | | | | | |
| 1 out of 10 | 11 | 8 | 7 | 7 | 6 |
| 2 out of 10 | 7 | 3 | 2 | 1 | 0 |
| 3 out of 10 | 5 | 0 | 0 | 0 | 0 |
| 5 out of 10 | 0 | 0 | 0 | 0 | 0 |

Source: Technical Bulletin No. 1209, "Drought and Water Surplus in Agricultural Soils of the Lower Mississippi Valley Area", by C.H.M. van Bavel, Agricultural Research Service, USDA, 1959.

In 1967, there were 1,545 acre-feet of water used supplementally to irrigate about 1,990 acres of crops. As changes occur in farming patterns

4-31721 2-74

and there is a shift to crops that are most sensitive to water requirements for quality, quantity, and income efficiences, there will be a need for additional irrigation. As agricultural technology and better management methods are developed, soil moisture is likely to become a more limiting factor in crop yields. There are approximately 231,500 acres with soils suitable for supplemental irrigation within the Basin. It is estimated that no more than 35,400 acres of this area will be irrigated by 1985, about 104,800 acres by 2000, and about 201,000 acres by 2020. Table 52 depicts supplemental irrigation water needs and other water needs.

Table 52 - Current and Projected Water Requirements
Southwest Louisiana River Basin

| | Agricultural[1] | | | | | | Industrial | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Irrigation | | | Fish Farming and | | | | | | | | | |
| Source | Rice | Supplemental | Rural Domestic | Livestock | Total Agricultural | Municipal[2] | Thermo-Electric[2] | Mineral Production[3] | Other[2] | Total Industrial | Total Withdrawals (Gross) | Water Quality Control[2] | Total Water Needs |
| | thousand acre feet per year | | | | | | | | | | | | |
| | | | | | | | 1967 | | | | | | |
| Ground | 581.9 | .4 | 8.1 | 21.0 | 611.5 | 61.3 | 9.0 | 238.1 | 401.1 | 648.3 | 1,321.1 | - | 1,321.1 |
| Surface | 1,112.0 | 1.1 | - | 8.1 | 1,121.2 | - | 368.0 | 17.9 | 183.5 | 569.4 | 1,690.5 | 26,073.2 | 27,763.7 |
| Total | 1,693.9 | 1.5 | 8.1 | 29.1 | 1,732.7 | 61.3 | 377.0 | 256.0 | 584.6 | 1,217.7 | 3,011.6 | 26,073.2 | 29,084.8 |
| | | | | | | | 1985 | | | | | | |
| Ground | 654.4 | 3.0 | 7.6 | 26.9 | 693.9 | 98.7 | 22.1 | 483.6 | 462.5 | 968.2 | 1,760.8 | - | 1,760.8 |
| Surface | 1,081.2 | 16.1 | - | 8.1 | 1,105.5 | 9.9 | 897.9 | 36.4 | 2,037.5 | 2,971.8 | 4,087.2 | 26,179.6 | 30,266.7 |
| Total | 1,735.6 | 19.1 | 7.6 | 35.0 | 1,799.4 | 108.6 | 920.0 | 520.0 | 2,500.0 | 3,940.0 | 5,848.0 | 26,179.6 | 32,027.5 |
| | | | | | | | 2000 | | | | | | |
| Ground | 648.2 | 8.9 | 7.0 | 35.7 | 699.8 | 134.5 | 41.4 | 712.1 | 861.2 | 1,614.7 | 2,449.0 | - | 2,449.0 |
| Surface | 1,007.0 | 48.3 | - | 8.1 | 1,063.4 | 12.3 | 1,677.9 | 59.6 | 4,093.2 | 5,830.7 | 6,906.4 | 47,281.7 | 54,188.2 |
| Total | 1,655.2 | 57.2 | 7.0 | 43.8 | 1,763.2 | 146.8 | 1,719.3 | 771.7 | 4,954.4 | 7,445.4 | 9,355.4 | 47,281.7 | 56,637.2 |
| | | | | | | | 2020 | | | | | | |
| Ground | 693.6 | 17.3 | 6.3 | 43.9 | 761.1 | 190.9 | 53.2 | 1,007.0 | 2,007.5 | 3,067.7 | 4,019.7 | - | 4,019.7 |
| Surface | 949.8 | 94.2 | - | 8.1 | 1,052.1 | 16.3 | 2,152.5 | 95.0 | 9,968.9 | 12,216.4 | 13,284.7 | 94,063.5 | 107,348.3 |
| Total | 1,643.4 | 111.5 | 6.3 | 52.0 | 1,813.2 | 207.2 | 2,205.7 | 1,102.0 | 11,976.4 | 15,284.1 | 17,304.4 | 94,063.5 | 111,368.0 |

1/ Source: ERS and SCS - October 1971
2/ Source: Gulf South Research Institute - August 1971
3/ Source: Bureau of Mines - April 6, 1971

Although studies indicate that national needs do not justify additional rice acreages, there are presently approximately 547,000 acres of rice being irrigated in the Southwest Louisiana River Basin. Approximately 1,700,000 acre-feet of water per year is needed for this purpose. This need will continue. Additionally, there are 539,000 acres of soils suitable for rice irrigation which at present do not have irrigation systems and 968,000 acres with irrigation systems.

Table 52 shows future rice irrigation water needs together with predicted water needs for other purposes. An estimated 580,500 acres of rice will be irrigated in 1985, 550,000 acres in 2000, and 546,000 acres in 2020.

## RURAL DOMESTIC AND LIVESTOCK WATER SUPPLY

The present supply of water for livestock, fish farming, and rural domestic water is adequate. Development needs include better distribution of livestock water facilities for improved grassland management. Livestock and fish farming needs are anticipated to be 52,000 acre-feet by the year 2020 with projected increase in the production of these products. Table 53 is the estimated need for domestic, fish farming, and livestock yearly water uses.

Table 53 - Yearly Water Needs for Rural Domestic, Fish Farming, and Livestock, 1967, 1985, 2000, and 2020, Southwest Louisiana River Basin

| Water Use | 1967 | 1985 | 2000 | 2020 |
|---|---|---|---|---|
| | ----------acre-feet---------- | | | |
| Rural Domestic | 8,100 | 7,500 | 7,000 | 6,300 |
| Fish Farming | 21,000 | 29,000 | 35,700 | 43,900 |
| Livestock | 100 | 8,100 | 8,100 | 8,100 |
| Total | 37,200 | 44,600 | 50,800 | 58,300 |

Total domestic, fish farming, and livestock water use is expected to increase from 37,200 acre-feet in 1967 to approximately 58,300 acre-feet in 2020. This is a 60-percent increase but critical water problems are not anticipated. Certain communities, however, need additional water. This can be supplied by wells more efficiently than by surface storage. The ground water supply is adequate for these needs.

## MUNICIPAL AND INDUSTRIAL WATER SUPPLY

Projections of municipal, industrial, thermo-electric, and water quality control water needs were made by the Louisiana Department of Public Works. The DPW reports provide the basis for the Comprehensive Water and Related Land Resources Plan for the State of Louisiana.

The DPW reports presented data by Water Resource Planning Areas (WRPA's), one of which corresponds roughly to the Southwest Louisiana River Basin Study Area. Where conflicts occurred, the DPW data were adjusted to match the Southwest River Basin data.

Projections of water needs for mineral production, such as sand, gravel, sulphur, and petroleum, were made by the Bureau of Mines. A letter, accompanying the report, dated April 6, 1971, transmitted this information to the U. S. Army Corps of Engineers in New Orleans. The

6-31721 2-74

same data are being recorded in the lower Mississippi River Basin Study Report.

Table 52 presents current and projected water needs for the Southwest Louisiana River Basin.

## RECREATION

Following the assumption that enough natural resources would be reserved and enough facilities will be developed to satisfy use levels projected on the basis of current rates and increasing population and incomes, the future of recreation planning and development would certainly be dynamic. If facilities are in fact developed to satisfy these units, they should be adequate for the needs throughout the year except for those peak holiday occasions which are greater than the average summer Sunday.

Outdoor recreation resources and facilities located in the Southwest Louisiana River Basin were inventoried by whole parishes (existing resources are shown in table 61). Some of the sites are located outside the Study Area, but are within close proximity of the boundaries and are easily accessible to portions of the Study Area population.

Additional development of facilities and resources required to satisfy the projected demand for outdoor recreation on an average summer Sunday are presented in table 54. These data are based on the projected number of activity occasions on an average summer Sunday in southwest Louisiana and the accepted daily capacity of specified facility units. These needs further assume that a portion of all outdoor recreation participations measured in 1967 was on private premises and that the availability of these private premises for outdoor recreation will not tend to increase. Facility and resource standards which are inherent to the physical requirements rates are principally based on the rates set forth in the Louisiana Statewide Comprehensive Outdoor Recreation Plan (SCORP).

Different perspectives on wildlife resource requirements are discussed in the following fish and wildlife subsection. These perspectives include management effects on resource requirements and resource constraint effects on potential game populations.

To further define and quantify surface water needs for recreation purposes, the following general procedure was used:

1. Concentrations of outdoor recreation needs were established by the following parish groups:

   Group I - Allen, Beauregard, and Vernon

   Group II - Avoyelles, Evangeline, Rapides, and St. Landry

   Group III- Calcasieu, Cameron, and Jefferson Davis

   Group IV - Acadia, Iberia, Lafayette, St. Martin, St. Mary, and Vermilion

Forest openings create excellent wildlife habitat.

A natural setting attracts many
people for recreational pleasures.

4-31721 2-74

Table 54 - Additional Facilities or Resources Needed to Satisfy Projected Outdoor Recreation Demand for the Market Area of the Southwest Louisiana River Basin on an Average Summer Sunday, 1985, 2000, and 2020, Assuming that 1967 Demand was Satisfied by Facility Supply

| Activities | Units | Average Summer Sunday 1985 | 2000 | 2020 |
|---|---|---|---|---|
| | | ----thousands---- | | |
| Swimming | | | | |
| Pool | | | | |
| Pool | Sq. ft. | 246.9 | 659.9 | 1,304.9 |
| Supporting land | Acres | .1 | .27 | .52 |
| Beach | | | | |
| Beach | Sq. ft. | 1,136.7 | 3,099.0 | 6,129.5 |
| Water | Sq. ft. | 763.8 | 2,082.2 | 4,118.3 |
| Supporting land | Acres | .05 | .14 | .27 |
| Camping | | | | |
| Tent | Sites | 1.5 | 4.1 | 8.3 |
| | Acres | .2 | .5 | 1.1 |
| Trailer | Sites | 2.1 | 5.6 | 11.1 |
| | Acres | .1 | .5 | 1.0 |
| Additional undeveloped land | Acres | 2.0 | 5.5 | 10.5 |
| Picnicking | | | | |
| Prepared site | Sites | 1.4 | 3.8 | 7.4 |
| | Acres | .1 | .4 | 1.0 |
| Wilderness site | Sites | 2.0 | 5.4 | 10.6 |
| | Acres | 1.0 | 2.7 | 5.3 |
| Additional undeveloped land | Acres | .8 | 2.3 | 5.3 |
| Fishing | | | | |
| Salt | | | | |
| Land | Acres | .6 | 1.6 | 3.1 |
| Water | Surface Acres | 20.1 | 53.5 | 105.1 |
| Fresh | | | | |
| Land | Acres | .4 | 1.0 | 2.1 |
| Water | Surface Acres | 38.9 | 105.6 | 152.8 |
| Other water sports | | | | |
| Land | Acres | .2 | .5 | 1.1 |
| Water | Surface Acres | 70.6 | 191.5 | 337.3 |
| Supporting land | Acres | .6 | 1.5 | 2.9 |
| Trails | Miles | .8 | 2.0 | 3.8 |
| | Acres | 2.0 | 5.1 | 9.8 |
| Hunting | Acres | 816.4 | 1,887.6 | 3,195.4 |
| Waterfowl | Acres | 167.4 | 387.0 | 655.1 |
| Upland | Acres | 650.0 | 1,500.6 | 2,540.3 |

4-31721 2-74

2. An inventory of existing water surface areas within the Basin was obtained with assistance of the Louisiana Wild Life and Fisheries Commission.

3. Lakes or water bodies suitable and accessible for further recreation development were delineated and tabulated by parish groups.

4. An inventory of small lakes (less than 40 acres), ricefields flooded for waterfowl, and stream surface acreages was also obtained from various sources. These areas reduced the total surface area needs for waterfowl hunting by a like amount.

5. The Louisiana Wild Life and Fisheries Commission has estimated fish production in freshwater lakes can be increased 25 percent on marshland lakes, and 50 percent on upland lakes through known management practices provided funds and personnel are made available. An acceleration of management practices, therefore, will reduce the required surface acres proportionately for freshwater fishing. Other biologists estimate the same is true for waterfowl.

6. It is assumed outside influences such as Toledo Bend Reservoir will further reduce required surface acres. It is assumed needs in Parish Groups I and II will be reduced by 10 percent and Groups III and IV by 5 percent. These assumptions were made in collaboration with the Louisiana State Parks and Recreation Commission.

The Residual Needs column in table 55 under each time frame indicates the remaining needs if all additional suitable surface water areas are developed and made accessible, the wildlife and fisheries management program is intensified, and special attraction areas outside the Basin drew off its proportionate share of people.

In the year 1985, an additional 23,300 acres of surface water will be required for water sports activities in the Basin. Parish Group I will require 11,600 acres for these purposes and Parish Group II will require 11,700 acres. Groups III and IV have no residual needs. The intensification of the wildlife and fisheries management program and improved access to existing water areas will help offset additional water needs for fishing and waterfowl hunting.

Studies indicate ample storage reservoir sites are available within the Southern Coastal Plains LRA of the Basin to provide the residual needs shown on table 55 for the year 1985.

In recent years, participation in outdoor recreation, such as camping, has increased tremendously and is continuing to increase. However, the rate of participation in outdoor recreation and facility requirements patterns may experience dramatic changes in the future which are not reflected in the projections of this Study. Participation changes may arise from changing mores and attitudes, recreational innovations, recreational costs to the consumer, and space standards. The application of a higher degree of planning and management that we currently possess in outdoor recreation could reduce facility requirements but are not assumed in this analysis.

4-31721 2-74

Table 55 - Recreational,Fish and Wildlife Surface Water Needs for 1967, 1985, 2000, and 2020, Southwest Louisiana River Basin

| Parish Group and Activity | 1967 Present Uses1/ | 1967 Additional Suitable | 1967 Total Available | 1985 Total Demand1/ | 1985 Residual Needs2/ | 2000 Total Demand1/ | 2000 Residual Needs2/ | 2020 Total Demand1/ | 2020 Residual Needs2/ |
|---|---|---|---|---|---|---|---|---|---|
| | acres (1,000) | | | | | | | | |
| Group I | | | | | | | | | |
| Fishing3/ | 13.6 | 0.6 | 14.2 | 22.4 | 0 | 37.4 | 2.6 | 60.4 | 13.0 |
| Hunting4/ | 43.4 | 6.8 | 50.2 | 81.1 | 0 | 130.5 | 8.6 | 190.9 | 36.2 |
| Other5/ | 24.8 | 0.2 | 25.0 | 40.7 | 11.6 | 68.0 | 36.2 | 109.8 | 73.8 |
| Group II | | | | | | | | | |
| Fishing | 15.0 | 10.5 | 25.5 | 24.6 | 0 | 41.2 | 0 | 66.6 | 4.5 |
| Hunting | 47.8 | 22.6 | 70.4 | 89.4 | 0 | 143.9 | 0 | 210.5 | 24.4 |
| Other | 27.3 | 1.4 | 28.7 | 44.9 | 11.7 | 74.9 | 38.8 | 121.1 | 80.3 |
| Group III | | | | | | | | | |
| Fishing | 14.4 | 130.2 | 144.6 | 23.6 | 0 | 39.5 | 0 | 63.8 | 0 |
| Hunting | 45.8 | 183.3 | 229.1 | 85.6 | 0 | 137.8 | 0 | 201.6 | 0 |
| Other | 26.2 | 109.8 | 136.0 | 43.0 | 0 | 71.8 | 0 | 116.0 | 0 |
| Group IV | | | | | | | | | |
| Fishing | 17.4 | 75.2 | 92.6 | 28.6 | 0 | 47.8 | 0 | 77.3 | 0 |
| Hunting | 55.4 | 127.7 | 183.2 | 103.8 | 0 | 167.1 | 0 | 244.4 | 0 |
| Other | 31.8 | 27.1 | 58.9 | 52.1 | 0 | 87.0 | 23.8 | 140.6 | 74.7 |
| Basin Total | | | | | | | | | |
| Fishing | 60.4 | 216.5 | 276.9 | 99.2 | 0 | 165.9 | 2.6 | 268.1 | 17.5 |
| Hunting | 192.4 | 340.4 | 532.9 | 359.9 | 0 | 579.3 | 8.6 | 847.4 | 60.6 |
| Other | 110.1 | 138.5 | 248.6 | 180.7 | 23.3 | 301.7 | 98.8 | 487.5 | 228.8 |

1/ Data derived from table 41.
2/ Acres of new surface water required to satisfy recreational, fish and wildlife needs after all existing water bodies have been fully utilized.
3/ Freshwater fishing.
4/ Waterfowl hunting.
5/ Includes boating, water skiing and swimming.

# FISH AND WILDLIFE

## Game and Resources

Projected hunting participation is shown in terms of game populations, hunter harvest, and acreage requirements by species. A basic assumption in these projected requirements is that current rates of hunting recreation per thousand dollar income will persist, and game population-harvest ratios will remain the same. Multiple use of the same acre of habitat was not considered in arriving at the total acreage requirements for each species. The results under two conditions of management are shown in table 56. For comparison, the projected resource base for each time frame was used to show the carrying capacity by species for the different resources. These estimates are shown in table 57 for low and high level management of wild game and hunters.

The projected wild game requirements shown in table 56 would require substantial increases in habitat to satisfy participation under the described assumptions. Increased management is not expected to sufficiently alleviate the excessive acreage or harvest requirements

Table 56 - Projected Game Populations and Game Habitat Requirements With and Without Advanced Management for 1985, 2000, and 2020 Southwest Louisiana River Basin

| Species | Population [1] | Harvest | Acre Requirements [2] Without Management | Acre Requirements [2] With Management |
|---|---|---|---|---|
| | thousands | | | |
| | | 1985 | | |
| Deer | 15.4 | 5.1 | 539.0 | 269.5 |
| Squirrel | 4,732.8 | 1,183.2 | 4,732.8 | 3,786.2 |
| Rabbit | 1,188.4 | 594.2 | 4,753.6 | 3,565.2 |
| Dove | 8,983.2 | 1,796.6 | 5,389.9 | 5,389.9 |
| Quail | 888.4 | 355.3 | 10,660.8 | 5,330.4 |
| Waterfowl | 5,312.0 | 1,061.3 | 1,050.0 | 1,050.0 |
| Turkey [3] | 43.3 | 10.8 | 1,623.7 | 1,623.7 |
| | | 2000 | | |
| Deer | 24.8 | 8.2 | 868.0 | 434.0 |
| Squirrel | 7,620.8 | 1,905.2 | 7,620.8 | 6,096.6 |
| Rabbit | 3,296.4 | 1,648.2 | 13,185.6 | 9,889.2 |
| Dove | 13,779.9 | 2,755.9 | 8,267.9 | 8,267.9 |
| Quail | 1,362.8 | 545.1 | 16,353.6 | 8,176.8 |
| Waterfowl | 8,499.0 | 1,698.1 | 2,430.0 | 2,430.0 |
| Turkey [3] | 43.3 | 10.8 | 1,623.7 | 1,623.7 |
| | | 2020 | | |
| Deer | 36.6 | 12.1 | 1,281.0 | 640.5 |
| Squirrel | 11,166.0 | 2,791.5 | 11,166.0 | 8,932.8 |
| Rabbit | 4,829.4 | 2,414.7 | 19,317.6 | 14,488.2 |
| Dove | 20,189.7 | 4,037.8 | 12,113.8 | 12,113.8 |
| Quail | 1,996.7 | 798.7 | 23,960.4 | 11,980.2 |
| Waterfowl | 12,408.5 | 2,479.2 | 4,122.6 | 4,122.6 |
| Turkey [3] | 43.3 | 10.8 | 1,623.7 | 1,623.7 |

1/ ERS Outdoor Recreation Demand Projections, assuming current rates of hunting recreation and game population harvest ratios.
2/ Multiple purpose use of land for wildlife habitat would reduce total acreage of land significantly.
3/ Currently being restocked.

4-31721 2-74

for wild game requirement projected on this basis. Beyond 1985, deer is the only wild game harvest that land resources could supply. Management of other species of wild game encounter difficulties of non-adaptable natural habitat, control, or compatibility with competing land uses.

Table 57 - Projected Resource Base and Potential Game Populations and Hunter Harvest which these Resources Will Support Without and With Management for 1985, 2000, and 2020, Southwest Louisiana River Basin

| Game | Acres[1] | Population Without Mgt. | Harvest Without Mgt. | Population With Mgt. | Harvest With Mgt. |
|---|---|---|---|---|---|
| | thousands | | | | |
| | | | 1985 | | |
| Deer | 2,521.1 | 72.0 | 24.0 | 144.0 | 48.0 |
| Squirrel | 2,521.1 | 2,521.1 | 630.2 | 3,151.0 | 787.7 |
| Rabbit | 5,723.4 | 1,430.8 | 572.3 | 1,907.8 | 953.9 |
| Dove | 2,824.4 | 4,707.3 | 941.4 | 4,707.3 | 941.4 |
| Quail | 5,723.4 | 476.9 | 190.7 | 953.8 | 381.5 |
| Waterfowl [2] | 1,700.9 | 2,887.0 | 576.8 | 2,887.0 | 576.8 |
| | | | 2000 | | |
| Deer | 2,483.2 | 70.9 | 23.6 | 141.8 | 47.2 |
| Squirrel | 2,483.2 | 2,483.2 | 620.8 | 3,104.0 | 776.0 |
| Rabbit | 5,659.7 | 1,414.9 | 565.9 | 1,886.5 | 943.2 |
| Dove | 2,804.1 | 4,673.5 | 934.7 | 4,673.5 | 934.7 |
| Quail | 5,659.7 | 471.6 | 188.6 | 943.2 | 377.2 |
| Waterfowl [2] | 1,700.9 | 2,887.0 | 576.8 | 2,887.0 | 576.8 |
| | | | 2020 | | |
| Deer | 2,420.4 | 69.1 | 23.0 | 138.2 | 46.1 |
| Squirrel | 2,420.4 | 2,420.4 | 605.1 | 3,025.5 | 756.3 |
| Rabbit | 5,570.3 | 1,392.5 | 557.0 | 1,856.7 | 928.3 |
| Dove | 2,778.8 | 4,631.3 | 926.2 | 4,631.3 | 926.2 |
| Quail | 5,570.3 | 464.2 | 185.6 | 928.4 | 371.3 |
| Waterfowl [2] | 1,700.9 | 2,887.0 | 576.8 | 2,887.0 | 576.8 |

1/ ERS Projected Resource Base.

2/ Migratory - limited control on population and harvest.

The combined projections indicate that the rate of participation in wild game hunting can be expected to adjust as a result of hunter crowding and poor hunter harvest rates or rising costs in the hunting privilege market. However, the potential participation expressed in these projections, identifies opportunities for land resource and wildlife management in both the public and private sectors. The public sector may be required, as a workable alternative, to maintain resources for these uses, and the private sector will have opportunity to provide a service for an expanding market.

Presently, needs are increasing for development of public regulation, private entrepreneurship, and wildlife resources. Since this area has historically enjoyed open hunting rights, there is hunter resistance to fees which would allow satisfactory return to improved management of wildlife or its habitat. Development of economic data such as a demand schedule over a range of costs for a corresponding set of services or advantages would aid proprietors in decision making. Many proprietors need the assistance of wildlife management programs to follow.

Recent changes in land uses have been detrimental to a number of wildlife species. The scale and persistence of these land use conversions suggest that alternative means of wildlife habitat preservation should be examined. One alternative would be to purchase more land areas for public control through State and Federal agencies to insure that future generations will have a place to hunt and fish. If between now and 1985 an additional 200,000 acres of public hunting areas were acquired with half the new areas located in upland type and half in the marsh, it would be used by the increasing number of hunters.

As pointed out in the inventory of wetland areas, there are 975,000 acres of wetland types 1 and 7. These are areas of national importance to the migratory waterfowl population as there is heavy utilization of these wetland types by wintering waterfowl in the Basin Area. Local wood ducks also use these wetland types as nesting, loafing, and feeding areas. Every effort should be made to improve management of these wetland areas.

## Regulatory, Coordinative, and Informational Programs

A need exists for better enforcement of existing game laws. Illegal hunting and free ranging dogs are keeping several species of wildlife below area carrying capacities. More enforcement personnel to handle this situation would help. State and Federal officials charged with enforcement of game laws are aware of this need.

Multiple-use management of forest land would help alleviate management conflicts between timber interests and other interests. Bird watchers, wildlife photographers, and other recreational enthusiasts are increasing in number faster than hunters. From this, it appears that multiple-use management of forest land will be needed badly in the future.

Better informational programs are needed to inform the general public of problems and needs related to game and fish resources. A strong program to maintain and improve these resources depends vitally on the support and cooperation of the general public. These educational or informational efforts should be initiated and supported jointly by State and Federal agencies concerned with these resources.

4-31721 2-74

WATER QUALITY

The DPW reports mentioned previously provide the basis for the Comprehensive Water and Related Land Resources Plan for the State of Louisiana. Projections of water quality needs by the DPW were restricted to "flowing bodies of water" or instream conditions. Bays and esturaries in the coastal areas of the State present many problems relative to salt-water intrusion in surface water systems and were beyond the scope of normal instream pollution considerations. Similarily, the quality and quantity of ground water is a separate problem. Projections of water quality needs by the DPW are presented in table 52.

RURAL POWER SUPPLY

Present and future electric energy needs have not been developed specifically for the Study Area. However, data developed by the DPW for their Southwest WRPA and data developed by the Federal Power Commission (FPC) for power supply area (PSA) 35 can be used to indicate trends in rural power use for the Study Area.

Projections by the FPC for PSA 35 indicate that total energy requirements by 1980 will almost triple the 1970 requirements, and the 1990 energy requirements will be almost six times as great as the 1970 values. Projections by DPW for the Southwest WRPA indicate that the 1980 water requirements for thermo-electric power will almost double the 1970 water requirements, and the year 2000 requirements will be almost five times as great as the 1970 values. (See table 52 for DPW projections)

Classified sales data for PSA 35 indicate that the rural load as a percent of the total energy load, have increased from about 3 percent in 1955 to about 5 percent in 1970. It would continue to increase slightly after 1970.

Rural power is presently supplied by several cooperative electric companies. They would expand to meet emerging future needs. Two generating plants that are under construction will help fulfill immediate needs.

4-31721 2-74

# EXISTING WATER AND RELATED LAND RESOURCE PROJECTS AND PROGRAMS

Projects and programs already in operation are making significant contributions to the protection and development of water and related land resources in the Basin. These include measures for flood prevention, drainage improvement, watershed protection, water supply, pollution abatement, recreation, fish and wildlife, and for improvement of socio-economic conditions.

## LAND TREATMENT MEASURES AND MANAGEMENT PRACTICES

### Soil and Water Conservation District Programs

#### Cropland and Pasture

Cropland is all land in a tillage rotation. This may be a rotation of row crops, a rotation of hay and pasture where a field crop is grown at least 1 out of 7 years, or hayland where seedbed preparation or other measures are used to improve the stand. Cropland may be in rotation with grasses, legume, or small grains not harvested or pastured. Also, it may be in rotation with land temporarily idle.

Pasture is land in grass or other long-term forage growth that is used primarily for grazing. It includes land that has been renovated periodically with ryegrass, oats, and other forage crops; but does not include pasture rotated with cropland 1 out of 7 years or more frequently.

A large portion of the cropland and pasture has been treated with one or several conservation practices. However, these practices have varying life spans. Only those practices functioning adequately were considered in place in the 1967 Conservation Needs Inventory.

Rice is the major crop grown on irrigated land. It is grown on the soil about 2 years out of 5. The primary water management practices applied to irrigated land are leveling, cleaning out canals, and improving drainage. Additionally, many irrigation pipelines increase watering efficiency. Drainage is needed for efficient production of other crops and pasture grown in rotation with rice.

On non-irrigated wetlands, drainage has been the principal practice for crops such as sugarcane and cotton. Land smoothing and land leveling which began on irrigated lands for better water management have become an important practice on non-irrigated wetlands to improve drainage and permit more efficient layout of drainage system. Some of the upland soils used for cropland need protection from erosion. Practices applied include contouring, strip cropping, terracing, sodding of waterways or diverting water flow, cover crops, and proper residue management.

4-31721 2-74

Liming and fertilizing practices have aided in conserving cropped soils. Plants grow faster and provide protection from erosion sooner when the soils contain adequate plant nutrients. Also, more crop residue which provides cover and organic matter is produced.

Nitrogen is used for non-leguminous crops on all areas. Phosphorous and potassium are used most on soils other than those of the Mississippi and Red River flood plains, although all soils benefit from these elements for maximum crop production. The use of certain minor elements on some of the soils has shown profitable results.

## Range

Range is land in grass or long-term forage growth that is used primarily for grazing. It may have shade trees or scattered trees with less than 10 percent canopy. The principal plant cover must be such to identify its use as permanent grazing land. Both upland range and marsh range are within the Basin.

Upland range management practices have been those which prevent overgrazing. These lands are open upland areas and are very small in total acreage. Practices applied include proper stocking rates, deferred grazing, and controlled burning.

Marsh range management practices mainly consist of proper stocking rates, construction of cattle walkways to distribute grazing, and water control structures to assist in water management. The decline of marsh range acreage--nearly 28 percent during the 1958 to 1967 period--is due to subsidence, saltwater intrusion, and hurricane damage.

## Forest

Forest land is land stocked at least 10 percent by trees of any size. The land must be capable of producing timber or other wood products. It may be classed either commercial or non-commercial. A commercial forest is capable of producing timber for industrial uses. A non-commercial forest is not capable of producing wood for industrial uses because site conditions are limiting. Both commercial and non-commercial forests may be grazed if grazing does not conflict with the primary use.

Management practices applied to prevent erosion and increase forest products consist of tree planting, reinforcement of existing stands, timber stand improvement, controlled burning, selective cutting, and proper forest harvesting. Also, proper grazing practices to improve forage production have been applied.

## Other Land

Other land includes non-Federal rural land that is not used for cropland, pasture, range, forest, or urban and built-up. The rural land is further classified farmland and non-farmland. Rural land in farms includes fence rows, farmsteads, farm roads, feedlots, ditch banks, and fence and hedge rows. Also, it includes marshland not used for cropland, pasture, range, or forest. Rural land in non-farm uses includes non-farm residences, urban and built-up areas less than 10 acres in size, and gravel and borrow pits.

The majority of land in this category is marsh which is used primarily for wildlife. Land treatment measures are installed primarily to benefit furbearers, waterfowl, or crawfish. Principal measures include level ditching, water control structures, and controlled burning. Management techniques vary depending upon the time of year and salinity of the area. Also, management practices differ for various game species. For example, controlled burning for geese is done in October and controlled burning for ducks is done in February. Geese need forage for grazing and ducks need seed for food.

Principal practices applied to farmstead and roads are critical area plantings, placing field roads on the contour, water diversion measures, and field drains. Critical area plantings or heavy use area protection can be applied to most of the rural non-farm area.

### Aquatic Crops

Channel catfish and crawfish are grown commercially as crops, sometimes in a fish-rice rotation. There are 166 ponds having about 625 surface acres of water devoted to producing channel catfish. These ponds, when managed properly, produce an average growth of 1,700 pounds per acre.

Both the red and white crawfish are produced. At present, there are 58 ponds constructed specifically for crawfish production. These ponds have a surface area of about 3,100 acres. This surface area, however, is not permanent.

## National Forest Programs

### Timber Management

The Kisatchie National Forest recently has been managing its timber, using an even-aged concept of growing, harvesting, and reproducing stands of trees essentially the same age. Each year, a certain acreage of mature stands is harvested and replaced by a new growth of young trees. The harvested stands are relatively small, 40-100 acres, and are dispersed throughout the entire forest. The dispersal of harvested stands is determined by the objectives set up for managing all the resources of the forest. Approximately 1 percent of the forest area will be regenerated each year.

4-31721 2-74

Even-aged management of timber stands has several advantages over management of stands with trees of all ages. When trees are of the same age, they compete more evenly and grow best in full sunlight without being dominated by surrounding trees. Harvesting operations are more economical and easier to accomplish.

Of nearly 164,000 acres commercial forest land on national forest land in the Study Area, approximately 95 percent can be classified as pine site and 5 percent as bottom land hardwood site. Of this, 70 percent consists of immature sawtimber and poletimber stands, 15 percent consists of seedling and sapling stands, 2 percent consists of mature sawtimber stands, and 13 percent consists of sparse or non-stocked stands. The total volume of timber on the Study Area is approximately 125 million board feet of sawtimber and 400,000 cords of pulpwood. The average annual cut consists of 12 million feet of sawtimber and 25,000 cords of pulpwood.

Approximately 2,500 acres are regenerated each year under even aged silviculture. There is only a minimum acreage of non-stocked acreage in need of reforestation. Very little timber stand improvement (TSI) is done that is not in conjunction with reforestation. Present policy of complete mechanical site preparation precludes the need for TSI work.

Other statistics on a "Going Program for 10-Year Period" are:

| Category # | Identification | Units | Cost |
|---|---|---|---|
| 28 | Planting & Seedling | 25,000 acres | @ $75.00 per acre |
| 31 | TSI Release | 10,000 acres | @ $25.00 per acre |
| 34 | TSI Burning | 2,000 acres | @ $00.50 per acre |

## Fish and Wildlife

Wildlife habitat development within the national forests is limited. Habitat improvement is accomplished primarily as a side benefit resulting from other activities. Present development include: 70 acres of planted wildlife openings, 35 acres of native plant openings, 37 waterholes, and 52 miles of utility right-of-way plantings.

Present annual visitor days use is 6,200 days for fishing and 20,200 days for hunting. Hunting demand is expected to increase about 20 percent over present use by 1985.

## Range

Approximately 5,000 head of cattle and horses are permitted to graze on national forest land within the Basin. Actually, more head graze the area, but many are only on national forest land a small percentage of the time. This is due to the broken pattern of ownership which allows for intermingled tracts of private land.

Not many local residents receive their total livelihood from grazing cattle on national forest lands. However, national forest grazing in this area does play quite an important part in supplementing income to local residents. Very few permittees own enough land to run their herds on their own land. Most operations are the cow-calf type which requires yearlong grazing and feeding.

Impact of grazing on the resources is light except on areas where numbers are not adequately controlled, where distribution is a problem, or where livestock are allowed to use hardwood areas, thus competing with deer during winter months.

Grazing on the Kisatchie National Forest is expected to continue with the management being greatly intensified. The grazing resource is mostly on the longleaf pine timber type. The future will probably find grazing confined mostly to areas supporting this timber type. Seasonal grazing is an objective that will hopefully be realized in the future.

## Transportation

The Evangeline Ranger District has 206 miles of system roads and the Vernon Ranger District has 90 miles. Only a few of these are parish roads maintained by the Forest Service and they are essential for Forest Service operations.

The average expenditure for maintenance by the Forest Service on all roads in 1970 was $210 per mile. The average expenditure for the same period on Forest Service roads only was $244 per mile.

Approximately 9 miles of system roads were constructed and reconstructed during Fiscal Year 1970. Construction and reconstruction is planned on 11.3 miles of Forest Service roads during Fiscal Year 1971.

## Watershed Restoration Program

Watersheds within national forests have been restored (1960-1970) as follows:

| Measure | Regular Program | |
|---|---|---|
| | Amount | Cost |
| Gully stabilization | 4.1 miles | $ 5,000 |
| Sheet erosion control | 454 acres | 15,000 |
| Rehabilitation of abandoned roads and trails | 49 miles | 5,000 |
| Mined area stabilization | 330 acres | 30,000 |
| Pollution abatement | 6 acres | 5,000 |
| | Total | $60,000 |

4-31721 2-74

Recreation

The Kisatchie National Forest, administered by the U. S. Forest Service, provides large acreages of land for dispersed type recreation use as well as developed recreation areas. There are presently three developed recreation areas on the Kisatchie National Forest in the Basin--Valentine Lake and Magnolia Campground in Rapides Parish and Fullerton Lake in Vernon Parish. These three areas constitute approximately 55 acres developed for recreation use. Large areas surrounding these developments are available for dispersed type use.

Located in the steeply rolling topography of the northern portion of the Basin, these heavily wooded recreation areas attract recreationists from population centers throughout the Basin. Valentine and Fullerton Lakes recreation areas provide water-based recreation. Camping, picnicking, and nature study are available in all three areas. These three recreation areas receive a combined visitation of about 70,000 visitor days annually. Over 53,000 visitor days of dispersed use occur in the general forest area. This includes uses such as hiking, horseback riding, hunting, fishing, nature study, and primitive camping.

## Cooperative State-Federal Forestry Programs

Table 58 gives a brief summary of the various cooperative State-Federal forestry programs by authorities, type of land, purpose, type of assistance, and agencies responsible.

## Defense Department Programs

The U. S. Army owns 53,890 acres of, predominantly, forest land within the boundaries of the post at Fort Polk in Vernon Parish near Leesville. An additional 44,700 acres are administered by the U. S. Forest Service and this entire acreage (98,590) is managed as one unit for the production of timber and wildlife resources. Of this acreage, 91,825 acres are in the Basin Study Area.

A combination forestry and wildlife management program is currently being carried out. The Army and the Louisiana Wild Life and Fisheries Commission have a cooperative agreement whereby the Commission has the responsibility of managing the fish and wildlife resources. Their program consists of establishing annual food plots for wildlife, regulating the seasons for the harvest of the wildlife, and patrolling the area for game law violators. Annual deer hunts are supervised by personnel of the Commission. The area is open to military and civilian personnel for hunting and fishing privileges with a daily military clearance required for safety reasons.

Personnel of the Soil Conservation Service have furnished technical assistance on fish ponds and erosion control measures. Six fish ponds are being managed for fish production and six wildlife water holes have

Table 58- Forest Management Assistance Programs for State and Private Forestry
Southwest Louisiana River Basin

| Program | Authority | Type of Land | Purpose of Program | Specific Forestry Assistance | Maximum Assistance Authorized | Agencies Responsible For Administration of Program |
|---|---|---|---|---|---|---|
| Cooperative Forest Fire Control (CM-2). | Clarke-McNary Act of 1924, sec. 2. | Private and public non-federal forest lands and certain non-forested watersheds. | Protection of forest resources from fire. | Fire protection is provided by the State forestry agency and its cooperators. | Federal share cannot exceed the net expenditures by a State in any fiscal year. | State Forester in cooperation with the Forest Service. |
| Cooperative Production and Distribution of Forest Tree Planting Stock, (CM-4). | Clarke-McNary Act 1924, sec. 4. | Private and non-federal public lands. | Produce, purchase and distribute planting stock or seed for forest, windbarrier or watershed plantings. | State forestry agency provides tree planting stock at moderate prices. | Federal share cannot exceed the net expenditures by a State in any fiscal year. | State Forester in cooperation with the Forest Service. |
| Assistance to States for Tree Planting and Reforestation. | Agricultural Act of 1956, Title IV. | All classes of forest land suitable for industrial wood production, regardless of ownership. USDA policy limits the program to non-federal land. | Assist the States in undertaking needed programs of tree planting and other forestation work to help assure an adequate future supply of industrial wood. | Cost-sharing on non-federal public lands. Cost-sharing and sometimes contractual services on private land. Technical assistance at no cost to private landowners. | Federal contribution shall not exceed the amount expended by a State. Private landowners will be required to contribute at least as much percentage-wise, as is required under ACP. | Forest Service in cooperation with States. |
| Cooperative Forest Management, (CFM). | Cooperative Forest Management Act of 1950. | Private lands. | Improve the management of small woodlands and the operations of small processors of primary forest products. | Technical assistance and advice in provided woodland owners and processors of primary forest products by the State forestry agency. | Federal share cannot exceed the net expenditures by a State in any fiscal year. | State Forester in cooperation with the Forest Service. |
| General Forestry Assistance, (GFA). | Annual Appropriation Act. | Private and public lands. | To stimulate interest in better forestry in places and with owners not now reached by other programs. | 1. Provides highly specialized technical forest management assistance when the States cannot. 2. Provides forest products processing advice. 3. Provides information and assistance in special programs such as Rural Areas Development. | Unlimited. | Forest Service. |
| Hardwood Improvements. | Supplemental appropriation under General Forestry Assistance. | Private lands. | Provides for development of techniques for getting people in many divergent interest working together to increase the quality and quantity of hardwood lumber production while improving the quality of hardwood stands. | Technical assistance and advice is provided woodland owners and processors of hardwood forest products by the State forestry agency and S&PF. | Federal cost-share approximately 80%. | Forest Service in cooperation with State Foresters. |
| Forest Pest Control. | Forest Pest Control Act of 1947. | Private and public forest lands. | Reduce to tolerable levels losses caused by forest insects and diseases, other than blister rust. | 1. Leadership in prevention, detection, evaluation and suppression of forest insect and disease outbreaks. 2. Aid in developing and conducting cooperative control programs. 3. Cost-sharing in cooperative control on State and private lands. | Federal cost-share approximately 25%. May not exceed 33-1/3% without Secretary's approval. Remainder of cost borne by State and private cooperators. | Forest Service in cooperation with States or with other Federal agencies. |

been built. Road crews are directing much of the labor resources to stabilizing road banks and ditches.

The Peason Ridge Wildlife Management Area located in portions of Vernon and Sabine Parishes is also owned by the U. S. Army. It contains 33,000 total acres with 2,970 in the Basin Study Area. Peason Ridge is handled the same way as the Fort Polk area. The only major difference is that hunting is restricted to certain days because Peason Ridge is the primary field training site for military personnel from Fort Polk.

England Air Force Base contains 1,946 acres owned by the U. S. Air Force. Adequate drainage is provided and a good sod cover is maintained to prevent soil erosion. No major land use programs are in effect now and none are planned.

## UPSTREAM WATERSHED PROJECTS

As of December 1, 1971, 15 Public Law 566 watershed projects, including 17 CNI Watersheds of the Southwest Louisiana River Basin, were completed, under construction, or approved for operations. Figure 24 shows locations and status of these watersheds and table 59 shows a pertinent data summary of computed costs and expected benefits.

Table 59 - Pertinent Data Summary of Watershed Completed, Under Construction, or Approved for Operations as of December 31, 1971 Southwest Louisiana River Basin

| Watershed Projects | | Watershed | Purpose1/ | Total | Total | Total | Benefit |
|---|---|---|---|---|---|---|---|
| CNI No. | Name | Area | | Installation Cost | Annual Costs | Annual Benefits | Cost Ratio |
| | | (sq. mi.) | | dollars | dollars | dollars | |
| 20-3;19-1 | Cameron-Creole | 176.56 | FP,D,SWI | 1,947,532 | 92,238 | 195,766 | 2.1:1 |
| 19-14 | Bear Creek | 31.88 | FP,D | 384,564 | 19,359 | 29,476 | 1.5:1 |
| 19-6 | English Bayou | 56.25 | FP,D | 630,500 | 35,568 | 80,146 | 2.3:1 |
| 20-9a | West Fork of Bayou Lacassine | 53.12 | FP,D | 1,481,480 | 79,407 | 194,768 | 2.4:1 |
| 20a-7 | Duralde-des Cannes | 251.72 | FP,D | 3,296,281 | 151,999 | 220,714 | 1.5:1 |
| 20a-8 | Bayou Blue | 127.88 | FP,D | 442,662 | 37,895 | 90,336 | 2.4:1 |
| 20a-9 | Upper Bayou Nezpique | 334.69 | FP,D,I,R | 5,746,425 | 234,382 | 388,689 | 1.7:1 |
| 11-5 | Lower Bayou Teche | 294.84 | FP,D | 2,123,560 | 137,653 | 403,810 | 2.9:1 |
| 11-6 | Upper Bayou Teche | 328.13 | FP,D | 2,974,125 | 174,250 | 393,329 | 2.3:1 |
| 11-10;10-12 | Cocodrie-Grand Louis | 206.25 | FP,D | 1,292,720 | 69,645 | 96,736 | 1.4:1 |
| 11-14 | Seventh Ward Canal | 50.00 | FP,D,I,SWI | 509,380 | 33,016 | 114,561 | 3.5:1 |
| 10-13 | Avoyelles-St. Landry | 385.94 | FP,D | 3,598,364 | 173,202 | 473,235 | 2.7:1 |
| 10-15 | Bayou Boeuf | 293.71 | FP,D,I,R, | 5,616,458 | 207,309 | 417,693 | 2.0:1 |
| 10-16 | Chatlin Lake Canal | 155.47 | FP,D | 2,245,420 | 104,862 | 331,528 | 3.2:1 |
| 10-17 | Bayou Rapides | 151.52 | FP,D,I,R | 3,171,218 | 158,195 | 359,006 | 2.3:1 |
| Total | | 2,897.96 | | 35,460,689 | 1,708,980 | 3,789,793 | 2.2:1 |

1/ Abbreviations: FP - Flood Prevention, D - Drainage, I - Irrigation, R - Recreation, SWI - Saltwater Intrusion

4-31721 2-74

Approximately 2,898 square miles are included in these watersheds. Structural measures consist of 5 multiple-purpose reservoirs, 12 single-purpose flood prevention reservoirs, approximately 1,435 miles of channel improvement for flood protection, drainage, and irrigation water delivery, 20 miles of flood prevention levees, and recreation basic facilities in connection with 4 multiple-purpose reservoirs. There are also 14 water control structures for flood protection, saltwater intrusion control, irrigation, and fish and wildlife mitigation.

Construction costs of structural measures are estimated at $20,197,500. Costs of recreation basic facilities, installation services, project administration, and land, easements, and rights-of-way bring the total installation costs of structural measures to $35,460,689.

Expected average annual benefits from the structural measures amount to $3,789,793 annually. Reduction of damages, directly attributable to structural measures, amounting to $1,067,936 annually comprises the major benefit item. Benefits of $1,014,868 are expected from drainage and $240,358 from more intensive land use. Annual benefits, include $515,475 from irrigation, $310,096 from recreation, and $641,321 from secondary sources.

The amortized annual equivalent of structural measures amounts to $1,390,634. With inclusion of $318,346 for operation and maintenance, the total annual cost of these measures is estimated at $1,708,980. In comparison of these costs to expected average annual benefits of $3,789,793, approximately $2.22 in benefits is returned for each dollar spent on improvements.

## MAJOR DRAINAGE AND FLOOD PREVENTION PROJECTS

With the exception of the structures mentioned under the Upstream Watershed Projects, there have been no impoundments constructed or planned for the purpose of controlling or detaining floodwater by local governmental entities or State and Federal agencies.

Drainage work has been an integral part of Basin life and economics for many years. Drainage work was started in earnest about 1940 by the Louisiana Department of Public Works. Most previous drainage projects were incorporated into this statewide drainage improvement program. Most improvements made were to secure drainage outlets and to reduce overbank flooding. From 1905 through 1969, 76 drainage districts covering about 2,610,000 acres in 11 parishes were formed. None of these have been legally dissolved and all but nine are still active.

The U. S. Army Engineers has installed many major drainage outlets in the Basin (table 60). Many of the navigational projects also serve a dual purpose as drainage outlets.

Table 60 also describes the many major flood control projects of the U. S. Army Engineers. Flood protection from the many rivers

4-31721 2-74

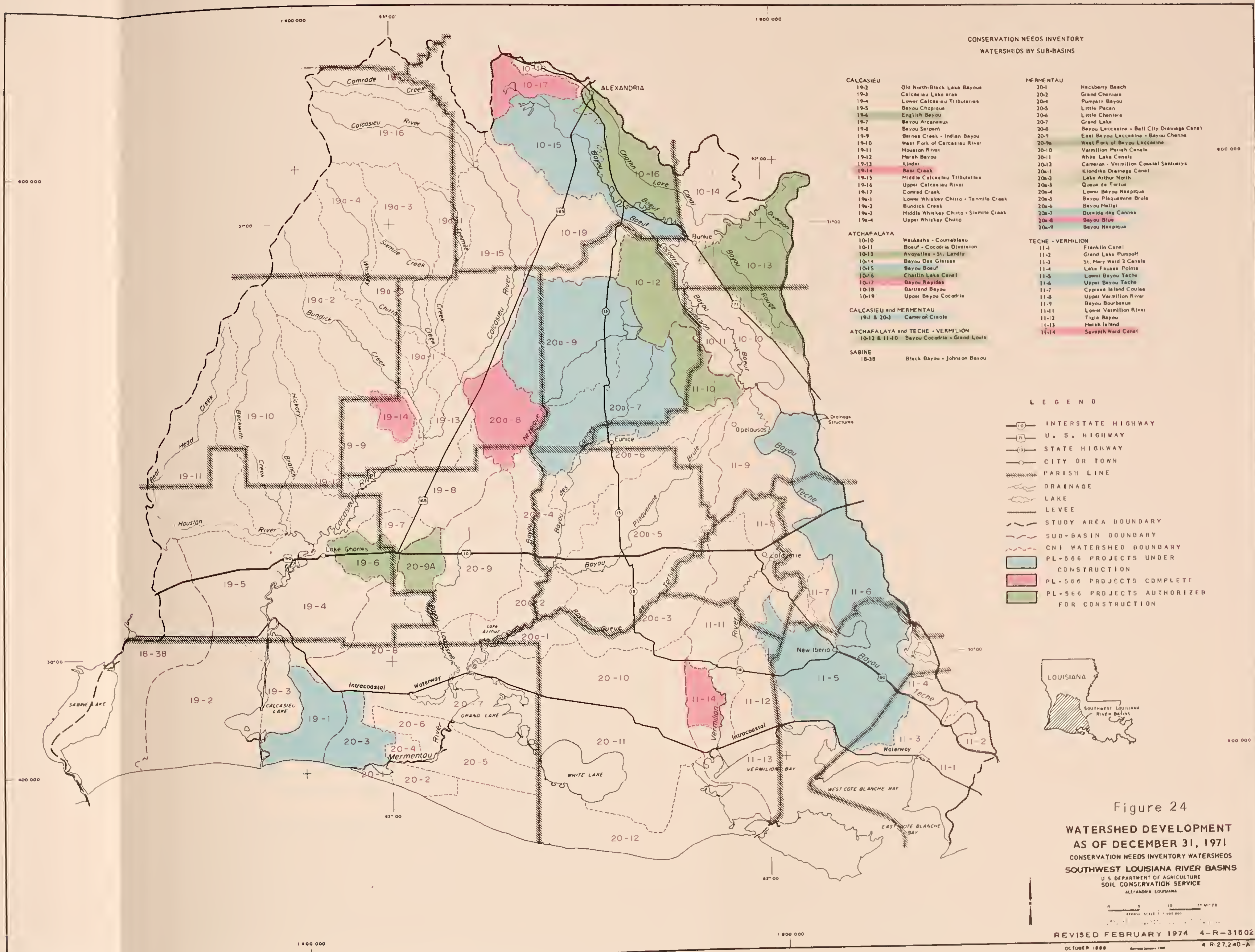


Figure 24

**WATERSHED DEVELOPMENT AS OF DECEMBER 31, 1971**

CONSERVATION NEEDS INVENTORY WATERSHEDS

SOUTHWEST LOUISIANA RIVER BASINS

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ALEXANDRIA LOUISIANA

REVISED FEBRUARY 1974 4-R-31602

OCTOBER 1968 4-R-27,240-A

Table 60 - Completed, Under Construction and Authorized Projects
United States Army Engineers - January 1, 1969,
Southwest Louisiana River Basin

| Project Name | Purpose 1/ | Estimated Construction Cost | Status 2/ | Completion or Authorization Date | Description and Location |
|---|---|---|---|---|---|
| | | dollars | | | |
| Bayou Plaquemine Brule | N | 33,410 | C | 1915 | 6'x60' channel from mouth of Bayou to Crowley, Louisiana (19 miles). |
| Bayou Queue de Tortue | N | 33,355 | C | 1923 | 14 miles of channel improvement from mouth of Bayou to Riceville, Louisiana. |
| Bayou Teche and Vermilion River | N,FC,I | 2,892,000 | C | 1957 | 8'x80' channel from Vermilion Bay to the Gulf Intracoastal Waterway, 9'x100' channel from the GIW to Lafayette, La. Enlargement of Vermilion River for flood prevention and the enlargement of Bayous Fusilier and Teche for flood control and irrigation. |
| Calcasieu River and Pass | N | 27,400,000 | C | 1968 | 42'x800' approach channel in Gulf of Mexico, 40'x400' channel and cutoffs from jetties to Lake Charles, La., thence 35'x250' channel to U. S. Highway 90. |
| Freshwater Bayou | N,SWI | 9,599,000 | C | 1967 | 12'x125' channel from Vermilion River to Gulf of Mexico through Schooner Bayou Cutoff, Schooner Bayou, Six Mile Canal, Belle Isle Canal and Freshwater Bayou, with 84'x600'x 16' lock at Beef Ridge near the Gulf to prevent salt water intrusion. |
| Mermentau River | FC,N,SWI | 4,631,910 | C | 1952 | 3,000 sq.ft. channel (below mean low gulf level) on Mermentau River below Grand Lake, Schooner Bayou Cutoff, North Prong of Schooner Bayou, and other existing channels between Grand Lake, White Lake and Vermilion Bay. Also included, the Catfish Point Control Structure and the Schooner Bayou Lock. |
| Mermentau River and Bayous Nezpique and Des Cannes | N | 58,000 | C | 1935 | 9'x100' channel on Mermentau River from Intracoastal Waterway to junction of Bayous Nezpique and Des Cannes. Removal of obstructions lower 25 miles of Nezpique and lower 8.5 miles of Des Cannes. |
| Mermentau River and Bayous Nezpique and Des Cannes | N | 4,787,000 | A | 1965 | 12'x125' channel through above sections with 12'x200' channel through Lake Arthur section. |
| Petit Anse, Tigre and Carlin Bayous | N | 392,200 | C | 1962 | 9'x80' channel in Petit Anse from the Gulf Intracoastal Waterway to Avery Island, 9'x80' channel from Petit Anse to Lake Peigneur via Bayou Carlin, and 7'x60' channel from GIW via McIlhenny Canal to Vermilion Bay. |
| Mississippi River and Tributaries Atchafalaya Basin Floodways | | | | | |
| a. West Atchafalaya Basin Protection Levee | FC,N,SWI | - | UC | 1969 | 68 miles of levee for flood control extending from Hamburg, La., south to the Wax Lake Outlet. Includes Bayous Darbonne and Courtableau Drainage Structures, the Charenton Floodgate, and the Berwick Lock (not in Basin Area). Listed here as complete, but approximately 3 miles of levee are not up to final grade. |
| b. The Mansura Hills to Hamburg Levee | FC | - | C | 1969 | Approximately 20.3 miles of backwater protection levee. Protects farmland and communities from the Ouachita-Black and Red Rivers' backwater. |



Continued-

Table 60 - Continued

| Project Name | Purpose 1/ | Estimated Construction Cost | Status 2/ | Completion or Authorization Date | Description and Location |
|---|---|---|---|---|---|
| | | dollars | | | |
| c. Levees West of Berwick | FC | - | UC | 1928 & 1966 | Approximately 60.5 miles of intermittent levees tying into high ground along Bayous Teche and Sale with internal drainage systems. |
| d. West Atchafalaya Basin Protection Levee, Landside Drainage Improvements | FC,I | 3,178,000 | C | 1956 | Includes improvements on the land side borrow canals, Bayou des Glaises Diversion channel, State Canal, Bayou Roseau, the Bayou des Glaises Culvert, Bayou Darbonne Drainage Structure, Bayou Courtableau Diversion Channels and Control Structures, the Courtableau Drainage Structure, Bayou Berard drainage canal and channel improvement from Cypremort to Dauterive. |
| Bayou Cocodrie and Tributaries | FC | 6,830,000 | UC | 1941 | Approximately 60 miles of diversion canal from Bayou Rapides to Bayou Courtableau at Washington, La., 17 miles of channel improvement on Bayou Boeuf and 25 miles on Bayou Cocodrie with appurtenant water control structures. Modified to include a diversion canal from Washington, La., to the Bayou Courtableau Drainage Structure and additional capacity to the drainage structure. |
| Bayou Teche | N,I | 754,330 | I | 1934 | Improvements to Bayou Teche consisting of 8'x80' channel from mouth to New Iberia, thence 6'x60' to Keystone Lock and thence 6'x50' to Arnaudville, La., and construction of Keystone Lock and Dam. |
| Calcasieu River and Pass, Saltwater Barrier | N,SWI | 4,047,000 | C | 1969 | Tainter gate structure and navigation channel with gated structure on bypass channel and earth dam in old channel at mile 43.2 on the Calcasieu River north of Lake Charles, La. |
| Teche-Vermilion Basin | M&I,I, WQ | 6,300,000 | A | 1966 | Diversion of supplemental water via pumping plant from the Atchafalaya River near Krotz Springs, La., to Bayou Courtableau thence into Bayou Teche and the Vermilion River through Bayou Fusilier, Ruth Canal and the Loreauville Canal. |
| Gulf Intracoastal Waterway Between Apalachee Bay, Florida and the Mexican Border | N,SWI | 58,233,827 | C | 1956 | Waterway along the Gulf of Mexico coast (12'x125' channel) from Lake Borgne to the Sabine River and 8'x60' channel from the waterway to Franklin, La. Includes the Vermilion and Calcasieu Locks. |
| a. Same as Above | N | - | A | 1962 | Enlargement of existing channel to 16'x200' between the Atchaflaya and Sabine Rivers. |
| b. Same as Above | N,SWI | 6,206,300 | A | 1967 | Enlargement and improvements to the Vermilion Locks. |

1/ N - Navigation, FC - Flood Control, I - Irrigation, SWI - Salt Water Intrusion, M&I - Municipal and Industrial

2/ C - Complete, A - Authorized, UC - Under Construction, I - Inactive

4-31721 8-74

which converge upon Louisiana and the Southwest Louisiana River Basin Area is a continuing battle. Levee systems such as those along the Mississippi, Red, and Atchafalaya Rivers are very necessary for the continuing development and use of lands in a large part of the Basin.

## LOCAL PROTECTION PROJECTS

Local protection projects of the Southwest Louisiana River Basin area include many drainage channels. Flood protection must be accomplished through channels because most of the area is too flat for impoundment reservoirs. Channels installed to protect communities and cities from runoff are numerous.

Levees and dikes are used extensively in the southwest to protect towns from floodwaters. The community of Mermentau is surrounded by a levee to protect it from backwaters of the Mermentau River. The city of Lake Charles is protected from floodwaters of the Calcasieu River by a levee and pump-off system. Several other towns have partial levee systems or are completely surrounded by levees. Some of these are Lake Arthur, Alexandria, Arnaudville, Abbeville, Lafayette, and Silverwood. These protection measures were installed by cities and towns either on their own or with technical assistance from the Louisiana Department of Public Works.

## OTHER PROJECTS AND PROGRAMS

### Recreation and Fish and Wildlife

In 1967, there were about 37,000 surface acres of water and about 358,000 land acres on 488 sites devoted to outdoor recreation in the Southwest Basin. (Table 61). All Federal, State, parish, municipal, commercial and non-profit areas open to the public for outdoor recreation uses including fishing and hunting were tabulated. Some of the sites tabulated are actually outside the Basin boundaries, but within close proximity and are readily accessible to portions of the Study Area. Table 62 lists the public recreational and fish and wildlife developments on State and Federal lands. The vast majority of the 488 recreational sites are of a general recreational type as defined by the U. S. Bureau of Outdoor Recreation. The 17 natural environmental sites, of which most permit hunting, constitute approximately 90 percent of the 358 thousand land acres included in the 488 sites. The survey information, from which these data were drawn, identified no high-density recreational sites.

Those organized facilities and recreational areas located within the Study Area are summaried in table 63 with the percentage administered by various levels of government and private groups. Local governments administer the majority of swimming pools and parishes administer most beach areas. The State administers large shares of camping trailer spaces, fishing piers, trails, hunting acreage, and 98 percent of the 24,502 designated recreational acres which have no facilities located

Small water areas provide countless hours of enjoyment.

4-31721 2-74

61 Numbers and Types of Outdoor Recreational Sites, Natural Resources Included and Three Pertinent Activity Measures for Whole Parishes, 1967
Southwest Louisiana River Basin

| Parish | Sites | Land Class 1/: High-density 2/ | Land Class 1/: General Recreation | Land Class 1/: Natural Environment | Land Class 1/: Outstanding Natural Site | Land Class 1/: Primitive Area | Land Class 1/: Historical and Cultural | Area: Total | Area: Land | Area: Water | Camping | Trails | Pool and Beach |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | number | | | | | | | acres | | | spaces | miles | (1,000 sq.ft.) |
| Acadia | 31 | 0 | 31 | 0 | 0 | 0 | 0 | 96 | 96 | 0 | 0 | 0 | 39.7 |
| Allen | 24 | 0 | 23 | 1 | 0 | 0 | 0 | 58,381 | 58,339 | 42 | 29 | 0 | 16.7 |
| Avoyelles | 14 | 0 | 13 | 1 | 0 | 0 | 0 | 12,262 | 8,627 | 135 | 0 | 17 | 5.1 |
| Beauregard | 26 | 0 | 24 | 1 | 0 | 0 | 1 | 2,321 | 2,151 | 170 | 158 | 0 | 115.1 |
| Calcasieu | 105 | 0 | 104 | 0 | 0 | 0 | 1 | 2,317 | 2,293 | 24 | 99 | 2 | 71.8 |
| Cameron | 23 | 0 | 17 | 6 | 0 | 0 | 0 | 89,288 | 56,388 | 32,900 | 0 | 0 | 67.5 |
| Evangeline | 18 | 0 | 17 | 0 | 0 | 0 | 1 | 7,489 | 5,078 | 2,411 | 91 | 4 | 42.0 |
| Iberia | 32 | 0 | 30 | 1 | 0 | 0 | 1 | 9,438 | 8,393 | 1,045 | 0 | 0 | 13.4 |
| Jefferson Davis | 23 | 0 | 23 | 0 | 0 | 0 | 0 | 123 | 123 | 0 | 0 | 0 | 194.0 |
| Lafayette | 33 | 0 | 33 | 0 | 0 | 0 | 0 | 1,341 | 1,305 | 36 | 0 | 0 | 83.6 |
| Natchitoches | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Rapides | 73 | 0 | 70 | 3 | 0 | 0 | 0 | 127,500 | 127,100 | 400 | 53 | 0 | 20.6 |
| St. Landry | 13 | 0 | 12 | 1 | 0 | 0 | 0 | 10,330 | 10,330 | 0 | 0 | 0 | 22.0 |
| St. Martin | 22 | 0 | 20 | 0 | 1 | 0 | 2 | 418 | 418 | 0 | 0 | 0 | 14.0 |
| St. Mary | 12 | 0 | 10 | 0 | 0 | 0 | 2 | 96 | 96 | 0 | 0 | 0 | 10.6 |
| Vernon | 10 | 0 | 9 | 1 | 0 | 0 | 0 | 41,083 | 41,083 | 0 | 0 | 0 | 0.0 |
| Vermilion | 28 | 0 | 26 | 2 | 0 | 0 | 0 | 36,244 | 36,244 | 0 | 0 | 2 | 19.6 |
| Total | 488 | 0 | 462 | 17 | 1 | 0 | 8 | 395,227 | 358,064 | 37,163 | 472 | 25 | 735.7 |

1/ U. S. Bureau of Outdoor Recreation

2/ School site recreational data not included

Source: Survey of Louisiana recreational facilities by Louisiana Parks and Recreation Commission

on them. The Federal Government administers a large share of the areas identified as hunting land.

Currently, there are 36 public boat launching ramps in the Basin. Ten were constructed by the Louisiana Wild Life and Fisheries Commission under the public works program and the Bureau of Outdoor Recreation; 6 were constructed by the Louisiana Department of Highways under the public works program, and 20 were constructed by the Louisiana Department of Public Works. Table 64 contains a list of the boat ramps, the body of water served, location, and parish.

Most commercial privately owned recreational developments have been concerned primarily with tent camping sites, boats, and boat ramps, although a wide range of facilities are administered by this sector. Two campground-recreational area developments of significance are now in operation; one each in Beauregard and Evangeline Parishes. These developments are water based and provide day-use activities and camping, both tent and trailer. Smaller commercial recreational areas are in operation throughout the Basin.

Local and parish governments administer significant facilities for almost all types of recreation, but the main investments by these two units of government have been in swimming pools and beaches. The bulk of swimming pools in the Basin, 70 percent, are administered by local governments. Parish governmental units, on the other hand, control 72 percent of the beach area. The most popular public beaches along the Coast are Holly Beach, Rutherford Beach, and Cypremort Point Beach.

Non-profit organizations are most active in the administration of trails and high-density playgrounds.

Table 62 - Public Recreation Areas, 1971
Southwest Louisiana River Basin

| Facility | Administrative Agency[2/] | Parish | Area[1/] Land | Water | Marsh | Total | Developed Recreation Area | Activity |
|---|---|---|---|---|---|---|---|---|
| | | | acres | | | | | |
| Chicot State Park | SPRC | Evangeline | 4,000 | 2,480 | - | 6,480 | 72 | Boating, Fishing, Camping, Picnicking, Swimming, Nature Study, Cabins, Hiking, Play Area |
| Sam Houston State Park | SPRC | Calcasieu | 1,047 | 15 | - | 1,062 | 24 | Boating, Fishing, Water Skiing, Picnicking, Nature Study, Cabins, Play Area |
| Longfellow-Evangeline State Park | SPRC | St. Martin | 157 | - | - | 157 | 11 | Picnicking, Camping, Nature Study, Play Area, Historical Study |
| Kisatchie National Forest[3/] | | | | | | | | |
| (Vernon Ranger District) | USFS | Vernon | 92,303 | 28 | - | 92,331 | 10 | Hunting, Picnicking, Camping, Hiking |
| (Evangeline Ranger District) | USFS | Rapides | 80,159 | 2,000 | - | 82,159 | 625 | Nature Study |
| (Kisatchie Ranger District) | USFS | Natchitoches | 2,280 | - | - | 2,280 | - | |
| Fullerton Lake Recreation Area | USFS | Vernon | 10 | 28 | - | 38 | 10 | Non-power Boating, Fishing, Camping, Picnicking, Play Areas, Swimming, Nature Study |
| Valentine Lake Recreation Area | USFS | Rapides | 40 | 80 | - | 120 | 40 | Non-power Boating, Fishing, Camping, Picnicking, Play Areas, Swimming, Nature Study |
| Magnolia Campground | USFS | Rapides | 5 | - | - | 5 | 5 | Camping, Picnicking, Nature Study, Swimming, Fishing |
| Kincaid Recreation Area[4/] | USFS | Rapides | 1,700 | 1,920 | - | 3,620 | 580 | Camping, Picnicking, Boating, Fishing, Hunting, Nature Study, Hiking, Play Area, Water Skiing, Swimming |
| Alexander State Forest and Wildlife Management Area[5/] | LFC[6/] | Rapides | 5,625 | 2,250 | - | 7,875 | 91 | Picnicking, Camping, Hiking, Nature Study |
| Indian Creek Recreation Area[4/] | LFC | Rapides | 618 | 2,250 | - | 2,868 | 91 | Camping, Picnicking, Boating, Fishing, Hunting, Nature Study, Hiking, Play Area, Water Skiing, Swimming |
| Evangeline Wildlife Management Area | USFS[6/] | Rapides | 14,500 | - | - | 14,500 | 5 | Camping, Hunting, Picnicking, Hiking, Nature Study |
| Fort Polk Wildlife Management Area[7/] | DOD[6/] USFS | Vernon | 91,825 (in basin) (98,590 total) | - | - | 91,825 | - | Camping, Hunting, Picnicking, Hiking, Nature Study |
| Peason Ridge Wildlife Management Area | DOD[6/] | Vernon | 2,970 (in basin) (33,000 total) | - | - | 2,970 | - | Camping, Hunting, Picnicking, Hiking, Nature Study |

4-31721 2-74

Continued -

Table 62 - Continued

| Facility | Administrative Agency 2/ | Parish | Area 1/ Land | Water | Marsh | Total | Developed Recreation Area | Activity |
|---|---|---|---|---|---|---|---|---|
| | | | acres | | | | | |
| Thistlewaite Wildlife Management Area | LWFC | St. Landry | 11,200 | - | - | 11,200 | - | Camping, Hunting, Picnicking, Hiking, Nature Study |
| West Bay Wildlife Management Area | LWFC | Allen | 57,575 | - | - | 57,575 | 9 | Camping, Hunting, Picnicking, Hiking, Nature Study |
| Rockefeller Wildlife Refuge and Game Preserve | LWFC | Cameron Vermilion | - | - | 84,000 | 84,000 | 1 | Fishing (salt water and fresh water), Crabbing, Crawfishing, Shrimping, Picnicking, 3 Boat Ramps |
| Marsh Island Wildlife Refuge and Game Preserve | LWFC | Iberia | - | - | 82,000 | 82,000 | - | Fishing (inland salt water), Crabbing, Shrimping |
| Louisiana State Wildlife and Game Preserve | LWFC | Vermilion | - | - | 13,000 | 13,000 | - | Fishing (inland salt water), Crabbing, Shrimping |
| Audubon (Paul J. Rainey) Wildlife Refuge and Game Preserve | NAS | Vermilion | - | - | 30,000 | 30,000 | - | Fishing (inland salt water), Crabbing, Shrimping |
| Lacassine Migratory Water Fowl Refuge | BSF&W | Cameron | - | 16,000 | 15,125 | 31,125 | - | 5,000 acres Waterfowl Hunting, Fishing, Crabbing, Crawfishing subject to refuge regulations |
| Sabine Migratory Water Fowl Refuge | BSF&W | Cameron | - | 33,000 | 109,896 | 142,896 | - | 10,000 acres Waterfowl Hunting, Fishing, Crabbing, Crawfishing, Shrimping subject to refuge regulations |

1/ Includes only that portion of area located within the study area

2/ SPRC - Louisiana State Parks and Recreation Commission, USFS - United States Forest Service, LFC - Louisiana Forestry Commission, LWFC - Louisiana Wildlife and Fisheries Commission, NAS - National Audubon Society, BSF&W - Bureau of Sport Fisheries and Wildlife, DOD - Department of Defense

3/ Includes acreage shown below in recreational areas on Kisatchie National Forest

4/ Areas under development at time of study

5/ Includes acreage shown below in recreational area on Alexander State Forest

6/ Wildlife resources managed by LWFC

7/ About 47,125 acres are located on Fort Polk Military Reservation and 44,700 acres are located on the Vernon Ranger District, Kisatchie National Forest

Table 63 - Outdoor Recreational Facilities or Resources and the Percentage Administered by Various Categories of Government or Ownership, 1967, Southwest Louisiana River Basin

| Activities | Unit | Facilities or Resources | Administrative Authority: Federal | State | Parish | Local | Commercial | Non-profit |
|---|---|---|---|---|---|---|---|---|
| | | number | percent | | | | | |
| Swimming | | | | | | | | |
| Pool | | | | | | | | |
| Pool | Sq. ft. | 368,300 | - | 14.0 | 3.5 | 70.4 | 2.7 | 9.4 |
| Supporting land | Acres | 150 | | | | | | |
| Beach | | | | | | | | |
| Beach | Sq. ft. | 95,500 | - | 1.7 | 71.9 | 1.5 | 21.8 | 3.1 |
| Water | Sq. ft. | 63,667 | | | | | | |
| Supporting land | Acres | 4 | | | | | | |
| Camping | | | | | | | | |
| Tent | Sites | 158 | - | 12.6 | 18.9 | 5.0 | 63.5 | - |
| | Acres | 25 | | | | | | |
| Trailer | Sites | 138 | - | 73.5 | 22.4 | - | 4.1 | - |
| | Acres | 15 | | | | | | |
| Additional undeveloped land | Acres | 185 | | | | | | |
| Picnicking | | | | | | | | |
| Prepared site | Tables | 933 | 1.0 | 28.5 | 21.1 | 29.4 | 18.9 | 1.1 |
| | Acres | 133 | | | | | | |
| Wilderness site | Tables | - | - | - | - | - | - | - |
| | Acres | - | - | - | - | - | - | - |
| Additional undeveloped land | Acres | 665 | | | | | | |
| Fishing and other water sports | | | | | | | | |
| Land | Acres | 77 | | | | | | |
| Water | Acres 1/ | 104,260 | | | | | | |
| Piers | Feet | 780 | - | 51.2 | 12.8 | 12.8 | 16.8 | 6.4 |
| Boat ramps | Number | 89 | 2.3 | 8.0 | 37.5 | 8.0 | 33.0 | 11.2 |
| Boats (rent or space) | Number | 737 | - | 14.9 | - | 2.2 | 71.9 | 11.0 |
| Supporting land | Acres | 178 | | | | | | |
| Trails | Miles | 44 | 1.0 | 44.0 | 0.7 | 4.6 | 14.3 | 35.4 |
| | Acres | 376 | | | | | | |
| Hunting | Acres | 276,950 | 37.0 | 52.7 | - | - | 2.8 | 7.5 |
| Designated recreation areas with no facilities | Acres | 24,502 | - | 98.0 | 0.2 | 1.2 | 0.5 | 0.1 |
| Other sporting facilities 2/ | Acres | 1,622 | - | 9.0 | 4.6 | 16.4 | 19.6 | 50.4 |

1/ Assuming standard unit/surface water ratio of Louisiana State Comprehensive Outdoor Recreation Plan
2/ School site recreational sites of high-density nature.
Source: Louisiana Parks and Recreation Commission

4-31721- 2-74

Table 64 - Existing Public Boat Ramps
Southwest Louisiana River Basin

| Water Body | Location | Parish |
|---|---|---|
| 1. Calcasieu River | 1.5 miles NW of Oakdale on S.R. 10 | Allen |
| 2. Calcasieu River | 3.4 miles NW of Oberlin on S.R. 26 | Allen |
| 3. Whiskey Chitto Creek | 9.8 miles NW of Oberlin on S.R. 26 | Allen |
| 4. Bundick Creek Lake | 5 miles NW of Dry Creek | Beauregard |
| 5. Prien Lake | On Lock Lane in the City of Lake Charles, La. | Calcasieu |
| 6. Lake Charles | Ft. of I-10 bridge over Calcasieu River | Calcasieu |
| 7. Calcasieu Ship Channel | Adjacent to Cameron Ferry | Cameron |
| 8. Mermentau | 30 miles east of Cameron Grand Chenier Park | Cameron |
| 9. Sabine Pass | East side of Sabine Lake immediately north of State Hwy. 82 | Cameron |
| 10. Upper B. Nezpique W/S Recreation Dev. Site No.3 | 7 Mi. West of Oakdale | Evangeline |
| 11. Delcambre Canal | Adjacent to Delcambre | Iberia |
| 12. Commercial Canal | E. bank of Commercial Canal approximately 5 Mi. south of New Iberia | Iberia |
| 13. Port of New Iberia | ½ Mi. south of New Iberia on U.S. 90 at Commercial Canal | Iberia |
| 14. Sandy Cove | West guideline levee road 10 Mi. NE of Jeanerette | Iberia |
| 15. L. Fausse Point Cut (under construction) | 6 Mi. NE of Town of Jeanerette | Iberia |
| 16. Bayou Teche | At New Iberia City Park | Iberia |
| 17. Bayou Teche | At Jeanerette City Park | Iberia |
| 18. Bayou Petit Anse | At Avery Island | Iberia |



Continued -

Table 64 - Continued

| Water Body | Location | Parish |
|---|---|---|
| 19. Spanish Lake | 4 miles NW of City of New Iberia | Iberia |
| 20. Dredge Canal | 2 blocks west of Main Street in Lake Arthur, La. | Jefferson-Davis |
| 21. Indian Creek Recreation Area- Site 2 | 3 Mi. SE of Woodworth | Rapides |
| 22. Indian Creek Recreation Area | 3.5 Mi. SE of Woodworth | Rapides |
| 23. Bayou Courtableau | At Town of Port Barre | St. Landry |
| 24. Bayou Courtableau | ¼ Mi. East of Town of Washington | St. Landry |
| 25. Eunice Lake | 2 Mi. West of Town of Eunice | St. Landry |
| 26. Krotz Springs | 6 Mi. West of Krotz Springs on U.S. Hwy. 190 | St. Landry |
| 27. Half Moon Lake | 2 Mi. W. of Krotz Springs along U.S. 190 | St. Landry |
| 28. Butte-La Rose Atchafalaya River | 5 Mi. S. of Henderson E. of W. Atchafalaya Guide Levee | St. Martin |
| 29. Bayou Benoit | 20 Mi. S. of Henderson on W. Atchafalaya Guide Levee | St. Martin |
| 30. Lake Dauterive | 25 Mi. S. of Henderson on W. Atchafalaya Guide Levee | St. Martin |
| 31. Lake Martin | 4 Mi. N. of Parks Hwy. 31 | St. Martin |
| 32. Bayou Teche | At Town of Breaux Bridge | St. Martin |
| 33. Quintana Canal | Near Cypremort Point Beach | St. Mary |
| 34. E. Cote Blanche Bay | At Burns Point 15 Mi. SW of Town of Centerville | St. Mary |
| 35. Franklin Canal | At Town of Franklin | St. Mary |
| 36. Vermillion River | At City of Abbeville | Vermilion |

There are three State parks located in the Basin - Chicot, Longfellow-Evangeline, and Sam Houston. In 1970, these three parks had a collective visitation of 2,533,669 people which represents an increase of 319 percent over visitation to the same recreational areas in 1967. This dramatic increase in visitation to these three State parks is indicative of the increasing demand for outdoor recreation throughout the Basin in recent years.

Two of the parks - Chicot and Sam Houston - provide water-based recreation. Collectively, these three parks encompass 5,047 acres of land and 2,495 acres of water which is devoted to recreation activities.

Chicot State Park, the largest in the Louisiana state park system, comprises 4,000 land acres and encompasses 2,500-acre Chicot Lake. Home of the 301-acre State Arboretum, Chicot Park is set among the pine-covered hills north of Ville Platte in Evangeline Parish. The 1,062-acre Sam Houston Park is located on the banks of the Calcasieu River just north of Lake Charles. Both of these parks are water-based developments and provide opportunities for almost all types of resource-oriented outdoor recreational activities. The gently rolling topography, wooded landscape and occasional ridges, ravines and swamps of both parks provide an attractive calling card to recreationists throughout the State. Both large and small forms of wildlife such as deer, squirrel, birds, and rabbit abound on the grounds of both developments.

Longfellow-Evangeline State Park, comprising 157 acres of land located on the banks of scenic Bayou Teche, is chiefly oriented to day-use activities and historical interests.

The Federal government, and particularly the U. S. Forest Service, make significant contributions in nearly all types of outdoor recreation in the Basin. Recreational developments by the U. S. Forest Service on the Kisatchie National Forest are discussed in a preceding section.

Developed recreational areas are under construction on two Public Law 566 reservoirs in the Bayou Boeuf Watershed in the Basin. These two reservoirs, one named Indian Creek and the other Kincaid, are located in Rapides Parish. When completed, they will provide a wide variety of recreational activities. Water-based activities will constitute the main attraction along with camping, nature study, and picnicking. The U. S. Forest Service is developing the recreational area on 1,920-acre Kincaid Reservoir. This complex, which will cover 1,700 land acres, will involve both developed areas for general type recreational use as well as undeveloped areas for dispersed use. The Soil Conservation Service and Rapides Parish Police Jury are sharing the cost on a 50-50 basis of developing the Indian Creek Recreational Area on Indian Creek Reservoir (2,250 surface acres). Like Kincaid, this recreational area will provide for recreational use on 618 land-acres both developed and undeveloped sites. The developed portion of the area will cover about 100 land-acres.

4-31721 2-74

Another Public Law 566 recreational development is planned on the Upper Bayou Nezpique Watershed in Evangeline Parish. The 100-acre developed area will offer opportunities for camping, picnicking, and nature study as well as water-dependent activities. It will be located on Reservoir No. 3 (430 surface acres). The Soil Conservation Service and local sponsors are jointly developing this recreational area and lake.

An analysis by the Economic Research Service of the supply of water-dependent and water-enhanced outdoor recreational facilities in the Basin reveals a critical shortage in all categories studied. Those activities having the greatest annual demand are pleasure driving, swimming, fresh-water fishing, trails, and sightseeing.

A comparison of the available facilities administered in 1967 (table 63) and the facilities required to satisfy the activity in that year (table 41) shows that, for most activities, the facilities under organized administration do not satisfy the demand at the prevailing level of activity. It may be assumed that if activity estimates are reasonably accurate, the remainder of the outdoor recreational activities were enjoyed on personal or private premises or on sites other than those administered by governments or organizations within the Basin Area.

The State also administers large acreages in the Basin for hunting areas and fishing waters known as wildlife management areas and refuges, which do not fall under the category of State parks. Other recreational activities such as camping, boating, and picnicking take place on these areas also. There are presently 17 of these areas covering approximately 90 percent of the 358,000 land acres devoted to outdoor recreation in the Basin.

Federal and State lands open to hunting and fishing within the watershed boundary are administered by the Louisiana Wild Life and Fisheries Commission, Louisiana State Parks and Recreation Commission, U. S. Forest Service, and U. S. Fish and Wildlife Service.

The areas managed for wildlife by the Louisiana Wild Life and Fisheries Commission require checking in and out on deer hunts but not on fishing, small game, and duck hunts. These areas in the Basin are: Fort Polk (Vernon Parish) 91,825 acres; Peason Ridge (Vernon Parish) 2,970 acres; Evangeline (Rapides Parish) 15,000 acres; West Bay (Allen Parish) 50,000 acres; Thistlewaite (St. Landry Parish) 11,200 acres; and Alexander State Forest (Rapides Parish) 7,875 acres. Marsh Island (Iberia Parish), Louisiana State Wildlife and Game Preserve (Vermilion Parish), and Rockefeller Refuge (Cameron Parish) are also under the jurisdiction of the Louisiana Wild Life and Fisheries Commission but are closed to hunting; they are open to fishing, crab-bing, crawfishing, and shrimping within season.

The Louisiana State Parks and Recreation Commission has two parks within the River Basin that offer fishing that is open to the public. These are Chicot and Sam Houston State Parks.

4-31721 2-74

The U. S. Forest Service has two of its divisions, Evangeline (Rapides Parish) and Vernon (Vernon Parish) that are open to hunting and fishing without restriction, other than game laws and seasons. This excludes the Evangeline and Fort Polk Game Management Area which are open to the public by permit only. Subtracting the land in the Wildlife Commission Game Management areas, the Vernon district has 37,459 acres and the Evangeline district has 77,331 acres open for public use.

The U. S. Fish and Wildlife Service has two large refuges within this area; the Sabine, 142,896 acres, and Lacassine, 31,125 acres, both in Cameron Parish. Of this acreage, Sabine has 10,000 acres and Lacassine 5,000 acres open to public duck and goose hunting. These areas, within seasonal restrictions, are also open to crabbing, fishing, and bird watching.

## Water Supply Projects

### Municipal and Industrial

Table 60 describes projects developed by the U. S. Army Engineers which help supply municipal and industrial water to cities and towns of the Basin. These projects furnish water from surface sources.

Almost all the present municipal water and about 67 percent of industrial water is derived from ground water sources. The Louisiana Department of Public Works is continually developing test wells and giving advice to cities and towns of the Basin about water availability.

Only one reservoir has been developed by Federal, State, or local interests to supply municipal or industrial water. Lake Vernon constructed by Department of Public Works has 55 million gallons per day available for water supply purposes.

The Farmers Home Administration has assisted numerous rural communities to develop water supply systems for domestic use. Table 65 lists these projects, gives their status, and lists other pertinent facts. The source of water for all projects is ground water.

### Irrigation Projects

Table 60 lists and describes projects of the U. S. Army Engineers and table 59 lists upland watershed projects of the Soil Conservation Service. Those projects which contribute irrigation water in the Southwest Louisiana River Basin are noted.

At present, private companies are supplying over 37 percent of the water used for irrigation in the Basin. Over 94 percent of their water

Table 65 - Completed and Authorized Project by
Farmers Home Administration - January 1, 1971
Southwest Louisiana River Basin

| Parish and Project Name | Status[1] | Purpose[2] | Users[3] | Total Installation Cost |
|---|---|---|---|---|
| | | | number | dollars |
| Acadia | | | | |
| Village of Mermentau | C | WS | 222 | 205,000 |
| | | S | 220 | 180,000 |
| Allen | | | | |
| Town of Elizabeth | C | WS | 227 | 160,000 |
| Waterworks District No. 1 | C | WS | 157 | 133,000 |
| South Oakdale | C | WS | 115 | 166,000 |
| Fairview Water System Inc. | C | WS | 65 | 95,000 |
| Greater Oberlin Water System, Inc. [4] | C | WS | 87 | 78,000 |
| Allen Country Club | C | R | 200 | - |
| Avoyelles | | | | |
| Fifth Ward Water System, Inc. | C | WS | 542 | 433,000 |
| Waterworks District No. 1 | C | WS | 550 | 560,000 |
| Brouillette Water System, Inc. | C | WS | 520 | 556,000 |
| Avoyelles Country Club | C | R | 250 | - |
| Beauregard | | | | |
| South Beauregard Water System, Inc. | C | WS | 421 | 530,000 |
| Calcasieu | | | | |
| Bell City Water System, Inc. | C | WS | 52 | 54,770 |
| Hayes Water System, Inc. | C | WS | 102 | 102,500 |
| Cameron | | | | |
| Creole Water System, Inc. | C | WS | 105 | 110,000 |
| Sewerage District No. 1 of Cameron | C | S | 600 | 912,000 |
| Evangeline | | | | |
| Chataignier Water System, Inc. | C | WS | 140 | 125,000 |
| The Mamou Water District | C | WS | 138 | 142,000 |
| Redell-Vedrine Water District | C | WS | 235 | 250,000 |
| Point Blue Water System, Inc. | C | WS | 170 | 140,000 |
| East Side Water System, Inc. | C | WS | 160 | 143,000 |
| St. Landry Water System, Inc. | A | WS | 90 | 75,000 |
| Iberia | | | | |
| Lydia Water Corp. | C | WS | 171 | 140,000 |
| Coteau Water System, Inc. | A | WS | 134 | 121,000 |
| Jefferson Davis | | | | |
| Waterworks District No. 1 | C | WS | 100 | 83,000 |
| Lacassine Water System, Inc. | C | WS | 89 | 101,700 |
| Village of | A | WS | 100 | 120,000 |

(continued)

Table 65 - Continued

| Parish and Project Name | Status1/ | Purpose2/ | Users3/ | Total Installation Cost |
|---|---|---|---|---|
| | | | number | dollars |
| Lafayette | | | | |
| Village of Youngsville | C | WS | 293 | 90,000 |
| Rapides | | | | |
| Town of Forest Hill | C | WS | 310 | 265,000 |
| Hineston Water System, Inc. | C | WS | 104 | 114,000 |
| Gardner Water System, Inc. | C | WS | 250 | 264,000 |
| Village of McNary | A | WS | 130 | 142,000 |
| St. Landry | | | | |
| Village of Leonville | C | WS | 297 | 262,000 |
| Village of Palmetto | C | WS | 201 | 177,000 |
| Lewisburg-Belleview Water System, Inc. | C | WS | 352 | 325,000 |
| Prairie Ronde Water System, Inc. | C | WS | 291 | 269,000 |
| Morrow Water System, Inc. | C | WS | 117 | 122,000 |
| Grand Prairie Water System, Inc. | C | WS | 126 | 125,000 |
| Garland-Whiteville Water System, Inc. | C | WS | 165 | 165,000 |
| Plaisance Water System, Inc. | C | WS | 336 | 330,000 |
| Manow Road Water System, Inc. | A | WS | 330 | 349,500 |
| St. Mary | | | | |
| Glencoe Water System, Inc. | C | WS | 83 | 70,000 |
| St. Martin | | | | |
| Cecelia Water Corp. | C | WS | 490 | 470,500 |
| Henderson-Nina Water System, Inc. | C | WS | 348 | 250,000 |
| Catahoula Water System, Inc. | C | WS | 195 | 192,000 |
| Vernon | | | | |
| Village of Rosepine | C | WS | 115 | 92,700 |
| Village of Simpson | A | WS | 140 | 140,000 |
| Total | | | | 9,930,670 |

SUMMARY

| Status | Purpose | Users |
|---|---|---|
| Authorized - 6 | Water Supply - 44 | Water Supply - 9,365 |
| Complete - 41 | Sewerage - 2 | Sewerage - 820 |
| | Recreation - 2 | Recreation -- 450 |

1/ Status: A - Authorized, C - Complete

2/ Purpose: WS - Water Supply, S - Sewerage, R - Recreation

3/ User: Family, Household, School, Business, etc.

4/ Buying water from Oberlin

comes from surface sources. Table 12, "Irrigation Water Supplied by Water Companies (1967)", lists major water supply companies and the amount supplied by each.

## Navigation and Saltwater Control Projects

All saltwater control projects are important but the most vital system of control in the southwest is that which forms the Mermentau freshwater basin (see figure 6). This system not only protects the area from saltwater intrusion, but maintains an almost constant water level for navigational purposes, provides water storage for irrigation, and creates a fishery and wildlife mecca. Tables 59 and 60 list projects including saltwater control.

A near constant water level and protection from saltwater is accomplished primarily by three major control structures. The first structure, known as Calcasieu Lock, is located on the Intracoastal Waterway near Calcasieu Lake. The second structure, Catfish Point Control Structure, is located on the Mermentau River just south of Grand Lake. The third structure, Vermilion Lock, is located on the Intracoastal Waterway just west of where the waterway crosses Vermilion River. The Scooner Bayou structure and natural streams and barriers complete the system. This system was constructed by the U. S. Army Engineers and is operated and maintained by them. Although this system is very effective, saltwater intrusion through the network of channels south of the Scooner Bayou structure has been reported.

The Department of Public Works has constructed several projects important to navigation. They include the Commercial Canal, Charenton Canal, and Franklin Canal.

## Pollution Control Projects

Industries and municipalities are striving to meet guidelines established by the Environmental Protection Agency and others. Many sewage treatment plants, oxidation ponds, and waste disposal sites have been built. Of course, saltwater is a type of pollutant and control projects are listed in tables 59 and 60.

The Louisiana State Board of Health has monitoring and policing responsibilities for municipal wastes. The Water Pollution Control Division of the Louisiana Wild Life and Fisheries Commission has primary responsibility for industrial pollution control. These agencies work together through the Stream Control Commission which has members from the two above agencies and five other members from concerned agencies. The Water Pollution Control Division of the Louisiana Wild Life and Fisheries Commission has had a stream monitoring program since about the year 1959.

4-31721 2-74

## Agricultural Stabilization and Conservation Service

The Agricultural Stabilization and Conservation Service (ASCS) has responsibility for improving and stabilizing farm income in order to bring about a better balance between supply and demand of agricultural commodities, and for assisting farmers in marketing their products. Stabilization of farm incomes is achieved by making loans to eligible farmers for producing various agricultural crops. If market prices are good at the time of harvesting, the farmer repays the loan from his profits. If market prices are not good, the farmer repays the loan by forfeiting the crop which served as collateral for the loan.

The ASCS provides cost sharing to farmers for implementing soil and water conservation practices that stabilize the land, reduce erosion, control sediment, improve and establish forest lands, manage runoff, and abate pollution. Recently, this program has been modified and updated.

A public access program, a relatively new program in experimental stages, pays landowners for opening their land to public hunting. Compensation is dependent on the value that various areas may have as a hunting resource.

## Farmers Home Administration

The Farmers Home Administration (FHA) provides financial assistance to the rural sector of the Nation. The primary objective is to improve the quality of rural living. Financial assistance provided by the FHA promotes rural development by:

1. Encouraging and supporting family farm ownership and operation.
2. Financing modest but adequate housing that includes private residences, rental apartments, and farm labor dwellings.
3. Providing loans for communities to build needed facilities - water supplies and waste disposal systems, fire-fighting equipment, streets, community and health centers, and other amenities.
4. Providing economic support to farmers and homeowners sustaining losses by natural events.
5. Fostering economic development for business and industrial enterprises.

## Economic Development Administration

The Public Works and Economic Development Act of 1965, Public Law 89-136, provides a means by which certain areas of the Nation suffering from substantial unemployment and underemployment can be helped to improve their physical and social structure and thereby stimulate economic growth.

4-31721 2-74

The Acadiana Economic Development District, designated under Title IV of the Public Works and Economic Development Act, was established to plan for and assist in the initiation of sustained economic development. This district includes the parishes of Acadia, Evangeline, Iberia, Lafayette, St. Landry, St. Martin, St. Mary, and Vermilion. The Kisatchie-Delta Economic Development District which covers eight parishes, was also established. Three of these parishes, Avoyelles, Rapides, and Vernon, are partially within the Basin.

Louisiana State Planning Office

The Louisiana State Planning Office was created in 1968 by amending Title 49 of the Louisiana revised statutes of 1950. This office has the responsibility for comprehensive statewide planning.

This office is responsible for assembling and coordinating all basic information with respect to the goals of the State and the development of programs and plans affecting the State. All municipal and regional development plans must be filed with the State Planning Office. They are responsible for reviewing the programming and planning of municipal and regional planning commissions. Among other duties, this office assists and advises citizens groups, governmental units, private organizations, and others in the formulation and development of goals and policies of the State. They also conduct studies and prepare reports on planning problems of parishes, municipalities, and subdivisions upon request.

Louisiana Commission on Intergovernmental Relations

The Louisiana Legislature passed Senate Concurrent Resolution 36 in 1969 designating the Intergovernmental Relations Commission as the State agency to have the authority to request from the Federal government any and all information respecting the Federal grants, purposes, and amounts thereof, payable to the State of Louisiana or its political subdivisions.

Executive Order 73 was issued on September 1, 1969, which authorized the Intergovernmental Relations Commission to establish substate planning areas and a network of district clearinghouse review boards. They were also authorized to serve as the official State clearinghouse. The purpose of the clearinghouse is to receive and disseminate project notifications to appropriate State agencies in the case of the State clearinghouse and to approriate local governments in the case of the district.

The Intergovernmental Relations Commission established eight planning districts for the State of which three are wholly or partially within the Basin. The three included within the Basin are:

4-31721 2-74

| Planning District | Parishes |
|---|---|
| No. 4 - Acadian | Acadia, Evangeline, Iberia Lafayette, St. Landry, St. Martin, St. Mary, and Vermilion |
| No. 5 - Southwest | Allen, Beauregard, Calcasieu, Cameron, and Jefferson Davis |
| No. 6 - Central | Avoyelles, Catahoula[1/], Concordia[1/], Grant[1/], LaSalle[1/], Rapides, Vernon, and Winn[1/] |

Executive Order 27, dated February 16, 1973, formalized the eight districts as the official State Planning Districts.

1/ Parishes not in Basin Study Area.

# WATER AND RELATED LAND RESOURCE DEVELOPMENT POTENTIAL

This section discusses the Basin's potential for solving problems, filling needs for water and related land, agricultural production, and recreation. It includes potentials for conserving and improving soils, forests, fish and wildlife habitat, and other environmental values.

## AVAILABILITY OF LAND FOR POTENTIAL DEVELOPMENT

### Cropland Suitable for Regular Cultivation

Based on the 1967 data in the Conservation Needs Inventory, there are 2,323,396 acres of cropland in the Southwest Louisiana River Basin. Of this, about 3,800 acres needed a change in land use because solutions to the flooding and drainage problems would be too costly. The remaining acreage had no problems that could not be solved gradually under the going program providing flood control and drainage needs could be met on a project basis. Experience has proved that an accelerated land treatment program generally is needed to protect and realize full benefits from project installations.

If economic and other conditions give rise to the need for more cropland, the 400,000 acres of bottom land in the north and eastern portion of the Basin offer the greatest potential for production of soybeans, rice, and grain sorghum. These crops can generally be planted and harvested during the non-flood season. Although drainage and flood protection provided by project improvement would permit earlier planting, more timely cultivation when needed, and allow more time for harvesting, it is estimated that 60,000 acres could be profitably converted to cropland without project improvement of main channels. With the present very favorable prices for soybeans, farmers may be willing to assume the risk of occasional flood damage on an additional 80,000 acres of bottom land having a somewhat higher risk potential than the 60,000 acres mentioned. In the past, much clearing has been done by non-resident or new resident owners unfamiliar with the local flood problems. As a consequence, much clearing has been on the entire area within ownership property lines and without regard to elevations. Consequently, sizable acreages have been cleared that are subject to overbank flooding from the main channels. Most of the remaining 260,000 acres would probably require levee protection and pumping if it is used for cropland.

The flatwood area of the Southern Coastal Plain LRA (figure 4) includes 500,000 acres of loamy soils on slopes of less than 3 percent and 650,000 acres of level poorly-drained soils. This area has a moderate potential for cropland provided erosion control or drainage practices are applied where needed. Because fertility is low, high rates of fertilizer application would be required for satisfactory yields. Relatively high prices for crops such as soybeans and rice will probably be needed before much of this land would be converted.

4-31721 2-74

The Southern Mississippi Valley Silty Uplands LRA offer little potential for an increase in cropland acreage. Nearly all the forest acreage is on the older, leached soils with rough topography, escarpments, or the poorly drained and frequently flooded soils.

In the Gulf Coast Prairie LRA, the forested area is almost entirely in the flood plain of the Mermentau and other streams. Flood protection on these areas is generally not feasible.

In the Gulf Coast Marsh LRA, about 100,000 acres of freshwater marsh could be leveed, then drained by pumps. With the high initial costs, the annual costs of pumping almost 60 inches of annual rainfall, and the costs of frequent hurricane damage added to the normal costs of producing crops, there seems little likelihood of much increase of cropland in the marsh.

## Potential Shift of Grassland Pasture to Cropland

Over half-a-million acres of pastureland is distributed throughout nearly all the soil productivity groups in the Basin. The potential for pastureland to be shifted into cropland use is dependent on a number of variables. The potential for shift is estimated on the basis of soils in Capability Classes 1 through 4 that have good to fairly good response to fertilizer. The acreage which qualify by these criteria are further identified by minimum, major, or intermediate management problems due to erosion or drainage which must be dealt with. There is a total of 337.1 thousand acres of pasture which has the potential for cropland use (table 66). Included are 146.7 thousand acres which have major management problems due to erosion or drainage and 123.9 thousand acres which have intermediate management problems.

Table 66 - Acres of Potential Shift Between Cropland, Pasture, and Forest Identified by Qualities of Soil Groups, Southwest Louisiana River Basin

| Shifts Potential | Total | Minimum E 1/ | Minimum D 2/ | Intermediate E 1/ | Intermediate D 2/ | Major E 1/ | Major D 2/ |
|---|---|---|---|---|---|---|---|
| | acres (1,000) | | | | | | |
| Pasture to cropland | 337.1 | 66.4 | -- | 2.1 | 121.9 | 19.6 | 127.1 |
| Forest to cropland | 581.5 | 18.5 | -- | .7 | 57.6 | 182.0 | 322.7 |
| Cropland to pasture or forest | 606.8 | 11.9 | -- | 13.7 | 140.4 | 10.7 | 430.1 |

1/ E - represents erosion
2/ D - represents drainage

## Potential Shift of Forest to Cropland

The major portion of forest coverage is in the northwestern quarter of the Basin on the Southern Coastal Plains LRA. Almost 2 million acres are on upland soils and over 400 thousand acres are on bottom land soils. Large amounts of forest land have been cleared in the eastern part of the Basin in recent years, and the practice is continuing. Most of this cleared land is being used for soybean production, which has been increasing faster than the national average. Much of the "flatwoods" area across the lower interior part of the Southern Coastal Plains LRA was cleared for cropping in the past, but low yields have caused it to revert to forest. An estimated 581.5 thousand acres of forest qualify as potential cropland. Included are 58.3 thousand acres with intermediate management problems and 504.7 thousand acres with major management problems.

## Potential Shift of Cropland to Grassland and Forest

The potential for current cropland to shift into other uses such as pasture or forest is related to soils with low, poor, or fair response to fertilizer or other factors. An example of this type of use-change is occurring in the lower interior part (flatwoods) of the Southern Coastal Plains LRA. Much of this land was cleared for cropping in the past, but low yields caused it to revert to forest. About 606.8 thousand acres of cropland in the Basin have a potential to shift into either pasture or forest. About 400 thousand acres of this is in the Coastal Prairie LRA and is not being actively used in rice production rotation. The potential for the shift of this land use would be to pasture rather than forest (table 66).

# CONSERVATION TREATMENT

## Cropland

Cropland has the potential to increase by 89,700 acres in 1985 (table 67). This will bring the total cropland to about 2,413,000 acres. Most of this land will come from the conversion of part of the 79,500 acres of forest land and 58,300 acres of pasture and range that are suited to crop production. Nearly all this land will need drainage. Urban and built-up areas will absorb some of the best cropland which was previously classed as needing little or no conservation treatment.

Table 67 shows that of the 2,413,000 acres of cropland in 1985, 1,019,900 acres will be adequately treated, and 1,393,200 acres will need treatment. In addition, 667,500 acres of land needing treatment will need more than one conservation practice applied. The farmer's cost (cost to the landuser to install these practices or treatments) and technical assistance cost (cost to Soil Conservation Service for salaries, etc.) will be $84,786,300.

## Pasture

Permanent pasture is expected to decrease by 57,500 acres in 1985, bringing the total to 476,900 acres. Most of the land previously in pasture

Table 67 - Potential Conservation Treatment by Land Use, Based on Projections to 1985, Southwest Louisiana River Basin

| Practice or Activity | Treatment Adequate | Treatment Inadequate | Total | Farmers Installation Cost | Technical Assistance Cost | Total Cost |
|---|---|---|---|---|---|---|
| | ---acres--- | | | ---dollars--- | | |
| CROPLAND | | | | | | |
| Improved irrigation systems | 1/ | 1,080,400 | 1/ | 46,942,200 | 1/ | 1/ |
| Drainage | 1/ | 818,000 | 1/ | 25,703,000 | 1/ | 1/ |
| Residue and annual cover | 1/ | 123,406 | 1/ | 1,480,700 | 1/ | 1/ |
| Grasses and Legumes in rotation | 1/ | 17,600 | 1/ | 69,800 | 1/ | 1/ |
| Contouring | 1/ | 9,300 | 1/ | 46,800 | 1/ | 1/ |
| Strip cropping, terraces, and diversions | 1/ | 8,200 | 1/ | 98,400 | 1/ | 1/ |
| Permanent cover | 1/ | 3,800 | 1/ | 132,400 | 1/ | 1/ |
| Total | 1,019,900 | 2,060,700 | 3,080,600 | 74,473,300 | 10,313,000 | 84,786,300 |
| Less acreage receiving more than one treatment practice | | -667,500 2/ | -667,500 2/ | | | |
| Total 1985 Cropland | 1,019,900 | 1,393,200 | 2,413,100 | 74,473,300 | 10,313,000 | 84,786,300 |
| PASTURE | | | | | | |
| Drainage 2/ | | 108,500 | 1/ | 2,713,500 | 1/ | 1/ |
| Reestablishment and brush control | 1/ | 1,300 | 1/ | 40,300 | 1/ | 1/ |
| Reestablishment of vegetative cover | 1/ | 135,200 | 1/ | 5,408,000 | 1/ | 1/ |
| Brush control and improvement | 1/ | 1,100 | 1/ | 42,900 | 1/ | 1/ |
| Needs treatment | 1/ | 60,800 | 1/ | 1,702,500 | 1/ | 1/ |
| Needs protection | 1/ | 38,400 | 1/ | 38,400 | 1/ | 1/ |
| Total | 240,100 | 345,300 | 585,400 | 9,945,500 | 1,371,000 | 11,316,500 |
| Less acreage receiving more than one treatment practice | | -108,500 2/ | -108,500 2/ | | | |
| Total 1985 Pasture | 240,100 | 236,800 | 476,900 | 9,945,500 | 1,371,000 | 11,316,500 |
| RANGE | | | | | | |
| Brush control and improvement | 1/ | 35,200 | 1/ | 70,300 | 1/ | 1/ |
| Needs improvement | 1/ | 55,900 | 1/ | 11,200 | 1/ | 1/ |
| Needs protection | 1/ | 87,600 | 1/ | 13,200 | 1/ | 1/ |
| Reestablishment | 1/ | 700 | 1/ | 200 | 1/ | 1/ |
| Total 1985 Range | 198,500 | 179,400 | 377,900 | 94,900 | 15,300 | 110,200 |
| FOREST | | | | | | |
| Site preparation and planting | 1/ | 452,000 | 1/ | 14,464,000 | 217,000 | 1/ |
| Reinforced planting and improvement | 1/ | 533,700 | 1/ | 12,808,800 | 192,000 | 1/ |
| Timber stand improvement | 1/ | 701,200 | 1/ | 8,414,400 | 126,000 | 1/ |
| Total 1985 Forest | 594,700 | 1,686,900 | 2,281,600 | 35,687,200 | 535,000 | 36,222.200 |
| OTHER LAND | | | | | | |
| Wildlife wetland habitat management | 1/ | 300,000 3/ | 1/ | 120,000 | 20,000 | 140.000 |
| Total 1985 Other Land | 634,377 | 300,000 3/ | 934,377 | 120,000 | 20,000 | 140,000 |
| GRAND TOTAL | 2,687,577 | 3,796,300 | 6,483,877 | 120,320,900 | 12,254,300 | 132,575,200 |

1/ Data not computed.
2/ Acreage computed to receive more than one treatment practice.
3/ Acreage used for wildlife only.

Good conservation farming increases crop yields and provides higher net returns.

4-31721 2-74

will be converted to cropland, urban, and built-up areas. However, this will not necessarily minimize treatment needs. Some of the land that was adequately treated in 1967 will have deteriorated and will need replacement, rehabilitation, or even relocation for more efficient pasture use.

In 1985, 240,100 acres of the 476,900 acres of pastureland will be adequately treated, leaving 236,800 acres that will need some conservation practices. In addition, 108,500 acres of the total pastureland needing treatment will need more than one conservation practice applied. The farmer's installation cost plus the cost of technical assistance brings the total installation cost to $11,316,500.

Range

Land used for range in the Basin is expected to decrease about 800 acres. This brings the total rangeland to 377,900 acres. Most of this 800 acres will be used for cropland with some going into urban and built-up areas. The need for conservation practices is not expected to decrease because the land taken out of range will come from that part adequately treated. Therefore, the total rangeland needing treatment is expected to remain about constant. This will be due mainly to the areas that will need conservation practices replaced, rehabilitated, or improved. The farmer's cost of installation plus the cost of technical assistance is expected to be $110,200.

Forest Land

Forest land is expected to decrease by 79,500 acres in 1985. This will bring the total forest land to about 2,281,600 acres. Most of this land will go into row crops and vegetable gardens. Of the total acreage of forest land in 1985, 594,700 acres will be adequately treated and 1,686,900 acres will need treatment. These treatment needs are based on timber production potential only and will be in conflict with some forest land uses, such as grazing. The costs, both farmers and technical, will be $36,222,200.

Other Land

Other land includes marshland not used for cropland, pasture, or range; and fence rows, ditch banks, field roads, farmsteads, etc. It is expected that these lands will increase by 48,072 acres in 1985 bringing the total to 934,377 acres. Most of this land will be used for wildlife, the addition of new farmsteads, and rural residences. Wetlands, both marsh and upland, used for wildlife habitat will be the largest single use of other land. It is expected that 300,000 acres will need treatment. The remaining 634,377 acres will be adequately treated. The farmers' installation cost and technical assistance costs will be $140,000.

Of the five land uses in the Basin, all are expected to decrease in acreage in 1985 except land classified as other land and cropland. The

Timber stand improvement eliminates undesirable trees.

Regeneration means beginning a new forest.

4-31721 2-74

total acreage in the Basin will remain at 6,483,877 acres. Of this, 3,796,300 acres will need conservation treatment with a total farmers' installation cost and technical assistance cost of $132,575,200. The remaining 2,687,577 acres will need no treatment.

## FOREST RESOURCES

### Roundwood Production and Poor Stocking

Present roundwood production potential for the average acre of forest land is about 40 cubic feet per acre per year, which is controlled by the degree and condition of stocking. However, if each acre were fully stocked, the projected growth potential by 2020 would be about 90 cubic feet per acre per year (see figure 22). Growth potential exceeds demand at all times.

### Erosion Control on Impact Areas

Severity of disturbances on artillery impact areas cause a potential loss of 17.7 tons of soil erosion per acre per year. Repeated use of these areas prevents healing.

### Grazing

The potential grazing resource for oak-pine and pine forest types within the Basin is 53,300 animal units per year. The potential resource on longleaf-slash pine type alone is 36,500 animal units per year. Currently, the forest resource in the Basin has a maximum potential of supporting 67,000 animal units as presented in figure 25.

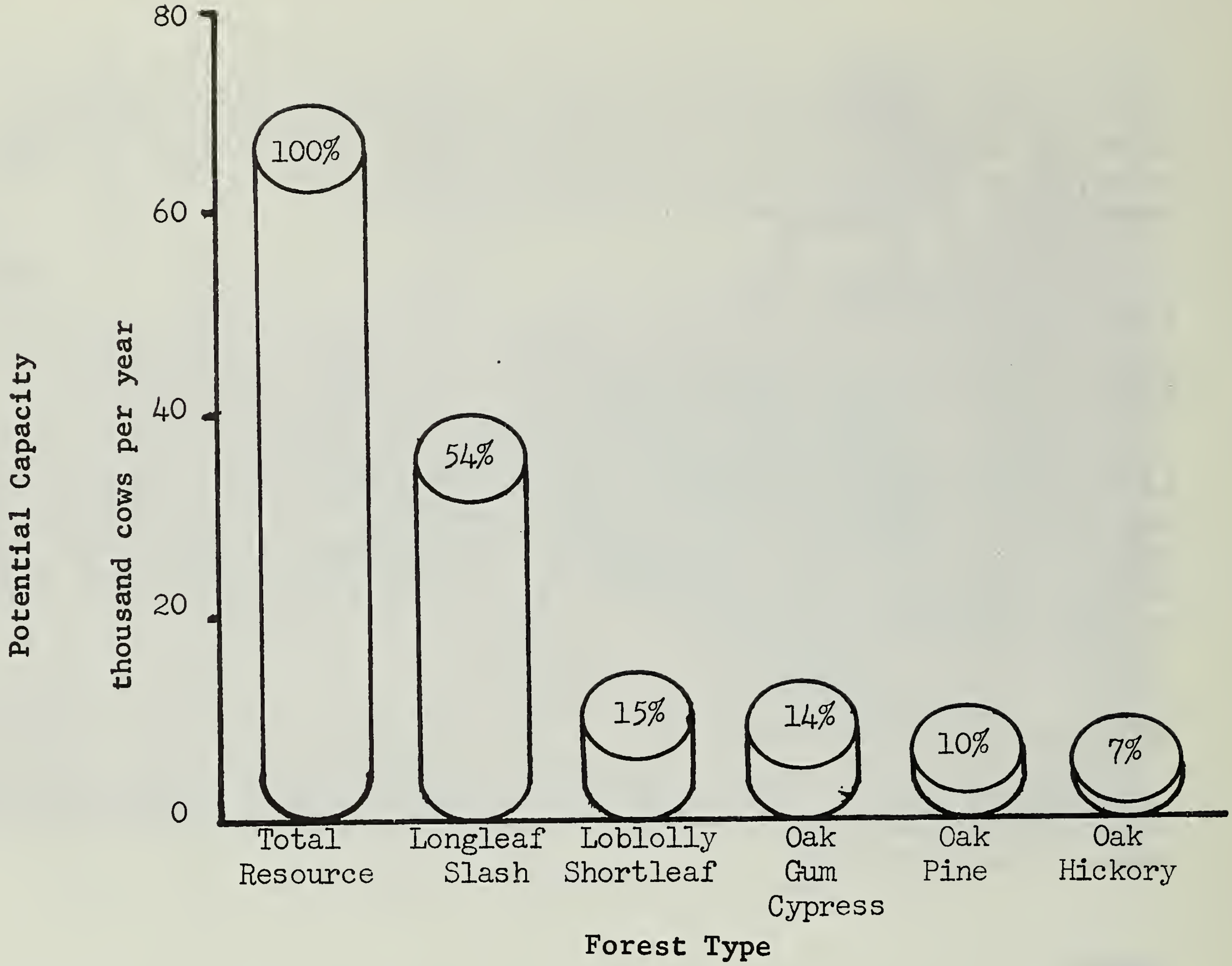


Figure 25 - Potential Grazing Capacity by Forest Type, Southwest Louisiana River Basin

IMPOUNDMENTS

There is an excellent physical potential for upstream reservoirs in LRA 133 (figure 4). The existing topography and soil conditions are favorable to obtain adequate storage at average costs. Total storage would be almost unlimited because the number of reservoir sites would be governed only by a practical approach to land use. Almost all sites would be located on productive timberland. In the remaining portion of the Basin where most flood damages occur, the topography is almost flat with no potential impoundment sites.

The potential impoundments offer excellent opportunity for recreational, fish and wildlife, irrigation, or water quality control uses. They could be used for storage of municipal and industrial water but this seems unlikely since most urban areas are presently using ground water. Also, there is a potential to import surface water from outside the Basin.

In addition to upstream reservoirs, there is a potential for many on-farm impoundments. These could be used for flood prevention, livestock water, fish farming, recreation, and fish and wildlife. No estimate has been made of this storage potential.

4-31721 2-74

GROUND WATER DEVELOPMENT

An analysis was made to determine the potential of the ground water resource to supply future irrigational needs for southwest Louisiana. Existing information and a U. S. Geological Survey Electrical Resistance Analog Model of the aquifers were utilized to simulate water-level declines resulting from the hypothetical future pumping. Wells were ideally distributed within the potentially irrigable areas in such a way that the additive drawdown effects of nearby pumping wells are minimized. The validity of the data resulting from the Analog Model study is based on three assumptions or qualifications: (1) the static piezometric or water surface will not fall below the top of the aquifer while future pumping is in effect; (2) the location of the zero rate of water-level decline contour will not change appreciably; and (3) that movement of the saltwater front will not accelerate.

Information is available in Water Resources Pamphlet No. 27, "Ground Water Pumpage and Related Effects, Southwestern Louisiana, 1970", published by the Louisiana Geological Survey, Department of Conservation, and the Louisiana Department of Public Works, 1971, which shows that regionwide saltwater encroachment could be as much as 70 feet per year horizontally northward from its present position which is roughly parallel to the gulf shore. This movement is relatively slow but withdrawals in the Lake Charles area will steepen the potentimetric gradient and consequently provide conditions which may speed up this saltwater movement. Local saltwater migration is occurring in the lower Chicot aquifer sand of the Lake Charles area in addition to upward coning of underlying saltwater.

In the Lake Charles area, increasing saltwater encroachment and severe water-level declines caused primarily by industrial withdrawals may present problems. In central and southern Evangeline Parish where the aquifer is very thin, water levels have dropped drastically and will continue to drop.

Analyses indicate that with the exception of the Lake Charles area and most of Evangeline Parish, projected agricultural ground water requirements can be met without serious problems. However, future development will cause significant regional water-level declines. In the Mamou area, the water level dropped from 30 feet above sea level in 1903 to 40 feet below sea level in 1970, and in the Lake Charles area during the same period, the level dropped from slightly above sea level to 140 feet below sea level. These dropping water levels will continue to steepen the gradients toward the inverted cones of the heavy withdrawal area. A direct economic effect will be the increased cost of pumping necessitated by lower pumping levels. "Ground Water Requirements, 1970-2020", a report prepared by the Louisiana Department of Public Works as a part of their "Comprehensive Water and Related Land Resources Study", presents more detailed data and sub-area breakdowns of the adequacy of the ground water resource.

Artificial ground water recharge is not considered feasible for this area. Information from other areas where recharge has been attempted

4-31721 2-74

indicates that costs are extremely high and, generally, recharge is attempted only as a last resort.

## CHANNEL WORK AND LEVEES

Channel work for flood prevention is suggested where inadequate or no reservoir sites are available. All areas except the Southern Coastal Plain portion of the Basin are in this category. Topography is level to nearly level; therefore, channel work is the most practicable means of flood prevention available. In most situations, enlarged channels will provide both flood prevention and drainage benefits. Runoff waters from higher lands accumulate in low-lying areas, causing flooding. Channels serve to remove this floodwater along with heavy direct precipitation, therefore, serving both flood prevention and drainage purposes.

In many channel reaches, the flow characteristics can be improved by removing (1) the trees overhanging the banks, (2) vegetal growth within the channel, (3) log jams, and (4) debris lodged within the channel. In some reaches, this work alone will provide an acceptable level of flood protection. In other reaches, some minor realignment may provide the desired control. In many areas, major channel work including realignment, enlargements, and stabilizing structures may be required. Very few new channels will be necessary.

It will be necessary to provide multiple-purpose drainage and flood prevention channels that will remove the excess surface water from heavy direct precipitation within a time that will keep damages to a minimum. In some locations, channels will also provide outlets for urban area runoff. Actual details for design of these channel systems will depend on existing soil conditions, topography, and type of farming to be practiced.

There is a potential for channel work for drainage and flood prevention on approximately 3,493,000 acres within the Basin. Table 48 gives an inventory of this acreage by land use, CNI watersheds, and sub-basins.

Most needed levee systems have been built by the Corps of Engineers or the Louisiana Department of Public Works. Mainly, these systems protect urban areas.

## IRRIGATION SYSTEMS

The physical potential for irrigation within the Basin is good. Most of the soils will respond to irrigation with increased yields. There are about 968,000 acres of land with water delivery systems for rice in the Basin. Additionally, there are about 539,000 acres suitable for rice irrigation which do not have delivery systems. Also, there are about 231,500 acres whith soils suitable for supplemental irrigation. Figure 26 shows those soils suitable for irrigation. The feasibility of using this

4-31721 2-74

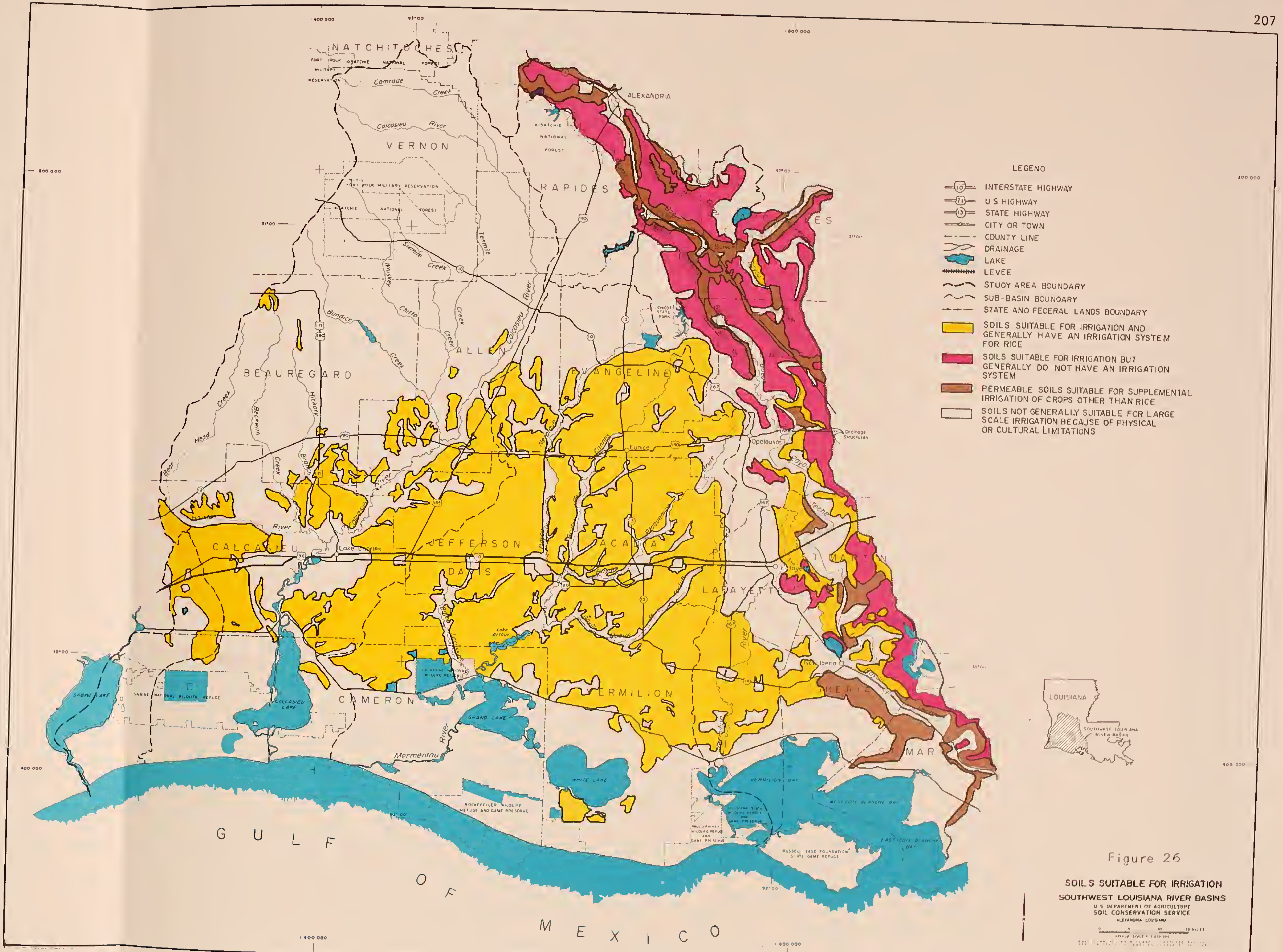


Figure 26

SOILS SUITABLE FOR IRRIGATION
SOUTHWEST LOUISIANA RIVER BASINS
U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ALEXANDRIA LOUISIANA

OCTOBER 1968 Revised Dec 1970 4-R-27,240

land to its highest capability is dependent upon the demand for crops that could be produced profitably with good management and irrigation.

At the present time, there are both ground and surface water supplies available within the Basin for additional development. Also, there is a potential to import surface water from outside the Basin. Water may be diverted from the Atchafalaya River by way of Bayou Courtableau, Bayou Teche, and the Vermilion River; or from Toledo Bend Reservoir by way of the Sabine River, Houston River, and Calcasieu River, on paralleling routes.

Supplemental irrigation has not been utilized to its fullest potential. This has been due to several factors, the most significant are: (1) high capital investments and operating expenses, (2) lack of technical know-how, and (3) competition has not been keen enough for market prices to warrant a level of management which required irrigation. These factors are changing, however. More investment capital is being brought into the farm management picture. More technical help is available to the irrigator today, and to keep his place in the competitive market, the operator must go to higher levels of management. As the average size of farms increases, irrigation becomes more efficient.

Irrigation farming reduces the risk of losses caused by drought. This more consistent output is highly attractive to processors, particularly those handling perishable crops. Markets which otherwise would not be available may be open to the irrigator.

It is reasonable to assume that not all the area having a potential for irrigation will be developed. After 1985, rice acreage is expected to decline. With greater technology and management, yields are expected to increase such that about 580,500 acres of rice will be irrigated in the year 1985, about 550,000 in 2000, and 546,000 in 2020.

Due to the factors mentioned above, supplemental irrigation is expected to increase. It is expected that about 35,400 acres will be irrigated in 1985, about 104,800 in 2000, and 201,000 in 2020.

## RECREATION DEVELOPMENT

An appraisal of potentials for outdoor recreation was made on a parish basis in the Southwest Louisiana River Basin area to examine the opportunities for future development of resources for recreational uses. Eleven types of recreational developments were appraised in the evaluation which was conducted as part of a nationwide study sponsored by the National Association of Conservation Districts (NACD). The methodology involved in making the study was developed on the national level under the auspicies of NACD. It involved the application of a standardized procedure by a parish group composed of representatives from several local, State, and Federal agencies and other interested organizations or persons. The results of the appraisal by this group is the rating of the potential

4-31721 2-74

for the development of the 11 types of recreational developments in the parish as high, medium, or low[1/].

As would be expected, the rating for user-oriented recreational developments was higher around the urbanized, more populous areas. Conversely, resource-oriented activities rated higher in parishes with extensive woodland, lakes, ponds, reservoirs, streams, impoundment sites, and aesthetically pleasing scenery. Proximity to selected distant urban centers influenced the ratings for both types of activities. Two parishes, Avoyelles and Vermilion, had not completed their appraisals at the time of this Study.

Vacation cabins, cottages, and homesites have a high potential in Rapides, Evangeline, Vernon, Allen, and Natchitoches. Only one parish, Acadia, rated the development as having low potential. Apparently, existing water areas and impoundment sites influenced these ratings.

Camping grounds include vacation sites, canoe or float trips, and transient types. The potential for vacation site and canoe or float trip type camping generally rated high in those parishes in the northwest portion of the Basin having natural resources conducive to development of these type facilities. Acadia, Lafayette, Iberia, St. Mary, and Cameron lack streams suitable for canoe and float trips and received low ratings. The existence of major tourist routes through an area greatly influences its potential for development of transient campgrounds. Consequently, parishes through which major tourist routes pass were rated as having a good potential for transient campground development.

Picnic, bicycle, and field sports areas are basically areas developed for day-use activities. Because field sports developments are primarily user-oriented, the potential for development of these areas was found to be highest in the more populous parishes. Bicycling and picnicking areas, on the other hand, are more resource-oriented and received higher ratings in parishes having natural resources conducive to these activities. All parishes in the Study Area received a rating of medium or high for picnic and field sports areas.

Fishing waters as recreational areas consist of any type of water area of any size that does or can furnish significant opportunities for catching fish by sport fishing methods. The fishing waters enterprise may include ownership, management, and control of the water plus service or it may be limited to furnishing access and services at public waters. Existing water is important but impoundment sites also greatly influence the development potential of this activity. Impoundment sites are severely limited in the southern and southeastern portions of the Study Area. Therefore, the potential for development of fishing enterprises in this area is limited mainly to enhancement of existing waters. However, there is some opportunity in this area for construction of ring-levee type reservoirs for crawfishing, crabbing, and sportfishing. Impoundment sites and existing waters are abundant in the northern and

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1/ The methodology and scoring system for the appraisal procedure is presented in the Guide to Making Appraisals of Potentials for Outdoor Recreation Developments, Soil Conservation Service, United States Department of Agriculture, Washington, D. C., 1966.

4-31721 2-74

northwestern portions of the Basin. The potential for development of fishing waters received high ratings in all but four parishes in the Basin.

Golfing activities are in two categories. First, standard and par-3 type courses which have substantial resource requirements and driving ranges and miniature golfing enterprises which are primarily user-oriented. The standard and par-3 type course development potential was rated as medium except in the more rural parishes of Acadia, St. Martin, Evangeline, and Allen. Reflecting an expanding urban environment, Calcasieu Parish was rated as having a high potential for development of these enterprises. The potential for development of miniature courses and driving ranges was rated low in most parishes, apparently influenced by the size of the population and the socio-economic condition of the population in each parish.

The evaluation of development potential for hunting areas was sub-divided into three categories - small game, big game, and waterfowl. All parishes were rated as having either a medium or high potential for development of small game hunting. Small game habitat and populations exerted the greatest influence on these ratings, contributing to high ratings in many of the parishes. Deer is the chief big game species hunted in the Study Area. Many of the farming parishes of the coastal plain do not possess habitat conducive to deer and, therefore, received a low rating in this category. Parishes rated as having high potential for development of big game hunting areas are those with large acreages of woodland. On the other hand, the parishes in the southern and southeastern portions of the Basin were rated as having high waterfowl hunting area development potential. This is not surprising since these parishes have extensive water acreage in ricefield, natural lakes, and marsh with a good potential for development and new construction.

The potential for development of natural areas is generally rated high in those parishes with extensive woodland or marshland. Both scenic and historic areas, on the other hand, were rated in most parishes, apparently due to few specific sites possessing possibilities for development of these enterprises.

All except three parishes in the Study Area rated the potential for development of riding stables as medium. Due to the emphasis placed on natural areas and close proximity to cities in scoring the potential for this enterprise, only Rapides and Calcasieu Parishes received high ratings. St. Martin Parish rated low.

Potential development for shooting preserves was consistently rated as medium throughout the Basin Area. Only one parish deviated from this pattern with Rapides Parish rated as high.

Rural ownership and land use patterns and climatic conditions in the Study Area are not generally conducive to the successful operation of vacation farms and ranches. For these reasons, the potential for development for vacation farms and ranches generally scored low in the parishes under study.

4-31721 2-74

The factors which largely determine the rating of water sports areas are existing lakes, ponds, reservoirs and streams, and potential impoundment sites. Most of the parishes were scored medium potential for development of this enterprise.

The northern and northwestern portions of the Basin offer an excellent potential for supplying a significant part of the resource-oriented and water-based recreational demand. This area is within one-half to three hours driving time from most of the larger cities within the area of influence. There are many good sites on tributaries of the Calcasieu River and a few on those of the Mermentau River suitable for the construction of multi-purpose reservoirs. There is also a largely untapped potential for private recreational developments.

With few exceptions, parish and municipal governments in the Study Area have been little involved in recreational developments to date. These two units of government have a tremendous opportunity to provide recreational opportunities through development of local urban and non-urban lands and facilities. New and expanded Federal programs designed to assist local governmental units in recreational development add to this opportunity. In the southern and southeastern portions of the Basin, opportunities for development of resource-oriented outdoor recreation are more restricted than elsewhere in the Study Area. Here, parish and municipal governments can be instrumental in satisfying a portion of the resident population's demand for recreation through development of local facilities, expecially for swimming, picnicking, high-density recreational sites, and golfing.

The State Parks and Recreation Commission and the Louisiana Wild Life and Fisheries Commission can satisfy a substantial portion of the recreational demand if provided with the necessary support. Increased financial support will give these agencies the opportunity to expand their programs and properly maintain existing facilities.

Seventeen requests have been made to the Louisiana Wild Life and Fisheries Commission for public boat ramps. These requests are in addition to the 26 existing public boat ramps. Table 68 contains the water body, parish, parish population, and party requesting the boat ramp.

Some of the demand for water-based recreational activities can be met by enhancement of existing water bodies through improved management, access, control, and water quality, removal of obstructions, and development of adjacent recreational facilities. Also, local, State, and Federal governmental agencies and organizations will have the opportunity to satisfy a significant portion of the demand through recreational development at reservoirs constructed by various Federal and State agencies.

A considerable potential for meeting water-based recreational and fish and wildlife needs in the Basin exists in the multi-purpose use of floodwater retarding reservoirs for recreation and fish and wildlife. Additional storage can be incorporated in floodwater retarding reservoirs for enhancement of fish and wildlife and water-based recreation. These multi-purpose reservoirs can provide water for low stream-flow augmentation, waterfowl feeding and resting areas, increased fish production, and water-based recreational activities.

Table 68 - Requests to Louisiana Wild Life and Fisheries Commission for Boat Ramps, Southwest Louisiana River Basin

| Parish | Parish Population | Water Body | Requested by |
|---|---|---|---|
| 1. Avoyelles | 37,751 | Old River | Town of Mansura |
| 2. Cameron | 8,194 | Sabine Refuge | Cameron Parish Police Jury |
| 3. Cameron | 8,194 | Hackberry Lake | Cameron Parish Police Jury |
| 4. Cameron | 8,194 | Calcasieu-Sabine Lake | Police Jury |
| 5. Cameron | 8,194 | Causeway | Police Jury |
| 6. Evangeline | 31,932 | Bayou Cocodrie | Evangeline Parish Police Jury |
| 7. Iberia | 57,397 | W. Atch. Bay Protection Levee Canal | Police Jury |
| 8. Iberia | 57,397 | Bayou Patout | Police Jury |
| 9. Jefferson Davis | 29,554 | Klondike Canal | Jerry Jones |
| 10. Jefferson Davis | 29,554 | Thornwell Canal | Jesse Knowles |
| 11. Lafayette | 109,716 | Vermilion River | City of Lafayette |
| 12. Rapides | 118,078 | Cocodrie Lake | Public through D.S.1/ |
| 13. Rapides2/ | 118,078 | Red River (Alexandria) | Public through D.S.1/ |
| 14. Rapides2/ | 118,078 | Lake Buhlow | Public through D.S.1/ |
| 15. St. Landry2/ | 80,364 | Atchafalaya River | Public through D.S.1/ |
| 16. Vermilion | 43,071 | Gueydan Canal | Police Jury |
| 17. Vermilion | 43,071 | Intercoastal City | Public through D.S.1/ |

1/ District Supervisor, Louisiana Wild Life and Fisheries Commission.
2/ Immediately outside Basin boundary.

4-31721 2-74

There are six waterways in the Basin dedicated in the Louisiana Natural and Scenic Rivers System. These are Spring Creek in Rapides Parish, Bayou Cocodrie in Evangeline Parish and Six Mile, Ten Mile, Mill, and Whiskey-Chitto Creeks in Allen Parish. With the exception of Ten Mile and Mill Creeks, these waterways, totaling about 81 miles, along with other streams, bayous, and rivers in the Basin, offer significant opportunities for float fishing and canoe tripping. All together, there are about 2,440 miles of streams, bayous, and rivers in the Basin.

Enhancement of the waterways suitable for canoe tripping and float fishing would entail improvement of accesses, construction of boat launching ramps, development of camping and other supporting facilities along routes, and limited removal of obstructions in the channels.

The U. S. Forest Service operates and maintains three developed recreational areas in that portion of the Kisatchie National Forest which lies within the Basin. Some of the future recreational needs of the area will be met upon completion of the Kincaid Recreation Area on the Evangeline District. However, the total needs for camping and day-use can never realistically be met on public lands alone. The private sector must furnish a significant portion of the recreational facilities.

With the continued shrinking of the number of forest acres open to the general public for dispersed type recreational use, national forest lands must play a larger role in meeting this demand. Private enterprise in many cases can more logically and economically furnish facilities to the public for camping and day-use type activities. This would free national forest land for more dispersed type use such as hunting, stream fishing, hiking, and primitive camping.

Most of the resource-oriented recreation development by private enterprise will take place in the forested portions of the Basin in the northern and northwestern sections. In this area, forest industries and other large forest landowners control the major portion of the forest. Most of the remaining area is in relatively small tracts held by individuals or estates.

Presently, most of the lands held by forest industries and large landowners are open to the public for hunting, stream fishing, picnicking, hiking, sightseeing, primitive camping, etc. However, developed areas providing facilities for family-type recreational use are almost wholly lacking. Also, those areas open for public use today may be closed tomorrow because of logging operations or severe fire hazards. From a physical aspect, much of the land owned or controlled by forest industry and large landowners is quite conducive to recreational development and use. By 1985, the increased demands should make recreational developments on some of these lands profitable.

4-31721 2-74

FISH AND WILDLIFE DEVELOPMENT

A great potential exists within the Basin for the development and management of the fish and wildlife resources. Some fish habitat could be improved by measures to reduce pollution and improve water quality. The topography of the upper reaches of the Basin is suitable for impoundments which would increase fishing opportunity. Diversity of wildlife species found on the five land resource areas in the Basin offer a potential for development on both public and privately-owned lands.

Within the Basin there are approximately 400,000 acres in bottom land hardwoods. This figure represents the highest value habitat for deer, squirrels, turkeys, and swamp rabbits. Maintaining these bottom land soils in hardwood timber will primarily determine the future of these species.

Eight State-owned wildlife management areas and waterfowl refuges from the nucleus of wildlife populations within the Basin. The potential for additional wildlife management areas in the uplands is good, and the potential for public hunting areas in the marsh is good. Tracts of land for this purpose at a reasonable price can be found if money for purchases should become available.

Producing high yields of food fish such as catfish is a potential development. Catfish farming is increasing but has not reached its potential yet. Adequate sources of high quality water are needed and available for this enterprise. Ground water supplies are generally plentiful and should be an asset to the growth of catfish farming. Catfish can be marketed through local restaurants, on the farm sales, and through fish-out ponds. Marketing cooperatives and cooperative fish processing plants are ways to aid both the small and large producer market a high protein food that is not a surplus commodity.

The majority of the lakes in the Basin are on a low level of management. If known fish management techniques were employed such as removal of trash fish and aquatic weed control, it is estimated that fish production could be increased by 50 percent in upland lakes and 25 percent in the marsh lakes.

Crawfish can be a primary or secondary crop depending upon the situation. Rice farmers consider the crawfish a secondary crop. After the rice is harvested, the fields are flooded and the crawfish utilize the rice stubble and associated vegetation as food. In a crawfish-rice rotation, farmers must be extremely careful to avoid use of chemicals that may be damaging to crawfish. Some farmers flood woodland tracts for crawfish production. Native vegetation is the food source for the crawfish. High quality water and adequate market outlets are two primary considerations in the future of crawfish production.

Turkeys have been stocked in 7 of the 17 parishes during the past few years by the Louisiana Wild Life and Fisheries Commission. According to their biologists, it is expected that the establishment of wild turkey on presently unoccupied ranges will continue at a greatly accelerated rate until all potential ranges are stocked by mid 1970's. Natural spread of expanding flocks into formerly vacant ranges will occur concurrently with the restocking program. Two factors in the past have determined the success of turkey stocking where suitable habitat is present - one is using high quality wild-trapped birds and the other is protection from illegal hunting.

The waterfowl resource ranks high in monetary value. Approximately 1,250,000 acres of marsh are found in the Basin and this area has one of the highest winter populations of waterfowl in the United States. This marsh, together with flooded ricefields, grainfields, and ponds on private land had a total of 2,111,500 ducks, 1,500 Canadian geese, 26,000 white-fronted geese, and 281,000 blue and snow geese during the mid-winter aerial waterfowl inventory of January 1968. The 1968 inventory of waterfowl, about 2.4 million birds, is considered average carrying capacity of the marsh without habitat deterioration under the present level of management. With an improved level of marsh management, it could safely carry without threat of habitat deterioration all waterfowl that might be expected to winter there.

Duck habitat in the marsh can be improved by manipulating water levels to get desired plant growth. Controlled burning of the marsh is a desirable practice that benefits both ducks and geese. Another management technique beneficial to waterfowl is the development of widgeongrass ponds. The locations of these ponds depend upon soil conditions and salinities in the correct range to be successful.

Privately-owned lands, including open agricultural lands and forest lands, are providing the bulk of wildlife habitat. The "edge effect" provided by agricultural crops is beneficial to nearly all wildlife species in the Study Area. Agricultural crops are highly nutritious and provide both forage and seed for food consumption by deer, doves, quail, rabbits, turkeys, and many non-game birds and animals. More fields of ryegrass, winter wheat, and oats would benefit geese and ducks. If landowners would flood their harvested ricefields and sell shooting privileges for waterfowl, this could provide them supplemental income.

Green-tree reservoirs could be established in bottom land hardwood stands that have a sufficient stand of oaks and an adequate water supply. A green-tree reservoir consists of a tract of bottom land hardwoods that has been leveed and a water control structure installed. The area is flooded in early fall to a depth of approximately 12 inches and then dewatered in March. The primary food in a "green-tree" is acorns. Studies have shown that winter flooding of hardwoods accelerates their growth rate.

Deerherds in the Basin are relatively new and thus far seasons have been restrictive to allow for expansion and growth of the herds. Commission biologists believe that poaching and year-around harassment of deer by dogs are the major factors in preventing deer from reaching the carrying capacity of their ranges. According to the 1967-68 deer kill survey published by the Louisiana Wild Life and Fisheries Commission, the Basin Area provided only 8 percent of the legal deer kill in Louisiana.

4-31721 2-74

Carrying capacities of hardwood bottom lands in the Basin are approximately one deer per 25 acres and the upland area will support about one deer per 50 acres. This varies with the degree of management applied to the forest and the forest type.

Maintaining present acreages in hardwoods would be a beneficial step toward deerherd development. Deer prefer woodlands with openings scattered over them. Woodland harvests could be carried out in a manner to create openings in the forest canopy. Landowners and timber companies doing timber stand improvement work should leave at least 1 acre of hardwoods for every 20 acres treated. All hardwoods along creeks and major streams should be left undisturbed.

Deer prefer a diet that consists of a wide variety of foods. Hardwood mast, browse consisting of vines, shrubs, forbs, mushrooms, and grass are some of the food items. Certain crops such as winter wheat, oats, ryegrass, fescue clover, soybeans, and corn are attractive to deer.

The potential for squirrel populations is related directly to the amount of hardwoods that can be maintained within the Basin. Research has shown that squirrel populations are determined primarily by the previous year's mast crop. In other words, management for hardwoods is management for squirrels although pines do furnish some food. Projections indicate that the acreage of hardwoods in the Basin will be reduced. In view of this, the outlook for increased squirrel populations is not bright.

Both the cottontail and swamp rabbit occur within the Basin. The swamp rabbit is found along the stream bottoms and the rangeland of the prairies. Cottontail rabbits are found in the upland forests and farmland. Potentials for increasing the cottontail rabbit on farms is good. Population increases result when small fields of clover and grasses are planted, limed, and fertilized. Maintaining brier thickets, honeysuckle patches, and plum thickets are good practices beneficial to the cottontail. Swamp rabbits reach their highest numbers in hardwood bottom lands. Periodic timber thinnings will help maintain swamp rabbit populations.

The bobwhite quail is found throughout most of the Study Area and populations could be increased if known management techniques would be followed. A limiting factor on most farms is lack of cover, usually winter cover and nesting cover. The common practice of clean farming is detrimental to quail. If 10 percent of the pasture and cropland could be maintained in food and cover plants, it would double the present quail population. The cover should be well distributed to provide travel lanes, escape cover, and nesting cover. On the upland pine areas and the prairie section of the Basin, periodic controlled burning would be an effective way to increase quail populations. Quail populations are highest in the lower plant succession stages and any type of soil disturbance and vegetative management to maintain this stage is beneficial.

The potential development of habitat for mourning doves in the Basin is high. According to the 1967-68 Small Game Kill Survey, approximately

40 percent of the doves killed in Louisiana were bagged in the Basin Area. This figure indicated there is currently a high nesting and migratory population using this area. By establishing more fields in browntop millet, dove proso, corn, or grain sorghum, the nesting birds could be more concentrated for harvest and in turn more food would be available to attract and hold migratory doves. The migratory birds make up the majority of the kill.

Snipe are very abundant in the rice growing area and in the marshes. Currently, they are under harvested. If interest in hunting this game bird could be increased, this species would offer a tremendous amount of hunter recreation.

## WATER QUALITY CONTROL

Point needs for low-flow augmentation were not developed for this Study. Therefore, specific reservoir locations for this purpose were not made. As the section entitled "Impoundments" indicates, storage will be confined to the Southern Coastal Plains LRA. Less water is required for pollution abatement in this area. However, water stored in the Southern Coastal Plain Area could be diverted by gravity flow through natural streams to points downstream where it is needed.

The U. S. Army Engineers in cooperation with the Department of Public Works has an authorized project for the purpose of water quality control among other purposes (see table 60, Teche-Vermilion Basin). This project proposes diversions of supplemental water via pumping plant from the Atchafalaya River near Krotz Springs, Louisiana, to Bayou Courtableau, thence into Bayou Teche and the Vermilion River through Bayou Fusilier, Ruth Canal, and the Loreauville Canal. Ultimate capacity of this system is planned at 1,000 cfs, with about one-half this amount needed for the alleviation of pollution and prevention of stagnation. Needs vary during the year with more water needed for irrigation at times and more water for pollution abatement during the post-irrigation period. The post-irrigation period corresponds to the sugarcane grinding season.

Similar water diversion systems could be developed to augment flow in the Calcasieu River with water from the Sabine River or Toledo Bend Reservoir. In fact, preliminary studies by the Louisiana Department of Public Works have been initiated. This study involves determining the feasibility of diverting water from the Sabine River through the Houston River and the Houston River Canal into the Calcasieu River near Lake Charles.

Another possible source of water for pollution abatement would be the Mermentau freshwater basin described in a previous section of this report. Diverting water from this source would be difficult and expensive since water would need to be moved upstream. Also, there are times when recharge of the freshwater basin would be necessary, but this could be done with the transfer of water from the Atchafalaya System. Water quality control needs in the Mermentau River Basin are small at the present time.

4-31721 2-74

# OPPORTUNITIES FOR RESOURCE DEVELOPMENT WITH U. S. DEPARTMENT OF AGRICULTURE PROGRAMS

Included in the opportunities for development of the Basin's resources are plans for reducing economic losses due to floods, inadequate drainage, soil loss, sedimentation, pollution, and plans for enhancing the natural environment. These projects and programs were designed to provide better economic opportunities through more efficient use of available resources and consequent improvement of the quality of living.

## LAND TREATMENT PROGRAMS

### Public Law 46

Land treatment measures can be installed with technical assistance provided through local soil and water conservation districts. These districts, established under State law as political units, encourage and support wise land use. Many of the land treatment measures, in addition to protecting the soil, also serve to enhance natural environmental values. Measures include proper land use, terracing, contour farming, stripcropping, cropping system revision, grass waterways, cover crops, residue management, and wildlife food plantings. In addition, technical assistance is available for construction and management of farm ponds and fish ponds. Measures which aid in water management include drainage land grading, irrigation land leveling, drainage field ditches, drainage mains and laterals, irrigation pipelines, and structures for water control.

Drainage and flood control measures are essential on most cropland and pasture which occupy flat topography. Sometimes, these measures can be provided by groups of farmers pooling their resources to provide main channels and laterals, as was done before the adoption of PL-566. The necessary technical assistance can be provided under the PL-46 program, provided adequate outlets are available. However, there are many drawbacks to this procedure. Farmers generally are not able to finance the cost of a large channel designed to last more than their average remaining lifetime. Without a well-coordinated program, this type of approach sometimes results in protecting only a small portion of a watershed. In general, it increases project costs because contractors are not anxious to bid on small jobs. Invariably, as more of this type construction progresses, the increased runoff aggravates problems for those downstream. Outweighing these effects, however, are the benefits foregone by the farmers and the people whose livelihoods are dependent on agriculture.

### Forest Land

The forest land treatment program is based on increasing the growth rate to the maximum on just enough acres to boost the average growth rate of the Basin's forest to the level necessary to meet the projected demands to 2020. This means increasing the current rate of growth to produce an additional 61 million cubic feet of timber production. Four alternative forest land treatment programs are discussed. Any one of the four alternatives will provide the needed 61 million cubic feet since cutting into the growing stock as demand increases, with no accelerated land treatment to maintain stocking, is not considered a viable alternative.

Alternative B-I is based on regenerating 813,000 acres of poorly-stocked (0-40%) area using site preparation plus treating 62,000 acres of moderately stocked (40-70%) with timber stand improvement. Alternative B-II is based on treating 942,000 acres of moderately-stocked area with timber stand improvement plus regenerating 440,000 acres of poorly-stocked area. Alternative B-III is based on treating 1,026,000 acres of moderately-stocked area with timber stand improvement plus regenerating 265,000 acres of poorly-stocked area. Alternative B-IV is based on a direct payment incentive to change 303,000 acres of cropland to forest while another 303,000 acres of marginal cropland is projected to revert to pasture and forest. Planting would be accomplished on 380,000[1/] acres to achieve the additional volume of wood.

The foregoing alternatives will appreciably affect other resources of the forest land. As shown in figure 28, the carrying capacity for squirrel and especially deer will increase significantly under Alternatives B-II and B-III. This would help meet projected demands on forest land to produce greater amounts of game, timber products, and recreation areas.

## EARLY-ACTION PROJECTS

USDA investigations show that projects and measures included for early-action development are feasible and are urgently needed to solve watershed problems and meet estimated needs through 1985.

Watersheds listed for early action have acute problems that can be solved under the USDA Upstream Watershed Program. Problems include floodwater, sediment, erosion, inadequate drainage, and pollution by saltwater intrusion. Although projections indicate a need for additional water areas for recreation in some parts of the Basin, recreational reservoirs were not included in the early-action plan. Most reservoir sites for this purpose would be located on Kisatchie National Forest Land in the Southern Coastal Plain LRA. The availability of National Forest land for reservoir sites would be dependent on the results of unit planning now in process by the Forest Service. Also, needs for municipal and industrial water and dilution flows were identified, but there is no practicable opportunity for PL-566 development to provide this water.

In addition to solving problems within the watersheds, the early-action watershed program can help alleviate related problems that occur outside the watershed areas and contribute to meeting estimated needs within the Basin. For example, several early-action watersheds are in areas designated eligible for assistance under the Public Works and Economic Development Act of 1965. Installation of watershed projects could provide an economic stimulus to both the watershed areas and the surrounding trade areas. The

1/ Includes planting costs, but not site preparation costs.

increased volume, storage, and processing of agricultural products will cause a multiplier effect on wholesale and retail sales. This multiplier effect, in turn, increases employment opportunities. Overall, the increased flow of dollars is conducive to a higher standard of living and human betterment.

Early-action projects would reduce floodwater damages, provide outlets for drainage improvements, reduce saltwater intrusion, facilitate better utilization of surface water sources, and allow better management of agricultural lands. Wildlife and aesthetic values would be more fully protected than if channel work were accomplished under conditions of no-project action.

## Assurances of Local Participation

Soil and water conservation districts will act as co-sponsors for each watershed project and will be responsible for carrying out all the accelerated land treatment measures as identified in the plan. The districts will be the primary sponsoring organization in planning for and in carrying out accelerated land treatment measures on critical areas in the Basin not otherwise identified with a watershed project.

Parish police juries will be co-sponsors of each watershed project. The juries, in some cases, will be responsible for the local share of the cost of construction, acquiring necessary land rights, obtaining necessary improvement changes to all roads, bridges, culverts, utilities, and other existing improvements which are needed; and advertising, awarding, and administering contracts. These juries have the power of eminent domain and have agreed to use these powers as necessary to obtain the needed land rights.

Where drainage districts have been formed within watersheds, each district has agreed to assume the responsibility of obtaining funds needed within its boundaries to finance that part of the project cost to be borne by local interests. All the gravity drainage districts have the power to acquire land using the right of eminent domain. They recognize that, in some instances, there may be no alternative but to condemn land in order to install works of improvement in a reasonable period of time; and they are willing to do so when necessary. All drainage districts have full authority to incur indebtedness and retire debt that will occur in the installation and maintenance of proposed measures.

Each of the sponsors has given verbal assurance that they are ready, willing, and able to carry out their responsibilities in the planning, installation, and maintenance of the proposed early-action projects.

## Summary of Project Proposals

### Land Treatment

Land treatment is essential for the proper functioning of the structural measures and the realization of full benefits from structural improvements included in the watershed projects recommended for early action.

4-31721 2-74

Land treatment practices will include conservation cropping systems, crop residue management, land smoothing, drainage mains and laterals, drainage land grading, pasture and hayland management, drainage field ditches, ponds, grade stabilization structures, structures for water control, irrigation land leveling, irrigation pipelines, and irrigation water management. Individual farm owners will install the treatment practies on lands in cooperation with the respective soil and water conservation district in each proposed early-action project. The installation cost will be a local interest responsibility.

Forest management practices on private land will be applied under the supervision of the Louisiana Forestry Commission in cooperation with the U. S. Forest Service. Installation costs will be shared by Federal, State, and local interests. The U. S. Forest Service will install the land treatment measures on national forest land.

The area needing land treatment in the early-action watersheds is about 2,180,900 acres (table 69) or 53 percent of the total area in the Basin needing treatment. Of this amount, about 1,690,900 acres would be treated during the installation period under the going program and about 490,000 acres would be treated under the accelerated program. The technical assistance costs would be about $1,860,000 under the going program and about $1,613,000 under the accelerated program. The total installation costs would be about $33,352,000.

Table 69 - Land Treatment Needs in Early-Action Watershed Projects
Southwest Louisiana River Basin

| Sub-basin and CNI Watershed | Land Resource Areas | Area Needing Treatment by Land Use 1/ | | | | | Technical Assistance Cost | | Installation Cost | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Cropland | Pasture | Forest | Other | Total | Going Program | Accelerated Program | On-Farm Cost | Total All Costs |
| | | acres (1,000) | | | | | dollars (1,000) | | | |
| Calcasieu | | | | | | | | | | |
| 19-4 | 150,133 | 71.0 | 5.9 | 16.2 | 36.0 | 129.1 | 58.0 | 41.0 | 2,834.0 | 2,933.0 |
| 19-7 | 150,133 | 23.3 | 3.0 | 3.2 | 0.1 | 29.6 | 46.7 | 41.0 | 686.3 | 774.0 |
| 19-8 | 150,133 | 64.5 | 8.8 | 30.3 | 0.6 | 104.2 | 78.0 | 76.0 | 1,574.5 | 1,728.5 |
| 19-13 | 133,150 | 23.8 | 1.7 | 34.1 | 2.5 | 62.1 | 72.7 | 70.0 | 881.3 | 1,024.0 |
| 19a-1 | 133 | 12.6 | 4.9 | 74.9 | 20.1 | 112.5 | 84.7 | 82.5 | 1,235.9 | 1,403.1 |
| Total | | 195.2 | 24.3 | 158.7 | 59.3 | 437.5 | 340.1 | 310.5 | 7,212.0 | 7,862.6 |
| Mermentau | | | | | | | | | | |
| 20-8 | 150,151 | 99.0 | 19.8 | 3.7 | 50.0 | 172.5 | 210.0 | 162.1 | 2,921.9 | 3,314.0 |
| 20-9 | 150 | 130.8 | 8.9 | 7.7 | 11.5 | 158.9 | 140.0 | 130.0 | 2,148.2 | 2,418.2 |
| 20a-1 | 150 | 26.8 | 4.6 | 2.0 | 5.5 | 38.9 | 28.1 | 38.0 | 447.9 | 514.0 |
| 20a-2 | 150 | 43.9 | 3.5 | 8.1 | 6.5 | 62.0 | 53.4 | 44.8 | 751.5 | 849.7 |
| 20a-3 | 150,134 | 125.8 | 28.7 | 8.0 | 8.3 | 170.8 | 138.8 | 115.1 | 2,528.0 | 2,781.9 |
| 20a-4 | 150 | 44.0 | 7.1 | 35.4 | 6.3 | 92.8 | 81.3 | 57.5 | 1,312.3 | 1,451.1 |
| 20a-5 | 150,134 | 184.2 | 19.4 | 26.7 | 12.1 | 242.4 | 143.2 | 129.0 | 4,007.8 | 4,280.0 |
| 20a-6 | 150,134 | 62.1 | 11.0 | 17.1 | 10.8 | 101.0 | 68.9 | 32.7 | 1,136.8 | 1,238.4 |
| Total | | 716.6 | 103.0 | 108.7 | 111.0 | 1,039.3 | 883.7 | 709.2 | 15,254.4 | 16,847.3 |
| Teche-Vermilion | | | | | | | | | | |
| 11-1 | 151,134 | 11.7 | 3.2 | 18.0 | 47.9 | 80.8 | 24.2 | 24.2 | 185.3 | 233.7 |
| 11-3 | 151,134 | 17.6 | 3.0 | 9.3 | 25.9 | 55.8 | 24.2 | 24.2 | 264.1 | 312.5 |
| 11-4 | 131,134 | 9.0 | 1.0 | 9.0 | 28.2 | 47.2 | 21.2 | 19.9 | 247.6 | 288.7 |
| 11-7 | 134,131 | 16.0 | 3.2 | 6.0 | 6.8 | 32.0 | 42.5 | 17.8 | 428.5 | 488.8 |
| 11-8 | 134,131 | 47.8 | 29.6 | 28.2 | 8.5 | 114.1 | 95.1 | 70.0 | 1,491.9 | 1,657.0 |
| 11-11 | 134 | 97.2 | 44.4 | 6.8 | 28.3 | 176.7 | 146.3 | 194.6 | 2,353.8 | 2,694.7 |
| 11-12 | 134,151 | 34.6 | 8.4 | 1.2 | 16.4 | 60.6 | 37.1 | 50.0 | 519.2 | 606.3 |
| Total | | 233.9 | 92.8 | 78.5 | 162.0 | 567.2 | 390.6 | 400.7 | 5,490.4 | 6,281.7 |
| Atchafalaya | | | | | | | | | | |
| 10-10 | 131 | 53.1 | 11.0 | 17.1 | 55.7 | 136.9 | 244.9 | 193.1 | 1,922.8 | 2,360.8 |
| Total | | 53.1 | 11.0 | 17.1 | 55.7 | 136.9 | 244.9 | 193.1 | 1,922.8 | 2,360.8 |
| GRAND TOTAL | | 1,198.8 | 231.1 | 363.0 | 388.0 | 2,180.9 | 1,859.3 | 1,613.5 | 29,879.6 | 33,352.4 |

1/ Land use definitions begin on page 166.

4-31721 2-74

## Structural Measures

Twenty-six projects are included in the early-action plan. Five of these - CNI's 10-15, 10-17, 11-5, 11- 6, and 11-10 - have been authorized for operations through existing Public Law 566, but need additional improvements. Applications for assistance have been requested on five others - CNI's 10-10, 19-13, 20a-3, 20a-5, and 20a-6. Table 70 lists these watersheds according to priority for construction and gives their planning status. Construction priority was based on the acuteness of watershed problems and an appraisal of local support for the projects. These watersheds have a combined total area of about 4,540 square miles. Measures to be installed include land treatment for watershed protection and wildlife management, and structural measures. Structural measures include stream modification for flood prevention and drainage which will benefit about 2,930 square miles, appurtenant erosion and grade control structures, and six saltwater intrusion control structures.

Table 70 - Pertinent Structural Data for Early-Action Watershed Projects
Southwest Louisiana River Basin

| Watershed Projects CNI No. | Name | Watershed Area | Area Benefitted by Channel Modification | Other Structural Measures No. | Purpose 1/ | Planning Status 2/ |
|---|---|---|---|---|---|---|
| | | ---------square miles--------- | | | | |
| 19-13 | Kinder | 97.1 | 58.6 | | | C |
| 19-4 | Lower Calcasieu Tributaries | 201.8 | 157.4 | 3 | SWIC | D |
| 11-7 | Cypress Island Coulee | 50.0 | 50.0 | | | D |
| 20a-5 | Plaquemine Brule | 378.8 | 378.8 | | | C,D |
| 11-12 | Tigre Bayou | 94.6 | 53.8 | 3 | SWIC | D |
| 11-11 | Lower Vermilion River | 276.1 | 102.9 | | | D |
| 11-4 | Lake Fausse Point | 73.8 | 8.3 | | | E |
| 20-8 | Bayou Lacassine-Bell City | 269.6 | 192.7 | | | E |
| 11-1 | Franklin Canals | 126.2 | 58.0 | | | E |
| 20a-6 | Bayou Mallet | 157.8 | 157.8 | | | E |
| 20a-3 | Queue de Tortue | 266.8 | 266.8 | | | E |
| 20a-1 | Klondike Drainage Canal | 60.8 | 46.8 | | | E |
| 11-8 | Upper Vermilion River | 178.3 | 175.8 | | | E |
| 20-9 | East Lacassine-Bayou Chene | 248.2 | 237.2 | | | E |
| 11-3 | St. Mary-Ward 2 Canals | 87.2 | 58.8 | | | E |
| 19-7 | Bayou Arceneaux | 46.3 | 43.0 | | | E |
| 19-8 | Bayou Serpent | 162.8 | 153.3 | | | E |
| 11-5 | Lower Bayou Teche | 296.8 | 64.1 | | | A |
| 20a-2 | Lake Arthur North | 96.9 | 80.2 | | | E |
| 20a-4 | Lower Bayou Nezpique | 145.0 | 145.0 | | | E |
| 19a-1 | Lower Whiskey Chitto-Ten Mile Creek | 175.7 | 19.1 | | | E |
| 11-6 | Upper Bayou Teche | 332.5 | 66.3 | | | A |
| 11-10 | Cocodrie-Grand Louis | 207.3 | 53.5 | | | A |
| 10-10 | Wauksha-Courtableau | 213.9 | 213.9 | | | C |
| 10-15 | Bayou Boeuf | 234.4 | 46.0 | | | A |
| 10-17 | Bayou Rapides | 63.1 | 41.2 | | | A |
| | Total | 4,541.8 | 2,929.3 | | | |

1/ SWIC - Saltwater intrusion control
2/ A - Authorized for construction, C - Application for planning assistance received, D - River basin watershed investigation report complete, E - Field examination scope studies complete.

4-31721 2-74

The total installation cost of structural measures is about $48,207,800 (table 71). Costs to flood prevention and drainage are allocated equally, $20,897,560; and costs allocated to saltwater control are $692,500.

Table 71 - Allocation of Structural Costs to Purposes, Early-Action Watershed Projects
Southwest Louisiana River Basin

| Watershed Projects CNI No. | Watershed Projects Name | Flood Prevention | Agricultural Water Management: Drainage | Agricultural Water Management: Saltwater Control | Subtotal | Project Administration | Total Installation |
|---|---|---|---|---|---|---|---|
| | | dollars | | | | | |
| 19-13 | Kinder | 486,585 | 486,585 | | 973,170 | 116,770 | 1,089,940 |
| 19-4 | Lower Calcasieu Tributaries | 837,550 | 837,550 | 447,600 | 2,122,700 | 349,100 | 2,471,800 |
| 11-7 | Cypress Island Coulee | 275,175 | 275,175 | | 550,350 | 79,650 | 630,000 |
| 20a-5 | Plaquemine Brule | 3,336,500 | 3,336,500 | | 6,673,000 | 927,000 | 7,600,000 |
| 11-12 | Tigre Bayou | 551,000 | 551,000 | 244,900 | 1,346,900 | 223,100 | 1,570,000 |
| 11-11 | Lower Vermilion River | 1,411,150 | 1,411,150 | | 2,822,300 | 367,700 | 3,190,000 |
| 11-4 | Lake Fausse Point | 48,100 | 48,100 | | 96,200 | 13,800 | 110,000 |
| 20-8 | Bayou Lacassine-Bell City | 1,016,400 | 1,016,400 | | 2,032,800 | 267,200 | 2,300,000 |
| 11-1 | Franklin Canals | 156,350 | 156,350 | | 312,700 | 47,300 | 360,000 |
| 20a-6 | Bayou Mallet | 1,574,800 | 1,574,800 | | 3,149,600 | 409,400 | 3,559,000 |
| 20a-3 | Queue de Tortue | 1,769,750 | 1,769,750 | | 3,539,500 | 443,500 | 3,983,000 |
| 20a-1 | Klondike Drainage Canal | 255,500 | 255,500 | | 511,000 | 59,000 | 570,000 |
| 11-8 | Upper Vermilion River | 1,250,150 | 1,250,150 | | 2,500,300 | 323,700 | 2,824,000 |
| 20-9 | East Lacassine-Bayou Chene | 1,687,100 | 1,687,100 | | 3,374,200 | 441,800 | 3,816,000 |
| 11-3 | St. Mary-Ward 2 Canals | 302,900 | 302,900 | | 605,800 | 79,200 | 685,000 |
| 19-7 | Bayou Arceneaux | 302,900 | 302,900 | | 605,800 | 79,200 | 685,000 |
| 19-8 | Bayou Serpent | 1,267,600 | 1,267,600 | | 2,535,200 | 330,800 | 2,866,000 |
| 11-5 | Lower Bayou Teche | 489,650 | 489,650 | | 979,300 | 137,700 | 1,117,000 |
| 20a-2 | Lake Arthur North | 742,550 | 742,550 | | 1,485,100 | 205,900 | 1,691,000 |
| 20a-4 | Lower Bayou Nezpique | 661,800 | 661,800 | | 1,323,600 | 173,400 | 1,497,000 |
| 19a-1 | Lower Whiskey Chitto-Ten Mile Creek | 46,700 | 46,700 | | 93,400 | 13,600 | 107,000 |
| 11-6 | Upper Bayou Teche | 489,650 | 489,650 | | 979,300 | 137,700 | 1,117,000 |
| 11-10 | Cocodrie-Grand Louis | 255,500 | 255,500 | | 511,000 | 59,000 | 570,000 |
| 10-10 | Wauksha-Courtableau | 1,420,050 | 1,420,050 | | 2,840,100 | 370,900 | 3,211,000 |
| 10-15 | Bayou Boeuf | 155,300 | 155,300 | | 310,600 | 36,400 | 347,000 |
| 10-17 | Bayou Rapides | 106,850 | 106,850 | | 213,700 | 27,300 | 241,000 |
| Total | | 20,897,560 | 20,897,560 | 692,500 | 42,487,620 | 5,720,120 | 48,207,740 |

Structural costs are distributed as shown in table 72. Construction costs, engineering services, and land rights amount to about $42,487,700, and project administration is about $5,720,100. This gives the total installation cost of about $48,207,800.

Table 72 - Distribution of Structural Costs, Early-Action Watershed Projects
Southwest Louisiana River Basin

| Watershed Projects CNI No. | Watershed Projects Name | Construction Cost | Engineering Services | Land Rights | Subtotal Installation | Project Administration | Total Installation Cost |
|---|---|---|---|---|---|---|---|
| | | dollars | | | | | |
| 19-13 | Kinder | 509,160 | 43,280 | 420,730 | 973,170 | 116,770 | 1,089,940 |
| 19-4 | Lower Calcasieu Tributaries | 1,598,000 | 141,900 | 382,800 | 2,122,700 | 349,100 | 2,471,800 |
| 11-7 | Cypress Island Coulee | 350,000 | 29,750 | 170,600 | 550,350 | 79,650 | 630,000 |
| 20a-5 | Plaquemine Brule | 4,370,000 | 372,000 | 1,931,000 | 6,673,000 | 927,000 | 7,600,000 |
| 11-12 | Tigre Bayou | 952,000 | 84,200 | 310,700 | 1,346,900 | 223,100 | 1,570,000 |
| 11-11 | Lower Vermilion River | 1,860,000 | 158,100 | 804,200 | 2,822,300 | 367,700 | 3,190,000 |
| 11-4 | Lake Fausse Point | 58,500 | 5,000 | 32,700 | 96,200 | 13,800 | 110,000 |
| 20-8 | Bayou Lacassine-Bell City | 1,310,000 | 109,400 | 613,400 | 2,032,800 | 267,200 | 2,300,000 |
| 11-1 | Franklin Canals | 200,000 | 17,000 | 95,700 | 312,700 | 47,300 | 360,000 |
| 20a-6 | Bayou Mallet | 2,059,200 | 175,000 | 915,400 | 3,149,600 | 409,400 | 3,559,000 |
| 20a-3 | Queue de Tortue | 2,215,200 | 188,300 | 1,136,000 | 3,539,500 | 443,500 | 3,983,000 |
| 20a-1 | Klondike Drainage Canal | 291,200 | 24,800 | 195,000 | 511,000 | 59,000 | 570,000 |
| 11-8 | Upper Vermilion River | 1,620,000 | 137,700 | 742,600 | 2,500,300 | 323,700 | 2,824,000 |
| 20-9 | East Lacassine-Bayou Chene | 2,204,800 | 187,400 | 982,000 | 3,374,200 | 441,800 | 3,816,000 |
| 11-3 | St. Mary-Ward 2 Canals | 395,200 | 33,600 | 177,000 | 605,800 | 79,200 | 685,000 |
| 19-7 | Bayou Arceneaux | 395,200 | 33,600 | 177,000 | 605,800 | 79,200 | 685,000 |
| 19-8 | Bayou Serpent | 1,653,600 | 140,600 | 741,000 | 2,535,200 | 330,800 | 2,866,000 |
| 11-5 | Lower Bayou Teche | 686,000 | 58,300 | 235,000 | 979,300 | 137,700 | 1,117,000 |
| 20a-2 | Lake Arthur North | 1,029,600 | 87,500 | 368,000 | 1,485,100 | 205,900 | 1,691,000 |
| 20a-4 | Lower Bayou Nezpique | 863,200 | 73,400 | 387,000 | 1,323,600 | 173,400 | 1,497,000 |
| 19a-1 | Lower Whiskey Chitto-Ten-Mile Creek | 63,000 | 6,300 | 24,100 | 93,400 | 13,600 | 107,000 |
| 11-6 | Upper Bayou Teche | 686,000 | 58,300 | 235,000 | 979,300 | 137,700 | 1,117,000 |
| 11-10 | Cocodrie-Grand Louis | 291,200 | 24,800 | 195,000 | 511,000 | 59,000 | 570,000 |
| 10-10 | Wauksha-Courtableau | 1,851,200 | 157,400 | 831,500 | 2,840,100 | 370,900 | 3,211,000 |
| 10-15 | Bayou Boeuf | 183,600 | 15,600 | 111,400 | 310,600 | 36,400 | 347,000 |
| 10-17 | Bayou Rapides | 135,200 | 11,500 | 67,000 | 213,700 | 27,300 | 241,000 |
| Total | | 27,831,060 | 2,374,730 | 12,281,830 | 42,487,620 | 5,720,120 | 48,207,740 |

The cost-sharing summary (table 73) shows the total installation cost of about $48,207,800 would be divided about $28,910,900 to Federal funds and about $19,296,900 to non-Federal funds.

Table 73 - Summary of Cost-Sharing for Structural Measures, Early Action Watershed Projects Southwest Louisiana River Basin

| Watershed Projects CNI No. | Name | Federal Funds | Non-Federal Funds | Total |
|---|---|---|---|---|
| | | dollars | | |
| 19-13 | Kinder | 540,720 | 549,220 | 1,089,940 |
| 19-4 | Lower Calcasieu Tributaries | 1,686,000 | 785,800 | 2,471,800 |
| 11-7 | Cypress Island Coulee | 371,100 | 258,900 | 630,000 |
| 20a-5 | Plaquemine Brule | 4,567,200 | 3,032,800 | 7,600,000 |
| 11-12 | Tigre Bayou | 1,019,100 | 550,900 | 1,570,000 |
| 11-11 | Lower Vermilion River | 1,917,100 | 1,272,900 | 3,190,000 |
| 11-4 | Lake Fausse Point | 62,575 | 47,425 | 110,000 |
| 20-8 | Bayou Lacassine-Bell City | 1,356,400 | 943,600 | 2,300,000 |
| 11-1 | Franklin Canals | 213,800 | 146,200 | 360,000 |
| 20a-6 | Bayou Mallet | 2,124,700 | 1,434,300 | 3,559,000 |
| 20a-3 | Queue de Tortue | 2,288,800 | 1,694,200 | 3,983,000 |
| 20a-1 | Klondike Drainage Canal | 301,600 | 268,400 | 570,000 |
| 11-8 | Upper Vermilion River | 1,673,200 | 1,150,800 | 2,824,000 |
| 20-9 | East Lacassine-Bayou Chene | 2,278,400 | 1,537,600 | 3,816,000 |
| 11-3 | St. Mary-Ward 2 Canals | 408,400 | 276,600 | 685,000 |
| 19-7 | Bayou Arceneaux | 408,400 | 276,600 | 685,000 |
| 19-8 | Bayou Serpent | 1,708,300 | 1,157,700 | 2,866,000 |
| 11-5 | Lower Bayou Teche | 709,100 | 407,900 | 1,117,000 |
| 20a-2 | Lake Arthur North | 1,063,500 | 627,500 | 1,691,000 |
| 20a-4 | Lower Bayou Nezpique | 892,500 | 604,500 | 1,497,000 |
| 19a-1 | Lower Whiskey Chitto-Ten-Mile Creek | 67,050 | 39,950 | 107,000 |
| 11-6 | Upper Bayou Teche | 709,100 | 407,900 | 1,117,000 |
| 11-10 | Cocodrie-Grand Louis | 301,600 | 268,400 | 570,000 |
| 10-10 | Wauksha-Courtableau | 1,913,000 | 1,298,000 | 3,211,000 |
| 10-15 | Bayou Boeuf | 189,300 | 157,700 | 347,000 |
| 10-17 | Bayou Rapides | 139,900 | 101,100 | 241,000 |
| Total | | 28,910,845 | 19,296,895 | 48,207,740 |

A summary of annual costs is given in table 74. The installation cost (1970 price base) was amortized for 50 years at 5 1/2 percent interest for a total of $2,512,340, plus a project administration cost of $337,830 amounts to $2,850,170. The operation and maintenance cost, using adjusted normalized prices, amounts to $800,030. The total annual cost is $3,650,200.

4-31721 2-74

Table 74 - Summary of Annual Costs, Early-Action Watershed Projects
Southwest Louisiana River Basin

| Item | Amortization of Installation Cost 2/ | Operation and Maintenance Cost | Total |
|---|---|---|---|
| | dollars 1/ | | |
| Early-Action Projects (26 CNI Watersheds) | 2,512,340 | 800,030 | 3,312,370 |
| Project Administration | 337,830 | - | 337,830 |
| Total | 2,850,170 | 800,030 | 3,650,200 |

1/ Price base: Installation Cost - 1970
Operation and Maintenance Cost - Adjusted Normalized Prices
2/ Amortized for 50 years at 5 1/2 percent interest

A summary of annual flood damage reduction is shown in table 75. The total damage reduction benefit, $2,435,800, compared to annual damage without project, $3,389,300, represents a reduction of about 72 percent. The average damage reduction benefit to crops and pasture, $2,412,300, would be achieved on about 2,000,000 acres which includes urban land.

Table 75 - Summary of Average Annual Flood Damage Reduction Benefits,
Early-Action Watershed Projects
Southwest Louisiana River Basin

| Item | Average Annual Damage | | Damage Reduction Benefit |
|---|---|---|---|
| | Without Project | With Project | |
| | dollars 1/ | | |
| Floodwater | | | |
| Crop and Pasture | 3,321,700 | 909,400 | 2,412,300 |
| Other Agricultural | 2,600 | 500 | 2,100 |
| Non-Agricultural | | | |
| Urban | 30,600 | 23,600 | 7,000 |
| Road and Bridge | 29,000 | 19,100 | 9,900 |
| Subtotal | 3,383,900 | 952,600 | 2,431,300 |
| Indirect | 5,400 | 900 | 4,500 |
| Total | 3,389,300 | 953,500 | 2,435,800 |

1/ Price Base - Adjusted Normalized Prices

4-31721 2-74

A comparison of annual benefits and costs is shown in table 76. The estimated total annual benefits from structural measures are $6,918,600. Of this amount, $2,435,800 are flood damage reduction benefits, $262,100 are more intensive land use, $2,723,100 are agricultural management benefits derived from increased efficiency, irrigation, and saltwater control, $296,200 are redevelopment benefits, and $1,201,400 are secondary benefits. The total average annual costs of structural measures, including operation and maintenance, are about $3,650,200. The benefit-cost ratio for all projects is 1.9:1.

Table 76 - Comparison of Annual Benefits and Costs for Structural Measures, Early-Action Southwest Louisiana River Basin

| CNI Watershed | Average Annual Benefits 1/ — Flood Prevention: Damage Reduction | More Intensive Land Use | Drainage | Saltwater Intrusion | Redevelopment | Secondary | Total | Average Annual Cost 2/ | Benefit-Cost Ratio |
|---|---|---|---|---|---|---|---|---|---|
| | dollars (1,000) | | | | | | | | |
| 19-13 | 124.6 | 8.9 | 117.6 | - | 7.2 | 40.2 | 298.5 | 73.2 | 4.1:1 |
| 19-4 | 125.2 | 13.9 | 139.1 | 32.3 | - | 63.2 | 373.7 | 182.7 | 2.1:1 |
| 11-7 | 28.9 | 3.2 | 32.1 | - | 5.4 | 18.8 | 88.4 | 47.2 | 1.9:1 |
| 20a-5 | 307.2 | 33.0 | 330.0 | - | 67.3 | 123.4 | 860.9 | 578.8 | 1.5:1 |
| 11-12 | 107.0 | 11.8 | 118.8 | 40.6 | 13.8 | 60.4 | 352.4 | 114.2 | 3.1:1 |
| 11-11 | 218.2 | 24.3 | 242.5 | - | 27.8 | 121.1 | 633.9 | 236.9 | 2.7:1 |
| 11-4 | 18.3 | 2.0 | 20.3 | - | - | 14.6 | 55.2 | 8.2 | 6.7:1 |
| 20-8 | 108.0 | 12.0 | 120.0 | - | - | 51.5 | 291.5 | 176.8 | 1.6:1 |
| 11-1 | 36.3 | 4.0 | 40.3 | - | - | 21.6 | 102.2 | 27.3 | 3.2:1 |
| 20a-6 | 118.8 | 13.2 | 132.0 | - | 31.8 | 56.9 | 352.7 | 272.0 | 1.3:1 |
| 20a-3 | 232.6 | 25.9 | 258.5 | - | 34.6 | 113.7 | 665.3 | 301.8 | 2.2:1 |
| 20a-1 | 26.6 | 3.0 | 29.6 | - | 5.1 | 17.9 | 82.2 | 49.9 | 1.6:1 |
| 11-8 | 145.9 | 16.3 | 162.2 | - | 25.2 | 69.9 | 419.5 | 216.9 | 1.9:1 |
| 20-9 | 135.5 | 15.0 | 150.5 | - | - | 64.6 | 365.6 | 291.4 | 1.3:1 |
| 11-3 | 38.8 | 4.4 | 43.2 | - | - | 22.6 | 109.0 | 52.8 | 2.1:1 |
| 19-7 | 41.0 | 4.5 | 45.5 | - | - | 23.6 | 114.6 | 52.8 | 2.2:1 |
| 19-8 | 127.9 | 14.2 | 142.1 | - | - | 60.7 | 344.9 | 219.1 | 1.6:1 |
| 11-5 | 48.9 | 5.4 | 54.4 | - | - | 26.9 | 135.6 | 82.0 | 1.7:1 |
| 20a-2 | 65.0 | 7.2 | 72.2 | - | 15.1 | 32.9 | 192.4 | 124.8 | 1.5:1 |
| 20a-4 | 54.9 | 6.1 | 61.0 | - | 13.3 | 29.2 | 164.5 | 114.5 | 1.4:1 |
| 19a-1 | 34.2 | 1.4 | 13.8 | - | .9 | 12.8 | 63.1 | 8.1 | 7.8:1 |
| 11-6 | 50.7 | 5.6 | 56.3 | - | 10.0 | 27.8 | 150.4 | 81.9 | 1.8:1 |
| 11-10 | 39.2 | 4.4 | 43.6 | - | 5.1 | 22.7 | 115.0 | 46.9 | 2.5:1 |
| 10-10 | 119.3 | 13.2 | 132.5 | - | 28.6 | 57.0 | 350.6 | 245.1 | 1.4:1 |
| 10-15 | 47.3 | 5.3 | 52.6 | - | 2.8 | 26.0 | 134.0 | 26.2 | 5.1:1 |
| 10-17 | 35.5 | 3.9 | 39.5 | - | 2.2 | 21.4 | 102.5 | 18.7 | 5.5:1 |
| Total | 2,435.8 | 262.1 | 2,650.2 | 72.9 | 296.2 | 1,201.4 | 6,918.6 | 3,650.2 | 1.9:1 |

1/ Adjusted Normalized Prices
2/ Total Annual Costs included O&M and Project Administration. Amortized 50 years at 5 1/2 percent.

Locations of the early-action and long-range projects are shown in figure 27. Areas are color coded for only that part of the CNI watersheds within project boundaries.

## Synopsis of Individual Watersheds

### 19-13, Kinder

This watershed, with a drainage area of about 97 square miles, is located primarily in Allen Parish with a small area in Jefferson Davis Parish. About 85 percent of the area is in the Southern Coastal Plain LRA, with the remaining 15 percent in the Gulf Coast Prairies LRA.

The major problems stem from flooding and inadequate drainage on about 45 square miles of prime agricultural land. Kinder, with a population of about 2,300, is the only incorporated town in the watershed. The residents depend almost entirely on agriculture for their income. Rice is the principal crop.

The watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on 1970

4-31721 2-74

census data, the median family income in the area was about $5,931, with about 30.1 percent of the families having incomes below the poverty level. In 1970, about 31.4 percent of the families received some type of public welfare assistance. The unemployment rate in 1970 was about 6.0 percent.

The plan provides for land treatment costing about $1,024,000 and about 60 miles of channel improvement with appurtenant erosion control, water control, and wildlife management structures. Fifty-eight miles of the channel work have been previously altered and two miles are new channels, all with ephemeral flow.

19-4, Lower Calcasieu Tributaries

This watershed, with a drainage area of about 202 square miles, is located primarily in Calcasieu Parish with a small area in Cameron Parish. About 88 percent of the area is in the Gulf Coast Prairies, 10 percent in the Southern Coastal Plain, and 2 percent in the Gulf Coast Marsh LRA.

The major problems stem from flooding, inadequate drainage, and saltwater intrusion on about 128 square miles of prime agricultural lands. Lake Charles, with a population of about 78,000, is the only incorporated town within the watershed. The economy of the area is based primarily on the petro-chemical industry.

Rural residents depend on agriculture for their income. Rice is the principal crop.

Based on 1970 census data, median family income in the area was $8,404 with about 16.5 percent of the families having incomes below the poverty level. In 1970, about 23.9 percent of the families received some type of public welfare assistance. The unemployment rate in 1970 was at an average of 5.7 percent.

The plan provides for land treatment costing about $2,933,000, three saltwater intrusion control structures, and about 130 miles of channel improvement with appurtenant erosion control, water control, and wildlife management structures. One hundred and twenty-eight miles of the channel work have been previously altered, and two miles are natural streams with no noticeable flow--ponded water.

11-7, Cypress Island Coulee

This watershed, with a drainage area of about 50 square miles, is located in St. Martin and Iberia Parishes. It lies primarily in the Southern Mississippi Valley Alluvium LRA with only about 5 percent in the Southern Mississippi Valley Silty Upland LRA.

The major problems stem from flooding and inadequate drainage on about 45 square miles of prime agricultural lands. St. Martinville,

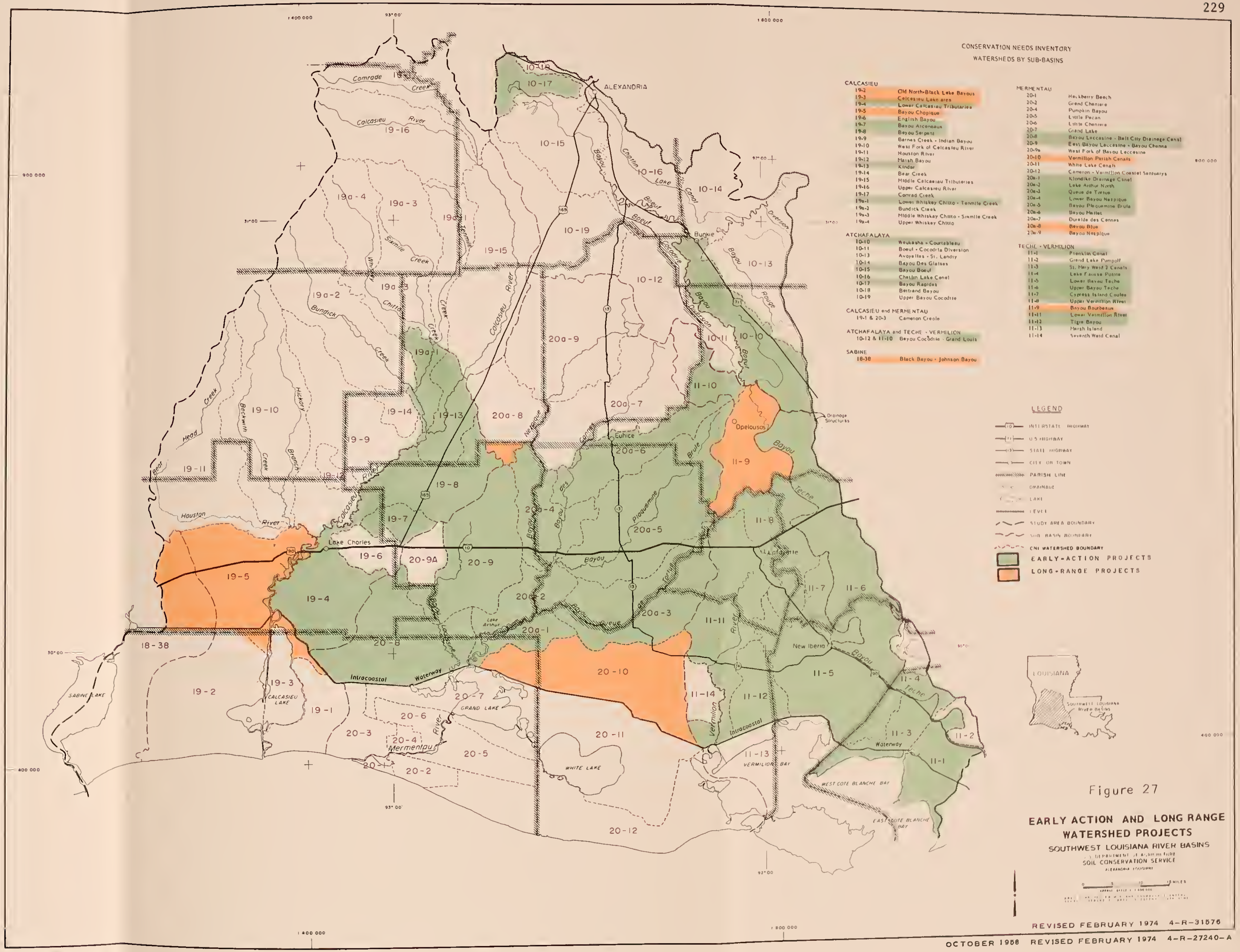



Figure 27

**EARLY ACTION AND LONG RANGE WATERSHED PROJECTS**

SOUTHWEST LOUISIANA RIVER BASINS

SOIL CONSERVATION SERVICE

with a population of about 7,150, is the largest town in the watershed, but the outskirts of New Iberia are also included at the south end of the watershed. Other small communities include Parks and Cade.

The primary outlet is Daigre Canal. The Department of Public Works has improved previously two lower reaches of Daigre Canal. A third and final reach of this canal is now under bid and will be improved soon.

The residents depend almost entirely on agriculture for their income. The main crops are rice and sugarcane.

The watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on 1970 census data, median family income in the area was about $5,157 with about 36.1 percent of the families having incomes below the poverty level. In 1970, about 28.6 percent of the families received some type of public welfare assistance. The unemployment rate in 1970 was at an average of 7.5 percent.

The plan provides for land treatment costing about $488,800 and about 40 miles of channel work with appurtenant erosion control, water control, and wildlife management structures. All channels have been previously modified.

20a-5, Bayou Plaquemine Brule

This watershed, with a drainage area of about 379 square miles, is located in Acadia and St. Landry Parishes. Most of the watershed lies in the Southern Mississippi Valley Silty Uplands and Gulf Coast Prairies LRA's with small areas in the Southern Coastal Plain LRA.

The major problems stem from flooding and inadequate drainage on about 272 square miles of prime agricultural lands. Crowley, population 16,100; Rayne, population 9,500; Church Point, population 3,865 are the main urban centers within the watershed. Other small communities include Esterwood, Egan, and Midland. The residents depend on agriculture and related industries for their income. The main enterprises are rice, soybeans, and cattle.

The watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on 1970 census data, median family income in the area was about $5,550 with about 29.5 percent of the families having incomes below the poverty level. In 1970, about 25.3 percent of the families received some type of public welfare assistance. The unemployment rate in 1970 was at an average of 4.7 percent.

The plan provides for land treatment costing about $4,280,000 and about 433 miles of channel work with appurtenant erosion control, water control, and wildlife management structures. Four hundred and

4-31721 2-74

twenty-three miles of the channel improvement have been previously altered and ten miles are new channels.

11-2, Tigre Bayou

This watershed, with a drainage area of about 95 square miles, is located in Vermilion and Iberia Parishes. The lower third of the watershed lies in the Gulf Coast Marsh LRA while the remainder is in the Southern Mississippi Valley Silty Uplands LRA.

The major problems stem from flooding, saltwater intrusion, and inadequate drainage on about 77 square miles of prime agricultural lands. Erath, population 2,020, and Delcambre, population 1,975 are the only incorporated towns within the watershed. The residents depend primarily on agriculture for their income. Rice, sugarcane, and cattle are the main agricultural enterprises.

The watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on 1970 census data, median family income in the area was about $5,946 with about 25.0 percent of the families having incomes below the poverty level. In 1970, about 19.6 percent of the families received some type of public welfare assistance. The unemployment rate in 1970 was at an average of 6.0 percent.

The plan provides for land treatment costing about $606,300, three saltwater intrusion control structures, and about 74 miles of channel work with appurtenant erosion control, water control, and wildlife management structures. All channels have been previously modified.

11-11, Lower Vermilion River

This watershed, with a drainage area of about 276 square miles, is located in Lafayette and Vermilion Parishes. About 10 percent is in the Gulf Coast Marsh LRA, and the rest is in the Mississippi Valley Silty Uplands LRA.

The major problems stem from flooding and inadequate drainage on about 203 square miles of prime agricultural lands. Lafayette, population 68,900 and Abbeville, population 11,000, are the main urban centers. Other small communities include Broussard, Scott, Milton, and Maurice. The rural residents depend almost entirely on agriculture for their income. Rice is the principal crop. Other agricultural enterprises include soybeans, sugarcane, and beef cattle.

The watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on 1970 census data, median family income in the area was about $6,930 with about 22.0 percent of the families having incomes below the poverty level. In 1970, about 20.6 percent of the families

4-31721 2-74

received some type of public welfare assistance. The unemployment rate in 1970 was at an average of 5.6 percent.

The plan provides for land treatment costing about $2,694,700 and about 194 miles of channel work with appurtenant erosion control, water control, and wildlife management structures. One hundred and eighty-seven miles of the channel work have been previously altered, five miles are new channels, and two miles are natural streams.

11-4, Lake Fausse Point

This watershed, with a drainage area of about 74 square miles, is located in Iberia, St. Mary, and St. Martin Parishes. About 60 percent of the area is in the Southern Mississippi Valley Alluvium and 40 percent is in the Southern Mississippi Valley Silty Uplands LRA's.

The major problems stem from flooding and inadequate drainage on about 15 square miles of prime agricultural lands. There are no incorporated towns within the watershed. The residents depend almost entirely on agriculture for their income. Sugarcane and soybeans are the principal crops.

Part of the watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on 1970 census data, median family income in the area was about $6,100 with about 21.0 percent of the families having incomes below the poverty level. In 1970, about 23.0 percent of the families received some type of public welfare assistance. The unemployment rate in 1970 was at an average of 5.4 percent.

The plan provides for land treatment costing about $288,700 and about 7 miles of channel work with appurtenant erosion control, water control, and wildlife management structures. All channels have been previously modified.

20-8, Bayou Lacassine-Bell City

This watershed, with a drainage area of about 270 square miles, is located in Cameron, Calcasieu, and Jefferson Davis Parishes. About 60 percent of the area is in the Gulf Coast Prairies LRA; about 40 percent is in the Gulf Coast Marsh LRA.

The major problems stem from flooding and inadequate drainage on about 94 square miles of agricultural lands. There are no incorporated towns within the watershed. The communities of Halmwood, Bell City, and part of Hayes are in the watershed. The residents depend almost entirely on agriculture for their income. Rice is the principal crop. Based on 1970 census data, median family income in the area was about $8,100 with about 16.6 percent of the families have

4-31721 2-74

incomes below the poverty level. In 1970, about 15.8 percent of the families received some type of public welfare assistance. The unemployment rate in 1970 was at an average of 5.3 percent.

The plan provides for land treatment costing about $3,314,000 and about 137 miles of channel work with appurtenant erosion control, water control, and wildlife management structures. All channels have been previously modified.

11-1, Franklin Canal

This watershed, with a drainage area of about 126 square miles, is located in St. Mary Parish. About 80 percent of the area is in the Gulf Coast Marsh LRA with the remaining 20 percent in the Southern Mississippi Valley Silty Uplands LRA.

The major problems stem from flooding and inadequate drainage on about 23 square miles of prime agricultural lands. Franklin, with a population of about 9,300, is the only incorporated town within the watershed. Other small communities include Centerville and Verdunville. The residents depend almost entirely on agriculture for their income. Sugarcane and soybeans are the principal crops.

Based on 1970 census data, median family income in the area was about $8,146 with about 19.0 percent of the families having incomes below the poverty level. In 1970, about 21.5 percent of the families received some type of public welfare assistance. The unemployment rate in 1970 was at an average of 4.8 percent.

The plan provides for land treatment costing about $233,700 and about 22 miles of channel work with appurtenant erosion control, water control, and wildlife management structures. All channels have been previously modified.

20a-6, Bayou Mallet

This watershed, with a drainage area of about 158 square miles, is located in Acadia and St. Landry Parishes. About 90 percent of the area is in the Gulf Coast Prairies LRA and the remaining 10 percent is in the Southern Mississippi Valley Silty Uplands LRA.

The major problems stem from flooding and inadequate drainage on about 123 square miles of prime agricultural lands. Eunice, with a population of about 11,400, is the only incorporated town within the watershed. Other small communities include Frey, Swords, and Lawtell. The residents depend almost entirely on agriculture for their income. Rice, soybeans, cotton, sweet potatoes, and cattle are the principal agricultural enterprises.

The watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on

1970 census data, median family income in the area was about $5,200 with about 33.9 percent of the families having incomes below the poverty level. In 1970, about 27.8 percent of the families received some type of public welfare assistance. The unemployment rate in 1970 was at an average of 5.8 percent.

The plan provides for land treatment costing about $1,238,400 and about 206 miles of channel work with appurtenant erosion control, water control, and wildlife management structures. One hundred and ninety-eight miles of the channel work have been previously modified, three miles are natural streams, and five miles are new channels.

20a-3, Queue de Tortue

This watershed, with a drainage area of about 267 square miles, is located in Acadia, Lafayette, and Vermilion Parishes. The majority of the area is in the Gulf Coast Prairies LRA with a small portion in the Southern Mississippi Valley Silty Uplands LRA.

The major problems stem from flooding and inadequate drainage on about 161 square miles of prime agricultural lands. Dudson, population 12,00; Gueydan, population 1,980; and Morse, population 760 are the only incorporated towns within the watershed. Other small communities include Riceville and part of the city of Rayne. The residents depend almost entirely on agriculture for their income. Rice and soybeans are the principal crops. The Department of Public Works enlarged two reaches in the lower main stem of Bayou Queue de Tortue, and a third reach is being scheduled for bid.

The watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on 1970 census data, median family income in the area was about $5,700 with about 27.2 percent of the families having incomes below the poverty level. In 1970, about 22.4 percent of the families received some type of public welfare assistance. The unemployment rate in 1970 was at an average of 5.3 percent.

The plan provides for land treatment costing about $2,781,900 and about 222 miles of channel work with appurtenant erosion control, water control, and wildlife management structures. All channels have been previously modified with the exception of 2 miles which are new channels.

20a-1, Klondike Drainage Canal

This watershed, with a drainage area of about 61 square miles, is located in Cameron and Vermilion Parishes. Most of the watershed is in the Gulf Coast Prairies LRA, with a small part in the Gulf Coast Marsh LRA.

The major problems stem from flooding and inadequate drainage on about 27 square miles of agricultural lands. There are no incorporated towns within the watershed. The residents depend almost entirely on agriculture for their income. Rice is the principal crop.

Part of the watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on 1970 census data, median family income in the area was about $6,800 with about 20.8 percent of the families having incomes below the poverty level. In 1970, about 18.6 percent of the families received some type of public welfare assistance. The unemployment rate in 1970 was at an average of 5.5 percent.

The plan provides for land treatment costing about $514,000 and about 44 miles of channel work with appurtenant erosion control, water control, and wildlife management structures. Thirty-seven miles of the channel work has been previously modified and seven miles are natural streams with no noticeable flow-ponded water.

11-8, Upper Vermilion River

This watershed, with a drainage area of about 178 square miles, is located in Lafayette and St. Martin Parishes. About 65 percent of the area is in the Southern Mississippi Valley Alluvium LRA and about 35 percent is in the Southern Mississippi Valley Silty Uplands LRA.

The major problems stem from flooding and inadequate drainage on about 102 square miles of prime agricultural lands. Parts of the city of Lafayette and the towns of Breaux Bridge, Broussard, and Youngsville are within the watershed. The rural residents depend almost entirely on agriculture for their income. Rice, sugarcane, soybeans, truck crops, and pasture are the principal crops.

The watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on 1970 census data, median family income in the area was about $6,540 with about 27.7 percent of the families having incomes below the poverty level. In 1970, about 25.1 percent of the families received some type of public welfare assistance. The unemployment rate in 1970 was at an average of 5.8 percent.

The plan provides for land treatment costing about $1,657,000 and about 167 miles of channel work with appurtenant erosion control, water control, and wildlife management structures. One hundred and sixty-one miles of the channel work have been previously modified, five miles are new channels, and one mile is a natural stream with no noticeable flow-ponded water.

4-31721 2-74

20-9, East Bayou Lacassine-Bayou Chene

This watershed, with a drainage area of about 248 square miles, is located in Jefferson Davis Parish. It lies entirely within the Gulf Coast Prairies LRA.

The major problems stem from flooding and inadequate drainage on about 237 square miles of prime agricultural lands. Jennings, population 11,780 and Welsh, population 3,200, are incorporated towns within the watershed. Other small communities include Niblett, Roanoke, Pine Island, Raymond, and Chene. The residents depend almost entirely on agriculture for their income. Rice is the principal crop.

Based on 1970 census data, median family income in the area was about $6,050 with about 28.0 percent of the families having incomes below the poverty level. In 1970, about 21.7 percent of the families received some type of public welfare assistance. The unemployment rate in 1970 was at an average of 5.3 percent.

The plan provides for land treatment costing about $2,418,000 and about 220 miles of channel work with appurtenant erosion control, water control, and wildlife management structures.

The channel conditions prior to project action have been classified as follows:

| | | |
|---|---|---|
| 1. | Previously modified with ephemeral flow | - 200 miles |
| 2. | Previously modified with no noticeable flow, but holding ponded water | - 16 miles |
| 3. | New channel construction | - 2 miles |
| 4. | Natural stream with no noticeable flow, but holding ponded water | - 2 miles |
| | Total | - 220 miles |

11-3, St. Mary-Ward 2 Canals

This watershed, with a drainage area of about 87 square miles, is located in St. Mary Parish. It lies within the Southern Mississippi Valley Silty Uplands and Gulf Coast Marsh LRA's.

The primary problem is inseparable flooding and inadequate drainage on about 59 square miles of prime agricultural lands within the Silty Uplands. There are no incorporated towns within the watershed. Small communities include Ashton, Adeline, Baldwin, and Cypremont. The residents depend almost entirely on agriculture for their income. Sugarcane is the principal crop.

4-31721 2-74

Based on 1970 census data, median family income in the area was about $8,150 with about 19.0 percent of the families having incomes below the poverty level. In 1970, about 21.5 percent of the population received some type of public welfare assistance. The unemployment rate in 1970 was at an average of 4.8 percent.

The plan provides for land treatment costing about $313,000 and enlargement of about 41 miles of channel which have previously been altered. Appurtenant erosion control, water control, and wildlife management structures are also included. About 20 miles of these channels have ephemeral flow. The remainder have no noticeable flow, but hold standing water.

19-7, Bayou Arceneaux

This watershed, with a drainage area of about 46 square miles, is located in Calcasieu and Jefferson Davis Parishes. It lies within the Southern Coastal Plain and Gulf Coast Prairies LRA's.

The major problems stem from flooding and inadequate drainage on about 43 square miles of prime agricultural land. Woodlawn is the only town within the watershed. It has a population of about 150. The residents depend almost entirely on agriculture for their income. Rice is the principal crop.

Based on 1970 census data, median family income in the area was about $7,230 with about 22.2 percent of the families having incomes below the poverty level. In 1970, about 22.8 percent of the population received some type of public welfare assistance and the unemployment rate was at an average of 5.5 percent.

The plan provides for land treatment costing about $774,000 and about 41 miles of channel work with appurtenant erosion control, water control, and wildlife management structures. All channels have been previously modified and have ephemeral flow characteristics.

19-8, Bayou Serpent

This watershed, with a drainage area of about 163 square miles, is located in Jefferson Davis and Allen Parishes. It lies within the Southern Coastal Plain and Gulf Coast Prairies LRA's.

The major problems stem from inseparable flooding and inadequate drainage on about 153 square miles of prime agricultural lands. Fenton, population 400, is the only town within the watershed. Other small communities include Edna, Fontenot, Hecker, and Rodgers. The residents depend almost entirely on agriculture for their income. Rice is the principal crop.

A portion of the watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965.

4-31721 2-74

Based on 1970 census data, median family income in the area was about $5,990 with about 29.0 percent of the families having incomes below the poverty level. In 1970, about 26.5 percent of the population received some type of public welfare assistance. The unemployment rate in 1970 was at an average of 5.7 percent.

The plan provides for land treatment costing about $1,728,000 and about 166 miles of channel work on previously modified channels, appurtenant erosion control, water control, and wildlife management structures. One hundred and fifty-four miles have ephemeral flow characteristics and 12 miles hold standing water.

11-5, Lower Bayou Teche

The total area of this watershed is about 297 square miles. It is located in Iberia, St. Mary, Vermilion, and Lafayette Parishes. Southern Mississippi Valley Silty Uplands and Southern Mississippi Valley Alluvium LRA's are predominant. Construction has been completed under a Public Law 566 Watershed Program. The land treatment program is still active. Structural measures were not planned for those portions of the watershed in St. Mary, Vermilion, and Lafayette Parishes during development of the original plan. Since that time, people of these areas have recognized their problems and are now willing to assume their responsibility for carrying out a watershed program. Problems are inseparable flooding and inadequate drainage on about 64 square miles of cropland and pasture. The principal crops grown in these portions of the watershed include sugarcane, rice, and soybeans.

The plan calls for accelerated land treatment under the going PL-566 project and the enlargement of about 53 miles of previously altered channels. Channel work would include installation of needed appurtenant erosion control, water control, and wildlife management structures. Forty-one miles of the proposed 53 miles of channel work are classified as having ephemeral flow characteristics. The remaining 12 miles have no noticeable flow, but hold standing water. Bottom grades are below sea level elevation.

New Iberia, population 30,150, is the only incorporated town within the watershed. Other small communities include Jefferson Island, Avery Island, Weeks, and Patoutville, The rural residents depend almost entirely on agriculture for their income.

Portions of the watershed are in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on 1970 census data, median family income in the area was about $7,300 with about 21 percent of the families having incomes below the poverty level. In 1970, about 21 percent of the population received some type of public welfare assistance and the unemployment rate was about 5.0 percent.

4-31721 2-74

20a-2, Lake Arthur North

This watershed, with a drainage area of about 97 square miles, is located in Jefferson Davis and Acadia Parishes. It lies entirely within the Gulf Coast Prairies LRA.

The major problems stem from inseparable flooding and inadequate drainage on about 80 square miles of prime agricultural lands. Lake Arthur, population 3,550, is the only incorporated town within the watershed. Other small communities include Mermentau and Silverwood with populations of 760 and 100, respectively. The residents depend almost entirely on agriculture for their income. Rice is the principal crop.

A portion of the watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on 1970 census data, median family income in the area was about $5,800 with about 28.7 percent of the families having incomes below the poverty level. In 1970, about 23.5 percent of the population received some type of public welfare assistance and the unemployment rate was at an average of 5.0 percent.

The plan provides for land treatment costing about $850,000 and enlargement of about 83 miles of channel which have previously been altered. Appurtenant erosion control, water control, and wildlife management structures are included. Sixty-eight miles have ephemeral flow and 15 miles have no noticeable flow, but hold standing water.

20a-4, Lower Bayou Nezpique

This watershed, with a drainage area of about 145 square miles, is located in Jefferson Davis and Acadia Parishes. It lies entirely within the Gulf Coast Prairies LRA.

The major problem is flooding and inadequate drainage on the entire watershed which consists of prime agricultural lands. There are no incorporated towns within the watershed. Small communities include Panchoville, Iota, Hathaway, Millerville, and Evangeline with populations of from 50 to 1,270. The residents depend almost entirely on agriculture for their income. Rice and soybeans are the principal crops.

A portion of the watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on 1970 census data, median family income in the area was about $5,800 with about 28.7 percent of the families having incomes below the poverty level. In 1970, about 23.5 percent of the population received some type of public welfare assistance. The unemployment rate in 1970 was at an average of 5.0 percent.

The plan provides for land treatment costing about $1,450,000 and about 87 miles of channel work with appurtenant erosion control, water control, and wildlife management structures.

4-31721 2-74

Classification of channels to be improved is as follows:

| | | |
|---|---|---|
| 1. | Previously modified with ephemeral flows | - 46 miles |
| 2. | Previously modified with no noticeable flow, but holding ponded water | - 19 miles |
| 3. | Enlargement of natural streams with perennial flow characteristics | - 12 miles |
| 4. | Clean out of natural streams with perennial flow characteristics | - 10 miles |
| | Total | - 87 miles |

19a-1, Lower Whiskey Chitto-Ten Mile Creek

This watershed, with a drainage area of about 176 square miles, is located in Vernon, Allen, and Rapides Parishes. It lies entirely within the Southern Coastal Plain LRA.

The major problems stem from inseparable flooding and inadequate drainage on about 19 square miles of prime agricultural lands. There are no incorporated towns within the watershed. Small communities include Westport and Mittie. The residents depend almost entirely on agriculture or forestry for their income. Rice rotated with soybeans are the principal crops.

The watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on 1970 census data, median family income in the area was about $6,400 with about 23.5 percent of the families having incomes below the poverty level. In 1970, about 28.2 percent of the population received some type of public welfare assistance and the unemployment rate averaged 6.0 percent.

The plan provides for land treatment costing about $1,403,000 and about 7 miles of channel work with appurtenant erosion control, water control, and wildlife management structures. All channels have been previously modified and have ephemeral flow.

11-6, Upper Bayou Teche

The watershed, composed of approximately 332 square miles is located in St. Landry, St. Martin, and Iberia Parishes. It is in the Southern Mississippi Valley Alluvium LRA. Construction is now underway through an existing Public Law 566 authorization. St. Landry Parish declined to participate in development of the original work plan, but now recognize the merits of a cooperated effort in solving their water problems. The main concern of watershed residents is inseparable flooding and drainage. About 53 miles of channel work is needed to alleviate these problems on about 66 square miles of agricultural lands. Principal crops grown in this portion of the watershed are sugarcane, rice, soybeans, cotton, and sweet potatoes.

The plan calls for the installation of needed land treatment measures under the going PL-566 project, the enlargement of approximately 48 miles of existing previously modified channels, and the construction of about 5 miles of new channels. Channel work will include appurtenant erosion control, water control, and wildlife management structures. All channels proposed for enlargement have ephemeral flow characteristics.

Breaux Bridge, population 4,940, is the only incorporated town within the watershed. Other small communities include Hazelwood, Armide, Henderson, Parks, and Loreauville with populations of from 75 to 725. The rural residents depend almost entirely on agriculture for their income.

A portion of the watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on 1970 census data, median family income in the area was about $5,730 with about 32 percent of the families having incomes below the poverty level. In 1970, about 28 percent of the population received some type of public welfare assistance and the unemployment rate was at an average of 7.0 percent.

11-10, Cocodrie-Grand Louis

This watershed, of about 207 square miles is located in Evangeline and St. Landry Parishes. It lies within the Southern Mississippi Valley Silty Uplands and Southern Mississippi Valley Alluvium LRA's. Construction has been authorized under an existing PL-566 watershed work plan, but work has not begun. St. Landry Parish declined to participate in the original work plan development, but has since joined the small watersheds program. Major problems are inseparable flooding and inadequate drainage on about 54 square miles of prime agricultural lands. Major crops grown in the St. Landry portion of the watershed are cotton, rice, soybeans, sweet potatoes, and cattle.

The plan calls for installation of a land treatment program under the existing PL-566 project and the enlargement of approximately 44 miles of channel. Channel work will include appurtenant erosion control, water control, and wildlife management structures. All channels proposed for enlargement are classed as having ephermeral flow characteristics.

There are no incorporated towns within the watershed. Small communities include Lonepine, Centerville, St. Landry, and Andrepont with populations ranging from 50 to 200. The rural residents depend almost entirely on agriculture for their income.

The watershed is in an area designated eligible for assistance under the Public Works and Economic Development of 1965. Based on

1970 census data, median family income in the area was about $4,600 with about 38.8 percent of the families having incomes below the poverty level. In 1970, about 35.5 percent of the population received some type of public welfare assistance and the unemployment rate was 6.6 percent.

10-10, Wauksha-Courtableau

This watershed, with a drainage area of about 214 square miles, is located in Avoyelles and St. Landry Parishes. It lies entirely within the Southern Mississippi Valley Alluvium LRA.

The primary problem is inseparable flooding and inadequate drainage on about 214 square miles of agricultural lands. Bunkie, population 5,400, is the only incorporated town within the watershed. Other small communities include LeBeau, Morrow, LeMoyen, Rosa, and Waxia. The rural residents depend almost entirely on agriculture for their income. Major crops are soybeans, cotton, rice, and cattle.

The watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on 1970 census data, median family income in the area was about $4,680 with about 38.0 percent of the families having incomes below the poverty level. In 1970, about 32.8 percent of the population received some type of public welfare assistance and the unemployment rate averaged 7.9 percent.

The plan provides for land treatment costing about $2,361,000 and about 185 miles of channel work with appurtenant erosion control, water control, and wildlife management structures.

Channels to be worked have been placed in the following classifications:

| | | |
|---|---|---|
| 1. | Enlargement of previously modified channels with ephemeral flow characteristics | - 166 miles |
| 2. | Clean out of natural streams which hold water, but have no noticeable flow | - 12 miles |
| 3. | Construction of new channels | - 7 miles |
| | Total | - 185 miles |

10-15, Bayou Boeuf

This watershed, with a drainage area of about 234 square miles, is located in Rapides Parish. It lies within the Southern Mississippi Valley Alluvium and Southern Coastal Plain LRA's. Construction has been completed under a Public Law 566 watershed work plan, but additional works of improvement are needed. The major problem is inseparable flooding and inadequate drainage on about 46 square miles of prime Mississippi Valley Alluvium agricultural lands. Major crops include cotton, soybeans, and pasture.

The plan provides for the continuation of the going land treatment program under the existing PL-566 project and the improvement of about 15 miles of existing channels and installation of about 4 miles of new channels. Channel work will include appurtenant erosion control, water control, and wildlife management structures. About 13 miles of the total 19 miles of channels are classed as having intermittent flow characteristics. The remainder have ephemeral flow.

Cheneyville, with a population of about 1,080 people, is the only incorporated town in the watershed. The city of Alexandria is on the northeast outside edge of the watershed. Woodworth, population 410, is also in the watershed.

The watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on 1970 census data, median family income in the area was about $6,830 with about 21.6 percent of the families having incomes below the poverty level. In 1970, about 25.7 percent of the population received some type of public welfare assistance and the unemployment rate was 5.3 percent.

10-17, Bayou Rapides

This watershed, with an area of about 63 square miles, is located in Rapides Parish. It lies within the Southern Mississippi Valley Alluvium and Southern Coastal Plain LRA's. Construction has been completed under a PL-566 work plan, but additional works of improvement are needed. The major problems stem from inseparable flooding and inadequate drainage on about 41 square miles of prime agricultural lands. Major crops are cotton and soybeans.

The plan provides for the continuation of the land treatment program now under way throught the existing PL- 566 project and the installation of about 15 miles of major outlet channels. Channel work will include appurtenant erosion control, water control, and wildlife management structures.

All channels proposed for enlargement have previously been altered and are classed as having ephemeral flow characteristics.

Hot Wells, with a population of approximately 100 persons, is the only community within the watershed. The city of Alexandria, population 41,650, lies just outside the eastern boundary.

The watershed is in an area designated eligible for assistance under the Public Works and Economic Development Act of 1965. Based on 1970 census data, median family income in the area was about $6,830 with about 21.6 percent of the families having incomes below the poverty level. In 1970, about 25.7 percent of the population received some type of public welfare assistance and the unemployment rate averaged 5.3 percent.

## LONG-RANGE WATERSHED PROJECTS

USDA investigations show that projects and measures included for development are feasible. However, some are not so urgently needed as the early-action projects and others are urgently needed, but delayed by coordination with projects of other agencies. Problems and project development are essentially the same as those in the early-action projects.

### Land Treatment

The proposed long-range projects will provide land treatment for about 159,500 acres of agricultural land or 9 percent of the land treatment needs in the Basin. Land treatment measures for the proposed long-range projects were not specifically developed. The types of land treatment practices needed are essentially the same as the proposed early-action projects. At the time plans for installing the proposed long-range projects are developed, land treatment measures and costs will be determined by the same procedures used in planning PL-566 watershed projects.

### Structural Measures

Seven projects are included in the long-range plan. One of these, Bayou Blue, has been approved for operations but needs additional improvements. Table 77 lists these watersheds and gives their status.

Table 77 - Data Summary, Long-Range Watershed Projects
Southwest Louisiana River Basin

| Watershed Projects | | Watershed Area | Area Benefited by Channel Improvement | Planning 1/ Status |
|---|---|---|---|---|
| CNI No. | Name | | | |
| | | ------square miles------ | | |
| 18-38 | Black Bayou-Johnson Bayou | 384.0 | 93.9 | E |
| 19-2 | Old North-Black Lake Bayous | 358.2 | 13.5 | E |
| 19-3 | Calcasieu Lake Area | 94.5 | 13.0 | E |
| 19-5 | Bayou Choupique | 220.0 | 195.0 | E |
| 20-10 | Vermilion Parish Canals | 300.8 | 255.5 | E |
| 11-9 | Bayou Bourbeaux | 144.1 | 144.1 | E |
| 20a-8 | Bayou Blue | 127.9 | 16.3 | A |
| Total | | 1,629.5 | 731.3 | |

1/ Abbreviations for Planning Status: E - River Basin Field Examination Scope Studies Complete, A - Authorized for Operations

These watersheds have a combined total area of about 1,630 square miles. Measures to be installed in the seven long-range watersheds include land treatment for watershed protection and wildlife management, and structural measures. Structural measures to be installed include stream development with appurtenant erosion and water control structures, and fish and wildlife improvement measures. Stream development would influence about 731 square miles through flood reduction and drainage benefits.

Data on costs and benefits for the seven long-range projects were not developed. The locations of the projects are shown in figure 27; areas are color coded for only that part of the CNI watersheds within project boundaries.

## OTHER PROJECTS AND PROGRAMS

### Kisatchie National Forest Development Program

Changing times have brought new challenges to the development of the Kisatchie National Forest. The demands for traditional forest products have increased and new ones have been created. Public awareness of present day pollution problems and demand for a cleaner environment intensify and complicate resource management.

To meet these demands, a new system has been developed. The system provides for public involvement, interdisciplinary teams, and unit planning. A unit is a block of forest land which comprises a realistic management unit. The unit plans will provide broad objectives, policy, and direction to be followed. Public involvement, interdisciplinary approach to planning, factual data, and reliable predictions will form the base for the unit plans which will cover all aspects of the environment for the unit including economic and social needs. The unit plans will be a basis for all action within the units, so any discussion of the ultimate use or uses of National Forest land is only subjective until they have been developed. The Kisatchie National Forest started on this job in January, 1973.

The Kisatchie National Forest is the only national forest in Louisiana and contained 593,789 acres in April, 1970. Approximately 30 percent of the forest lies within the Study Area. Parts of three Ranger Districts are located within the Study Area. The Forest Service has had a steadily increasing land ownership adjustment program since 1962. Some of the objectives have been to acquire certain tracts by direct purchase, by land exchange, and by interchange with the military. The greatest opportunity for making land ownership adjustments is by land exchange. The land ownership adjustment plan proposes that approximately 37,000 acres be acquired for National Forest purposes within the Study Area. The plan also proposes that approximately 13,000 acres of National Forest land within the Study Area be made available for disposal by land exchange and interchange.

Deer, turkey, squirrel, and quail are the game species emphasized in habitat development. The management of deer and turkey is more easily achieved with the even-aged management of pine timber stands. However, the squirrel population has been suffering from a lack of sufficient hard mast trees of oak, hickory, and beech. These species, which frequent the lower moist areas, have been converted to pine through many years of high grading and constant fires. Management to convert these stands back to hardwood is being implemented. Quail habitat is being developed in some of the longleaf-pine stands which are naturally more open. Some areas will be used to develop a habitat for one species of game, but not the exclusion of all other game.

The National Forest lands have a high capability to produce softwood timber products. Timber management will continue to be intensified resulting in higher yields and better growing conditions. Approximately 1,800 acres will be regenerated each year under even-aged management. Very little timber stand improvement will be done in conjunction with reforestation. Present policy of complete mechanical site preparation precludes the need for timber stand improvement.

To help meet the Basin's recreational needs within the Kisatchie National Forest, roads, trails, beaches, boat ramps, camping spurs, etc., are planned for the Kincaid Recreation Area on the Evangeline Ranger District. Dispersed-type recreation can be complemented by the layout and construction of trails for bicyclists and motor cyclists on the Evangeline District. Forest administrators are aware of pressures to develop more water-based recreation. However, the availability of National Forest land for individual reservoir sites would depend on the outcome of the unit planning process. Some of the known factors which would be considered include existing special use permits, military activities, the proximity to State-designated natural and scenic streams, and development of critical wildlife habitat in bottom land hardwood areas.

## Cooperative Forestry Programs

### Fire Control

The Louisiana Forestry Commission maintains personnel and equipment necessary to provide adequate fire control on all private forest land. However, cooperative work with the Forest Service, USDA, is accelerated where special fire problems arise. An example is the cooperative study of the high incidence of burn in Beauregard Parish. Here, new approaches to the problem were developed and they are now being implemented.

### Insects and Diseases

The Louisiana Forestry Commission and the Forest Service, USDA, make aerial surveys of outbreak areas. When infestations are located, the landowner is notified and informed of the proper control measures.

An intensive news release program is initiated to inform the public of the outbreak.

Guidelines for suppressing the Southern Pine Beetle include the immediate removal of all infected trees. Because timing is critical, logging of the infested material should begin immediately. Contract time limits for removal of material should reflect and insure removal as rapidly as possible.

## Utilization

Available timber supplies can be stretched by making better use of them. Industry has made good progress in utilizing the residue of manufacturing, and in reducing the volume of unused material left in the woods after logging. But much more could be done through research and development, industrial application of better technology, and market development. Modernization of may plants would permit increased recovery of lumber from available logs. Better sorting of material to insure the best end use would also help stretch saw log supplies. Development of structural particle boards could have the effect of supplementing supplies of veneer logs.

The Forest Service, USDA, has utilization specialists who are made available to industry for advice and technology in improving an operation.

## Improved Stocking

The forest land treatment program for this Basin is predicated upon increasing the current rate of growth to produce an additional 61 million cubic feet of timber production. This can be accomplished by applying several optional forest land treatment programs, all of which will increase the percent of stocking with more desirable commercial species. Such treatment will allow the land to more closely meet its full potential for producing forest products.

## Erosion Control

Comparison of erosion volumes on all forest land indicate the artillery impact areas are producing more than one-half of the total volume of erosion. The degree of erosion and sediment is directly related to the area of bare ground exposed, the degree of slope, and the infiltration capacity of the upper soil profile.

Critical areas created from continuous artillery impact use can be healed with proper care. Vegetative covers can be established at frequent intervals after disturbances. Terraces and water bars can be constructed to break up the accumulation of water courses which pick up and suspend sediment before it reaches the streams.

4-31721 2-74

Grazing

Almost 80 percent of the forage for grazing is provided by the pine and oak-pine timber types. In the future, management objectives for some of these areas will change. Under new management objectives, the forage productivity of these areas will change. Livestock that graze these areas should be rotated periodically to ungrazed areas in order to maintain optimum forage productivity for all areas.

Resource Conservation and Development Projects

A Resource Conservation and Development (RC&D) is a locally initiated and sponsored activity to expand the economic opportunities for people of an area by developing and carrying out a plan of action for the orderly conservation, improvement, development, and wise use of their natural resources. This program authorized technical, financial, and loan assistance to legal sponsors in approved areas where the acceleration of current programs, plus authorization of new programs and stimulating local people to individual and group action, will increase economic opportunities for people in the area. Financial assistance may be used for eligible community-type project measures involving flood prevention, erosion and sediment control, fish and wildlife, recreation, etc.

Presently, no RC&D projects exist in the Southwest Louisiana River Basin; however, all the area has the potential for development of projects. Interest is high and local leadership is aware of the opportunities available through RC&D to effectively plan programs for action and carry out the activities necessary to achieving development, improvement, conservation, and more efficient utilization of natural resources.

Agricultural Stabilization and Conservation Service

This agency has several programs which will enhance environmental conservation and rural stabilization and development. Also, they will contribute to meeting present and future needs in the Basin.

The farm income stabilization program was modified in 1974 to stimulate the production of feed grains, cotton, and wheat which are in short supply both nationally and worldwide. This increased production will increase farm incomes which are already lagging State and national averages.

The Rural Environment Assistance Program (REAP), which provided cost-sharing to farmers for implementing various soil and water conservation practices, was superseded in 1974 by a new program. This new program, the Rural Environmental Conservation Program (RECP) will strengthen environmental conservation and rural development in the Basin. The principal objectives of this program are: (1) to stimulate and assist farmers, ranchers, and woodland owners to carry out approved soil, water, woodland, and wildlife conservation practices along with related land, water, and air pollution abatement practices, (2) to assure wise use and adequate protection of the Nation's agricultural lands, (3) to assist in achieving additional conservation of land now in agricultural production, and (4) to improve man's total environment with direct benefits to the public.

Within the RECP is a Forestry Incentive Program (FIP) which is the most recent forestry action program available to private landowners. A plan for timber management would be developed with the assistance and concurrence of the Louisiana Forestry Commission. It would be carried out under a cost-sharing arrangement with the Federal Government.

The relatively new Public Access Program pays farmers and landowners for opening their land to public hunting. This program could do much toward reviving hunting interest and fulfilling needed recreational pleasure. The economic returns from additional hunting would increase wildlife habitat development and add significantly to the economy of the Basin.

## Farmers Home Administration

The Farmers Home Administration would be instrumental in fostering rural development, establishing sound programs of land and water conservation, and improving the natural environment.

This agency makes water development and soil conservation loans to eligible individual farmers, groups of farmers, rural residents, and rural communities. Credit is available to help make needed adjustments in family farm operations; to buy, operate, and develop family farms; to purchase housing - rural and urban; to develop water supply systems for irrigation, household, and livestock use; to develop rural recreation enterprises; to install drainage systems on farmlands; and to carry out soil conservation practices. Loans for water and waste disposal systems are available to local organizations for installation of project measures in Public Law 566 Projects and RC&D Projects.

Opportunities for development of town or community water supply or sewage disposal systems are numerous. Some locations have no systems but need them, and some locations have inadequate systems or systems that should be replaced. State Planning Districts No. 3, 4, and 5 (see page 195) have prepared for their districts a tabulation of towns and communities needing either new systems or modification of existing systems. These tabulations must be updated frequently and are not included in this report. However, a summary tabulation for the Study Area indicates about 45 towns and communities (population less than 10,000) needed new water supply or sewage systems, or modification of existing systems.

# IMPACTS OF U. S. DEPARTMENT OF AGRICULTURE PROGRAM OPPORTUNITIES

This section compares the projected effects of without and with resource development conditions in the Basin. As indicated in the subsequent discussion, these resource development conditions will affect physical, environmental, economic, and institutional conditions.

## ENVIRONMENTAL EFFECTS OF DEVELOPMENT CONDITIONS

### Without Project Development

Past and current trends clearly show that development in the Basin will continue even if no Federally-assisted projects are initiated. That is, additional bottom land hardwoods will be cleared, additional wetlands will be drained, and many channels will be enlarged or constructed.

Motivating forces involved in this trend have been (1) the capture of highly productive soils for crop production, (2) an easier and often less costly means of obtaining large tracts of farmland than buying out numerous proprietors, (3) new crops which allow early conversion cost payback, (4) capital gains, and (5) utilization of capital sources. These factors have contributed significantly to the changing production patterns in the Basin, and in a way have circumvented the institutional restrictions of proprietorship and farm capital availability.

Estimates of clearing on the remaining bottom land hardwood forest not in public ownership range from 50 to 100 percent of that resource. A primary reason for these high estimates is the large difference in net returns from crop production and land appreciation as compared to that of existing forest opportunities. At current management levels, average annual returns to land and management from hardwood timber has been about $2 per acre. Privately-owned bottom land forest clearing for cropland is expected on an additional 200,000 acres by 2020. If demand for crops is not limiting, most privately-owned bottom land forest will be cleared eventually for cultivation of crops.

Wetlands in the Basin constitute about 2.4 million acres. About 1.4 million acres of this are in the Gulf Coast Marsh LRA and, probably, will remain unaffected. About 1.0 million acres are timbered wetlands. If no project action is taken, drainage improvement by individual or private groups will continue. About 13,000 acres of timbered wetlands would be cleared or drained. It is possible, of course, that much of this land would be cleared and drained under project conditions, but Federal funds would not be involved. Historically, this type work begins in the higher portions of the flatlands areas and proceeds to the lower areas. This sequence of construction usually induces damage in the lower areas that could be eliminated by Federal project-type action. All channel improvement work would be done as cheaply as possible to insure its functioning for water disposal only. There is no indication that extra work would be done or extra expense incurred to minimize adverse effects on the environment.

The history of the Basin's development indicates that several features of resource development which many people consider undesirable, especially land clearing and channel improvement, will continue steadfastly in spite of what is proposed here. Very little capital from private sources has ever been expended for measures reducing adverse environmental effects of such work. Constructive action designed to minimize or mitigate the undesirable effects of resource development could be expected only under a public-funded type project. It appears reasonable to assume that if no project action is taken, more adverse effects on fish and wildlife, aesthetic, and other environmental values will result than would result from Federally designed and coordinated projects conceived to minimized adverse effects and designed to include measures for enhancing their values.

## Accelerated Development

Accelerated development would require less total acreage to produce this Basin's projected food and fiber - 82.5 thousand acres less in 1985 and 189.7 thousand acres less in 2020 than the future condition without resource development. One result of this reduced need for land resources for projected production could be less forest land conversion to cropland. About 38 thousand acres in 1985 and 104 thousand acres in 2020 could be saved as a result of resource development.

The factors which have encouraged forest conversion in the past must be reckoned with in the future if these projections are kept intact. Government programs, financial institutions, and financial combinations which have been instrumental in encouraging forest conversion may require some restraint in the future. On the basis of production requirements and yield increasing technology however, this analysis shows that the demand for forest conversion could be reduced by the proposed development program.

Rights-of-way for the proposed projects would require 30 thousand acres in the early future and 7 thousand acres more in the long run. The manner in which this space is utilized and managed could have a significant bearing on the environment.

The primary assumption of the foregoing analyses is that the Basin will maintain its competitive position in the production of food and fiber among the many basins or regions of the United States. As a follow-up, additional acreage, added gross income was estimated for the case of expanded Basin production beyond these production levels. Over 400 thousand acres of the Basin's development-affected land could conceivably be brought into crop production. If development improves the competitive advantage of these fertile soils sufficiently to encourage their conversion to cropping activities, the Basin would surely experience economic development. However, adverse effects could result if production were expanded through

4-31721 2-74

further reduction of the forest lands base of about 114 thousand acres. Wildlife habitat and natural environment areas would lose. Encouraging conversion of bottom land forest into cropland is not an expressed goal of the resource development program, but the proposed program could be instrumental in encouraging it.

Assessment of Early-Action Watershed Projects

All watershed projects include a land treatment program, and channel work with appurtenant erosion control, water control, and wildlife management structures. Two projects in the coastal area have structures to prevent saltwater intrusion.

Installation and maintenance of land treatment practices are essential to sustained, profitable agricultural production. Additionally, they have proved effective in reducing erosion and sediment and in enhancing wildlife habitat. Estimates indicate the early-action program would reduce gross erosion about 6 percent and reduce annual sediment yield about 17 percent.

The estimated average annual flood damages for the Study Area amounted to about $4.6 million in 1970. Installation of the early-action program would reduce this about 53 percent or $2,436,000; about 2,000,000 acres would benefit. Additionally, about $2,985,000 in average annual benefits would accrue from drainage improvements, more intensive land use, and protection from saltwater intrusion. Remaining damages (47 percent) amounted to $2,164,000.

Planned early-action structural measures would improve wildlife habitat. Several low-level weirs and dams planned in association with channel work will establish or improve waterfowl areas by providing "green-tree reservoirs". These reservoirs provide for waterfowl shallow water areas for feeding and resting from October through January. Additionally, these measures will improve the stream fishery.

Channel construction procedures are designed to minimize adverse effects on fish and wildlife and natural beauty. Spoil and berm areas, where possible, will be seeded with food and cover for wildlife. Excavation in many instances, would be from one side of the channel only. This will maintain shade beneficial to stream fishery and conserve natural beauty.

About 2,750 miles of channel work is included in the early-action plan. About 500 miles of channel would pass through narrow strips (less than 2 miles wide) of forested flood plain; about 100 miles would pass through large forested tracts; and about 2,150 miles would pass through open land and marsh. In the forested strips, about 2,050 acres would be lost; about 320 acres occupied by channel areas and about 1,730 acres occupied by berm areas and spoil placement. In the large forested tracts, about 500 acres would be lost; about 80 acres occupied by channel areas and about 420 acres occupied by berm areas and spoil placement. Thus, the total acreage of forested bottom land lost to channel, berm, and spoil areas amounts to 2,550 acres. Additionally, in the open lands and marsh, another 1,500 acres would be lost; 1,440 acres lost to channel areas in the open lands where the spoil is spread (no land needed for spoil and berm areas),

4-31721 4-74

and 60 acres lost to spoil and berm areas in open marsh where no new channel areas are needed. In summary, a total of 4,050 acres of land would be required for channel, berm, and spoil areas of channel work included in the early-action plan. Forest clearing, induced by implementation of the projects, will not be extensive. Estimates indicate the present forest acreages would decline less than 1 percent.

All channel work has been classified according to existing conditions and type of work required. A summary of the classification is shown in table 78.

Table 78 - Classification of Channel Work in Early-Action Projects, Southwest Louisiana River Basin

| Type of Work 1/ | | Type of Channel Prior to Project 2/ | | Flow Conditions Prior to Project 3/ | |
|---|---|---|---|---|---|
| code | miles | code | miles | code | miles |
| I | 50 | N | 50 | Pr | 70 |
| II | 2,580 | M | 2,650 | I | 50 |
| III | 120 | O | 50 | S | 270 |
| | | | | E | 2,360 |
| Total | 2,750 | | 2,750 | | 2,750 |

1/ Type of work: I - establishment of new channel including necessary stabilization measures; II - enlargement of existing channel or stream; III - cleaning out natural or manmade channel ( includes bar removal and major clearing and snagging operation).

2/ Type of channel prior to project: N- an unmodified, well defined natural channel or stream; M - a manmade ditch or previously modified channel; O - none or practically no defined channel.

3/ Flow conditions prior to project: Pr - perennial flows at all times except during extreme drought; I - intermittent, continuous flow through some seasons of the year but little or no flow through other seasons; S - ponded water, no noticeable flow caused by lack of outlet or high ground water table; E - ephemeral flows only during periods of surface runoff.

The Louisiana Wild Life and Fisheries Commission has inventoried most major streams in the Basin that have fisheries value. These are listed in table 2 of the Appendix. Though not all streams included for work in the early-action plan are listed in the table, the 3,010 miles of streams listed include about 850 miles within early-action project areas. Only 335 miles of the 850 miles are proposed for improvement. Of the 335 miles proposed for improvement, about 300 miles have been altered previously. Only 35 miles of previously unaltered streams are proposed for improvement.

Flow conditions of the 335 miles of channel included in the early-action plan are as follows: About 40 miles have perennial flow; about 20 miles have intermittent flow; about 90 miles hold ponded water; and about 18 miles are ephemeral streams.

4-31721 2-74

Of the 2.4 million acres of wetlands found in the Basin, about 16,250 acres could be physically altered by project installation. The actual acreage would be less than this, however, because opportunities exist where planned spoil placement and water control structures would prevent much land from being drained. In some cases, wetland areas that had been drained previously could be restored.

Installation of the early-action plan would not disturb any known historical or archaeological sites, or unique scenic beauty areas. However, detailed channel locations in each project area will be checked with the Curator of Anthropology, Louisiana State University, and the Louisiana Historical Preservation and Cultural Commission before any excavation begins.

## LAND USE EFFECTS OF RESOURCE DEVELOPMENT

### Crop Production

Food and fiber production projections used in this analysis were derived from OBERS data, a joint effort by the Departments of Commerce and Agriculture. These projections reflect national and regional expectations as conceived in 1967. Since then, world markets and U. S. agricultural production policies and world markets have changed. National population projections have been revised from Series B to Series E (a much lower rate of growth), but new export demands tend to offset this change. Production could be greater and the crop mix different than that represented in this Study. However, the differences between "with" and "without" development conditions should be similar in either case.

Resource development will decrease land requirements for the Basin's projected food and fiber production. Table 79 shows that by 1985, projected land requirements are expected to be 48 thousand acres less than in 1967, and this trend is expected to continue through 2020 when 92 thousand fewer acres will be required. Specified cropland requirements are expected to decline from the base year by over 7 percent, while the acreage requirements without proposed development would increase about 8 percent. The developed condition is expected to require 83 thousand acres less than the without development condition in 1985; by 2000, 143 thousand acres less; and by 2020, 189 thousand acres less. If production requirements should increase dramatically during the projected time frames these effects may not be evident.

Table 79 - Comparative Effects of Projected Land Use for Specified Crops Without and With Resource Development Conditions, 1967, 1985, 2000, and 2020, Southwest Louisiana River Basin

| Condition | 1967 | 1985 | 2000 | 2020 |
|---|---|---|---|---|
| | acres (1,000) | | | |
| Specified crops: | | | | |
| W/O development | 1,241 | 1,276 | 1,285 | 1,338 |
| With development | - | 1,193 | 1,142 | 1,149 |
| Development effects: | | | | |
| From base year | - | -48 | -99 | -92 |
| Projected w/o development | - | -83 | -143 | -189 |

The major reduction in projected usage resulting from proposed development is expected in the three major crops: rice, soybeans, and sugarcane. The greatest net effect of developed resources over non-developed in each time frame will probably be in soybean acreage. In this crop, acreage requirements may be 100 thousand less by 2020. The projected reduction in cropland acreage requirements resulting from development assumes that:

(1) Existing land improvements (e.g., channels, levees, and retarding structures) would be maintained in their current condition,

(2) In the long run, future production of the major crops in this Basin would not increase as a result of further development of Basin resources, and

(3) Over time, economic considerations would increasingly influence land use shifts within the Basin.

If one or more of these assumptions do not hold, the effects of development on land use could be much different. However, to appraise the impact of the proposed resource developments on national income, it was necessary to make these simplifying assumptions.

## Within Basin Shifts of Cropland

Shifts of total cropland acreage within the Basin and between SPG's as a result of the proposed development are expected to be widespread but on a small scale. In 1985, some cropland is expected to be idled in all soil productivity groups. By 2020, the Southern Mississippi Valley Alluvium (frontlands, SPG 1) will have a slight increase in cropland acreage and intensification of land use in comparison to the non-developed condition.

Additional upland soils in the Gulf Coastal Prairies and the Southern Coastal Plains (SPG 15) may be utilized for soybeans. Probably little new land will be converted since there is such a large amount of idled riceland in the area. Riceland is expected to decrease in this area, but not more than that required for soybeans. Less soybeans will be grown in the upland fine, sandy loams of the northwest section (SPG 2) and the clay subsoil bottom lands (SPG 12).

Rice production is expected to increase in the fertile, clay subsoil bottom lands of the Southern Mississippi Valley Alluvium and Gulf Coastal Prairie (SPG 12). More intense use of this fertile and less risky alluvium by rice producers would tend to decrease availability of rotation land for forage production here and probably increase the amount of land in the south central upland available for forage production.

As early as 2000, sugarcane production may become the dominant crop in the frontlands and continue to expand through time frame 2020. In the slightly flatter and more poorly drained silty clay loam bottom land (SPG 10), sugarcane acreage is expected to expand to the limits of resource availability.

4-31721 2-74

Irrigation System Land

In either development situation, there is expected to be enough land with an irrigation system to produce rice. Out of 1.5 million acres of irrigation system land identified in 1967, only about 813 thousand acres are required for rice production, including rotation requirements in any time frame or development situation. The most significant effects of accelerated development on irrigation system acreage were increases of use in the predominantly loess terrace soils (SPG 11) and the fertile, clay subsoil bottom lands (SPG 12) and a decrease in utilization of the upland silt-loam surfaced soils (SPG 15) of the south central part of the Basin.

Rotational and Available Cropland Categories

In the base year 1967, there were 895 thousand acres of cropland categorized as hay-pasture rotational land and other miscellaneous and idle uses. Of this amount, 822 thousand were rotational acres for rice production, but only a part of this acreage was in an active rotational state. In the future, it was assumed that 40 percent of the acres actually used for rice production would be needed for rotation and 25 percent of the acres actually used would be needed for sugarcane fallow. In the long-run, a portion of the actual rotation and fallow land may be used for early maturing soybeans and grain sorghum. Using these assumptions, the projected land-use inventory indicates that the Basin will still have an excess of over half-a-million acres in rice irrigation system land by 2020.

Forage Potential

Potential forage-producing acreage is maintained in both conditions. The net effect of development is to increase the availability of these acreages by about 28 thousand in 1985 and 55 thousand by 2020.

Forest Land

The 2.4 million acres of forest land in the base year is not seriously depleted in either development situation. But from the standpoint of future forest products supply and wildlife habitat, any depletion is viewed with concern. The aggregate effect of the proposed development (table 80) is expected to reduce the necessity for forest conversion by 38 thousand acres in 1985 and 104 thousand by 2020. Depletion of existing forest acreage will include urban and industrial expansion, as well as agricultural incursion in the without development condition, while the developed condition will also include losses due to stream development right-of-way.

Without development, about 40 thousand acres of forest land in the Southern Mississippi Valley Silty Uplands (SPG 2) will be converted to cropland by 2020. With development, no conversion is expected on these soils. Forest acreage on soils of SPG 1 and SPG 10 (Southern Mississippi Valley Alluvium)

4-31721 2-74

in the eastern part of the Basin will be essentially all converted to cropland. Forest cover on other SPG's with large forested acreage will probably remain essentially the same.

Table 80 - Existing Forest Acreage and Projected Acreage Under Different Conditions of Development in the Basin, 1985, 2000, and 2020, Southwest Louisiana River Basin

| Condition | Year | | | |
|---|---|---|---|---|
| | 1967 | 1985 | 2000 | 2020 |
| | acres (1,000) | | | |
| Without development | 2,361 | 2,281 | 2,149 | 2,115 |
| With development | - | 2,319 | 2,282 | 2,219 |
| Effect | - | +38 | +133 | +104 |

The majority of the forest losses expected to occur from agricultural activity are in the soils of SPG 12. Forest clearing in SPG 12 may be reduced by about 40 percent as a result of proposed resource development.

Changes in land use (particularly forest land conversion) which have been experienced in the past have not been entirely due to aggregate economic efficiencies of production. Ownership patterns, individual financial circumstances, and supply control programs have also been influential. This Study focused on the influence of aggregate economic efficiencies and historical land use patterns as surrogates for all the many factors that could influence future land use. Greater national food and fiber production and corresponding Basin production would increase the demands for fertile soils now in forest. In this event, forest conversion would likely be no less with resource development than without. High product prices over an extensive period of time could result in neutralization of reduced forest conversion effects reflected in this analysis.

Total forest acreage within the confines of this Study Area could change drastically in future years if forces of change were directed, without restraint, toward conversion of this land to other uses. In the event of vast forest clearing in highly productive agricultural soils, the forest industry and program would face the option of realizing a smaller total acreage or shifting forest stands to other areas through plantation establishment and management.

ECONOMIC EFFECTS OF RESOURCE DEVELOPMENT

Production Costs

Natural development goals place major importance on the improvement of food and fiber production efficiency. Though the Basin's land resource base has sufficient capacity to produce its projected output of national food and fiber requirements either with or without the proposed development, efficiency gains are expected to occur in the Basin as a result of development. For this Basin, total on-farm cost of production for the six crops which represented about 98 percent of 1967 crop income would in 1985 be reduced from $160.8 million without development to $151.8 million with development. In 2020, without-development costs of $242.9 million would be reduced to $214.1 million by resource development (table 81).

The net national gain as expressed in terms of reduced cost of production as a result of the proposed resource development would be about $9 million annually by 1985, assuming that the early-action program was complete and effective. By 2000, the annual gain would be about $15.7 million. By 2020, with both early-action and long-range projects completed, annual gains in national income would be about $28.8 million. The largest decrease in total cost of production would occur in soybeans and sugarcane production.

Table 81 - Total Cost of Specified Crops Production and Per Acre Effects Under Conditions of With and Without Proposed Resource Development, 1985, 2000, and 2020, Southwest Louisiana River Basin

| Item | Year | | |
|---|---|---|---|
| | 1985 | 2000 | 2020 |
| | dollars (1,000,000) | | |
| Total cost of production: | | | |
| Without | 160.8 | 190.3 | 242.9 |
| With | 151.8 | 174.6 | 214.1 |
| Net National gain | 9.0 | 15.7 | 28.8 |
| | dollars | | |
| Increased average cost per cropped acre | 1.23 | 4.80 | 4.80 |
| Increase in net returns per base year acre | 7.25 | 12.65 | 23.21 |

The more productive and intensive activity induced by development will result in average per-cropped-acre cost increases of $1.23 in 1985 and $4.80 in 2000 and 2020. Greater productivity per acre will conversely cause increases in the net income per composite acre of $7.25 in 1985 and $23.21 in 2020. The significance of these data is that accelerated development would not result in less cost per acre to produce food and fiber but that production efficiencies would permit lower cost per unit of product Fewer acres would be required to produce the projected quantity at less total cost. National efficiency gains would result from production shifts out of less productive soils, lower total acreage requirements, and reduced operating costs.

4-31721 2-74

## Value of Crop Production

Total value of the crop production-mix representing the Basin is the same for either the nonaccelerated or the accelerated development condition since the land resource is no limitation to projected production. In terms of adjusted normalized prices[1/] total value from the Basin's crop production would be $215.9 million in 1985, $254.3 million in 2000, and $315.4 million in 2020 (table 82).

The Basin's national efficiency gains due to resource development are essentially the same whether expressed as production cost decreases or as net income increases (tables 81 and 82). Average net income gains per acre are expected to increase at each time frame resulting in per-cropped-acre gains of $7.54 in 1985, $13.75 in 2000, and $25.07 by 2020.

Table 82 - Total Value of Specified Crops Production and Per-Acre Net Income Effects Under Conditions of Accelerated Development, 1985, 2000, and 2020, Southwest Louisiana River Basin

| Item | Year | | |
|---|---|---|---|
| | 1985 | 2000 | 2020 |
| | dollars (1,000) | | |
| Total value of crop production, either condition | 215.9 | 254.3 | 315.4 |
| Increased net income per cropped acre | 7.54 | 13.75 | 25.07 |

## Distribution of Income

To measure income distribution effects, four subareas composed of soil productivity groups (see table 3, page 36) with predominant characteristics are thus identified as : (1) northwest uplands, (2) central uplands, (3) south and south-central uplands and marsh, and (4) bottom lands. Total agricultural income of these subareas at time from 2020 should provide an indication of the long range income distribution effects of proposed resource development as compared to the projections representing no accelerated development. Table 83 shows how crop production gross income is expected to be geographically distributed without accelerated resource development. Gross income would be heavily weighted to the bottom lands

1/ Normalized prices are estimates derived from mathematically fitted (non-linear) long-term trend lines which remove abnormalities caused by extreme weather and other short-term circumstances. Interim Price Standards for Planning and Evaluating Water and Land Resources, Interdepartmental Staff Committee, WRC, Washington, D. C., 1966.

and the south-central uplands similar to the distribution in the base year of this Study. The $147.5 million bottom lands gross income would be from a variety of crops, the south-southcentral income of $125.3 million would be primarily from the Basin's major crop, rice, while the northwest and central upland incomes, $17.3 and $25.3 million respectively, would be heavily dependent on the expansion of soybeans production and the maintenance of cotton. The northwest uplands would be especially dependent on soybeans (growing on 90 thousand acres out of a total of 135 thousand acres of cropland).

The proposed USDA program would not alter the general pattern of subarea crop production income within the Basin but would tend to accentuate the distribution (table 83). With development, soybeans production would not be expected to expand so noticeably in the northwest uplands thus causing that subarea to share in crop income increases to a lesser extent, while the bottom lands income would increase more. By 2020, the northwest uplands would achieve almost $10 million less gross income and the bottom lands would gain almost $12 million. Gross income changes in the other upland subareas were not extensive. Gross income reductions in the flatwoods of the central uplands would be offset by increases in the benefited portion of the loess terrace area.

Table 83 - Projected Long Range Sub-Area Gross Income From Specified Crops and Income Shifts Resulting from Resource Development 2020, Southwest Louisiana River Basin

| Development | Northwest Uplands | Central Uplands | South and South-central Uplands | Bottom lands |
|---|---|---|---|---|
| | dollars (1,000,000) | | | |
| Without | 17.3 | 25.3 | 125.3 | 147.5 |
| With | 7.5 | 28.0 | 120.7 | 159.2 |
| Effect | -9.8 | +2.7 | -4.6 | +11.7 |

Increase of gross income in the bottom lands was not attributable to increased forest conversion to cropland or more total acres. Development caused increased per acre income and concurrently reduced total land requirements to maintain the Basin's projected position of importance. As a result, less acreage was required in the less productive and/or non-benefited areas.

## Inducement to Further Economic Activity

Three assumptions underlying this analysis were given at the beginning of the Impacts section. The second was that "in the long run, future production of the major crops in the Basin would not increase as a result of further development of Basin resources". In this section, this assumption is relaxed to get an estimate of possible regional gains of resource development. While this assumption is likely to hold for the country as a whole, its validity may decline as the area under consideration decreases in size. In the extreme case, one would expect a single farm to increase production if its resources were developed (i.e., displacement effects would be outside of the "farm gate"). In the case of the Southwest Louisiana Basin Area, this assumption is considered most likely valid because, (1) at least a portion of the Nation's marginal agricultural resources are in the Basin, and (2) national income effects of resource development are approximated even if the production displaced by development in the Southwest Louisiana River Basin Area is outside of the area. Thus, it is felt that net "regional effects" of development are probably no more than national effects. Nevertheless, the probable maximum regional effect is indicated here to gain perspective.

The year 2020 is the time frame used to describe the regional effects in this conceptual evaluation. The soils on which regional development gains may occur are SPG's 2, 8, 11, 12, and 15. See table 84.

Table 84 - Acreage on Which Crop Production Could Expand if the Basin's Production Were Expanded Beyond its Historical Position of Importance to National Production, 2020[1/], Southwest Louisiana River Basin

| Use Category | Soil Productivity Group | | | | |
|---|---|---|---|---|---|
| | 2 | 8 | 11 | 12 | 15 |
| | acres (1,000) | | | | |
| Available cropland | 12.1 | 0.1 | 51.1 | - | 137.5 |
| Pastureland | 18.4 | - | 75.1 | - | - |
| Forestland | 62.8 | - | 14.6 | 35.8 | - |
| Total | 93.3 | 0.1 | 140.8 | 35.8 | 137.5 |

1/ Subject to qualifications stated in the text of this report.

Crop production expanded to the benefited SPG's would not reduce Basin pasture acreage nor would forest conversion exceed trends projected in the "Economic Base Report" for this Basin. SPG's 2, 11, and 12 are the higher quality soils. SPG's 8 and 15 are marginal.

Differences in net returns between non-developed and developed acres are used to represent economic values for regional expansion effects. If the higher quality cropland acres idled by resource development were instead used for crop production, the 63.2 thousand acres benefited by resource development would produce $1.6 million additional net income to the Basin (table 85). Expansion to include 137.6 thousand acres in SPG's 8 and 15 would increase additional net income by $3.4 million for a total of $5.0 million.

If production were expanded to include pastureland in the benefited portions of SPG's 2 and 11, economic gains could be realized from 93.5 thousand additional acres (table 85). There would be no loss of total pasture in the basins as a whole because large amounts are available for use change from cropland to pasture in other SPG's. The economic value of this expansion would be an additional $3.6 million of gross income. Efficiency gains as a result of resource development would be $2.3 million.

Table 85 - Additional Income Effects of Proposed Resource Development at Various Levels of Expanded Production, 2020, Southwest Louisiana River Basin

| Expansion | Area | Additional Gross Income | Additional Efficiency Gains |
|---|---|---|---|
| | acres (1,000) | -------dollars | (1,000,000)-- |
| Available cropland | 63.2 | 2.5 | 1.6 |
| Improved marginally responding available cropland | 137.6 | 5.3 | 3.4 |
| Pastureland | 93.5 | 3.6 | 2.3 |
| Forestland | 113.2 | 4.4 | 2.8 |
| Total | 407.5 | 15.8 | 10.1 |

Basin cropland production could also expand on converted forest land in the qualified soils at the expense of the forest products industry and recreational resource base. The 113.2 thousand acres of forest lands that would be benefited by proposed resource development and with which additional income to the Basin would be associated are located in SPG's 2, 11, and 12 (table 85). Additional gross income as a result of resource development on this land would be $4.4 million and additional efficiency gains would amount to about $2.8 million.

If production expansion occurred in each of the described categories to the extent indicated, it would amount to 407.5 thousand additional acres of USDA program improved cropland which would contribute about $15.8 million in additional net income to the basins or about $10.1 million in efficiency gains as compared to the non-developed condition (table 85). Each of these levels of expanded production may be viewed by various interests as the maximum extent of possible or potential intrusion of cropland into other existing land use categories or even future land needs. They do, however, permit perspective in potential efficiency gains to expanded crop production as a result of the proposed USDA program.

4-31721 2-74

## PERSPECTIVE OF ALTERNATIVE PRODUCTIVITY LEVELS

Alternative future conditions in the Southwest Louisiana River Basin Area were examined to provide additional perspective in determining policies for future resource development. These conditions were incorporated into the analyses as variations in yield per acre. The various alternative land use requirements are shown in table 86.

Table 86 - Acreage Requirements for Specified Crops in the Base Year and Projected Requirements Under Various Conditions, 1985, 2000, and 2020, Southwest Louisiana River Basin

| Year | Base | W/O Dev. | Alternative Without Development 1 | 2 | 3 | 4 | With Dev. |
|---|---|---|---|---|---|---|---|
| | acres (1,000) | | | | | | |
| 1967 | 1,241 | - | - | - | - | - | - |
| 1985 | - | 1,276 | 1,154 | 1,404 | 1,397 | 1,271 | 1,193 |
| 2000 | - | 1,248 | - | - | - | - | 1,142 |
| 2020 | - | 1,338 | 1,248 | 1,497 | 1,486 | 1,312 | 1,149 |

Alternative 1 includes yield coefficients which were 10 percent higher than the principal analysis in all time frames. These may be conceived as representative of an accelerated rate of technology adoption even though risk is increased due to lack of further resource development. Under these conditions, the Basin would utilize little or no more acreage in the future than in the base year, though producing significantly more product. This condition requires as little as 122 thousand acres less than the principal non-developed condition. Compared with the proposed development condition, Alternative 1 required 39 thousand less acres in 1985; but by 2020, it required 99 thousand acres more. Thus, the 10 percent yield increase due to possible accelerated technology adaptation was a sufficient substitute for accelerated resource development in the earlier time frames; but in the long-run, this approach to increasing productivity requires more acreage. The results of this alternative could also be indicative of the acreage requirements for a 10 percent reduction in production from the area.

A second alternative condition included yield coefficients which were 10 percent lower than those in the principal analysis and could be conceived of as an indicator of conditions if the principal yield projections were too high in general. Under these conditions (reduced productivity) there would be a much greater demand on land resource beginning in the early time frames. Over 160 thousand more acres would be required by 1985; and in the long-run, this level of productivity would require about 256 thousand acres of cropland more than is now being utilized. When compared to the proposed development estimates, approximately 211 thousand acres more cropland would be needed in 1985 and 348 thousand more in 2020.

A third alternative reflected rice yields which approximated the levels anticipated by some Louisiana specialists. These productivity projections were lower than any of the other projections, anticipating only 5 cwt. increase by 1985 and a 13 cwt. additional increase by 2020. Reduced yield levels in rice alone increased cropland requirements about as much as when reducing yields by 10 percent for all crops. This additional acreage of rice would create excessive demand on available irrigation system land because there is about 1.5 million acres of this resource in the Basin, and the greatest amount required for production and rotation would be less than a million acres. However, in a situation where there are growing demands for land, rising land costs, and competition from other producing regions with higher productivity levels, the social and economic costs of the additional acreage requirements could be significant unless combined with other productive activities so as to reduce overhead costs.

A fourth alternative condition permitted more conversion of forest land to cropland in high producing soil groups. This resulted in additional forest clearing while maintaining the Basin production. Only 71 thousand more acres of cropland were required in 2020 than in the base year. This analysis resulted in the conversion of about 65 thousand more acres of forest land to cropland uses than the principal analysis.

A comparison of these alternative conditions with the proposed development condition indicates that two circumstances equal or better the proposed development effects by 1985, i.e., accelerated technology adaptation and more extensive conversion of productive soils now occupied by forest. Either or both of these options are obviously being utilized now and will be means in the future. However, there will continue to be mounting social and political pressure to effectively police and/or set policy for limitations on those means of expanding productivity. By 2020, the beneficial effects of either accelerated technology or forest conversion were not as great as the proposed resource development. By that time, the first alternative required 99 thousand more acres, and the fourth alternative required about 163 thousand acres more than the proposed resource development.

## FOREST LAND TREATMENT

### Timber Management

Each of the following four approaches under Alternative B on page 148 is designed to increase the production of wood in the Study Area by 61 million cubic feet by 2020. A brief description of each alternative follows: (1) Alternative B-I is an accelerated program based on maximum forestation (planting) effort; (2) Alternative B-II is based on a maximum timber stand improvement (TSI) program; (3) Alternative B-III is a program balanced between a maximum planting and a maximum TSI alternative; and (4) Alternative B-IV is a direct payment incentive program which should increase the projected forest acreage base by about 0.13 percent.

Figure 28 provides a summary for each alternative of work that would be done, the cost, and subsequent effect on range, wildlife, and erosion

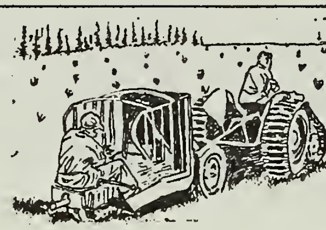
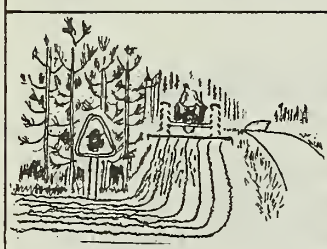
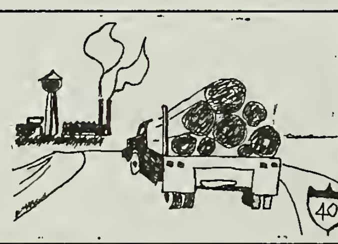
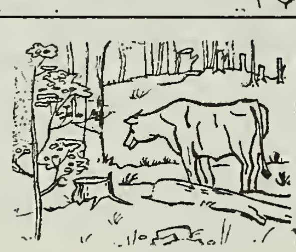
| ALTERNATIVE **B** | | I | II | III | IV |
|---|---|---|---|---|---|
| COST PER YEAR $ (thousand dollars) | Fire | 443 | 443 | 443 | 443 |
| | Forestation | 1,153 | 626 | 377 | 452 |
| | TSI | 22 | 342 | 373 | - |
| | Other | 7 | 11 | 10 | 369 |
| | TOTAL | 1,625 | 1,422 | 1,203 | 1,264 |
| FORESTATION (thousand acres) |  | 813 | 440 | 265 | 380 |
| STAND IMPROVEMENT (thousand acres) |  | 62 | 942 | 1,026 | NONE |
| FIRE PROTECTION (thousand acres) |  | 2,500 | 2,500 | 2,500 | 2,500 |
| WOOD PRODUCTS (thousand cubic feet) |  | 61,000 | 61,000 | 61,000 | 61,000 |
| RANGE (thousand animal unit months) |  | -192 | -192 | -192 | -192 |
| WILDLIFE (thousand hunter days)  | deer | + 3 | + 98 | +111 | - 2 |
| | squirrel | - 23 | + 21 | + 29 | - 12 |
| | TOTAL | - 20 | +119 | +140 | - 14 |
| EROSION & SEDIMENT (tons/acre/year)  | without program | 1.27 | 0.94 | 0.78 | 0.56 |
| | with program | 1.20 | 0.88 | 0.72 | 0.50 |

Figure 28 - Comparative Analysis of Four Accelerated Forest Management Approaches under Alternative B in 2020, Southwest Louisiana River Basin.

and sediment. The average costs used in the computations by practices were $32 per acre for forestation, $12 per acre for TSI, and $8 per acre for incentive payments. Also, costs[2/] per year reflect interest and amortization on equal annual increased investments for a 20-year period of implementation. Regeneration includes site preparation and planting on poorly stocked areas for Alternatives B-I, B-II, and B-III but includes only planting for Alternative B-IV. Timber stand improvement includes deadening undesirable hardwood on moderately stocked areas. The application of a selected alternative would begin by 1980 and be completed by 2000.

## Erosion

The erosion rates under alternative conditions "with" and "without" accelerated forest land treatment are given in table 87. Comparing present erosion rates with accelerated rates indicate that for Alternative B-I, the rate is compounded by two and one-half times present rate, for Alternative B-II, almost two times, for Alternative B-III, one and one-half times, and for Alternative B-IV, about equal to the present rate.

Table 87 - Erosion Rates Under Alternative Conditions With and Without Watershed Program for Accelerated Forest Land Treatment Program, Southwest Louisiana River Basin

| Alternative Condition | Year 1970 | 1980 | 2000 | 2020 |
|---|---|---|---|---|
| | ---tons per acre per year--- | | | |
| | | WITHOUT PROGRAM | | |
| No Accelerations | 0.54 | 0.56 | 0.57 | 0.58 |
| B-I | 1/ | 1.27 | 1.30 | 1.27 |
| B-II | 1/ | 0.94 | 0.96 | 0.94 |
| B-III | 1/ | 0.78 | 0.80 | 0.78 |
| B-IV | 1/ | 0.56 | 0.57 | 0.56 |
| | | WITH PROGRAM | | |
| No Accelerations | 0.48 | 0.48 | 0.49 | 0.50 |
| B-I | 1/ | 1.20 | 1.22 | 1.20 |
| B-II | 1/ | 0.88 | 0.88 | 0.88 |
| B-III | 1/ | 0.72 | 0.72 | 0.72 |
| B-IV | 1/ | 0.50 | 0.49 | 0.50 |

1/ Acceleration would begin in 1980.

2/ Costs are based on a minimum return of 5½ percent on forestry investments and prices of lumber averaging 30 percent above 1970 prices.

4-31721 2-74

With a watershed protection program combined with the accelerated land treatment program, the rates for Alternative B-I will decrease by 6 percent, for Alternative B-II, by 6 percent, for Alternative B-III, by 7 percent, and for Alternative B-IV, by 11 percent between 1980 and 2000.

## Range

The forest range habitat objective is to recognize its full potential of Animal Unit Months (AUM) with no attempt to maximize forage production by cultural practices.

Since the amount of available forage varies inversely to wood production and basal area, and since "pine regeneration is the major deterrent to long term increases in forage production"3/, variable production capacities were applied to "present-trend" forest management practices and to the intensified forest management programs described in the 1972 publication by the U. S. Forest Service, "Forest Range Evaluation System".

The present annual use of forest lands for forage use is estimated at 120,000 AUM's - less than 14 percent of the sites' capacity.

Since the projected demands are considerably less than 20 percent of the potential supply from even the most intensively managed forest lands, no effort was made to refine the data by the alternative management strategies. Also, the data for forage resources were not sophisticated enough to make comparison among the accelerated forest management alternatives. So a simple comparison between normal and intensified forest management strategies showed that one could expect about a 25 percent reduction from 834,000 potential AUM's to 642,000 AUM's, for a net loss of 192,000 AUM's for each approach under Alternative B (figure 28).

## Wildlife

The forest wildlife habitat objective is to obtain full use of the wildlife habitat available with no attempt to maximize wildlife production by cultural practices. The impacts measured are those due solely to the accelerated forest management alternatives.

Since forage and carrying capacities vary inversely to basal area, stocking, and crown cover, and vary directly to rotation ages and soil fertility; since deer habitat varies among forest cover types; since squirrel habitat varies from excellent in hardwood to very poor in pine; since the acreage of softwoods and hardwoods in the Basin are almost equal, and this ratio is not expected to vary; and, if the forestation practices are directed to softwood production and shorter rotations; and, if the stand improvement practices are aimed at improving hardwood stands;

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3/ Forage Production... in a Southern Pine-Hardwood Stand, R. M. Blair, Forest Service Vo. 17, No. 3. Sept. 1971, pp. 279-284.

4-31721 2-74

then, the differences in animal capacities can be determined and applied to the relative practices in each forest management alternative and the results are indicated in figure 28.

Areas of regeneration and planting reduce the animal carrying capacity for both deer and squirrel, whereas areas of timber stand improvement increases the carrying capacity for deer and squirrel. Carrying capacity is expressed in hunter days based on a 20 percent harvest. Therefore, the impact of forest land treatment under Alternative B-I on wildlife would be a net gain of 3,000 hunter days for deer and a loss of 23,000 hunter days for squirrel. Under Alternative B-II, there would be a net gain of 98,000 hunter days for deer and a net gain of 21,000 hunter days for squirrel. Under Alternative B-III, there would be a net gain of 111,000 hunter days for deer and a net gain of 29,000 hunter days for squirrel. Under Alternative B-IV, there would be a net loss of 2,000 hunter days for deer and a net loss of 12,000 hunter days for squirrel.

## SURFACE FLOW AT DOWNSTREAM LOCATIONS

### Flood Stages

Analyses were made to indicate effects, if any, the aggregate USDA potential programs would have on stream stages at downstream locations. Since the potential for future watershed development is greatest in the Mermentau Basin, this basin was selected for analyses. Estimates for the remaining basins were not made.

Before the analyses were begun, a conference involving the Department of Public Works, the Corps of Engineers, and the Soil Conservation Service was held to review the task, exchange information, and coordinate procedures. At this initial meeting, it was agreed that hydrograph routings would give acceptable indications of stage changes when routing parameters could be verified. Routing parameters could be considered properly selected when, for some historical storm events, routed hydrographs compare reasonably well with recorded hydrographs at gaging station.

The Mermentau Basin above Lake Arthur was set up for computer routing using the Soil Conservation Service developed computed program for project formulation. The historical storms of February 1955 and April 1967 were used to verify routing parameters. Routing parameters were adjusted so that routed hydrographs for these two storm events compared favorably with actual recorded hydrographs at the Basile, Eunice, and Mermentau stream gage locations. A 48-hour synthetic storm was routed through the Basin under assumed alternative watershed conditions; six frequencies spanning from a 2-year event to a 100-year event of this storm were used to establish corresponding stage elevations at several key locations.

Results of the routing are summarized at Basile, Eunice, and Mermentau gage locations. At the Basile location, stages resulting from installation of three presently authorized watershed projects - Upper Bayou Nezpique, Bayou Blue, and Duralde des Cannes - would be reduced an average of about 1.8 feet over without-project conditions. Installation of the Basin early-action plan would not cause any additional changes. At the Eunice location, stages resulting from installation of the authorized Duralde-des Cannes watershed project would be increased an average of about 1 foot over without-project conditions. Installation of the Basin early-action plan would not cause any additional changes. At the Mermentau location, installation of either the three authorized watershed projects or the Basin early-action plan will not cause any significant stage changes over without-project conditions. In summary, installation of the total potential watershed program will not cause any detrimental stage effects downstream.

Stream Yield

The Soil Conservation Service made estimates of the effects of the potential agricultural program on annual stream yield.

A calculation was made at the Bayou Nezpique stream gage location near Basile. The potential upstream watershed program above this gage was assumed in place. The method employed considered the effects of land treatment, stock ponds, and permanent pools of upstream reservoirs. Also, it considered net accretion to base flow at the gage.

Results of the computations at this gage indicate that annual yield would be reduced less than 2 percent during years of normal precipitation, less than 3 percent during drought years, and less than 1 percent during wet years. These results should be regarded as approximations only because the net effect could be well within the error of measuring water yield from the gaged area. Similar studies in other areas indicate that significant depletions become apparent only in arid, semi-arid, and dry sub-humid regions; the effect becomes negligible in humid areas of high rainfall.

Experimental research data from small watershed plots show that a sound program of conservation farming increases infiltration rates. The same is true for large watersheds. However, in very large areas, compensating changes in land treatment practices are likely to occur. Also, in some cases, it is apparent that water which enters the soil as infiltration will appear later as surface runoff at some downstream point.

Gross annual lake surface evaporation losses are about 50 inches, reservoir net evaporation losses are about 6 inches. Losses, if any, would come mainly from farm pond pools.

Reservoir seepage is not expected to produce any significant changes in stream yield because the construction procedures used to build reservoirs are designed to minimize seepage losses.

RURAL ELECTRIFICATION

Rural power use has been increasing steadily since 1955. The present supply is adequate and is supplied by several electric cooperatives. The co-ops have the capability to serve all the area, and they have the potential to expand and meet the expected increased power use. The increased power use should come from increased rural population, and added uses of electricity in the home and around the farm.

# COORDINATION AND PROGRAMS FOR FURTHER DEVELOPMENT

## ALTERNATIVE APPROACHES CONSIDERED

Alternative plans involving separate costs and benefits were not prepared during Study investigations. Consequently, a summary for comparison of alternative plans cannot be presented. However, alternative approaches and measures were employed in evolving the early-action plan. These are:

1. Watershed protection, flood prevention, and drainage

    a. Application of land treatment measures only - Though very effective for erosion and sediment reduction, these measures do not provide adequate protection against floodwater damages. Also, these measures do not provide outlets which are required for on-farm drainage systems to function effectively.

    b. Flood plain zoning restrictions - Flooding of buildings and other structures is not a major problem in the watersheds. Restrictions in land use would be impracticable. This alternative would reduce damages, but seriously impair the agricultural economy of much of this area.

    c. Floodwater retarding structures - Most early-action project areas are flatland farming areas. Reservoir site locations to effectively reduce floodwater damages are not available.

    d. Levees and diversions - These have been used judiciously throughout early-action project plans, primarily in the interest of fish and wildlife.

    e. Alternative channel locations - Channel locations in project areas were planned to provide a degree of flood protection and drainage that would remove these major limitations to crop production. Also, construction of these channels would not destroy and known historical, archeological, or paleontological sites. However, exact locations of all channels will be made during later planning stages in coordination with appropriate Federal, State, and local groups.

2. Recreation

    a. Development from other sources - The recreational needs computed for the Basin allow for development from private, State, and other Federal sources.

b. Development on existing water areas - Recreational needs for the Basin have been discounted to allow for access sites and facility development on existing water areas. Much of this type development is planned by other sources during the early-action period. However, new water areas are needed in certain parts of the Study Area in order to be reasonably accessible to some population segments.

3. Fish and Wildlife

a. Development versus preservation - Scenic streams in Louisiana have been identified and designated by law. Additional streams have been identified for this purpose by State agencies but have not yet been designated by law. The USDA early-action plan is compatible with both the scenic streams designated by law and those recommended for same.

b. Mitigation measures - Each early-action watershed project plan has been formulated with consideration for fish and wildlife resources. Low-water weirs and dams were included where recommended by fish and wildlife biologists. These can be used to control stream water levels favorable to fish and wildlife. Several of the weirs and dams can be used to make "green tree reservoirs" - shallow water areas that waterfowl use for feeding and resting. Exact locations and numbers of these measures will be determined in detailed planning stages.

c. Alternative channel locations - Within each project area, channel locations were selected in consideration of both agricultural and environmental impacts. That is, benefits to agricultural productions, fish and wildlife resources, and environmental quality will be obtained. Channels that would primarily drain forest were not included in the plan. Swamps and wetland areas that had wildlife or fishery value were left undisturbed, usually by routing the channel around the area or terminating the channel safely above or below the area. Appurtenant structures for water control were planned in channels where recommended by fish and wildlife biologists.

d. Channel construction procedures - Where feasible, planned channels will be constructed from one side only. This will leave trees or other existing vegetation on the opposite side. This work will be planned by a fish and wildlife biologist. All areas that are disturbed during construction will be fertilized and seeded immediately following construction. This will help prevent soil losses. The vegetation used for seeding will depend on the time of year the work would be done. Where recommended by biologists, spoil from channel excavation can be placed judiciously along the channel to prevent wet areas from being drained or to create new wet areas.

4. Multiple-use management programs

The Study Area has large acreages of forest land managed largely for timber production by Federal, State, and private groups. Programs that produce recreation, timber, and wildlife have been considered in satisfying the wide range of increasing demands on these resources.

PROJECTS, PROGRAMS, OR MEASURES NEEDED BUT NOT PRESENTLY AVAILABLE THROUGH USDA PROGRAMS

It would appear that new programs are needed in several areas of concern. Details of the programs are not intended to be worked out; only the areas of concern are mentioned.

1. Private land has a great potential for meeting fishing, hunting, and other recreational needs, but much of this land is barred to public use. Programs that would provide economic return to the landowner could open much of this land for public use. Additional development or management could be fostered by making low interest loans available for such purposes, or by providing a tax incentive for this type development.

2. The uses of many lakes and water bodies in the South have been seriously restricted by unwanted vegetative growth. All new lakes lose nearly all their fishing value within 5 years, and by this time, much of their value for other types of recreation has been lost. A more intensive research program devoted to clearing water bodies of detrimental vegetative growth could do much to increase the productive, aesthetic, and recreational values of existing water bodies.

3. A tremendous need exists for recreational facilities. A program is needed to provide low-interest loans to private developers who will build facilities for public use. This would help relieve the pressure of Federal and State governments operating and maintaining numerous areas.

4. Some sections of the Internal Revenue Code provide a decided encouragement to investment in corporate forestry enterprises by reducing the effective tax rate. The rapid increase in investment[1/] in timber growing since World War II is proof of its effectiveness. However, presently the Code favors the gain from product manufacturing rather than the growing of raw wood. Similar revisions in the Code would promote incentive for the private forest landowner.

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1/ Briggs, C. W., 1962 Tax treatment of timber 4th edition, Washington, D. C. Forest Industries Committee on Timber Valuation and Taxation.

4-31721 2-74

## PROGRAMS OF OTHER AGENCIES

The Corps of Engineers, the Louisiana Department of Public Works, the Louisiana Wild Life and Fisheries Commission, the Louisiana State Parks and Recreation Commission, and the Louisiana Highway Department have proposed works within the Study Area. To the extent possible at this time, coordination of future projects and proposals has been made with these groups. As planned projects are completed in the future, revisions in the original plan may be necessary to enhance project compatability.

## POTENTIAL DEVELOPMENTS NEEDING FURTHER COORDINATION WITH OTHER AGENCIES

The presently authorized watershed project Bayou Cocodrie-Grand Louis (CNI's 10-12 and 11-10) will require further coordination with the Corps of Engineers. The Corps is considering improvement in the Lower Bayou Boeuf area with additional openings through the West Atchafalaya Floodway Levee near the present drainage structures. Design elements of the two projects should be coordinated before construction is initiated.

The Study has identified the general areas where single-purpose reservoir construction would help fulfill future recreational needs. Since the State Parks and Recreation Commission has a statewide development plan for recreation, plan details should be coordinated with this agency at the time sites become more specifically located pending imminent construction. Also, plan details and site locations would have to be coordinated with the Forest Service if site locations involved National forest lands.

4-31721 2-74

Exhibit 1 - Inventory Land Use by Soil Productivity Group[1/]
Southwest Louisiana River Basin

| Land Use Category | Basin Total | Soil Productivity Group 01 | 02 | 03 | 04 | 05 | 06 | 07 |
|---|---|---|---|---|---|---|---|---|
| | acres | | | | | | | |
| Cropland | 2,323,396 | 79,267 | 102,368 | 32,633 | 0 | 0 | 16,895 | 9,010 |
| Cropland, No Irrigation System | 808,196 | 76,160 | 85,951 | 32,633 | 0 | 0 | 8,706 | 9,010 |
| Corn and Sorghum | 98,537 | 5,710 | 12,875 | 1,915 | 0 | 0 | 251 | 1,534 |
| Corn | 92,331 | 5,350 | 12,064 | 1,794 | 0 | 0 | 235 | 1,426 |
| Sorghum | 6,206 | 360 | 811 | 121 | 0 | 0 | 16 | 108 |
| Other Row Crops | 492,077 | 62,947 | 44,407 | 12,812 | 0 | 0 | 4,955 | 4,589 |
| Soybeans | 253,354 | 28,186 | 24,300 | 3,050 | 0 | 0 | 3,555 | 1,589 |
| Cotton | 71,135 | 14,071 | 15,919 | 7,665 | 0 | 0 | 1,400 | 2,600 |
| Sugarcane | 107,585 | 17,400 | 500 | 0 | 0 | 0 | 0 | 0 |
| Sweet Potatoes | 36,525 | 500 | 1,000 | 0 | 0 | 0 | 0 | 0 |
| Other Vegetables | 5,808 | 750 | 552 | 287 | 0 | 0 | 0 | 400 |
| Miscellaneous Row Crops | 17,670 | 2,040 | 2,136 | 1,810 | 0 | 0 | 0 | 0 |
| Close Grown Crops | 45,055 | 0 | 8,100 | 13,302 | 0 | 0 | 2,000 | 0 |
| Rotation Hay-Pasture | 24,151 | 1,359 | 461 | 0 | 0 | 0 | 0 | 0 |
| Hayland | 19,168 | 1,264 | 4,837 | 0 | 0 | 0 | 0 | 0 |
| Conservation Use Only | 80,516 | 2,600 | 10,064 | 4,434 | 0 | 0 | 1,500 | 1,520 |
| Temporarily Idle Cropland | 35,757 | 2,000 | 2,432 | 170 | 0 | 0 | 0 | 1,367 |
| Orch. Vine.-Bush Fruit | 3,137 | 280 | 2,175 | 0 | 0 | 0 | 0 | 0 |
| Openland, formerly cropped | 9,798 | 0 | 600 | 0 | 0 | 0 | 0 | 0 |
| Cropland, With Irrigation System | 1,515,200 | 3,107 | 16,417 | 0 | 0 | 0 | 8,189 | 0 |
| Corn and Sorghum | 3,054 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Corn | 3,054 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sorghum | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Row Crops | 129,000 | 593 | 2,727 | 0 | 0 | 0 | 2,294 | 0 |
| Soybeans | 124,000 | 456 | 2,510 | 0 | 0 | 0 | 2,198 | 0 |
| Cotton | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sugarcane | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sweet Potatoes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Vegetables | 1,000 | 68 | 135 | 0 | 0 | 0 | 21 | 0 |
| Miscellaneous Row Crops | 4,000 | 69 | 82 | 0 | 0 | 0 | 75 | 0 |
| Close Grown Crops | 552,300 | 2,134 | 3,289 | 0 | 0 | 0 | 1,198 | 0 |
| Rice | 547,000 | 1,597 | 2,811 | 0 | 0 | 0 | 1,181 | 0 |
| Other | 5,300 | 537 | 478 | 0 | 0 | 0 | 17 | 0 |
| Rotation Hay-Pasture | 798,696 | 380 | 8,048 | 0 | 0 | 0 | 2,250 | 0 |
| Hayland | 3,150 | 0 | 1,000 | 0 | 0 | 0 | 0 | 0 |
| Conservation | 2,000 | 0 | 1,000 | 0 | 0 | 0 | 1,000 | 0 |
| Temporarily Idle Cropland | 27,000 | 0 | 353 | 0 | 0 | 0 | 1,447 | 0 |
| Pasture and Range | 913,089 | 17,949 | 48,633 | 19,554 | 1,492 | 1,548 | 5,394 | 2,052 |
| Pasture | 534,387 | 17,949 | 48,633 | 19,554 | 1,492 | 1,029 | 5,394 | 2,052 |
| Range | 378,702 | 0 | 0 | 0 | 0 | 519 | 0 | 0 |
| Forest | 2,361,087 | 1,596 | 168,959 | 182,011 | 11,724 | 47,088 | 80,723 | 668 |
| Not Grazed | 430,225 | 205 | 20,710 | 11,510 | 0 | 5,404 | 5,551 | 668 |
| Grazed | 1,930,862 | 1,391 | 148,249 | 170,501 | 11,724 | 41,684 | 75,172 | 0 |
| Other Land | 886,305 | 10,944 | 11,168 | 1,408 | 0 | 0 | 2,698 | 2,935 |
| Total Inventory Land | 6,483,877 | 109,756 | 331,128 | 235,606 | 13,216 | 48,636 | 105,710 | 14,665 |

Continued-

Exhibit 1 - Continued

| Land Use Category | Soil Productivity Group 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|
| | acres | | | | | | | |
| Cropland | 39,390 | 10,017 | 36,343 | 249,157 | 476,931 | 579,929 | 137,640 | 512,077 |
| Cropland, No Irrigation System | 18,428 | 1,860 | 27,510 | 165,154 | 224,640 | 116,131 | 20,636 | 17,597 |
| Corn and Sorghum | 483 | 1,290 | 1,396 | 28,570 | 21,980 | 17,718 | 1,918 | 2,897 |
| Corn | 453 | 1,210 | 1,307 | 26,771 | 20,596 | 16,602 | 1,808 | 2,715 |
| Sorghum | 30 | 80 | 89 | 1,799 | 1,384 | 1,116 | 110 | 182 |
| Other Row Crops | 10,907 | 0 | 14,187 | 93,505 | 168,402 | 53,076 | 12,788 | 7,712 |
| Soybeans | 2,000 | 0 | 0 | 51,474 | 84,000 | 41,217 | 9,468 | 2,725 |
| Cotton | 6,557 | 0 | 0 | 10,560 | 4,497 | 4,646 | 1,720 | 1,500 |
| Sugarcane | 0 | 0 | 13,000 | 0 | 76,685 | 0 | 0 | 0 |
| Sweet Potatoes | 0 | 0 | 0 | 28,350 | 0 | 4,500 | 0 | 2,175 |
| Other Vegetables | 500 | 0 | 0 | 1,107 | 1,220 | 780 | 0 | 212 |
| Miscellaneous Row Crops | 1,850 | 0 | 1,187 | 2,014 | 2,000 | 1,933 | 1,600 | 1,100 |
| Close Grown Crops | 2,000 | 0 | 0 | 3,748 | 0 | 13,905 | 2,000 | 0 |
| Rotation Hay-Pasture | 467 | 0 | 0 | 7,761 | 3,076 | 8,825 | 1,279 | 923 |
| Hayland | 720 | 200 | 5,324 | 3,777 | 0 | 0 | 214 | 2,832 |
| Conservation Use Only | 1,900 | 200 | 3,000 | 17,434 | 16,000 | 20,248 | 1,116 | 500 |
| Temporarily Idle Cropland | 1,300 | 170 | 3,403 | 8,155 | 11,463 | 1,986 | 1,321 | 0 |
| Orch. Vine.-Bush Fruit | 309 | 0 | 200 | 0 | 0 | 173 | 0 | 0 |
| Openland, formerly cropped | 342 | 0 | 0 | 2,204 | 3,719 | 200 | 0 | 2,733 |
| Cropland, With Irrigation System | 20,962 | 8,157 | 8,833 | 84,003 | 252,291 | 463,798 | 117,004 | 494,480 |
| Corn and Sorghum | 0 | 0 | 0 | 3,054 | 0 | 0 | 0 | 0 |
| Corn | 0 | 0 | 0 | 3,054 | 0 | 0 | 0 | 0 |
| Sorghum | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Row Crops | 4,894 | 0 | 0 | 2,668 | 5,167 | 37,343 | 6,310 | 64,004 |
| Soybeans | 4,749 | 0 | 0 | 2,531 | 7,929 | 35,781 | 5,836 | 62,010 |
| Cotton | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sugarcane | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sweet Potatoes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Vegetables | 30 | 0 | 0 | 27 | 45 | 272 | 0 | 399 |
| Miscellaneous Row Crops | 115 | 0 | 0 | 110 | 190 | 1,290 | 474 | 1,595 |
| Close Grown Crops | 2,400 | 0 | 3,781 | 41,472 | 125,239 | 111,213 | 32,250 | 199,099 |
| Rice | 2,000 | 0 | 3,781 | 41,022 | 124,339 | 110,420 | 32,250 | 197,599 |
| Other | 400 | 0 | 0 | 450 | 900 | 793 | 0 | 1,500 |
| Rotation Hay-Pasture | 11,931 | 8,157 | 5,052 | 33,672 | 108,107 | 307,532 | 77,456 | 228,377 |
| Hayland | 0 | 0 | 0 | 300 | 1,250 | 0 | 600 | 0 |
| Conservation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Temporarily Idle Cropland | 1,737 | 0 | 0 | 2,837 | 9,528 | [illegible].710 | 388 | 3,000 |
| Pasture and Range | 22,760 | 18,550 | 13,584 | 108,178 | 127,110 | 96,912 | 8,193 | 43,771 |
| Pasture | 22,242 | 4,843 | 13,584 | 108,178 | 127,110 | 96,912 | 7,969 | 40,618 |
| Range | 518 | 13,707 | 0 | 0 | 0 | 0 | 224 | 3,153 |
| Forest | 343,877 | 20,387 | 6,476 | 51,071 | 322,655 | 295,202 | 184,031 | 43,767 |
| Not Grazed | 28,155 | 4,414 | 0 | 8,661 | 46,123 | 82,556 | 27,304 | 12,280 |
| Grazed | 315,722 | 15,973 | 6,476 | 42,410 | 276,532 | 212,646 | 156,727 | 31,487 |
| Other Land | 933 | 2,340 | 4,951 | 12,875 | 11,622 | 26,953 | 3,493 | 15,059 |
| Total Inventory Land | 406,960 | 51,294 | 61,354 | 421,281 | 938,318 | 998,996 | 333,357 | 614,674 |

Continued-

Exhibit 1 - Continued

| Land Use Category | Soil Productivity Group | | | | | | |
|---|---|---|---|---|---|---|---|
| | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| | acres | | | | | | |
| Cropland | 37,516 | 0 | 0 | 0 | 0 | 4,223 | 0 |
| Cropland, No Irrigation System | 0 | 0 | 0 | 0 | 0 | 3,780 | 0 |
| Corn and Sorghum | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Corn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sorghum | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Row Crops | 0 | 0 | 0 | 0 | 0 | 1,790 | 0 |
| Soybeans | 0 | 0 | 0 | 0 | 0 | 1,790 | 0 |
| Cotton | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sugarcane | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sweet Potatoes | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Vegetables | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Miscellaneous Row Crops | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Close Grown Crops | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rotation Hay-Pasture | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hayland | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Conservation Use Only | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Temporarily Idle Cropland | 0 | 0 | 0 | 0 | 0 | 1,990 | 0 |
| Orch. Vine.-Bush Fruit | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Openland, formerly cropped | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cropland, With Irrigation System | 37,516 | 0 | 0 | 0 | 0 | 443 | 0 |
| Corn and Sorghum | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Corn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sorghum | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Row Crops | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Soybeans | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cotton | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sugarcane | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sweet Potatoes | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Vegetables | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Miscellaneous Row Crops | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Close Grown Crops | 30,000 | 0 | 0 | 0 | 0 | 225 | 0 |
| Rice | 30,000 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | 0 | 0 | 0 | 0 | 0 | 225 | 0 |
| Rotation Hay-Pasture | 7,516 | 0 | 0 | 0 | 0 | 218 | 0 |
| Hayland | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Conservation | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Temporarily Idle Cropland | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pasture and Range | 10,920 | 4,597 | 348,217 | 8,376 | 0 | 5,299 | 0 |
| Pasture | 7,020 | 4,597 | 0 | 0 | 0 | 5,211 | 0 |
| Range | 3,900 | 0 | 348,217 | 8,376 | 0 | 88 | 0 |
| Forest | 0 | 117,376 | 0 | 47,041 | 0 | 436,385 | 0 |
| Not Grazed | 0 | 1,818 | 0 | 44,831 | 0 | 129,985 | 0 |
| Grazed | 0 | 115,558 | 0 | 2,210 | 0 | 306,400 | 0 |
| Other Land | 0 | 3,119 | 33,322 | 58,996 | 0 | 3,116 | 680,373 |
| Total Inventory Land | 48,436 | 125,092 | 381,539 | 114,413 | 0 | 449,023 | 680,373 |

1/ Derived from Louisiana Conservation Needs Inventory, 1969.

4-31721 2-74

Exhibit 2 - Current and Projected Population of Southwest Louisiana River Basin and Standard Metropolitan Statistical Areas Which Significantly Contribute to the Utilization of Basin Outdoor Recreation Resources and Facilities

| Area | 1967 | 1985 | 2000 | 2020 |
|---|---|---|---|---|
| | --------------- | thousand | --------------- | --------------- |
| Non-SMSA, within the Basin | 338.2 | 277.9 | 249.1 | 197.5 |
| SMSA, within Basin | | | | |
| Alexandria | 125.8 | 159.4 | 190.9 | 244.7 |
| Lake Charles | 170.8 | 244.5 | 336.0 | 458.0 |
| Lafayette | 101.4 | 138.2 | 174.0 | 239.8 |
| Total | 398.0 | 542.1 | 700.9 | 942.5 |
| Total inside the Basin | 736.2 | 820.0 | 950.0 | 1,200.0 |
| SMSA, outside the Basin | | | | |
| New Orleans | 1,075.4 | 1,477.1 | 1,886.1 | 2,431.5 |
| Baton Rouge | 278.5 | 485.0 | 663.1 | 900.0 |
| Shreveport | 310.8 | 451.9 | 622.5 | 850.0 |
| Monroe | 121.8 | 178.1 | 249.0 | 343.0 |
| Total | 1,786.5 | 2,592.1 | 3,420.7 | 4,524.5 |
| SMSA, outside the State | | | | |
| Beaumont, Texas | 341.6 | 445.7 | 552.7 | 743.7 |
| Jackson, Mississippi | 262.4 | 452.2 | 660.1 | 960.8 |
| Total | 604.0 | 897.9 | 1,212.8 | 1,704.5 |
| Total outside SMSA | 2,390.5 | 3,490.0 | 4,633.5 | 6,229.0 |

4-31721 2-74

Exhibit 3 - Outdoor Recreational Activities Included in the Southwest Louisiana River Basin Showing State Participation Rates, 1967 and 1968

| Activities | Activity occasions per capita, ages six years & older | | |
|---|---|---|---|
| | Annual | Summer | Average Summer Sunday1/ |
| | ---number--- | | |
| Swimming | 8.58 | 7.83 | .2255 |
| Pool | 5.68 | 5.00 | .1440 |
| Beach | 2.90 | 2.83 | .0815 |
| Camping | 1.83 | 1.34 | .03859 |
| Tent | .72 | .56 | .016128 |
| Trailer | 1.11 | .78 | .022464 |
| Picnicking | 2.30 | 1.79 | .05155 |
| Fishing | 7.11 | 4.44 | .12787 |
| Salt2/ 4/ | 2.18 | 1.50 | .04320 |
| Fresh3/ 4/ | 4.93 | 2.94 | .08467 |
| Other water sports5/ | 3.38 | 2.53 | .07286 |
| Trails6/ | 4.35 | 2.13 | .06134 |
| Aesthetic | 12.31 | 6.57 | .189216 |
| Pleasure driving | 8.33 | 4.15 | .11952 |
| Sightseeing | 3.98 | 2.42 | .069696 |
| Hunting | 1.66 | - | .04256 |
| Waterfowl7/ | .61 | - | .01596 |
| Upland | 1.05 | - | .02660 |

1/ State Park study indicates 2.88 percent of all summer activity is on a Sunday.

2/ Includes crabbing.

3/ Includes crawfishing.

4/ Assumes the same distribution of preference annually as that measured in summer.

5/ Includes sampling account of motor boating, canoeing, water skiing and sailing.

6/ Includes trail activities such as nature walks, hiking, bird watching, and horseback riding. Horseback riding constitutes approximately 31 percent annually and 33 percent in the summer. Hiking is approximately 15 percent annually and 22 percent in the summer.

7/ Based on preliminary estimate of 37.5 percent by Louisiana Wild Life and Fisheries Commission.

4-31721 2-74

Exhibit 4 - Forest Fire Occurrence Statistics 1/ by Parishes by Years for Protected Privately Owned Lands, 1954 - 1968
Southwest Louisiana River Basin Study

| Entire Parish | Fires | Area Burned | Fires | Area Burned | Fires | Area Burned | Fires | Area Burned | Fires | Area Burned | Totals Fires | Totals Area Burned | Average Fires | Average Fire Size | Parish Fire Occurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | number | acres | number | acres | number | acres | number | acres | number | acres | number | acres | number | acres | percent |
| | 1954 | | 1955 | | 1956 | | 1957 | | 1958 | | 5 year period 1954 - 1958 | | | | |
| Allen | 797 | 28,701 | 469 | 15,454 | 682 | 19,192 | 318 | 6,264 | 430 | 12,135 | 2,696 | 81,746 | 539 | 30.3 | 21.1 |
| Avoyelles | 1 | 2 | 1 | 12 | 1 | 1 | 1 | 2 | 1 | 2 | 5 | 19 | 1 | 3.8 | 0.1 |
| Beauregard | 1,312 | 85,164 | 595 | 24,545 | 928 | 44,577 | 265 | 10,625 | 535 | 27,474 | 3,635 | 192,385 | 727 | 52.9 | 28.5 |
| Calcasieu | 320 | 14,481 | 211 | 6,517 | 246 | 7,858 | 102 | 3,358 | 146 | 4,259 | 1,025 | 36,473 | 205 | 35.6 | 8.0 |
| Evangeline | 290 | 12,659 | 156 | 3,650 | 288 | 6,380 | 106 | 1,290 | 162 | 6,948 | 1,002 | 30,927 | 200 | 30.9 | 7.9 |
| Jeff. Davis | 7 | 1,085 | 1 | 40 | 18 | 984 | 2 | 55 | 3 | 105 | 31 | 2,269 | 6 | 73.2 | 0.2 |
| Natchitoches | 372 | 3,543 | 198 | 1,711 | 273 | 1,794 | 36 | 266 | 60 | 418 | 939 | 7,732 | 188 | 8.2 | 7.4 |
| Rapides | 810 | 13,922 | 250 | 1,814 | 466 | 3,688 | 176 | 847 | 268 | 1,428 | 1,970 | 21,699 | 394 | 11.0 | 15.4 |
| Vernon | 646 | 19,875 | 282 | 3,476 | 283 | 2,361 | 80 | 638 | 168 | 4,202 | 1,459 | 30,552 | 292 | 20.9 | 11.4 |
| Totals - 9 Parishes | 4,555 | 179,432 | 2,163 | 57,219 | 3,185 | 86,835 | 1,086 | 23,345 | 1,773 | 56,971 | 12,762 | 403,802 | 2,552 | 31.6 | 100.0 |
| Totals - Louisiana | 11,714 | 284,052 | 6,490 | 98,309 | 6,836 | 124,114 | 2,408 | 38,329 | 4,467 | 86,262 | 31,915 | 631,066 | 6,383 | 19.8 | |
| Percent of La. Totals | 39 | 63 | 33 | 58 | 47 | 70 | 45 | 60 | 40 | 66 | 40 | 64 | 40 | 160 % | |
| | 1959 | | 1960 | | 1961 | | 1962 | | 1963 | | 5 year period 1959 - 1963 | | | | |
| Allen | 492 | 15,061 | 524 | 11,859 | 396 | 10,713 | 775 | 13,383 | 728 | 16,972 | 2,915 | 67,988 | 583 | 23.3 | 24.2 |
| Avoyelles | 4 | 6 | 7 | 182 | 2 | 14 | 20 | 98 | 26 | 172 | 59 | 472 | 12 | 8.0 | 0.5 |
| Beauregard | 693 | 28,241 | 533 | 13,999 | 381 | 11,504 | 850 | 23,034 | 763 | 22,951 | 3,220 | 99,729 | 644 | 31.0 | 26.8 |
| Calcasieu | 150 | 3,254 | 163 | 2,918 | 121 | 1,760 | 246 | 4,749 | 231 | 5,506 | 911 | 18,187 | 182 | 20.5 | 7.6 |
| Evangeline | 190 | 2,462 | 220 | 5,372 | 155 | 1,167 | 491 | 5,475 | 342 | 6,475 | 1,398 | 20,951 | 280 | 15.0 | 11.6 |
| Jeff. Davis | 3 | 17 | 9 | 761 | 5 | 119 | 10 | 290 | 5 | 131 | 32 | 1,318 | 6 | 41.2 | 0.3 |
| Natchitoches | 78 | 738 | 69 | 1,284 | 38 | 140 | 123 | 576 | 136 | 625 | 444 | 3,363 | 89 | 7.6 | 3.7 |
| Rapides | 338 | 2,953 | 233 | 4,051 | 136 | 1,567 | 332 | 3,017 | 413 | 3,852 | 1,452 | 15,440 | 290 | 10.6 | 12.1 |
| Vernon | 243 | 5,616 | 230 | 5,574 | 156 | 2,709 | 479 | 8,710 | 480 | 7,384 | 1,588 | 29,993 | 318 | 18.9 | 13.2 |
| Totals - 9 Parishes | 2,191 | 58,348 | 1,988 | 46,000 | 1,390 | 29,693 | 3,326 | 59,332 | 3,124 | 64,068 | 12,019 | 257,441 | 2,404 | 21.4 | 100.0 |
| Totals - Louisiana | 5,916 | 107,346 | 6,184 | 106,899 | 3,478 | 46,462 | 8,639 | 103,545 | 9,648 | 136,009 | 33,865 | 500,261 | 6,773 | 14.8 | |
| Percent of La. Totals | 37 | 54 | 32 | 43 | 40 | 64 | 38 | 57 | 32 | 47 | 35 | 51 | 35 | 145 % | |
| | 1964 | | 1965 | | 1966 | | 1967 | | 1968 | | 5 year period 1964 - 1968 | | | | |
| Allen | 733 | 11,335 | 712 | 10,720 | 592 | 10,045 | 891 | 15,397 | 675 | 8,554 | 3,603 | 56,051 | 721 | 15.6 | 25.7 |
| Avoyelles | 5 | 76 | 14 | 160 | 8 | 17 | 2 | 1 | 2 | 29 | 31 | 283 | 6 | 9.1 | 0.2 |
| Beauregard | 856 | 20,256 | 735 | 17,922 | 800 | 13,900 | 1,210 | 22,686 | 874 | 17,805 | 4,475 | 92,569 | 895 | 20.7 | 32.0 |
| Calcasieu | 188 | 2,929 | 303 | 3,586 | 164 | 2,620 | 357 | 6,760 | 190 | 3,057 | 1,202 | 18,952 | 240 | 15.8 | 8.6 |
| Evangeline | 154 | 1,720 | 276 | 2,862 | 225 | 2,668 | 319 | 3,659 | 140 | 1,216 | 1,114 | 12,125 | 223 | 10.9 | 8.0 |
| Jeff. Davis | 3 | 170 | 7 | 240 | 5 | 175 | 6 | 111 | 0 | 0 | 21 | 696 | 4 | 33.1 | 0.1 |
| Natchitoches | 103 | 527 | 80 | 1,034 | 39 | 157 | 109 | 1,267 | 42 | 80 | 373 | 3,065 | 75 | 8.2 | 2.7 |
| Rapides | 286 | 4,533 | 248 | 1,137 | 297 | 1,191 | 495 | 2,140 | 322 | 2,263 | 1,648 | 11,264 | 329 | 6.8 | 11.8 |
| Vernon | 316 | 5,626 | 310 | 3,548 | 183 | 2,514 | 502 | 7,912 | 222 | 3,513 | 1,533 | 23,113 | 307 | 15.1 | 10.9 |
| Totals - 9 Parishes | 2,644 | 47,172 | 2,685 | 41,209 | 2,313 | 33,287 | 3,891 | 59,933 | 2,467 | 36,517 | 14,000 | 218,118 | 2,800 | 15.6 | 100.0 |
| Totals - Louisiana | 5,848 | 71,570 | 6,800 | 74,476 | 5,947 | 69,143 | 9,847 | 139,896 | 6,360 | 78,999 | 34,802 | 434,084 | 6,960 | 12.5 | |
| Percent of La. Totals | 45 | 66 | 39 | 55 | 39 | 48 | 40 | 43 | 49 | 49 | 40 | 50 | 40 | 125 % | |

Exhibit 5-Erosion Rates for Forest Lands by Soil Groups and by Land Disturbance Factors as Determined by May Inventory and Display System (M.I.A.D.S.) Field Plot Data, July 1970. Southwest Louisiana River Basin.

| Soil Groups | Ownership Class[1/] | Area in: Basin acres | Total[3/] | Natural | Logging | Grazing | Burning | Skid Trails | Spur Roads | Landings | Open-Impact Areas | Stream Scour | Firelines |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Average Erosion Rates[2/] —tons per acre per year— | | | | | | | | | | |
| Harris Clays | OF-u | 1,450 | 0.000 | | | | | | | | | | |
| Harris Clays | OF-s | 47,445 | 0.000 | | | | | | | | | | |
| Crowley-Patoutville | OF-u | 27,989 | 0.161 | 0.081 | 0.019 | 0.016 | 0.043 | | 4.375 | | | | |
| Alligator-Sharkey-Tunica-Iberia-Baldwin | OF-u | 175,274 | 0.000 | | | | | | | | | | |
| Alligator-Sharkey-Tunica-Iberia-Baldwin | OF-s | 26,880 | 0.000 | | | | | | | | | | |
| Memphis-Loring | OF-u | 8,278 | 0.000 | | | | | | | | | | |
| Jeanerette-Patoutville | OF-u | 7,936 | 0.000 | | | | | | | | | | |
| Coteau-Calhoun-Loring | OF-u | 59,989 | 0.038 | 0.016 | 0.006 | 0.001 | 0.002 | 0.521 | | | | | |
| Ruston-Bowie-Eustis | NF-w | 124,426 | 1.036 | 0.380 | 0.052 | 0.041 | 0.419 | | 41.875 | 30.468 | | | |
| Ruston-Bowie-Eustis | NF-o | 20,346 | 0.300 | 0.098 | 0.065 | 0.064 | 0.140 | | | | | | |
| Ruston-Bowie-Eustis | FP-w | 22,500 | 1.200 | 0.328 | 0.824 | | 1.166 | | | | | | |
| Ruston-Bowie-Eustis | FP-o | 27,243 | 17.767 | 0.111 | | | | | | | 17.656 | | |
| Ruston-Bowie-Eustis | OF-u | 568,342 | 0.536 | 0.094 | 0.059 | 0.038 | 0.129 | 1.406 | 7.344 | 11.406 | | | |
| Acadia-Wrightsville | OF-u | 230,058 | 0.103 | 0.034 | 0.014 | 0.009 | 0.035 | 0.313 | | | | | 7.813 |
| Acadia-Wrightsville | OF-s | 683 | 0.000 | | | | | | | | | | |
| Caddo-Beauregard | NF-w | 3,652 | 0.089 | 0.070 | 0.005 | 0.004 | 0.023 | 2.604 | 0.521 | | | | |
| Caddo-Beauregard | NF-o | 2,696 | 0.089 | 0.070 | 0.005 | 0.004 | 0.023 | 2.604 | 0.521 | | | | |
| Caddo-Beauregard | OF-u | 553,173 | 0.089 | 0.070 | 0.005 | 0.004 | 0.023 | 2.604 | 0.521 | | | | |
| Moreland-Roxana-Norwood-Buxin | NF-w | 2,609 | 0.000 | | | | | | | | | | |
| Moreland-Roxana-Norwood-Buxin | OF-u | 210,431 | 0.000 | | | | | | | | | | |
| Gore-Hortman | NF-w | 15,998 | 0.894 | 0.141 | 0.024 | 0.022 | 0.061 | 1.719 | 8.340 | | | | |
| Gore-Hortman | NF-o | 261 | 0.188 | 0.136 | 0.044 | | | 2.813 | 0.469 | | | | |
| Gore-Hortman | OF-u | 61,354 | 0.188 | 0.136 | 0.044 | | | 2.813 | 0.469 | | | | |
| Kisatchie-Eustis-Sumter-Houston-Vaiden | NF-w | 1,304 | 0.672 | 0.659 | | | | 0.156 | 1.094 | | | | |
| Kisatchie-Eustis-Sumter-Houston-Vaiden | NF-o | 174 | 0.672 | 0.659 | | | | 0.156 | 1.094 | | | | |
| Kisatchie-Eustis-Sumter-Houston-Vaiden | FP-w | 25,298 | 0.672 | 0.659 | | | | 0.156 | 1.094 | | | | |
| Kisatchie-Eustis-Sumter-Houston-Vaiden | FP-o | 16,176 | 17.767 | 0.111 | | | | | | | 17.656 | | |
| Kisatchie-Eustis-Sumter-Houston-Vaiden | OF-u | 60,953 | 0.139 | 0.111 | | 0.053 | | | | | | | |
| Mantachie-Bibb-Iuka-Chastain | NF-w | 5,304 | 0.608 | 0.014 | 0.111 | 0.045 | | 9.883 | 4.375 | | | 0.781 | |
| Mantachie-Bibb-Iuka-Chastain | FP-w | 608 | 0.608 | 0.014 | 0.111 | 0.045 | | 9.883 | 4.375 | | | 0.781 | |
| Mantachie-Bibb-Iuka-Chastain | OF-u | 318,719 | 0.608 | 0.014 | 0.111 | 0.045 | | 9.883 | 4.375 | | | 0.781 | |
| Mantachie-Bibb-Iuka-Chastain | OF-s | 2,133 | 0.000 | | | | | | | | | | |

1/ NF National Forest
OF Other Forest
FP Fort Polk
-o open
-s swamp
-u upland
-w wood

2/ Based on estimated disturbances during past 5-year period. The range of erosion rates by strata and disturbance must be secured from field tally sheets. The soil erosion rate for each disturbance is the amount produced by that land use, i.e. in BF grazing produces 0.016 tons per acre per year in addition to natural erosion of 0.081 tons per acre per year, therefore, the erosion on a grazed acre would be 0.097 tons per acre per year (0.016 + 0.081).

3/ This is the "average erosion rate" on the "average acre" and is not the total of other columns.

Source: M.I.A.D.S. field plot data.

Southwest Louisiana River Basin

Comprehensive Report

APPENDIX

(FISH AND WILDLIFE DATA)

4-31721 2-74

Southwest Louisiana River Basin
Comprehensive Report

APPENDIX

CONTENTS



TABLES



4-31721 2-74

# INTRODUCTION

At the request of the U. S. Department of Agriculture (USDA), the Louisiana Wild Life and Fisheries Commission developed and made available much information regarding fish and wildlife resources of the Basin. These data were used by USDA in completing an inventory of present status. Also, data on carrying capacities and habitat requirements were used to project future hunter demands and needs. These data, too voluminous for inclusion in the main report, are included in this appendix for supplemental information purposes.

The appendix contains information concerning each species and data on populations, harvests, and economic values.

4-31721 2-74

# WILDLIFE RESOURCES

## INVENTORY OF LAKES, STREAMS, AND GAME SPECIES

An inventory of lakes, streams, and game species was made in the Southwest Louisiana River Basin Study Area by personnel of the Louisiana Wild Life and Fisheries Commission. Data for the inventory came from sources such as kill surveys, game inventories, forest inventories, land use breakdowns, national economic surveys, fish inventories, and information from local county agents, district conservationists, fish and game personnel, foresters, and others.

Some of the inventory data represent estimates only. For example, pollution in lakes and streams was included in the inventory but the amount of any particular pollutant was not known. If it were present in minute amounts, it was still listed. Several of the streams and lakes had one or more pollutants but still had average or above average fish populations. Due to the extremely long list of fish species present in both streams and lakes, only the more important sport and commercial fishes were listed.

The inventory of lakes describes physical and ecological characteristics such as location, surface area, pounds of fish per acre, pollution, water quality, fish species, and water type. The data for this inventory are shown in table 1.

The inventory of streams describes physical and ecological characteristics such as location, length, width, flow, pollution, water quality, fish species, pounds of fish per acre, water type, previously channeled sections, and amount of permanent water. The last two items -- previously channeled sections and amount of permanent water -- were compiled by the Soil Conservation Service. There are about 3,000 miles of stream in the inventory, of which about 1,270 miles have been previously channeled and about 1,960 miles hold permanent water. Other data in this inventory shown in table 2.

The inventory of game species was compiled according to land use and timber types by parish. The current populations and harvests are evaluated by habitat types and man-days of recreation provided. Also, the potential populations, harvests, and man-days of recreation are given by habitat types. The inventory included deer, dove, quail, rabbit, squirrel, and turkey. Data for this inventory are shown in table 3.

## SQUIRRELS

In attempting to identify and evaluate the recreation provided by squirrel hunting in the Study Area, use was made of the trained experience

Table 1 - An Inventory of Lakes in the Southwest River Basin Study Area With Some Physical and Ecological Characteristics Southwest Louisiana River Basin

| Parish and Lakes | Surface Area | Standing Crop | Fish Species[1/] | Type of Pollution[2/] | Type[3/] | Water Quality[4/] |
|---|---|---|---|---|---|---|
| | Acre | (lbs./ac.) | | | | |
| Acadia | | | | | | |
| LeDeux Lake | 32 | 30 | 1,2,3,4,5,6 | 2 | F | G |
| Peter Klines Lake | 39.7 | 30 | 1,2,3,4,5,6 | 2 | F | G |
| Fenner Duncan Lake | 35 | 30 | 1,2,3,4,5,6 | 2 | F | G |
| Beauregard | 1,850 | | | | | |
| Longville Lake | 125 | 80 | 1,2,3,4 | None | F | E |
| Carson Lake | 45 | 40 | 1,2,3,4 | None | F | E |
| Bundick Lake | | 105 | 1,2,3,4,5 | 1,3 | F | G |
| Bruce Brown Lake | 55 | 45 | 1,2,3,4 | None | F | E |
| Old River | 273 | 125 | 1,2,3,4,5,6 | 4,5 | F | G |
| Evangeline | | | | | | |
| Chicot Lake | 1,625 | 220 | 1,2,3,4,5,6 | 2 | F | G |
| Millers Lake | 3,352 | 120 | 1,2,3,4,5,6 | 2 | F | G |
| Nigger Lake | 64 | 45 | 1,2,3,4,5,6 | 2 | F | G |
| Bryans Lake | 32 | 30 | 1,2,3,4,5,6 | 2 | F | G |
| Calcasieu | | | | | | |
| Lake Charles | 1,038 | 55 | 1,2,4,5 | 1,3,4,5 | B | P |
| Prien Lake | 1,056 | 60 | 1,2,4,5 | 1,3,4,5 | B | P |
| Moss Lake | 544 | 55 | 4,5 | 1,3,4,5 | B | G |
| Clear Marais | 320 | 50 | 1,2,3,4,5,6 | 2,4 | F | G |
| Goose Lake | 96 | 50 | 1,2,3,4,5,6 | 2,4 | F | G |
| Lake Ged | 128 | 30 | 1,2,3,4,5,6 | 4 | F | G |
| Mud Lake | 32 | 20 | 1,2,3,4,5 | None | F | G |
| Blue Lake | 25.6 | 30 | 1,2,3,4,5 | None | F | E |
| Lost Lake | 26.9 | 30 | 1,2,3,4,5 | 4 | F | G |
| Phoenix Lake | 96.0 | 30 | 1,2,3,4,5,6 | 4 | B | G |
| Cameron | | | | | | |
| Petit Lac L'Huit | 64 | 70 | 1,2,3,4,5,6 | 4 | F | G |
| Grand Lac L'Huit | 192 | 70 | 1,2,3,4,5,6 | 4 | F | G |
| Turtle Lake | 384 | 70 | 1,2,3,4,5,6 | 4 | F | G |
| Alligator Lake | 448 | 70 | 1,2,3,4,5,6 | 4 | F | G |
| Collicon Lake | 2,432 | 90 | 1,2,3,4,5,6 | 4 | F | G |
| Blackfish Lake | 288 | 70 | 1,2,3,4,5,6 | 4 | F | G |
| Lake LeBleu | 128 | 50 | 1,2,3,4,5,6 | 4 | F | G |
| Round Lake | 192 | 55 | 1,2,3,4,5,6 | 4 | F | G |
| Devils Lake | 57.6 | 40 | 1,2,3,4,5,6 | 4 | F | G |
| Snake Lake | 192 | 55 | 1,2,3,4,5,6 | 4 | F | G |
| Willow Lake | 128 | 50 | 1,2,3,4,5,6 | 4 | F | G |
| Lake Monzelum | 32 | 35 | 1,2,3,4,5,6 | 4 | F | G |
| Lake Benoit | 192 | 55 | 1,2,3,4,5,6 | 4 | F | G |
| Long Lake | 128 | 50 | 1,2,3,4,5,6 | 4 | F | G |
| Mud Lake | 320 | 65 | 1,2,3,4,5,6 | 4 | F | G |
| Latania Lake | 512 | 60 | 1,2,3,4,5,6 | 4 | F | G |
| Little Lake Misere | 512 | 70 | 1,2,3,4,5,6 | 2,4 | F | G |
| Lake Misere | 2,368 | 75 | 1,2,3,4,5,6 | 2,4 | F | G |
| Little Catfish Lake | 24.3 | 70 | 1,2,3,4,5,6 | 4 | F | G |
| Catfish Lake | 896 | 70 | 1,2,3,4,5,6 | 4 | F | G |
| Little Pecan Lake | 384 | 60 | 1,2,3,4,5,6 | None | F | E |
| Little Pecan Lake #2 | 170 | 65 | 1,2,3,4,5,6 | 4 | B | G |
| Upper Mud Lake | 725 | 90 | 1,2,3,4,5,6 | 4 | B | G |
| Grand Lake | 43,000 | 75 | 1,2,3,4,5,6 | 2,4 | F | G |
| Alligator Lake #2 | 64 | 70 | 4,5 | 4 | B | G |
| Round Lake #2 | 64 | 70 | 4,5 | 4 | B | G |
| Teal Lake | 51.2 | 70 | 4,5 | 4 | B | G |
| Tolan Lake | 38.4 | 70 | 4,5 | 4 | B | G |
| Second Lake | 64.0 | 70 | 4,5 | 4 | B | G |
| First Lake | 32.0 | 70 | 4,5 | 4 | B | G |
| Beach Pond | 25.6 | 70 | 4,5 | 4 | B | G |
| Crab Lake | 89.6 | 70 | 4,5 | 4 | B | G |
| Lower Mud Lake | 1,920 | 70 | 4,5 | 4 | B | G |
| Boudreaux Lake | 160 | 60 | 1,2,3,4,5,6 | 4 | F | G |
| Willow Lake #2 | 704 | 70 | 1,2,3,4,5,6 | 4 | F | G |
| Sweet Lake | 1,728 | 75 | 1,2,3,4,5,6 | 4 | F | G |
| Blind Lake | 64 | 60 | 1,2,3,4,5,6 | 4 | F | G |
| Broussard Lake | 83.2 | 60 | 1,2,3,4,5,6 | 4 | F | G |
| Lambert Lake | 128 | 60 | 1,2,3,4,5,6 | 4 | B | G |
| Miller Lake | 384 | 65 | 4,5 | 4 | B | G |
| Deep Lake | 896 | 70 | 4,5 | 4 | B | G |

4-3172

Continued -

Table 1 - Continued

| Parish and Lakes | Surface Area Acre | Standing Crop (lbs./ac.) | Fish Species[1/] | Type of Pollution[2/] | Type[3/] | Water Quality[4/] |
|---|---|---|---|---|---|---|
| Cameron | | | | | | |
| Little Constance Lake | 358.4 | 65 | 4,5 | 4 | B | G |
| Big Constance Lake | 1,120 | 80 | 4,5 | 4 | B | G |
| Black Lake | 2,240 | 65 | 4,5 | 4 | B | G |
| Wild Cow Lake | 26.9 | 40 | 1,2,3,4,5,6 | None | B | G |
| Browns Lake | 25.6 | 40 | 1,2,3,4,5,6 | None | B | G |
| Mud Lake #2 | 2,560 | 60 | 4,5 | 4,5 | B | G |
| Greens Lake | 96.0 | 50 | 1,2,3,4,5,6 | 4 | B | G |
| Hamilton Lake | 448 | 60 | 1,2,3,4,5,6 | 4 | B | G |
| Sabine Refuge Pool | 33,705.5 | 80 | 1,2,3,4,6 | None | F | E |
| Lacassine Refuge Pool | 17,280 | 80 | 1,2,3,4,6 | 4 | F | G |
| Rockefeller Refuge Pool | 3,000 | 70 | 1,2,3,4,6 | None | F | G |
| Sabine Lake | 28,159 | 80 | 4,5 | 1,4,5 | B | G |
| Calcasieu Lake | 56,800.5 | 90 | 2,4,5,6 | 1,4 | B | G |
| Long Point Lake | 3,986 | 70 | 2,4,5,6 | 4 | B | G |
| Cameron, Jefferson Davis, Vermilion | | | | | | |
| Lake Arthur | 2,200 | 125 | 1,2,3,4,5,6 | 1,2,4 | F | G |
| Evangeline | | | | | | |
| Chicot Lake | 1,800 | 200 | 1,2,3,4,5,6 | None | F | E |
| Evangeline, Rapides | | | | | | |
| Cocodrie Lake | 2,000 | 100 | 1,2,3,4,5,6 | None | F | E |
| Iberia | | | | | | |
| Tigre Lagoon | 314 | 35 | 4,6 | 2,4,5 | F | F |
| Vermilion Bay | 143,000 | 150 | 2,4,5,6 | 2,4,5 | B | G |
| Lake Peigneur | 822 | 35 | 1,2,4,6 | 2,4,5 | F | F |
| Iberia, St. Mary | | | | | | |
| Lake Fausse Point | 14,000 | 100 | 1,2,3,4,5,6 | 2,4,5 | F | G |
| East Cote Blanche Bay | 67,747 | 150 | 2,4,5,6 | 2,4,5 | B | G |
| West Cote Blanche Bay | 97,148 | 150 | 2,4,5,6 | 2,4,5 | B | G |
| St. Landry | | | | | | |
| Mathis Lake | 200 | 80 | 1,2,3,4,5,6 | 2 | F | F |
| St. Mary | | | | | | |
| Flat Lake | 3,949 | 100 | 1,2,4,6 | 2,4,5 | F | G |
| Misc. Lagoons, Lakes | 597 | 100 | 1,2,3,4,6 | 2,4,5 | F | G |
| Hackberry Lake | 110 | 100 | 1,2,4,6 | 2,4,5 | F | G |
| Grand Avoille Cove | 173 | 100 | 1,2,4,6 | 2,4,5 | F | G |
| Mud Lake | 392 | 100 | 1,2,4,6 | 2,4,5 | F | G |
| Wax Lake | 4,050 | 100 | 1,2,4,6 | 2,4,5 | F | G |
| Six Mile Lake | 31,000 | 323 | 1,2,3,4,5,6 | 2,4,5 | F | G |
| Grand Lake | 27,000 | 323 | 1,2,3,4,5,6 | 2,4,5 | F | G |
| Rapides | | | | | | |
| Valentine Lake | 80 | 60 | 1,2,3,4,5,6 | 2,5 | F | G |
| Weem's and Hardy Lake | 100 | 60 | 1,2,3,4,5,6 | 2,5 | F | G |
| Oden Lake | 120 | 60 | 1,2,3,4,5,6 | 2,5 | F | G |
| Cotile Lake | 1,775 | 75 | 1,2,3,4,5,6 | 2 | F | G |
| Vernon | | | | | | |
| Slagle Lake | 80 | 65 | 1,2,3,4,5,6 | None | F | G |
| T. L. James Lake | 26 | 50 | 1,2,3,4,6 | None | F | G |
| Fullerton Lake | 40 | 50 | 1,2,3,4,5,6 | None | F | G |

[1/]Fish Species
1 = Largemouth Bass
2 = Bream
3 = Crappie
4 = Catfish
5 = Drum
6 = Buffalo, carp, etc.

[2/]Type of Pollution
1 = Domestic Sewage
2 = Agricultural (Sediment, Pesticides, etc.)
3 = Industrial
4 = Oil or Salt Water
5 = Miscellaneous

[3/]Water Type
F - Fresh
B - Brackish

[4/]Water Quality
E - Excellent
G - Good
F - Fair
P - Poor

Table 2 - An Inventory of Streams in the Southwest River Basin Study Area
With Some Physical and Ecological Characteristics

| Parish and Stream | Length miles | Width miles | Standing Crop (lbs./ac.) | Fish Species 1/ | Type of Pollution 2/ | Water Type 3/ | Water Quality 4/ | Flow 5/ | Previously Channeled 6/ miles | Permanent Water 6/ miles |
|---|---|---|---|---|---|---|---|---|---|---|
| Avoyelles | | | | | | | | | | |
| Bayou Des Glaises | 30.0 | 40' | 125 | 1,2,4,6 | 1,2 | F | G | S | 0 | 30.0 |
| Acadia | | | | | | | | | | |
| Bayou Barwick | 6.0 | 70' | 10 | 1,2,3,4,5,6 | 2,4 | F | G | S | 1.0 | 0 |
| Bayou des Cannes | 25.0 | 36' | 25 | 1,2,3,4,5,6 | 2,4 | F | G | S | 1.0 | 25.0 |
| Richard Gully | 4.0 | 10' | 8 | 1,2,3,4,5,6 | 2,4 | F | G | S | 4.0 | 0 |
| Bayou Mallet | 18.0 | 20' | 10 | 1,2,3,4,5,6 | 2,4 | F | G | S | 0 | 15.0 |
| Bayou Pointe aux Loups | 11.2 | 30' | 12 | 1,2,3,4,5,6 | 2 | F | G | S | 4.0 | 2.0 |
| Abbot and Duson Canal | 14.8 | 40' | 10 | 1,2,3,4,5,6 | 2 | F | G | S | 11.0 | 0 |
| Lazy Point Drainage Canal | 15.0 | 20' | 10 | 1,2,3,4,5,6 | 2,4 | F | G | S | 15.0 | 1.0 |
| Lyons Point Gully | 33.0 | 20' | 10 | 1,2,3,4,5,6 | 2,4 | F | G | S | 28.0 | 4.0 |
| Bayou Blanc | 14.0 | 40' | 10 | 1,2,3,4,5,6 | 2 | F | G | S | 14.0 | 2.0 |
| Bayou Jonas | 14.5 | 15' | 10 | 1,2,3,4,5,6 | 2,4 | F | G | S | 10.0 | 2.0 |
| Coulee Andre | 6.3 | 10' | 8 | 1,2,3,4,5,6 | 2 | F | G | S | 6.3 | 0 |
| Coulee des Saule | 6.2 | 12' | 8 | 1,2,3,4,5,6 | 2,4 | F | F | S | 6.2 | 0 |
| Long Point Gully | 22.0 | 8' | 8 | 1,2,3,4,5,6 | 2,4 | F | G | S | 22.0 | 0 |
| Gumpoint Gully | 2.5 | 20' | 10 | 1,2,3,4,5,6 | 2,4 | F | G | S | 2.5 | 0 |
| Prather Gully | 8.9 | 20' | 6 | 1,2,3,4,5,6 | 2,4 | F | G | S | 8.9 | 0 |
| Coles Gully | 6.0 | 20' | 6 | 1,2,3,4,5,6 | 2,4 | F | G | S | 6.0 | 0 |
| Grande Coulee | 9.5 | 10' | 7 | 1,2,3,4,5,6 | 2,4 | F | G | S | 9.5 | 2.0 |
| Bideman Gully | 2.5 | 20' | 10 | 1,2,3,4,5,6 | 2 | F | G | S | 2.5 | 0 |
| Bayou Plaquemine Burle | 31.0 | 85' | 20 | 1,2,3,4,5,6 | 2,4 | F | G | S | 31.0 | 15.0 |
| Wikoff Bayou | 20.5 | 20' | 15 | 1,2,3,4,5,6 | 2,4 | F | G | S | 20.6 | 5.0 |
| Blaise Lejeune Gully | 8.0 | 8' | 6 | 1,2,3,4,5,6 | 2,4 | F | G | S | 8.0 | 0 |
| Acadia, Vermilion, Lafayette | | | | | | | | | | |
| Bayou Queue de Tortue | 37.5 | 80' | 40 | 1,2,3,4,5,6 | 2 | F | G | S | 37.5 | 20.0 |
| Beauregard | | | | | | | | | | |
| Sugar Creek | 7.0 | 10' | 10 | 1,2,3,4 | None | F | E | R | 0 | 7.3 |
| Little Sugar Creek | 2.5 | 4' | 6 | 1,2,3,4 | None | F | E | L | 0 | .7 |
| Whiskey Chitto Creek | 12.1 | 35' | 40 | 1,2,3,4,5,6 | 5 | F | G | R | 0 | 10.8 |
| Hargroves Branch | 2.3 | 5' | 5 | 1,2,4 | 5 | F | E | R | 0 | 0 |
| Bear Slough | 3.2 | 35' | 15 | 1,2,4 | None | F | F | L | 0 | 0 |
| Spring Branch | 3.2 | 5' | 5 | 2,3,4 | None | F | E | R | 0 | 3.0 |
| Sandy Creek | 3.7 | 10' | 12 | 2,3,4 | None | F | E | R | 0 | 4.7 |
| Black Jack Branch | 3.0 | 6' | 6 | 1,2,4 | None | F | E | R | 0 | 0 |
| Jumping Gully | 1.8 | 4' | 4 | 1,2,4 | None | F | E | R | 0 | 1.1 |
| Spring Creek | 4.3 | 8' | 8 | 1,2,4 | None | F | E | R | 0 | 0 |
| Spring Creek Branch | 3.2 | 5' | 5 | 1,2,4 | None | F | E | R | 0 | 0 |
| West Caney Branch | 6.0 | 6' | 7 | 1,2,4 | None | F | E | R | 0 | 2.2 |
| East Caney Branch | 4.2 | 6' | 5 | 1,2,4 | None | F | E | R | 0 | 0 |
| Jim Barney Branch | 4.5 | 9' | 5 | 1,2,4 | None | F | E | R | 0 | .3 |
| Smith Branch | 4.3 | 8' | 5 | 1,2,4 | None | F | E | R | 0 | .3 |
| Short Prong | 1.9 | 5' | 5 | 1,2,4 | None | F | E | R | 0 | 0 |
| Dry Branch | 7.2 | 5' | 7 | 1,2,4 | None | F | G | L | 0 | 0 |
| Indian Branch | 2.0 | 4' | 4 | 1,2,4 | None | F | E | R | 0 | 0 |
| Muley Branch | 4.2 | 5' | 5 | 1,2,4 | None | F | G | L | 0 | .3 |
| Cowpen Creek | 2.5 | 6' | 4 | 1,2,4 | None | F | G | R | 0 | 0 |
| Deer Creek | 15.1 | 6' | 7 | 1,2,4 | 5 | F | G | R | 0 | 5.1 |
| Hickory Hollow Branch | 2.0 | 3' | 3 | 1,2,4 | None | F | G | L | 0 | 0 |
| Crooked Creek | 8.3 | 9' | 8 | 1,2,4 | None | F | G | R | 0 | 0 |
| Little Dry Creek | 6.2 | 8' | 7 | 1,2,4 | None | F | G | L | 0 | 0 |
| Dry Creek | 15.0 | 12' | 15 | 1,2,3,4,5 | 5 | F | G | R | 0 | 2.2 |
| Pumpkin Branch | 4.2 | 6' | 7 | 1,2,3,4 | None | F | E | R | 0 | 0 |
| Caney Creek | 5.5 | 15' | 6 | 1,2,3,4 | 4 | F | G | R | 0 | 0 |
| Crooked Bayou | 3.7 | 6' | 6 | 1,2,3,4 | None | F | G | R | 0 | 0 |
| Mayhaw Branch | 8.5 | 7' | 6 | 1,2,3,4 | None | F | E | P. | 0 | 0 |
| Little Barnes Creek | 6.0 | 10' | 6 | 1,2,3,4 | None | F | G | R | 0 | 0 |
| Little Caney Creek | 6.0 | 8' | 6 | 1,2,3,4 | 4 | F | G | R | 0 | 0 |
| Barnes Creek | 29.0 | 17.5' | 15 | 1,2,3,4,5 | 4 | F | G | R | 0 | 16.0 |
| Barranlin Branch | 2.1 | 4' | 3 | 1,2,4 | None | F | E | R | 0 | 0 |
| Snikey Branch | 1.5 | 4' | 3 | 1,2,4 | None | F | E | R | 0 | 0 |
| Redhead Branch | 3.3 | 8' | 4 | 1,2,4 | None | F | E | R | 0 | 0 |
| Long Gully | 1.6 | 4' | 3 | 1,2,4 | None | F | E | R | 0 | .2 |
| Cole's Branch | 2.0 | 4' | 4 | 1,2,4 | None | F | E | R | 0 | .2 |
| Lumber Branch | 2.0 | 3' | 3 | 1,2,4 | None | F | E | R | 0 | 1.7 |
| Kent Branch | 3.5 | 4' | 4 | 1,2,4 | None | F | E | R | 0 | 0 |
| Long Branch | 2.0 | 4' | 4 | 1,2,4 | None | F | E | R | 0 | 0 |
| Turkey Hollow Creek | 4.0 | 5' | 4 | 1,2,3,4 | None | F | E | R | 0 | 0 |
| Black Creek | 5.0 | 6' | 4 | 1,2,3,4 | None | F | E | R | 0 | 0 |
| Beetree Branch | 2.0 | 3' | 3 | 1,2,4 | None | F | G | R | 0 | 0 |
| Church Branch | 1.5 | 3' | 3 | 1,2,4 | None | F | G | R | 0 | 0 |
| Palmetto Creek | 8.2 | 7' | 0 | None | 1 | F | P | R | 0 | 2.8 |
| Hickory Branch | 1.5 | 4' | 3 | 1,2,4 | 1 | F | G | R | 0 | 5.8 |
| Flat Creek | 5.0 | 10' | 0 | None | 1 | F | P | R | 0 | 5.0 |
| Spring Branch #2 | 4.0 | 6' | 4 | 1,2,4 | None | F | E | R | 0 | 2.0 |
| Poley Branch | 3.8 | 3' | 3 | 1,2,4 | None | F | E | R | 0 | 2.0 |
| Beckwith Creek | 48.5 | 25' | 18 | 1,2,3,4,5 | 4 | F | F | R | 0 | 33.0 |
| Cowpen Creek | 23.5 | 8' | 10 | 1,2,3,4 | None | F | E | S | 0 | 0 |
| Black Creek #2 | 5.0 | 6' | 50 | 1,2,3,4,5,6 | 5 | F | F | R | 0 | 0 |
| Cameron | | | | | | | | | | |
| Mangrove Bayou | 2.5 | 30' | 15 | 1,2,3,4,5,6 | None | B | G | N | 0 | 2.0 |
| Lambert Bayou | 1.3 | 30' | 20 | 2,4,5,6 | 3,4 | B | G | L | 0 | 1.0 |
| Grande Bayou | 22.2 | 100' | 25 | 2,4,5,6 | 4 | B | G | L | 0 | 20.0 |
| Lakeshore Canal | 2.5 | 40' | 10 | 1,2,3,4,5,6 | None | B | G | N | 2.5 | 2.5 |
| Peconi Bayou | 10.0 | 50' | 15 | 1,2,3,4,5,6 | None | B | G | N | 0 | 8.0 |
| South Fork Black Bayou | 5.5 | 50' | 8 | 1,2,3,4,5,6 | 4 | F | F | S | 5.5 | 5.5 |
| Creole Canal | 4.8 | 60' | 10 | 1,2,3,4,5,6 | 4 | B | F | S | 4.8 | 4.8 |
| Bayou LaBauve | 7.5 | 30' | 6 | 1,2,3,4,5,6 | 4 | B | G | S | 0 | 5.0 |
| Kings Bayou | 8.0 | 30' | 6 | 1,2,3,4,5,6 | 4 | B | G | S | 1.0 | 1.0 |
| Pumpkin Bayou | 5.0 | 60' | 5 | 1,2,3,4,5,6 | 4 | B | G | S | .05 | 4.0 |
| Beach Prong | 1.0 | 80' | 15 | 4,5,6 | 4 | B | G | M | .6 | .6 |
| Pren Branch | 1.0 | 20' | 10 | 4,5,6 | 4 | B | G | S | .5 | .5 |
| North Island Canal | 3.4 | 100' | 25 | 4,5,6 | 4 | B | G | S | 3.4 | 3.4 |
| Little Cheniere Canal | 5.4 | 50' | 10 | 1,2,3,4,5,6 | 4 | B | G | S | 5.4 | 5.4 |
| North Canal | 3.5 | 40' | 15 | 1,2,3,4,5,6 | 2,4 | F | G | S | 3.5 | 3.5 |
| Bell City Drainage Ditch | 8.5 | 100' | 15 | 1,2,3,4,5,6 | 2,4 | F | G | S | 8.5 | 8.5 |
| Marseillaise Bayou | 3.5 | 50' | 15 | 1,2,3,4,5,6 | 4 | B | G | S | 0 | 3.0 |
| Big Mouth Bayou | 2.0 | 50' | 10 | 1,2,3,4,5,6 | 4 | B | G | S | 0 | 1.7 |

Table 2 - Continued

| Parish and Stream | Length miles | Width miles | Standing Crop (lbs./ac.) | Fish Species[1/] | Type of Pollution[2/] | Water Type[3/] | Water Quality[4/] | Flow[5/] | Previously Channeled[6/] miles | Permanent Water[6/] miles |
|---|---|---|---|---|---|---|---|---|---|---|
| Cameron | | | | | | | | | | |
| Little Chenier Bayou | 6.0 | 50' | 10 | 1,2,3,4,5,6 | 4 | B | G | S | 2.0 | 5.0 |
| Little Pecan Bayou | 9.5 | 50' | 10 | 1,2,3,4,5,6 | 4 | B | G | S | 8.0 | 9.5 |
| Cut Around Bayou | 2.0 | 20' | 10 | 1,2,3,4,5,6 | 4 | B | G | S | .0 | 2.0 |
| Bayou Lacassine | 14.5 | 125' | 40 | 1,2,3,4,5,6 | 2,4 | F | G | S | .0 | 14.5 |
| Bayou Misere | 3.0 | 100' | 40 | 1,2,3,4,5,6 | 2,4 | F | G | S | .0 | 3.0 |
| Lindstrom Bayou | 3.0 | 25' | 10 | 1,2,3,4,5,6 | 4 | B | G | S | .0 | .7 |
| Portie Bayou | 4.0 | 25' | 8 | 1,2,3,4,5,6 | 4 | B | G | S | .0 | 1.0 |
| Club Canal | 3.0 | 50' | 12 | 4,5,6 | 4 | B | G | S | 3.0 | 3.0 |
| Hog Bayou | 16.5 | 50' | 15 | 4,5,6 | 4 | B | G | S | 15.0 | 15.0 |
| Klondite Drainage Canal | 9.0 | 50' | 10 | 1,2,3,4,5,6 | 2 | F | F | S | 9.0 | 5.0 |
| Greydan Canal | 2.5 | 50' | 10 | 1,2,3,4,5,6 | 2 | F | G | S | 2.5 | 2.5 |
| Latanier Ditch | 2.4 | 30' | 10 | 1,2,3,4,5,6 | 2 | F | G | S | 2.4 | 2.4 |
| Mermentau River | | | | | | | | | | |
| (Above Catfish Locks) | 13.5 | 250' | 50 | 1,2,3,4,5,6 | 2,4,5 | F | G | S | 13.5 | 13.5 |
| (Below Catfish Locks) | 17.9 | 200' | 30 | 1,2,3,4,5,6 | 4 | B | G | S | 13.5 | 13.5 |
| Southwest Bayou | 7.2 | 30' | 10 | 1,2,3,4,5,6 | 4,5 | F | G | S | 0 | 6.8 |
| Mound Bayou | 6.5 | 30' | 10 | 1,2,3,4,5,6 | 4 | F | G | S | 0 | 5.5 |
| Blackfish Canal | 1.0 | 30' | 10 | 1,2,3,4,5,6 | 4 | F | G | S | 1.0 | 1.0 |
| Round Lake Canal | 1.0 | 30' | 10 | 1,2,3,4,5,6 | 4 | F | G | S | 1.0 | 1.0 |
| Snake Bayou | 5.0 | 30' | 10 | 1,2,3,4,5,6 | 4 | F | G | S | 1.0 | 4.0 |
| Constance Bayou | 20.5 | 75' | 10 | 1,2,3,4,5,6 | 4 | B | G | S | 2.0 | 8.0 |
| Little Constance Bayou | 1.4 | 75' | 25 | 4,5,6 | 4 | B | G | S | 1.3 | 1.4 |
| Joseph Harbor Bayou | 4.5 | 75' | 25 | 4,5,6 | 4 | B | G | S | 1.0 | 3.8 |
| Sabine River | 35.0 | 400' | 30 | 1,2,3,4,5,6 | 1,3,4,5 | B | P | R | 17.0 | 17.0 |
| Pat Clennons Bayou | 3.5 | 50' | 15 | 1,2,3,4,5,6 | 4 | B | G | S | .5 | .5 |
| Lighthouse Bayou | 3.0 | 30' | 12 | 1,2,3,4,5,6 | 4 | B | G | S | .5 | .5 |
| Big Forge Bayou | 4.5 | 30' | 12 | 1,2,3,4,5,6 | 4 | B | G | S | .0 | .7 |
| Green's Bayou | 4.2 | 40' | 15 | 1,2,3,4,5,6 | 4 | B | G | S | .0 | 2.5 |
| Madame Johnson's Bayou | 5.0 | 40' | 12 | 1,2,3,4,5,6 | 4 | B | G | S | 1.2 | 1.2 |
| Johnson's Bayou | 6.0 | 50' | 15 | 1,2,3,4,5,6 | 4 | B | G | S | 5.0 | 5.0 |
| Deep Bayou | 5.0 | 100' | 15 | 1,2,3,4,5,6 | 4 | B | G | S | 4.5 | 4.5 |
| Magnolia-Vacuum Canal | 4.5 | 60' | 15 | 1,2,3,4,5,6 | 4 | B | G | S | 4.5 | 4.5 |
| Old Bayou | 3.5 | 15' | 8 | 1,2,3,4,5,6 | 4,5 | B | F | S | 3.5 | 3.5 |
| Old North Bayou | 12.0 | 30' | 15 | 1,2,3,4,5,6 | 4 | B | G | S | 5.0 | 10.0 |
| Grey's Ditch | 7.5 | 40' | 10 | 1,2,3,4,5,6 | 4 | B | G | S | 7.5 | 7.5 |
| Double Island Gully | 6.5 | 30' | 12 | 1,2,3,4,5,6 | 4 | B | G | S | 0 | 5.5 |
| Willow Bayou | 1.9 | 50' | 10 | 1,2,3,4,5,6 | 4 | B | G | S | 0 | 1.9 |
| Bridge Bayou | 1.0 | 30' | 8 | 1,2,3,4,5,6 | None | B | G | S | 0 | .7 |
| Three Bayou | 1.0 | 30' | 8 | 1,2,3,4,5,6 | None | B | G | S | 0 | .7 |
| Whiskey Bayou | .8 | 30' | 8 | 1,2,3,4,5,6 | None | B | G | S | 0 | .6 |
| Black Bayou | 16.6 | 100' | 25 | 1,2,3,4,5,6 | 4 | B | G | S | 16.6 | 16.6 |
| Starks Bayou | 1.9 | 30' | 10 | 1,2,3,4,5,6 | 4 | B | G | S | 0 | 1.2 |
| Right Prong | 3.7 | 60' | 10 | 1,2,3,4,5,6 | 4 | B | G | S | 2.0 | 3.0 |
| East Fork of Right Prong | 2.2 | 30' | 10 | 1,2,3,4,5,6 | 4 | B | G | S | .5 | 1.5 |
| Green's Bayou | 4.6 | 45' | 15 | 1,2,3,4,5,6 | 4 | B | G | S | 2.0 | 4.0 |
| Starks North Canal | 44.0 | 40' | 15 | 1,2,3,4,5,6 | 4 | B | G | S | 44.0 | 44.0 |
| Starks Canal | 36.0 | 40' | 12 | 1,2,3,4,5,6 | 4 | B | G | S | 36.0 | 36.0 |
| Deep Bayou Canal | 3.0 | 40' | 12 | 1,2,3,4,5,6 | 4 | B | G | S | 3.0 | 3.0 |
| Willow Bayou Canal | 13.0 | 50' | 10 | 1,2,3,4,5,6 | 4 | B | G | S | 13.0 | 13.0 |
| Beach Canal | 13.0 | 40' | 12 | 1,2,3,4,5,6 | 4 | B | G | S | 13.0 | 13.0 |
| Back Ridge Canal | 23.5 | 40' | 10 | 1,2,3,4,5,6 | 4 | B | G | S | 23.5 | 23.5 |
| Central Canal | 7.0 | 40' | 10 | 1,2,3,4,5,6 | 4 | B | G | S | 7.0 | 7.0 |
| Old East Bayou | 11.9 | 30' | 15 | 1,2,3,4,5,6 | 4 | B | G | S | 0 | 4.0 |
| Mud Pass | 3.0 | 30' | 12 | 1,2,3,4,5,6 | 4 | B | G | S | 0 | 0 |
| First Bayou | 3.5 | 35' | 10 | 1,2,3,4,5,6 | 4,5 | B | G | S | 0 | 1.5 |
| Second Bayou | 2.2 | 30' | 8 | 1,2,3,4,5,6 | 4 | B | G | S | 0 | 1.0 |
| Oyster Bayou | 4.0 | 70' | 15 | 4,5,6 | 3,4 | B | G | S | 0 | 4.0 |
| Mud Bayou | 3.6 | 30' | 10 | 4,5,6 | 3,4 | B | G | S | 0 | .5 |
| Island Canal | 2.0 | 35' | 12 | 1,2,3,4,5,6 | 4 | B | G | S | 2.0 | 2.0 |
| Hog Island Gully | 6.0 | 60' | 10 | 1,2,3,4,5,6 | 4 | B | G | S | .1 | 2.0 |
| Long Point Bayou | 2.9 | 40' | 10 | 1,2,3,4,5,6 | 4 | B | G | S | 0 | 2.2 |
| Black Lake Bayou | 6.4 | 100' | 10 | 4,5 | 4,5 | B | G | S | 6.4 | 6.4 |
| Alkali Ditch | 3.9 | 100' | 10 | 4,5 | 4,5 | B | C | S | 3.9 | 3.9 |
| Evangeline | | | | | | | | | | |
| Turkey Creek | 8.0 | 25' | 15 | 1,2,3,4,5,6 | 5 | F | G | R | 0 | 0 |
| Beaver Creek | 13.2 | 15' | 12 | 1,2,3,4,5,6 | None | F | E | M | 0 | 0 |
| Caney Creek | 12.8 | 10' | 10 | 1,2,3,4,5,6 | 2 | F | G | S | 0 | 0 |
| Manwell Gully | 7.0 | 18' | 10 | 1,2,3,4,5,6 | 2,4 | F | G | S | 7.0 | 0 |
| West Fork,Bayou Nezpique | 7.0 | 7' | 8 | 1,2,3,4,5,6 | 2,4 | F | G | S | 0 | 0 |
| Bayou Nezpique | 37.0 | 18' | 18 | 1,2,3,4,5,6 | 2 | F | G | S | 14.3 | 0 |
| East Fork, Bayou Nezpique | 13.5 | 12' | 12 | 1,2,3,4,5,6 | 2,4 | F | G | S | .0 | 0 |
| Grand Louis Bayou | 10.0 | 9' | 10 | 1,2,3,4,5,6 | 2 | F | G | S | 10.0 | 0 |
| Tiger Point Gully | 4.0 | 20' | 10 | 1,2,3,4,5,6 | 2 | F | G | S | 0 | 0 |
| Bayou Durel | 20.5 | 12' | 10 | 1,2,3,4,5,6 | 2 | F | G | S | 10.0 | 0 |
| Bayou Cocodrie | 80.0 | 50' | 25 | 1,2,3,4,5,6 | 2 | F | G | M | 0 | 0 |
| Black Lake Bayou | 6.0 | 20' | 15 | 1,2,3,4,5,6 | 2 | F | G | S | 0 | 0 |
| Elm Bayou | 7.5 | 15' | 15 | 1,2,3,4,5,6 | 2 | F | G | M | 0 | 0 |
| Bayou des Cannes | 37.7 | 22' | 15 | 1,2,3,4,5,6 | 2 | F | G | S | 37.7 | 0 |
| Beacons Gully | 7.1 | 20' | 15 | 1,2,3,4,5,6 | 2 | F | G | S | 7.1 | 0 |
| Pine Point Gully | 7.4 | 15' | 10 | 1,2,3,4,5,6 | 2,4 | F | G | S | 0 | 0 |
| Bayou Nezpique ** | 14.6 | 20' | 10 | 1,2,3,4,5,6 | 2 | F | G | S | 0 | 0 |
| Bayou Chicot | 9.5 | 20' | 15 | 1,2,3,4,5,6 | 2 | F | G | S | 0 | 0 |
| Mill Creek | 4.2 | 15' | 12 | 1,2,3,4,5,6 | 2 | F | G | S | 0 | 0 |
| Bayou Joe Marcel | 8.2 | 15' | 10 | 1,2,3,4,5,6 | 2 | F | G | S | 8.2 | 0 |
| Bayou Petite Passe | 6.3 | 12' | 8 | 1,2,3,4,5,6 | 2 | F | G | S | 0 | 0 |
| Coulee de Manuel | 11.5 | 15' | 14 | 1,2,3,4,5,6 | 2 | F | G | S | 11.5 | 0 |
| Bayou Doza | 9.5 | 12' | 10 | 1,2,3,4,5,6 | 2 | F | G | S | 9.5 | 0 |
| Bayou Cocodrie #2 | 30.0 | 50' | 100 | 1,2,4,5,6 | 2,5 | F | G | R | 30.0 | 30.0 |
| Iberia | | | | | | | | | | |
| Bayou Petite Anse | 20.0 | 300' | 35 | 1,2,3,4,6 | 2,4,5 | F | F | S | 20.0 | 20.0 |
| Bayou Portage | 1.5 | 75' | 35 | 1,2,3,4,6 | 2,4,5 | F | F | S | 1.5 | 1.5 |
| Three Bayou | 8.0 | 100' | 35 | 1,2,3,4,6 | 2,4,5 | F | F | S | 1.0 | 4.0 |
| Avery Canal | 2.0 | 200' | 100 | 1,2,3,4,6 | 2,4,5 | F | G | S | 2.0 | 2.0 |
| Bayou Casmer | 3.0 | 50' | 35 | 1,2,3,4,6 | 2,4,5 | F | F | S | 0 | 2.0 |
| Bayou Tigre | 5.0 | 100' | 35 | 1,2,3,4,6 | 2,4,5 | F | F | S | 5.0 | 5.0 |
| Hayes Coulee | 3.0 | 50' | 100 | 1,2,3,4,6 | 2,4,5 | F | G | S | 3.0 | 3.0 |
| Jefferson Canal | 5.0 | 25' | 35 | 1,2,3,4,6 | 2,4,5 | F | F | S | 5.0 | 4.0 |

** Two separate streams with same name.

Continued-

Table 2 - Continued

| Parish and Stream | Length | Width | Standing Crop | Fish Species[1/] | Type of Pollution[2/] | Water Type[3/] | Water Quality[4/] | Flow[5/] | Previously Channeled[6/] | Permanent Water[6/] |
|---|---|---|---|---|---|---|---|---|---|---|
| | miles | miles | (lbs./ac.) | | | | | | miles | miles |
| Iberia | | | | | | | | | | |
| Roufette | 4.0 | 25' | 35 | 1,2,3,4,6 | 2,4,5 | F | F | S | 4.0 | 4.0 |
| Norris Branch Canal | 2.0 | 50' | 35 | 1,2,3,4,6 | 2,4,5 | F | F | S | 2.0 | 2.0 |
| Deblanc Canal | 2.0 | 50' | 35 | 1,2,3,4,6 | 2,4,5 | F | F | S | 2.0 | 2.0 |
| Weeks Bayou | 4.0 | 200' | 100 | 1,2,3,4,6 | 2,4,5 | F | G | S | 4.0 | 4.0 |
| Bayou Pete | 3.0 | 50' | 100 | 1,2,3,4,6 | 2,4,5 | F | G | S | .6 | 2.0 |
| Stumpy Bayou | 4.0 | 100' | 100 | 1,2,3,4,6 | 2,4,5 | F | G | S | 4.0 | 4.0 |
| Warehouse Bayou | 7.0 | 100' | 100 | 1,2,3,4,6 | 2,4,5 | F | G | S | 5.0 | 5.0 |
| Bayou Putout | 6.0 | 60' | 35 | 1,2,3,4,6 | 2,4,5 | F | F | S | 6.0 | 6.0 |
| Bayou Carlin | 6.0 | 75' | 100 | 1,2,3,4,6 | 2,4,5 | F | G | S | 6.0 | 6.0 |
| Bayou Tete | 8.0 | 50' | 100 | 1,2,3,4,6 | 2,4,5 | F | C | S | 8.0 | 7.5 |
| Delahoussaye Canal | 7.0 | 40' | 35 | 1,2,3,4,6 | 2,4,5 | F | F | S | 7.0 | 4.0 |
| Sandager Canal | 2.0 | 40' | 35 | 1,2,3,4,6 | 2,4,5 | F | F | S | 2.0 | .2 |
| Wilkins Canal | 2.0 | 50' | 35 | 1,2,3,4,6 | 2,4,5 | F | F | S | 2.0 | 2.0 |
| Jacks Coulee Canal | 4.0 | 25' | 35 | 1,2,3,4,6 | 2,4,5 | F | F | S | 4.0 | 2.0 |
| New Iberia Drainage | 10.0 | 75' | 35 | 1,2,3,4,6 | 2,4,5 | F | F | S | 10.0 | 10.0 |
| Iberia, St. Mary | | | | | | | | | | |
| Intracoastal Waterways | 25.0 | 400' | 35 | 1,2,3,4,6 | 2,4,5 | F | F | S | 25.0 | 25.0 |
| Iberia-St. Mary Drainage | 14.0 | 80' | 35 | 1,2,3,4,6 | 2,4,5 | F | F | S | 14.0 | 14.0 |
| Jefferson Davis | | | | | | | | | | |
| Bayou Lacassine | 14.0 | 75' | 80 | 1,2,3,4,5,6 | 2 | F | G | S | 0 | 14.0 |
| East Fork, Bayou Lacassine | 12.0 | 50' | 80 | 1,2,3,4,5,6 | 2 | F | G | S | 10.0 | 12.0 |
| Bayou Chene | 11.0 | 50' | 80 | 1,2,3,4,5,6 | 2 | F | G | S | 11.0 | 11.0 |
| Grand Marias | 4.0 | 30' | 80 | 1,2,3,4,5,6 | 2 | F | G | S | 4.0 | 4.0 |
| East Grand Marias | 5.0 | 40' | 80 | 1,2,3,4,5,6 | 2 | F | G | S | 5.0 | 5.0 |
| Bayou Serpent | 24.0 | 40' | 50 | 1,2,3,4,5,6 | 2 | F | G | S | 24.0 | 9.0 |
| Little Bayou | 8.0 | 30' | 50 | 1,2,3,4,5,6 | 2 | F | G | S | 8.0 | 1.0 |
| Jefferson Davis, Acadia | | | | | | | | | | |
| Lower Bayou Nezpique | 28.0 | 40' | 50 | 4,5,6 | 2,4 | F | G | S | 0 | 28.0 |
| Rapides, Allen | | | | | | | | | | |
| Calcasieu River | 35.0 | 35' | 65 | 1,2,3,4,5,6 | None | F | G | R | 0 | 35.0 |
| Cherrywinch | 11.0 | 15' | 65 | 1,2,3,4,5,6 | None | P | G | L | 0 | 11.0 |
| Swetz Branch | 3.0 | 10' | 65 | 1,2,3,4,5,6 | None | F | G | L | 0 | 3.0 |
| Rapides | | | | | | | | | | |
| Blounts Creek | 4.0 | 10' | 65 | 1,2,3,4,5,6 | None | F | G | R | 0 | 4.0 |
| Prairie Branch | 3.0 | 10' | 65 | 1,2,3,4,5,6 | None | F | G | L | 0 | 3.0 |
| Masters Creek | 3.0 | 10' | 65 | 1,2,3,4,5,6 | None | F | G | L | 0 | 0 |
| Goodman Branch | 4.0 | 10' | 65 | 1,2,3,4,5,6 | None | F | G | L | 0 | 3.0 |
| Swetz Creek | 2.0 | 8' | 50 | 1,2,3,4,5,6 | None | F | C | R | 0 | 2.0 |
| Bouef-Cocodrie Diversion | 18.0 | 40' | 80 | 1,2,3,4,5,6 | 2 | F | F | R | 18.0 | 18.0 |
| Bayou Bouef | 58.0 | 50' | 60 | 1,2,3,4,5,6 | None | F | F | L | 13.0 | 58.0 |
| Indian Creek | 11.0 | 20' | 60 | 1,2,3,4,5,6 | None | F | G | R | 0 | 0 |
| Bayou Clear | 6.0 | 15' | 60 | 1,2,3,4,5,6 | None | F | G | R | 6.0 | 6.0 |
| Burgess Creek | 4.0 | 10' | 60 | 1,2,3,4,5,6 | None | F | G | R | 0 | 0 |
| Valentine Creek | 8.0 | 15' | 60 | 1,2,3,4,5,6 | None | F | G | R | 0 | 8.0 |
| Lamotte Bayou | 6.0 | 10' | 60 | 1,2,3,4,5,6 | None | F | G | R | 0 | 6.0 |
| Caster Creek | 6.0 | 15' | 60 | 1,2,3,4,5,6 | None | F | G | R | 0 | 3.0 |
| Loving Creek | 4.0 | 15' | 60 | 1,2,3,4,5,6 | None | F | G | R | 0 | 4.0 |
| Chatline Lake Canal | 27.0 | 20' | 80 | 1,2,3,4,5,6 | 2 | F | P | L | 27.0 | 15.0 |
| Bayou Latanier | 13.0 | 10' | 80 | 1,2,3,4,5,6 | 2 | F | P | L | 0 | 6.0 |
| Wilson Bayou | 9.0 | 10' | 80 | 1,2,3,4,5,6 | 2 | F | P | L | 0 | 0 |
| Bayou Lamourie | 6.0 | 15' | 80 | 1,2,3,4,5,6 | 2 | F | P | L | 0 | 2.0 |
| Rattlesnake Bayou | 6.0 | 10' | 80 | 1,2,3,4,5,6 | 2 | F | P | L | 0 | 0 |
| Cowhead Bayou | 5.0 | 10' | 80 | 1,2,3,4,5,6 | 2 | F | P | L | 0 | 0 |
| Bayou Rouge | 8.0 | 10' | 80 | 1,2,3,4,5,6 | 2 | F | P | L | 0 | 0 |
| Bayou Current | 5.0 | 10' | 80 | 1,2,3,4,5,6 | 2 | F | P | L | 0 | 0 |
| Bayou Rapides | 25.0 | 25' | 75 | 1,2,3,4,5,6 | 2 | F | P | L | 1.0 | 25.0 |
| Brown's Creek | 5.0 | 10' | 75 | 1,2,3,4,5,6 | 2 | F | G | R | 0 | 5.0 |
| Saline Bayou | 3.0 | 10' | 75 | 1,2,3,4,5,6 | 2 | F | G | R | 7.0 | 3.0 |
| Bertrand Bayou | 8.0 | 8' | 90 | 1,2,3,4,5,6 | 2 | F | F | L | 8.0 | 8.0 |
| Sandy Bayou | 6.0 | 8' | 90 | 1,2,3,4,5,6 | 2 | F | F | L | 6.0 | 0 |
| Big Bayou | 6.0 | 8' | 90 | 1,2,3,4,5,6 | 2 | F | F | L | 6.0 | 6.0 |
| Irish Ditch No. 1 | 4.0 | 8' | 90 | 1,2,3,4,5,6 | 2 | F | F | L | 4.0 | 4.0 |
| Irish Ditch No. 2 | 2.0 | 8' | 90 | 1,2,3,4,5,6 | 2 | F | F | L | 2.0 | 2.0 |
| Bayou Cocodrie | 9.0 | 30' | 70 | 1,2,3,4,5,6 | 4,5 | F | G | L | 0 | 9.0 |
| Spring Creek | 24.0 | 25' | 70 | 1,2,3,4,5,6 | 4,5 | F | C | R | 0 | 24.0 |
| Beaver Creek | 9.0 | 20' | 70 | 1,2,3,4,5,6 | 4,5 | F | G | R | 0 | 9.0 |
| Marshall Creek | 3.0 | 10' | 70 | 1,2,3,4,5,6 | 4,5 | F | G | R | 0 | 3.0 |
| Roaring Creek | 4.0 | 10' | 70 | 1,2,3,4,5,6 | 4,5 | F | G | R | 0 | 4.0 |
| Germany Creek | 3.0 | 6' | 70 | 1,2,3,4,5,6 | 4,5 | F | G | R | 0 | 1.0 |
| Barber Creek | 5.0 | 6' | 70 | 1,2,3,4,5,6 | 4,5 | F | G | R | 0 | 5.0 |
| Hurrican Creek | 8.0 | 10' | 70 | 1,2,3,4,5,6 | 4,5 | F | G | R | 0 | 8.0 |
| Tannera Creek | 4.0 | 6' | 70 | 1,2,3,4,5,6 | 4,5 | F | G | R | 0 | 4.0 |
| Little Spring Creek | 7.0 | 6' | 70 | 1,2,3,4,5,6 | 4,5 | F | C | R | 0 | 7.0 |
| Clear Creek | 4.0 | 6' | 70 | 1,2,3,4,5,6 | 4,5 | F | G | R | 0 | 4.0 |
| St. Martin, Lafayatte | | | | | | | | | | |
| Upper Vermilion River | 36.0 | 70' | 80 | 4,6 | 1,2 | F | G | S | 15.0 | 36.0 |
| St. Martin, Iberia | | | | | | | | | | |
| Upper Teche Bayou | 76.0 | 50' | 80 | 4,6 | 1,2 | F | G | S | 26.0 | 76.0 |
| St. Mary | | | | | | | | | | |
| Franklin Canal | 8.0 | 50' | 80 | 1,2,3,4,6 | 2,4,5 | F | G | S | 4.0 | 8.0 |
| Pipeline Canal | 13.0 | 25' | 80 | 1,2,3,4,6 | 2,4,5 | F | G | S | 13.0 | 13.0 |
| Charentow Drainage Canal | 12.0 | 200' | 58 | 1,2,3,4,6 | 2,4,5 | F | G | S | 0 | 12.0 |
| Bayou Choupique | 8.0 | 100' | 80 | 1,2,3,4,6 | 2,4,5 | F | G | S | 6.0 | 8.0 |
| Stump Bayou | 3.0 | 50' | 80 | 1,2,3,4,6 | 2,4,5 | F | G | S | 3.0 | 3.0 |
| Onion Bayou | 3.0 | 25' | 80 | 1,2,3,4,6 | 2,4,5 | F | G | S | 0 | 3.0 |
| Leapard Bayou | 3.0 | 200' | 80 | 1,2,3,4,6 | 2,4,5 | F | G | S | 0 | 3.0 |
| Oak Bayou | 4.0 | 150' | 80 | 1,2,3,4,6 | 2,4,5 | F | G | S | 2.0 | 4.0 |
| Horseshoe Bayou | 4.0 | 100' | 80 | 1,2,3,4,6 | 2,4,5 | F | G | S | 2.0 | 4.0 |
| Bayou Sale | 10.0 | 200' | 80 | 1,2,3,4,6 | 2,4,5 | F | G | S | 4.0 | 4.0 |
| Black Crook Bayou | 2.0 | 100' | 80 | 1,2,3,4,6 | 2,4,5 | F | G | S | 0 | 2.0 |
| Bayou Massot | 3.0 | 100' | 150 | 1,2,3,4,6 | 2,4,5 | F | G | S | 0 | 3.0 |
| Ivan Hoe Canal | 8.0 | 75' | 80 | 1,2,3,4,6 | 2,4,5 | F | G | S | 6.0 | 8.0 |
| Hog Bayou | 6.0 | 100' | 150 | 1,2,3,4,6 | 2,4,5 | F | G | S | 3.0 | 6.0 |
| Miscellaneous Canals | 64.0 | 40' | 80 | 1,2,3,4,6 | 2,4,5 | F | G | S | 64.0 | 64.0 |
| Vermilion | | | | | | | | | | |
| Lower Vermilion River | 30.0 | 100' | 80 | 4,6 | 1,2,3 | F | G | S | 30.0 | 30.0 |

Continued-

Table 2 - Continued

| Parish and Stream | Length miles | Width miles | Standing Crop (lbs./ac.) | Fish Species 1/ | Type of Pollution 2/ | Water Type 3/ | Quality 4/ | Flow 5/ | Previsouly Channeled 6/ miles | Permanent Water 6/ miles |
|---|---|---|---|---|---|---|---|---|---|---|
| Vermilion, Acadia, Jefferson Davis | | | | | | | | | | |
| Mermentau River | 16.0 | 100' | 80 | 1,2,3,4,5,6 | 2,4 | F | G | S | 0 | 16.0 |
| Vernon | | | | | | | | | | |
| Yellow Branch | 4.0 | 6' | 65 | 1,2,3,4,5,6 | None | F | G | R | 0 | 0 |
| Greys Creek | 3.0 | 8' | 65 | 1,2,3,4,5,6 | None | F | G | R | 0 | 6.0 |
| Evans Branch | 3.0 | 6' | 65 | 1,2,3,4,5,6 | None | F | G | R | 0 | 2.0 |
| Flectaw Creek | 5.0 | 8' | 65 | 1,2,3,4,5,6 | None | F | G | R | 0 | 2.0 |
| Shingle Mill Branch | 4.0 | 8' | 65 | 1,2,3,4,5,6 | None | F | G | R | 0 | 3.0 |
| Indian Creek | 4.0 | 8' | 65 | 1,2,3,4,5,6 | None | F | G | R | 0 | 1.0 |
| Mims Creek | 4.0 | 6' | 65 | 1,2,3,4,5,6 | None | F | G | R | 0 | 0 |
| Mill Creek | 5.0 | 8' | 65 | 1,2,3,4,5,6 | None | F | G | R | 0 | 5.0 |
| Thompson Branch | 6.0 | 10' | 50 | 1,2,3,4,5,6 | None | F | G | R | 0 | 0 |
| Steep Gully | 6.0 | 10' | 50 | 1,2,3,4,5,6 | None | F | G | R | 0 | 4.0 |
| Clear Creek | 5.0 | 8' | 50 | 1,2,3,4,5,6 | 5 | F | F | R | 0 | 4.0 |
| Big Brushy | 12.0 | 10' | 50 | 1,2,3,4,5,6 | 5 | F | G | R | 0 | 12.0 |
| Little Six Mile | 6.0 | 10' | 50 | 1,2,3,4,5,6 | 5 | F | G | R | 0 | 6.0 |
| East Fork Six Mile | 8.0 | 10' | 50 | 1,2,3,4,5,6 | 5 | F | G | R | 0 | 8.0 |
| West Fork Six Mile | 8.0 | 10' | 50 | 1,2,3,4,5,6 | 5 | F | G | R | 0 | 8.0 |
| Little Brushy Creek | 5.0 | 6' | 50 | 1,2,3,4,5.6 | 5 | F | G | R | 0 | 5.0 |
| Whiskey Chitto | 18.0 | 25' | 50 | 1,2,3,4,5,6 | 5 | F | G | R | 0 | 18.0 |
| Drakes Creek | 14.0 | 10' | 50 | 1,2,3,4,5,6 | 5 | F | G | R | 0 | 12.0 |
| Birds Creek | 10.0 | 10' | 50 | 1,2,3,4,5,6 | 5 | F | G | R | 0 | 9.0 |
| Horse Branch | 3.0 | 6' | 50 | 1,2,3,4,5,6 | 5 | F | G | R | 0 | 3.0 |
| Glade Branch | 4.0 | 6' | 50 | 1,2,3,4,5,6 | 5 | F | G | R | 0 | 2.0 |
| Vernon, Allen | | | | | | | | | | |
| Six Mile Creek | 20.0 | 15' | 50 | 1,2,3,4,5,6 | 5 | F | G | R | 0 | 20.0 |
| Vernon, Allen, Beauregard | | | | | | | | | | |
| Bundick Creek | 32.0 | 15' | 50 | 1,2,3,4,5,6 | 5 | F | F | R | 0 | 32.0 |
| Vernon, Rapides | | | | | | | | | | |
| Calcasieu River | 27.0 | 20' | 65 | 1,2,3,4,5,6 | None | F | G | R | 0 | 27.0 |
| Big Creek | 14.0 | 12' | 65 | 1,2,3,4,5,6 | None | F | G | R | 0 | 14.0 |
| Comrade Creek | 20.0 | 23' | 50 | 1,2,3,4,6 | None | F | G | R | 0 | 18.0 |
| Middle Creek | 13.0 | 15' | 50 | 1,2,3,4,6 | None | F | G | R | 0 | 9.0 |
| Bayou Celestine | 6.0 | 10' | 50 | 1,2,3,4,6 | None | F | G | R | 0 | 4.0 |
| Vernon, Rapides, Natchitoches | | | | | | | | | | |
| Devils Creek | 12.0 | 10' | 50 | 1,2,3,4,6 | None | F | G | R | 4.0 | 12.0 |
| Vernon, Rapides, Allen | | | | | | | | | | |
| Ten Mile Creek | 19.0 | 15' | 50 | 1,2,3,4,5,6 | None | F | G | R | 0 | 19.0 |
| TOTAL | 3,009.6 | | | | | | | | 1,315.45 | 1,914.5 |

1/ Fish Species
- 1 = Largemouth Bass
- 2 = Bream Perch
- 3 = Crappie
- 4 = Catfish
- 5 = Drum
- 6 = Buffalo, Carp, etc.

2/ Type of Pollution
- 1 = Domestic Sewage
- 2 = Agricultural (Sediment, Pesticides, etc.)
- 3 = Industrial
- 4 = Oil and Salt Water
- 5 = Miscellaneous

3/ Water Type
- F = Fresh
- B = Brackish

4/ Water Quality
- E = Excellent
- G = Good
- F = Fair
- P = Poor

5/ Flow
- L = Languid
- M = Moderate
- N = No Flow
- R = Rapid
- S = Slow

6/ Data developed by the Soil Conservation Service

4-31721 2-74

Table 3 - Inventory of Game Species by Land Use or Timber Types;
Present and Potential Populations and Harvest Trends, Southwest Louisiana River Basin

| Species and Parish | PASTURE Present Population Per. Ac. | Present Population Total | Present Harvest No. | Present Harvest Man-day Rec. | Potential Population Per. Ac. | Potential Population Total | Potential Harvest No. | Potential Harvest Man-day Rec. | CROPLAND Present Population Per. Ac. | Present Population Total | Present Harvest No. | Present Harvest Man-day Rec. | Potential Population Per. Ac. | Potential Population Total | Potential Harvest No. | Potential Harvest Man-day Rec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dove** | | | | | | | | | | | | | | | | |
| Acadia | .82 | 29,975 | 5,995 | 1,394 | .82 | 29,975 | 5,995 | 1,394 | 4.0 | 1,150,025 | 230,005 | 98,922 | 4.0 | 1,150,025 | 230,005 | 98,922 |
| Allen | .30 | 3,380 | 676 | 157 | | | | | 2.7 | 232,440 | 46,488 | 10,811 | | | | |
| Avoyelles | .96 | 41,105 | 8,221 | 1,912 | | | | | 1.9 | 215,710 | 43,142 | 10,033 | | | | |
| Beauregard | .30 | 6,145 | 1,229 | 286 | | | | | 3.2 | 111,765 | 22,353 | 5,198 | | | | |
| Calcasieu | .80 | 40,946 | 8,188 | 1,904 | | | | | .78 | 224,365 | 44,873 | 10,436 | | | | |
| Cameron | .39 | 15,370 | 3,074 | 714 | | | | | .71 | 73,070 | 14,614 | 3,399 | | | | |
| Evangeline | .30 | 9,775 | 1,955 | 455 | | | | | .83 | 137,905 | 27,581 | 6,414 | | | | |
| Iberia | .97 | 19,320 | 3,864 | 899 | | | | | 1.93 | 168,565 | 33,713 | 7,840 | | | | |
| Jefferson Davis | .48 | 5,315 | 1,063 | 247 | | | | | 1.28 | 407,380 | 81,476 | 18,948 | | | | |
| Lafayette | .95 | 67,620 | 13,524 | 3,145 | | | | | .96 | 74,865 | 29,946 | 6,964 | | | | |
| Natchitoches | | | | | | | | | | | | | | | | |
| Rapides | 2.43 | 193,200 | 38,640 | 8,986 | | | | | 4.78 | 386,400 | 77,280 | 17,972 | | | | |
| St. Landry | .93 | 30,910 | 6,182 | 1,438 | | | | | 1.92 | 464,680 | 92,936 | 21,613 | | | | |
| St. Martin | .32 | 8,355 | 1,671 | 389 | | | | | 1.93 | 162,000 | 32,400 | 7,535 | | | | |
| St. Mary | .96 | 1,110 | 222 | 52 | | | | | 1.93 | 103,650 | 20,730 | 4,821 | | | | |
| Vermilion | .80 | 40,320 | 8,064 | 1,874 | | | | | 1.55 | 460,810 | 92,162 | 21,433 | | | | |
| Vernon | .86 | 7,245 | 1,449 | 337 | | | | | 4.76 | 19,320 | 3,864 | 899 | | | | |
| **Quail** | | | | | | | | | | | | | | | | |
| Acadia | .25 | 8,975 | 3,590 | 1,561 | .25 | 8,975 | 3,590 | 1,561 | .12 | 33,652 | 13,461 | 3,096 | .12 | 33,652 | 13,461 | 3,096 |
| Allen | .05 | 640 | 256 | 111 | | | | | .12 | 9,935 | 3,974 | 1,728 | | | | |
| Avoyelles | .06 | 2,740 | 1,096 | 476 | | | | | .12 | 13,012 | 5,205 | 2,263 | | | | |
| Beauregard | .06 | 1,282 | 513 | 223 | | | | | .06 | 2,050 | 820 | 356 | | | | |
| Calcasieu | .06 | 3,205 | 1,282 | 557 | | | | | .12 | 33,652 | 13,461 | 5,853 | | | | |
| Cameron | .06 | 2,565 | 1,026 | 446 | | | | | .11 | 11,218 | 4,487 | 1,951 | | | | |
| Evangeline | .06 | 2,082 | 833 | 362 | | | | | .12 | 19,230 | 7,692 | 3,344 | | | | |
| Iberia | .64 | 12,820 | 5,128 | 2,230 | | | | | .09 | 7,700 | 3,080 | 1,339 | | | | |
| Jefferson Davis | .06 | 640 | 256 | 111 | | | | | .12 | 36,858 | 14,743 | 6,410 | | | | |
| Lafayette | .06 | 4,582 | 1,833 | 797 | | | | | .12 | 9,038 | 3,615 | 1,572 | | | | |
| Natchitoches | | | | | | | | | | | | | | | | |
| Rapides | .06 | 5,128 | 2,051 | 891 | | | | | .12 | 9,615 | 3,846 | 672 | | | | |
| St. Landry | .06 | 2,082 | 833 | 362 | | | | | .12 | 28,220 | 11,288 | 4,908 | | | | |
| St. Martin | .06 | 1,668 | 667 | 290 | | | | | .12 | 9,775 | 3,910 | 1,700 | | | | |
| St. Mary | .07 | 80 | 32 | 14 | | | | | .12 | 6,250 | 2,500 | 1,087 | | | | |
| Vermilion | .06 | 3,205 | 1,282 | 557 | | | | | .12 | 34,615 | 13,846 | 6,020 | | | | |
| Vernon | .03 | 270 | 108 | 47 | | | | | .12 | 480 | 192 | 83 | | | | |
| **Rabbit** | | | | | | | | | | | | | | | | |
| Acadia | .08 | 2,920 | 1,168 | 730 | .08 | 2,920 | 1,168 | 730 | .39 | 110,992 | 44,397 | 27,748 | .39 | 110,992 | 44,397 | 27,748 |
| Allen | .07 | 780 | 312 | 195 | | | | | .39 | 33,492 | 13,397 | 8,373 | | | | |
| Avoyelles | .06 | 2,565 | 1,026 | 641 | | | | | .39 | 43,482 | 17,393 | 10,871 | | | | |
| Beauregard | .08 | 1,558 | 623 | 389 | | | | | .38 | 13,240 | 5,296 | 3,310 | | | | |
| Calcasieu | .08 | 3,895 | 1,558 | 974 | | | | | .39 | 112,162 | 44,865 | 28,041 | | | | |
| Cameron | .07 | 2,920 | 1,168 | 730 | | | | | .38 | 38,945 | 15,578 | 9,736 | | | | |
| Evangeline | .08 | 2,725 | 1,090 | 681 | | | | | .39 | 64,260 | 25,704 | 16,065 | | | | |
| Iberia | .08 | 1,558 | 623 | 389 | | | | | .39 | 33,980 | 13,592 | 8,495 | | | | |
| Jefferson Davis | .07 | 780 | 312 | 195 | | | | | .39 | 124,625 | 49,850 | 31,156 | | | | |
| Lafayette | .08 | 5,560 | 2,224 | 1,390 | | | | | .39 | 30,240 | 12,096 | 7,560 | | | | |
| Natchitoches | | | | | | | | | | | | | | | | |
| Rapides | .08 | 6,190 | 2,476 | 1,548 | | | | | .39 | 31,545 | 12,618 | 7,886 | | | | |
| St. Landry | .06 | 2,142 | 857 | 536 | | | | | .39 | 94,295 | 37,718 | 23,574 | | | | |
| St. Martin | .06 | 1,685 | 674 | 421 | | | | | .39 | 32,645 | 13,058 | 8,161 | | | | |
| St. Mary | .08 | 98 | 39 | 18 | | | | | .39 | 20,885 | 8,354 | 5,221 | | | | |
| Vermilion | .02 | 972 | 389 | 243 | | | | | .39 | 114,887 | 45,955 | 28,721 | | | | |
| Vernon | .09 | 662 | 265 | 167 | | | | | .39 | 1,578 | 631 | 394 | | | | |

Continued-



4-31721 2-74

Table 3 - Continued

| Species and Parish | Present | | | | Potential | | | | Present | | | | Potential | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Population | | Harvest | | Population | | Harvest | | Population | | Harvest | | Population | | Harvest | |
| | Per. Ac. | Total | No. | Man-day Rec. | Per. Ac. | Total | No. | Man-day Rec. | Per. Ac. | Total | No. | Man-day Rec. | Per. Ac. | Total | No. | Man-day Rec. |
| | PASTURE | | | | | | | | CROPLAND | | | | | | | |
| **Turkey** | | | | | | | | | | | | | | | | |
| Acadia | Stocking Anticipated by 1974 | | | | | | | | | | | | | | | |
| Allen | Recently Stocked | | | | | | | | | | | | | | | |
| Avoyelles | Stocking Anticipated by 1974 | | | | | | | | | | | | | | | |
| Beauregard | Stocking Anticipated by 1974 | | | | | | | | | | | | | | | |
| Calcasieu | Stocking Anticipated by 1974 | | | | | | | | | | | | | | | |
| Cameron | Stocking Not Anticipated | | | | | | | | | | | | | | | |
| Evangeline | Recently Stocked | | | | | | | | | | | | | | | |
| Iberia | Stocking Anticipated by 1974 | | | | | | | | | | | | | | | |
| Jefferson Davis | Stocking Anticipated by 1974 | | | | | | | | | | | | | | | |
| Lafayette | Stocking Anticipated by 1974 | | | | | | | | | | | | | | | |
| Natchitoches | Recently Stocked | | | | | | | | | | | | | | | |
| Rapides | Recently Stocked | | | | | | | | | | | | | | | |
| St. Landry | Recently Stocked | | | | | | | | | | | | | | | |
| St. Martin | Stocking Anticipated by 1974 | | | | | | | | | | | | | | | |
| St. Mary | Recently Stocked | | | | | | | | | | | | | | | |
| Vermilion | Stocking Anticipated by 1974 | | | | | | | | | | | | | | | |
| Vernon | Recently Stocked | | | | | | | | | | | | | | | |
| | BOTTOMLAND | | | | | | | | OAK - PINE | | | | | | | |
| **Deer** | | | | | | | | | | | | | | | | |
| Acadia | 1/220 | 224 | 0 | 0 | 1/20 | 2,474 | 825 | 23,512 | 1/250 | 22 | 0 | 0 | 1/40 | 138 | 46 | 1,311 |
| Allen | 1/291 | 3,150 | 450 | 12,825 | 1/30 | 3,060 | 1,020 | 29,070 | 1/615 | 1,050 | 150 | 4,275 | 1/50 | 1,292 | 431 | 12,278 |
| Avoyelles | 1/104 | 560 | 80 | 2,280 | 1/20 | 2,899 | 966 | 27,531 | | | | | | | | |
| Beauregard | 1/177 | 280 | 40 | 1,140 | 1/30 | 1,654 | 551 | 15,704 | 1/517 | 140 | 20 | 570 | 1/50 | 1,447 | 482 | 13,737 |
| Calcasieu | 1/73 | 560 | 80 | 2,280 | 1/30 | 1,664 | 555 | 15,818 | | | | | | | | |
| Cameron | 1/20 | 78 | 10 | 285 | 1/15 | 104 | 35 | 998 | | | | | | | | |
| Evangeline | 1/82 | 700 | 100 | 2,850 | 1/30 | 1,905 | 635 | 18,098 | 1/196 | 175 | 25 | 712 | 1/50 | 687 | 229 | 6,526 |
| Iberia | 1/116 | 483 | 69 | 1,966 | 1/20 | 2,804 | 935 | 26,648 | | | | | | | | |
| Jefferson Davis | | | | | | | | | 1/112 | 140 | 20 | 570 | 1/50 | 314 | 105 | 2,992 |
| Lafayette | 1/151 | 30 | 0 | 0 | 1/20 | 226 | 75 | 2,138 | | | | | | | | |
| Natchitoches | 1/28 | 35 | 5 | 142 | 1/30 | 33 | 11 | 314 | 1/43 | 35 | 5 | 142 | 1/50 | 30 | 10 | 285 |
| Rapides | 1/111 | 1,050 | 150 | 4,275 | 1/25 | 4,661 | 1,554 | 44,289 | 1/236 | 175 | 25 | 712 | 1/50 | 828 | 276 | 7,866 |
| St. Landry | 1/146 | 770 | 110 | 3,135 | 1/20 | 5,613 | 1,871 | 53,324 | | | | | | | | |
| St. Martin | 1/258 | 259 | 37 | 1,054 | 1/20 | 3,338 | 1,113 | 31,720 | | | | | | | | |
| St. Mary | 1/181 | 245 | 35 | 998 | 1/20 | 2,217 | 739 | 21,062 | | | | | | | | |
| Vermilion | 1/27 | 1,106 | 158 | 4,503 | 1/20 | 1,502 | 301 | 8,578 | | | | | | | | |
| Vernon | 1/57 | 630 | 90 | 2,565 | 1/30 | 1,197 | 399 | 11,372 | 1/157 | 595 | 85 | 2,422 | 1/50 | 1,866 | 622 | 17,727 |
| **Dove** | | | | | | | | | | | | | | | | |
| Acadia | | | | | | | | | | | | | | | | |
| Allen | | | | | | | | | | | | | | | | |
| Avoyelles | | | | | | | | | | | | | | | | |
| Beauregard | | | | | | | | | | | | | | | | |
| Calcasieu | | | | | | | | | | | | | | | | |
| Cameron | | | | | | | | | | | | | | | | |
| Evangeline | 1/82 | 700 | 100 | 2,850 | 1/30 | 1,905 | 635 | 18,098 | | | | | | | | |
| Iberia | | | | | | | | | | | | | | | | |
| Jefferson Davis | | | | | | | | | | | | | | | | |
| Lafayette | | | | | | | | | | | | | | | | |
| Natchitoches | | | | | | | | | | | | | | | | |
| Rapides | | | | | | | | | | | | | | | | |
| St. Landry | | | | | | | | | | | | | | | | |
| St. Martin | | | | | | | | | | | | | | | | |
| St. Mary | | | | | | | | | | | | | | | | |
| Vermilion | | | | | | | | | | | | | | | | |
| Vernon | | | | | | | | | | | | | | | | |

4-31721 4-2

Table 3 - Continued

| Species and Parish | Bottomland Present Population Per. Ac. | Bottomland Present Population Total | Bottomland Present Harvest No. | Bottomland Present Harvest Man-day Rec. | Bottomland Potential Population Per. Ac. | Bottomland Potential Population Total | Bottomland Potential Harvest No. | Bottomland Potential Harvest Man-day Rec. | Oak - Pine Present Population Per. Ac. | Oak - Pine Present Population Total | Oak - Pine Present Harvest No. | Oak - Pine Present Harvest Man-day Rec. | Oak - Pine Potential Population Per. Ac. | Oak - Pine Potential Population Total | Oak - Pine Potential Harvest No. | Oak - Pine Potential Harvest Man-day Rec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quail | | | | | | | | | | | | | | | | |
| Acadia | .013 | 640 | 256 | 111 | | | | | .064 | 352 | 141 | 61 | | | | |
| Allen | .12 | 1,122 | 449 | 195 | | | | | .06 | 4,140 | 1,656 | 720 | | | | |
| Avoyelles | | | | | | | | | | | | | | | | |
| Beauregard | .013 | 640 | 256 | 111 | | | | | .07 | 4,640 | 1,856 | 807 | | | | |
| Calcasieu | .012 | 480 | 192 | 83 | | | | | | | | | | | | |
| Cameron | | | | | | | | | | | | | | | | |
| Evangeline | .01 | 800 | 320 | 139 | | | | | .06 | 2,208 | 883 | 384 | | | | |
| Iberia | .01 | 685 | 274 | 119 | | | | | | | | | | | | |
| Jefferson Davis | | | | | | | | | .06 | 1,005 | 402 | 175 | | | | |
| Lafayette | | | | | | | | | | | | | | | | |
| Natchitoches | | | | | | | | | .06 | 95 | 38 | 16 | | | | |
| Rapides | .01 | 1,538 | 615 | 267 | | | | | .06 | 2,660 | 1,064 | 462 | | | | |
| St. Landry | | | | | | | | | | | | | | | | |
| St. Martin | | | | | | | | | | | | | | | | |
| St. Mary | .01 | 512 | 205 | 89 | | | | | | | | | | | | |
| Vermilion | | | | | | | | | | | | | | | | |
| Vernon | .01 | 448 | 179 | 79 | | | | | .07 | 6,410 | 2,564 | 1,115 | | | | |
| Rabbit | | | | | | | | | | | | | | | | |
| Acadia | .39 | 19,472 | 7,789 | 4,868 | | | | | .035 | 195 | 78 | 49 | | | | |
| Allen | .39 | 36,025 | 14,410 | 9,006 | | | | | .05 | 3,505 | 1,402 | 876 | | | | |
| Avoyelles | | | | | | | | | | | | | | | | |
| Beauregard | .39 | 19,472 | 7,789 | 4,868 | | | | | .03 | 2,338 | 935 | 584 | | | | |
| Calcasieu | .38 | 15,578 | 6,231 | 3,894 | | | | | | | | | | | | |
| Cameron | .38 | 585 | 234 | 146 | | | | | | | | | | | | |
| Evangeline | .38 | 21,892 | 8,957 | 5,598 | | | | | .02 | 725 | 389 | 243 | | | | |
| Iberia | .39 | 21,845 | 8,738 | 5,461 | | | | | | | | | | | | |
| Jefferson Davis | | | | | | | | | .03 | 847 | 195 | 122 | | | | |
| Lafayette | .39 | 1,752 | 701 | 438 | | | | | | | | | | | | |
| Natchitoches | | | | | | | | | .18 | 272 | 109 | 68 | | | | |
| Rapides | .12 | 14,215 | 5,686 | 3,554 | | | | | .08 | 3,408 | 1,363 | 839 | | | | |
| St. Landry | .39 | 43,720 | 17,488 | 10,930 | | | | | | | | | | | | |
| St. Martin | .39 | 25,995 | 10,398 | 6,499 | | | | | | | | | | | | |
| St. Mary | .39 | 17,310 | 6,924 | 4,328 | | | | | | | | | | | | |
| Vermilion | .27 | 6,815 | 2,726 | 1,704 | | | | | | | | | | | | |
| Vernon | .38 | 13,630 | 5,452 | 3,407 | | | | | .18 | 17,135 | 6,854 | 4,284 | | | | |
| Squirrel | | | | | | | | | | | | | | | | |
| Acadia | 2.41 | 119,400 | 29,850 | 16,583 | | | | | .52 | 2,864 | 716 | 1,289 | | | | |
| Allen | 2.4 | 219,696 | 54,924 | 30,513 | | | | | .29 | 19,104 | 4,776 | 2,653 | | | | |
| Avoyelles | 2.4 | 138,432 | 34,608 | 19,227 | | | | | | | | | | | | |
| Beauregard | 2.4 | 119,400 | 29,850 | 16,583 | | | | | .59 | 42,984 | 10,746 | 5,970 | | | | |
| Calcasieu | 2.3 | 95,520 | 23,880 | 13,267 | | | | | | | | | | | | |
| Cameron | | | | | | | | | | | | | | | | |
| Evangeline | 2.51 | 143,280 | 35,820 | 19,900 | | | | | .63 | 21,492 | 5,373 | 2,985 | | | | |
| Iberia | 2.3 | 129,196 | 32,299 | 17,944 | | | | | | | | | | | | |
| Jefferson Davis | | | | | | | | | .61 | 9,552 | 2,388 | 1,327 | | | | |
| Lafayette | 2.39 | 10,792 | 2,698 | 1,499 | | | | | | | | | | | | |
| Natchitoches | | | | | | | | | .36 | 538 | 215 | 119 | | | | |
| Rapides | 2.38 | 277,008 | 69,252 | 38,473 | | | | | .59 | 24,356 | 6,089 | 3,383 | | | | |
| St. Landry | 2.39 | 268,076 | 67,019 | 37,233 | | | | | | | | | | | | |
| St. Martin | 2.39 | 159,400 | 39,850 | 22,139 | | | | | | | | | | | | |
| St. Mary | 2.17 | 96,116 | 24,029 | 13,349 | | | | | | | | | | | | |
| Vermilion | 1.49 | 44,775 | 17,910 | 9,950 | | | | | | | | | | | | |
| Vernon | 2.39 | 85,968 | 21,492 | 11,940 | | | | | .61 | 57,312 | 14,328 | 7,960 | | | | |

Continued-



4-31721 2-74

Table 3 - Continued

| Species and Parish | Present: Population: Per. Ac. | Present: Population: Total | Present: Harvest: No. | Present: Harvest: Man-day Rec. | Potential: Population: Per. Ac. | Potential: Population: Total | Potential: Harvest: No. | Potential: Harvest: Man-day Rec. | Present: Population: Per. Ac. | Present: Population: Total | Present: Harvest: No. | Present: Harvest: Man-day Rec. | Potential: Population: Per. Ac. | Potential: Population: Total | Potential: Harvest: No. | Potential: Harvest: Man-day Rec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | BOTTOMLAND | | | | | | | | OAK - PINE | | | | | | | |
| **Turkey** | | | | | | | | | | | | | | | | |
| Acadia | | | | | 1/25 | 1,979 | 495 | 9,900 | | | | | 1/35 | 157 | 39 | 780 |
| Allen | | | | | 1/25 | 3,672 | 918 | 18,360 | | | | | 1/35 | 1,846 | 461 | 9,220 |
| Avoyelles | | | | | 1/25 | 2,319 | 580 | 11,600 | | | | | | | | |
| Beauregard | | | | | 1/25 | 1,985 | 496 | 9,920 | | | | | 1/35 | 2,068 | 517 | 10,340 |
| Calcasieu | | | | | 1/25 | 1,637 | 409 | 8,180 | | | | | | | | |
| Cameron | | | | | | | | | | | | | | | | |
| Evangeline | | | | | 1/25 | 2,286 | 571 | 11,420 | | | | | 1/35 | 981 | 245 | 4,900 |
| Iberia | | | | | 1/25 | 2,244 | 561 | 11,220 | | | | | | | | |
| Jefferson Davis | | | | | | | | | | | | | 1/35 | 448 | 112 | 2,240 |
| Lafayette | | | | | 1/25 | 181 | 45 | 900 | | | | | | | | |
| Natchitoches | | | | | 1/25 | 40 | 10 | 200 | | | | | 1/35 | 43 | 11 | 220 |
| Rapides | | | | | 1/25 | 4,661 | 1,165 | 23,300 | | | | | 1/35 | 1,183 | 296 | 5,920 |
| St. Landry | | | | | 1/25 | 4,490 | 1,122 | 22,440 | | | | | | | | |
| St. Martin | | | | | 1/25 | 2,670 | 667 | 13,340 | | | | | | | | |
| St. Mary | | | | | 1/25 | 1,774 | 443 | 8,860 | | | | | | | | |
| Vermilion | | | | | 1/25 | 1,202 | 300 | 6,000 | | | | | | | | |
| Vernon | | | | | 1/25 | 1,436 | 359 | 7,180 | | | | | 1/35 | 2,666 | 666 | 13,320 |
| | LOBLOLLY - SHORTLEAF | | | | | | | | OAK - HICKORY | | | | | | | |
| **Deer** | | | | | | | | | | | | | | | | |
| Acadia | 1/350 | 47 | 0 | 0 | 1/50 | 330 | 110 | 3,135 | 1/442 | 490 | 70 | 1,995 | 1/45 | 481 | 160 | 4,574 |
| Allen | 1/753 | 1,365 | 195 | 5,558 | 1/60 | 1,714 | 571 | 16,279 | | | | | | | | |
| Avoyelles | | | | | | | | | | | | | | | | |
| Beauregard | 1/487 | 140 | 20 | 570 | 1/60 | 1,137 | 379 | 10,802 | 1/354 | 140 | 20 | 570 | 1/45 | 1,103 | 368 | 10,488 |
| Calcasieu | 1/971 | 42 | 6 | 171 | 1/60 | 680 | 227 | 6,470 | | | | | | | | |
| Cameron | | | | | | | | | | | | | | | | |
| Evangeline | 1/244 | 280 | 40 | 1,140 | 1/60 | 1,141 | 380 | 10,830 | 1/130 | 175 | 25 | 712 | 1/45 | 507 | 169 | 4,816 |
| Iberia | | | | | | | | | | | | | | | | |
| Jefferson Davis | 1/298 | 105 | 15 | 428 | 1/60 | 522 | 174 | 4,959 | 1/75 | 140 | 20 | 570 | 1/45 | 232 | 77 | 2,194 |
| Lafayette | | | | | | | | | | | | | | | | |
| Natchitoches | 1/62 | 161 | 23 | 656 | 1/60 | 167 | 56 | 1,596 | 1/43 | 35 | 5 | 142 | 1/45 | 33 | 11 | 314 |
| Rapides | 1/369 | 231 | 33 | 940 | 1/60 | 1,421 | 474 | 13,509 | 1/183 | 350 | 50 | 1,425 | 1/45 | 1,422 | 474 | 13,509 |
| St. Landry | 1/300 | 8 | 0 | 0 | 1/35 | 65 | 22 | 627 | | | | | | | | |
| St. Martin | | | | | | | | | | | | | | | | |
| St. Mary | | | | | | | | | | | | | | | | |
| Vermilion | | | | | | | | | | | | | | | | |
| Vernon | 1/143 | 735 | 105 | 2,992 | 1/60 | 1,751 | 584 | 16,644 | 1/96 | 525 | 75 | 2,138 | 1/45 | 1,127 | 376 | 10,716 |
| **Quail** | | | | | | | | | | | | | | | | |
| Acadia | .12 | 1,922 | 769 | 334 | | | | | | | | | | | | |
| Allen | .12 | 12,820 | 5,128 | 2,230 | | | | | .12 | 255 | 102 | 44 | | | | |
| Avoyelles | | | | | | | | | | | | | | | | |
| Beauregard | .13 | 8,975 | 3,590 | 1,561 | | | | | .013 | 640 | 256 | 111 | | | | |
| Calcasieu | .12 | 4,808 | 1,923 | 836 | | | | | | | | | | | | |
| Cameron | | | | | | | | | | | | | | | | |
| Evangeline | .12 | 8,012 | 3,205 | 1,392 | | | | | .01 | 320 | 128 | 56 | | | | |
| Iberia | | | | | | | | | | | | | | | | |
| Jefferson Davis | .12 | 3,840 | 1,536 | 668 | | | | | .11 | 1,122 | 449 | 195 | | | | |
| Lafayette | | | | | | | | | | | | | | | | |
| Natchitoches | .13 | 1,282 | 513 | 223 | | | | | .04 | 65 | 26 | 11 | | | | |
| Rapides | .01 | 832 | 333 | 145 | | | | | .01 | 832 | 333 | 145 | | | | |
| St. Landry | | | | | | | | | | | | | | | | |
| St. Martin | | | | | | | | | | | | | | | | |
| St. Mary | | | | | | | | | | | | | | | | |
| Vermilion | | | | | | | | | | | | | | | | |
| Vernon | .12 | 12,820 | 5,128 | 2,230 | | | | | .01 | 640 | 256 | 111 | | | | |

Continued-

Table 3 - Continued

| Species and Parish | Present Population Per. Ac. | Present Population Total | Present Harvest No. | Present Harvest Man-day Rec. | Potential Population Per. Ac. | Potential Population Total | Potential Harvest No. | Potential Harvest Man-day Rec. | Present Population Per. Ac. | Present Population Total | Present Harvest No. | Present Harvest Man-day Rec. | Potential Population Per. Ac. | Potential Population Total | Potential Harvest No. | Potential Harvest Man-day Rec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LOBLOLLY - SHORTLEAF | | | | | | | | OAK - HICKORY | | | | | | | |
| Rabbit | | | | | | | | | | | | | | | | |
| Acadia | .03 | 525 | 210 | 131 | | | | | | | | | | | | |
| Allen | .076 | 7,790 | 3,116 | 1,948 | | | | | .31 | 682 | 273 | 171 | | | | |
| Avoyelles | | | | | | | | | | | | | | | | |
| Beauregard | .03 | 2,142 | 857 | 536 | | | | | .20 | 9,968 | 2,492 | 1,558 | | | | |
| Calcasieu | .03 | 1,362 | 545 | 303 | | | | | | | | | | | | |
| Cameron | | | | | | | | | | | | | | | | |
| Evangeline | .03 | 1,948 | 779 | 487 | | | | | .03 | 682 | 273 | 171 | | | | |
| Iberia | | | | | | | | | | | | | | | | |
| Jefferson Davis | .03 | 1,070 | 428 | 268 | | | | | .11 | 1,168 | 467 | 292 | | | | |
| Lafayette | | | | | | | | | | | | | | | | |
| Natchitoches | .13 | 1,305 | 522 | 326 | | | | | .65 | 972 | 389 | 242 | | | | |
| Rapides | .13 | 11,100 | 4,440 | 2,775 | | | | | .19 | 12,462 | 4,985 | 3,115 | | | | |
| St. Landry | .02 | 48 | 19 | 12 | | | | | | | | | | | | |
| St. Martin | | | | | | | | | | | | | | | | |
| St. Mary | | | | | | | | | | | | | | | | |
| Vermilion | | | | | | | | | | | | | | | | |
| Vernon | .13 | 13,630 | 5,452 | 3,408 | | | | | .18 | 9,735 | 3,894 | 2,434 | | | | |
| Squirrel | | | | | | | | | | | | | | | | |
| Acadia | .29 | 4,776 | 1,194 | 663 | | | | | | | | | | | | |
| Allen | .30 | 31,044 | 7,761 | 4,312 | | | | | .48 | 10,344 | 2,586 | 1,437 | .48 | 10,344 | 2,586 | 1,437 |
| Avoyelles | | | | | | | | | | | | | | | | |
| Beauregard | .29 | 20,060 | 5,015 | 2,786 | | | | | .45 | 22,208 | 5,552 | 3,084 | .45 | 22,208 | 5,552 | 3,084 |
| Calcasieu | .29 | 11,940 | 2,985 | 1,658 | | | | | | | | | | | | |
| Cameron | | | | | | | | | | | | | | | | |
| Evangeline | .28 | 19,104 | 4,776 | 2,653 | | | | | .39 | 8,712 | 2,178 | 1,210 | .39 | 8,712 | 2,178 | 1,210 |
| Iberia | | | | | | | | | | | | | | | | |
| Jefferson Davis | .27 | 8,596 | 2,149 | 1,194 | | | | | .32 | 3,332 | 833 | 463 | .32 | 3,332 | 833 | 463 |
| Lafayette | | | | | | | | | | | | | | | | |
| Natchitoches | .30 | 2,984 | 746 | 414 | | | | | 1.99 | 2,984 | 746 | 414 | 1.99 | 2,984 | 746 | 414 |
| Rapides | .31 | 26,268 | 6,567 | 3,648 | | | | | .60 | 38,208 | 9,552 | 5,307 | .60 | 38,208 | 9,552 | 5,307 |
| St. Landry | .03 | 75 | 30 | 17 | | | | | | | | | | | | |
| St. Martin | | | | | | | | | | | | | | | | |
| St. Mary | | | | | | | | | | | | | | | | |
| Vermilion | | | | | | | | | | | | | | | | |
| Vernon | .23 | 23,880 | 5,970 | 3,317 | | | | | .56 | 28,656 | 7,164 | 3,980 | .56 | 28,656 | 7,164 | 3,980 |
| Turkey | | | | | | | | | | | | | | | | |
| Acadia | | | | | 1/50 | 330 | 82 | 1,640 | | | | | | | | |
| Allen | | | | | 1/50 | 2,056 | 514 | 10,280 | | | | | 1/35 | 619 | 155 | 3,100 |
| Avoyelles | | | | | | | | | | | | | 1/35 | 1,418 | 354 | 7,080 |
| Beauregard | | | | | 1/50 | 1,365 | 341 | 6,820 | | | | | | | | |
| Calcasieu | | | | | 1/50 | 815 | 204 | 4,080 | | | | | | | | |
| Cameron | | | | | | | | | | | | | | | | |
| Evangeline | | | | | 1/50 | 1,369 | 342 | 6,840 | | | | | 1/35 | 652 | 163 | 3,260 |
| Iberia | | | | | | | | | | | | | | | | |
| Jefferson Davis | | | | | 1/50 | 626 | 156 | 3,120 | | | | | 1/35 | 299 | 75 | 1,500 |
| Lafayette | | | | | | | | | | | | | | | | |
| Natchitoches | | | | | 1/50 | 200 | 50 | 1,000 | | | | | 1/35 | 43 | 11 | 220 |
| Rapides | | | | | 1/50 | 1,706 | 426 | 8,520 | | | | | 1/35 | 1,829 | 457 | 9,140 |
| St. Landry | | | | | 1/50 | 46 | 11 | 220 | | | | | | | | |
| St. Martin | | | | | | | | | | | | | | | | |
| St. Mary | | | | | | | | | | | | | | | | |
| Vermilion | | | | | | | | | | | | | | | | |
| Vernon | | | | | 1/50 | 2,101 | 525 | 10,500 | | | | | 1/35 | 1,449 | 362 | 7,240 |

Continued-



4-31721 2-74

Table 3 - Continued

| Species and Parish | LONGLEAF - SLASH Present Population Per. Ac. | Present Population Total | Present Harvest No. | Present Harvest Man-day Rec. | Potential Population Per. Ac. | Potential Population Total | Potential Harvest No. | Potential Harvest Man-day Rec. | RANGE Present Population Per. Ac. | Present Population Total | Present Harvest No. | Present Harvest Man-day Rec. | Potential Population Per. Ac. | Potential Population Total | Potential Harvest No. | Potential Harvest Man-day Rec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Deer | | | | | | | | | | | | | | | | |
| Acadia | 1/800 | 1,078 | 154 | 4,389 | 1/80 | 1,079 | 359 | 10,246 | | | | | | | | |
| Allen | | | | | | | | | | | | | | | | |
| Avoyelles | | | | | | | | | | | | | | | | |
| Beauregard | 1/1365 | 203 | 29 | 826 | 1/80 | 3,464 | 1,155 | 32,918 | | | | | | | | |
| Calcasieu | 1/1298 | 35 | 5 | 142 | 1/80 | 568 | 189 | 5,386 | | | | | | | | |
| Cameron | | | | | | | | | 1/499 | 500 | 7 | 200 | 1/200 | 1,248 | 416 | 11,856 |
| Evangeline | 1/362 | 63 | 9 | 256 | 1/80 | 285 | 95 | 2,708 | | | | | | | | |
| Iberia | | | | | | | | | | | | | | | | |
| Jefferson Davis | 1/299 | 35 | 5 | 142 | 1/80 | 131 | 44 | 1,254 | | | | | | | | |
| Lafayette | | | | | | | | | | | | | | | | |
| Natchitoches | 1/108 | 14 | 2 | 57 | 1/80 | 19 | 6 | 171 | | | | | | | | |
| Rapides | 1/448 | 175 | 25 | 712 | 1/80 | 980 | 327 | 9,320 | | | | | | | | |
| St. Landry | | | | | | | | | | | | | | | | |
| St. Martin | | | | | | | | | | | | | | | | |
| St. Mary | | | | | | | | | | | | | | | | |
| Vermilion | | | | | | | | | 1/101 | 700 | 100 | 2,850 | 1/100 | 705 | 235 | 6,698 |
| Vernon | 1/164 | 987 | 141 | 4,018 | 1/80 | 2,023 | 674 | 19,209 | | | | | | | | |
| Quail | | | | | | | | | | | | | | | | |
| Acadia | | | | | | | | | | | | | | | | |
| Allen | .13 | 11,062 | 4,425 | 1,924 | | | | | | | | | | | | |
| Avoyelles | | | | | | | | | | | | | | | | |
| Beauregard | .13 | 35,520 | 14,208 | 6,177 | | | | | | | | | | | | |
| Calcasieu | .13 | 5,822 | 2,329 | 1,013 | | | | | .014 | 640 | 256 | 111 | | | | |
| Cameron | | | | | | | | | .01 | 3,205 | 1,282 | 557 | | | | |
| Evangeline | .13 | 2,925 | 1,170 | 509 | | | | | | | | | | | | |
| Iberia | | | | | | | | | | | | | | | | |
| Jefferson Davis | .13 | 1,340 | 536 | 233 | | | | | | | | | | | | |
| Lafayette | | | | | | | | | | | | | | | | |
| Natchitoches | .13 | 192 | 77 | 33 | | | | | | | | | | | | |
| Rapides | .13 | 10,095 | 4,038 | 1,756 | | | | | | | | | | | | |
| St. Landry | | | | | | | | | | | | | | | | |
| St. Martin | | | | | | | | | | | | | | | | |
| St. Mary | | | | | | | | | .01 | 172 | 69 | 30 | | | | |
| Vermilion | | | | | | | | | .01 | 800 | 320 | 139 | | | | |
| Vernon | .13 | 20,832 | 8,333 | 3,623 | | | | | | | | | | | | |
| Rabbit | | | | | | | | | | | | | | | | |
| Acadia | | | | | | | | | | | | | | | | |
| Allen | .03 | 2,735 | 1,094 | 684 | | | | | | | | | | | | |
| Avoyelles | | | | | | | | | | | | | | | | |
| Beauregard | .03 | 9,152 | 3,661 | 1,663 | | | | | | | | | | | | |
| Calcasieu | .03 | 1,460 | 584 | 365 | | | | | .19 | 8,608 | 3,443 | 2,152 | | | | |
| Cameron | | | | | | | | | .36 | 91,130 | 36,452 | 22,782 | | | | |
| Evangeline | .03 | 682 | 27[illegible] | 171 | | | | | | | | | | | | |
| Iberia | | | | | | | | | | | | | | | | |
| Jefferson Davis | .03 | 292 | 117 | 73 | | | | | | | | | | | | |
| Lafayette | | | | | | | | | | | | | | | | |
| Natchitoches | .13 | 195 | 78 | 49 | | | | | | | | | | | | |
| Rapides | .13 | 10,125 | 4,050 | 2,531 | | | | | | | | | | | | |
| St. Landry | | | | | | | | | | | | | | | | |
| St. Martin | | | | | | | | | | | | | | | | |
| St. Mary | | | | | | | | | .19 | 2,658 | 1,063 | 664 | | | | |
| Vermilion | | | | | | | | | .23 | 16,552 | 6,621 | 4,138 | | | | |
| Vernon | .13 | 21,030 | 8,412 | 5,258 | | | | | | | | | | | | |

Continued-

4-31721 2-74

Table 3 - Continued

| Species and Parish | Present Population Per. Ac. | Present Population Total | Present Harvest No. | Present Harvest Man-day Rec. | Potential Population Per. Ac. | Potential Population Total | Potential Harvest No. | Potential Harvest Man-day Rec. | Present Population Per. Ac. | Present Population Total | Present Harvest No. | Present Harvest Man-day Rec. | Potential Population Per. Ac. | Potential Population Total | Potential Harvest No. | Potential Harvest Man-day Rec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LONGLEAF - SLASH | | | | | | | | | | | | | | |
| Squirrel | | | | | | | | | | | | | | | | |
| Acadia | | | | | | | | | | | | | | | | |
| Allen | .28 | 23,880 | 5,970 | 3,317 | | | | | | | | | | | | |
| Avoyelles | | | | | | | | | | | | | | | | |
| Beauregard | .29 | 81,192 | 20,298 | 11,277 | | | | | | | | | | | | |
| Calcasieu | .26 | 11,940 | 2,985 | 1,658 | | | | | | | | | | | | |
| Cameron | | | | | | | | | | | | | | | | |
| Evangeline | .27 | 6,208 | 1,552 | 862 | | | | | | | | | | | | |
| Iberia | | | | | | | | | | | | | | | | |
| Jafferson Davis | .27 | 2,864 | 716 | 398 | | | | | | | | | | | | |
| Lafayette | | | | | | | | | | | | | | | | |
| Natchitoches | .20 | 298 | 119 | 66 | | | | | | | | | | | | |
| Rapides | .48 | 37,444 | 9,361 | 5,200 | | | | | | | | | | | | |
| St. Landry | | | | | | | | | | | | | | | | |
| St. Martin | | | | | | | | | | | | | | | | |
| St. Mary | | | | | | | | | | | | | | | | |
| Vermilion | | | | | | | | | | | | | | | | |
| Vernon | .30 | 48,236 | 12,059 | 6,699 | | | | | | | | | | | | |
| Turkey | | | | | | | | | | | | | | | | |
| Acadia | | | | | | | | | | | | | | | | |
| Allen | | | | | 1/50 | 1,726 | 431 | 8,620 | | | | | | | | |
| Avoyelles | | | | | | | | | | | | | | | | |
| Beauregard | | | | | 1/50 | 5,542 | 1,542 | 27,700 | | | | | | | | |
| Calcasieu | | | | | 1/50 | 908 | 227 | 4,540 | | | | | | | | |
| Cameron | | | | | | | | | | | | | | | | |
| Evangeline | | | | | 1/50 | 456 | 114 | 2,280 | | | | | | | | |
| Iberia | | | | | | | | | | | | | | | | |
| Jefferson Davis | | | | | 1/50 | 209 | 52 | 1,040 | | | | | | | | |
| Lafayette | | | | | | | | | | | | | | | | |
| Natchitoches | | | | | 1/50 | 30 | 7 | 140 | | | | | | | | |
| Rapides | | | | | 1/50 | 1,568 | 302 | 7,840 | | | | | | | | |
| St. Landry | | | | | | | | | | | | | | | | |
| St. Martin | | | | | | | | | | | | | | | | |
| St. Mary | | | | | | | | | | | | | | | | |
| Vermilion | | | | | | | | | | | | | | | | |
| Vernon | | | | | 1/50 | 3,237 | 809 | 16,180 | | | | | | | | |



4-31721 2-74

of the game supervisors of the four administrative districts that contain the Study Area.

Two species of squirrels occur here, the fox squirrel and the gray squirrel. In many areas they occupy the same ranges, and the same harvest regulations govern both. From survey data, it was impossible to assign numerical values to either so they are treated as squirrels, with no effort to gauge their respective importance.

The hunter take of squirrels varies considerably from year to year and appears to be more closely associated with squirrel population density than with any other factor. The target year, 1967, coincides with the Small Game Survey of the 1967-68 hunting season in Louisiana. This mail questionnaire survey as designed, measured the statewide kill of squirrels within a latitude of 2.1 percent at the 95 percent confidence level.

Squirrels reported killed by hunters who purchased a basic hunting license within the Study Area were taken on a fraction of the total reported killed by respondents from throughout the state. This fraction was applied to the statewide computed squirrel kill to get a computed squirrel kill by basic hunting license buyers of the Study Area. Since residents over 60 and under 16 are not required to purchase a resident hunting license, the above survey fails to estimate the participation or the kill by hunters of this category. To find a basis for such an estimate, an evaluation of the 1967-68 deer kill survey revealed that 21.6 percent of the hunting efforts for deer were made by hunters outside the age bracket that requires a basic hunting license. It further indicated that 16.2 percent of the deer kill was made by persons under or over license buying age.

The assumption was made that hunters of doves, quail, rabbits, and squirrels have a similar relationship between the participation and success of licensed to non-licensed hunters. Based on this, the small game participation estimates were expanded by 1.275 and the small game kill estimates by 1.193.

Since only 7 of the 17 parishes comprising the Study Area were entirely within the area, it was necessary to make judgements as to the fraction of the kill that should be assigned the portion of the parishes in the area. The fraction of the total kill of a parish that was assigned to the portion of the parish within the Study Area varied by species. For instance, 80 percent of the dove kill and only 40 percent of the deer kill of St. Landry Parish was attributed to the Study Area portion of the parish.

Since the small game survey sampling was designed to estimate the statewide kill rather than the kill by individual parishes, the subdivision of the kill into Study Area kill and remainder of state kill broadened the confidence limits of computed estimates considerably. By using the Study Area kill, more precision is possible than with individual parish estimates.

The 1967-68 Small Game Survey showed a harvest rate of 1.8 squirrels per effort. Studies with marked squirrels on several wildlife management areas opened to measured hunting showed that 25 percent of the population is removed by hunting annually.

The district supervisors' estimates of kill by forest types within each of their parishes of the Study Area was totaled. This total was divided into the Study Area computed kill and gave 1.208 as a "K" factor to apply to each forest type estimate. This makes use of the supervisors' estimates of squirrel harvests relative to timber types and at the same time adjusts their estimates so that the sum of these estimates approximates the computed kill. See table 4.

Table 4 - Squirrel Kill by Parishes and by Forest Timber Types, Southwest Louisiana River Basin

| Parish | Total Kill[1/] | Bottomland | Oak-Hickory | Oak Pine | Loblolly Shortleaf | Long Leaf Slash |
|---|---|---|---|---|---|---|
| Acadia | 31,760 | 29,850 | | 716 | 1,194 | |
| Allen | 76,017 | 54,924 | 2,586 | 4,776 | 7,761 | 5,970 |
| Avoyelles | 34,608 | 34,608 | | | | |
| Beauregard | 71,461 | 29,850 | 5,552 | 10,746 | 5,015 | 20,298 |
| Calcasieu | 33,432 | 23,880 | | 3,582 | 2,985 | 2,985 |
| Cameron | | | | | | |
| Evangeline | 49,699 | 35,820 | 2,178 | 5,373 | 4,776 | 1,552 |
| Iberia | 32,299 | 32,299 | | | | |
| Jeff. Davis | 6,086 | | 833 | 2,388 | 2,149 | 716 |
| Lafayette | 2,698 | 2,698 | | | | |
| Natchitoches | 1,826 | | 746 | 215 | 746 | 119 |
| Rapides | 100,821 | 69,252 | 9,552 | 6,089 | 6,567 | 9,361 |
| St. Landry | 67,049 | 67,019 | | | 30 | |
| St. Martin | 39,850 | 39,850 | | | | |
| St. Mary | 24,029 | 24,029 | | | | |
| Vermilion | 17,910 | 17,910 | | | | |
| Vernon | 61,013 | 21,492 | 7,164 | 14,328 | 5,970 | 12,059 |
| Total | 650,558 | 483,481 | 28,611 | 48,213 | 37,193 | 53,060 |

1/ Squirrel Kill computed from estimated kill by forest timber types multiplied by "K" 1.194 to make total satisfy 1967-68 small game kill survey estimate of kill for study area.

## RABBITS

Two species of rabbits, the cottontail and the swamp rabbit, occur in the Study Area. The cottontail is more common to pastures, croplands, and better drained pinelands. Swamp rabbits occur throughout the area from the narrow stream bottoms of the pinelands to the rangeland of the prairies. They reach their greatest density in the bottom land hardwood timber types. Rabbits were the only game providing recreation in all land use types.

The 1967-68 Small Game Kill Survey was used to compute the kill of rabbits in the area. Use of these data was similar to the use of squirrel kill data.

In the case of rabbits, the kill estimated by district supervisors for each type was reduced by use of 0.7789 as a "K" factor to make the sum of the estimates approximate the Study Area kill computed by use of the 1967-68 survey.

## DOVES

Some doves are present throughout the year in the Study Area. Only two land use types were assigned a dove harvest since no appreciable hunting for doves occurs in other than pasture or cropland. Several timber types have breeding populations of mourning doves but none can be counted upon to concentrate dove during the fall and winter months to the point that hunting is feasible. The longleaf-slash pine type generally contains the best dove populations during breeding seasons and along with other forest types, makes a significant, though unmeasured, contribution to the welfare of resident doves in the Study Area.

In addition to locally reared birds, a great many migrant birds spend a portion of the year here. Population estimates were made with the knowledge that the transitory habits of doves during the cooler months make realistic inventories almost impossible at this time. Estimates are for the highest population present at any one time during the year.

A 20 percent harvest of doves is assumed. Survey data indicates that approximately 20 percent of the highest population present at one time in the Study Area are harvested. This is considerably less than 20 percent of all of the birds that make some use of this area during a year.

Data gleaned from the 1967-68 Small Game Kill Survey reveal that approximately 40 percent of the doves killed in Louisiana that season were bagged in the Study Area. Table 5 shows the dove kill by parishes in the Basin Area for the year 1967-68.

Table 5 - Computed Dove Kill, Southwest Louisiana River Basin

| Parish | Land Use: Pasture | Land Use: Cropland | Total |
|---|---|---|---|
| | number | | |
| Acadia | 5,995 | 230,005 | 236,000 |
| Allen | 676 | 46,488 | 47,164 |
| Avoyelles | 8,221 | 43,142 | 51,363 |
| Beauregard | 1,229 | 22,353 | 23,582 |
| Calcasieu | 8,188 | 44,873 | 53,061 |
| Cameron | 3,074 | 14,614 | 17,688 |
| Evangeline | 1,955 | 27,581 | 59,536 |
| Iberia | 3,864 | 33,713 | 37,577 |
| Jeff. Davis | 1,063 | 81,476 | 82,539 |
| Lafayette | 13,524 | 29,946 | 43,470 |
| Natchitoches | 0 | 0 | 0 |
| Rapides | 38,640 | 77,280 | 115,920 |
| St. Landry | 6,182 | 92,936 | 99,118 |
| St. Martin | 1,671 | 32,400 | 34,071 |
| St. Mary | 222 | 20,730 | 20,952 |
| Vermilion | 8,064 | 92,162 | 100,226 |
| Vernon | 1,449 | 3,864 | 5,313 |
| Total | | | 1,027,580 |

QUAIL

The bobwhite quail occurs throughout the Study Area except in large tracts of bottom land hardwoods. The fraction of the statewide 1967-68 kill computed from the mail survey was expanded using the method employed for squirrels, rabbits, and doves.

Estimates of populations and kills by land use types submitted by Commission district supervisors were adjusted to approximate the kill computed from the survey information. In this instance the "K" factor was 1.282 which means that each of the 82 estimates by types were increased by 28.2 percent.

The assumption was made that 40 percent of the fall population is harvested and hunter success was found to be 2.3 birds per effort. Projections for the potential are the same as the present harvest, recreations, etc.

WHITE-TAILED DEER

Deer were absent from much of the Study Area prior to a restocking effort by the Louisiana Wild Life and Fisheries Commission that lasted from 1949 to 1965. Many deerherds were relatively new and were still expanding in 1967. Hunting seasons have been conservatively restrictive to allow for almost maximum growth of the herds.

In this area, as in much of the State, poaching and year-around harrassment of deer by dogs are believed to be major factors in preventing deer from reaching the carrying capacity of their ranges. Because of the losses associated with these two factors, the older herds have not required either sex hunting. Liberal either sex seasons are essential for herds near carrying capacity to provide a sustained yield harvest of one-third the total fall population annually.

Projections of potential population, potential harvest, potential recreation, etc., are based upon estimates of carrying capacities as they exist under 1967 land uses. They do not include any consideration of deliberate alternation of habitat to increase deer. They assume that good compliance with game laws can be obtained and that legislative action to curtail the wasteful, although presently legal, practice of allowing dogs to pursue deer throughout the year will materialize. The 1970 Louisiana Legislature passed into law Act 337, which provides a mandatory jail sentence for taking deer or turkey during closed season. This should assist the Study Area in nearing the deer potential.

Present harvest values were taken from the 1967-68 Deer Kill Survey published June 14, 1968, by the Louisiana Wild Life and Fisheries Commission (see table 6). This survey indicates that the Study Area provided only 8 percent of the legal deer kill of Louisiana during the 1967-68 hunting season. The computed recreation value (cost of bagging) of deer that year was only $28,000 in the area.

Since grazing by domestic livestock varies in intensity within land use types, carrying capacities were assigned based upon estimates of the average conditions within a type. For example, 15 to 30 acres per deer were the outside limits used for deer potential in the bottom land hardwood type and most estimates fell between the extremes of heavy grazing and no grazing. See table 7 for deer carrying capacity guidelines.

Table 6 - Deer Kill, Southwest Louisiana River Basin Study

| Parish | Total 1/ Parish Kill | Estimated Kill in Study Area | Study Area Kill |
|---|---|---|---|
| | ---number----- | ----percent---- | ---number------ |
| Acadia | 0 | 100. | 0 |
| Allen | 1,019 | 100. | 1,019 |
| Avoyelles | 398 | 10. | 40 |
| Beauregard | 199 | 65. | 129 |
| Calcasieu | 126 | 80. | 101 |
| Cameron | 17 | 100. | 17 |
| Evangeline | 199 | 100. | 199 |
| Iberia | 153 | 45. | 69 |
| Jefferson Davis | 60 | 100. | 60 |
| Lafayette | 0 | 100. | 0 |
| Natchitoches | 801 | 05. | 40 |
| Rapides | 345 | 85. | 283 |
| St. Landry | 274 | 40. | 110 |
| St. Martin | 184 | 20. | 37 |
| St. Mary | 175 | 20. | 35 |
| Vermilion | 258 | 100. | 258 |
| Vernon | 708 | 70. | 496 |
| Total | | | 2,893 |

1/ Deer kill data from Louisiana Wild Life and Fisheries Commission 1967-68 Deer Kill Survey

Table 7 - Deer Carrying Capacity Guidelines, Southwest Louisiana River Basin

| Land Use Type | Grazed | Ungrazed |
|---|---|---|
| | ----------acres per deer | ------------ |
| Pasture | - | - |
| Cropland | - | - |
| Bottom land | 30 | 15 |
| Oak-Hickory | 45 | 25 |
| Oak-Pine | 50 | 30 |
| Loblolly Shortleaf Pine | 60 | 35 |
| Longleaf-Slash Pine | 80 | 50 |
| Range | 100 | 200 |

TURKEY

Seven of the 17 parishes in the Study Area have been stocked with wild turkey during the past few years. It is expected that the establishment of wild turkeys on presently unoccupied ranges will continue at a greatly accelerated rate until all potential ranges are stocked by 1975. Natural spread of expanding flocks into formerly vacant ranges will occur concurrently with the restocking program.

Present populations were not estimated because realistic numerical values could not be assigned to these new flocks.

The assigned carrying capacities are safely conservative for the average of the habitat type that they represent. All of them depend directly upon two important factors. Of primary importance, or course, is a continuation of the stocking program using quality wild birds until stocking needs are met. Another essential is compliance with the game laws. Act 337 of the 1970 Louisiana Legislature imposing a mandatory jail sentence for taking deer or turkey during closed season is intended to be a powerful deterrent for would-be violators. If Louisiana can successfully protect existing and future flocks of wild turkey from illegal harvest, the present "gobblers only" seasons in the state will become antiquated.

Observations to date indicate that "gobblers only" seasons set to coincide with the mating activity of turkeys furnish a large amount of recreation per bird brought to bag. Yancey, 1970, estimated that each kill resulted from an average of 60 hunting efforts. This willingness to tolerate low hunter success stems from the high esteem held for the trophy value of a mature gobbler. Under this type harvest and management, a very small percent of the total turkey population is ever legally bagged.

It is anticipated that with better protection and more liberal regulations that allow a reasonable harvest of all sex and age classes of birds, the average trophy value would decline. For this reason, a hunter success ratio of one legal kill per 20 hunting efforts is used in the projection of the potential for turkey related recreation of the Study Area.

No potential was computed for pasture, cropland, or range although turkey are known to make use of each of these types when proper interspersion between these and occupied forested ranges occur. Where an interspersion of timber types occurs, flocks will often make use of several types. It appears that man has altered the pattern of flooding of vast tracts of bottom land hardwood timber and has created so much edge of grassland openings that turkey can now thrive in some portions of the Study Area outside their endemic range.

A compilation of potential man-days recreation takes into account only the hunter recreation involved. By applying the $9.55 per man-day value obtained from the United States Department of the Interior, 1965 National Survey of Fishing and Hunting, the total potential monetary value for turkey hunting in the Study Area is $3,412,215.

4-31721 2-74

WATERFOWL

The Study Area contains extensive marshes and estaurine water bodies. According to Chabreck, Joanen, and Palmisano as quoted by the Thirteenth Biennial Report - 1968-69, Louisiana Wild Life and Fisheries Commission; the area of interest has four classifications based upon salinity ranges and resultant vegetative types. They classify the approximately 1,250,000 acres of marsh in this area as fresh, intermediate, brackish, or saline.

During the mid-winter aerial waterfowl inventory of January 15 - 19, 1968, ducks other than wood ducks, which were not counted, totaled 2,111,500 in the area. Also present were 1,500 Canadian geese, 26,000 white-fronted geese, 281,000 blue and snow geese, and 287,000 coots.

In addition to the birds present during the mid-winter, large numbers of waterfowl stop from briefer feeding and resting periods enroute to winter homes south of the gulf shore. The value of this waterfowl habitat is spread throughout the ranges of the birds that utilize it. It would not be meaningful to compute a monetary value for it.

The Louisiana Wild Life and Fisheries Commission did not conduct a waterfowl kill survey at the close of the 1967-68 season as was done with deer and small game (dove, quail, squirrel, and rabbit). At the conclusion of the 1968-69 season however, a mail survey was conducted. Data from this survey were handled as explained under the discussion of squirrels. It indicates a harvest of 418,405 ducks, 80,361 geese, and 38,132 coots during the regular waterfowl season. A total of 217,484 hunting efforts were expended in bagging these birds. These efforts cannot be accurately credited to the various species by use of available survey data. A judgement by the Louisiana Wild Life and Fisheries Commission Waterfowl Study Leader places the white-fronted goose harvest at 9,000. Coot harvest was computed at 38,132 birds. In September of 1968, a teal season was held and a separate kill survey was conducted following that season. This survey resulted in an estimate that 70,346 teal were harvested with 30,575 hunting efforts. This estimate resulted from a judgement assignment of a portion of the total state-wide kill and was expanded to include the kill by non-licensed hunters employing the methods previously mentioned for squirrels.

In the case of the 1968-69 waterfowl kill survey following the regular waterfowl season, respondents were asked to indicate the parish of kill. The state was broken down into regions of interest to the waterfowl survey. Nearly all of Region 2 fell within the Study Area and the larger portion of the Study Area that was outside of Region 2 is comprised mostly of poorer waterfowl habitat than the portion of Region 2 outside the Study Area. The survey harvest estimate for Region 2 was adjusted to derive the Study Area kill estimate.

The recreation associated with all types of waterfowl hunting was converted to monetary values using the USDI "National Survey of Fishing and Hunting" values. This survey indicates that $6.44 is spent per day by waterfowl hunters. This figure, derived from nationwide information is below the actual cost of hunting in Louisiana. Although the value was used in analyses, it probably understates the value of waterfowl hunting.

The Study Area waterfowl resource is dependent largely upon the more than 1,000,000 acres of marshland of Calcasieu, Cameron, Iberia, and Vermilion Parishes and the associated riceland on the slightly higher prairies. The 367,000 acres of fresh marsh ranks first as duck habitat. Many ducks alternate between the marshes and flooded ricefields.

Geese make use of agricultural lands and marshes. A December 1969, aerial survey revealed 22 percent of the Study Area geese were on agricultural lands while the remainder were in marshes. Only 2 percent of the geese were in Saline marsh and another 2 percent were in fresh marsh. These types contained 5 percent and 31 percent respectively of marsh habitat. Brackish marsh which accounted for 37 percent of the marshes and intermediate marsh with 28 percent, had 40 percent and 34 percent of the geese accounted for on this survey.

## WOODCOCK, SNIPE, RAIL, AND GALLINULES

Guideline information is not available to compute population levels, harvest rates, or the economics of hunting several species of game birds that occur in the Study Area.

Woodcock hunting has grown in popularity in the Study Area in recent years. Since most of the woodcock harvest is associated with quail hunting, woodcock hunting does not generate much hunting effort. It is estimated that 1,000 efforts made primarily for woodcock have a value of $4.79 per effort. The total value estimated for woodcock alone is $4,790. Because of the recent increased interest in woodcock hunting in this area, the future harvest of woodcock was projected to increase 50 percent. Hunter interest in woodcock is expected to increase causing a greater percent of the harvest to go to hunters who are primarily seeking woodcock. The anticipated future economic worth of the recreation generated by woodcock hunting in the Study Area is $23,950.

Snipe occur in large numbers in the rangeland, marshes, ricefields, and low pastures along the southern portion of the Study Area. Most resident hunters have little interest in snipe and the annual harvest is estimated at 20,000 birds. The present population levels of snipe indicate these birds could prosper with as much as a five-fold increase in annual harvest. Projected recreational value for an annual harvest of 100,000 birds is $119,750.

Several species of rails occur within the Study Area. Four of these are classed as game birds with two of these four furnishing the bulk of the hunting and the best future prospects. These are the clapper rail of salt marshes and his fresh marsh counterpart, the king rail. Both birds breed locally and each is capable of providing much more hunting recreation than is presently obtained.

A limited number of hunter bag checks indicates that four birds per hunter per day are required to maintain hunter interest. It is projected that with greater recreational demands, rails will provide an annual bag of 100,000 birds and generate 25,000 hunting efforts worth a total of $119,750.

The gallinules of the Study Area, the purple and the common, are both lightly regarded game birds. The current harvest of 10,000 birds was estimated from information casually obtained from hunters. The recent (1970) trend in setting an early season indicates that the interest in gallinule hunting has already surpassed the level it held during 1967. With more hunter interest, the kill of these birds can be increased by at least 300 percent. A kill of 30,000 with 10,000 hunting efforts valued at $47,900 per year is projected.

## ENDANGERED, RARE, OR UNIQUE WILDLIFE

Several forms of wildlife that occur in the Study Area have been classified as rare or endangered. They are the southern bald eagle, the northern red-cockaded woodpecker, the southern wolf, and the American alligator.

Shooting of eagles by hunters has probably contributed to their decline in numbers in this area. Another factor suspected in this decline is their poisoning as a side effect of the use of agricultural pesticides. The eagles' propensity of dining upon easily available fish from any source attracts birds to pesticide-caused fish kills. Until recently, eagles have been shot or trapped during lambing time on portions of the area used for open range sheep raising.

A better program of education of the public and more knowledge and proper restraint in the use of pesticides will help the southern bald eagle survive and increase in this area. No major habitat changes that will adversely affect the eagle are foreseen for the area.

The northern red-cockaded woodpecker is in population trouble because of its highly specialized nesting habit. It nests only in living southern pines that have a core of heartwood destroyed by red heart, a fungus specific for pines. Since very young pines are without heartwood and the disease has to be present several years before it progresses to the point that a suitable nest tree results, only older pines are suitable. Modern, intensive forestry practices favor younger, more vigorous trees and therefore reduce nesting sites.

Some of the best colonies in the occupied range of the bird occur within the Study Area. While no concerted effort has ever been made to inventory the population of these birds, personnel of the Louisiana Wild Life and Fisheries Commission state that there are several hundred nest sites on the Fort Polk Wildlife Management Area. Many more occur on the portion of the Kisatchie Division in the area of interest and in the Vernon Division of the Kisatchie National Forest.

While habitat alterations on privately owned forest lands will continue to be detrimental to the red-cockaded woodpecker in this area,

4-31721 2-74

management of selected timber stands on public lands can be tailored to provide suitable habitat for enough of these birds to assure their future survival as a species.

The southern wolf probably occurs in pure form only in the southwest corner of the area. In other portions of the area he apparently hybridizes readily with the coyote who colonized wolf ranges of this area as early as 1951. It is likely that interbreeding with coyotes and even with feral dogs will prevent the retention of this species in most of the area. Steps should be taken to preserve some wolf habitat in Cameron Parish where a breeding population of apparently pure stock animals are known to survive. Other management tools include rigid control of feral dogs by selective methods and measures to indemnify livestock owners for damages caused by wolves.

The American alligator does not appear to be in danger of extinction, nor even extremely rare. The present population estimate of 70,000 animals is about 28 percent of the potential of the present habitat to support alligators. New Federal bans on interstate shipment of illegal alligators or hides will greatly bolster state regulations. The outlook for the alligator is bright in this area.

Under the head of rare wildlife forms is the swallow-tailed kite. This bird formerly nested in the area and appears to be absent now except during periods of migration. Preferred habitat appears to be mature bottom land hardwoods interspersed with streams or lakes.

No management is suggested except the protection of the migrants from shooting. The prognosis is not good for the future of this bird as a resident species.

The Canadian goose formerly wintered in this area in large numbers. Despite protection from shooting, flocks have dwindled due to the increased attractiveness of wintering areas to the north. There appears to be little that can be done locally to increase the number of migrant geese wintering in the area.

Locally reared Canadian geese have been released to the wild in the area for a number of years. These efforts have resulted in the establishment of a flock of birds that reside in Louisiana throughout the year. If these birds continue to prosper and to expand their area of occupancy, the maintenance of quality habitat and continued protection from illegal hunting are all that will be needed for their management.

The black francolin, a game bird imported from Asia, was established in the area from releases made in 1961 and 1962. These birds are well established in about 40,000 acres of range, cropland, and pasture in northwest Cameron and southeast Calcasieu Parishes. They are still spreading and more recent releases have been made southeast of Lake Charles. It is too early to judge the success of the latest releases but with the very good showing made by the first releases, several hundred thousand acres of potential habitat is present in the southern portion of the Study Area.

The brown pelican formerly occurred throughout the coastal portions of the Study Area. During the late 1950's, pelicans became noticeably scarcer and completely disappeared by the early 1960's. Several theories have been advanced regarding the cause of their disappearance although none have been conclusively demonstrated.

Recent efforts to reestablish the brown pelican have been made. Results are encouraging in the vicinity of Grand Isle, east of the Study Area. On Grand Cheniere, within the area, there has been considerable mortality in the hand reared birds which were obtained from Florida. It is very likely that interested agencies and individuals will continue their efforts to restore this bird to the fauna of the Study Area.

The red jungle fowl of India has been introduced to Avery Island in the Study Area. While these birds seem to be maintaining a wild population of locally reared birds on the island, previous failures of this bird at other release sites indicates that very little, if any, acceptable habitat is present in this area.

## NON-GAME BIRDS AND ANIMALS

Nature studies and bird watching are both out-of-door recreational activities available within the Study Area. The wide range of forest types and the diverse habitat of the coastal marshes provide habitat for a variety of non-game animal life.

The position of the southern portion of the Study Area makes it the first landfall for spring migrant birds returning from warmer regions. This area also serves as a staging area for many birds prior to flying across the Gulf of Mexico in their southward movement in the fall. Bird watchers are out in numbers during peak periods of migration and find much enjoyment in this area throughout the year. It was in Cameron Parish that the 1953 Christmas bird census revealed 153 different species of birds.

Many of the amateur and professional ornithologists who come here to observe birds come from outside the Study Area. No effort has been made to measure the economic impact of this visitation on the area.

Non-game resources have a great economic value in the Study Area, but lack of data preclude a reasonably good dollars-and-cents estimate of this value.

## ANNUAL ECONOMIC VALUE OF FURBEARERS

The Fur Division of the Louisiana Wild Life and Fisheries Commission publishes annual fur values based on records obtained by buyers and landowners. The target year (1967-68) finds fur prices starting upwards and muskrat production and harvest and nutria harvest on the increase.

Computed values were based on total statewide sales which increased from $3.7 million in 1967-68 to $7.2 million during 1968-69. While final figures are not available for the 1969-70 season it is believed that the upward trend was continued. It is noteworthy that nutria, the backbone of the Louisiana fur industry, brings approximately twice as much per pelt in the Study Area as they bring in southeast Louisiana. While only approximately 43 percent of the nutria pelts marketed in the State come from southwest Louisiana, they command about 60 percent of the total market value. Muskrat pelts from this area bring a better price.

While considerably lower than the past 2 years, the 1967-68 sales value of the unfinished fur and meat by-products of the Study Area is computed at $1,697,712. See table 8.

The economic potential of the Study Area for the fur industry can only be estimated. Values almost doubled from 1967-68 to 1968-69. As the per pelt value increases, trapping is intensified. This makes it profitable to crop fur, especially nutria, from populations that were formerly untrapped due to the difficulty of access or lack of animal density, or both. This means that considerably more animals can be removed from the area than have been taken annually. The acceptance of the nutria by the fur industry and the garment trade within recent years indicates that the average annual dollar value for unprocessed pelts and the associated meat by-products will be at least twice the 1967-68 level. A potential value of $3.4 million is estimated. This value is estimated only from the trappable animals from the wild, essentially unmanaged, populations. With sustained high prices, landowners could be expected to increase their yield manyfold through habitat manipulation.

Table 8 - Fur Resources, Southwest Louisiana River Basin

| Species | Units | Value Each | Total Value |
|---|---|---|---|
| | number | | |
| | | --------dollars-------- | |
| | | PELTS | |
| Muskrat | 232,500 | 1.00 | 232,500 |
| Nutria | 479,600 | 2.25 | 1,079,100 |
| Mink | 5,500 | 3.00 | 16,500 |
| Raccoon | 5,000 | 1.50 | 7,500 |
| Otter | 1,200 | 14.00 | 16,800 |
| Total | | | 1,352,400 |
| | | MEAT | |
| Nutria | 479,600 | .09/lb. | 345,312 1/ |
| Grand Total | | | 1,697,712 |

1/ 8-lb. animal for average.

ALLIGATOR

The American alligator occurs with streams, swamps, lakes, and marshes throughout the Study Area. This reptile has erroneously been reported as in danger of extinction and therefore placed on the Department of the Interior's list of "Endangered Species". The season was closed in Louisiana until 1972. A short experimental season was allowed in portions of Cameron and Vermilion Parishes in September of 1972 and 1973. State wildlife officials believe that these seasons were favorable and can be continued on an annual basis.

Since the welfare of the alligator depends in large part upon the maintenance of suitable habitat, it follows that incentive for habitat maintenance can best be accomplished by allowing the land manager to profit from his efforts. To do this, it is essential for the alligator skin to regain its former high regard and legal status at the marketplace. A promotional program now aimed at this can be expected to increase the worth of potential alligator habitat in the Study Area.

Known sales of legally and illegally taken alligator skins have not exceeded $100,000 in the Study Area within recent years. The present population of the Study Area is estimated at 70,000 animals.

The potential population under sustained yield harvest and with rigid protection from poaching is estimated at 250,000. From this an annual harvest of 50,000 hides could be made. With market prices averaging 65 percent of the prevailing prices before the season was closed, the gross annual worth of hides from the Study Area should be around $1,000,000.

POLLUTION

The levels of soil, water, and air pollution found within the area of interest are relatively low at this time so far as wildlife is concerned. The water pollution that damages the fisheries resource has not yet done noticeable damages to wildlife. Saltwater discharges have killed vegetation in some areas of oil recovery activity. This often results in an increased use by doves and as the areas revegetate, quail use them at a greater rate than they use unaltered perrenial grass roughs.

There have been some cases of poisoning in waterfowl, especially the fulvous tree duck and the mottled duck, by the ingestion of endrin treated seed rice which is sown on flooded fields. The presence of the imported fire ant and the Texas leaf cutting ant in this area poses a threat as agricultural interest may pressure for governmental control of the wide-scale broadcast application of materials toxic to wildlife.

Oil spills on water are capable of contaminating waterfowl and other aquatic bird life and causing considerable mortality. Some spills from ruptured transmission lines have occurred in the past. Most of these have been confined to relatively small areas with the seriousness of the spills dependent upon the season of the year and the attractiveness of the area to bird life.

4-31721 2-74

It is felt that because of the human health factor involved, air pollution will be controlled far short of significant danger to wildlife.

## ECONOMIC SUMMARY OF WILDLIFE SPECIES

Table 9 contains a summary by game species of the economic values of the 1967-68 kill. The potential kill and potential value of this kill is projected by species. The 1965 USDI "National Survey for Fishing and Hunting" values were used to arrive at monetary figures.

As shown in table 9, the total value in the Study Area attributed to the 1967-68 kill amounts to about $8,200,000. This represents a conservative estimate of economic stimuli to the area. With improved management and better enforcement of existing game laws, potential future monetary values could be approximately doubled or about $17,000,000.

Table 9 - Recreation and Economic Worth of Game Harvest
Southwest Louisiana River Basin Study

| Game Hunted | Efforts Per Kill | Total Kill | Total Efforts | Total Value | Potential Kill | Potential Value |
|---|---|---|---|---|---|---|
| | number | | | dollars | number | dollars |
| Deer | 28.50 | 2,893 | 82,450 | 787,398 | 21,976 | 5,981,356 |
| Squirrel | .55 | 650,588 | 361,421 | 1,731,207 | 650,588 | 1,731,207 |
| Rabbit | .62 | 576,023 | 357,134 | 1,710,672 | 576,023 | 1,710,672 |
| Quail | .43 | 268,214 | 115,332 | 552,440 | 268,214 | 552,440 |
| Dove | .25 | 1,027,580 | 256,895 | 1,230,527 | 1,027,580 | 1,230,527 |
| Turkey | 20.00 | 0 | 0 | 0 | 17,865 | 3,412,215 |
| Waterfowl | | | | | | |
| Ducks | | 418,405 | 271,484 1/ | 1,748,357 | 418,405 | 1,748,357 |
| Blue & Snow Geese | | 7[illegible],361 | | | | |
| White-fronted Geese | | 9,000 | | | | |
| Coots 2/ | | 38,132 | | | | |
| Teal 2/ | .43 | 70,346 | 30,575 | 196,903 | 70,346 | 196,903 |
| Woodcock | | 30,000 | 1,000 2/ | 4,790 | 45,000 | 23,950 |
| Snipe | .25 | 20,000 | 5,000 | 24,000 | 100,000 | 119,750 |
| Rail | .25 | 20,000 | 5,000 | 24,000 | 100,000 | 119,750 |
| Gallinule | .33 | 10,000 | 10,000 | 16,000 | 30,000 | 47,900 |
| Raccoon | 1.00 | 10,000 | 10,000 | 48,000 | 10,000 | 48,000 |
| Non-Resident Hunting | | | | | | |
| All Species | not measured | | 7,826 | 125,216 | | 125,216 |
| Total | | | 1,514,117 | 8,199,510 | | 17,048,243 |

1/ Includes all ducks, geese, and coots.
2/ Balance of harvest is associated with hunts for other game because woodcock generate few hunting efforts