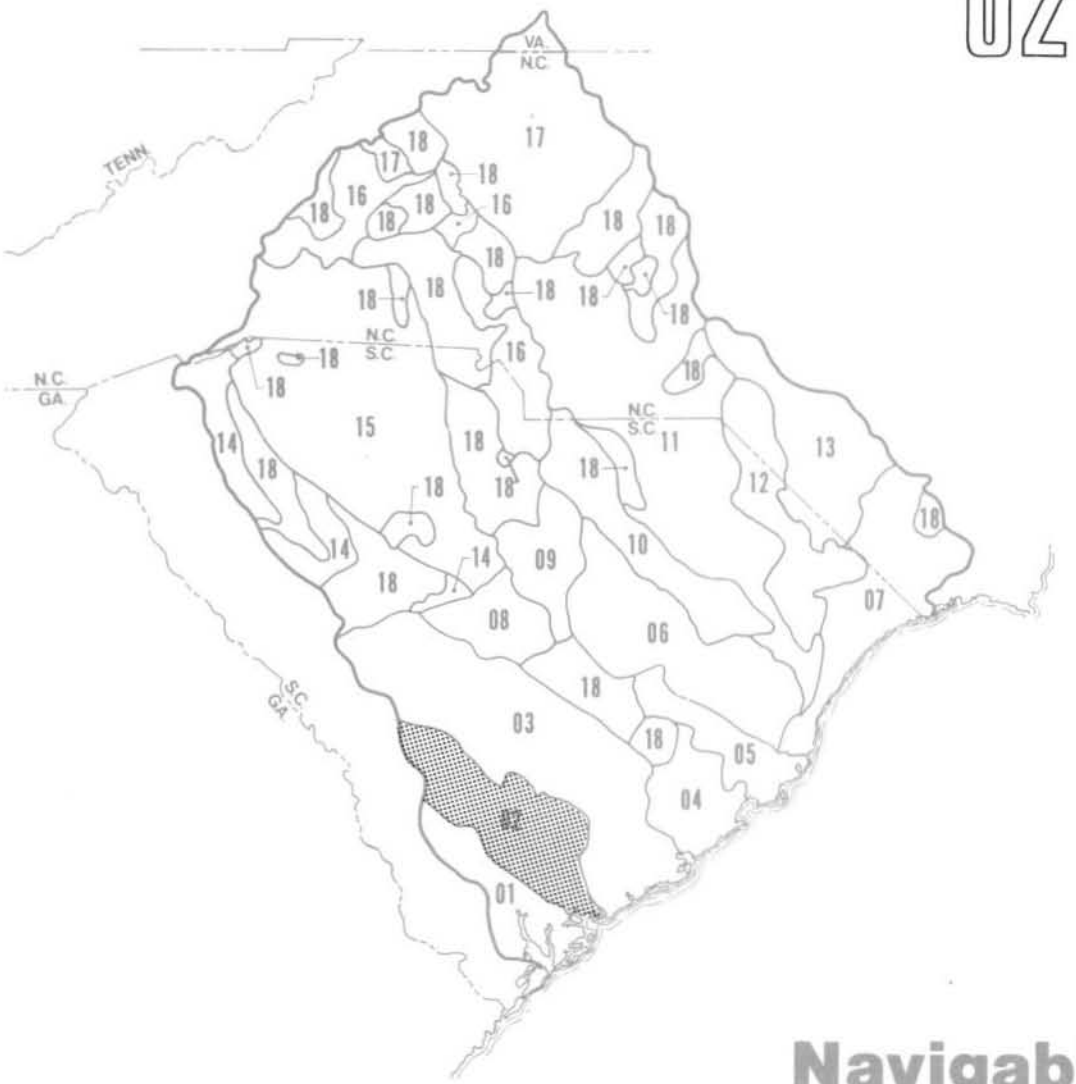
U.S. ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
Charleston, South Carolina

COMBAHEE RIVER AREA

Report No. 02



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.

Number	Title
--	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

Number	Title
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 Combahee River area, as shown on Plate 02-1, is located in the southeastern portion of the state of South Carolina and is bounded by the Edisto River basin on the east and the Coosawhatchie River basin on the west. The largest river in the area covered by this report is the Combahee River, which is formed by the confluence of the Salkehatchie and Little Salkehatchie Rivers at approximately river mile (R.M.) 49 and flows to St. Helena Sound. The Salkehatchie River extends upstream another 60 miles and forms the headwaters of the basin. The Intracoastal Waterway, Coosaw, and Ashepoo Rivers are also large waterbodies in the report area. In addition, Fish Creek, South Wimbee Creek, Big Creek, St. Helena Sound, Mosquito Creek, and Musselboro Creek are located within the basin and discussed further in Section 5. There are many more important rivers and streams located within the basin, especially near the coast, however, emphasis has been primarily placed on large rivers that extend inland. Plates 02-2 and 02-3 are detailed maps indicating the location of significant features in the basin. Additional information on the Edisto and Coosawhatchie Rivers is presented in Reports 03 and 01, respectively.

The Combahee River lies almost entirely in the coastal lowlands which results in a very gently sloped gradient with low, heavily vegetated banks and flood plains. The flood plains are generally swampy and a considerable quantity of water flows outside the main channel. As the Combahee River nears the ocean, fewer trees and more grass grow along the flood plains and a substantial increase in width occurs over a relatively short distance. Table 1 presents selected physical characteristics, such as approximate drainage areas, mean water flows, and slopes for the Combahee River, some of its tributaries, and the Ashepoo River. The methodology used in developing these characteristics is defined in the Summary Report. Table 2 presents information on the USGS gaging station located in the Combahee River basin. Additional flows, river miles, and slopes are presented in Section 6.

TABLE 1

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

Stream & Code[1]	Length-Mouth to Headwaters (mi)	Elevation Change (ft)	Drainage Area (sq.mi.)	Mean Discharge at Mouth (cfs)	Limit of Tidal Influence (R.M.)	Confluence With Combahee River (R.M.)	Present Navigable Waters of the U. S. (R.M.)
Combahee 02-01	49[2]	20[2]	1,310	1,310	37.0	--	49.4
Salkehatchie 02-01-16	60[3]	250[3]	550	550	None	49	17.1 (R.M. 49.4-66.5)[4]
Little Salkehatchie 02-01-17	54[3]	200[3]	470	470	None	49	None
Ashepoo 02-06	60	70	400	400	36.5	--	40

1) See Summary Report for explanation of code.

2) From mouth to confluence of Salkehatchie and Little Salkehatchie Rivers.

3) From confluence with the Combahee River to a remote point having a mean annual flow of 5 cfs in the respective river basin.

4) River mileage is continued from the Combahee River to the Salkehatchie River.

* See Bibliography for these references.

TABLE 2

KEY STREAM GAGING STATION (1)(5)

USGS Gaging Station Number[1)]	02175500
Location Description	On Salkehatchie River near Miley, S.C., Hampton County, at U. S. Highway 601 Bridge, 2.4 miles downstream of Savannah Creek (R.M. 68)
Drainage Area	341 square miles
Mean Flow	349 cfs
Minimum Flow[2)]	88 cfs
Maximum Flow[3)]	680 cfs

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1) No gaging stations are located on the Combahee River.

2) Exceeded or equaled 90 percent of the time.

3) Exceeded or equaled 10 percent of the time.

SECTION 3 - NAVIGATION IMPROVEMENT PROJECTS

Federal Navigation Projects

Two Federal navigation improvement projects have been authorized in the Combahee River basin. One of the projects provided for the removal of sunken logs, snags, trees, and similar obstructions in such manner as to create a clear channel for rafts and flatboats from R.M. 22.0 to R.M. 66.5 on the Combahee and Salkehatchie Rivers. (River mileage developed in reference (2).) The project was completed in 1896. (3)

The second project located within the report area is part of the Atlantic Intracoastal Waterway between Norfolk, Virginia, and the St. Johns River, Florida. This project provides for a 12 feet deep and 90 feet wide channel at mean low water and enters the Combahee basin at Fenwick Cut. The Waterway follows Ashepoo River for a short distance to Ashepoo-Coosaw Cutoff, which includes part of Rock Creek, to the Coosaw River, and continues along the Coosaw to where it enters the Coosawhatchie River basin (see Report 01). The project was completed in 1940. Surveys made in 1975 indicated a controlling depth of 7.2 feet and a channel 90 feet wide in the Combahee River area. (3)

Table 3, on the following page, summarizes information on both of these navigation projects.

TABLE 3

AUTHORIZED FEDERAL NAVIGATION PROJECTS (3)(6)

Waterbody	Combahee & Salkehatchie Rivers	Atlantic Intracoastal Waterway
Work Authorized	Channel Clearing	12 feet deep by 90 feet wide channelization
Date Complete	1896	1940
Project Location	R.M. 22.0 to R.M. 66.5	Norfolk, Virginia to St. Johns River, Florida
Authorization	River and Harbor Act of 1880 -H. Doc. No. 23, 46th Cong., 1st Session	River and Harbor Act of 3 March 1925* -S. Doc. 178, 68th Cong., 2nd Sess. River and Harbor Act of 30 August 1935 -H. Doc. 129, 72nd Cong., 1st Sess. River and Harbor Act of 26 August 1937 Rivers and Harbors Committee Doc. 6, 75th Cong., 1st Sess.

*These authorization documents primarily represent projects affecting areas within the basin boundary.

Other Navigation Projects

No other modern-day navigation improvement projects have been identified in the basin. As discussed in Section 4, several legislative efforts by the state of South Carolina were directed toward the Combahee and Salkehatchie Rivers in the 1700's; however, evidence of these improvements has long since ceased to exist.

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 Combahee River.

SECTION 4 - INTERSTATE COMMERCE

Past

The boom which occurred in South Carolina's rice-growing culture (approximately 1730) drew additional settlers to the Combahee River basin. "Up the Combahee" and other streams, wrote Meriwether, "the tides run for thirty miles, and these streams with their numerous tidal creeks and inlets and the inland passage to Charleston afforded unusually easy transportation." (7) In 1778, the South Carolina General Assembly passed an act to cut and clear connections from Ashepoo River to Pon Pon River and from Ashepoo River to Chehaw River. Seven years later, the legislature passed an ordinance for clearing additional rivers, among them the "Saltcatcher" (i.e., the Salkehatchie River), the name used for the upper stretch of the Combahee River. An ordinance of 1787 called for "Drains and Water passages in the swamps and Savannahs formed by Wannell's, otherwise called Cuckhold's Creek, a branch of Combahee River." (8)

The vessels employed in moving commodities on the Combahee-Salkehatchie River consisted of pole boats, bateaux, rafts, perriaugers*, and schooners and yawls of various sizes and capacities. The exports comprised rice and naval stores, along with additional timber products of various sorts. A range of trade goods -- sent either from Beaufort, Charleston, or Savannah -- were sent up the river. By 1818, John Wilson, the Civil and Military Engineer of South Carolina, could report that the Combahee River "is navigable from St. Helena's Sound to Paterson's bridge, about 35 miles. From hence to the confluence of the Big and Little Salketchier Rivers, about 18 miles, the navigation is obstructed by sandbars and logs," its depth varying "from 4 to 8 feet." The "Big Saltketcher" (Salkehatchie) had "from 2 to 4 feet depth of water," and was obstructed in places by sandbars and logs.

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* 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.

But it might be "rendered navigable up to Broxton's Ford, nearly 40 miles from its confluence with the Little Saltketcher." The Little Saltketcher River (Little Salkehatchie) is "impeded by sandbars and logs, and might be opened to Buckhead Ford." (9)

By the time that Robert Mills compiled his Statistics of South Carolina in 1826, the Combahee River had "a schooner navigation to Saltcatcher bridge," and the main Saltcatcher was "navigable for boats 10 miles higher." Merely by "removing the logs which now obstruct it", the river could be "made navigable to Barnwell court house." The Chehaw River, which feeds into the Combahee-Salkehatchie River, was "navigable for schooners." (10) Mill's rather optimistic reports notwithstanding, in practical terms, the Combahee-Salketchie was "not capable of navigation above tidewater." (11) To correct this situation, South Carolina appropriated, in 1837, the sum of $35,000 for the "Saltketcher" River. (12)

In 1880, Brevet Major General Quincy A. Gillmore, Corps of Engineers, examined the Combahee-Salkehatchie River basin. He reported that the river "from Hickory Hill to the sea ... was free and open for all purposes of traffic needed." During low water, however, the river could not be navigated; and at Hickory Hill were "two rows of piles, driven during the late Civil War [sic], which prevent boats from ascending to the junction" of the two Salkehatchies. The commerce consisted of timber and rice. (13) Nine years later, Captain F. V. Abbot observed that the lower or tidal portion of the river had various connections with other tidal streams in the region. The commerce for the "Combahee or Salkehatchie River ... for the fiscal year ending June 30, 1888, "comprised 200,000 bushels of rice, plus rosin, turpentine, cross-ties, and timber, amounting to $342,045. (14)

A series of River and Harbor Acts, commencing with the act of 2 August 1882, sought to improve the river. The authorized project provided "for clearing the channel for rafts and flatboats from a point 5 miles above Toby Bluff to Hickory Hill, 46 miles above the river mouth, a total of 77 miles."* In 1887, the riverine commerce

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

amounted to $342,045, but by 1893 had slipped to $121,510. By 1894, the river had been "quite thoroughly cleared", and was to be "maintained in fair rafting order," but the commerce continued to decline. (15) The entire project was completed in 1896, but "has been inactive for many years." (16) It was recommended for abandonment in 1926, reflecting the impact of railroad and highway transportation modes. (17)

Present

The Combahee-Salkehatchie River is not currently being used for purposes of interstate waterborne commerce. (18)

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 Combahee River and its tributaries for interstate commerce in future years is difficult to predict. It is anticipated, however, that the river has the potential to be utilized, particularly within the tidal zone, for shipment of goods into other states since it is connected directly to the Atlantic Ocean. Beyond the tidal limit the river becomes quite narrow and would require extensive development to be utilized for shipping.

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 stems 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 legal documentation reveals there are no Federal court decisions which apply specifically to navigation in the Combahee 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 their 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, the private ownership of the bed will not affect the rights of the public to the use of navigable waters.

Review of legal documentation indicates no South Carolina state court cases which deal specifically with the Combahee River, however, several cases have been identified that apply to streams within the Combahee River area. (19) These cases are briefly summarized below.

State v. Pacific Guano Co.* - This case applies to the following creeks: Palmer's Creek, Haulover Creek, Horse Island Creek, Sheaphead or Fish Creek, South Wimbee Creek, Chisolm's Creek, and Big Creek, off Coosaw River, in Beaufort County. The case arose under a statute designed to "protect the rights and interests of the state in the phosphate rocks and phosphatic deposits in the navigable streams and waters of the state ..." [XVI Stat. 615 (S.C. 1878)]. Damages and an injunction were sought from the out-of-state corporate defendant. The question of interest arose as to streams which were tidal but not navigable in fact. The court, on appeal, did take an unusual approach to the question. The circuit court had ruled:

> "Chisolm's Creek and Big Creek were not navigable streams. Although the tide ebbs and flows through them, yet the conditions necessary to sustain trade or commerce of any kind do not exist ... Flowing out of Coosaw, with the tide,

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* 22 S. C. 50 (1884).

> into Chisolm's island, they lose themselves in the marshes with which they are surrounded. They are entirely within the private estate of the owners of the island and make no connection with thoroughfares of travel or trade and are none themselves."

After observing that "the fundamental idea (of the common law) was that the property in the sea and tide-waters, and in the soil and shore thereof, was in the sovereign," the court went on to sustain the opinion below as a factual question not reviewable on appeal:

> "(T)he Circuit judge, notwithstanding the positive rule of the common law as to the navigability of all tidal streams, held that even tidal channels are navigable in law only when they are navigable in fact ... and we cannot say that this was error of law ... These were pure findings of fact by the Circuit judge ... We cannot hold that the bed of a creek not navigable, although tidal, belongs to the state to the exclusion of the riparian proprietor."

Thus, the court took the unusual tack of allowing the circuit judge to displace the common law by declaring that it was a factual finding not subject to review in a law case. In this regard, the circuit judge found, based on the facts, that the following creeks were navigable in fact, the state supreme court refusing to overturn this determination: Palmer's Creek, Haulover Creek, Horse Island Creek, Sheaphead or Fish Creek, a branch of Palmer's Creek, and South Wimbee Creek. Accordingly, the tidal channels were deemed navigable in law only when they were navigable in fact for trade and commerce by craft of some kind.

State v. Pinckney* - This case deals with the following water-bodies: Beaufort County tidal area, near Coosaw River, Parrott Creek, Morgan River, and St. Helena Sound. In this case, the state sought recovery of land between the high and low-water marks of a tidal body of water. The court found the correct common law rule to be that:

> "(T)he space between the high and low water mark of the border of the sea is called the "shore", and belongs by the common law to the sovereign, unless acquired by grant from the sovereign..."

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* 22 S. C. 484 (1884).

Essential to this holding is that the tidal areas in Beaufort County are navigable waters, including the area near the Coosaw River, Parrott Creek, Morgan River, and St. Helena Sound.

Heyward v. Farmers' Mining Co.* - This case involves Shingle Creek, tributary of Coosaw River in Beaufort County. Bull River and Coosaw River reportedly united at nearly a right angle, the former running north and south and the latter running east and west. Shingle Creek ran up into the marsh nearly at a right angle to the Coosaw River, in a northerly direction, and another similar creek called "Buzzard Island Creek" ran into the marsh from the Bull River in an easterly direction. In a trespass action, the trial court found as a fact that certain streams were not navigable and was reversed on appeal. The ruling is summed up by the headnote editor:

> "Therefore, where the trial judge ruled that a tidal creek was not a navigable stream of the state, because it ran up into a private estate and lost itself in the surrounding marsh, because it had never been used as a highway for commerce, and there seemed to be no prospect of its ever being so used, and because it makes no connection with other highways he erred in all of these rulings."

The court considered all these conditions irrelevant to the true test - navigable capacity; "to be navigable, a stream should have sufficient depth and width to float useful commerce ..." As a result the plaintiff could not have title to the tidal lands, and his trespass action failed.

Recent Federal Litigation

A review of recent Federal litigation concerning the Charleston District reveals two court actions pertaining to streams in the Combahee River area. The summaries indicate jurisdictional "navigable waters of the U. S." wherein recent activities have entailed court actions. (19) The cases are briefly summarized below.

U. S. v. William S. Baldwin and Hugh H. Lee** - This case regards Fish Creek at South Fenwick Island. This civil complaint seeking an injunction, restoration, and civil monetary penalties was filed on 8 October 1975; it alleges violation of Sections 10 and 13 of the

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* 42 S. C. 138, 19 S. E. 963 (1894).

** U.S.D.C., South Carolina Civil Action No. 75-1772.

River and Harbor Act of 1899 and non-compliance with Sections 404(a) and 301(a) of the Federal Water Pollution Control Act (1972 Amendment). The complaint alleges that defendants excavated, constructed pilings, deposited dredged and fill material, obstructed tidal creek flow, and impounded approximately fifteen acres of tidal marsh in the area of Fish Creek and its tidal tributary at South Fenwick Island, Colleton County, South Carolina. Defendants answered this suit on 5 December 1975 and counterclaimed that the Government's forbidding them from conducting the subject operation amounts to the taking of their property without compensation in derogation of the Fifth Amendment of the U. S. Constitution. The District refused to accept an after-the-fact permit application for the entire unauthorized work as inconsistent with prior administrative determination. A proposed Stipulation of Facts has been drafted to accompany a Motion for Summary Judgment on Corps regulatory jurisdiction over a repair of an eleven year breach where the District Engineer determined that previously impounded areas had been open long enough to allow re-establishment of a tidal marsh.

U. S. v. Hugh H. Lee and R. T. Lee* - This case involves Mosquito and Musselboro Creeks, tributaries of Ashepoo River. This civil complaint seeking an injunction, restoration, and civil monetary penalties was filed on 31 October 1975, and alleges violation of Sections 10 and 13 of the River and Harbor Act of 1899 and non-compliance with Sections 404(a) and 301(a) of the Federal Water Pollution Control Act (1972 Amendment). The complaint alleges that defendants excavated, constructed earthen embankments, deposited dredged and fill material, obstructed tidal flow, and impounded approximately two acres of tidal marsh in the area of Mosquito and Musselboro Creeks at Bennett's Point, Colleton County, South Carolina. After District refusal to accept an after-the-fact permit application for the entire unauthorized work as inconsistent with prior administrative determination, a proposed Consent Order has been drafted providing for removal of all fill below mean high water and affording defendants an opportunity to apply for an after-the-fact permit for embankment relocations above mean high water.

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* U.S.D.C., South Carolina, Civil Action No. 75-1844.

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.

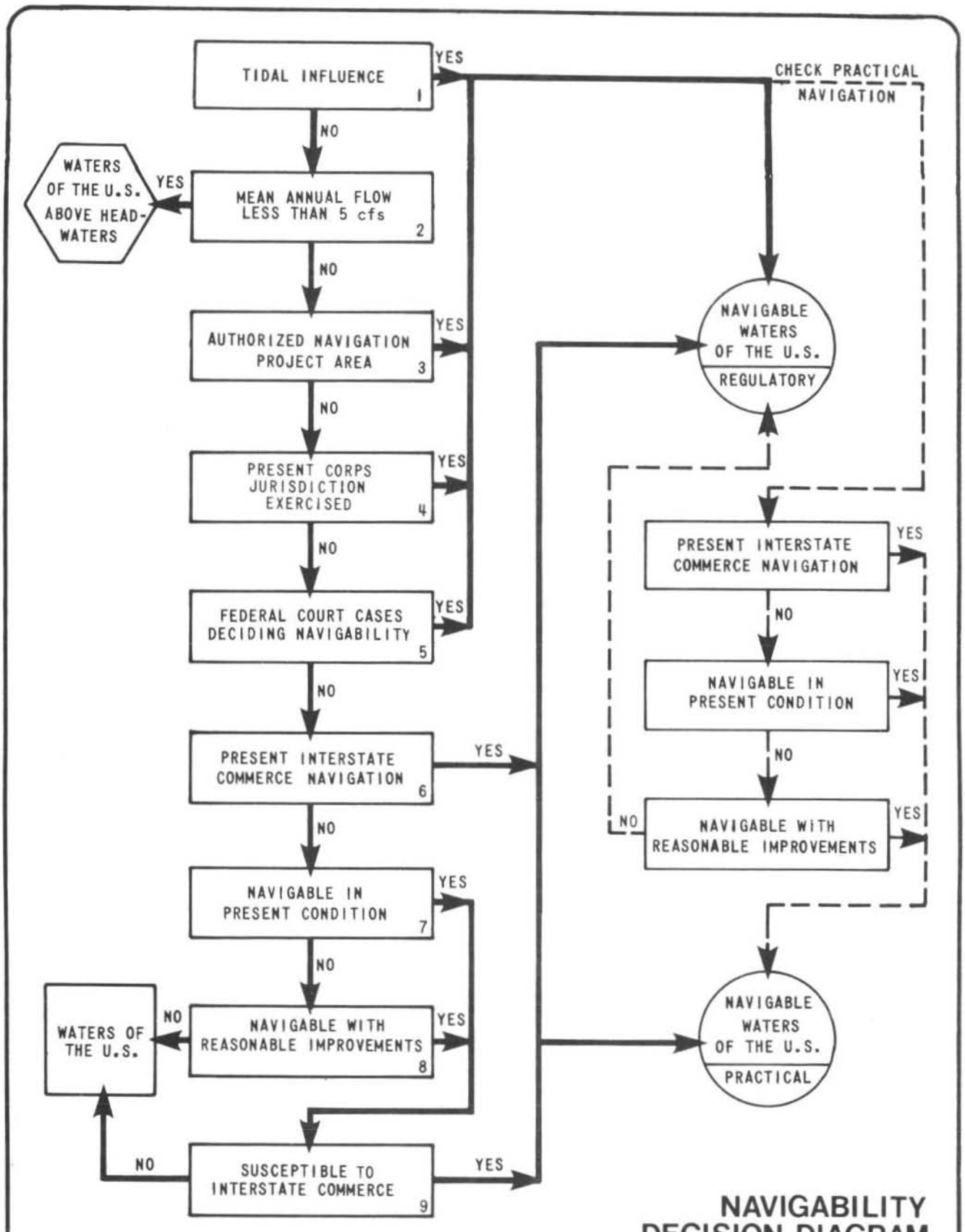
SECTION 6 - NAVIGATION OBSTRUCTIONS AND CLASSIFICATIONS

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 Combahee River is classified as "navigable waters of the U. S." from its mouth at St. Helena Sound to the confluence of the Salkehatchie and Little Salkehatchie Rivers (R.M. 49.4). The Salkehatchie River is also classified as "navigable waters of the U. S." for 17.1 miles, from its mouth (R.M. 49.4) to R.M. 66.5 (see plate 02-2 for map location). (3)(4) River mileage has been developed as discussed in the Summary Report, and is continued on the Salkehatchie River from the Combahee River. These classifications are based on the limits of the Federally authorized navigation project discussed in Section 3 and the limit of tidal influence, which extends to R.M. 37. The Intracoastal Waterway is also classified as "navigable waters of the U. S." over its entire length, based on the authorized navigation project limit as well as its location within the tidal zone. In addition, although not specifically named in this report, all rivers, creeks, streams, and parts of streams subject to tidal influence are presently classified as "navigable waters of the U. S." based on the legal and administrative definition of the term "navigable waters of the U. S." (see Section 5).

No streams in the basin, other than the Combahee River, are tidally influenced and meet "navigable waters of the U. S." criteria in the non-tidal portion.

Historically Navigable Waters

Throughout various periods of history the Combahee and Salkehatchie Rivers have been navigable over varying lengths. The furthest navigable distance recorded was 66.5 miles in 1885; however, no indication of the volume of commerce utilizing the upper reaches during this period is available (see plate 02-2 for map 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 limits of "navigable waters of the U. S." (for regulatory purposes) on the Combahee River and Salkehatchie River must be at R.M. 49.4 and R.M. 66.5, respectively, because these are the limits of authorized Federal navigation projects (see plate 02-2 for map location). The Intracoastal Waterway as well as the tidal portion of streams in the Combahee River area are recommended as "navigable waters of the U. S."

The recommended practical limit of navigation for the Combahee River is at the I-95 highway bridge (R.M. 43.0), when "reasonable improvements" are considered (see Figure 1). This recommendation is a reduction of the present and recommended classifications. It is based on field observations and computational analysis of channel dimensions made at the four bridges crossing the Combahee and Salkehatchie Rivers between the limit of tidal influence (R.M. 37) and S. C. 63 highway bridge (R.M. 60.7). The results indicated an approximate water depth of at least 7 feet, an approximate channel width of at least 50 feet, and an average slope less than 2.5 feet per mile at mean water to the I-95 highway bridge at R.M. 43.0 on the Combahee River (see plate 02-2 for map location). The channel at several bridge locations upstream of this point, on both the Salkehatchie and Little Salkehatchie Rivers, was analyzed but failed to meet the criteria defining practical navigation.

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.

Plates 02-4 and 02-5 are plan 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. (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 presents the vertical clearance to mean water level and mean water slope at all obstructions, and the mean discharge of the river at all bridges, located within the recommended "practical navigable waters of the U. S."

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. Figures 2 through 7 are photographs of the obstructions starting with the one most downstream. These photographs are 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 water flow points associated with the Combahee River report area. Each point is located by stream code, stream name, latitude and longitude, and a mileage reference.

Appendix B lists the lakes located in the Combahee River report area 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 TIDAL INFLUENCE LIMIT TO RECOMMENDED PRACTICAL LIMIT OF NAVIGABLE WATERS OF THE U. S. (2)

River Mile	Description	Mean Discharge (cfs)	Mean Water Slope (ft/mi)	Approximate Vertical Clearance To Obstruction (ft)
40.1	Seaboard Coast Line Railroad Bridge	968	0.7	10.0
40.1	Utility Line (underground telephone)	--	0.7	On Streambed
40.1	Utility Line (telephone)	--	0.7	62.5
40.4	U. S. 17A-21 Highway Bridge	968	0.7	7.5
40.4	Utility (power)	--	0.7	27.0
41.2	Utility (power)	--	0.7	39.0
42.5	Utility (power)	--	0.7	30.0
43.0	I-95 Highway Bridge	850	0.7	10.0

FIGURE 2 - SEABOARD COAST LINE RAILROAD BRIDGE (R.M. 40.1)

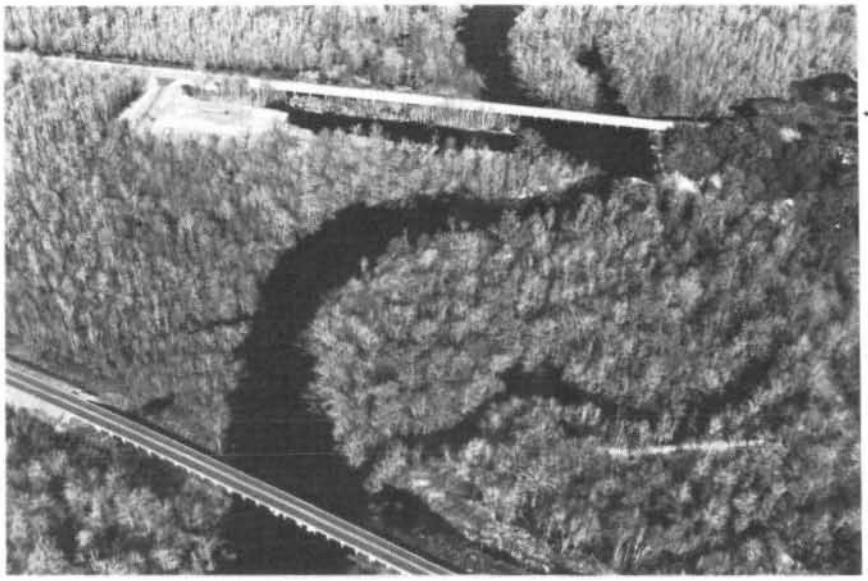


FIGURE 3 - TWO UTILITY LINES (R.M. 40.1) AND (R.M. 40.4)
(WITH SEABOARD COAST LINE RAILROAD BRIDGE, FOREGROUND,
AND U. S. 17A HIGHWAY BRIDGE, BACKGROUND)

FIGURE 4 - U. S. 17A HIGHWAY BRIDGE (R.M. 40.4)

FIGURE 5 - UTILITY LINE (R.M. 41.2)

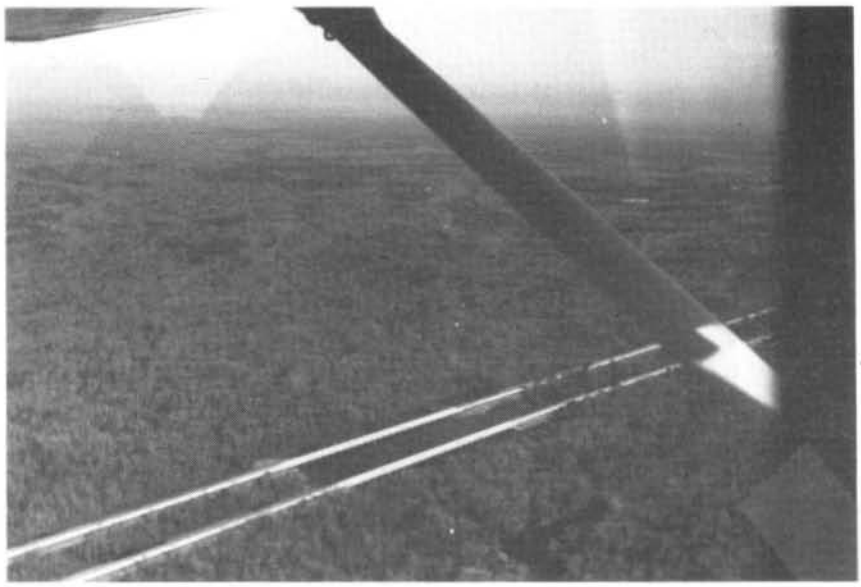


FIGURE 6 - UTILITY LINE (R.M. 42.5) (WITH I-95 HIGHWAY BRIDGE)

FIGURE 7 - I-95 HIGHWAY BRIDGE (R.M. 43.0)

SECTION 7 - CONCLUSIONS AND RECOMMENDATIONS

Five classifications of navigation on streams in the Combahee River report area 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 all bridge crossings over the river from the point of tidal influence (R.M. 37) to the upstream limit. Classification 4 is based on review of all previously determined limits with a recommendation for 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 Combahee River is presently classified as "navigable waters of the U. S." from its mouth in St. Helena Sound to the confluence of the Salkehatchie and Little Salkehatchie Rivers (R.M. 49.4). The Salkehatchie River is presently classified as "navigable waters of the U. S." from the confluence with the Little Salkehatchie River (R.M. 49.4) to R.M. 66.5.
2. Historically, the furthest upstream navigable length has been to R.M. 66.5 on the Salkehatchie River. Several additional rivers have been historically navigable and are presented in Section 4.
3. The recommended practical limit of navigation on the Combahee River is at the I-95 highway bridge (R.M. 43.0). The Salkehatchie River is not recommended as practically navigable.
4. Since an authorized project establishes "navigable waters of the U. S." up to R.M. 49.4 and R.M. 66.5 on the Combahee and Salkehatchie Rivers, respectively, this limit cannot be declassified. Therefore, the recommended limit of "navigable waters of the U. S." is at R.M. 49.4 on the Combahee River and R.M. 66.5 on the Salkehatchie River.

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.

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Match Plate 02-3

02
COMBAHEE RIVER AREA

03
EDISTO RIVER AREA

04
COOPER RIVER AREA

01
COOSAWHATCHIE RIVER AREA

ATLANTIC OCEAN

SAVANNAH

FORT STEWART MILITARY RESERVATION

SAVANNAH NATIONAL WILDLIFE REFUGE

HILTON HEAD ISLAND

EDISTO ISLAND

EDISTO BEACH STATE PARK

HUNTING ISLAND STATE PARK

ST HELENA ISLAND

PORT ROYAL ISLAND

LADIES ISLAND

TYBEE ROADS

SKULL INLET

TRIPPS INLET

POPULATED PLACES
NEW ORLEANS
CHARLOTTE
CHARLESTON
Georgetown
Kingstree
ROADS
RAILROADS
BOUNDARIES

USGS BASE MAP
SAVANNAH, GA.; S.C.
1957 Revised 1967
NI 17-11

0 5 10
scale in miles

N

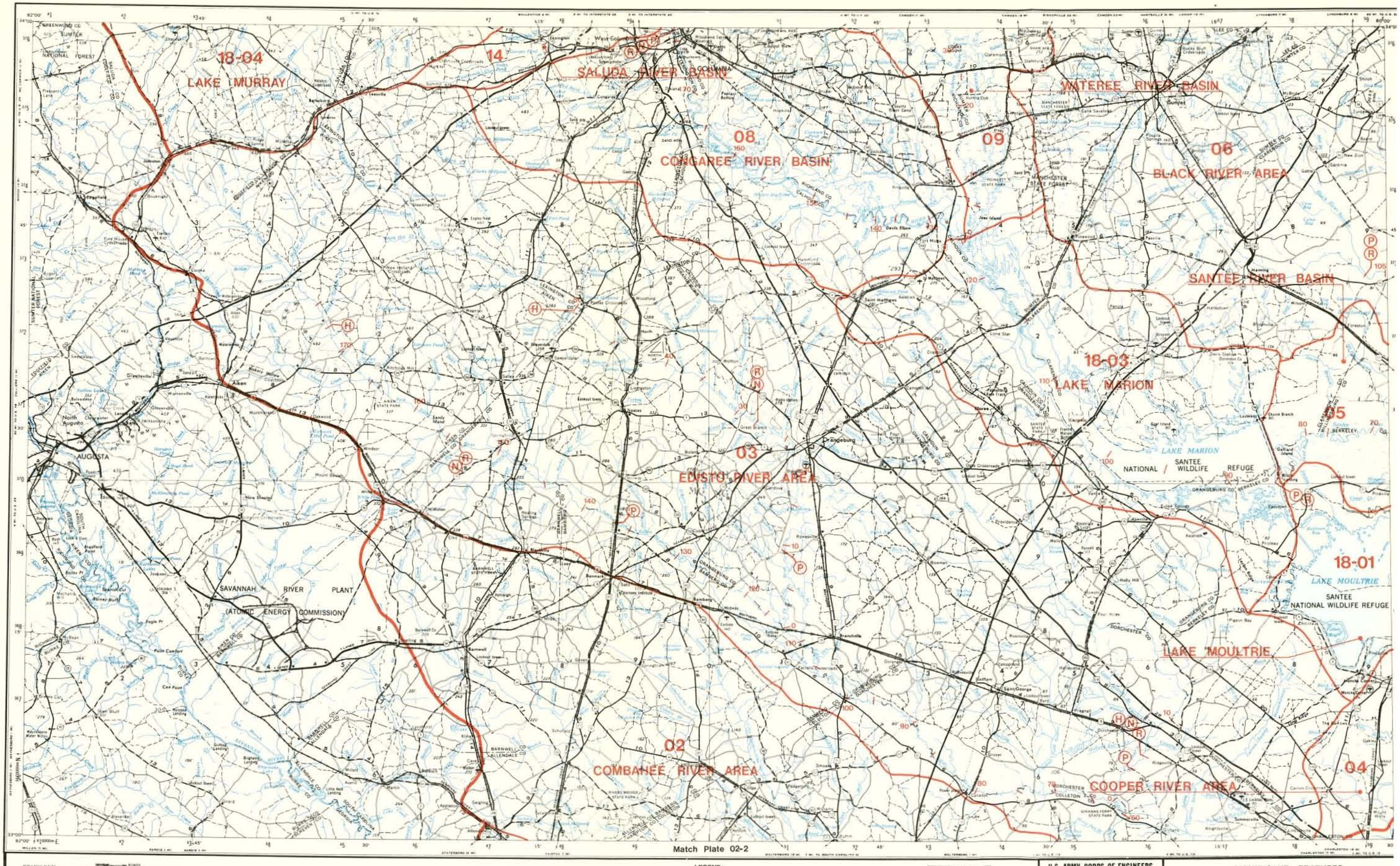
LEGEND:
- (N) PRESENT LIMIT OF NAVIGABLE WATERS OF THE U.S.
- (H) HISTORIC LIMIT OF NAVIGATION
- (P) PRACTICAL LIMIT OF NAVIGATION (RECOMMENDED)
- (R) LIMIT OF NAVIGABLE WATERS OF THE U.S. (RECOMMENDED)
- (T) APPROXIMATE LIMIT OF TIDAL INFLUENCE
- 20 RIVER MILE

1977

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

STANLEY CONSULTANTS

SIGNIFICANT FEATURES
COMBAHEE RIVER AREA
Report No. 01,02,03,04
NAVIGABILITY STUDY
Plate 02-2



NEW ORLEANS
CHARLOTTE
CHARLESTON

USGS BASE MAP
AUGUSTA, GA., S.C.
1957, Revised 1969
NI 17-8

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)
- 20 RIVER MILE

1977

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

SIGNIFICANT FEATURES
COMBAHEE RIVER AREA
Report No. 01,02,03,04,05,06,08,09,14,18
NAVIGABILITY STUDY
Plate 02-3

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)

18-01 18-02 18-03 18-04 18-05 18-06 18-07 18-08 18-09 18-10 18-11 18-12 18-13 18-14 18-15 18-16 18-17 18-18 18-19 18-20 18-21 18-22 18-23 18-24 18-25

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17

CHARLESTON HARBOR
PORT ROYAL HARBOR
GEORGETOWN HARBOR (WINYAH BAY)
MURRELLS INLET
LITTLE RIVER INLET

N

8 4 0 8 16
Scale in Miles

1977

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

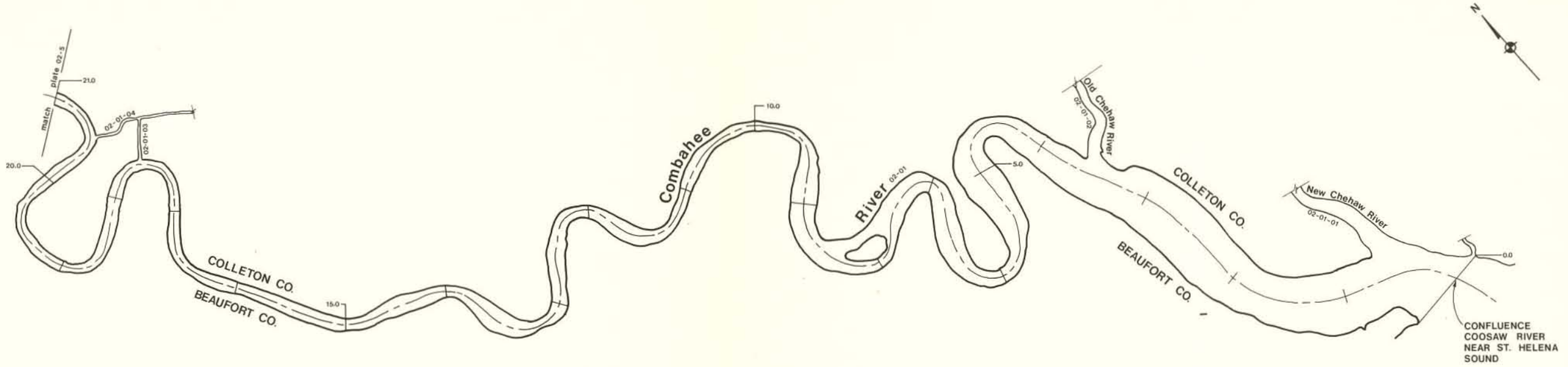
STANLEY CONSULTANTS

CHARLESTON DISTRICT

LOCATION MAP

NAVIGABILITY STUDY

Plate 02-1



ELEVATION FEET ABOVE MSL

TIDAL INFLUENCE EXTENDS TO R.M. 37

21 20 15 10 5 0

RIVER MILES

ELEVATION FEET ABOVE MSL

LEGEND:

OVERHEAD STRUCTURE — 75' — HORIZONTAL CLEARANCE IN MAIN CHANNEL

12' — VERTICAL CLEARANCE TO STRUCTURE

MEAN WATER SURFACE — MAXIMUM DEPTH AT MEAN FLOW

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 CRUSS SECTIONS AND VELOCITIES. STREAM FLOW RECORDS, THE MANNING EQUATION, AND FIELD OBSERVATIONS. SEE SUMMARY REPORT FOR COMPLETE EXPLANATION.

2. THE UPSTREAM EXTENT OF TIDAL INFLUENCE IS APPROXIMATED BY PROJECTING THE ELEVATION OF MEAN HIGH TIDE HORIZONTALLY FROM THE MOUTH OF A RIVER TO A MILE POINT WHERE IT INTERSECTS THE PLOTTED MEAN WATER SURFACE OF THAT RIVER.

1977

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

STANLEY CONSULTANTS

PLAN AND PROFILE

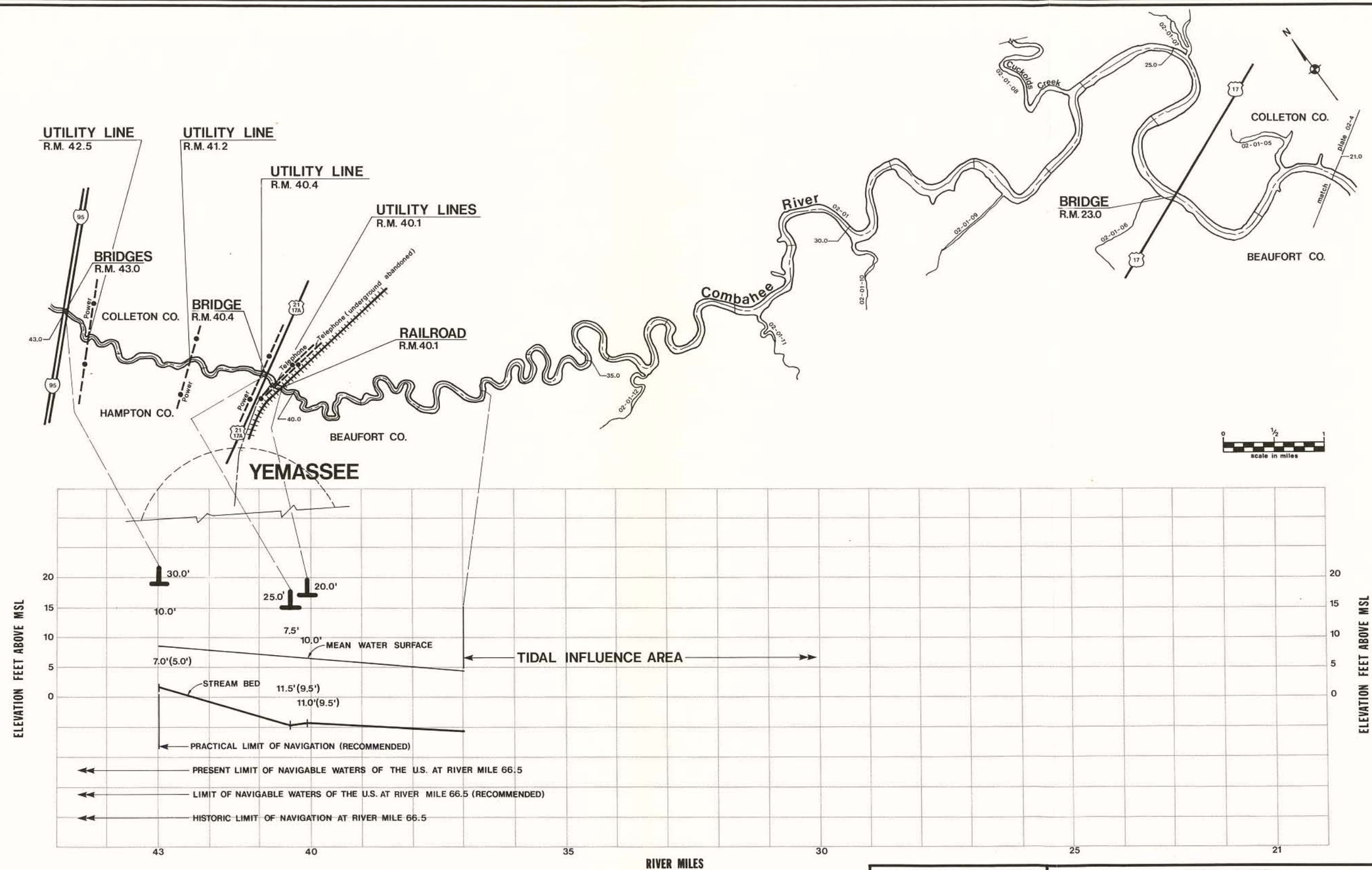
COMBAHEE RIVER

Combahee River Area

BEAUFORT - COLLETON CO., S.C.

NAVIGABILITY STUDY

Miles 0.0-21.0 Plate 02-4



LEGEND:

OVERHEAD STRUCTURE — 75' — HORIZONTAL CLEARANCE IN MAIN CHANNEL

12' — VERTICAL CLEARANCE TO STRUCTURE

MEAN WATER SURFACE — MAXIMUM DEPTH AT MEAN FLOW

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.

2. THE UPSTREAM EXTENT OF TIDAL INFLUENCE IS APPROXIMATED BY PROJECTING THE ELEVATION OF MEAN HIGH TIDE HORIZONTALLY FROM THE MOUTH OF A RIVER TO A MILE POINT WHERE IT INTERSECTS THE PLOTTED MEAN WATER SURFACE OF THAT RIVER.

1977

U.S. ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
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STANLEY CONSULTANTS

PLAN AND PROFILE

COMBAHEE RIVER

Combahee River Area

BEAUFORT-COLLETON-HAMPTON CO., S.C.

NAVIGABILITY STUDY

Miles 21.0-43.0 Plate 02-5

APPENDIX A
STREAM CATALOG

This appendix presents a coded listing of all non-tidal streams located in the Combahee River Report area having a mean annual flow greater than or equal to five cfs. In tidal areas essentially all streams are coded; however, some very small, short streams and drainage tile systems were not coded.

Streams which are all or partially subject to tidal influence are noted in the listing. These are classified "navigable waters of the U. S." to the tidal limit. Non-tidal reaches of streams classified "navigable waters of the U. S." are covered in Section 6 of this report. All other streams not tidally influenced are classified "waters of the U. S."

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

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 UP	STREAM MILES DOWN	FROM
02	01						Combahee River * # (St. Helena Sound)					
		01					New Chehaw River * #					
		02					Old Chehaw River * (Chehaw River)					
			01				New Chehaw River * #					
			02				Social Hall Creek *					
			03				Unnamed Tributary					
		03					Unnamed Tributary *					
		04					Unnamed Tributary *					
		05					Unnamed Tributary *					
		06					Unnamed Tributary *					
		07					Unnamed Tributary *					
		08					Cuckholds Creek *					
			01				Unnamed Tributary *					
			02				Unnamed Tributary *					
		09					Unnamed Tributary *					
		10					Unnamed Tributary *					
		11					Unnamed Tributary *					

* All or part tidally influenced. # Dual code in Report 02.

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 UP	STREAM MILES DOWN	FROM
02	01	12					Unnamed Tributary *					
		13					Black Creek	32 54 35	80 46 25	3.4		S.C. 63 Highway Bridge
			01				Unnamed Tributary	32 52 25	80 46 45	0.7		Black Creek
		14					Unnamed Tributary	32 49 10	80 50 25	3.4		Salkehatchie River
		15					Unnamed Tributary	32 48 15	80 55 35	3.4		Salkehatchie River
		16					Salkehatchie River					
			01				Whippy Branch					
				01			Calico Branch	33 00 45	81 08 10	7.2		Jackson Branch
				02			Caw Caw Branch	32 57 50	81 11 15	5.0		Jackson Branch
				03			Jackson Branch	33 03 15	81 18 35	2.3		Log Branch
					01		Miller Branch	33 03 40	81 14 05	4.7		Jackson Branch
					02		Log Branch	33 01 45	81 19 30	2.3		Jackson Branch
			02				Savannah Creek	33 04 55	81 02 00	2.7		Long Branch
			03				Threemile Creek	33 05 40	81 06 15	2.4		Big Branch
			04				Kirkland Creek	33 06 55	81 09 35	1.7		Salkehatchie River
			05				Wells Branch	33 06 45	81 16 30	5.1		Salkehatchie River

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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 UP	STREAM MILES DOWN	FROM
02	01	16	06				Birds Branch	33 10 50	81 09 35	4.2		Salkehatchie River
			07				Georges Creek	33 12 50	81 12 30	0.7		Juniper Branch
			08				Hercules Creek	33 14 00	81 16 10	4.7		Salkehatchie River
			09				Toby Creek	33 18 45	81 17 40	6.4		Jordan Branch
			10				Hurricane Creek	33 10 15	81 20 45	2.2		Salkehatchie River
			11				Turkey Creek	33 20 00	81 21 05			Confluence-Shrub Br
			12				Buck Creek	33 20 15	81 25 05	3.3		Salkehatchie River
			13				Rosemary Creek	33 23 20	81 27 10	8.0		Buck Creek
		17					Little Salkehatchie R	33 19 45	81 14 50	3.5		Ghents Branch
			01				Unnamed Tributary	32 55 25	80 56 45	1.2		S.C. 63 Highway Bridge
			02				Deep Creek	32 53 45	80 53 45	2.7		Little Salkehatchie River at S.C. 63
			03				Indian Creek	32 55 10	80 50 30	2.0		Little Salkehatchie River at S.C. 63
			04				Willow Swamp	33 03 55	80 58 20	2.3		Fender Creek
				01			Fender Creek	33 02 10	80 59 05	1.1		Willow Swamp
			05				Buckhead Creek	33 07 55	80 50 10	6.5		Bear Branch

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 UP	STREAM MILES DOWN	FROM
02	01	17	05	01			Unnamed Tributary	32 59 15	80 47 55	2.6		Buckhead Creek
				02			Bear Branch	33 04 25	80 46 25	2.3		Buckhead Creek
			06				Unnamed Tributary	33 05 40	80 52 40	3.2		Little Salkehatchie
			07				Lemon Creek	33 16 25	81 07 30	5.2		S.C. Secondary 33 Highway Bridge
			08				Colston Branch	33 10 05	81 05 40	5.0		Little Salkehatchie River
				01			McMillian Branch	33 08 00	81 01 45	0.8		Colston Branch
			09				Gall Branch	33 16 50	81 12 25	1.8		Little Salkehatchie River
	02						Coosaw River * (St. Helena Sound)					
		01					Unnamed Tributary *					
		02					Unnamed Tributary *					
		03					Morgan Back Creek * #					
			01				Morgan Back Creek * #					
			02				Unnamed Tributary *					
		04					Unnamed Tributary *					
		05					Ashepoo Coosaw Cutoff * #					

* All or part tidally influenced. # Dual code in Report 02.

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 UP	STREAM MILES DOWN	FROM
02	02	05	01				Unnamed Tributary *					
				01			Unnamed Tributary *					
			02				Rock Creek * #					
		06					Unnamed Tributary *					
		07					Combahee River * #					
		08					Bull River *					
			01				Unnamed Tributary *					
			02				Unnamed Tributary *					
			03				Unnamed Tributary *					
			04				Unnamed Tributary *					
			05				Williman Creek *					
				01			Unnamed Tributary *					
				02			Unnamed Tributary *					
				03			Unnamed Tributary *					
				04			Unnamed Tributary *					
				05			Unnamed Tributary *					
				06			Unnamed Tributary *					

* All or part tidally influenced. # Dual code in Report 02.

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 UP	STREAM MILES DOWN	FROM
02	02	08	05	07			Schooner Channel * #					
					01		Unnamed Tributary *					
					02		Unnamed Tributary *					
			06				Unnamed Tributary *					
			07				Unnamed Tributary *					
			08				Unnamed Tributary *					
			09				Wimbee Creek *					
				01			South Wimbee Creek *					
				02			Schooner Channel * #					
				03			Barnwell Creek *					
					01		Unnamed Tributary *					
				04			Briars Creek *					
				05			Unnamed Tributary *					
				06			Unnamed Tributary *					
				07			True Blue Creek *					
				08			Unnamed Tributary *					
				09			Branford Creek *					

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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 UP	STREAM MILES DOWN	FROM
02	02	08	09	09	01		Unnamed Tributary *					
		09					Unnamed Tributary *					
		10					Parrot Creek * #					
		11					Luck Point Creek * #					
		12					Brickyard Creek * #					
			01				Unnamed Tributary * #					
		13					McCalleys Creek * ##					
			01				Unnamed Tributary * ##					
			02				Unnamed Tributary * ##					
			03				Unnamed Tributary * ##					
		14					Unnamed Tributary * ##					
			01				McCalleys Creek * ##					
		15					Unnamed Tributary * ##					
			01				McCalleys Creek * ##					
		16					Unnamed Tributary *					
		17					Hospa Creek * #					

* All or part tidally influenced. # Dual code in Report 01. ## Dual code in Report 02.

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 UP	STREAM MILES DOWN	FROM
02	03						Rock Creek * #					
		01					Ashepoo Coosaw Cutoff * #					
			01				Unnamed Tributary *					
			02				Ashepoo River * #					
		02					Unnamed Tributary *					
		03					Ashepoo Coosaw Cutoff * #					
		04					Unnamed Tributary *					
	04						Two Sisters Creek *					
		01					Unnamed Tributary *					
		02					Unnamed Tributary *					
		03					Unnamed Tributary *					
		04					Long Ashepoo Creek * #					
	05						Bank Creek *					
	06						Ashepoo River * # (St. Helena Sound)					
		01					Otter Creek * #					
		02					Long Ashepoo Creek * #					

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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 UP	STREAM MILES DOWN	FROM
02	06	03					Jefford Creek * #					
		04					Fenwick Cut * ##					
		05					Ashepoo Coosaw Cutoff * #					
		06					Mosquito Creek * # ##					
			01				Musselboro Creek * #					
			02				Unnamed Tributary *					
			03				Bull Cut *					
				01			Mosquito Creek * # ##					
			04				Musselboro Creek * #					
		07					Crooked Creek *					
		08					Hole in the Wall * #					
			01				Unnamed Tributary *					
		09					Hole in the Wall * #					
		10					Unnamed Tributary *					
		11					Unnamed Tributary *					
		12					Deer Creek *					

* All or part tidally influenced. # Dual code in Report 02. ## Dual code in Report 03.

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 UP	STREAM MILES DOWN	FROM
02	06	12	01				Unnamed Tributary *					
			02				Unnamed Tributary *					
		13					Unnamed Tributary *					
		14					Unnamed Tributary *					
		15					Unnamed Tributary *					
		16					Unnamed Tributary *					
		17					Unnamed Tributary *					
		18					Horseshoe Creek *					
			01				Chessey Creek	32 50 20	80 34 45			Confluence-Pringle Creek
			02				Sandy Dam Creek	32 52 50	80 35 40	1.2		Shereau Creek
				01			Shereau Branch	32 54 10	80 35 30	1.8		Sandy Dam Creek
			03				Fuller Swamp	32 58 25	80 34 35	5.6		Chessey Creek
			04				Chessey Creek	32 56 55	80 31 20	0.4		S.C. 64 Highway Bridge
		19					Ireland Creek					
			01				Allen Creek	33 00 20	80 39 25	1.4		Ireland Creek

* All or part tidally influenced.

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 UP	STREAM MILES DOWN	FROM
02	06	20					Doctors Creek	33 56 00	80 43 30	2.4		Jones Swamp
			01				Jones Swamp	33 00 05	80 42 05	6.5		Ashepoo River
	07						Unnamed Tributary *					
	08						Fish Creek *					
		01					Otter Creek * #					
			01				Unnamed Tributary *					
		02					Unnamed Tributary *					
		03					Pine Island Creek * ##					
			01				Unnamed Tributary *					
		04					Jefford Creek * #					
			01				Unnamed Tributary *					
		05					Unnamed Tributary *					
		06					Unnamed Tributary *					

* All or part tidally influenced. # Dual code in Report 02. ## Dual code in Report 01.

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 Combahee River report area.

This inventory was compiled from the following sources:

1. Inventory of Lakes in South Carolina Ten Acres or More in Surface Area.
2. 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

STREAM CODE							LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (SOUTH CAROLINA)
REPORT NUMBER	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER	FIFTH ORDER				
02	03	01	01				Hutchinson Island	10	20	Colleton
02	03	01	01				Hutchinson Island	10	20	Colleton
02	06						Hutchinson Island	10	20	Colleton
02	06	06					Billy Baldwin #	150	240	Colleton
02	06						Ashepoo Plantation	30	120	Colleton
02	06						Ashepoo Plantation	85	340	Colleton
02	06						Albert Love	30	60	Colleton
02	06						Bear Island	800	2,400	Colleton
02	06	12					Ti-Ti Peat Corp.	135	810	Colleton
02	01	02					Lightsey Brothers	60	180	Colleton
02	06						Lightsey Brothers	25	75	Colleton
02	06						Poco Sabo	30	60	Colleton
02	06						White House Plantation	28	56	Colleton
02	06	18					L. G. Fishburne	140	210	Colleton
02	06	18	02				L. G. Fishburne	35	87	Colleton
02	06	18	02				L. G. Fishburne	20	50	Colleton
02	06	19					Franklin Avant	10	20	Colleton
02	01	13	01				Elegebar Corporation	40	80	Colleton

Dual code in Report 03.

APPENDIX B

SUMMARY OF 10 TO 1,000 ACRE LAKES

STREAM CODE							LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (SOUTH CAROLINA)
REPORT NUMBER	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER	FIFTH ORDER				
02	06	20					M. P. Howell	12	38	Colleton
02	01	02					March Plantation	25	37	Colleton
02	01	02					March Plantation	65	97	Colleton
02	01	02					March Plantation	25	37	Colleton
02	01						Chehaw-Combahee Plantation B. R. Smith	80	200	Colleton
02	01						Chehaw-Combahee Plantation B. R. Smith	100	240	Colleton
02	01	04					Paul & Dalton Plantation	300	360	Colleton
02	01						Myrtle Grove Plantation	10	24	Colleton
02	01						Cherokee Plantation	150	300	Colleton
02	01						C. T. Cummings	60	120	Colleton
02	01	13	04				Eddie Mitchell	15	60	Colleton
02	01	13	04				J. J. Padgett	30	120	Colleton
02	02	08	09				A. R. Dupont	15	45	Beaufort
02	02	08	09				Coosaw Plantation	40	100	Beaufort
02	02						Coosaw Plantation	73	180	Beaufort

APPENDIX B

SUMMARY OF 10 TO 1,000 ACRE LAKES

STREAM CODE							LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (SOUTH CAROLINA)
REPORT NUMBER	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER	FIFTH ORDER				
02	02	08	09				Nemours Plantation Eugene Dupont	220	660	Beaufort
02	01						Nemours Plantation Eugene Dupont	30	90	Beaufort
02	01	13	03				J. L. Mixon	24	125	Hampton
02	01	13	05				Kinards Pond	35	230	Hampton
02	01	13	05				Jennys Pond	32	220	Hampton
02	01	13					Dick Thomas	18	90	Hampton
02	01	13	05				Tutems Millpond	175	630	Allendale
02	01	13	05				J. A. Barker	10	40	Allendale
02	01	13	05				W. T. Riley	10	32	Allendale
02	01	13					F. W. Manuel	11	44	Allendale
02	01	13	09				J. C. McMillan	11	35	Allendale
02	01	13	09				J. V. Spigener	15	36	Allendale
02	01	13	04				George Prester Pond	12	48	Bamberg
02	01	13	04				Clear Pond	20	96	Bamberg
02	01	13	04				Town of Bamberg	10	50	Bamberg
02	01	13	04				Town of Denmark	18	90	Bamberg

APPENDIX B

SUMMARY OF 10 TO 1,000 ACRE LAKES

REPORT NUMBER	STREAM CODE: MAJOR RIVER	STREAM CODE: PRIMARY	STREAM CODE: SECONDARY	STREAM CODE: TERTIARY	STREAM CODE: FOURTH ORDER	STREAM CODE: FIFTH ORDER	LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (SOUTH CAROLINA)
02	01	13	04				Fish Pond	--	--	Bamberg
02	01	13	04				Unnamed Lake	--	--	Bamberg
02	01	13	04				Crooked Pond	--	--	Bamberg
02	01	13	04				Unnamed Lake	--	--	Bamberg
02	01	13	04				Clarks Lake	12	60	Bamberg
02	01	13	04				Dobsons	16	39	Bamberg
02	01	13	04				Jacob Hartzog	10	30	Bamberg
02	01	13	04				J. A. Turner	18	50	Bamberg
02	01	13	06				Gorden B. Kearse	10	28	Bamberg
02	01	13	07				L. W. Hiers	20	48	Bamberg
02	01	13	07				Lake Hi-Ki-Pen	10	30	Bamberg
02	01	13	07				W. M. Brant	10	28	Bamberg
02	01	13					C. G. Fuller	52	208	Barnwell
02	01	13	15				Lake Edgar A. Brown	133	426	Barnwell
02	01	13	16				Thompson Bates	11	35	Barnwell
02	01	13	16				Bolen Pond	18	58	Barnwell
02	01	13	17				Andersons Pond	20	72	Barnwell
02	01	13	17				Folk's Pond	24	77	Barnwell

APPENDIX B

SUMMARY OF 10 TO 1,000 ACRE LAKES

STREAM CODE							LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (SOUTH CAROLINA)
REPORT NUMBER	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER	FIFTH ORDER				
02	01	13	17				Bells Mill	--	--	Barnwell
02	01	13	13				Barnwell State Park	20	72	Barnwell
02	01	13	13				Barnwell State Park	12	53	Barnwell
02	01	13	04				Harold Lott	35	112	Barnwell
02	01	16	13				Sister Lake	--	--	Barnwell
02	01	16	13				White Pond	--	--	Barnwell
02	01	16	13				Ditch Pond	--	--	Aiken-Barnwell
02	01	16					Woodward Mill	--	--	Barnwell
02	01	16	09				Unnamed Lake	--	--	Barnwell