

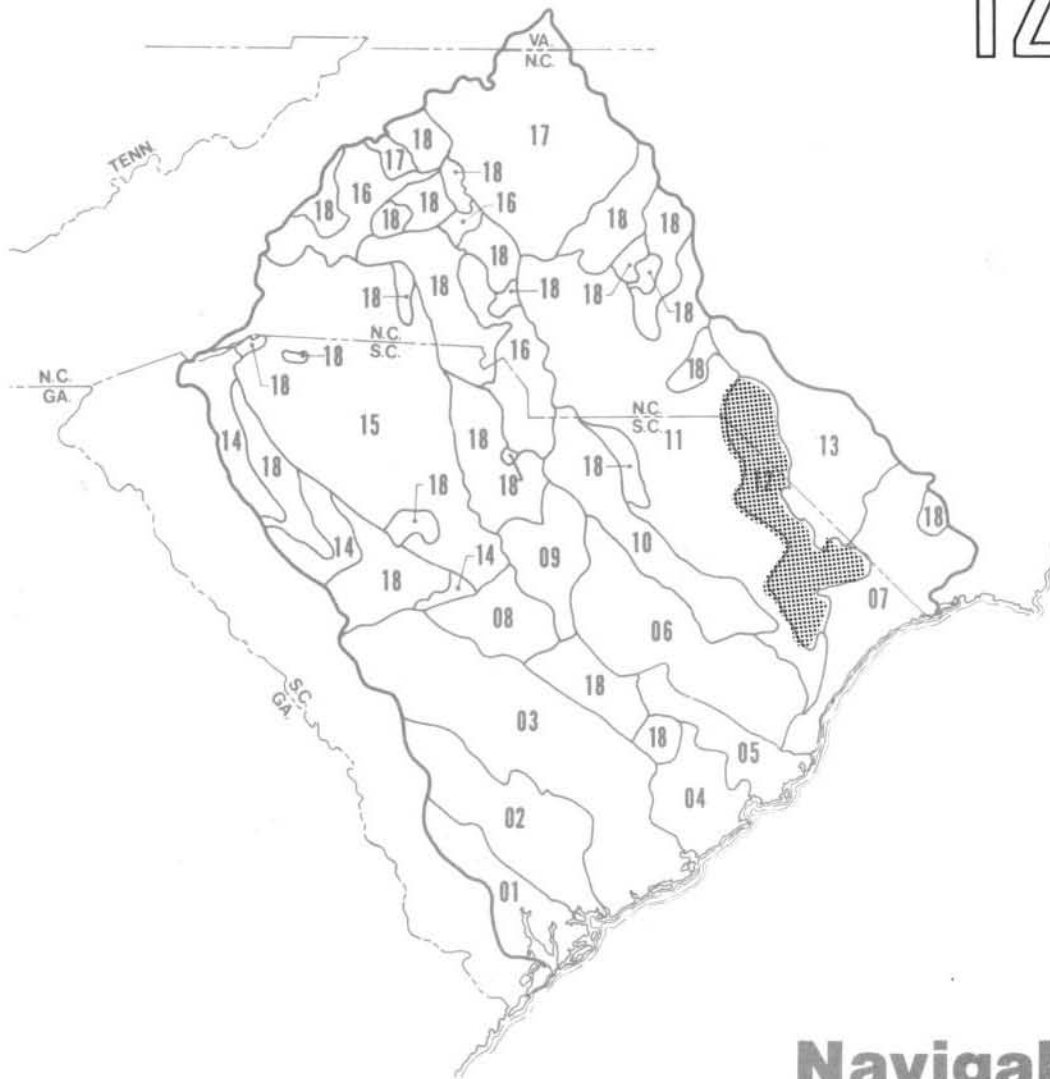
U.S. ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
Charleston, South Carolina



LITTLE PEE DEE RIVER BASIN

Report No.

12



**Navigability
Study
1977**



STANLEY CONSULTANTS

CONTENTS

	<u>Page</u>
SECTION 1 - INTRODUCTION	12-1
Purpose	12-1
Scope	12-1
Related Reports	12-2
Acknowledgements and Data Sources	12-3
SECTION 2 - PHYSICAL CHARACTERISTICS	12-4
SECTION 3 - NAVIGATION IMPROVEMENT PROJECTS	12-7
Federal Navigation Projects	12-7
Other Navigation Projects	12-7
SECTION 4 - INTERSTATE COMMERCE	12-9
Past	12-9
Present	12-10
Future Potential	12-10
SECTION 5 - LEGAL AUTHORITY	12-12
General	12-12
Navigability Interpretations	12-12
General Federal Court Cases	12-13
Specific Federal Court Cases	12-15
South Carolina State Court Cases	12-15
North Carolina State Court Cases	12-16
Recent Federal Litigation	12-16
Federal Agency Jurisdiction	12-17
SECTION 6 - NAVIGATION OBSTRUCTIONS AND CLASSIFICATIONS	12-19
Navigation Classification Procedures	12-19
Navigation Classification Categories	12-23
Present Navigable Waters of the U. S.	12-23
Historically Navigable Waters	12-23
Recommended and Practical Navigable Waters of the U. S.	12-24
Obstructions to Navigation	12-26
Waters of the U. S.	12-26
SECTION 7 - CONCLUSIONS AND RECOMMENDATIONS	12-32

CONTENTS (continued)

	<u>Page</u>
BIBLIOGRAPHY	12-34
Cited References	12-34
Other Background Information	12-35
APPENDIX A - STREAM CATALOG	12-A1
APPENDIX B - SUMMARY OF 10 TO 1,000 ACRE LAKES	12-B1

TABLES

<u>Number</u>		<u>Page</u>
1	Physical Characteristics	12-5
2	Key Stream Gaging Station	12-6
3	Authorized Federal Navigation Projects	12-8
4	Obstruction Listing from River Mouth to Recommended Practical Limit of Navigable Waters of the U. S.	12-27

FIGURES

<u>Number</u>		<u>Page</u>
1	Navigability Decision Diagram	12-20
2	Two Utility Lines	12-28
3	U. S. 378 Highway Bridge	12-28
4	Utility Line	12-29
5	U. S. 501 Highway Bridges	12-29
6	Utility Line	12-30
7	S. C. 917 Highway Bridge	12-30
8	U. S. 76 Highway Bridge	12-31
9	Utility Line	12-31

CONTENTS (continued)

PLATES

<u>Number</u>		<u>Follows Page</u>
12-1	Location Map	12-35
12-2	Significant Features	12-35
12-3	Significant Features	12-35
12-4	Plan and Profile - Miles 0.0 - 17.0	12-35
12-5	Plan and Profile - Miles 17.0 - 37.0	12-35
12-6	Plan and Profile - Miles 37.0 - 56.0	12-35
12-7	Plan and Profile - Miles 56.0 - 78.0	12-35
12-8	Plan and Profile - Miles 0.0 - Practical Limit Small Streams	12-35

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 Little Pee Dee River is a major tributary of the Great Pee Dee River. The river extends approximately 109 miles from its mouth at river mile (R.M.) 33.2 on the Great Pee Dee River to its headwaters on Beaverdam Creek, approximately seven miles northwest of Laurinburg, North Carolina. The Lumber River is a significant tributary to the Little Pee Dee River (see Report 13 for further information). Plate 12-1 shows the drainage area of the Little Pee Dee River and its tributaries.

The significant features of the river basin are presented on Plates 12-2 and 12-3. The towns of Mullins and Dillon, South Carolina are located near the river.

At the mouth of the Little Pee Dee River the mean annual flow is 3,770 cfs from a total drainage area of 3,140 square miles (including the Lumber River basin). The river has a gentle sloped channel with variable widths (300 feet at R.M. 41.7, 130 feet at R.M. 59.0 and 60 feet at R.M. 104.5). Up to R.M. 66 the river channel appears to be a debris-free, relatively straight channel. Beyond this point, however, the river has a twisting and a debris-cluttered channel. From the headwaters on Beaverdam Creek to the mouth, the elevation changes approximately 190 feet over 109 river miles. The Little Pee Dee River is not tidally influenced.

Table 1 presents selected physical characteristics of the Little Pee Dee and Lumber Rivers. Included are approximate values for drainage areas, mean discharges, and elevation changes for the streams. Detailed slope information may be found in Table 4. Methodology for determining the numerical values of physical characteristics is defined in the Summary Report.

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

TABLE 1

PHYSICAL CHARACTERISTICS (1)(2)(3)(4)*

<u>Stream¹⁾ & Code</u>	<u>Length-Mouth to Headwaters²⁾</u> (mi)	<u>Elevation Change</u> (ft)	<u>Drainage Area</u> (sq.mi)	<u>Mean Discharge at Mouth</u> (cfs)	<u>Limit of Tidal Influence</u> (R.M.)	<u>Confluence With Little Pee Dee River</u> (R.M.)	<u>Present Navi- gable Waters of the U. S.</u> (R.M.)
Little Pee Dee River 12-01	109.0	190	3,140 ³⁾	3,770 ³⁾	None	--	0 - 99.0
Lumber River 12-01-20	142.8	415	1,740	1,910	None	58.0	0 - 63.4

1) See Summary Report for explanation of code.

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

3) Values include Lumber River basin.

* See Bibliography for these references.

TABLE 2

KEY STREAM GAGING STATION (1)(5)

USGS Gaging Station Number	02135000
Location Description	Located near Galivants Ferry, Horry-Marion Counties, South Carolina on U. S. 501 Highway Bridge
Drainage Area	2,790 square miles
Mean Flow	3,265 cfs
Minimum Flow ¹⁾	700 cfs
Maximum Flow ²⁾	7,300 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

The Little Pee Dee River has had two authorized Federal navigation projects. The initial project provided for a four feet deep channel for steamboat navigation from the mouth to the Lumber River and it allowed for pole boat navigation on the Lumber to Little Rock, South Carolina. The project was recommended for abandonment in 1926. Approximately 15 miles of the river has been under an aquatic plant control program which was initiated in the interest of navigation, flood control, drainage, agriculture, fish and wildlife conservation, public health, and related purposes. The program was suspended in 1975 pending receipt from the Environmental Protection Agency of an exemption for the use of 2, 4-D in flowing waters. Table 3 identifies these two programs and indicates appropriate authorizing legislation. Currently there are no other navigation improvements on the Little Pee Dee River.

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 affect navigation on the Little Pee Dee River.

TABLE 3

AUTHORIZED FEDERAL NAVIGATION PROJECTS (4) (6)

Waterbody	Little Pee Dee River
Work Authorized	4 feet deep navigation channel
Date Complete	1926 (recommended for abandonment)
Project Location (R.M.)	0-99.0
Authorization	Abandon recommendation 1926, H. Doc. 467, 69th Cong., 1st Session

Waterbody	Little Pee Dee River
Work Authorized	Aquatic plant control - provides for control and progressive eradication of water hyacinth, alligatorweed, Eurasian water- milfoil and other obnoxious aquatic plant growths from navigable waters, tributary streams, connecting channels, and other allied waters of the U. S.
Date Complete	1975 (suspended)
Project Location (R.M.)	0-15.0
Authorization	Section 302, 1965 River and Harbor Act, H. Doc. 251, 89th Cong., 1st Session

SECTION 4 - INTERSTATE COMMERCE

Past

In the middle 1700's, groups of Scotch-Irish settlers from Pennsylvania and Virginia moved south to join other settlers already present along the Little Pee Dee River. These settlers were fortunate in that the Little Pee Dee River formed a sort of canal by which surplus corn and wheat crops could be exported directly to the coastal port of entry at Georgetown, South Carolina. Keeping the river open was a constant problem which resulted in a series of legislative efforts for river improvement in the late 1700's and early 1800's. (7)(8)

By 1818, the Civil and Military Engineer of South Carolina noted that the "Little Pee Dee River was navigable for boats drawing 3 feet of water from its confluence with the Great Pee Dee, to the North Carolina line, a distance of 80 miles*. The accumulation of logs is the only obstruction to the navigation of this river." (9) Legislative appropriations occurred in 1823 and 1825 which were aimed at removing obstructions on the Little Pee Dee and its tributary, Downing Creek. This enabled the Public Works Commission to report in 1825 that these two streams would be "fine streams, suited to the navigation of boats carrying 100 bales of cotton or rafts of 20,000 feet of boards for nine months in the year." (10)(11)(12)

Captain W. H. Bixby found, in 1886-87, when the U. S. Army Corps of Engineers inherited the task of keeping the Little Pee Dee River open, that:

"The present commerce of this stream is only about \$100,000 of goods transported by rafts and pole boats. The river, from the Little Rock to the Lumber River, is well adapted to pole boats, and from the Lumber River to the Great Pee Dee is well adapted to the service by small stern-wheel 30-ton boats such as are in use on neighboring streams." (13)

After a decade or so river commerce declined. By 1914, as an example, 1,626 short tons (valued at \$48,647) had been moved on the

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

river. This figure declined to 350 short tons (\$1,050) by 1916 and in 1918 there was no reported commerce at all. Following the advent of a paved highway network with no prospect to renew commerce, the Corps recommended in 1926 that the project for navigational improvement of the Little Pee Dee River be abandoned. In 1967, that project was categorized as "inactive or deferred". Volumes selected from 1953, 1961, and 1975 publications of Waterborne Commerce of the United States indicate the present absence of any river commerce on the Little Pee Dee River. (14)

Present

Although the Little Pee Dee River was extensively used for interstate river commerce up to approximately 1910, the river is not presently used as an artery of waterborne interstate commerce.

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 Little Pee Dee 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 Little Pee Dee River is practically navigable, with reasonable improvements, up to the U. S. 76 highway bridge at R.M. 59.0. 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 Great Pee Dee River, which is also recommended as practically navigable (see Report 11). The Little Pee Dee further upstream is not currently used for interstate commerce and the future potential is not anticipated to be significant. This is due in part to limited industrial and commercial activity and

heavy dependence on other forms of regional transportation including the interstate highway system, railroads, and air transport.

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 there are no decisions which apply specifically to navigation in the Little Pee Dee 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 there are no South Carolina state court cases which specifically deal with navigation considerations in the Little Pee Dee 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 decisions which relate to navigation in the Little Pee Dee River basin.

Recent Federal Litigation

A review of recent Federal litigation concerning the Charleston District did not reveal any court actions in the Little Pee Dee River basin concerning 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.

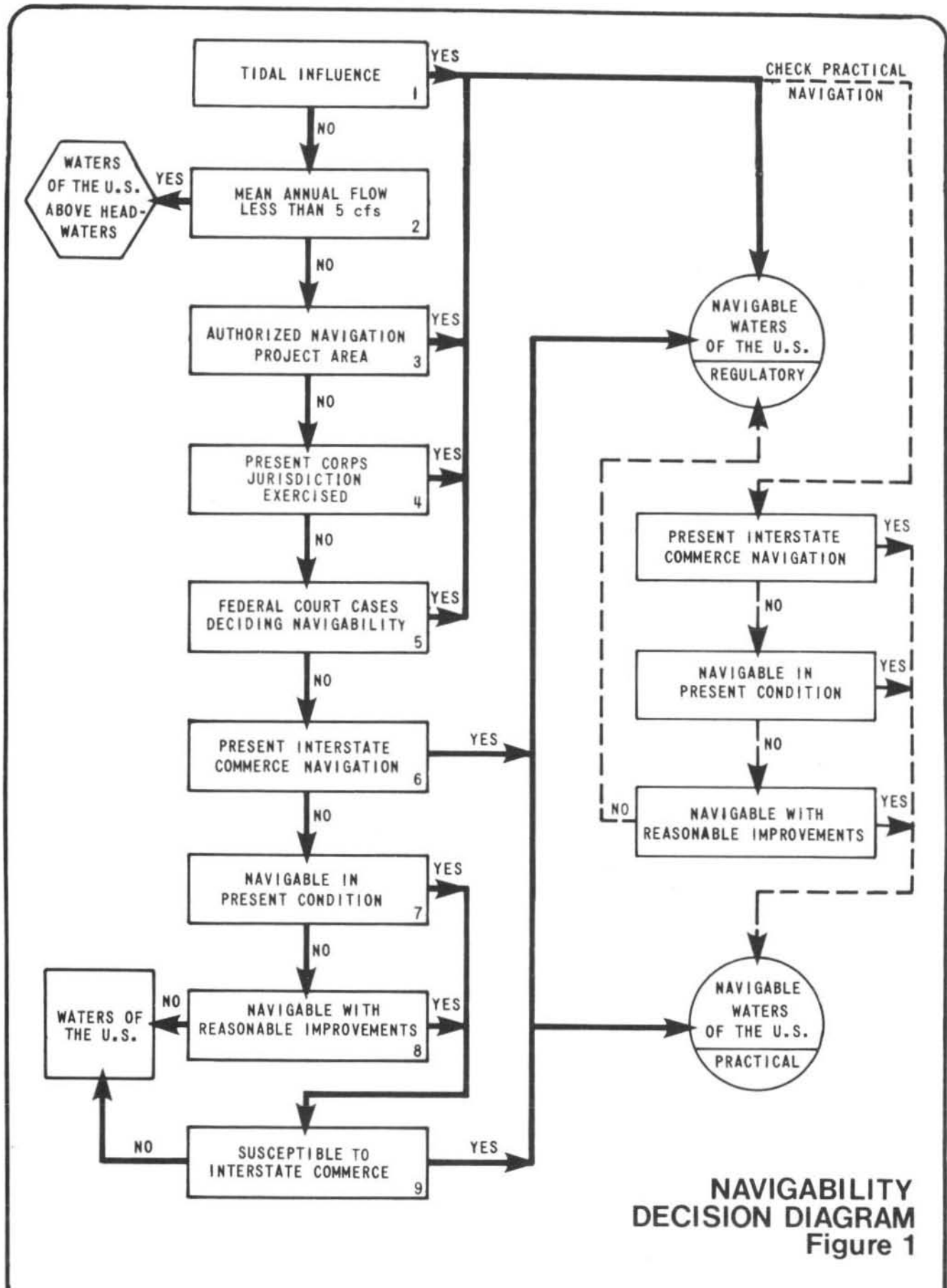
SECTION 6 - NAVIGATION OBSTRUCTIONS AND CLASSIFICATIONS

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). (4) 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 Little Pee Dee River is classified as "navigable waters of the U. S." from its confluence with the Great Pee Dee River (R.M. 33.2) to Little Rock, South Carolina (R.M. 99.0) where the Federal navigation project ends (for location see Plate 12-3). The present-day limit of practical navigation is at the U. S. 501 highway bridges at R.M. 41.7. (4)(6)

The following non-tidal waterbodies, which form a continuous stream tributary to the Little Pee Dee River at R.M. 6.1 and R.M. 0.5 respectively, are currently classified as "navigable waters of the U. S." from their confluences to the upstream limits indicated in parentheses: Russ Lake (R.M. 1.5) and Russ Creek (R.M. 1.0). (4)

Historically Navigable Waters

In the past the Little Pee Dee River was navigable to Little Rock, South Carolina (R.M. 99.0); however, there has been no reported commerce since 1918 (see Section 4 and Plate 12-3 for location).

Recommended and Practical Navigable Waters of the U. S.

"Navigable waters of the U. S.", once classified in the past, cannot be declassified. Thus, the recommended limit of "navigable waters of the U. S." (for regulatory purposes) on the Little Pee Dee River must be at R.M. 99.0, because that is the limit of an authorized Federal navigation project. This recommendation of navigation limit for regulatory purposes must be made even though the original Federal project was recommended for abandonment in 1926.

The recommended practical limit of navigation is at R.M. 59.0 when "reasonable improvements" are considered (see Figure 1). The U. S. 76 highway bridge crosses the river at R.M. 59.0. The channel at this location has a 3.5 feet navigable depth (depth of a 50 feet wide minimum width channel) at mean annual flow based on field measurements. Beyond the U. S. 76 highway bridge, field investigation of nine of the twelve bridges up to R.M. 104.5 indicated navigable channel depths of substantially less than seven feet at mean flow. Visual observations in the field and on USGS maps indicate that the river above R.M. 59.0 has a debris-clogged and winding channel. All bridges crossing the river would require significant renovation to meet vertical and horizontal clearances required for present-day commercial navigation vessels.

Extension of present-day practical navigation to R.M. 59.0 would at least require renovation of three highway bridges to allow sufficient horizontal and vertical clearances for river traffic. This is considered a reasonable improvement as the Lumber River (confluence at R.M. 58.0 on the Little Pee Dee River) would then be opened for practical navigation (see Report 13). Extending the practical head of navigation beyond R.M. 59.0 would require significant channel realignment, dredging, and clearing in addition to major bridge renovation. There are no commercial or industrial centers located on the Little Pee Dee River which could utilize river transportation to justify the extensive channel and bridge improvements needed above R.M. 59.0.

Russ Lake and Russ Creek are presently classified "navigable waters of the U. S." from their confluence to R.M. 1.5 and R.M. 1.0, respectively. The recommended practical limits of "navigable waters of the U. S." for Russ Lake and Russ Creek are the same as the present limits (R.M. 1.5

and R.M. 1.0, respectively) since field investigation revealed sufficient water depths of at least 7 feet and channel widths of at least 50 feet to justify this recommendation. In addition, field investigation of other small tributary streams revealed sufficient depth and width to justify recommendation of some additional tributaries for navigability classification. Thus, the following streams (which confluence with the Little Pee Dee River within its recommended 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: Dead River (R.M. 1.1), Jiles Creek (R.M. 0.5), tributary near R.M. 4.2 (R.M. 0.4), Byrd Island Channel (R.M. 0.6), Johnson Big Lake (R.M. 0.5), Gunter Lake (R.M. 0.5), The Falls (R.M. 1.5), Carmichael Lake (R.M. 0.4), Broad Lake (R.M. 0.2), Bass Lake (R.M. 0.2), Smokey Lake (R.M. 0.5), tributary near R.M. 51.9 (R.M. 0.1), and tributary near R.M. 55.7 (R.M. 0.2). The downstream limit for each of these small streams is at its confluence with the Little Pee Dee River.

These conclusions on the navigation limits 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.

Other than the Lumber River (Report 13), there are no other tributaries of the Little Pee Dee River which warrant classification as "navigable waters of the U. S." This conclusion is based on insufficient stream flow in the tributaries to fill a channel suitable for navigation (see the Summary Report for further details on this methodology).

Plates 12-4 through 12-8 are plans and profiles of the recommended "practical navigable waters of the U. S." The plan and profile plates show mean water surface as determined from USGS maps, stream bed depth, 50 feet wide navigable channel depth, pier spacing for bridges crossing the river, and vertical clearances at structures. Approximate vertical clearances for overhead utilities are shown later in this section in Table 4. 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 tributary streams 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 water depth at mean flow.)

Obstructions to Navigation

Table 4 is a listing of all obstructions within the recommended practical limits of "navigable waters of the U. S." on the Little Pee Dee River. No obstructions were found on the small tributary streams recommended for classification as "navigable waters of the U. S." Vertical clearance to mean water level and mean water slope are presented at all obstructions and mean discharge is shown at all bridges. It is emphasized that mean discharge, slope, and vertical clearances are only approximations based on best available data. Specific procedures for determining mean flow and average slope are discussed in the Summary Report.

Photographs of each obstruction are presented in Figures 2 through 9. Each photograph is identified to correspond with the data 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 Little Pee Dee 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 Little Pee Dee 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 PRACTICAL LIMIT OF NAVIGABLE WATERS OF THE U. S. (3)

<u>Little Pee Dee 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>
6.1	Utility Line (power)	--	0.60	45.0
6.1	Utility Line (power)	--	0.60	58.5 ¹⁾
12.7	U. S. 378 Highway Bridge	3,580	0.60	23.0
41.7	Utility Line (power)	--	0.72	38.0
41.7	U. S. 501 Highway Bridges	3,265	0.72	13.5
41.9	Utility Line (power)	--	0.72	37.0
51.8	S. C. 917 Highway Bridge	3,170	0.70	12.0
59.0	U. S. 76 Highway Bridge	1,010	1.10	10.5
59.0	Utility Line (telephone)	--	1.10	33.0

1) Approximate vertical clearance at high water.

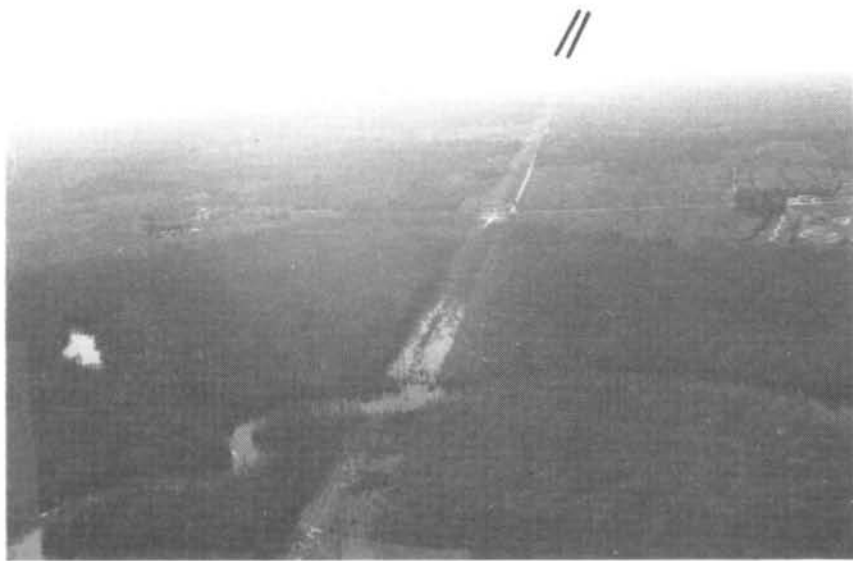


FIGURE 2 - TWO UTILITY LINES (R.M. 6.1)



FIGURE 3 - U. S. 378 HIGHWAY BRIDGE (R.M. 12.7)



FIGURE 4 - UTILITY LINE (R.M. 41.7) (AND U. S. 501 HIGHWAY BRIDGES)



FIGURE 5 - U. S. 501 HIGHWAY BRIDGES (R.M. 41.7)



FIGURE 6 - UTILITY LINE (R.M. 41.9)

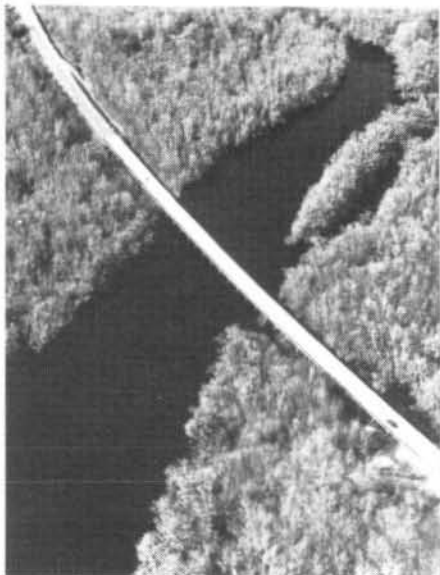


FIGURE 7 - S. C. 917 HIGHWAY BRIDGE (R.M. 51.8)



FIGURE 8 - U. S. 76 HIGHWAY BRIDGE (R.M. 59.0)



FIGURE 9 - UTILITY LINE (R.M. 59.0) (AND U. S. 76 HIGHWAY BRIDGE)

SECTION 7 - CONCLUSIONS AND RECOMMENDATIONS

Five classifications of navigation on streams in the Little Pee Dee 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 Little Pee Dee River is presently classified "navigable waters of the U. S." from its confluence with the Great Pee Dee River (R.M. 33.2) to R.M. 99.0 at Little Rock, South Carolina. (4) (6) Russ Lake and Russ Creek are presently classified "navigable waters of the U. S." from their confluence with the Little Pee Dee River to R.M. 1.5 and R.M. 1.0, respectively. (4)
2. The historical limit of navigation on the Little Pee Dee River is at Little Rock, South Carolina (R.M. 99.0).
3. The recommended practical limit of navigation on the Little Pee Dee River is the U. S. 76 highway bridge (R.M. 59.0). Some channel improvements and bridge renovation will be necessary for commercial river craft to actually use the river up to this point. The recommended practical limit of "navigable waters of the U. S." for Russ Lake and Russ Creek is R.M. 1.5 and R.M. 1.0, respectively; which is the same as the present classification. (4) In addition, the following streams (which confluence with the Little Pee Dee River within its recommended practical limits of "navigable waters of the U. S.") are recommended for classification and are listed with their upstream recommended practical limits of "navigable waters of the U. S." indicated in parentheses: Dead River (R.M. 1.1), Jiles Creek (R.M. 0.5), tributary near

R.M. 4.2 (R.M. 0.4), Byrd Island Channel (R.M. 0.6), Johnson Big Lake (R.M. 0.5), Gunter Lake (R.M. 0.5), The Falls (R.M. 1.5), Carmichael Lake (R.M. 0.4), Broad Lake (R.M. 0.2), Bass Lake (R.M. 0.2), Smokey Lake (R.M. 0.5), tributary near R.M. 51.9 (R.M. 0.1), and tributary near R.M. 55.7 (R.M. 0.2). The downstream limit for each of these small streams is at its confluence with the Little Pee Dee River.

4. Since an authorized project establishes "navigable waters of the U. S." up to R.M. 99.0 on the Little Pee Dee River and this cannot be declassified, the recommended limit of "navigable waters of the U. S." is at R.M. 99.0. The recommended limit of "navigable waters of the U. S." for Russ Lake and Russ Creek is R.M. 1.5 and R.M. 1.0, respectively; which is the same as the present classification. (4) In addition, the following streams (which confluence with the Little Pee Dee River within its recommended practical limits of "navigable waters of the U. S.") are recommended for classification and are listed with their upstream recommended limits of "navigable waters of the U. S." indicated in parentheses: Dead River (R.M. 1.1), Jiles Creek (R.M. 0.5), tributary near R.M. 4.2 (R.M. 0.4), Byrd Island Channel (R.M. 0.6), Johnson Big Lake (R.M. 0.5), Gunter Lake (R.M. 0.5), The Falls (R.M. 1.5), Carmichael Lake (R.M. 0.4), Broad Lake (R.M. 0.2), Bass Lake (R.M. 0.2), Smokey Lake (R.M. 0.5), tributary near R.M. 51.9 (R.M. 0.1), and tributary near R.M. 55.7 (R.M. 0.2). This is based on the analytical procedures and tests of navigability used in this study effort.
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. Incomplete List of Navigable Waters, RCS ENGCW-ON (OT), U. S. Army Corps of Engineers, Charleston District, Charleston, South Carolina, 1965.
5. South Carolina Stream Flow Characteristics Low-Flow Frequency and Flow Duration, U. S. Geological Survey, Columbia, South Carolina, 1967.
6. Project Maps Charleston District 1975, U. S. Army Corps of Engineers, Office of the District Engineer, Charleston, South Carolina, 1975.
7. McCord, David J. ed., The Statutes at Large of South Carolina: Edited Under Authority of the Legislature, Vol. VII, (Columbia: A. S. Johnston, 1840), p. 531.
8. Ibid, p. 538.
9. Kohn, David, ed., Internal Improvement in South Carolina 1817-1828, USGPO, Washington, D. C., 1938, p. 414.
10. Ibid, p. 276.
11. Ibid, p. 415.
12. Phillips, U. B., A History of Transportation in the Eastern Cotton Belt to 1860, Columbia U. P., New York, 1908, p. 91.
13. Annual Report of the Chief of Engineers, U. S. Army, 1887, U. S. War Department, Pt. II, pp. 1113-1114.
14. Waterborne Commerce of the United States, (Vol. 1953, 1961 & 1975), U. S. Army Corps of Engineers, USGPO, Washington, D. C., Vol. 1953, pp. 317-324, Vol. 1961, pp. 307-314, Vol. 1975, pp. 119-124.

Other Background Information

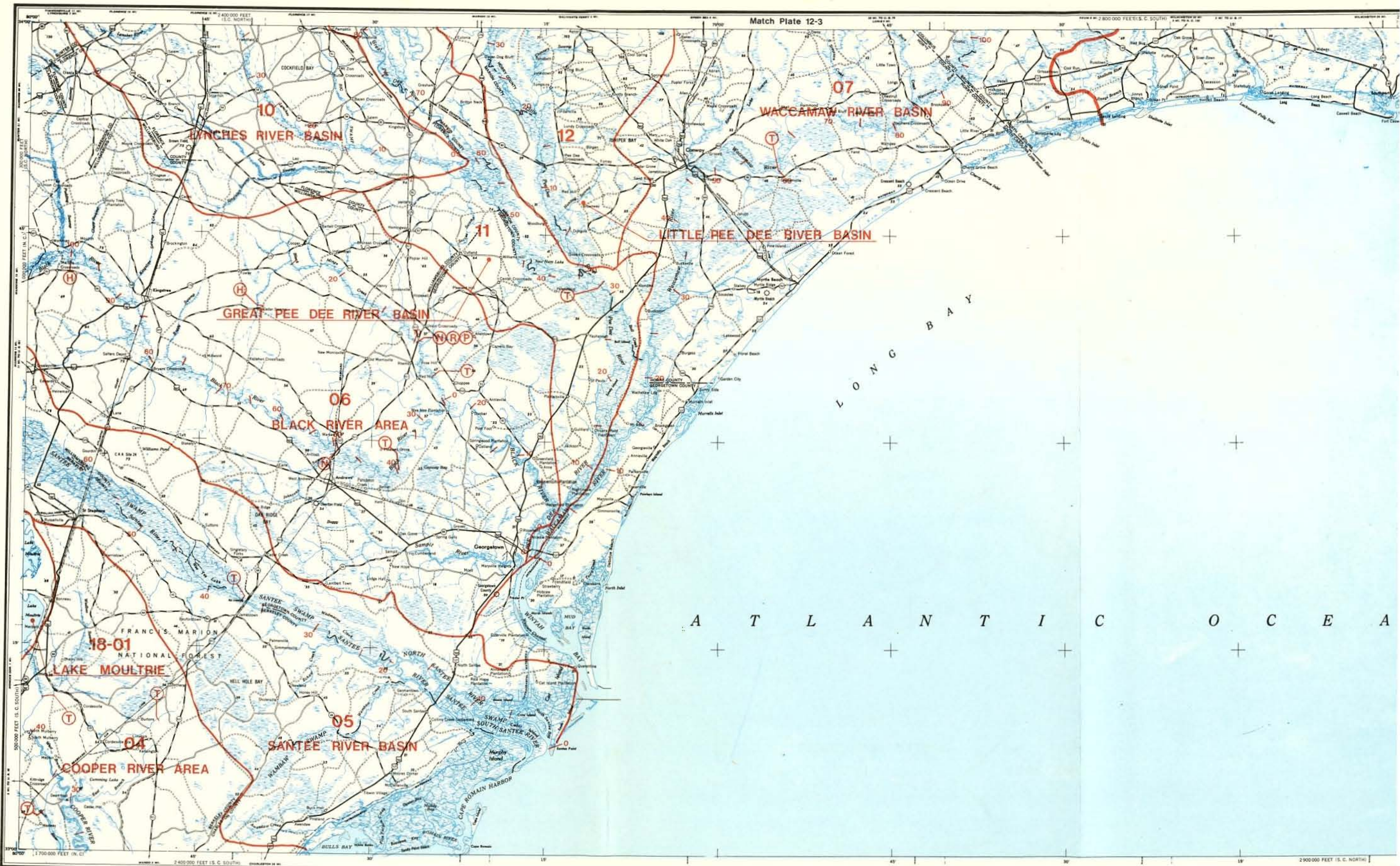
Annual Report of the Chief of Engineers, U. S. Department of the Army, USGPO, Washington, D. C., 1974, Vol. 11, pp. 7-16.

Kohn, David, ed., Internal Improvements in South Carolina 1817-1828, USGPO, Washington, D. C., 1938, p. 462.

Mills, Robert, Statistics of South Carolina 1826, Reprint Company, Spartanburg, South Carolina, 1972, p. 158.

The Rivers of South and North Carolina Entering Winyah Bay, South Carolina, Board of Trade of Georgetown, South Carolina, 1896, Tables entitled "Winyah Bay System" and "A Short Statement".

U. S. Congress, H. Doc. No. 239, 63rd Congress, 1st Session, 1913, p. 4.



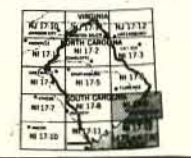
<p>POPULATED PLACES</p> <p>NEW ORLEANS CHARLOTTE CHARLESTON</p>	<p>ROADS</p> <p>Primary, all-weather, hard surface Secondary, all-weather, hard surface Fair or poor weather, unpaved surface Track Interchange</p> <p>Route markers: Interstate, U.S., State</p>
<p>RAILROADS</p> <p>Standard gauge Narrow gauge Interurban Park or recreational Other</p>	<p>Water</p> <p>Landmark, School, Church, Other, etc. Landing area Boat launch or moorage Seawall or breakwater Marine or pier</p>

USGS BASE MAP
GEORGETOWN, S.C.; N.C.
NI 17-9

0 5 10
 scale in miles

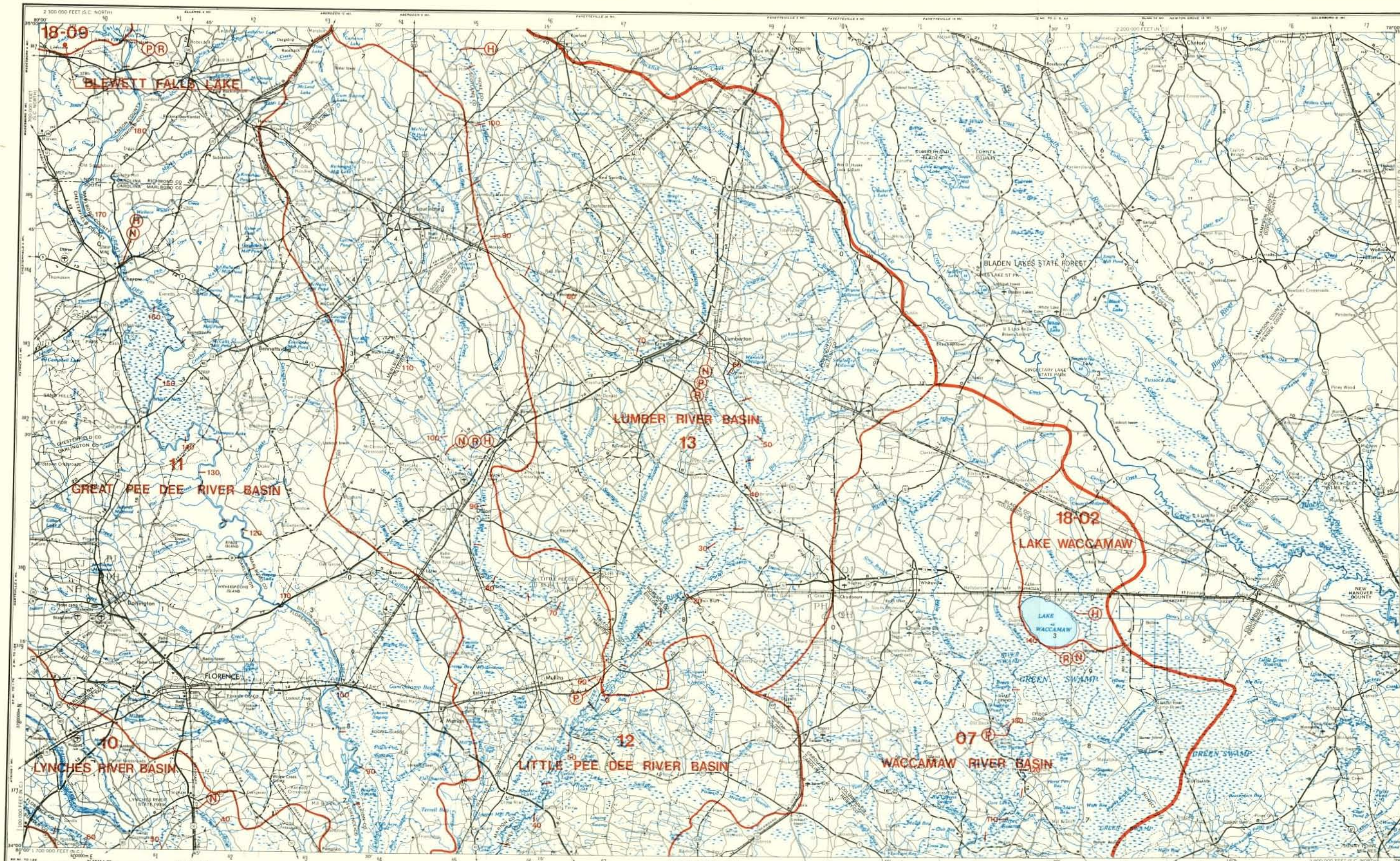


- LEGEND:**
- (N) PRESENT LIMIT OF NAVIGABLE WATERS OF THE U.S.
 - (H) HISTORIC LIMIT OF NAVIGATION
 - (P) PRACTICAL LIMIT OF NAVIGATION (RECOMMENDED)
 - (R) LIMIT OF NAVIGABLE WATERS OF THE U.S. (RECOMMENDED)
 - (T) APPROXIMATE LIMIT OF TIDAL INFLUENCE
 - 70 RIVER MILE



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

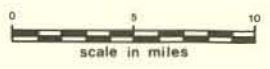
SIGNIFICANT
LITTLE PEE DEE
 Report No. 04,05,0
NAVIGABILITY



Match Plate 12-2

NEW ORLEANS CHARLOTTE	
1:50,000	Primary, all weather, hard surface
1:100,000	Secondary, all weather, hard surface
1:250,000	Light duty, all weather, improved surface
1:500,000	Light duty, all weather, improved surface
1:1,000,000	Light duty, all weather, improved surface
1:2,500,000	Light duty, all weather, improved surface
1:5,000,000	Light duty, all weather, improved surface
1:10,000,000	Light duty, all weather, improved surface
1:20,000,000	Light duty, all weather, improved surface
1:50,000,000	Light duty, all weather, improved surface
1:100,000,000	Light duty, all weather, improved surface
1:200,000,000	Light duty, all weather, improved surface
1:500,000,000	Light duty, all weather, improved surface
1:1,000,000,000	Light duty, all weather, improved surface

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

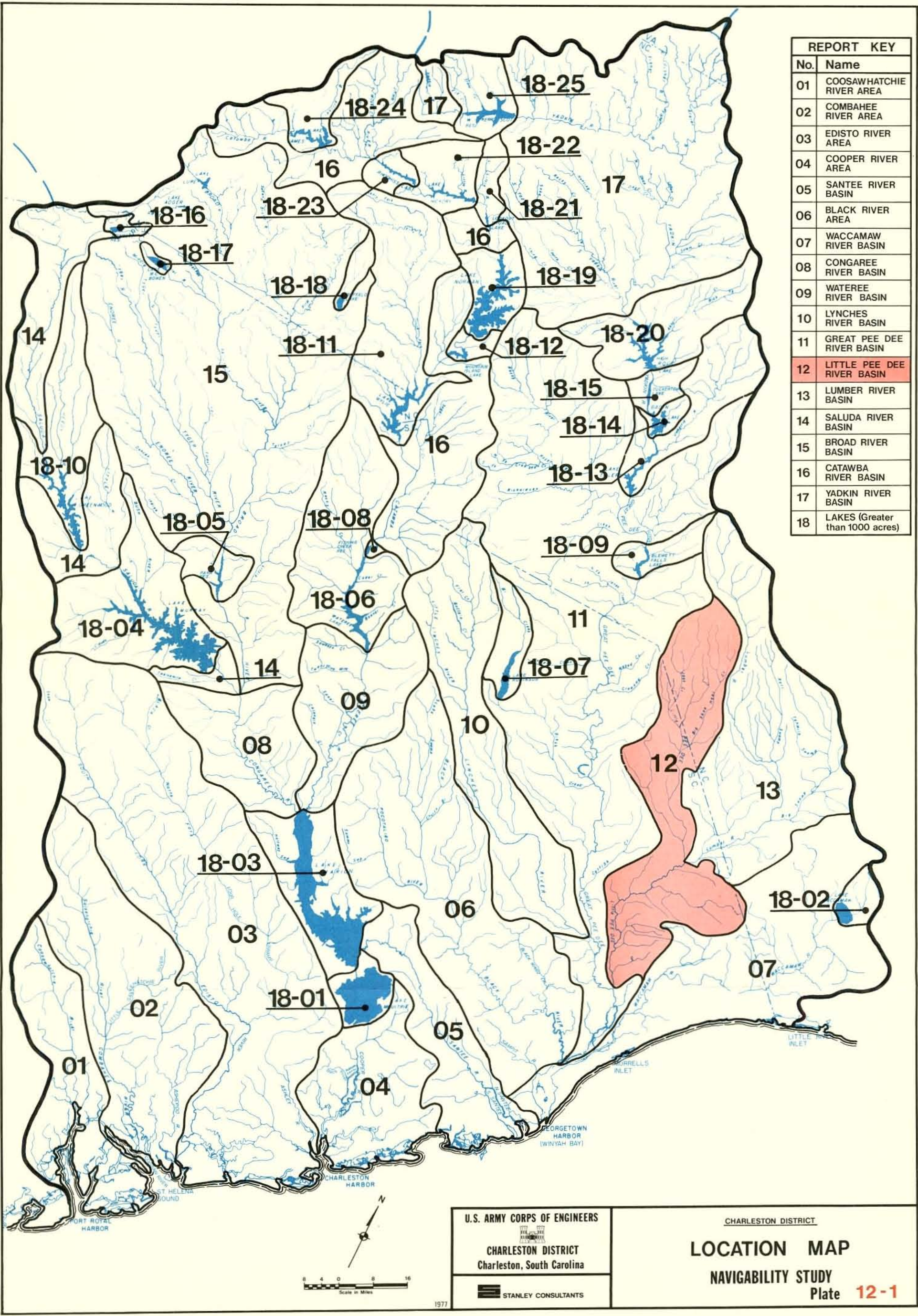


- LEGEND:**
- (N) PRESENT LIMIT OF NAVIGABLE WATERS OF THE U.S.
 - (H) HISTORIC LIMIT OF NAVIGATION
 - (P) PRACTICAL LIMIT OF NAVIGATION (RECOMMENDED)
 - (R) LIMIT OF NAVIGABLE WATERS OF THE U.S. (RECOMMENDED)
 - RIVER MILE



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

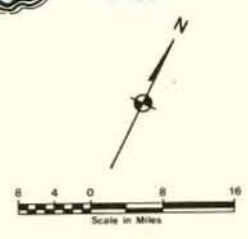
SIGNIFICANT FEATURES
LITTLE PEE DEE RIVER BASIN
Report No. 06,07,10,11,12,13,18
NAVIGABILITY STUDY
Plate 12-3

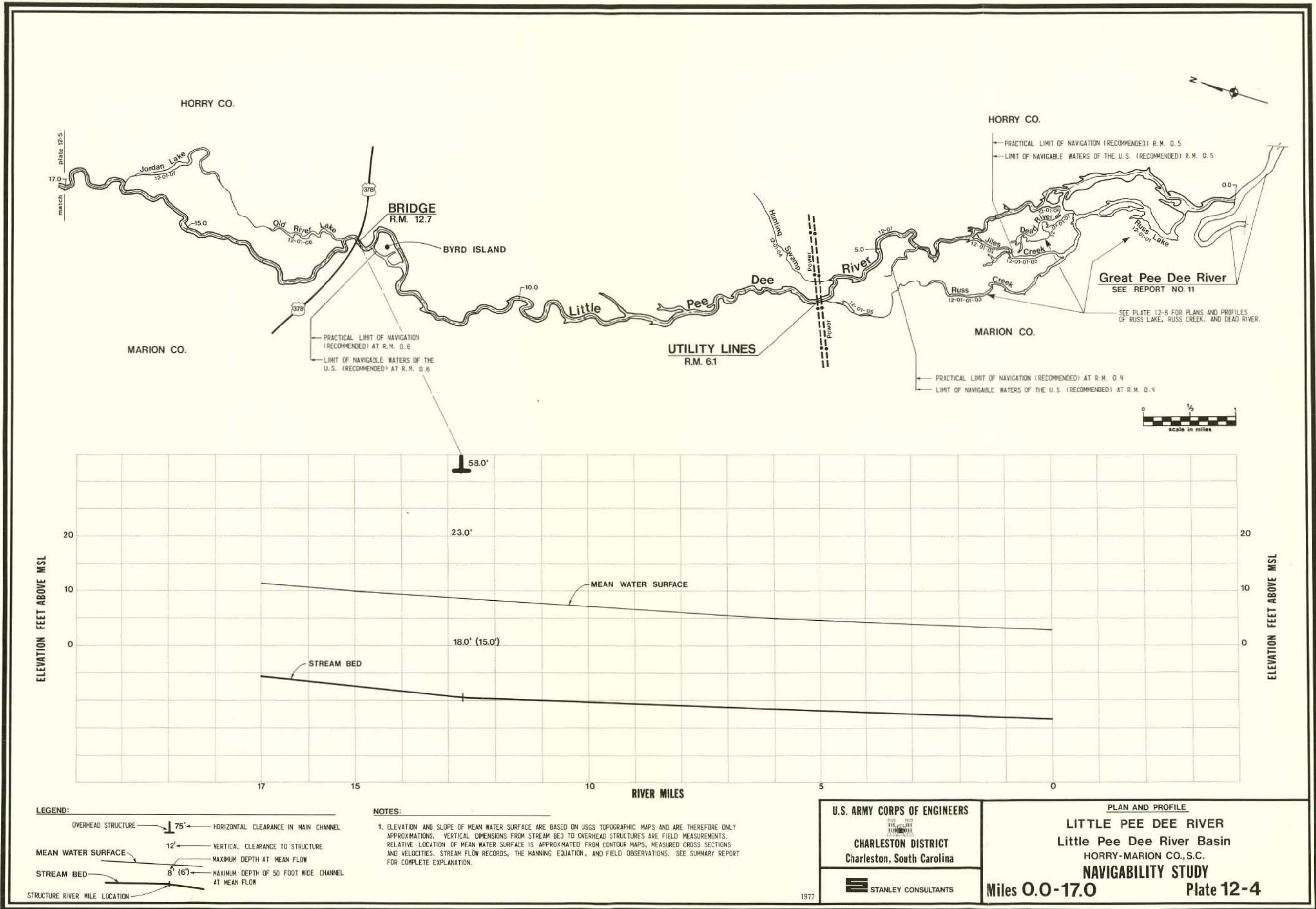


REPORT KEY	
No.	Name
01	COOSAWHATCHIE RIVER AREA
02	COMBAHEE RIVER AREA
03	EDISTO RIVER AREA
04	COOPER RIVER AREA
05	SANTEE RIVER BASIN
06	BLACK RIVER AREA
07	WACCAMAW RIVER BASIN
08	CONGAREE RIVER BASIN
09	WATEREE RIVER BASIN
10	LYNCHEs RIVER BASIN
11	GREAT PEE DEE RIVER BASIN
12	LITTLE PEE DEE RIVER 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)

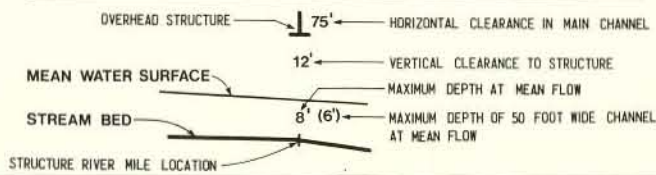
U.S. ARMY CORPS OF ENGINEERS
 CHARLESTON DISTRICT
 Charleston, South Carolina
 STANLEY CONSULTANTS

CHARLESTON DISTRICT
LOCATION MAP
 NAVIGABILITY STUDY
 Plate 12-1





LEGEND:



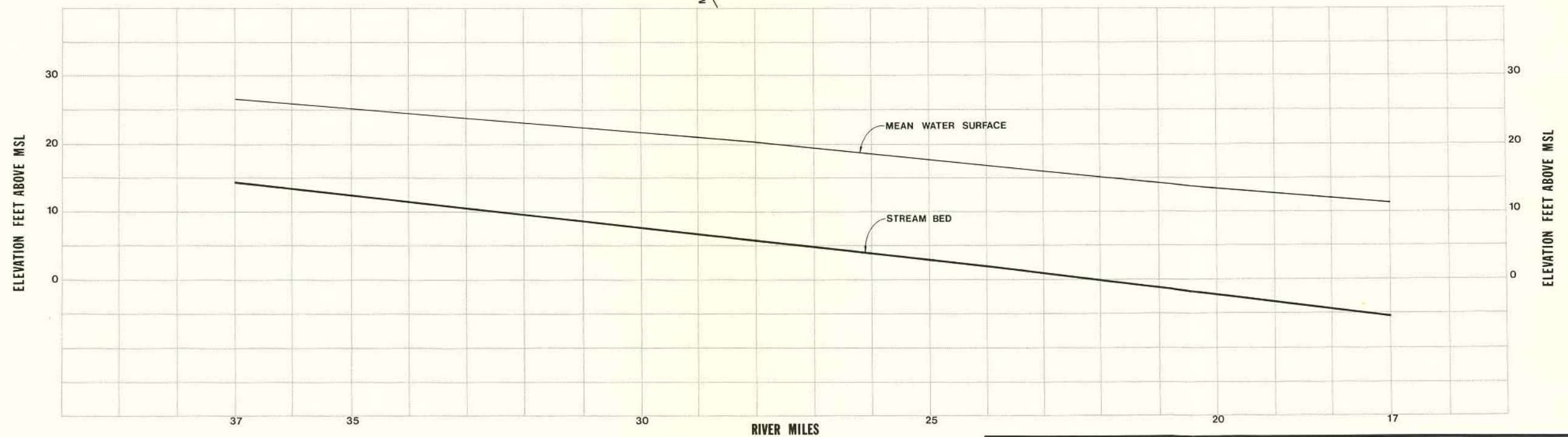
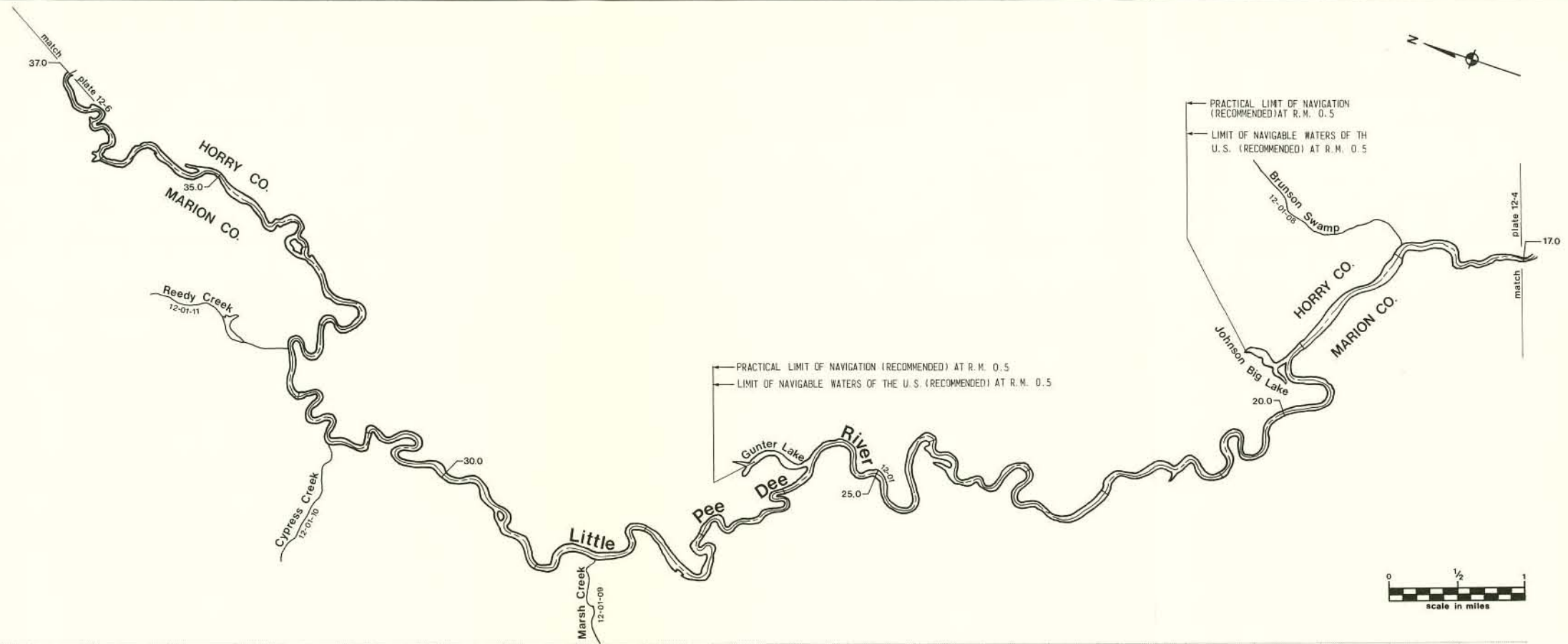
NOTES:

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
LITTLE PEE DEE RIVER
 Little Pee Dee River Basin
 HORRY-MARION CO., S.C.
NAVIGABILITY STUDY
 Miles 0.0-17.0 Plate 12-4



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

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

STRUCTURE RIVER MILE LOCATION

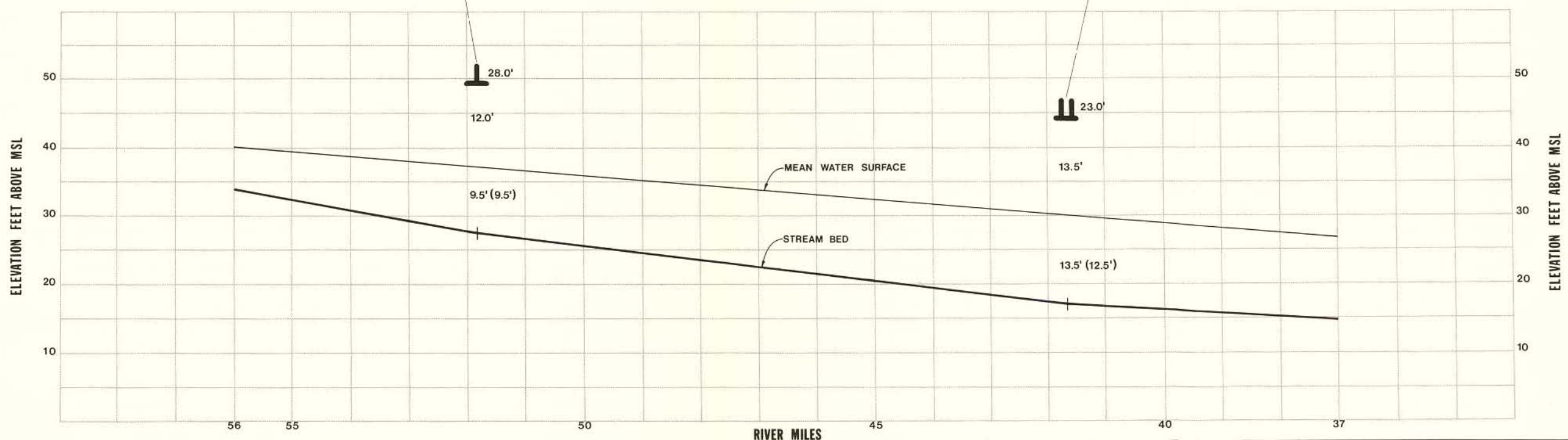
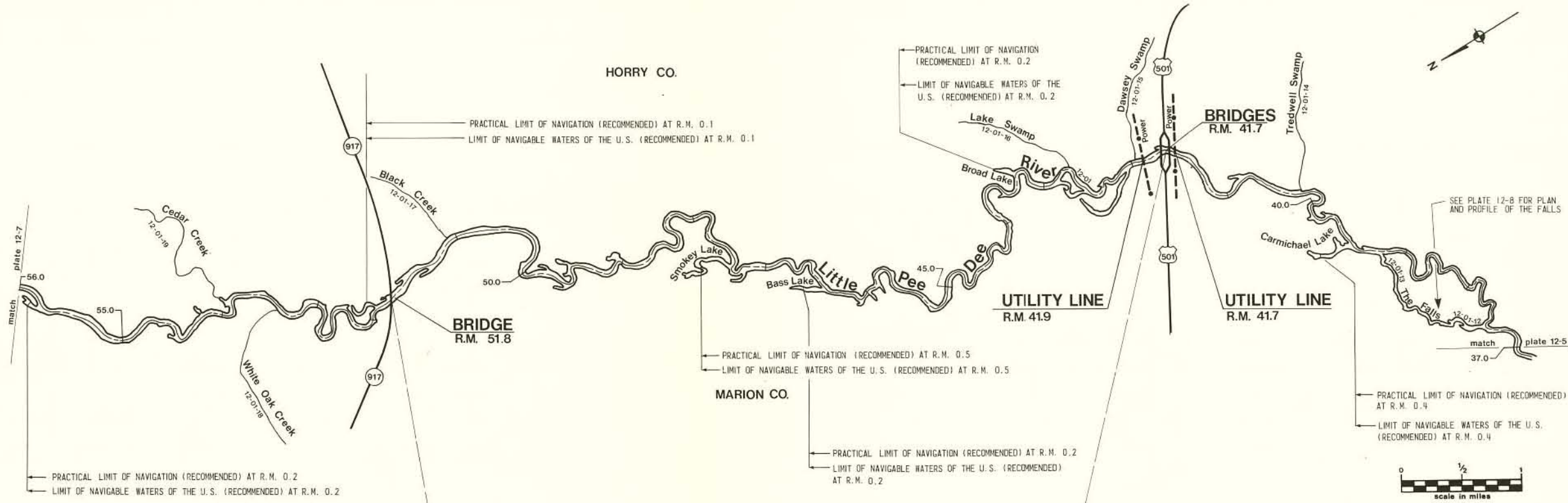
NOTES:

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
 LITTLE PEE DEE RIVER
 Little Pee Dee River Basin
 HORRY-MARION CO., S.C.
 NAVIGABILITY STUDY
 Miles 17.0-37.0 Plate 12-5



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

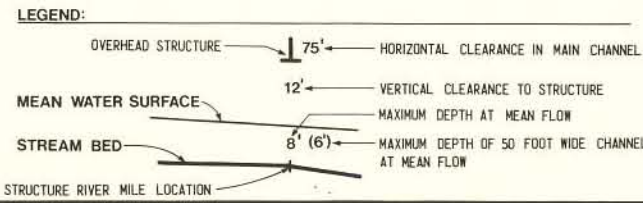
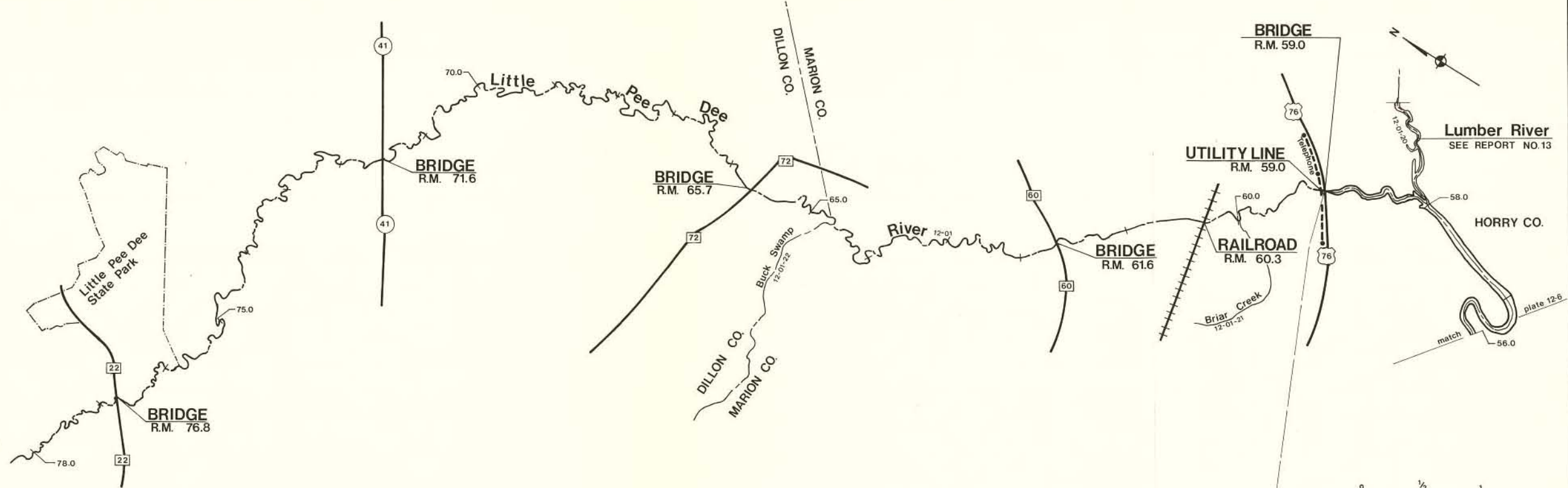
STANLEY CONSULTANTS

PLAN AND PROFILE

LITTLE PEE DEE RIVER
Little Pee Dee River Basin
HORRY-MARION CO., S.C.

NAVIGABILITY STUDY

Miles 37.0-56.0 Plate 12-6



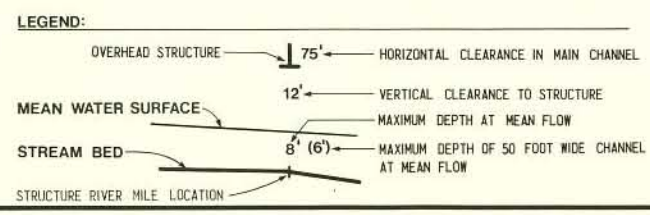
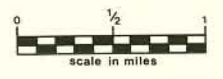
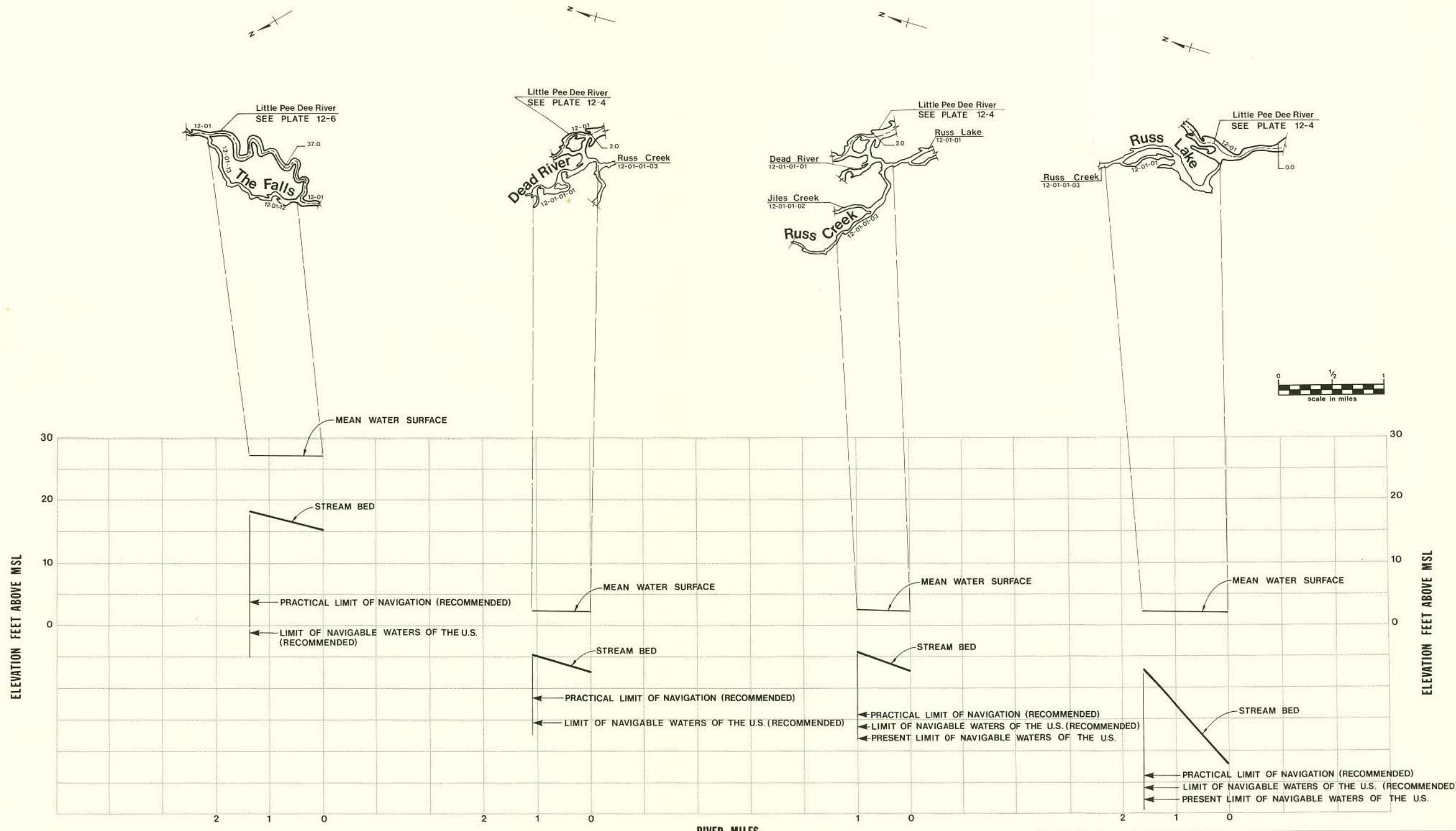
NOTES:

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
 LITTLE PEE DEE RIVER
 Little Pee Dee River Basin
 DILLON-HORRY-MARION CO., S.C.
 NAVIGABILITY STUDY
 Miles 56.0-78.0 Plate 12-7



NOTES:

- ELEVATION AND SLOPE OF MEAN WATER SURFACE ARE BASED ON USGS TOPOGRAPHIC MAPS AND ARE THEREFORE ONLY APPROXIMATIONS. 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
 PRACTICALLY NAVIGABLE SMALL STREAMS
 Little Pee Dee River Basin
 NAVIGABILITY STUDY
 Miles 0.0 - Practical Limit Plate 12-8

APPENDIX A
STREAM CATALOG

This appendix presents a coded listing of all streams located in the Little Pee Dee River basin having a mean annual flow greater than or equal to five cfs. The Little Pee Dee River and its tributaries are not tidally influenced; therefore, only those streams having a mean annual flow of five cfs or greater are coded.

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	
12	01											
		01				Little Pee Dee #						
			01			Russ Lake						
				01		Dead River ##						
				02		Jiles Creek ##						
				03		Russ Creek ##						
		02				Dead River ##						
		03				Jiles Creek ##						
		04				Hunting Swamp						
			01			Sarah Branch	33 45 30	79 11 00	3.5		Hunting Swamp	
			02			Jenkins Swamp	33 49 30	79 08 45	1.4		Hunting Swamp	
		05				Russ Creek ##						
		06				Old River Lake						
			01			Brown Swamp	33 53 00	79 10 10	0.8		Cooper Branch	
				01		Singleton Creek	33 49 53	79 14 08	1.8		Brown Swamp	
			02			Palmetto Swamp	33 54 10	79 13 10	4.8		Jordan Lake	
		07				Jordan Lake						
		08				Brunson Swamp	33 57 20	79 10 05	4.9		Spring Swamp	
			01			Chinners Swamp	33 58 45	79 06 50	6.2		Mill Branch	

Dual code in Report 11.

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			
12	01	08	01	01		Savannah Creek	34 00 40	79 15 35	4.2		Chinners Swamp			
				02		Mill Branch	33 59 20	79 10 55	2.0		Chinners Swamp			
				02			Spring Swamp	33 56 25	79 09 10	5.8		Brunson Swamp		
				09			Marsh Creek	33 57 30	79 22 55	3.2		Little Pee Dee River		
							Cypress Creek	34 01 10	79 22 20	5.2		Little Pee Dee River		
							Reedy Creek	34 09 15	79 16 50	7.0		Little Reedy Creek		
						01		Little Reedy Creek	34 05 50	79 19 50	1.5		Reedy Creek	
						12		The Falls #						
						13		The Falls #						
						14		Tredwell Swamp	34 01 40	79 13 00	3.3		Little Pee Dee River	
						15		Dawsey Swamp	34 02 50	79 13 45	1.5		Little Pee Dee River	
						16		Lake Swamp						
							01		Loosing Swamp	34 02 00	79 08 40	5.5		Lake Swamp
							02		Joiner Swamp	34 04 10	79 09 00	1.2		Lake Swamp
							03		Prince Mill Swamp	34 04 05	79 05 45	0.7		Lake Swamp
							04		Playcard Swamp	34 03 00	79 00 20	3.3		Lake Swamp

12-A3

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	
12	01	16	05				Pleasant Meadow Swamp	34 03 30	78 54 50	6.9		Lake Swamp
			06				Mitchell Swamp	34 51 45	78 53 20	2.3		Mill Branch
				01			Long Branch Swamp	34 08 45	79 00 35	1.9		Mitchell Swamp
				02			Iron Springs Swamp	34 09 20	78 58 50	2.3		Mitchell Swamp
				03			Huggins Creek	34 09 55	78 54 55	2.2		Mitchell Swamp
		17					Black Creek	34 08 10	79 11 20			Confluence-Gunter Bay
		18					White Oak Creek	34 10 20	79 13 20			Confluence-Brown Swp
		19					Cedar Creek	34 10 45	79 05 10			Confluence-Poplar Br
		20					Lumber River #					
		21					Briar Creek	34 12 15	79 11 20	0.7		Little Pee Dee River
		22					Buck Swamp					
			01				Maidendown Swamp	34 12 45	79 16 50	4.3		Buck Swamp
			02				Reedy Creek	34 31 00	79 31 10	8.6		Eli Branch
			03				Little Reedy Creek	34 25 10	79 33 25	8.6		Confluence-Reedy Creek, Buck Swamp
		23					Maple Swamp	34 23 40	79 22 30	2.1		Little Pee Dee River

12-A4

Dual code in Report 13.

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	
12	01	24				Hayes Swamp						
		01				Mitchell Swamp	34 30 45	79 19 00	1.6		Hayes Swamp	
		25				Sweat Swamp	34 34 10	79 29 45	2.3		Wash Branch	
		01				Beaverdam Creek	34 30 00	79 26 10	1.5		Sweat Swamp	
		26				Big Shoe Heel Creek	34 53 40	79 24 45	0.7		Laurinburg & Southern Railroad	
		01				Wilkinson Swamp	34 36 20	79 18 50	0.9		Watering Hole Swp	
				01		Watering Hole Swamp	34 36 20	79 19 45	1.4		Wilkinson Swamp	
				02		Juniper Creek	34 55 30	79 29 30	8.2		Jordan Creek	
				01		Jordan Creek	34 54 15	79 30 30	9.2		Juniper Creek	
		27				Leith Creek	34 47 40	79 27 45			At U.S. 401 Bypass Bridge	
				01		Bull Branch	34 23 20	79 25 30			Confluence-Little Bull Branch	
				02		Bridge Creek	34 44 15	79 28 20	3.1		Big Branch	
				01		Big Branch	34 43 15	79 26 15			Confluence-Cabin Br	
		28				Gum Swamp	34 57 45	79 34 20	0.8		Clay Branch	

12-A5

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	
12	01	28	01				Joes Creek	34 52 25	79 37 40	1.1		U.S. 74 Highway Bridge
			02				Lower Beaverdam Creek	34 47 10	79 33 10			Confluence-Browns Br
			03				Upper Beaverdam Creek	34 51 00	79 34 20			Confluence-Bass Br
			04				Crawford Branch	34 53 40	79 34 45	1.1		Gum Swamp
			05				Undermine Branch	34 55 40	79 33 15	0.9		Gum Swamp
		29					Beaverdam Creek	34 42 45	79 36 30	1.8		Parker Branch
			01				Panther Creek	34 41 30	79 33 20	1.1		Bear Creek
				01			Bear Creek	34 41 15	79 32 10	0.7		Panther Creek

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 Little Pee Dee 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	FIFTH ORDER				
12	01	04					S. C. Martin	19	63	Horry
12	01	04					Mack James	15	48	Horry
12	01	06	01				Woodrow Smith	12	38	Horry
12	01	24	01				Unnamed Lake	--	--	Horry
12	01	14					Boyce Graham	12	40	Horry
12	01	16	06				Unnamed Lake	--	--	Horry
12	01	16	01				Harry Howle	20	80	Horry
12	01	16					Hughes Lake	--	--	Horry
12	01	16					Chalmer Small	11	40	Horry
12	01	16					Gerald Lake	--	--	Horry
12	01	16	05				Loris Lagoon	12	60	Horry
12	01	16					Johnny Lake	--	--	Horry
12	01	16	06				Fulton Floyd	14	56	Horry
12	01						Palmer Lake	--	--	Horry
12	01	16	06				Levy Lewis	13	104	Horry
12	01						Newfound Lake	--	--	Horry
12	01	19					J. R. Battle	10	40	Horry

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	FIFTH ORDER				
12	01					Gunter Lake	--	--	Horry
12	01	19				John Hooks	10	50	Horry
12	01					Johnson Big Lake	--	--	Horry
12	01	11				Leggttes Millpond	85	238	Marion
12	01	11				McIntyres Millpond (Smith)	100	240	Marion
12	01					Cox Lake	--	--	Marion
12	01	11	01			Reedy Creek Lake	22	88	Marion
12	01	01				Russ Lake	--	--	Marion
12	01					Richard Lake	--	--	Marion
12	01					Cannon Lake	--	--	Marion
12	01					Carmichael Lake	--	--	Marion
12	01					Blocker Lake	--	--	Marion
12	01					Mash Lake	--	--	Marion
12	01	22	02			Olin Lane	23	95	Dillon
12	01	22	02			A. W. (Red) Bethea	12	50	Dillon
12	01	22	03			Allen Johnson	13	60	Dillon
12	01					Pee Dee State Park Pond	65	210	Dillon

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	FIFTH ORDER				
12	01					Dr. B. F. Hardy	15	60	Dillon
12	01					Squires Lake	11	45	Dillon
12	01					A. E. Carmichael	12	60	Dillon
12	01	24				Dixon Lee	14	50	Dillon
12	01	24	01			Monroe Lane	10	40	Dillon
12	01	25				Brook Homer	10	40	Dillon
12	01	25	01			Unnamed Lake	--	--	Dillon
12	01					Red Bluff Pond (Red Bluff Lake)	75	240	Marlboro
12	01	29				McLaurens Millpond	50	180	Marlboro
12	01	29				Crows Pond	14	45	Marlboro
12	01	29				McNairs Millpond	65	234	Marlboro
12	01	29				Adams Pond	15	42	Marlboro
12	01	29				Unnamed Lake	--	--	Marlboro

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				
12	01	29	01			Unnamed Lake	--	--	Scotland
12	01	28				Ida Millpond	--	--	Scotland
12	01	28				Richmond Mill Lake	--	--	Scotland
12	01	28				McLeods Lake	--	--	Scotland
12	01	28				Pine Lake	--	--	Scotland
12	01	28	01			Pate Pond	--	--	Richmond
12	01	28	01			Blues Pond (Gibsons Millpond) (McNeill Pond)	30	--	Scotland
12	01	28	04			Buchanans Pond	23	--	Scotland
12	01	26	02			Camp Monroe Pond	35	--	Scotland
12	01	26				Cooley Pond	25	--	Scotland
12	01	28	04			Crawford Lake	35	--	Scotland
12	01	26				Creeds Pond	75	--	Scotland
12	01	28				Crossway Pond (Lyches Pond)	325	--	Scotland
12	01	28				Fair Pond	10	--	Scotland
12	01	28				Gum Swamp Lake	65	--	Scotland
12	01	28				Unnamed Lake	--	--	Scotland

12-85

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				
12	01	28				Unnamed Lake	--	--	Scotland
12	01	28				Unnamed Lake	--	--	Scotland
12	01	28	01			Gwinns Millpond	75	--	Scotland/Richmond
12	01	26				Hayes Pond (Pope Pond)	290	--	Robeson
12	01	26				Unnamed Lake	--	--	Robeson
12	01	27				Johns Pond	125	--	Scotland
12	01	27	02			Jones Pond	75	--	Scotland
12	01	28				Laurel Hill Dam (Richmond Mill Lake)	200	--	Scotland
12	01	27	01			McIntyre Pond	10	--	Robeson
12	01	26	02			McLaurin Pond	15	--	Scotland
12	01	26	02			McNair Pond	25	--	Scotland
12	01	26	02			Monroe Millpond (Fayetteville Presbytery)	70	--	Scotland
12	01	27	02			Norton Pond	10	--	Scotland
12	01	27	02			Saint Andrews College Lake	75	--	Scotland
12	01	27	02			Saint Andrews College Pond	10	--	Scotland