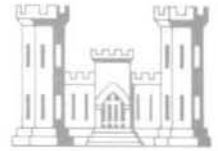




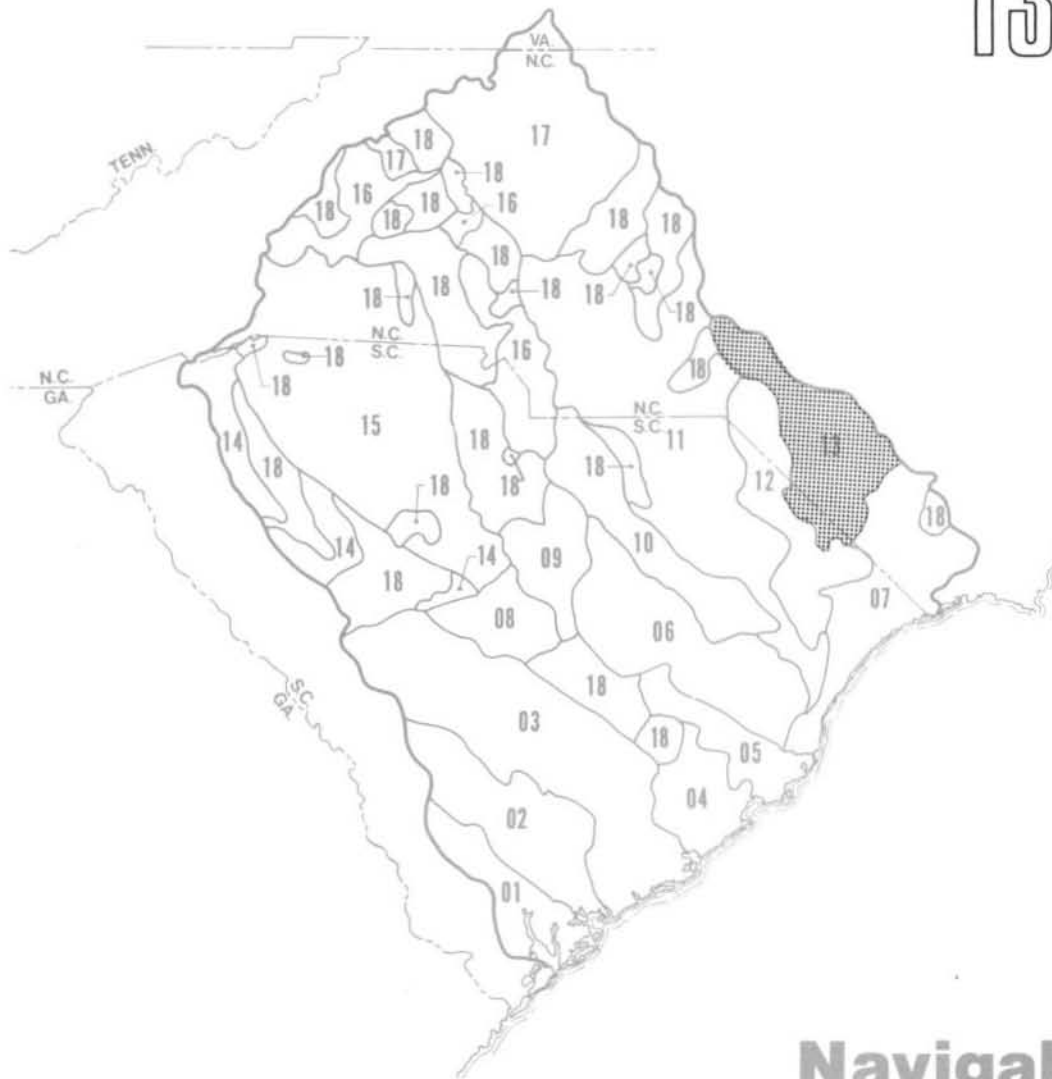
U.S. ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
Charleston, South Carolina



LUMBER RIVER BASIN

Report No.

13



**Navigability
Study
1977**



STANLEY CONSULTANTS

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SECTION 1 - INTRODUCTION

Purpose

The purpose of this study is to collect, develop, and evaluate information on waterbodies within the boundaries of the Charleston District, Corps of Engineers, for establishing the classification of "navigable waters of the U. S." and "waters of the U. S." (During the course of this study the term "navigable waters" was changed to "waters of the U. S." Herein references to "navigable waters" are synonymous with "waters of the U. S.") Study objectives include definition of the present head of navigation, the historic head of navigation, the potential head of navigation, and the headwaters of all waterbodies within the district.

The information generated as a part of the study will be utilized by the Charleston District in administration of its programs dealing with water resource project construction permits in "navigable waters of the U. S." (River and Harbor Act of 1899), and the deposition of dredge or fill material in "navigable waters" or their contiguous wetlands (Section 404 of PL 92-500).

Scope

The scope of this project is generally summarized by the following:

1. Outline drainage areas, locate headwater points where mean flow is five cubic feet per second (cfs), summarize lake data (10 to 1,000 acres), establish stream mileage for "navigable waters of the U. S.", and prepare a stream catalog summary for the district.
2. Conduct field surveys of waterbodies to establish mean water levels and obstruction clearances for evaluating the potential head of navigation.
3. Analyze available hydrological data to estimate mean, maximum, and minimum discharge rates at obstructions and other selected locations.
4. Conduct a literature review to identify past, present, and future uses of waterbodies for interstate commerce.

5. Conduct a legal search to identify Federal and state court cases which impact on navigation classifications.
6. Prepare plan and profile drawings, maps of the district showing significant physical features, and a map delineating the recommended navigation classifications.
7. Prepare reports on all major river basins and large lakes (greater than 1,000 acres) including information on physical characteristics, navigation projects, interstate commerce, court decisions, navigation obstructions, and recommended classification of waterbodies for navigation.
8. Prepare a summary report outlining navigation-related information for the entire district as well as the methodology, procedures, and other factors pertinent to the development of each of the river basin reports.

Conduct of this study relies heavily upon available information. Compilation and evaluation of existing data from many sources and development of field survey information are the main contributions to the new water resource data base represented by this study.

Related Reports

Information pertaining to this navigability study for the Charleston District has been compiled into a series of reports, one of which is represented by this document. A complete listing of the reports is presented below to facilitate cross referencing.

<u>Number</u>	<u>Title</u>
--	Summary Report
01	Coosawhatchie River Area
02	Combahee River Area
03	Edisto River Area
04	Cooper River Area
05	Santee River Basin
06	Black River Area
07	Waccamaw River Basin
08	Congaree River Basin
09	Wateree River Basin
10	Lynches River Basin

<u>Number</u>	<u>Title</u>
11	Great Pee Dee River Basin
12	Little Pee Dee River Basin
13	Lumber River Basin
14	Saluda River Basin
15	Broad River Basin
16	Catawba River Basin
17	Yadkin River Basin
18	Lakes - Greater Than 1,000 Acres
--	Coastal Supplement

The eighteen reports covering various drainage areas in the district present information for the specific basins. The Summary Report provides an overview of the entire study of district waterbodies and presents information applicable to all waters in the district. Reference should be made to both the individual drainage area reports as well as the Summary Report to obtain a thorough understanding of the study approach and results.

Acknowledgements and Data Sources

The contribution of many project team members within the Corps of Engineers, Charleston District, and Stanley Consultants is gratefully acknowledged by Stanley Consultants. In addition to the legal search and other evaluations and input from Charleston District staff, several others made significant contributions to this study effort. Dr. John W. Gordon, Assistant Professor in the Department of History, The Citadel, prepared the narrative and literature review information for past and present interstate commerce.

Several state water resource, transportation, utility, and planning agencies also cooperated and provided useful data for compiling these reports. Federal water resource and regulatory agencies and private utilities provided information along with public and private operators of large reservoirs.

Specific numbered data sources are referenced in the reports in parentheses. These data sources are listed in the Bibliography of each report of the navigation study.

SECTION 2 - PHYSICAL CHARACTERISTICS

The Lumber River is a major tributary to the Little Pee Dee River which is a tributary to the Great Pee Dee River. The Lumber River extends approximately 143 miles from its mouth at river mile (R.M.) 58.0 on the Little Pee Dee River to its headwaters on Drowning Creek between Eagle Springs and Emery, North Carolina. The shaded area in Plate 13-1 represents the geographic area covered in this report and is the entire drainage basin of the Lumber River and its tributaries. Some small tributaries to the Lumber River are discussed further in this report. Information on the Little Pee Dee and Great Pee Dee Rivers may be found in Reports 12 and 11, respectively.

The significant features of the Lumber River basin are presented on Plates 13-2 and 13-3. Towns located on or near the river include Lumberton and Fair Bluff, North Carolina and Nichols, South Carolina.

The Lumber is a river having a gentle, sloped channel and a total drainage area of 1,740 square miles. Mean stream discharge at the mouth of the river is about 1,910 cfs. From the headwaters on Drowning Creek to the mouth of the Lumber River, the elevation changes approximately 415 feet over 143 river miles. The Lumber River is not tidally influenced.

Table 1 is a summary of selected physical characteristics of the Lumber River. Included in the table are approximate values for drainage area, mean water flow, and elevation change. Detailed slope information may be found in Table 4. Methodology for determining the numerical values of physical characteristics appearing in Table 1 is defined in the Summary Report.

The location of a key USGS stream gaging station on the Lumber River is presented in Table 2. Also shown are the mean, minimum, and maximum flows at the gaging station.

TABLE 1
PHYSICAL CHARACTERISTICS (1) (2) (3)*

Length-Mouth to Headwaters ¹⁾	143 miles
Elevation Change ¹⁾	415 feet
Drainage Area	1,740 square miles
Mean Discharge at Mouth	1,910 cfs
Limit of Tidal Influence	--
Length of Present Navigable Waters of the U. S.	0-63.4 (R.M.)

1) From mouth of the river to a remote point in the basin having a mean annual flow of five cfs.

* See Bibliography for these references.

TABLE 2

KEY STREAM GAGING STATION (2) (4)

USGS Gaging Station Number	02134500
Location Description	Located in Robeson County, North Carolina downstream of U. S. 74 Highway Bridge and 1 mile downstream from Seaboard Coast Line Railroad Bridge near Boardman
Drainage Area	1,220 square miles
Mean Flow	1,338 cfs
Minimum Flow ¹⁾	348 cfs
Maximum Flow ²⁾	3,179 cfs

1) Exceeded or equaled 90 percent of the time.

2) Exceeded or equaled 10 percent of the time.

SECTION 3 - NAVIGATION IMPROVEMENT PROJECTS

Federal Navigation Projects

There is one Federal navigation project authorized on the Lumber River. The project was authorized by the River and Harbor Act of 1896 and was completed in 1897. The river was snagged and cleared from the mouth to approximately R.M. 63 at Lumberton, North Carolina. Information on the project is summarized in Table 3. Currently there are no other navigation improvements on the Lumber River.

TABLE 3

AUTHORIZED FEDERAL NAVIGATION PROJECT (5) (6)

Waterbody	Lumber River
Work Authorized	Snagging and clearing for navigation
Date Completed	1897
Project Location	R.M. 0 to 63
Authorization	River and Harbor Act of 1896

Other Navigation Projects

Inquiries made at various state and Federal agencies indicate no projects are now planned or under construction which would improve or substantially benefit navigation on the Lumber River.

SECTION 4 - INTERSTATE COMMERCE

Past

Early settlers arrived in the Lumber River basin about 1750. Almost immediately they began to use the river for the movement of surplus crops and timber. This utilization appears to have been less extensive than that found on other streams in the Great Pee Dee River basin. Various kinds and sizes of vessels, including pole boats, flat boats, perriaugers*, and bateaux, appear to have been used. (7)

In 1816, the North Carolina legislature attempted through the passage of an act "to facilitate the navigation of Lumber River from the mouth of the Great Swamp to the South Carolina line." This effort, however, was apparently no more successful in producing an improvement in the navigation of the Lumber than those acts which followed it in 1847, 1870, and 1897. (8)

In 1818, John Wilson, Civil and Military Engineer of South Carolina, pronounced the Lumber River "navigable ... to Lumberton." (9) Later, when the U. S. Army Corps of Engineers examined it in 1886, Captain W. H. Bixby reported that, "At present the commerce of the river is small." "Nonetheless, each year about two hundred rafts ... containing 40,000 feet of timber, and flats ... carrying 20 tons of rosin or cotton ... [were] poled down this river to the Great Pee Dee River and Georgetown." From there, "the goods were reshipped to coast towns or foreign ports." Bixby judged the value of this commerce at about \$30,000 per year. During six months of the year, rafts and flats could navigate the river from Pike, North Carolina, to the mouth, a distance of approximately 185 miles.** (Interpretation of available historic data indicates the approximate location of Pike, North Carolina near the present location of Oak Hill, North Carolina.) (7)

* Perriauger - A vessel used during the early development period of the United States (1700's-1800's) for the transportation of supplies. The vessel was sometimes oared, poled, or pulled and was occasionally fitted with mast and sail.

** This distance does not correspond to river miling developed as a part of this study. This study shows a distance of about 106 miles.

A series of River and Harbor Acts, beginning with the one passed 11 August 1888, sought to improve the Lumber for steam navigation as far upriver as Lumberton, North Carolina, which became the head of stream navigation. Bixby had hoped that the Lumber would become navigable for a 30-ton stern-wheel steamer, but only \$19,000 of the total Federal appropriation was expended, resulting in nominal improvement. While steam navigation did not become a major factor on the Lumber, the commerce moved down that waterbody to the Great Pee Dee and Georgetown in 1897 amounted to 51,846 tons valued at \$151,260. This tonnage comprised mostly timber, lumber, fertilizer, cotton, rosin, turpentine, fowl, eggs, and general merchandise. (10)

Lumberton, at R.M. 63 was judged as the head of navigation, and the commerce figures for the Lumber River given by the Georgetown Board of Trade are identical to those submitted by the Corps of Engineers. In 1891, 5,100 tons (worth \$39,000) of commerce, and in 1894, 10,550 tons (worth \$75,800), had been moved on the Lumber. In 1897, the "five low bridges without draw spans and one moderately high railroad bridge" which crossed the river along its North Carolina stretch, plus two more in South Carolina, had been altered with draw spans, replaced with higher ones, or removed altogether. (11)

The river's traffic gradually fell off by 1933 and had clearly fallen prey to the railroads. "Waterborne traffic," the Corps of Engineers reported, "has been extensive in the past on the [Great] Pee Dee River and, to a lesser extent, on ... Lumber River, but has steadily declined within recent years. The decline was significant to the extent that none of the streams of the Yadkin-Pee Dee system is now of importance in the transportation system of the basin." This was because the basin was "now more or less adequately supplied with railroad ... trunk and branch lines [,and] highways ... as feeders to the railroads." (12)

Present

During the 19th and early 20th Centuries, the Lumber River, from its mouth on the Little Pee Dee River to Pike, North Carolina, a

distance of approximately 185 miles*, was a significant artery for moving interstate commerce by water. Pike, North Carolina, was considered the head of navigation during this time, although periods of flush water may have enabled vessels to move to locations above that point.

In 1965, the Lumber River was designated by the Corps of Engineers as a navigable stream to Lumberton, North Carolina. The Lumber River is not currently being used for purposes of waterborne interstate commerce. (6) (13)

Future Potential

Comprehensive analysis of the regional economics (income, education, employment, community facilities, transportation systems, and similar factors), which would indicate growth patterns and the services needed to sustain various types of industrial and commercial activities, is beyond the scope of this study. Thus, the potential use of the Lumber River and its tributaries for interstate commerce in future years is difficult to predict. However, some analysis and judgments have been made concerning future commerce to assist in establishing navigation classifications.

As discussed later in Section 6, the Lumber River is practically navigable, with improvements, up to R.M. 63.4. It is anticipated that this stretch of stream has the potential to be utilized for shipment of goods into other states since it is connected with the Little Pee Dee River, Great Pee Dee, Winyah Bay, and the Atlantic Ocean. The stream is not currently used for interstate commerce. Future potential interstate waterborne commerce is not anticipated to be significant. This is due in part to limited industrial and commercial activity and heavy dependence on other forms of transportation including the interstate highway system, railroads, and air transport.

* This distance does not correspond to river miling developed as a part of this study. This study shows a distance of about 106 miles.

SECTION 5 - LEGAL AUTHORITY

General

This section presents information pertaining to the legal aspects of the navigability investigation. Such Federal and state court decisions as apply to the specific basin reported on herein are outlined. The Summary Report presents more complete documentation and references to the court cases dealing with navigation classifications and legal jurisdiction.

Navigability Interpretations

The term "navigable waters of the U. S." is used to define the scope and extent of the regulatory powers of the Federal government. Precise definitions of "navigable waters" or "navigability" are ultimately dependent on judicial interpretation, and are not made conclusively by administrative agencies.

Definitions of "navigability" are used for a wide variety of purposes and vary substantially between Federal and state courts. Primary emphasis must therefore be given to the tests of navigability which are used by the Federal courts to delineate Federal powers. Statements made by state courts, if in reference to state tests of navigability, are not authoritative for Federal purposes.

Federal courts may recognize variations in definition of navigability or its application where different Federal powers are under consideration. For instance, some tests of navigability may include:

1. Questions of title to beds underlying navigable waters.
2. Admiralty jurisdiction.
3. Federal regulatory powers.

This study is concerned with Federal regulatory powers. Unfortunately, courts often fail to distinguish between the tests, and instead rely on precedents which may be inapplicable. Thus, a finding that waters are "navigable" in a question dealing with land title may have a somewhat different meaning than "navigable waters of the U. S." which pertains to Federal regulatory functions.

In this study, the term "navigable waters of the U. S." is used to define the extent and scope of certain regulatory powers of the Federal government (River and Harbor Act); this is distinguished from the term "navigable waters" which refers to other Federal regulatory powers (Section 404 of PL 92-500).

Administratively, "navigable waters of the U. S." are determined by the Chief of Engineers and they may include waters that have been used in the past, are now used, or are susceptible to use as a means to transport interstate commerce landward to their ordinary high water mark and up to the head of navigation. "Navigable waters of the U. S." are also waters subject to the ebb and flow of the tide shoreward to their mean high water mark. These waters are deemed subject to a Federal "navigation servitude". The term "navigable waters of the U. S." defines the more restricted jurisdiction which pertains to the River and Harbor Acts -- particularly the one of 1899 which specifically defined certain regulatory functions for the Corps of Engineers.

In contrast, the term "navigable waters" defines the new broader jurisdiction with respect to Section 404 of the Federal Water Pollution Control Act Amendments of 1972. Accordingly, "navigable waters" not only include those waters subject to the navigation servitude, but adjacent or contiguous wetlands, tributaries, and other waters, as more fully defined in revised Corps of Engineers Regulations.

Although this navigability study covers both "navigable waters of the U. S." and "navigable waters", the analysis of judicial interpretation has only focused upon determining "navigable waters of the U. S." to the head of navigation. Due to common usages in court cases, the terms "navigability" and "navigable waters" may herein appear interchangeably with the term "navigable waters of the U. S." However, the summary of court cases is directed at the Federal regulatory jurisdiction of the River and Harbor Acts, and not necessarily regulatory jurisdiction under the Federal Water Pollution Control Act.

General Federal Court Cases

Powers of the Federal government over navigable waters stem from the Commerce Clause of the U. S. Constitution (Art. I, §8). Pursuant

to its powers under the Commerce Clause, Congress enacted the River and Harbor Act of 1899 which particularly specifies regulatory powers of the Federal government in "navigable waters of the U. S."

The well-established Federal test of navigability is whether a body of water is used or is capable of being used in conjunction with other bodies of water to form a continuous highway upon which commerce with other states or countries might be conducted.

Several Federal court decisions make it clear that a waterway which was navigable in its natural or improved state retains its character as "navigable in law" even though it is not presently used for commerce. The test of navigability is not whether the particular body of water is in fact being used for any form of commerce but whether it has the capacity for being used for some type of commerce. Several cases substantiate this (see the Summary Report for details on the court decisions).

The ebb and flow of the tide is another test which remains a constant rule of navigability in tidal areas, even though it has sometimes been disfavored as a test of Federal jurisdiction. Several cases note that ebb and flow should not be the sole criterion of navigability, but that extension of Federal jurisdiction into the major non-tidal inland waters is possible by an examination of the waters "navigable character". The ebb and flow test, however, remains valid as a rule of navigability in tidal areas; it is merely no longer a restriction for non-tidal areas. For bays and estuaries, this extends to the entire surface and bed of all waterbodies subject to tidal action, even though portions of the waterbody may be extremely shallow or obstructed by shoals, vegetation, or other barriers as long as such obstructions are seaward of the mean high tidal water line. Marshlands and similar areas are thus considered "navigable in law" insofar as they are subject to inundation by the mean high waters. The relevant test is therefore the presence of the mean high tidal waters. Navigable waters are considered navigable laterally over the entire surface regardless of depth.

Another factor relevant to navigability determinations is land title. Whatever title a party may claim under state law, the private ownership of the underlying lands has no bearing on the existence or

extent of the dominant Federal jurisdiction over "navigable waters of the U. S." Ownership of a river or lake bed will vary according to state law; however, the Supreme Court has consistently held that title to the bottomlands is subordinate to the public right of navigation.

Specific Federal Court Cases

Navigability, in the sense of actual usability for navigation or as a legal concept embracing both public and private interests, is not defined or determined by a precise formula which fits every type of stream or body of water under all circumstances and at all times. A general definition or test which has been formulated for Federal purposes is that rivers or other bodies of water are navigable when they are used, or are susceptible of being used, in their ordinary condition as highways for commerce over which trade and travel are or may be conducted in the customary modes of trade and travel on water.

The question of navigability of water when asserted under the Constitution of the U. S., as is the case with "navigable waters of the U. S.", is necessarily a question of Federal law to be determined according to the general rule recognized and applied in the Federal courts.

Review of Federal case history reveals no decisions which apply specifically to navigation in the Lumber River basin.

South Carolina State Court Cases

The South Carolina legislative enactment defining navigability and requiring freedom from obstruction may be found in Section 70-1 of the South Carolina Code of Laws. This section essentially provides that all streams which can float rafts of lumber or timber are considered navigable by state law.

Many of the South Carolina state cases reported are primarily concerned with state ownership questions. While the majority of states actually own streams and exercise control over their navigable waters, the ultimate authority has been granted to the Federal government by the Commerce Clause of the Constitution. The general rule, then, is that

the states both own and control the navigable streams within their borders, subject to exercise of the superior right of control by the U. S. Although case histories show that state and Federal concepts of navigability do not always agree, when Federal interests are at stake, the Federal test will govern.

There are exceptions, however, to the "overwhelming majority rule of state ownership of lands beneath navigable waters", and South Carolina is in the minority. In the minority states, it was considered that property rights were vested at the time of independence from England and that the state took title only to tidal-navigable streams while riparian owners took title to all stream beds, both navigable and non-navigable, if non-tidal. Even in the minority states, however, private ownership of the bed does not affect the rights of the public to the use of navigable waters.

A legal search indicates that there are no South Carolina state court cases which specifically deal with navigation considerations in the Lumber River basin.

North Carolina State Court Cases

The issue of navigability has arisen in a number of actions in the state courts of North Carolina. However, most of these cases concern coastal areas not within the boundary of the Charleston District.

North Carolina does not follow the English common-law rule that streams are navigable only as far as tidewater extends. Thus, unlike South Carolina as discussed previously, North Carolina conforms to the majority rule within the U. S. (i.e., state ownership of land beneath navigable waterways).

A review indicates there are no North Carolina state court cases which relate to navigation in the Lumber River basin.

Recent Federal Litigation

A review of recent Federal litigation concerning the Charleston District did not reveal any court actions in the Lumber River basin relating to navigation.

Federal Agency Jurisdiction

The delineation of "navigable waters of the U. S.", as discussed earlier, in essence, defines the Federal navigation servitude and is applicable to Federal jurisdiction generally (not merely applicable to the Corps of Engineers). No matter which Federal agency or activity may be involved, the assertion of "navigability" ("navigable waters of the U. S.") arises under the U. S. Constitution, or under application of Federal statute.

By virtue of the Commerce Clause of the Federal Constitution, and the clause empowering Congress to make all laws necessary to carry into execution the Federal judicial power in admiralty and maritime matters, "navigable waters of the U. S." are under the control of Congress, which has the power to legislate with respect thereto. It is for Congress to determine when and to what extent its power shall be brought into activity. It may be exercised through general or special laws, by Congressional enactments, or by delegation of authority.

Thus, Congress has power which is paramount to that of the states to make improvements in the navigable streams of the U. S. and for this purpose to determine and declare what waters are navigable. The Federal government also has the power to regulate the use of, and navigation on, navigable waters.

The above presents the basis upon which Federal jurisdiction in "navigable waters of the U. S." is established. The basic definition or jurisdictional concept of "navigable waters of the U. S." remains consistent, irrespective of which department or office of the Federal government may be delegated particular responsibility. For instance, the safety, inspection, and marine working functions of the U. S. Coast Guard embrace vessel traffic within "navigable waters of the U. S." as previously defined.

With specific reference to agency regulation of construction or work within "navigable waters of the U. S.", other than by the Corps of Engineers, the Department of Transportation Act of 15 October 1966 (PL 89-670) transferred to and vested in the Secretary of Transportation, certain functions, powers, and duties previously vested in the Secretary

of the Army and the Chief of Engineers. By delegation of authority from the Secretary of Transportation, the Commandant, U. S. Coast Guard, has been authorized to exercise certain of these functions, powers, and duties relating to the location and clearances of bridges and causeways in the "navigable waters of the U. S."

An additional agency of particular interest concerning work or construction within "navigable waters of the U. S." is the Federal Power Commission. The Federal Power Act, Title 16, United States Code, Sections 791 et. seq. contemplates the construction and operation of water power projects on navigable waters in pursuance of licenses granted by the Federal Power Commission. The statute was enacted to develop, conserve, and utilize the navigation and water power resources of the nation. The act provides for the improvement of navigation, development of water power, and use of public lands to make progress with the development of the water power resources of the nation.

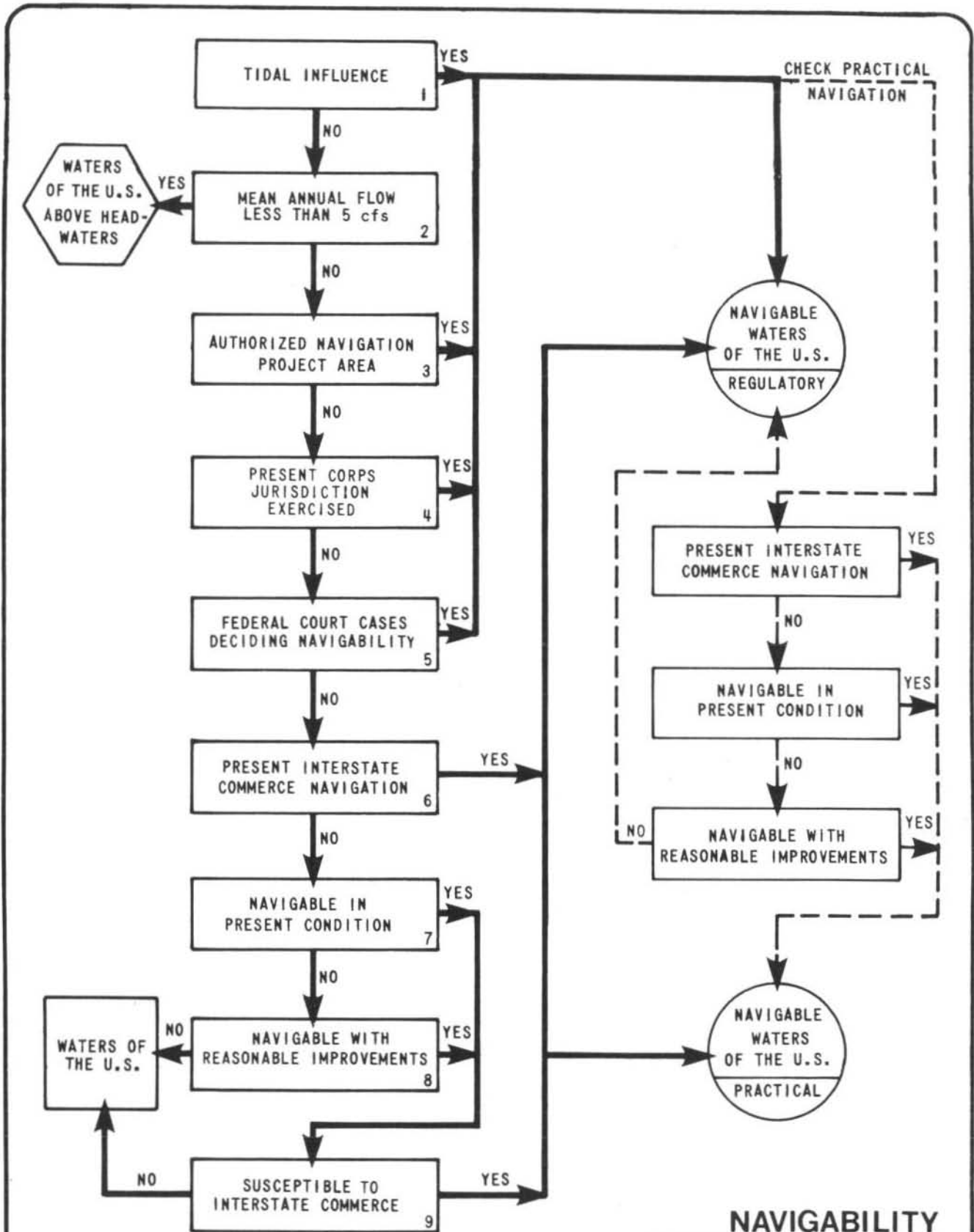
SECTION 6 - NAVIGATION OBSTRUCTIONS AND CLASSIFICATIONS

Navigation Classification Procedures

As noted in Section 5, definition of navigability is not subject to a single precise formula which applies to every circumstance. Many factors including stream physical characteristics (depth, width, flow, slope, etc.), presence of obstructions, court decisions, authorized navigation projects, potential for reasonable improvements, and susceptibility of a stream to interstate commerce activities, play a role in the decision-making process for classifying waterbodies in the Charleston District. In an effort to make the analytical process concerning stream classifications as systematic as possible, a "Navigability Decision Diagram" has been developed and is presented in Figure 1. This diagram has been utilized as a guide in assessing the various navigation classifications for streams in the Charleston District. The Summary Report includes a detailed presentation on the methodology and approaches used in the analysis; however, the following presents a brief synopsis of the techniques as indicated in Figure 1.

Tidal Influenced Areas - Tidal areas (see Item 1 in Figure 1) which are affected by mean high water are classified "navigable waters of the U. S." according to various legislative and judicial actions. The "navigable waters of the U. S." are subject to regulatory jurisdiction by the Corps of Engineers and other agencies. Even though all tidal areas are so classified and subject to regulatory procedures, many are not practically navigable based upon past and/or present requirements for vessels. Figure 1 shows that some additional "check" analyses are necessary to distinguish those tidal waters which are actually capable of practical navigation. Investigation of the tidal areas is beyond the scope of this study; however, drawings showing the "plan" of major rivers to their mouth, often tidal influenced, are presented in the interest of continuity.

Waters of the U. S. Above Headwaters - Section 404 of PL 92-500 considers the headwaters of waterbodies to be the point at which the mean annual flow is five cfs. Waterbodies or portions of waterbodies



**NAVIGABILITY
DECISION DIAGRAM
Figure 1**



located upstream of the headwaters are nationally permitted by law and will not require an individual application for dredge or fill discharge permits provided the proposed work will meet certain conditions.

However, these waters are classified "waters of the U. S." and are within Corps of Engineers jurisdiction as applicable to Section 404. Item 2 in Figure 1 shows the testing procedure for the five cfs point.

Authorized Navigation Project Area - Any streams which currently have authorized Federal projects to aid navigation are classified as "navigable waters of the U. S." (Item 3 in Figure 1). Many of the projects thus authorized were based upon conditions which are not currently applicable (for example, use of pole boats or steamboats for justifying the navigation benefits). Consequently, many of the streams having older authorized projects will not allow passage of present-day commercial navigation vessels without some additional improvement. Thus, some portions of the authorized project areas are not considered practical for navigation. Figure 1 shows the additional "check" procedure which has been followed to assess the practical limit of "navigable waters of the U. S."

Present Corps Jurisdiction Exercised - The Corps of Engineers is exercising jurisdiction on several non-tidal waterbodies which are not covered by authorized projects (Item 4 in Figure 1). (6) Determinations previously made on these waterbodies under the River and Harbor Act indicated use for interstate commerce and hence the current classification as "navigable waters of the U. S." Some of these streams are not currently navigable by present-day commercial vessels and thus have practical limits. Figure 1 shows the "check" used to assess the practical limits of "navigable waters of the U. S."

Federal Court Decisions - As noted in Section 5, Federal case law is the predominant indicator which is to be used for establishing Federal jurisdiction over waterbodies in the Charleston District (Item 5 in Figure 1). Several decisions have been rendered which classify certain streams in the district as "navigable waters of the U. S." However, some of these court decisions have been arrived at under different circumstances or without the benefit of the data developed as a part of this investigation. Therefore, even though some of the

streams are classified by judicial review as "navigable waters of the U. S.", they are not practical for navigation with present-day vessels. Figure 1 shows the steps necessary to "check" those portions of the "navigable waters of the U. S." which are capable of practical navigation.

Present Interstate Commerce Navigation - Any rivers currently involved in interstate commerce activities are classified as "navigable waters of the U. S." from both the regulatory and practical standpoint (see Item 6 in Figure 1).

Waters of the U. S. Below Headwaters - For those streams, or portions of streams, not subject to authorized projects, court cases, or present interstate commerce navigation, several additional tests for determining navigability are required (Items 7 and 8 in Figure 1). If the waterbody is not judged to be navigable in its present state or with reasonable improvements, then it is beyond the limit of "navigable waters of the U. S." and is termed "waters of the U. S." over the remaining length. These "waters of the U. S." (as well as the "navigable waters of the U. S.") up to the headwaters (five cfs points) of the streams are subject to jurisdiction under Section 404 of PL 92-500. A general or individual permit is required for discharge of dredged or fill material below the headwaters (five cfs point) of "waters of the U. S." Discharges above the headwaters are discussed in the previous subsection, "Waters of the U. S. Above Headwaters."

Interstate Commerce - Some non-tidal waters in the district are not now subject to authorized projects, court decisions, or interstate commerce navigation, but can be navigated under present or reasonably improved conditions. These streams may be considered for classification as "navigable waters of the U. S." if they are susceptible to interstate commerce activities (past, present, or future). A combined judgment considering both "reasonable improvement" factors (Item 8 in Figure 1) and "interstate commerce" factors (Item 9 in Figure 1) has often been utilized in arriving at the conclusions and recommendations concerning navigability of waterbodies in the Charleston District. The Summary Report provides further details on these factors.

Navigation Classification Categories

This study classifies streams into several different categories, each of which is discussed subsequently:

1. Present "navigable waters of the U. S." (by regulatory procedures).
2. Historically navigable waters (based on literature review).
3. Recommended "navigable waters of the U. S." (based upon data developed as a part of this investigation).
4. Recommended waters for practical navigation (within "navigable waters of the U. S.>").
5. Headwaters for all waterbodies (five cfs points).

The first four navigation classifications are displayed on the plates presented later in this report. The headwater limits are summarized in Appendix A.

Present Navigable Waters of the U. S.

Currently the Lumber River is classified as "navigable waters of the U. S." from its mouth at R.M. 58.0 on the Little Pee Dee River to Lumberton, North Carolina (R.M. 63.4 on the Lumber River) (5)(6). This is the upstream limit of a Federal snagging and clearing project completed in 1897 (for location see Plate 13-2). Present use of the river by commercial river craft is impractical.

Historically Navigable Waters

The Lumber River has been navigated by rafts and flats carrying timber, rosin, and cotton from Pike, North Carolina to the Little Pee Dee River, a distance of approximately 106 miles. Interpretation of available historic data indicates the approximate location of Pike, North Carolina, near the present location of Oak Hill, North Carolina (see Plate 13-2 for location). Section 4 presents a detailed description of the significance of historical navigation on the Lumber River.

Recommended and Practical Navigable Waters of the U. S.

The recommended and practical limit of "navigable waters of the U. S." on the Lumber River is at R.M. 63.4 in Lumberton, North

Carolina where the S. C. 41 highway bridge and the Seaboard Coast Line Railroad bridge cross the Lumber River. At these crossings the navigable depth of a 50-foot (minimum) wide channel is 4.0 feet which is considerably less than the minimum depth (7 feet) necessary for commercial navigation. At three river crossings upstream (to R.M. 66.8) the navigable depth of the river channel is consistently less than 7 feet. Of eight bridge crossings prior to R.M. 63.4, four do not meet the navigable depth criteria being used in this study and none of these bridge structures meet minimum horizontal or vertical clearances of 50 feet and 25 feet, respectively, necessary for commercial river traffic.

To open the Lumber River to practical commercial navigation from its mouth to R.M. 63.4, channel dredging and bridge renovation would be the minimum necessary improvements, and channel alignment and clearing of debris may be necessary at some locations. These tasks are considered to be within the scope of reasonable improvements. Beyond R.M. 63.4 extensive channel alignment, dredging, and clearing in addition to bridge renovation would be necessary. Opening the river to R.M. 63.4 would allow river traffic access to Lumberton; there are no major commercial or industrial centers on the Lumber River beyond Lumberton which use or have significant potential for interstate river commerce.

In addition, field investigation of small tributary streams revealed sufficient water depth of at least 7 feet and channel width of at least 50 feet to justify recommendation of some tributaries for navigability classifications. Thus, the following streams (which confluence with the Lumber River within its recommended and practical limits of "navigable waters of the U. S.") are recommended for classification and are listed with their upstream recommended and practical limits of "navigable waters of the U. S." indicated in parentheses: secondary channel near R.M. 10.1 (R.M. 0.1) and secondary channel near R.M. 10.3 (R.M. 0.1). The downstream recommended and practical limit of "navigable waters of the U. S." for each of these streams is at its confluence with the Lumber River.

There are no other tributaries to the Lumber River which have sufficient mean flow to maintain a minimum navigation channel. Big Swamp at R.M. 41.8 on the Lumber was investigated for possible classification as "navigable waters of the U. S." Field inspection of eight bridge crossings revealed insufficient water depth at mean flow to accommodate commercial navigation on Big Swamp. There are no major commercial or industrial centers located in the Big Swamp area which might use interstate river commerce. Thus, Big Swamp is not recommended for classification as "navigable waters of the U. S."

These conclusions on the navigation limit meet the criteria established for the Federal test of navigability that the body of water is used, or is capable of being used, in conjunction with other bodies of water to form a continuous highway upon which commerce with other states or countries might be conducted.

Plates 13-4 through 13-6 are plan and profiles for the recommended "navigable waters of the U. S." The plan and profile plates show mean water surface as determined from USGS maps, stream bed depth, 50-foot wide navigable channel depth, pier spacing for bridges crossing the river, and vertical clearances at structures. It is emphasized that all references to elevation are approximate since vertical control was established from USGS contour maps and not field instrument surveys. Water depth and structure vertical clearance measurements are also approximate due to the accuracy inherent in the field techniques. Small tributaries recommended for classification as "navigable waters of the U. S." for less than one mile in length from their confluences are shown on the plan only. (See the Summary Report for a detailed description of field procedures and the methodology used to calculate the water depth at mean flow.)

Obstructions to Navigation

Table 4 is a listing of all obstructions within the recommended "navigable waters of the U. S." on the Lumber River. No obstructions were found on the small tributary streams recommended for classification as "navigable waters of the U. S." Mean water slope and vertical clearance to mean water level at all obstructions and mean discharge at

all bridges are presented in the table. It is emphasized that mean discharge, slope, and vertical clearances are only approximations based on best available data. Specific procedures for determining these are discussed in the Summary Report.

Photographs of each obstruction investigated in the field are presented in Figures 13-2 through 13-26. Each photograph is identified to correspond with the obstructions listed in Table 4.

Waters of the U. S.

"Waters of the U. S." are considered to be all streams beyond the recommended limits of "navigable waters of the U. S." "Waters of the U. S." with more than five cfs mean annual flow require a permit for discharge of dredged or fill material. "Waters of the U. S." with less than five cfs mean annual flow are nationally permitted by law and will not require an individual application for dredge or fill discharge permits provided the proposed work will meet certain conditions.

Appendix A lists all the five cfs flow points located in the Lumber River basin. Each point is located by stream code, stream name, latitude and longitude, and a mileage reference.

Appendix B lists the lakes located in the Lumber River basin which have surface areas between 10 and 1,000 acres. The lake summary identifies the stream basin code, lake name or owner, county location, and where data is available, the surface area and gross storage.

TABLE 4

OBSTRUCTION LISTING FROM RIVER MOUTH
TO RECOMMENDED LIMIT OF NAVIGABLE WATERS OF THE U. S. (3)

<u>Lumber River Mile</u>	<u>Description</u>	<u>Mean Discharge (cfs)</u>	<u>Mean Water Slope (ft/mi)</u>	<u>Approximate Vertical Clearance To Obstruction (ft)</u>
4.8	Utility Line (telephone)	--	0.68	20.0
4.8	Utility Line (power)	--	0.68	35.0
4.8	U. S. 76, S. C. 9 Highway Bridge	1,820	0.68	11.5
6.9	Seaboard Coast Line Rail- road Bridge	1,810	0.68	8.0
7.4	Utility Line (power)	--	0.68	35.0
20.1	N. C. 904 Highway Bridge	1,485	0.97	6.5
20.1	Utility Line (power)	--	0.97	35.0
39.9	U. S. 74, N. C. 130 High- way Bridge	1,340	1.08	9.5
40.0	Utility Line (power)	--	1.08	30.0
49.2	N. C. Secondary 2121 Highway Bridge	840	1.75	6.5
52.6	N. C. Secondary 2123 Highway Bridge	820	1.56	3.5
59.5	Utility Line (power)	--	1.45	69.0
59.9	Utility Line (power)	--	1.45	49.0
60.1	Utility Line (power)	--	1.45	15.0
60.2	Utility Line (power)	--	1.45	35.0
60.2	N. C. Secondary 1620 Highway Bridge	740	1.45	7.0

TABLE 4 (continued)

OBSTRUCTION LISTING FROM RIVER MOUTH
TO RECOMMENDED LIMIT OF NAVIGABLE WATERS OF THE U. S. (3)

<u>Lumber River Mile</u>	<u>Description</u>	<u>Mean Discharge (cfs)</u>	<u>Mean Water Slope (ft/mi)</u>	<u>Approximate Vertical Clearance To Obstruction (ft)</u>
60.2	Utility Line (power)	--	1.45	25.0
60.3	Utility Line (power)	--	1.45	35.0
62.1	Utility Line (power)	--	1.45	25.0
62.1	N. C. Secondary 2202 Highway Bridge	730	1.45	7.0
62.5	Utility Line (power)	--	1.45	35.0
62.6	Utility Line (power)	--	1.45	25.0
62.6	N. C. Secondary 2289 Highway Bridge	720	1.45	13.5
62.6	Utility Line (power)	--	1.45	35.0
63.0	Utility Line (power)	--	1.45	40.0
63.0	Utility Line (power)	--	1.45	35.0
63.0	Utility Line (power)	--	1.45	30.0
63.3	Seaboard Coast Line Rail- road Bridge	720	1.45	12.0
63.3	Utility Line (power)	--	1.45	36.0
63.4	Utility Line (power)	--	1.45	36.0
63.4	N. C. 41 Highway Bridge	720	1.45	11.5



FIGURE 2 - TWO UTILITY LINES (R.M. 4.8)
(AND U. S. 76, S. C. 9 HIGHWAY BRIDGE)



FIGURE 3 - U. S. 76, S. C. 9 HIGHWAY BRIDGE (R.M. 4.8)



FIGURE 4 - SEABOARD COAST LINE RAILROAD BRIDGE (R.M. 6.9)



FIGURE 5 - UTILITY LINE (R.M. 7.4)



FIGURE 6 - N. C. 904 HIGHWAY BRIDGE (R.M. 20.1)



FIGURE 7 - UTILITY LINE (R.M. 20.1) (AND N. C. 904 HIGHWAY BRIDGE)



FIGURE 8 - U. S. 74, N. C. 130 HIGHWAY BRIDGE (R.M. 39.9)



FIGURE 9 - UTILITY LINE (R.M. 40.0)
(AND U. S. 74, N. C. 130 HIGHWAY BRIDGE)



FIGURE 10 - N. C. SECONDARY 2121 HIGHWAY BRIDGE (R.M. 49.2)



FIGURE 11 - N. C. SECONDARY 2123 HIGHWAY BRIDGE (R.M. 52.6)



FIGURE 12 - N. C. SECONDARY 2123 HIGHWAY BRIDGE (R.M. 52.6)



FIGURE 13 - UTILITY LINE (R.M. 59.5)



FIGURE 14 - UTILITY LINE (R.M. 59.9)



FIGURE 15 - THREE UTILITY LINES (R.M. 60.1, 60.2, & 60.2)
(AND N. C. SECONDARY 1620 HIGHWAY BRIDGE)

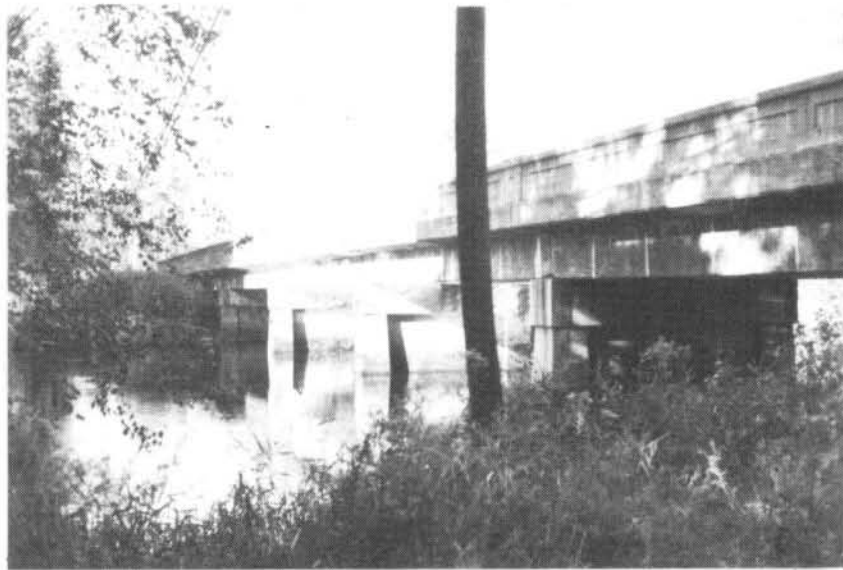


FIGURE 16 - N. C. SECONDARY 1620 HIGHWAY BRIDGE (R.M. 60.2)



FIGURE 17 - UTILITY LINE (R.M. 60.3)
(AND N. C. SECONDARY 1620 HIGHWAY BRIDGE)



FIGURE 18 - UTILITY LINE (R.M. 62.1)
(AND N. C. SECONDARY 2202 HIGHWAY BRIDGE)



FIGURE 19 -- N. C. SECONDARY 2202 HIGHWAY BRIDGE (R.M. 62.1)



FIGURE 20 - UTILITY LINE (R.M. 62.5)
(AND N. C. SECONDARY 2289 HIGHWAY BRIDGE)



FIGURE 21 - TWO UTILITY LINES (R.M. 62.6)
(AND N. C. SECONDARY 2289 HIGHWAY BRIDGE)



FIGURE 22 - N. C. SECONDARY 2289 HIGHWAY BRIDGE (R.M. 62.6)

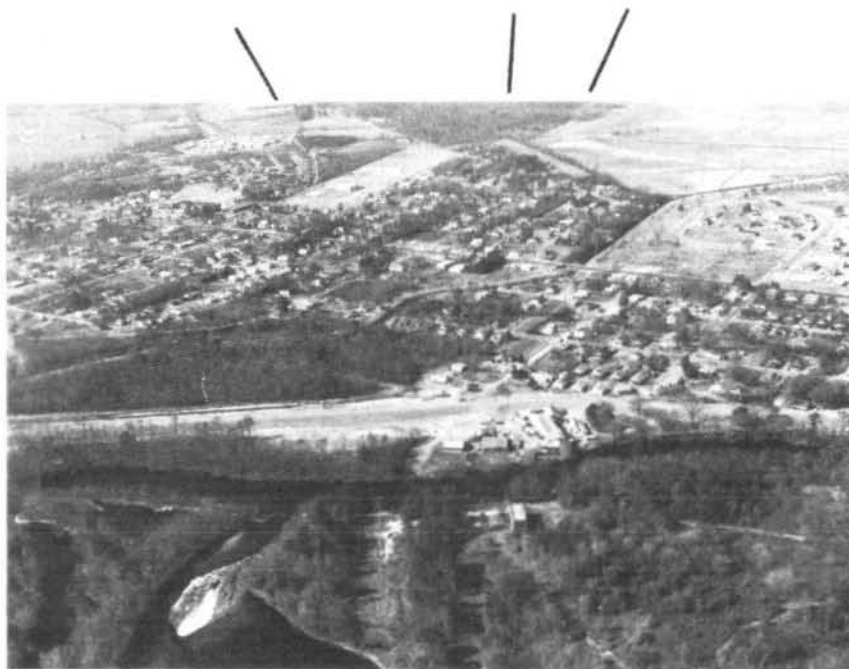


FIGURE 23 - THREE UTILITY LINES (R.M. 63.0)

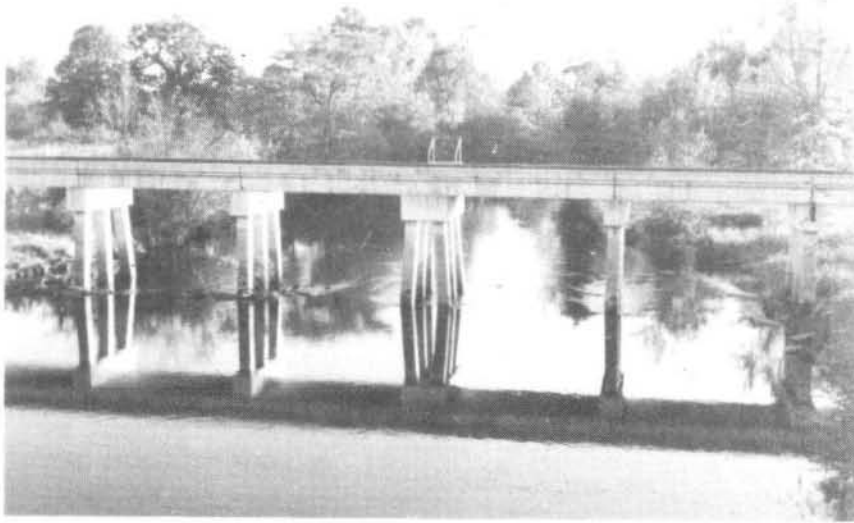


FIGURE 24 - SEABOARD COAST LINE RAILROAD BRIDGE (R.M. 63.3)



FIGURE 25 - TWO UTILITY LINES (R.M. 63.3 & 63.4)
(AND SEABOARD COAST LINE RAILROAD BRIDGE & N. C. 41
HIGHWAY BRIDGE)

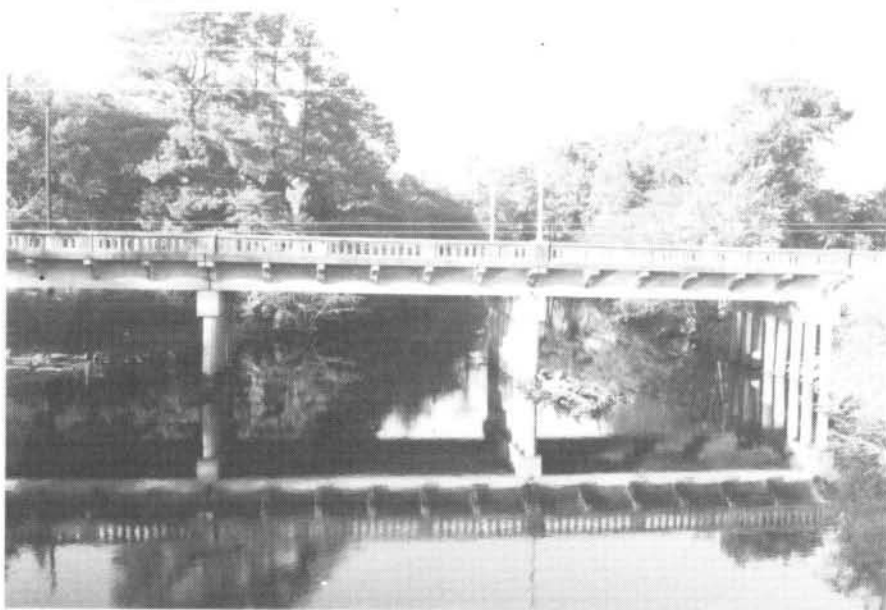


FIGURE 26 - N. C. 41 HIGHWAY BRIDGE (R.M. 63.4)

SECTION 7 - CONCLUSIONS AND RECOMMENDATIONS

Five classifications of navigation on streams in the Lumber River basin have been determined and are presented below. The first two are classifications developed from historical evidence and current Federal stream classifications. Classification 3 is based on field measurements, observations, and data analysis for the river. Classification 4 is based on review of all previously determined limits with a recommendation of the most upstream locations with supporting evidence of navigability. The fifth classification accounts for all streams not otherwise classified and was determined based on the drainage area and hydrological aspects of the stream.

1. The Lumber River is presently classified "navigable waters of the U. S." between its mouth on the Little Pee Dee River to Lumberton, North Carolina (R.M. 63.4).
2. The historical limit of navigation on the Lumber River is near Oak Hill, North Carolina (approximate R.M. 106).
3. The recommended practical limit of navigation is at the Seaboard Coast Line Railroad bridge and N. C. 41 highway bridge in Lumberton (R.M. 63.4). Several channel improvements and bridge renovation projects will be necessary for commercial river craft to actually use the river up to this point. In addition, the following small tributaries are recommended for practical navigation, and are listed with their upstream recommended practical limit of navigation indicated in parentheses: secondary channel near R.M. 10.1 (R.M. 0.1) and secondary channel near R.M. 10.3 (R.M. 0.1). The downstream limit for each of these small streams is at its confluence with the Lumber River.
4. It is recommended that the Lumber be classified "navigable waters of the U. S." between its mouth and Lumberton (R.M. 63.4) based on the analytical procedures and tests of navigability used in this study effort. In addition, the following small tributaries are recommended for classification as "navigable waters of the U. S." from

their confluences with the Lumber River to the upstream limits indicated in parentheses: secondary channel near R.M. 10.1 (R.M. 0.1) and secondary channel near R.M. 10.3 (R.M. 0.1).

5. All streams not recommended for classification as "navigable waters of the U. S." are recommended for classification as "waters of the U. S." throughout their entire length.

BIBLIOGRAPHY

Cited References

1. Water Resources Data for South Carolina Water Year 1975, Water Data Report 75-1, U. S. Geological Survey, Columbia, South Carolina, 1976.
2. Water Resources Data for North Carolina Water Year 1975, Water Data Report N. C. 75-1, U. S. Geological Survey, Raleigh, North Carolina, 1976.
3. Summary Report, Navigability Study, U. S. Army Corps of Engineers, Charleston District, by Stanley Consultants, 1977.
4. Thomas, N. O., Summaries of Streamflow Records, State of North Carolina Department of Natural and Economic Resources, Office of Water and Air Resources, Raleigh, North Carolina, 1973.
5. Project Maps Charleston District 1975, U. S. Army Corps of Engineers, Office of the District Engineer, Charleston, South Carolina, 1975.
6. Incomplete List of Navigable Waters, RCS ENG CW-ON(OT), U. S. Army Corps of Engineers, Charleston, South Carolina, 1965.
7. Annual Report of the Chief of Engineers, U. S. War Department, USGPO, Washington, D. C., 1887, Pt. II, Appendix M, pp. 1102-1106.
8. Acts and Statutes of the General Assembly of North Carolina, Chapter LXXX, p. 158; Chapter XX, p. 61; Chapter 473, p. 655.
9. Kohn, David, ed., Internal Improvement in South Carolina 1817-1828, USGPO, Washington, D. C., 1938, p. A14.
10. Annual Report, 1897, Pt. I, pp. 214-215; Pt. II, pp. 1442-1444.
11. Annual Report, 1887, and ibid., pp. 1444.
12. U. S. Congress, House, Yadkin-Pee Dee River, N. C. and S. C., H. Doc. No. 68, 73rd Cong., 1st Session, 1933, pp. 24-25.
13. Waterborne Commerce of the United States, 1975, U. S. Department of the Army, Pt. I, Waterways and Harbors: Atlantic Coast, Vicksburg: U. S. Army Engineer Division, Lower Mississippi Valley, 1975, pp. 119-124.

Other Background Information

Board of Trade of Georgetown, S. C., The Rivers of South and North Carolina entering Winyah Bay, S. C., Georgetown, Edward Perry, 1896.

Boyd, William K., ed., The History of North Carolina: The Federal Period, 1783-1860, Spartanburg, Reprint Co., 1973.

Clonts, F. W., "Travel and Transportation in Colonial North Carolina", N.C.H.R., VIII, No. 2, April 1933, pp. 145-154.

Crittenden, C. C., "Inland Navigation in North Carolina 1763-1789", N.C.H.R., VIII, No. 2, April 1933, pp. 145-154.

Crittenden, C. C., "Means of Communication in North Carolina 1763-1789", N.C.H.R., VIII, No. 3, July 1931, pp. 239-57.

Hobbs, S. H., North Carolina: Economic and Social., Chapen Hill, UNC Press, 1930.

Lefler, Hugh Talmage and Albert R. Newsome, North Carolina: The History of a Southern State, Chapel Hill, UNC Press, 1954.

Lumber River, N. C. and S. C., H. Doc. No. 138, 63rd Cong., 1st Sess., 1913.

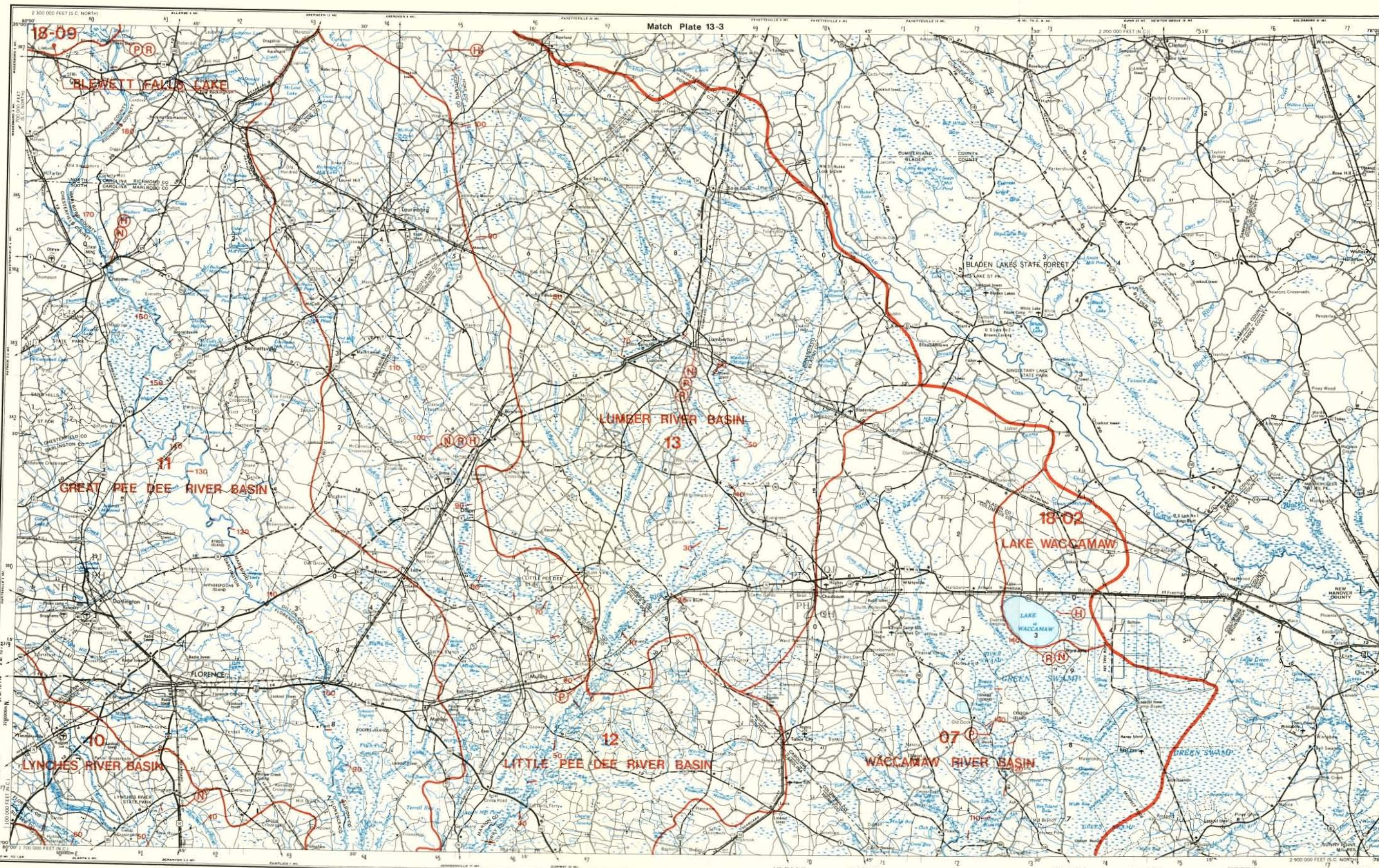
Merrens, Harry R., Colonial North Carolina in the Eighteenth Century, Chapel Hill, UNC Press, 1964.

Parsons, Brinckerhoff, Hall and MacDonald, Survey and Report on the Inland Ports and Waterways of North Carolina, (Prepared for the Dept. of Conservation and Development), New York, Parsons, 1954.

Phillips, Ulrich B., A History of Transportation in the Eastern Cotton Belt to 1860, New York, Columbia University Press, 1908.

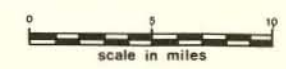
Thompson, S. A., The Waterways and Harbors of the South, Part II, The South's Development, Baltimore, Manufacturers Record, 1924.

Weaver, C. C., "Internal Improvements in North Carolina Previous to 1860", the Johns Hopkins University Series in Historical and Political Science, XXI, Nos. 3-4, March-April 1903, pp. 9-95.

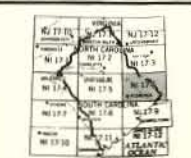


POPULATED PLACES	ROADS
NEW ORLEANS	Primary, all weather, hard surface
CHARLOTTE	Secondary, all weather, hard surface
Other cities	Tertiary, all weather, unpaved surface
	Quaternary, all weather, unpaved surface
	Other roads
	Railroads
	Other transportation
	Other features

USGS BASE MAP
 FLORENCE, S.C.; N.C.
 1953, Revised 1974
 NI 17-6

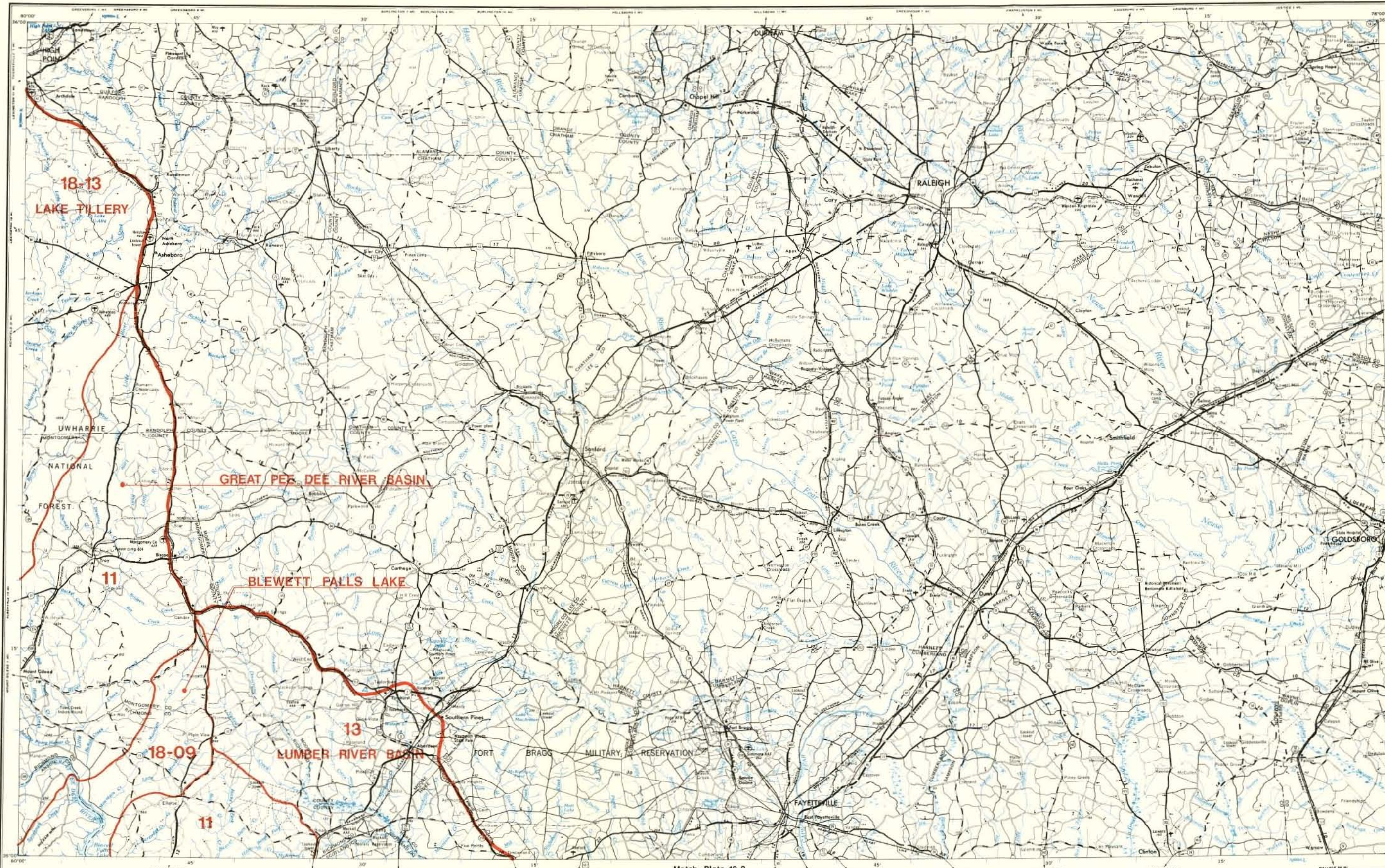


- LEGEND:**
- (N) PRESENT LIMIT OF NAVIGABLE WATERS OF THE U.S.
 - (H) HISTORIC LIMIT OF NAVIGATION
 - (P) PRACTICAL LIMIT OF NAVIGATION (RECOMMENDED)
 - (R) LIMIT OF NAVIGABLE WATERS OF THE U.S. (RECOMMENDED)
 - RIVER MILE



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 CHARLESTON DISTRICT
 Charleston, South Carolina
 STANLEY CONSULTANTS

SIGNIFICANT FEATURES
LUMBER RIVER BASIN
 Report No. 06, 07, 10, 11, 12, 13, 10
NAVIGABILITY STUDY
 Plate 13-2

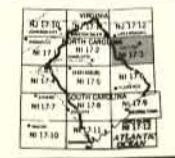


POPULATED PLACES	
Over 100,000	NEW ORLEANS
25,000 to 100,000	CHARLOTTE
10,000 to 25,000	CHARLOTTE
5,000 to 10,000	CHARLOTTE
1,000 to 5,000	CHARLOTTE
Under 1,000	CHARLOTTE

USGS BASE MAP
RALEIGH, N.C.
1953, Revised 1969
NI 17-3



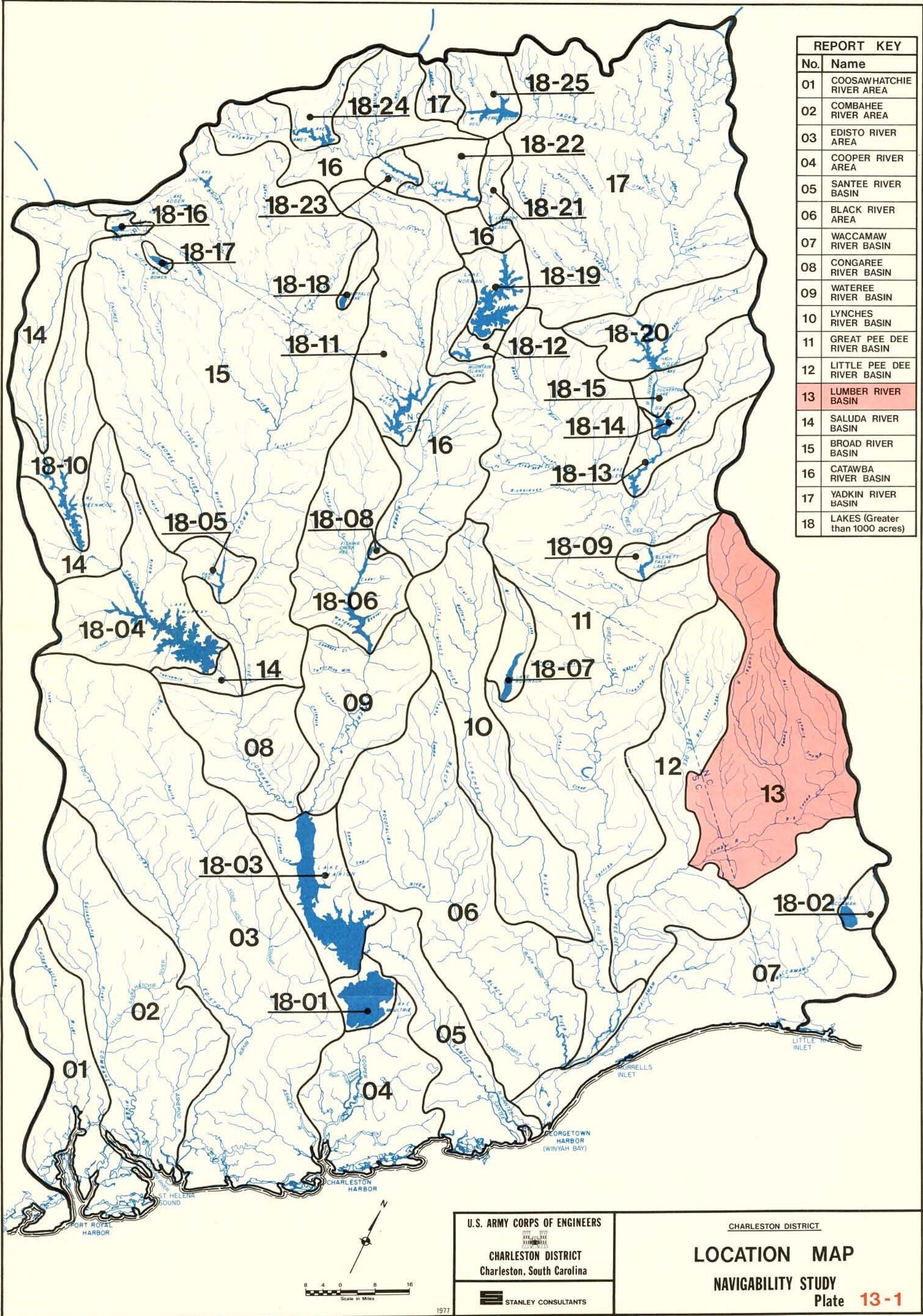
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 - (H) HISTORIC LIMIT OF NAVIGATION
 - (P) PRACTICAL LIMIT OF NAVIGATION (RECOMMENDED)
 - (R) LIMIT OF NAVIGABLE WATERS OF THE U.S. (RECOMMENDED)
 - RIVER MILE



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Charleston, South Carolina
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SIGNIFICANT FEATURES
LUMBER RIVER BASIN
Report No. 11, 10, 17, 10
NAVIGABILITY STUDY
Plate 13-3

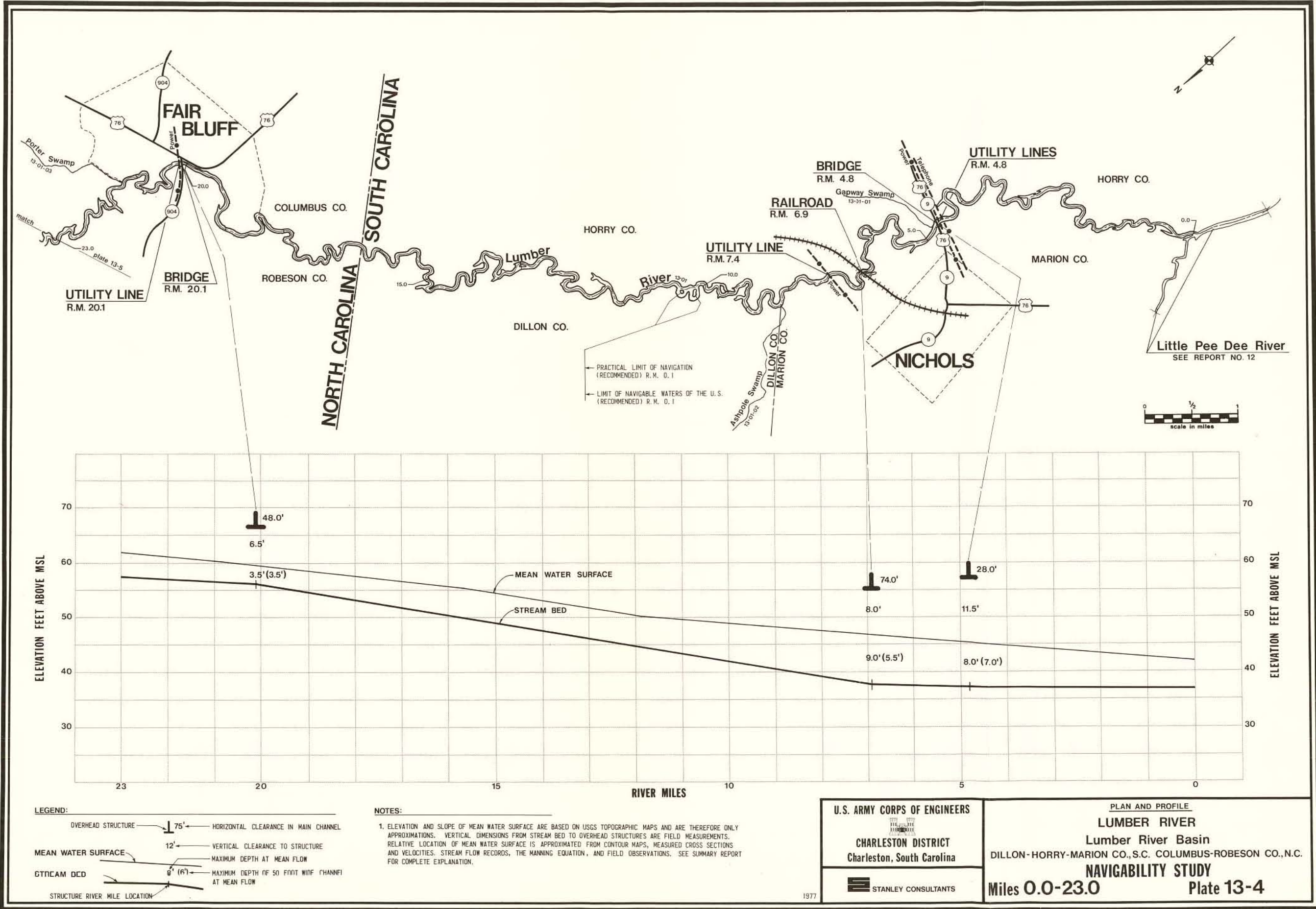
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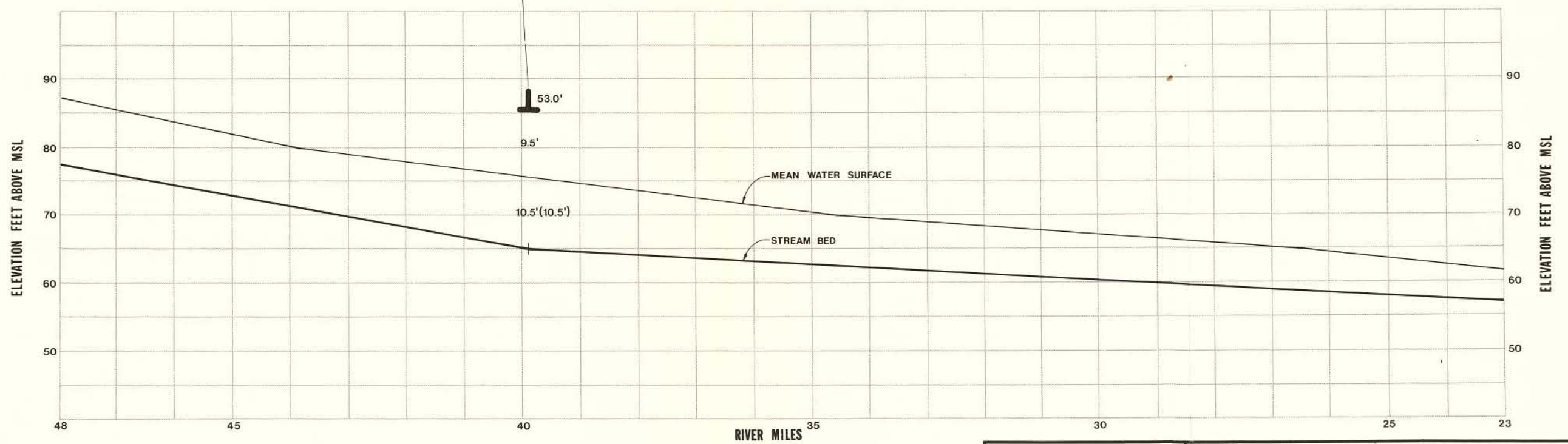
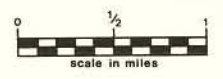
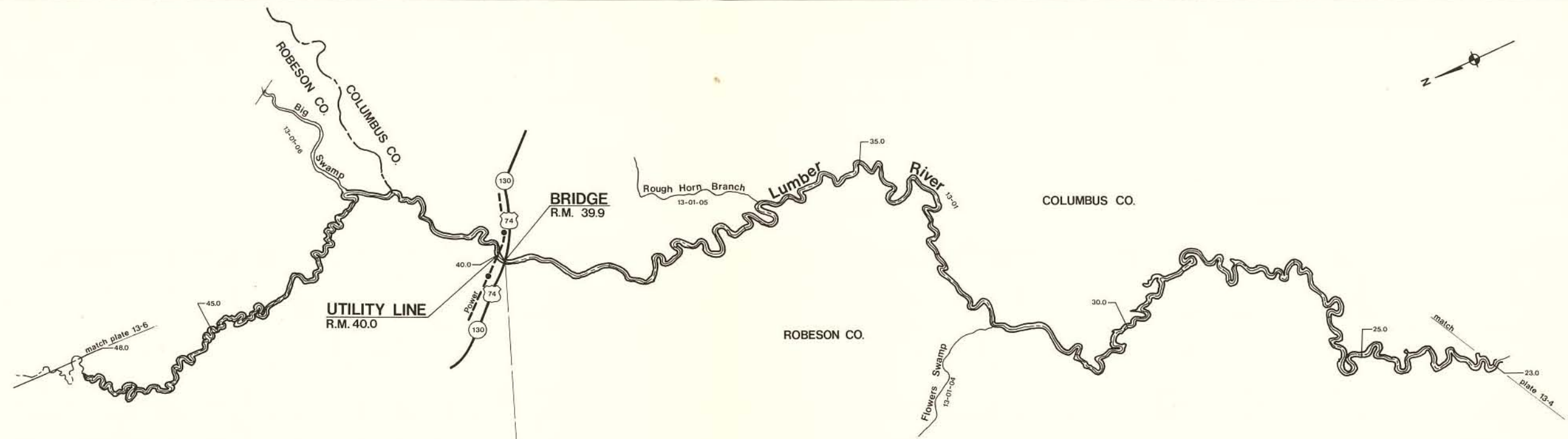


REPORT KEY	
No.	Name
01	COOSAWHATCHIE RIVER AREA
02	COMBAHEE RIVER AREA
03	EDISTO RIVER AREA
04	COOPER RIVER AREA
05	SANTEE RIVER BASIN
06	BLACK RIVER AREA
07	WACCAMAW RIVER BASIN
08	CONGAREE RIVER BASIN
09	WATEREE RIVER BASIN
10	LYNCHES RIVER BASIN
11	GREAT PEE DEE RIVER BASIN
12	LITTLE PEE DEE RIVER BASIN
13	LUMBER RIVER BASIN
14	SALUDA RIVER BASIN
15	BROAD RIVER BASIN
16	CATAWBA RIVER BASIN
17	YADKIN RIVER BASIN
18	LAKES (Greater than 1000 acres)

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CHARLESTON DISTRICT
LOCATION MAP
 NAVIGABILITY STUDY
 Plate 13-1





LEGEND:

OVERHEAD STRUCTURE — 75' — HORIZONTAL CLEARANCE IN MAIN CHANNEL

MEAN WATER SURFACE — 12' — VERTICAL CLEARANCE TO STRUCTURE

STREAM BED — 8' (6') — MAXIMUM DEPTH AT MEAN FLOW

STRUCTURE RIVER MILE LOCATION — 8' (6') — MAXIMUM DEPTH OF 50 FOOT WIDE CHANNEL AT MEAN FLOW

NOTES:

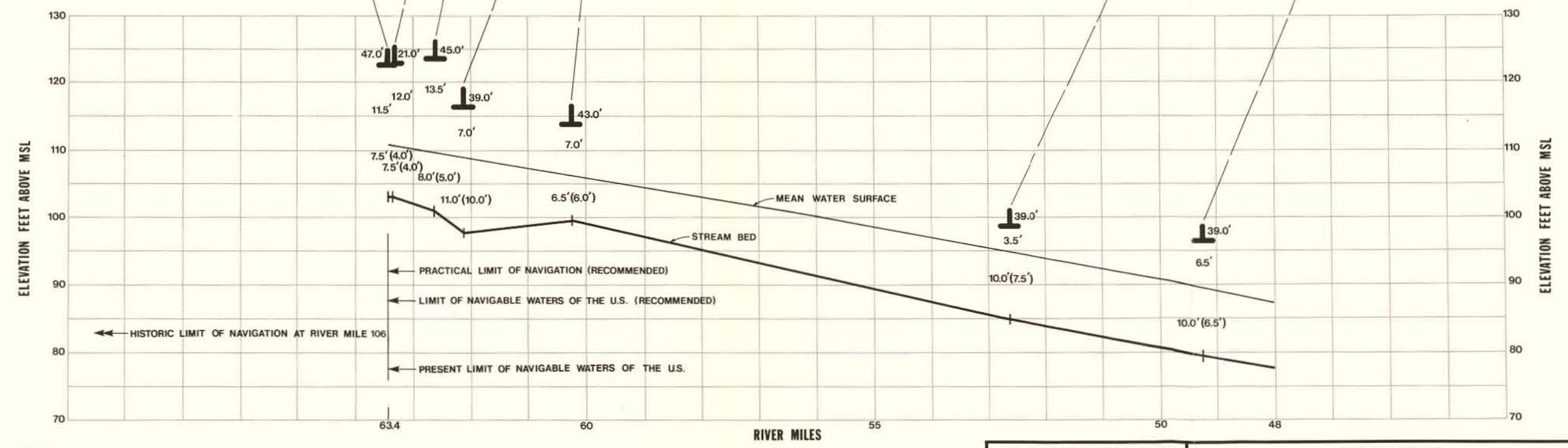
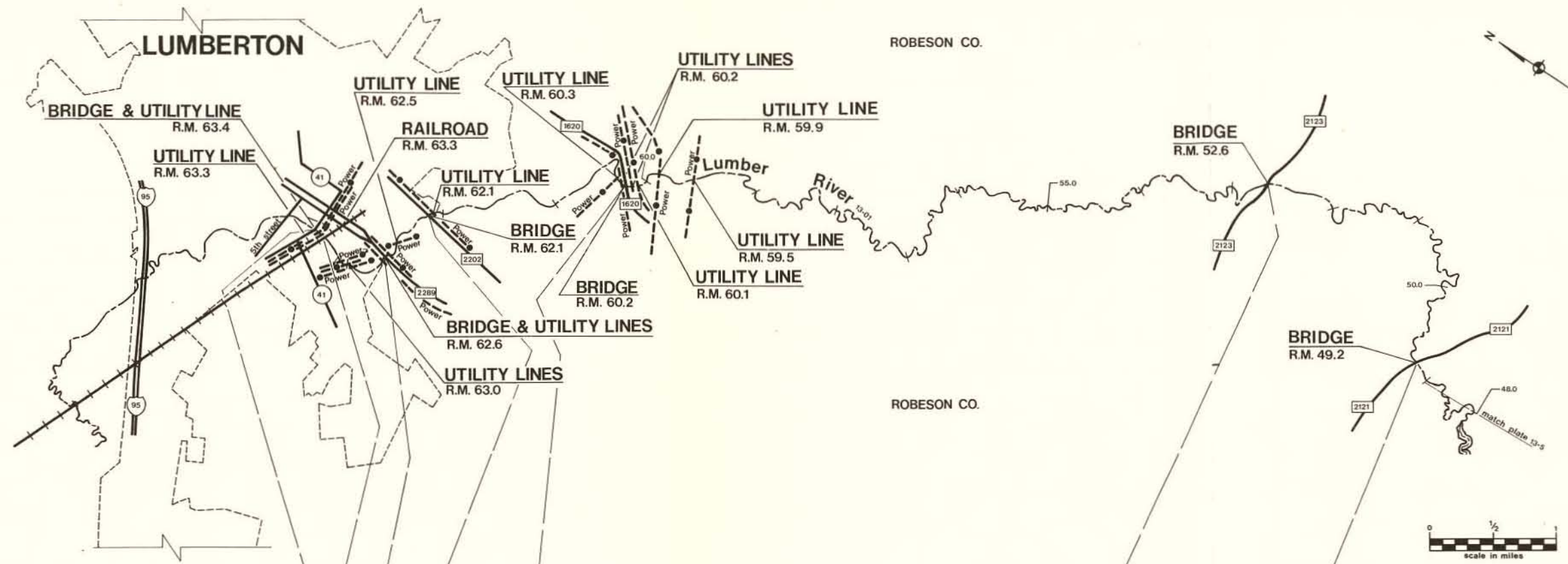
1. ELEVATION AND SLOPE OF MEAN WATER SURFACE ARE BASED ON USGS TOPOGRAPHIC MAPS AND ARE THEREFORE ONLY APPROXIMATIONS. VERTICAL DIMENSIONS FROM STREAM BED TO OVERHEAD STRUCTURES ARE FIELD MEASUREMENTS. RELATIVE LOCATION OF MEAN WATER SURFACE IS APPROXIMATED FROM CONTOUR MAPS, MEASURED CROSS SECTIONS AND VELOCITIES, STREAM FLOW RECORDS, THE MANNING EQUATION, AND FIELD OBSERVATIONS. SEE SUMMARY REPORT FOR COMPLETE EXPLANATION.

U.S. ARMY CORPS OF ENGINEERS
 CHARLESTON DISTRICT
 Charleston, South Carolina

STANLEY CONSULTANTS

PLAN AND PROFILE
LUMBER RIVER
 Lumber River Basin
 COLUMBUS-ROBESON CO., N.C.
NAVIGABILITY STUDY
 Miles 23.0-48.0 Plate 13-5

1977



LEGEND:

- OVERHEAD STRUCTURE — 75' — HORIZONTAL CLEARANCE IN MAIN CHANNEL
- MEAN WATER SURFACE — 12' — VERTICAL CLEARANCE TO STRUCTURE
- STREAM BED — 8' (6') — MAXIMUM DEPTH OF 50 FOOT WIDE CHANNEL AT MEAN FLOW
- STRUCTURE RIVER MILE LOCATION

NOTES:

1. ELEVATION AND SLOPE OF MEAN WATER SURFACE ARE BASED ON USGS TOPOGRAPHIC MAPS AND ARE THEREFORE ONLY APPROXIMATIONS. VERTICAL DIMENSIONS FROM STREAM BED TO OVERHEAD STRUCTURES ARE FIELD MEASUREMENTS. RELATIVE LOCATION OF MEAN WATER SURFACE IS APPROXIMATED FROM CONTOUR MAPS, MEASURED CROSS SECTIONS AND VELOCITIES, STREAM FLOW RECORDS, THE MANNING EQUATION, AND FIELD OBSERVATIONS. SEE SUMMARY REPORT FOR COMPLETE EXPLANATION.

U.S. ARMY CORPS OF ENGINEERS
 CHARLESTON DISTRICT
 Charleston, South Carolina
 STANLEY CONSULTANTS

PLAN AND PROFILE
 LUMBER RIVER (R.M. 48.0-63.0)
 Lumber River Basin
 ROBESON CO., N.C.
 NAVIGABILITY STUDY
 Miles 48.0-63.4 13-6

APPENDIX A
STREAM CATALOG

This appendix presents a coded listing of all streams located in the Lumber River basin having a mean annual flow greater than or equal to five cfs.

The points where flow is approximately equal to five cfs (headwaters) are defined by approximate longitude and latitude, and river miles from the nearest named tributary, major highway, railroad, or other similar reference point. Some streams listed in the tabulation may not have headwater locations identified. This occurs when the name of a stream changes at a confluence where the flow immediately downstream is greater than five cfs. Thus, the headwater locations for streams with more than one name are associated with the appropriate upstream name found on USGS quadrangle maps. Some streams in this appendix listing are also coded in other reports for this study. Cross-references to specific reports are noted.

The coding system shown in the tabulation uses a procedure developed by the Charleston District, Corps of Engineers. Streams are summarized from the mouth of the major river upstream to the report boundary.

USGS data was used to identify the location where the mean annual stream flow is five cfs. Flow records from gaging stations throughout the Charleston District were evaluated and an isoflow map developed to indicate variations in runoff (cfs per square mile). These runoff values were then applied to the appropriate stream drainage areas (as determined from USGS quadrangle maps) so that a flow of five cfs was approximated.

APPENDIX A
STREAM CATALOG

REPORT NUMBER	STREAM CODE						STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)				
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER	FIFTH ORDER		LATITUDE (° ' ")	LONGITUDE (° ' ")	STREAM MILES		FROM
										UP	DOWN	
13	01						Lumber River #					
		01					Gapway Swamp	34 14 00	78 57 50			Confluence-Big Fresh Water Branch
			01				Jordan Creek	34 13 00	79 02 05	2.5		U. S. 76 Bridge
		02					Ashpole Swamp	34 36 30	79 14 45	3.3		U. S. 301 Bridge
			01				Bear Swamp	34 25 35	79 18 30	6.0		Gully Branch
				01			Big Cowpen Swamp	34 22 20	79 09 45	2.0		Bear Swamp
				02			Gully Branch	34 24 20	79 14 40			Confluence-Beaverdam Creek
				02			Indian Swamp	34 27 40	79 02 45	0.6		Little Indian Swamp
				03			Hog Swamp	34 33 00	79 04 00	7.8		Old Field Swamp
					01		Old Field Swamp	34 33 00	79 08 00	5.0		Hog Swamp
					04		Horse Swamp	34 31 00	79 11 00	1.0		Aaron Swamp
						01	Aaron Swamp	34 33 50	79 12 15	4.6		Horse Swamp
					05		Cowford Swamp	34 29 00	79 13 45	0.3		Ashpole Swamp
					06		Unnamed Tributary	34 32 30	79 14 00	0.8		Ashpole Swamp
		03					Porter Swamp	34 15 50	78 53 15	1.0		Cypress Branch

Dual code in Report 12.

APPENDIX A
STREAM CATALOG

REPORT NUMBER	STREAM CODE						STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)					
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER	FIFTH ORDER		LATITUDE (° ' '')	LONGITUDE (° ' '')	STREAM MILES		FROM	
										UP	DOWN		
13	01	03	01				Mill Branch	34 20 45	78 58 30	0.7		Porter Swamp	
			02				Cow Branch	34 23 45	78 56 00	3.5		Porter Swamp	
			03				Dunn Swamp	34 22 05	78 51 30	3.0		Greene Swamp	
				01			Brown Mill Branch	34 21 35	78 54 50	1.0		Dunn Swamp	
				02			Unnamed Tributary	34 20 30	78 51 15	0.8		Dunn Swamp	
			04				Flowers Swamp	34 24 20	79 00 15	0.5		Lumber Swamp	
			05				Rough Horn Branch	34 25 20	78 57 40	1.0		Lumber Swamp	
			06				Big Swamp						
				01			Gum Swamp Canal	34 29 15	78 54 25	2.0		Willoughby Canal	
				02			Brier Creek	34 26 45	78 53 30	1.8		Lumber River	
				03			Rattlesnake Creek	34 28 45	78 51 30			Confluence-Spring Br	
					01		Horsepen Branch	34 30 05	78 49 35	1.8		Slender Branch	
				04			Bryant Swamp	34 32 45	78 45 45	6.6		Big Swamp	
				05			Peters Branch	34 32 45	78 54 30	2.4		Big Swamp	
				06			Little Swamp	34 35 20	78 52 00	1.2		Big Swamp	
				07			Unnamed Tributary	34 35 45	78 49 50	0.7		Big Swamp	

APPENDIX A
STREAM CATALOG

REPORT NUMBER	STREAM CODE						STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)				
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER	FIFTH ORDER		LATITUDE (° ' '')	LONGITUDE (° ' '')	STREAM MILES		FROM
										UP	DOWN	
13	01	06	08				34 36 45	78 43 50		0.2	Singletary Swamp	
				01			34 38 15	78 46 45	2.0		Crawley Swamp	
			09				34 38 00	78 54 45	4.8		Big Swamp	
			10				34 40 40	78 47 05	2.0		Big Swamp	
			11				34 45 10	78 49 10	0.5		Buck Branch	
			12				34 41 15	78 51 15	2.2		Big Swamp	
			13				34 45 25	79 01 10	1.7		Little Tenmile Swamp	
				01			34 43 20	78 52 45	0.8		Tenmile Swamp	
				02			34 43 05	78 55 30	0.8		Tenmile Swamp	
				03			34 40 45	78 57 15	0.9		Tenmile Swamp	
			14				34 54 15	79 11 00	5.0		Seaboard Coast Line Railroad Bridge	
			15									
				01			34 55 15	79 06 10	2.8		N. C. 71 Highway Bridge	
				02			34 54 00	78 59 00	1.0		U. S. 301 Highway Bridge	

APPENDIX A
STREAM CATALOG

REPORT NUMBER	MAJOR RIVER	STREAM CODE					STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)				
		PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER	FIFTH ORDER		LATITUDE (° ' '')	LONGITUDE (° ' '')	STREAM MILES		FROM
										UP	DOWN	
13	01	06	15	03		Cold Camp Creek	34 53 00	78 56 00	1.6		Gallberry Swamp	
						Big Branch Canal	34 29 45	78 59 00	3.5		Lumber River	
						Jacob Swamp	34 36 05	78 57 00			Confluence-Reedy Br	
						Saddletree Swamp	34 42 50	79 02 30	1.0		Poplar Pole Branch	
						Raft Swamp (Big Raft Swamp)	34 56 45	79 14 00	2.8		N. C. 211 Highway Bridge	
						Holy Swamp	34 39 30	79 06 00	1.4		Raft Swamp	
						Richland Swamp						
						Burnt Swamp	34 44 15	79 10 30	0.4		N. C. 72 Highway Bridge	
						Unnamed Tributary	34 46 10	79 08 45	1.7		Richland Swamp	
						Long Swamp	34 50 45	79 14 15	1.8		N. C. 71 Highway Bridge	
			Little Raft Swamp	34 55 30	79 17 15	0.4		Laurinburg Southern Railroad Bridge				
			Unnamed Tributary	34 56 30	79 15 30	1.0		Raft Swamp				
			Bear Swamp	34 44 50	79 13 45	1.0		N. C. 710 Highway Bridge				
			11									

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APPENDIX A
STREAM CATALOG

STREAM CODE							STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)					
REPORT NUMBER	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER	FIFTH ORDER		LATITUDE (° ' '')	LONGITUDE (° ' '')	STREAM MILES		FROM	
										UP	DOWN		
13	01	12					Back Swamp	34 38 00	79 13 45	8.0		Lumber River	
		13					Gum Swamp	34 49 15	79 17 30	2.8		Jordans Swamp	
		14					Buffalo Creek	34 59 50	79 20 25	3.3		Lumber River	
		15					Drowning Creek	35 17 00	79 43 00	9.3		Jackson Creek	
		01					Hills Creek	34 58 25	79 25 05	2.0		Drowning Creek	
		02					Mountain Creek	35 02 15	79 22 00	4.1		Drowning Creek	
		03					Little Muddy Creek	34 59 40	79 26 20	1.6		Drowning Creek	
		04					Quewhiffle Creek						
		01					Unnamed Tributary	35 04 40	79 24 50	0.8		Quewhiffle Creek	
		05					Beaverdam Creek	35 00 25	79 27 15	1.4		Drowning Creek	
		06					Big Muddy Creek	35 01 00	79 31 25	0.1		Towers Fork	
		01					Towers Fork	35 00 30	79 31 20	0.7		Big Muddy Creek	
		07					Aberdeen Creek	35 09 50	79 26 05	8.9		Drowning Creek	
		08					Horse Creek	35 09 20	79 29 40	5.1		Deep Creek	
		01					Deep Creek	35 11 25	79 32 25	2.2		Sandy Run	

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APPENDIX A
STREAM CATALOG

STREAM CODE							STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)				
REPORT NUMBER	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER	FIFTH ORDER		LATITUDE (° ' ")	LONGITUDE (° ' ")	STREAM MILES		FROM
										UP	DOWN	
13	01	15	09				Naked Creek	35 12 25	79 42 35	3.8		N. C. 73 Highway Bridge
				01			Rocky Ford Branch	35 07 30	79 40 05	0.6		Naked Creek
			10				Jackson Creek	35 14 35	79 37 45	6.0		Drowning Creek
			11				Unnamed Tributary	35 16 00	79 40 00	0.8		Drowning Creek

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APPENDIX B
SUMMARY OF 10 TO 1,000 ACRE LAKES

This appendix is a compilation of lakes from 10 to 1,000 acres which are contained in the Lumber River basin.

This inventory was compiled from the following sources:

1. Inventory of Lakes in South Carolina Ten Acres or More in Surface Area.
2. Hydrologic Information Storage and Retrieval System, Register of Dams for North Carolina (computer printout).
3. USGS Quadrangle Maps.

The USGS quadrangle maps were used to locate and to detect lakes that were not listed in the other sources. Actual surface area and gross storage information is supplied where available. The lakes were coded by major stream basin in accordance with other procedures developed for identifying streams. The map data from Source 1 above generally does not permit detailed location of the small lakes. Thus, lakes are coded by basin only as far as the secondary order.

APPENDIX B
SUMMARY OF 10 TO 1,000 ACRE LAKES

REPORT NUMBER	STREAM CODE					LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (SOUTH CAROLINA)
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER				
13	01	02	01			Gaddys Millpond	165	400	Dillon
13	01	02	01			Pages Millpond	200	640	Dillon
13	01	02	01			Millers Pond (Spiveys Millpond)	50	140	Dillon
13	01	02	01			Danny Nance (Flowers Pond)	10	35	Dillon
13	01	02	01			B. A. Rogers	12	50	Dillon
13	01	01				Grainger Millpond	110	330	Horry
13	01	01				Rafe Gardiner	10	30	Horry
13	01	02	01			Unnamed Lake	--	--	Dillon
13	01	01				Unnamed Lake	--	--	Horry
13	01	01				Unnamed Lake	--	--	Horry
13	01	01				Unnamed Lake	--	--	Horry
									(NORTH CAROLINA)
13	01	15	07			City of Aberdeen	50	--	Moore
13	01	15	07			Aberdeen Pond	35	--	Moore
13	01	15	07			Pages Lake	--	--	Moore
13	01	10				Antioch Pond (Hodgins Pond)	100	--	Hoke
13	01	03				Arnette's Pond	40	--	Columbus

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APPENDIX B
SUMMARY OF 10 TO 1,000 ACRE LAKES

REPORT NUMBER	STREAM CODE					LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (NORTH CAROLINA)
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FIFTH ORDER				
13	01	02	03			Atkinson Pond (Atkins Pond)	100	--	Robeson
13	01	15				Bengston Pond	13	--	Moore
13	01	15	10			Curries Pond	--	--	Moore
13	01	15	06			Big Muddy Lake	70	--	Scotland
13	01	06	04			Bridger Millpond	15	--	Bladen
13	01	06	02			Britts Pond	12	--	Columbus
13	01	15	06			Broadacres Lakes	22	--	Richmond
13	01	15				Crappie Lake	--	--	Richmond
13	01	06	10			Bryant Millpond	180	--	Bladen
13	01	10	02			Buie Pond	100	--	Robeson
13	01	10	02			Buie Pond (John Buie)	25	--	Robeson
13	01	10	02			Buie Pond	75	--	Robeson
13	01	10	02			Buie Pond (Lacy Buie)	25	--	Robeson
13	01	15	06			Cameron Lake (Kinney Cameron Lake)	35	260	Scotland
13	01	06	15			Canady Pond	16	--	Cumberland
13	01	15				Candor Water Supply Dam	16	--	Moore
13	01	15	07			Colony Lakes Golf Course Pond	10	60	Moore

APPENDIX B
SUMMARY OF 10 TO 1,000 ACRE LAKES

REPORT NUMBER	STREAM CODE					LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (NORTH CAROLINA)
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FIFTH ORDER				
13	01	15	07			Country Club of N.C. Pond	20	72	Moore
13	01	10				Covington Pond	12	30	Hoke
13	01	15				Dixie Pond	15	--	Scotland
13	01	15	04			Duncan Pond	25	--	Moore
13	01	03				Edmund Millpond	60	--	Columbus
13	01	15				Foxfire Country Club Pond	16	153	Moore
13	01	15				Foxfire Pond	15	--	Moore
13	01	15	07			Gilmore Pond	10	61	Moore
13	01	02	03			Griffin Pond (V. J. Griffin)	12	--	Robeson
13	01	02	03			Hardin Pond (Albert Hardin)	10	--	Robeson
13	01	02				Hayes Pond (James Hayes)	22	88	Robeson
13	01	02	03			Hayes Pond (Bill Hayes)	12	42	Robeson
13	01	10				Hendrix Pond	11	45	Hoke
13	01	06	08			Hester Millpond	100	--	Bladen
13	01	02				Horns Old Millpond	14	--	Robeson
13	01	02				Unnamed Tributary	--	--	Robeson

APPENDIX B
SUMMARY OF 10 TO 1,000 ACRE LAKES

REPORT NUMBER	STREAM CODE					LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (NORTH CAROLINA)
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FIFTH ORDER				
13	01	06	15			Hughes Pond	30	--	Robeson
13	01	15	06			Indian Camp Lake	100	--	Scotland
13	01	06	05			Johnson Pond (Lennon Pond)	300	--	Robeson
13	01	06	14			Keith Pond (Odom Pond)	30	--	Robeson
13	01	08				Lee Pond	10	--	Robeson
13	01	01				Lovett Pond	10	--	Columbus
13	01	03	01			Mill Pond	--	--	Columbus
13	01					Lumber Recreation Site Pond	100	300	Robeson
13	01					Lumberton Recreation Site Pond	15	--	Robeson
13	01	06	15			McGougan Pond	11	--	Robeson
13	01	10	03			McNeill Pond	32	100	Robeson
13	01	06	14			McNeills Pond	100	--	Hoke
13	01	02	03			Mitchell Pond	12	--	Robeson
13	01	02	03			Mitchell Pond (A. N. Mitchell)	11	49	Robeson
13	01	15	06			Muddy Lake (Big Muddy Lake)	100	--	Scotland
13	01	15				Parsons Pond	14	90	Moore
13	01					Unnamed Lake	--	--	Robeson
13	01	06	05			Unnamed Lake	--	--	Robeson

APPENDIX B
SUMMARY OF 10 TO 1,000 ACRE LAKES

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REPORT NUMBER	STREAM CODE					LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (NORTH CAROLINA)
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FIFTH ORDER				
13	01	10	02			Philadelphus Pond	50	--	Robeson
13	01	15	07			Pleasants Sand & Gravel Pond	20	96	Moore
13	01	15				Pompelli Pond	11	--	Moore
13	01	15				Rankin Pond (P. R. Rankin, Jr.)	13	88	Moore
13	01	15				Research Pond	10	--	Montgomery
13	01	15	08			Sandy Woods Lake	18	158	Moore
13	01	15	08			Sandy Woods Pond	16	--	Moore
13	01	02	03			Scarborough Pond	12	48	Robeson
13	01	15				Sheppard Pond	24	--	Moore
13	01	06	08			Singletary Millpond	150	--	Bladen
13	01	06	12			Smiths Millpond	25	--	Robeson
13	01	06	12			Smiths Pond	75	--	Robeson
13	01	15	04			Stainback Pond	20	--	Moore
13	01	10				B. Thomas Pond	11	50	Hoke
13	01	10				B. Thomas Pond	13	30	Hoke

APPENDIX B
SUMMARY OF 10 TO 1,000 ACRE LAKES

REPORT NUMBER	STREAM CODE					LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (NORTH CAROLINA)
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FIFTH ORDER				
13	01	10				W. H. Tyner Pond (Circle T Lake)	10	40	Robeson
13	01	10				J. Warner Pond	10	20	Hoke
13	01	08				Warwick Millpond	100	--	Robeson
13	01	15	07			Watsons Lake	40	--	Moore
13	01	15				(Arthur) Williams Pond	12	108	Moore
13	01	15				(Arthur) Williams Pond	20	320	Moore
13	01	15				Williams Pond	10	--	Moore
13	01	10				(J. Williamson) Williams Pond	16	75	Hoke
13	01	10				(C.) Wright Pond	15	60	Hoke
13	01	06	04			Unnamed Lake	--	--	Robeson
13	01					Plant Cooling Lake	--	--	Robeson
13	01	06	13			Unnamed Lake	--	--	Robeson
13	01	02	03			Unnamed Lake	--	--	Robeson
13	01	15	10			McCaskill Pond	--	--	Montgomery
13	01	15	08			Unnamed Lake	--	--	Moore
13	01	15	08			Unnamed Lake	--	--	Moore
13	01	15	01			Unnamed Lake	--	--	Moore

APPENDIX B
SUMMARY OF 10 TO 1,000 ACRE LAKES

REPORT NUMBER	STREAM CODE					LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (NORTH CAROLINA)
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FIFTH ORDER				
13	01	06				Unnamed Lake	--	--	Robeson
13	01	06				Unnamed Lake	--	--	Robeson
13	01					Smith Lake	--	--	Robeson
13	01	15	01			Unnamed Lake	--	--	Moore
13	01	15	06			Moss Gill Lake	--	--	Scotland
13	01	15	07			Unnamed Lake	--	--	Moore
13	01	10				Unnamed Lake	--	--	Robeson
13	01	10				Unnamed Lake	--	--	Robeson
13	01	06	13			Unnamed Lake	--	--	Robeson
13	01	09				Unnamed Lake	--	--	Robeson
13	01	06	13			Unnamed Lake	-	--	Robeson
13	01	06				Hodgins Pond	--	--	Hoke