

**WATERSHED PLANNING IN
THE ALBEMARLE-PAMLICO
ESTUARINE SYSTEM:**

Fishing Practices Mapping

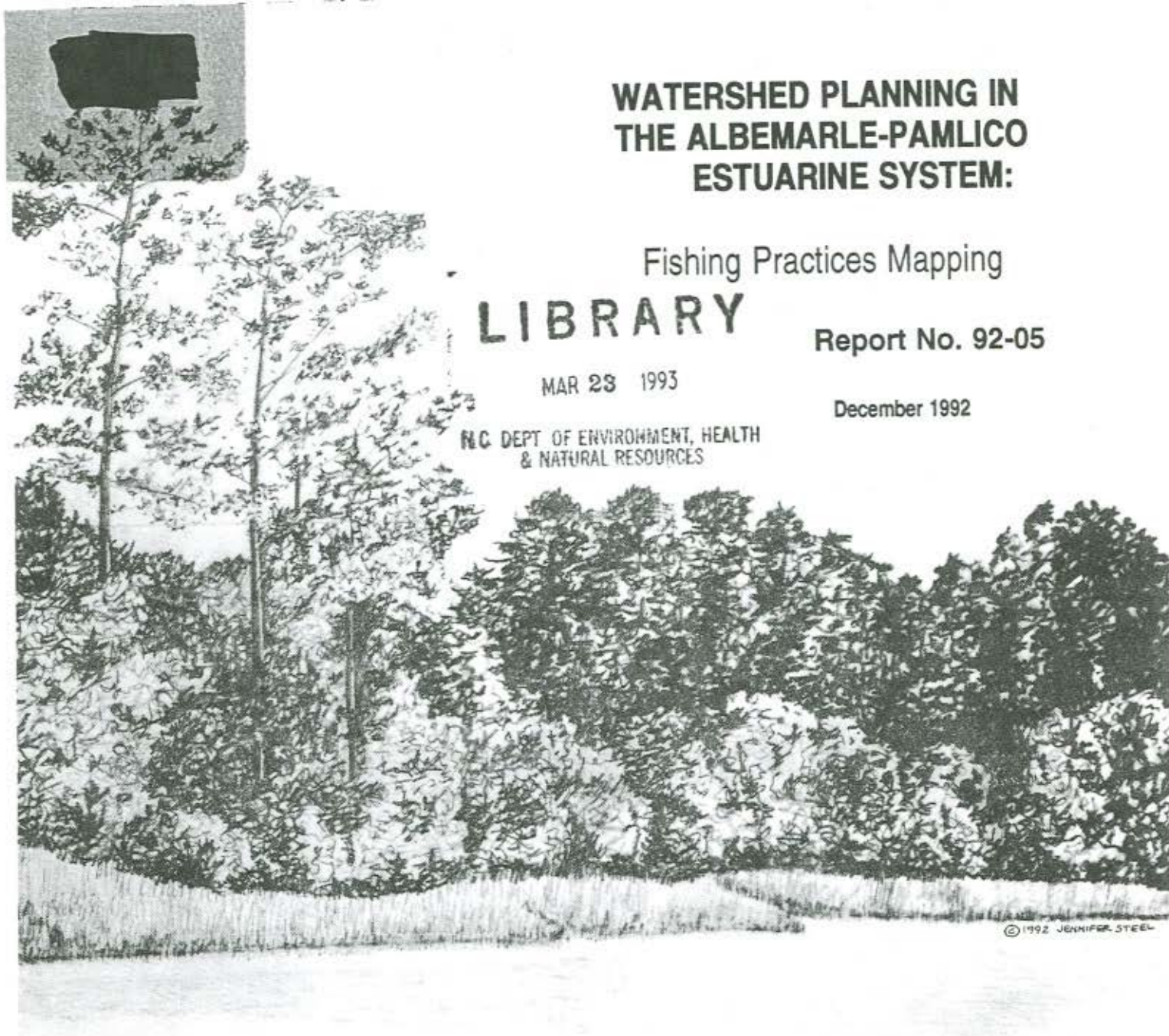
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**ALBEMARLE-PAMLICO
ESTUARINE STUDY**

Department of
Environment, Health,
and Natural Resources



Environmental
Protection Agency
National Estuary Program



**Watershed Planning in the
Albemarle-Pamlico Estuarine System**
Report 5 — Fishing Practices Mapping

by

**Research Triangle Institute
Research Triangle Park, NC**

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"The research on which this report is based was financed in part by the United States Environmental Protection Agency and the North Carolina Department of Environment, Health, and Natural Resources, through the Albemarle-Pamlico Estuarine Study."

"Contents of the publication do not necessarily reflect the views and policies of the United States Environmental Protection Agency, the North Carolina Department of Environment, Health, and Natural Resources, nor does mention of trade names or commercial products constitute their endorsement by the United States or North Carolina Governments."

PREFACE

This report is the fifth in a series of nine reports by Research Triangle Institute (RTI) to support watershed planning and the Comprehensive Conservation and Management Plan for the Albemarle-Pamlico (A/P) Estuarine Study Area. This work is being done under Cooperative Agreement No. C-14010 between RTI and the State of North Carolina Department of Environment, Health, and Natural Resources and the U.S. Environmental Protection Agency (EPA), Region 4.

Current plans call for the report series to include the following:

- Annual Average Nutrient Budgets
- Groundwater Discharge and Groundwater Quality
- Toxics Analysis
- A Subbasin PC Database
- Fishing Practices Mapping
- Subbasin Profiles and Critical Areas
- Geographic Targeting for Nonpoint Source Programs
- Future Nutrient Loading Scenarios and Target Nutrient Reductions
- Nutrient Mass Balances.

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ACKNOWLEDGMENTS

The authors wish to thank the following individuals for their assistance during the course of this project:

- William Hogarth, Michael Street, Chris Wilson, James Monaghan, Michael Marshall, Mike Pulley, Wayne Cuthrell, Jack Guthrie, David Taylor, and Jeff French of the North Carolina Division of Marine Fisheries
- Randy Waite and Jennifer Steel of the Albemarle Pamlico Estuarine Study
- Zsolt Nagy of the North Carolina Center for Geographic Information and Analysis.

EXECUTIVE SUMMARY

The Albemarle-Pamlico (A/P) estuarine system is one of 17 estuaries identified nationwide under EPA's National Estuary Program. This report presents the results of a project to map current fishing practice areas in the A/P estuarine system, one of several efforts by Research Triangle Institute (RTI) to support State watershed planning in the A/P Study Area. Major waterbodies of the A/P estuarine system are shown in Figure ES-1. This work was performed under contract to the North Carolina Department of Environment, Health and Natural Resources and the U.S. Environmental Protection Agency (EPA), Region 4.

The main purposes of this project were to

- Identify major finfishing and shellfishing practices
- Describe gear used in these practices
- Identify equipment and harvest restrictions currently in force to manage these practices
- Use Geographic Information System (GIS) technology to display the extent of each fishing practice area in graphical (map) form for further analysis and management action by State agencies.

This joint project was conducted by RTI in conjunction with staff of the North Carolina Division of Marine Fisheries (DMF). RTI reviewed various sources of information on fishing practices in the A/P estuarine system and worked closely with DMF staff at the Morehead City, Elizabeth City, Washington, and Manteo offices to identify fishing practices for inclusion in this report. The reader should note that this report is not an all-inclusive summary of fishing practices currently used in the A/P Study Area. It is, rather, a first attempt to create a GIS database of fishing practice areas that DMF staff can expand, update, or modify as needed.

RTI converted hard copies of fishing practice area maps marked by DMF staff into GIS data layers. The GIS technology was employed so that geographic locational information on fishing practice areas could be integrated with other GIS data layers (e.g., toxics contamination, marina development, shellfish harvesting closures, algal blooms, and fish consumption advisories) to assist DMF staff in developing future strategies for fisheries resource management. Fishing practice area maps developed as part of this project are available in the centralized A/P Study database archived in the NC Center for Geographic Information and Analysis (NCCGIA) in Raleigh.

In addition to fisheries resource managers, researchers, private interest groups, public officials, and the general public can also derive useful information on fishing practice areas identified in this report either through direct access of the GIS database or through use of the hard copy maps provided in this report. However, because of the dynamic nature of both the regulations and proclamations that may be issued concerning the fishing practices described, it is important that all users contact the DMF to obtain current information on regulations for each fishing practice.

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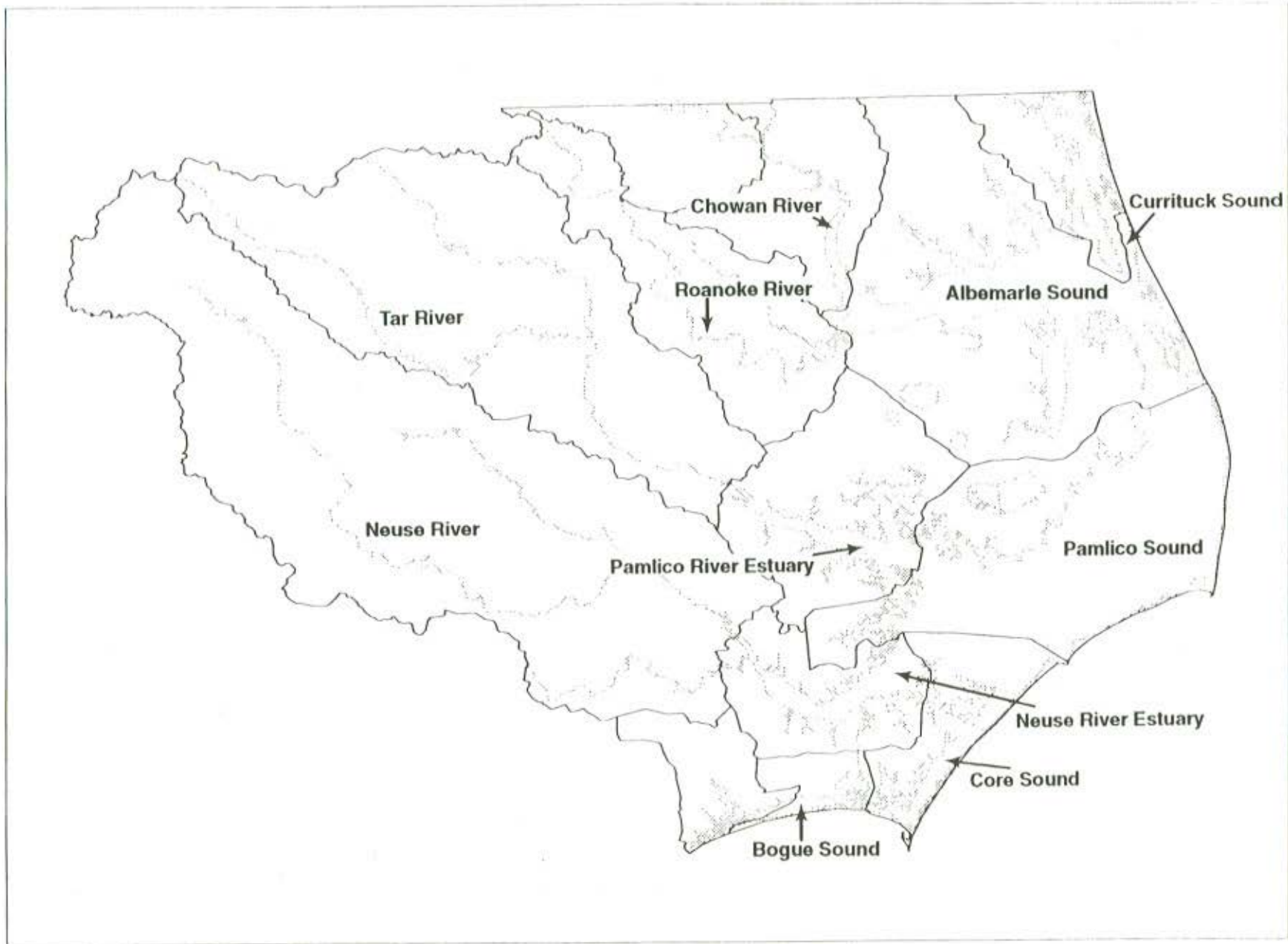


Figure ES-1. Major waterbodies of the Albemarle-Pamlico Study Area within North Carolina.

Introduction

INTRODUCTION

The Albemarle-Pamlico (A/P) Estuary is the second largest estuarine complex in the United States and the third largest in North America. Fishery resources of the A/P Estuary are important natural and economic resources to the State of North Carolina and the Southeast region. This system functions not only as a major fishing area for finfish, crustaceans, and molluscs but also provides essential nursery habitat for species that migrate along the entire Atlantic Coast. About 90 percent of the North Carolina commercial landings are composed of estuarine-dependent species (Epperly and Ross, 1986). In recognition of the national and regional importance of this estuarine system and because of growing concerns about the potential adverse influence of human activities on the system, the A/P Estuary was identified as one of 17 sites for intensive study under the Environmental Protection Agency's National Estuary Program in 1986.

Serious concerns developed during the 1980s over the quantity and quality of North Carolina's commercial and recreational fisheries. Declines in landings of some important species as well as the appearance of pathologic conditions (e.g., fin erosion and shell disease) were noted during this period. Potential causes for these conditions include water quality degradation, estuarine and wetland habitat modification or loss, overfishing, and environmental impacts of various fishing practices. An integrated analysis of existing data was needed to clarify the potential causes of these fisheries problems.

One result of the designation of the A/P Estuary System as part of the National Estuary Program was the initiation of a concerted effort to consolidate a variety of environmental data into a centralized database. The decision was made to use Geographic Information System (GIS) technology and capabilities of the North Carolina Center for Geographic Information and Analysis (NCCGIA) located in Raleigh, North Carolina, to house this central database and make the data layers available to resource managers, State officials, researchers, private interest groups, and the general public. The GIS provides a tool for integrating spatial information in different databases using both cartographic layers and attribute files to assist in development of environmental management alternatives and strategies. Prior to this project, no comprehensive GIS data layers existed for identification of fish and shellfish harvest areas in the A/P Study Area. This information is critical for resource management if future fisheries resources are to be protected from various anthropogenic impacts.

GIS data layers are available that identify primary and secondary nursery areas, toxic "hot spots," where high concentrations of toxic pollutants in point source effluents, ambient water, sediment, and fish and shellfish tissues have been detected; that provide estimates of nitrogen and phosphorus loadings from both point and nonpoint sources; and that identify locations of marinas, Superfund sites, landfill sites, and hazardous waste sites that may potentially degrade surface water quality. Development of maps identifying the locations of various fishing and shellfishing harvest areas would enable State resource managers to correlate harvest area data with these and other GIS information layers.

The primary purpose of this project was to map the areas where specific fishing practices are conducted. The practices summarized in this report cover major commercial and recreational fishing practices that have been used in the area over the past decade

(1982-1992). These maps are included in this report and are archived in the GIS database maintained by the NCCGIA. Staff members of the North Carolina Division of Marine Fisheries (DMF) in the various regional offices within the A/P estuarine system provided all information on the location of individual fishing practice areas. The digitized library of maps created by this project will be used, added to, and revised by the DMF as future resource management strategies are modified to best protect the State's fish and shellfish resources.

The information in this report is presented in two major sections—shellfishing practices and finfishing practices. Shellfishing practices include hand and mechanical harvesting methods associated with hard clam, bay scallop, oyster, blue crab, and penaeid shrimp fisheries. Finfishing practices include passive harvest methods (i.e., pound nets, gill nets, fish pots, and trotline fishing) and active harvest methods (i.e., long haul seines or swipe nets and hook-and-line fishing).

For each fishing practice, the following information is provided:

- Description of the fishing gear (including illustrations)
- Use of the gear
- Areas where the gear is currently deployed
- Fisheries management regulations and restrictions associated with the harvesting practice (summary table).

It is important for the reader to understand that harvest areas as well as regulations and restrictions governing each fishing practice are dynamic in nature and are therefore subject to change to either protect and manage specific fisheries resources or to better protect the general public from health hazards associated with the consumption of contaminated fish and shellfish. All users of this document and its associated database maintained by the NCCGIA should contact DMF staff to obtain copies of current fishing regulations, restrictions, and shellfish harvest area closures and fish consumption advisories for the A/P Study Area.

***Shellfish Harvesting
Practices***

SHELLFISH HARVESTING PRACTICES

Hard Clams

Hard clams (*Mercenaria mercenaria*) are both a commercial and recreational resource harvested in the A/P estuarine region by five distinct methods: raking, bull raking, and tonging (hand harvest methods) and clam kicking and hydraulic dredging (mechanical harvesting methods).

Bay Scallops

Atlantic bay scallops (*Argopecten irradians*) are harvested in the more saline areas of the A/P estuarine region primarily by hand raking and dredging for commercial and personal use. This species is typically found in areas predominated by eelgrass (*Zostera marina*) and shoalgrass (*Halodule wrightii*).

Oysters

Oysters (*Crassostrea virginica*) are both a commercial and recreational fishery resource harvested in the A/P estuarine region by four distinct methods: hand collecting, raking, and tonging (hand harvest methods) and mechanical harvesting using towed dredges.

Blue Crabs

Blue crabs (*Callinectes sapidus*) are both a commercial and recreational fishing resource in the A/P region and are harvested by three methods: one passive harvest method using crab pots and two active harvest methods using towed trawls or dredges.

Shrimp

Three species of penaeid shrimp, white shrimp (*Penaeus setiferus*), brown shrimp (*P. aztecus*), and pink shrimp (*P. duorarum*), are among the primary species harvested in estuarine waters of North Carolina. All three species are of both commercial and recreational value. Brown shrimp account for the largest percentage (69 percent) of the annual catch (Albemarle-Pamlico Estuarine Study, 1991). Harvest practices for shrimp include one passive harvest method (shrimp channel nets) and an active harvest method (shrimp trawls).

Hard Clam Harvesting Practices

Clam Raking

Description

A clam rake is much like a garden rake except the teeth are longer and sharper. It is equipped with a wire mesh basket or apron of net webbing to hold the catch (Figure 1). Clams are taken with rakes in shallow waters up to 4 feet deep. Regular hand rakes have evolved from garden type "pea diggers" to lightweight aluminum models with blade-like stainless steel tines.



Figure 1. Types of clam rakes.

Use

Clams are normally located by pushing the rake forward or "sweeping," analogous to using a push-broom. When a clam is located, usually by feel and sound (both of which are enhanced by the more recent aluminum-handled rakes), the rake is pulled back and pressed down against the clam and then pulled forward and upward, which dislodges the clam. The rake is then lifted and rotated, which rolls the clam into the rake "basket," and the clam is dropped from the rake into a basket or boat.

Clams are also located by "signing," in which one sights the clam's respiratory hole appearing in the bottom sediment or, if the clam is pumping a material of a different shade than the bottom surface, one sights the v- or fan-shaped deposition that is left. Clams thus located are removed with either a regular clam rake, or preferably with a "signer," which is similar to a rake, but only four or five tines wide, so less bottom is disturbed when the clam is dislodged. Large numbers of clams can be taken over a relatively short period of time in this fashion. Large numbers of clams are taken by commercial clammers using this method, which is most effective during rising tides.

Equipment and harvesting restrictions for clam raking are summarized in Table 1.

Harvest Area

Raking is used by commercial clammers to take intertidal clams during all tidal stages but is generally used by recreational clammers during periods of low tide. Principal fishing areas include portions of the White Oak, North, and Newport Rivers; Bogue, Back, and Core Sounds; and areas around Ocracoke Inlet in eastern Pamlico Sound (Figure 2).

Sources

- Dumont, W.H., and G.T. Sundstrom. 1961. *Commercial Fishing Gear of the United States*. Fish and Wildlife Circular 109. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.
- Street, Michael W. *Comprehensive Report on the Hard Clam (*Mercenaria mercenaria*) Industry in North Carolina*. 1976.

Table 1. Hard Clam Hand Harvesting—Restrictions and Regulations

Months Conducted
Duration: Year round
Peak: June through August
Major Species Targeted
Hard clam <i>Mercenaria mercenaria</i>
Equipment Restrictions or Specifications
None
Harvest Restrictions
<p>15A NCAC 3K .0101 .0101 Prohibited Shellfish Areas/Activities</p> <p>(a) It is unlawful to possess, sell, or take . . . clams . . . from areas which have been designated as prohibited (polluted) by proclamation by the Fisheries Director except as provided in 15A NCAC 3K .0103, .0104, and .0401. The Fisheries Director shall issue such proclamations upon notice by the Division of Health Services of the Department of Human Resources that duly adopted criteria for approved shellfish harvest areas have not been met. The Fisheries Director may reopen any such closed area upon notification from the Division of Environmental Health that duly adopted criteria for approved shellfish harvest areas have been met.</p> <p>Copies of these proclamations and maps of these areas are available upon request at the Division of Marine Fisheries, 3411 Arendell St., Morehead City, NC 28557; 919 726-7021.</p> <p>(b) The Fisheries Director may, by proclamation, close areas to the taking of . . . clams . . . in order to protect the shellfish populations for management purposes or for public health purposes not specified in (a) of this Rule.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p> <p>15A NCAC 3K .0103 .0103 Shellfish/Seed Management Areas</p> <p>(a) It is unlawful to take . . . clams from any Shellfish Management Area which has been closed and posted, except that the Fisheries Director may, by proclamation, open specific areas to allow the taking of . . . clams and may designate time, place, character, or dimensions of any method or equipment that may be employed.</p> <p>(b) It is unlawful to take . . . clams from Seed Management Areas for planting on private bottoms without first obtaining a permit from the Fisheries Director.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p> <p>15A NCAC 3K .0105 .0105 Non-Commercial Harvest of Shellfish</p> <p>(a) It is unlawful for individuals claiming exemption from the . . . clam . . . license required by G.S. 113-154, by reason of non-commercial harvest, to take more than:</p>

(continued)

Table 1. (continued)

Harvest Restrictions (continued)
<p>.0105 Non-Commercial Harvest of Shellfish (continued)</p> <p>(2) One hundred clams per person per day, not to exceed two hundred clams per vessel per day, and</p> <p>(b) A vessel license, as required by G.S. 113-152 for the use of commercial fishing equipment as defined in 15A NCAC 3I .0001 (b) (1) is not required for the non-commercial harvest of shellfish in accordance with limits in Paragraph (a) of this Rule.</p> <p>(c) It is unlawful to take . . . clams on Sundays . . . except:</p> <ol style="list-style-type: none"> (1) During open seasons, and (2) In accordance with limits outlined in Paragraph (a) of this Rule with or without license. (3) . . . clams may also be taken on Sundays . . . during regular open seasons. <p><i>History Note: Statutory Authority G.S. 113-134; 113-152; 113-154; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. February 1, 1992; September 1, 1991.</i></p>
<p>15A NCAC 3K .0106</p> <p>.0106 Taking or Unloading Oysters and Clams on Sunday or at Night</p> <p>(a) It is unlawful to take . . . clams on Sunday, except in accordance with 15A NCAC 3K .0105 (c), or between the hours of sunset and sunrise on any day.</p> <p>(b) It is unlawful to unload . . . clams from any vessel or remove any vessel containing . . . clams from the water on Sunday or between sunset and sunrise on any day except that in New Hanover, Pender, and Brunswick counties, . . . clams may be unloaded until two hours after sunset. . . . clams taken on Sunday under the provisions of 15A NCAC 3K .0105 are exempt from the Sunday unloading prohibition.</p> <p><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>
<p>15A NCAC 3K .0301</p> <p>.0301 Size and Harvest Limit</p> <p>(a) It is unlawful to take, land, or possess aboard a vessel more than 6,250 hard clams per fishing operation from public bottom. It is unlawful to take, possess, sell or purchase any clams (except Rangia or freshwater clams) less than one inch thick except in accordance with 15A NCAC 3K .0305(b). Clams shall be culled where harvested and all clams of less than legal size with their shell, shall be immediately returned to the bottom from which taken. The Fisheries Director and his agents are authorized and empowered to grade all, or any portion, or any combination of portions of the entire quantity of clams being graded and may require seizure and return to public bottom or other disposition as authorized by law of the entire quantity being graded or any portion thereof.</p> <p>(b) For temporary openings made upon the recommendation of Shellfish Sanitation, for maintenance dredging operations, or for relaying of polluted clams to private shellfish bottoms as permitted by 15A NCAC 3K .0104, size and harvest limits established in Paragraph (a) of this Rule and the season and area limitations established in 15A NCAC 3K .0302 may not apply.</p> <p><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>

Source: N.C. Marine Fisheries Commission, 1992.

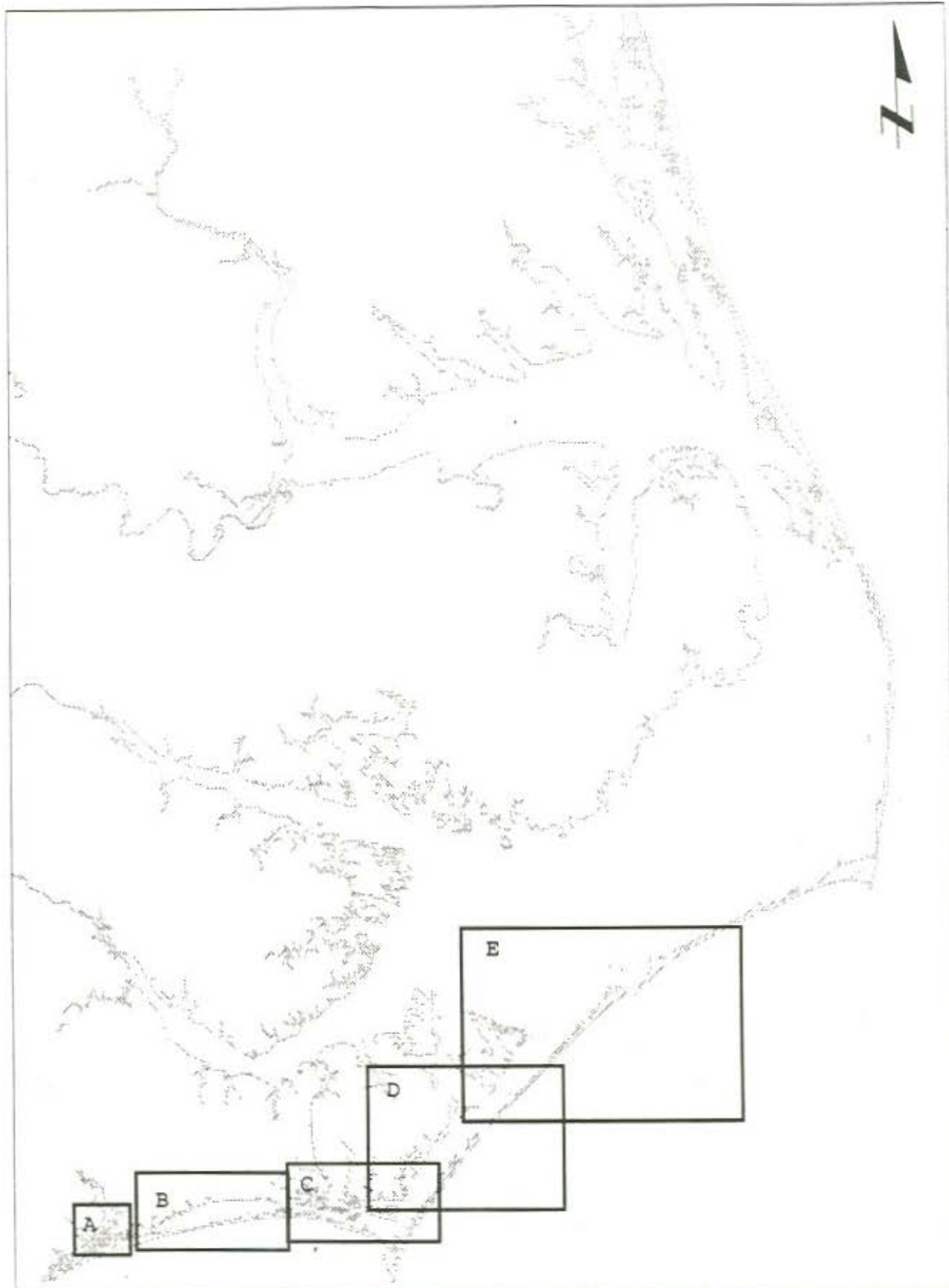


Figure 2. Clam raking harvesting area.

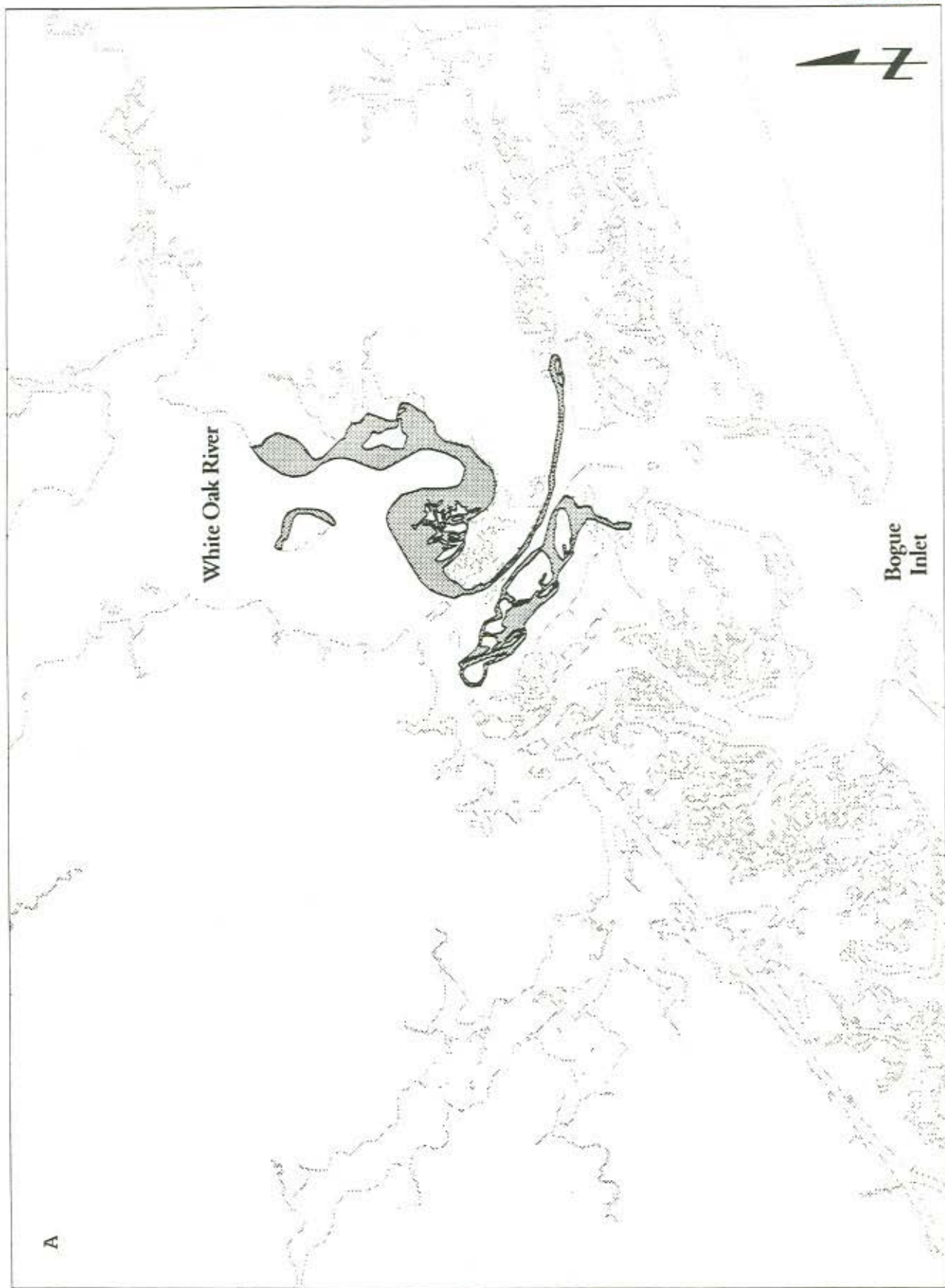


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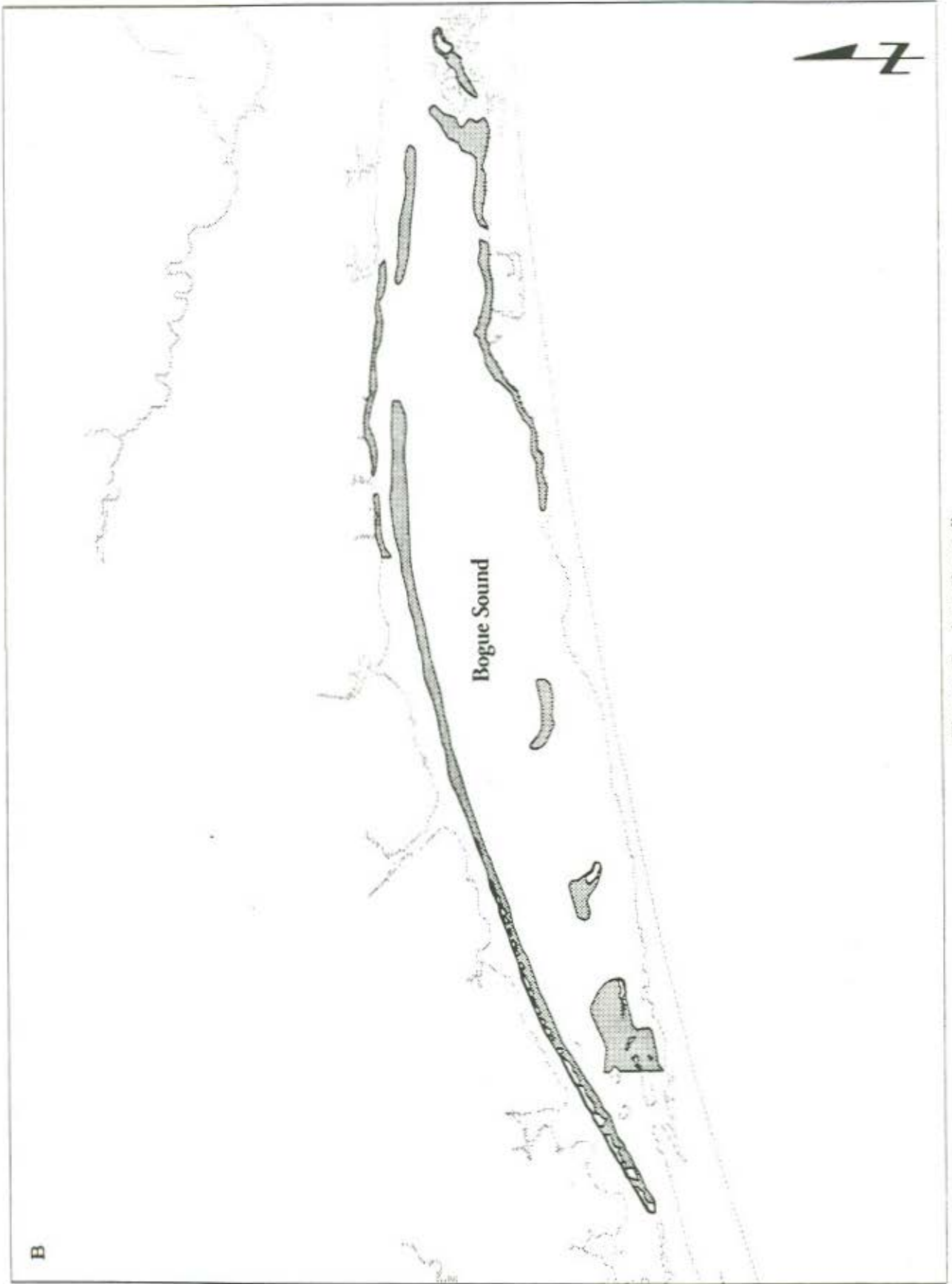


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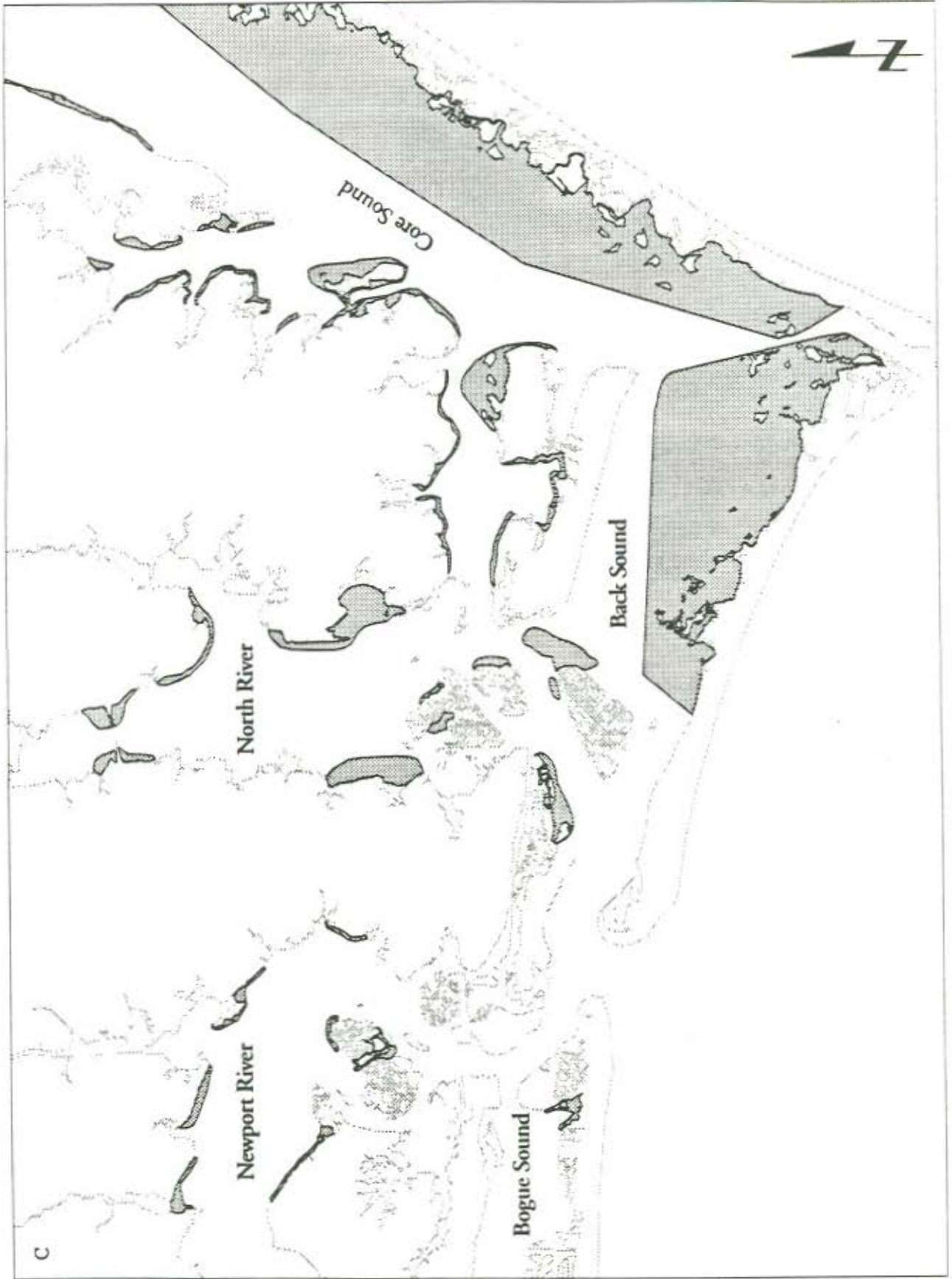


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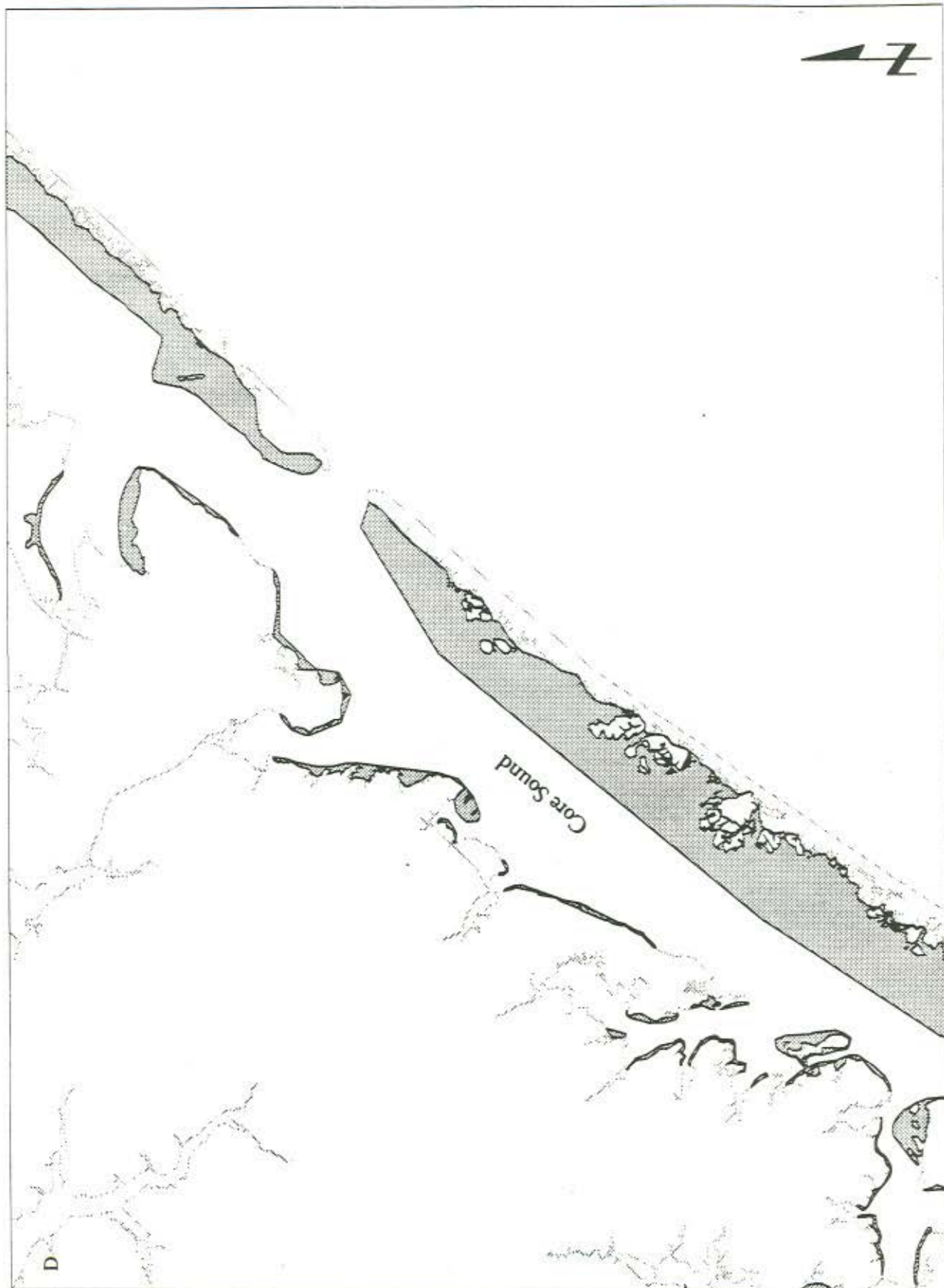


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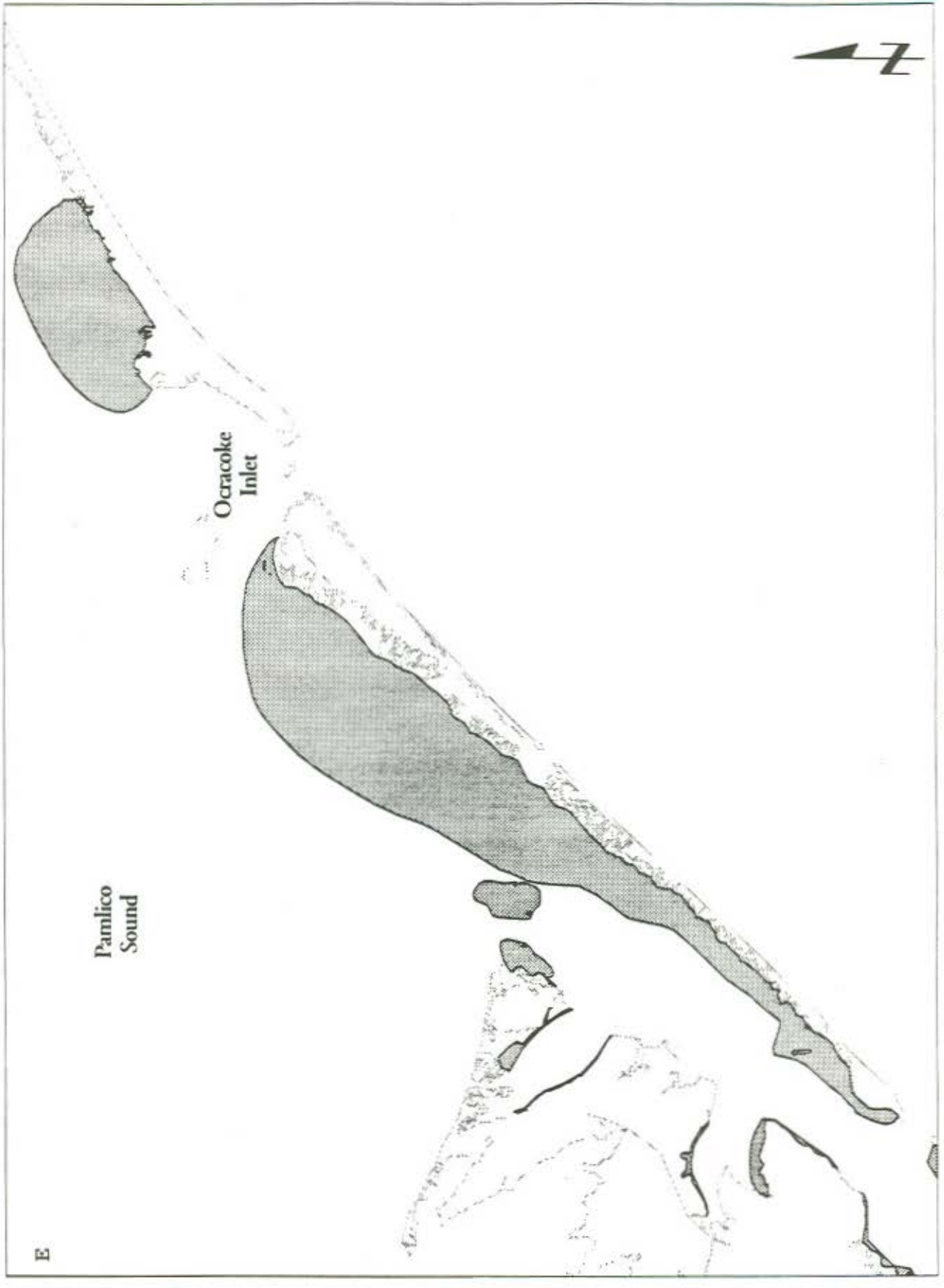


Figure 2. (continued)

Clam Bull Raking

Description

The bull rake is a large implement with a 12- to 30-inch wide head and 9-inch-long curved teeth (Figure 3). The bull rake does not have a basket or apron to trap the catch. Bull rakes have telescoping handles that enable clambers to work in water up to approximately 20 feet deep.



Figure 3. Types of bull rakes.

Use

The bull rake is pulled toward the clammer in short jerks so that the long tines dig into the sediment and dislodge the clams. The clammer frequently brings the bull rake to the surface to empty the catch. Equipment and harvesting restrictions for bull raking are summarized in Table 1.

Harvest Area

Bull rakes are used primarily in the White Oak River, in Bogue Sound, and in Core Sound in the vicinity of Nelson Bay (Figure 4).

Source

Dumont, W.H., and G.T. Sundstrom. 1961. *Commercial Fishing Gear of the United States*. Fish and Wildlife Circular 109. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

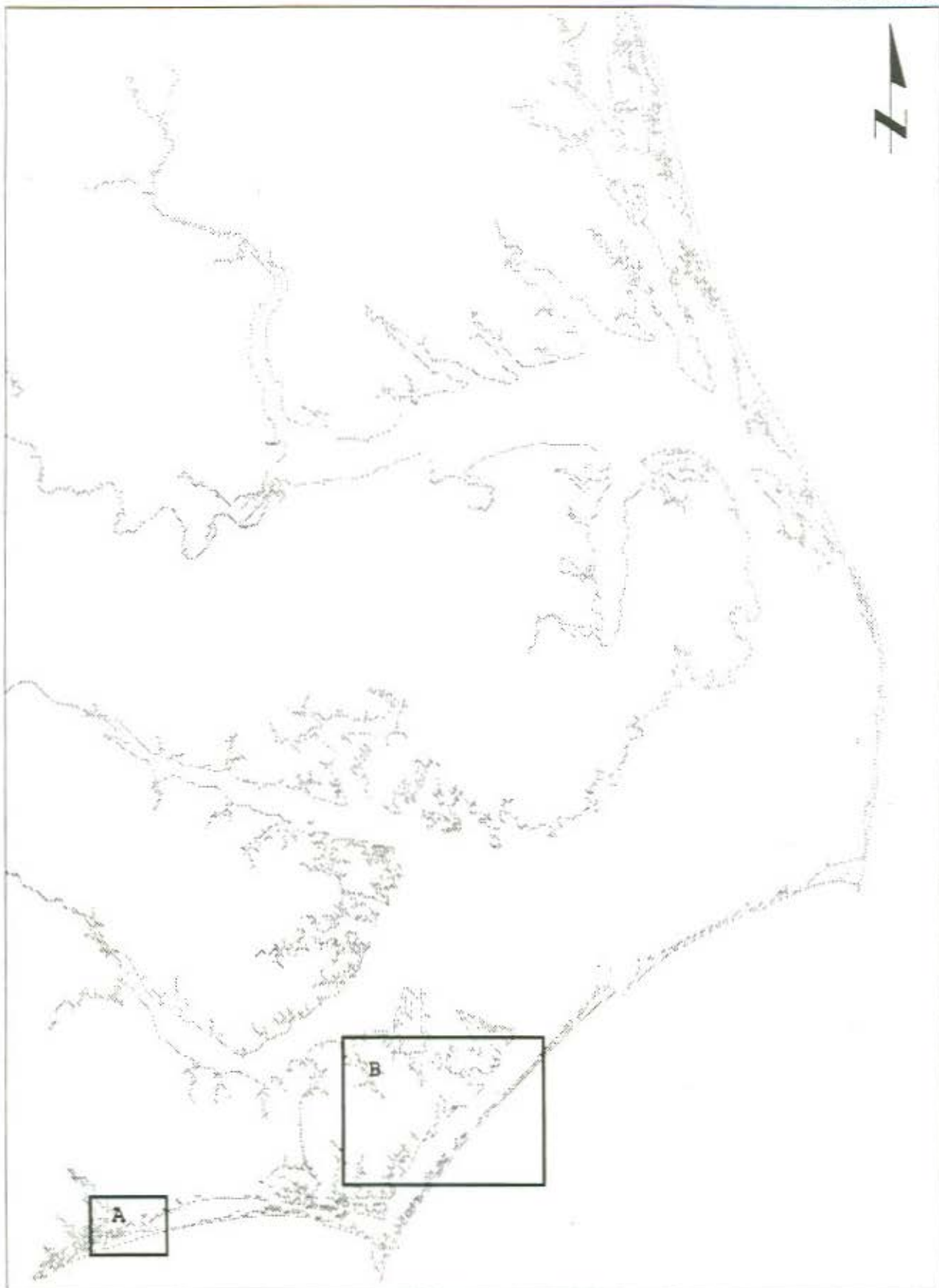


Figure 4. Bull raking harvest area.

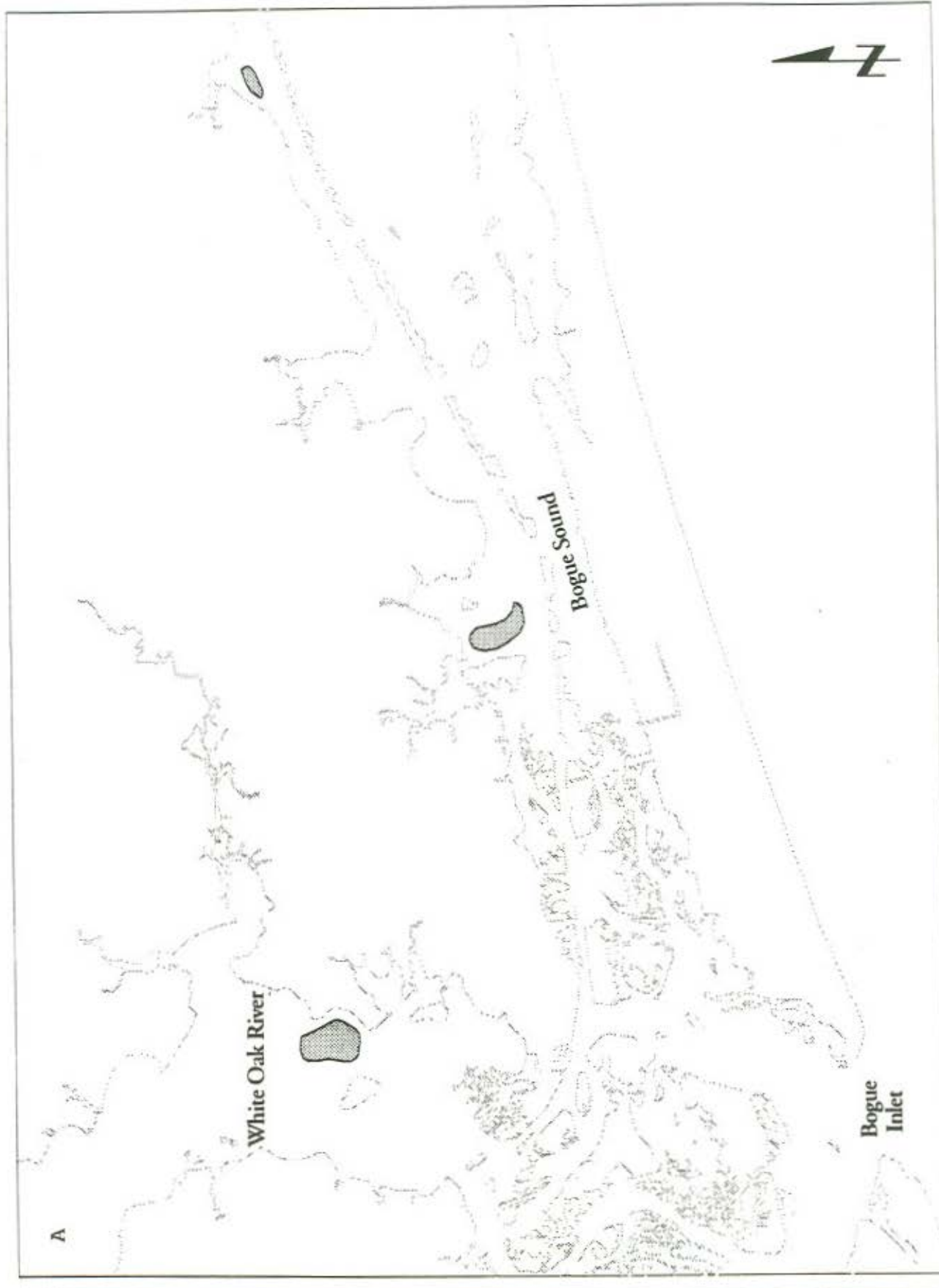


Figure 4. (continued)

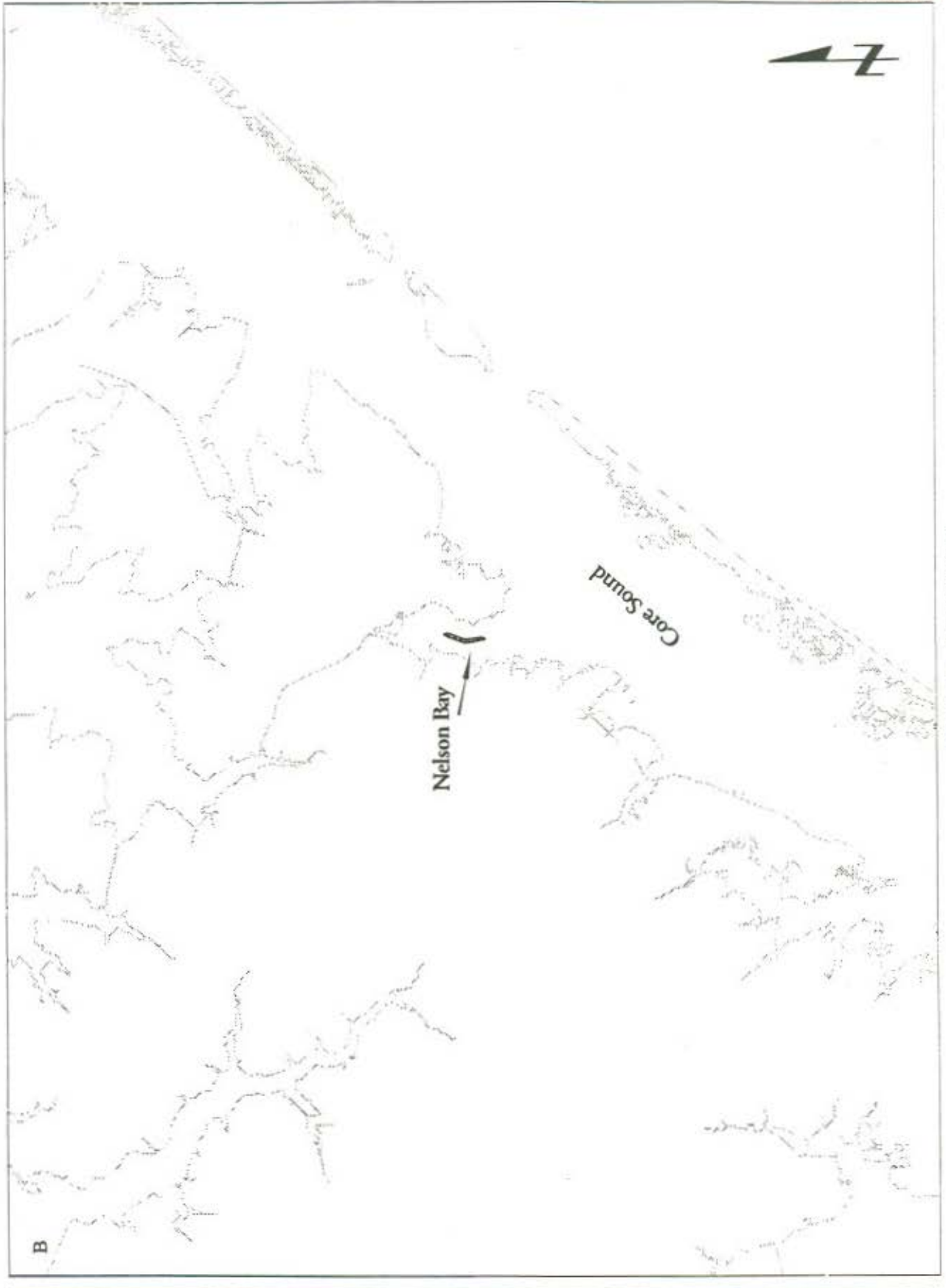
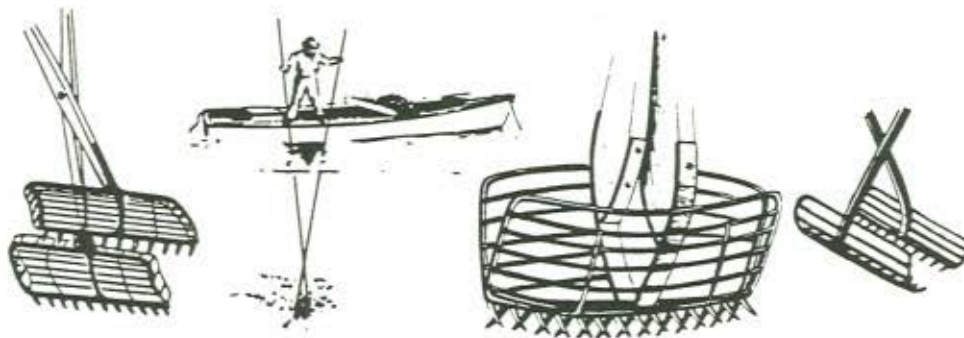


Figure 4. (continued)

Clam TONGING

Description

Clam tongs consist of two long wooden handles (up to 20 feet long) joined together like scissors with the fulcrum at the lower end (Figure 5). Attached to the end of each handle is a rake with teeth on the bottom edge. A basket-like frame for holding the catch is attached to the back side of each rake.



Source: Dumont and Sundstrom, 1961.

Figure 5. Types of clam tongs.

Use

Tonging is performed by a clammer standing in a boat. Tongs are lowered to the bottom and worked back and forth, the teeth digging out clams and the basket holding them. The tongs are raised to the surface frequently to empty the catch. Regulations and restrictions for use of clam tongs are summarized in Table 1.

Harvest Area

Clam tonging is conducted primarily in limited areas of the White Oak, Newport and North Rivers (Figure 6).

Sources

Dumont, W.H., and G.T. Sundstrom. 1961. *Commercial Fishing Gear of the United States*. Fish and Wildlife Circular 109. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Tyler, J., and M. McKenzie. 1969. *To Catch a Million Fish: North Carolina Commercial Fishing Gear and Methods*. North Carolina Department of Conservation and Development, Division of Commercial and Sport Fishing, Raleigh, North Carolina.



Figure 6. Clam tonging harvest area.



Figure 6. (continued)

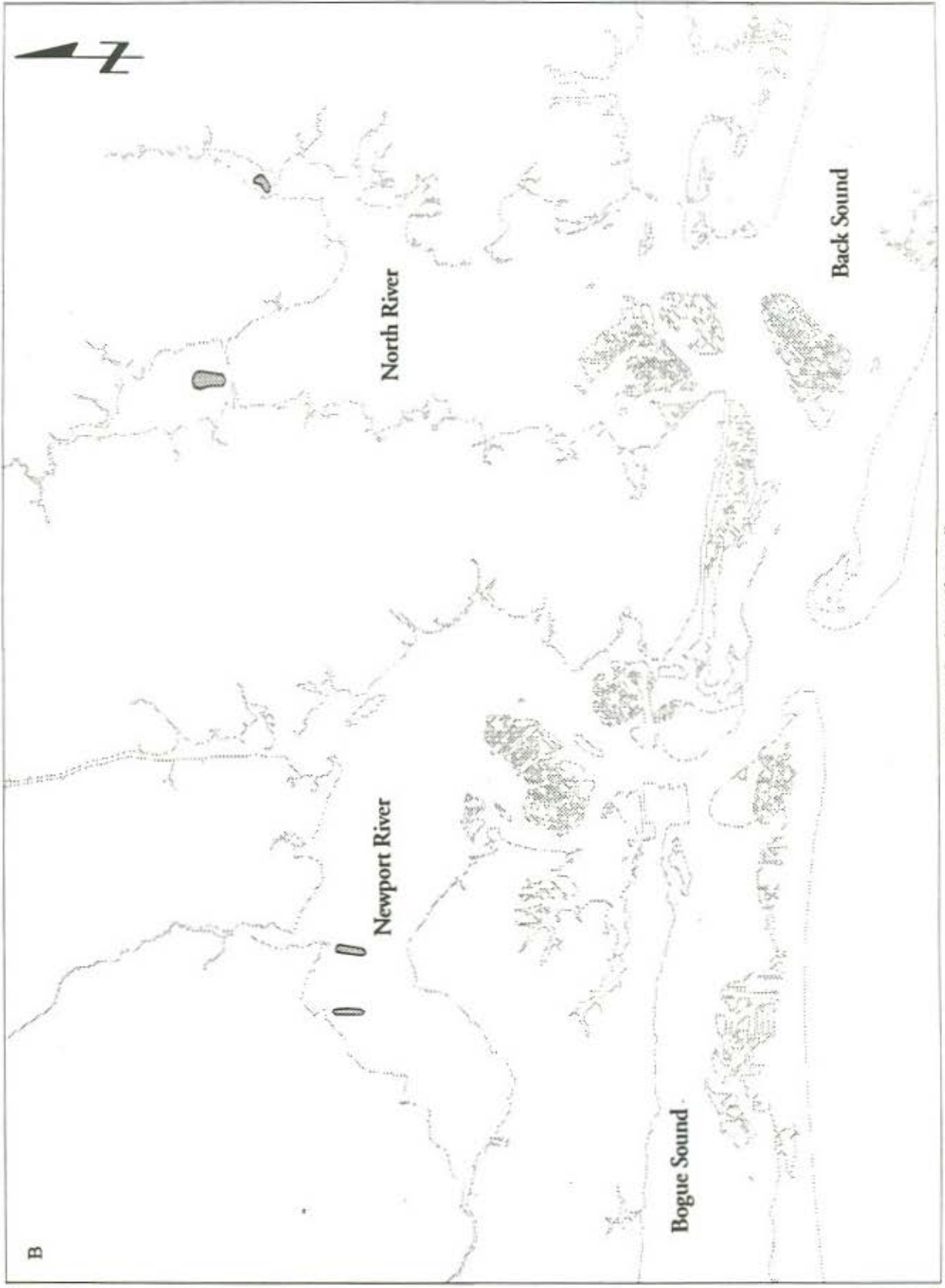


Figure 6. (continued)

Clam Kicking

Description

Clam kicking is a mechanical method of harvesting clams using a towed clam trawl (Figure 7) after dislodging the clams from the sediment with propeller backwash from a 20- to 50-foot-long tow boat. Trawl boards are attached directly to the trawl net, and the gear is fished about 15 feet behind the tow boat (Figure 8). The trawl boards for a 10- to 12-foot trawl are 5 feet by 2 feet. Trawl board and net size vary with the size of the kicking boat and depths of the water fished. Boards for a 20-foot clam trawl may be up to 9 feet by 3-1/2 feet.

A single towing line that runs from the winch through a block on the lower mast is bridled to the trawl boards that keep the mouth of the net open during towing. A lazy line around the cod end of the trawl net runs through a block high on the mast, enabling the whole trawl net to be lifted out of the water for dumping the catch (Figure 8).

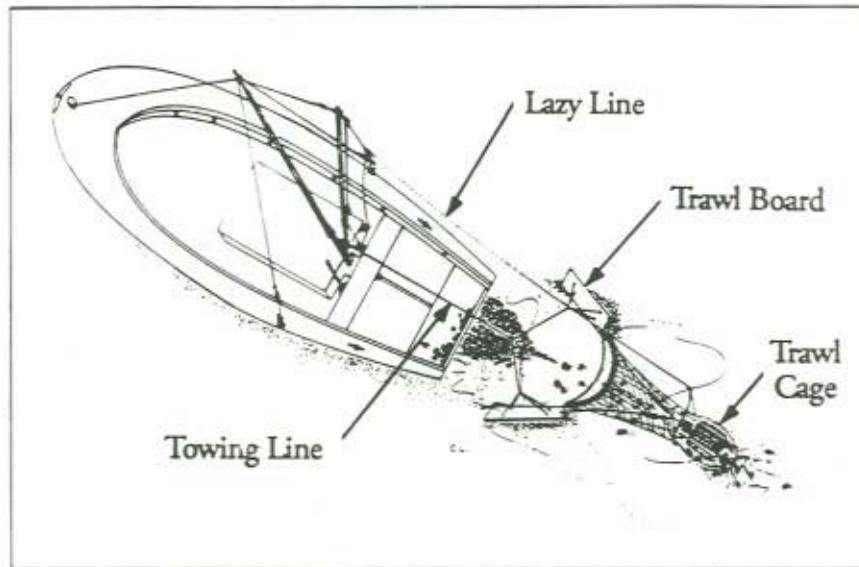
The typical clam trawl designed for a 21-foot boat is 10 to 12 feet long and is hung on 0.5-inch polydacron rope with 72- to 84-strand braided nylon twine. Twine size in the trawl body varies from 42- to 84-strand nylon (rolled or braided). Mesh size varies from 1-1/4-inch bar in the bottom to 3-inch bar in the body. The same twine and mesh size are used in the larger trawls. The net usually is pulled with one or two 2-5/16-inch tickler chains 12 inches ahead of three chains attached to the bottom of the net as a lead line. The three chains (1/2-inch diameter) are hooked together by a series of S-hooks attached directly to the net (Figure 9). A 25-mesh square in the bottom and top of the cod end of the net is usually cut out and replaced by 1-1/4-inch diameter metal rings also held together by S-hooks.

A heavily weighted steel trawl cage placed in the bunt end of the trawl net is pulled behind



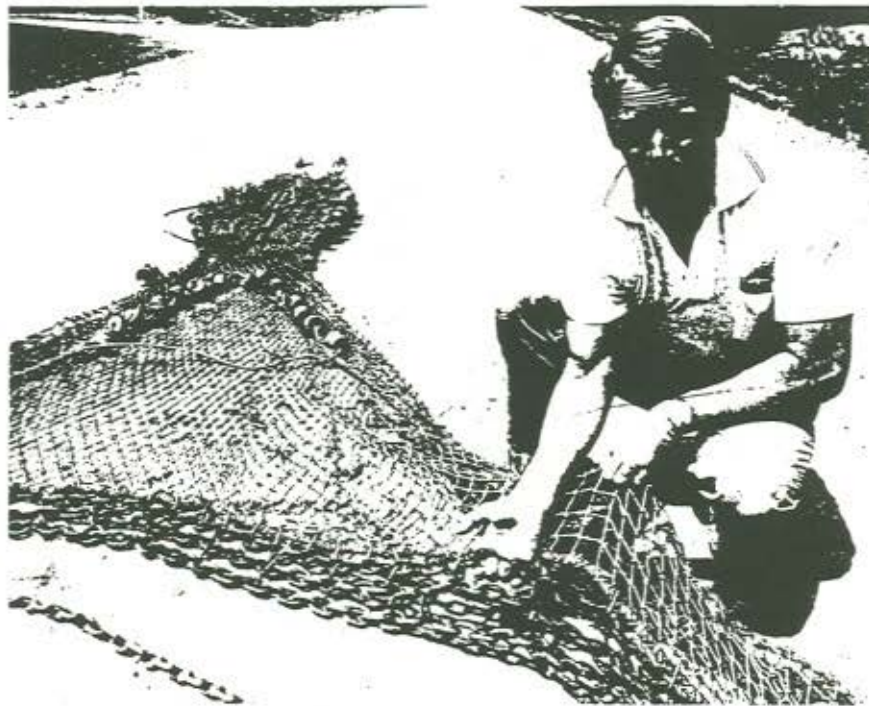
Source: Guthrie and Lewis, 1982.

Figure 7. A clam trawl, with trawl boards attached.



Source: Guthrie and Lewis, 1982.

Figure 8. A boat rigged for clam kicking with the clam trawl.



Source: Guthrie and Lewis, 1982.

Figure 9. Heavy anchor chain attached to lead line of a clam trawl.

a boat to catch clams that are kicked out of the sediment. The trawl cage is a 2- by 3-foot rectangular box made of 3/8-inch steel rod spaced 7/8 inch apart with sled runners underneath (Figure 8). The trawl cage is retrieved periodically to empty the catch into the boat. A latch on the rear door of the trawl cage can be released to dump the contents onto the culling tray on board the boat. The trawl cage was developed and is used by fishermen to cull small clams and shell material from the catch during towing.

Use

Clam kicking is generally restricted to water depths less than 10 feet. Fishermen generally try to position the propeller about 12 to 15 inches above the bottom for most efficient operation. Boats with drafts up to 7 feet can clam in water up to 10 feet deep; boats built with a tunnel for the propeller shaft can clam at depths of 1 to 2 feet. Extra weight can be added to the stern or shifted around on the boat to achieve the optimum propeller angle and depth above the bottom.

For better efficiency in varying water depths, boats are often equipped with a winged rudder (Figure 10). A winged rudder is a rudder to which two iron deflectors have been welded at an angle of about 30°. The deflectors extend about 18 inches on either side of the rudder and bend downward at an angle of about 20° approximately 10 inches from the center post of the rudder. Water from the propeller wash is deflected downward and compensates for the propeller not being at the optimum angle or distance from the bottom.

This clam harvesting method can be used only on shallow sand shoals and is hard on engines because they must operate at high speed to stir up the sediments. Smaller kick boats are operated by one person; larger boats, by a two- or three-person crew. Specifications for the use of mechanical harvesting methods for clams are summarized in Table 2.

It is important to note that, because clam kicking results in production of trenches of varying depths and widths in the bottom sediment that may impact benthic organisms, this



Source: Guthrie and Lewis, 1982.

Figure 10. The winged rudder, used to deflect propeller backwash to the bottom.

harvesting method is strictly regulated by the Marine Fisheries Commission, and only limited areas are open for harvesting each year during the winter months.

Harvest Area

Principal shellfish harvesting areas where clam kicking is permitted include limited areas of the White Oak, Newport, and North Rivers and the northeast portion of Core Sound (Figure 11).

Sources

Guthrie, J.F., and C.W. Lewis. 1982. The Clam-Kicking Fishery of North Carolina. *Marine Fisheries Review* 44(1):16-21.

Street, Michael W. *Comprehensive Report on the Hard Clam (Mercenaria mercenaria) Industry in North Carolina.* 1976.

Table 2. Hard Clam Mechanical Harvesting—Restrictions and Regulations

Months Conducted
Duration: December 1 through March 31 (by proclamation 15A NCAC 3K .0302(b)).
Peak: December
Major Species Targeted
Hard clam <i>Mercenaria mercenaria</i>
Equipment Restrictions or Specifications
<p>15A NCAC 3K .0303 .0303 Mechanical Harvest Permit Requirement</p> <p>(a) It is unlawful to harvest hard clams by the use of mechanical methods from public or private bottom without first obtaining a permit. Permits are valid only in areas, at times, and under conditions specified by the Fisheries Director based on concerns for other fisheries resources in the vicinity of the areas within which such activity is permitted. Such permit may impose conditions and requirements reasonably necessary for management and enforcement purposes.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p> <p>15A NCAC 3K .0304 .0304 Prohibited Taking</p> <p>(a) It is unlawful to take clams by any method, other than by hand tongs, hand rakes, or by hand, except as provided in Rules 15A NCAC 3K .0302 and .0303. Regardless of the areas which may be opened, it is unlawful to take clams by any method other than hand tongs, hand rakes as described in 15A NCAC 3K .0102, or by hand in any live oyster bed, or in any established bed of aquatic vegetation which is defined as those marine and estuarine areas of North Carolina where eelgrass (<i>Zostera marina</i>), shoalgrass (<i>Halodule wrightii</i>), widgeon grass (<i>Ruppia maritima</i>), and smooth or salt water cordgrass (<i>Spartina alterniflora</i>) that may exist together or separately. These vegetation beds occur in both subtidal and intertidal zones, and may occur in isolated patches or cover extensive areas. In either case, the bed is defined by the presence of and consists of entire plants (which during some seasons may be mostly underground) including the above ground leaves and the below ground rhizomes, together with the sediment in which the plant grows.</p> <p>(b) It is unlawful to possess clam trawls or cages aboard a vessel at any time, or have kick/deflector plates normally used in the mechanical harvest of clams affixed to a vessel at any time, except during the time period specified for a mechanical clam harvest season in internal waters in accordance with 15A NCAC 3K .0302 (a). A period of 14 days before and after the season as specified will be allowed for the installation and removal of kick/deflector plates and clam trawls or cages. Vessels with permits for activities provided for in Rules 15A NCAC 3K .0104, .0107, .0303 (a), and .0401 shall be exempt from this rule during the times such activities are permitted.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>

(continued)

Table 2. (continued)

Equipment Restrictions or Specifications (continued)
<p>15A NCAC 3N .0004 .0004 Prohibited Gear, Primary Nursery Areas It is unlawful to use any trawl net, long haul seine, swipe net, dredge or mechanical method for clams . . . , for the purpose of taking any marine fishes in any of the primary nursery areas described in 15A NCAC 3R .0003.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1991.</i></p>
Harvest Restrictions
<p>15A NCAC 3K .0101 .0101 Prohibited Shellfish Areas/Activities (a) It is unlawful to possess, sell, or take . . . clams . . . from areas which have been designated as prohibited (polluted) by proclamation by the Fisheries Director except as provided in 15A NCAC 3K .0103, .0104, and .0401. The Fisheries Director shall issue such proclamations upon notice by the Division of Health Services of the Department of Human Resources that duly adopted criteria for approved shellfish harvest areas have not been met. The Fisheries Director may reopen any such closed area upon notification from the Division of Environmental Health that duly adopted criteria for approved shellfish harvest areas have been met. Copies of these proclamations and maps of these areas are available upon request at the Division of Marine Fisheries, 3411 Arendell St., Morehead City, NC 28557; 919 726-7021. (b) The Fisheries Director may, by proclamation, close areas to the taking of . . . clams . . . in order to protect the shellfish populations for management purposes or for public health purposes not specified in (a) of this Rule.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>
<p>15A NCAC 3K .0103 .0103 Shellfish/Seed Management Areas (a) It is unlawful to take . . . clams from any Shellfish Management Area which has been closed and posted, except that the Fisheries Director may, by proclamation, open specific areas to allow the taking of . . . clams and may designate time, place, character, or dimensions of any method or equipment that may be employed. (b) It is unlawful to take . . . clams from Seed Management Areas for planting on private bottoms without first obtaining a permit from the Fisheries Director.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>
<p>15A NCAC 3K .0106 .0106 Taking or Unloading Oysters and Clams on Sunday or at Night (a) It is unlawful to take . . . clams on Sunday, except in accordance with 15A NCAC 3K .0105 (c), or between the hours of sunset and sunrise on any day.</p>

(continued)

Table 2. (continued)

Harvest Restrictions (continued)**.0106 Taking or Unloading Oysters and Clams on Sunday or at Night (continued)**

(b) It is unlawful to unload . . . clams from any vessel or remove any vessel containing . . . clams from the water on Sunday or between sunset and sunrise on any day except that in New Hanover, Pender, and Brunswick counties, . . . clams may be unloaded until two hours after sunset. . . . clams taken on Sunday under the provisions of 15A NCAC 3K .0105 are exempt from the Sunday unloading prohibition.

*History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4;
Eff. January 1, 1991.*

15A NCAC 3K .0301**.0301 Size and Harvest Limit**

(a) It is unlawful to take, land, or possess aboard a vessel more than 6,250 hard clams per fishing operation from public bottom. It is unlawful to take, possess, sell or purchase any clams (except Rangia or freshwater clams) less than one inch thick except in accordance with 15A NCAC 3K .0305(b). Clams shall be culled where harvested and all clams of less than legal size with their shell, shall be immediately returned to the bottom from which taken. The Fisheries Director and his agents are authorized and empowered to grade all, or any portion, or any combination of portions of the entire quantity of clams being graded and may require seizure and return to public bottom or other disposition as authorized by law of the entire quantity being graded or any portion thereof.

(b) For temporary openings made upon the recommendation of Shellfish Sanitation, for maintenance dredging operations, or for relaying of polluted clams to private shellfish bottoms as permitted by 15A NCAC 3K .0104, size and harvest limits established in Paragraph (a) of this Rule and the season and area limitations established in 15A NCAC 3K .0302 may not apply.

*History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4;
Eff. January 1, 1991.*

15A NCAC 3K .0302**.0302 Mechanical Harvest Season**

(a) It is unlawful to take, buy, sell, or possess any clams taken by mechanical methods from public bottom except that the Fisheries Director may, by proclamation, open and close the season at any time in the Atlantic Ocean and only between December 1 through March 31 in internal waters for the use of mechanical clam harvesting gear. The Fisheries Director is further empowered to impose any or all of the following restrictions:

- (1) specify number of days,
- (2) specify areas,
- (3) specify time period,
- (4) specify quantity and/or size, and
- (5) specify means/methods. Any proclamation specifying means and/or methods must be approved by the Marine Fisheries Commission prior to issuance.

(b) The Fisheries Director may, by proclamation, open only areas in Core and Bogue Sounds, Newport, North, White Oak and New Rivers and the Intracoastal Waterway north of "BC" Marker at Topsail Beach which have been opened at any time from January, 1977, through September, 1988, and the Atlantic Ocean to the harvest of clams by mechanical methods. Other areas opened for purposes as set out in 15A NCAC 3K .0301 (b) will open only for those purposes.

*History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4;
Eff. January 1, 1991.*

Source: N.C. Marine Fisheries Commission, 1992.

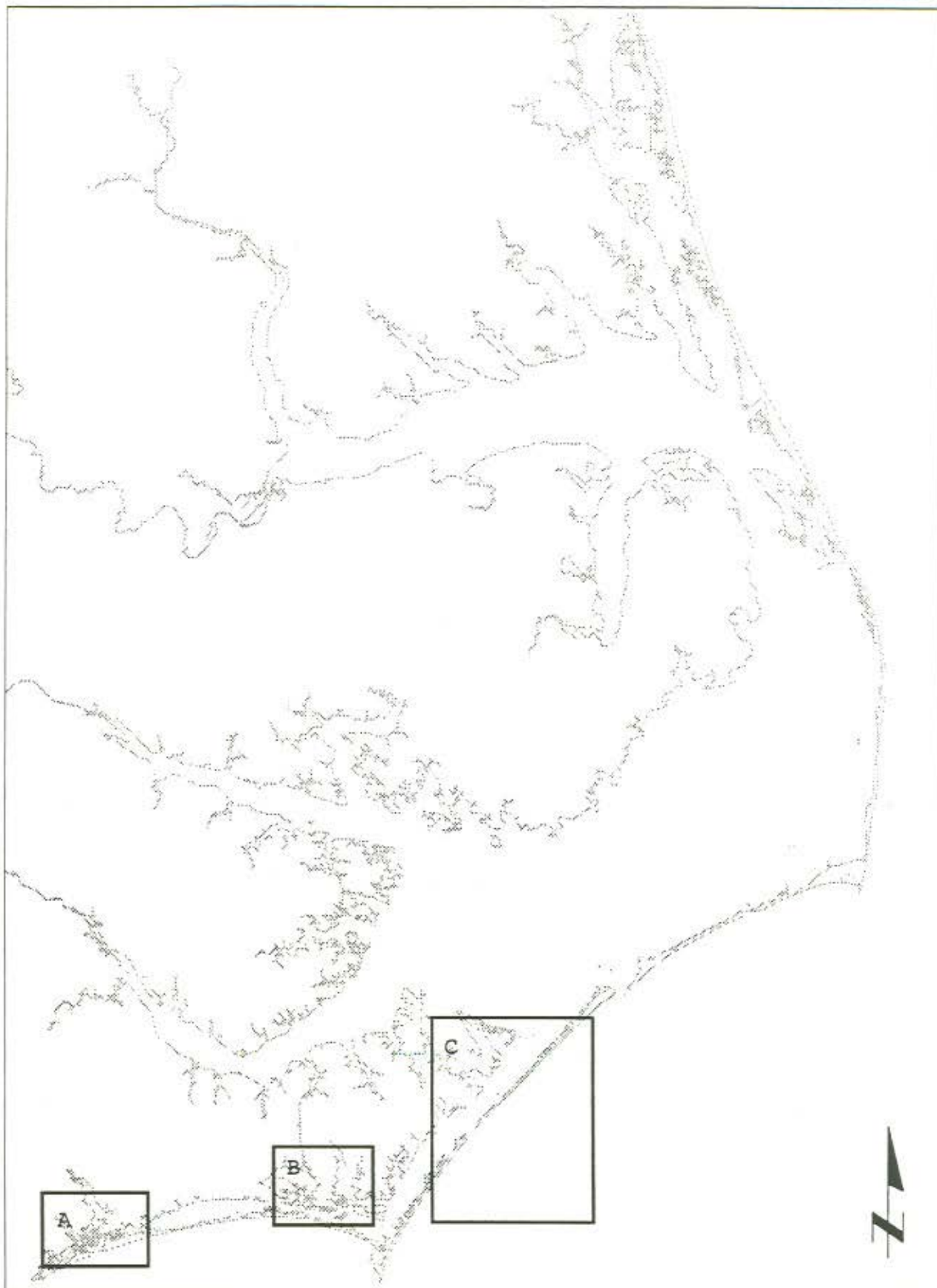


Figure 11. Clam kicking harvest area.

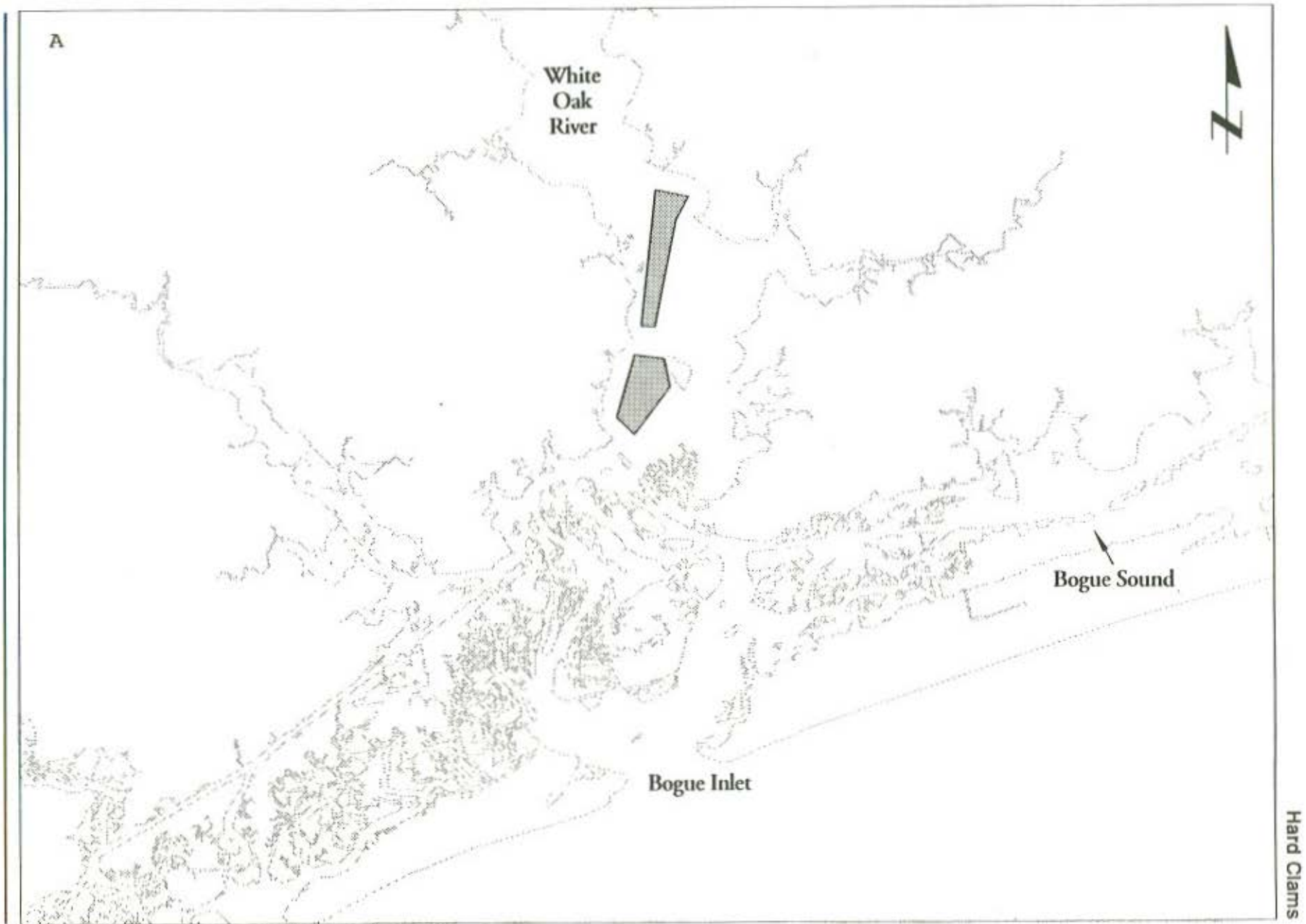


Figure 11. (continued)

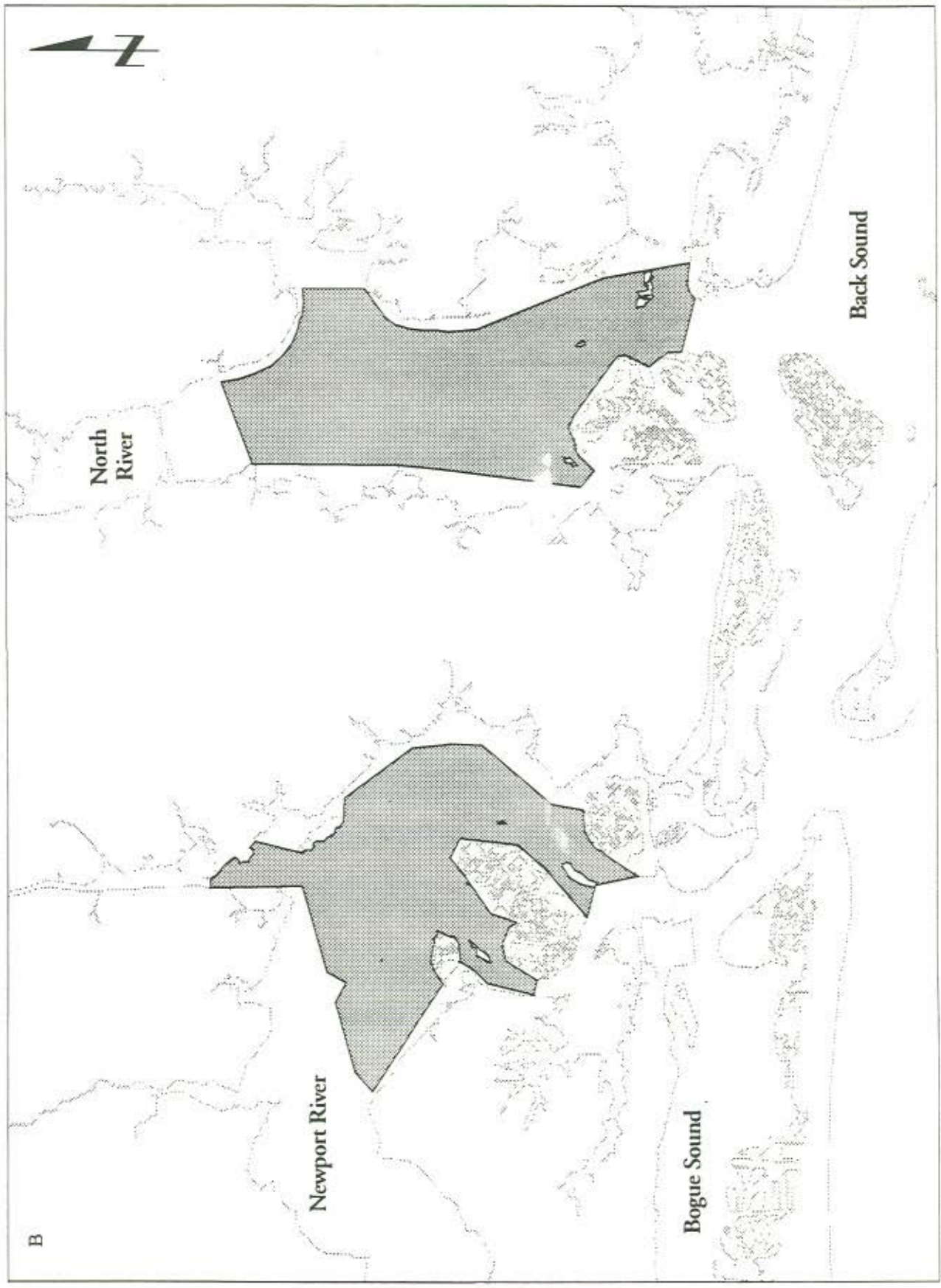


Figure 11. (continued)

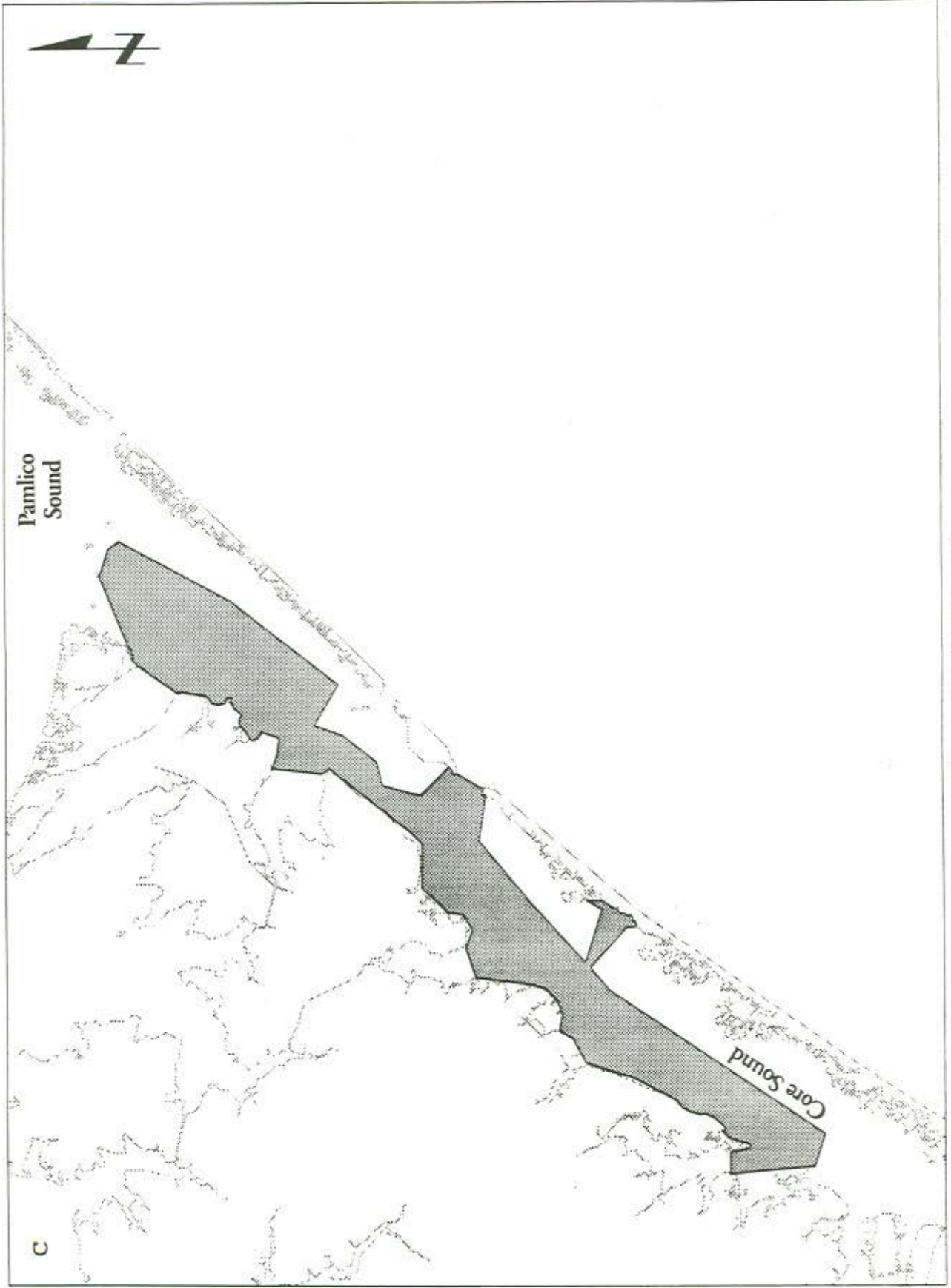
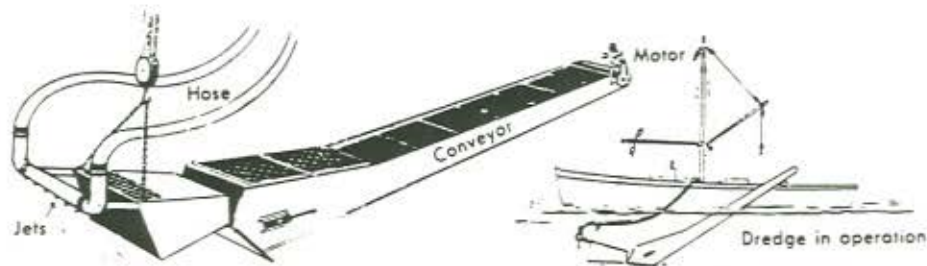


Figure 11. (continued)

Clam Hydraulic Dredging

Description

The hydraulic escalator clam dredge is a metal cage that is pushed along by a boat; high-pressure jets of water located anterior to the dredge mouth wash hard clams out of the sediments. Clams are collected by the tooth bar of the dredge, and a conveyor brings the clams to the surface where the catch is emptied onto the deck of the boat for culling (Figure 12).



Source: Sundstrom, 1957.

Figure 12. Hydraulic escalator dredge with conveyer.

Use

Because these dredges dig trenches of varying depths and widths in the bottom sediment that may have an adverse impact on the entire benthic community, their use is strictly regulated by the Marine Fisheries Commission, and only limited areas are open for mechanical harvesting during winter months.

Hydraulic escalator dredges are generally deployed in shallow waters at depths of 4 to 15 feet. Generally, three or four crew members are needed to operate a hydraulic escalator dredge.

Specifications for the use of hydraulic dredges to harvest clams are summarized in Table 2.

Harvest Area

Principal shellfishing areas where hydraulic dredges are permitted to be used to harvest hard clams in the A/P Study Area include limited areas in the White Oak, Newport, and North Rivers and the northeastern portion of Core Sound (Figure 11).

Sources

Albemarle-Pamlico Estuarine Study. 1991. *Status and Trends Report*. Raleigh, NC.

Dumont, W.H., and G.T. Sundstrom. 1961. *Commercial Fishing Gear of the United States*. Fish and Wildlife Circular 109. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Street, Michael W. *Comprehensive Report on the Hard Clam (Mercenaria mercenaria) Industry in North Carolina*. 1976.

Sundstrom, G.T. 1957. *Commercial Fishing Vessels and Gear*. Fish and Wildlife Circular 48. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Tyler, J., and M. McKenzie. 1969. *To Catch a Million Fish: North Carolina Commercial Fishing Gear and Methods*. North Carolina Department of Conservation and Development, Division of Commercial and Sport Fishing, Raleigh, North Carolina.

Bay Scallop Harvesting Practices

Scallop Hand Harvesting

Description

Bay scallops are hand harvested by two methods in the A/P estuarine area: scallop raking and scooping.

A scallop rake is a hand harvesting device much like a garden rake except the teeth are longer and sharper. It is equipped with a wire mesh basket or apron of net webbing attached to hold the catch (Figure 13). Scallops are taken with rakes in shallow waters up to 4 feet deep. Regular hand rakes have evolved from garden type "pea diggers" to lightweight aluminum models with blade-like stainless steel tines. This hand harvesting method is used by both recreational and commercial harvesters.

The more common method of hand harvesting scallops for commercial purposes employs a scoop. The scoop is a short-handled dip net approximately 5 inches in diameter with a nylon mesh bag attached that can hold from 20 to 30 scallops.



Source: Dumont and Sundstrom, 1961.

Figure 13. Types of scallop rakes.

Use

The scallop rake is pulled toward the harvester so that the long tines dig into the sediment and disturb the scallops. The catch is trapped in the wire mesh basket or net webbing at the base of the tines. The harvester empties the catch frequently into a basket or boat.

The scallop scoop is used by harvesters wading in clear, shallow water. The harvester walks along visually sighting the scallops and dips the net underwater to scoop up the catch. The catch contained in the mesh bag is periodically emptied into a basket or boat.

Equipment and harvest restrictions for scallop raking are summarized in Table 3.

Harvest Area

Rakes and scoops are used principally for taking scallops in the southern coastal area of the A/P estuarine system including areas in Bogue, Back, and Core Sounds (Figure 14), but the range of scallop harvest areas also includes nearshore seagrass beds of the eastern Pamlico Sound from Hatteras north to areas off Avon.

Note: DMF staff are developing more extensive maps for this shellfish harvesting practice.

Source

Dumont, W.H., and G.T. Sundstrom. 1961. *Commercial Fishing Gear of the United States*. Fish and Wildlife Circular 109. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Table 3. Scallop Raking—Restrictions and Regulations

Months Conducted
Duration: Up to 4 days in December and between the second Monday in January and the last Friday in May (by proclamation 15A NCAC 3K .0501 (a)(b)).
Peak: December
Major Species Targeted
Atlantic bay scallop <i>Argopecten irradians</i>
Equipment Restrictions or Specifications
15A NCAC 3K .0102 .0102 Prohibited Rakes. It is unlawful to use a rake more than 12 inches wide or weighing more than six pounds to take . . . scallops. <i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i>
Harvest Restrictions
15A NCAC 3K .0101 .0101 Prohibited Shellfish Areas/Activities (b) The Fisheries Director may, by proclamation, close areas to the taking of . . . scallops . . . in order to protect the shellfish populations for management purposes or for public health purposes not specified in (a) of this Rule. <i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i>
15A NCAC 3K .0105 .0105 Non-Commercial Harvest of Shellfish (a) It is unlawful for individuals claiming exemption from the . . . scallop license required by G.S. 113-154, by reason of non-commercial harvest, to take more than: (3) One-half bushel of scallops per person per day, not to exceed one bushel per vessel per day. (b) A vessel license, as required by G.S. 113-152 for the use of commercial fishing equipment as defined in 15A NCAC 3I .0001 (b) (1) is not required for the non-commercial harvest of shellfish in accordance with limits in Paragraph (a) of this Rule. (c) It is unlawful to take . . . scallops on Saturdays and Sundays except: (1) During open seasons, and (2) In accordance with limits outlined in Paragraph (a) of this rule with or without a license. <i>History Note: Statutory Authority G.S. 113-134; 113-152; 113-154; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. February 1, 1992; September 1, 1991.</i>

(continued)

Table 3. (continued)

Harvest Restrictions (continued)
<p>15A NCAC 3K .0501 .0501 Bay Scallops—Seasons and Harvest Limits</p> <p>(a) The Fisheries Director may, by proclamation, specify open seasons for the taking of bay scallops during the following periods:</p> <ol style="list-style-type: none"> (1) During the month of December for a total of not more than four days; (2) Between the second Monday in January and the last Friday in May; and (3) Between August 1 and September 15 by hand harvest methods only as described by proclamation. <p>(b) The Fisheries Director may impose any or all of the following restrictions during any open season specified:</p> <ol style="list-style-type: none"> (1) Specify number of days; (2) Specify areas; (3) Specify means and methods which may be employed in the taking; (4) Specify time period; and (5) Limit the quantity. <p>(c) For any season provided from December through May, it is unlawful to take more than 20 standard U.S. bushels per person per day or to exceed a total of 40 standard U.S. bushels per day in any combined fishing operation.</p> <p>(d) For any season provided from August 1 through September 15, it is unlawful to take more than 10 standard U.S. bushels per person per day or exceed a total of 20 standard U.S. bushels per day in any combined fishing operation.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p> <p>15A NCAC 3K .0502 .0502 Taking Bay Scallops at Night and on Weekends</p> <p>It is unlawful to take bay scallops between sunset and sunrise, or on Saturdays or Sundays, except as provided in 15A NCAC 3K .0105 (c).</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>

Source: N.C. Marine Fisheries Commission, 1992.

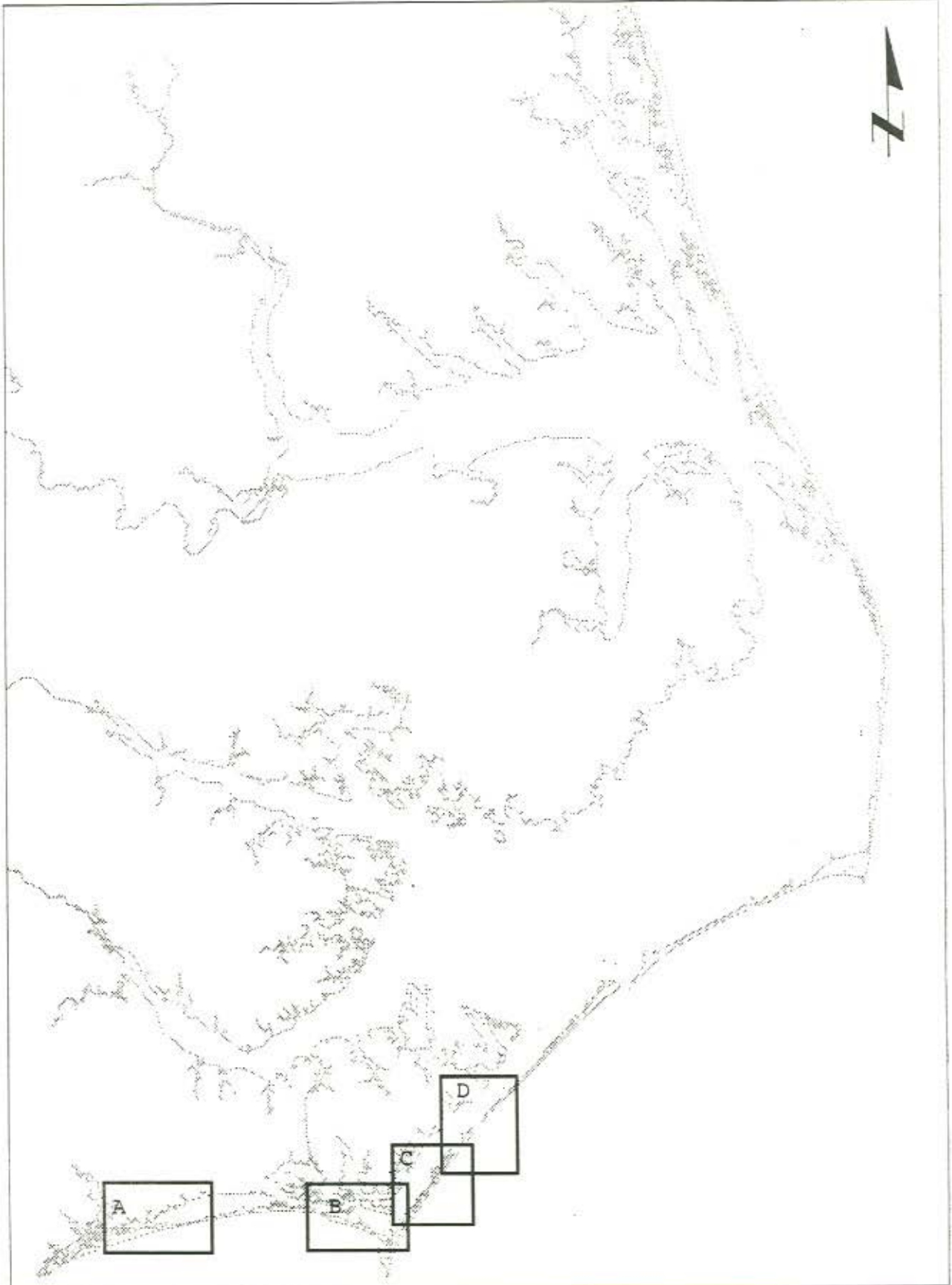


Figure 14. Scallop raking harvest area.

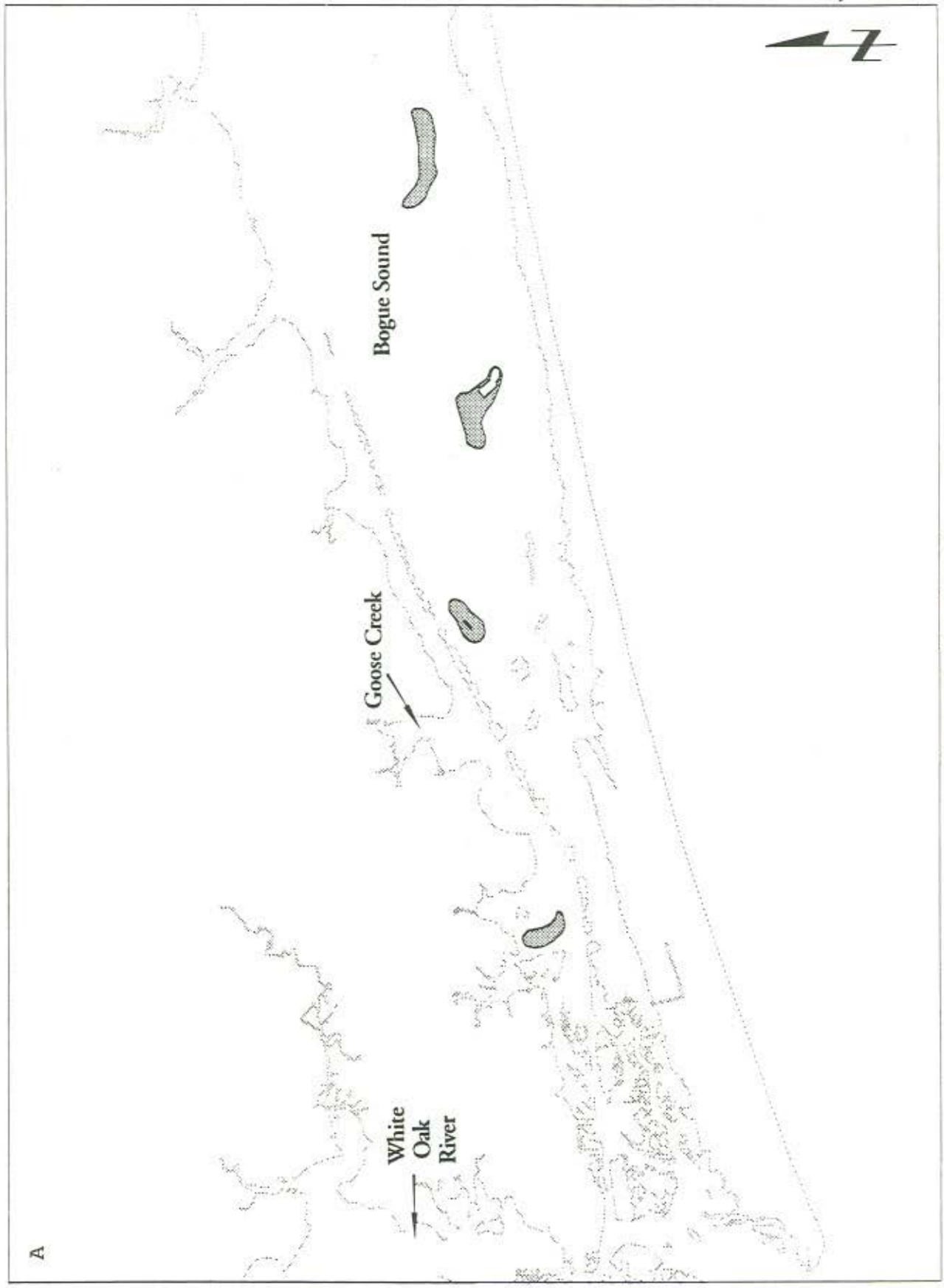


Figure 14. (continued)

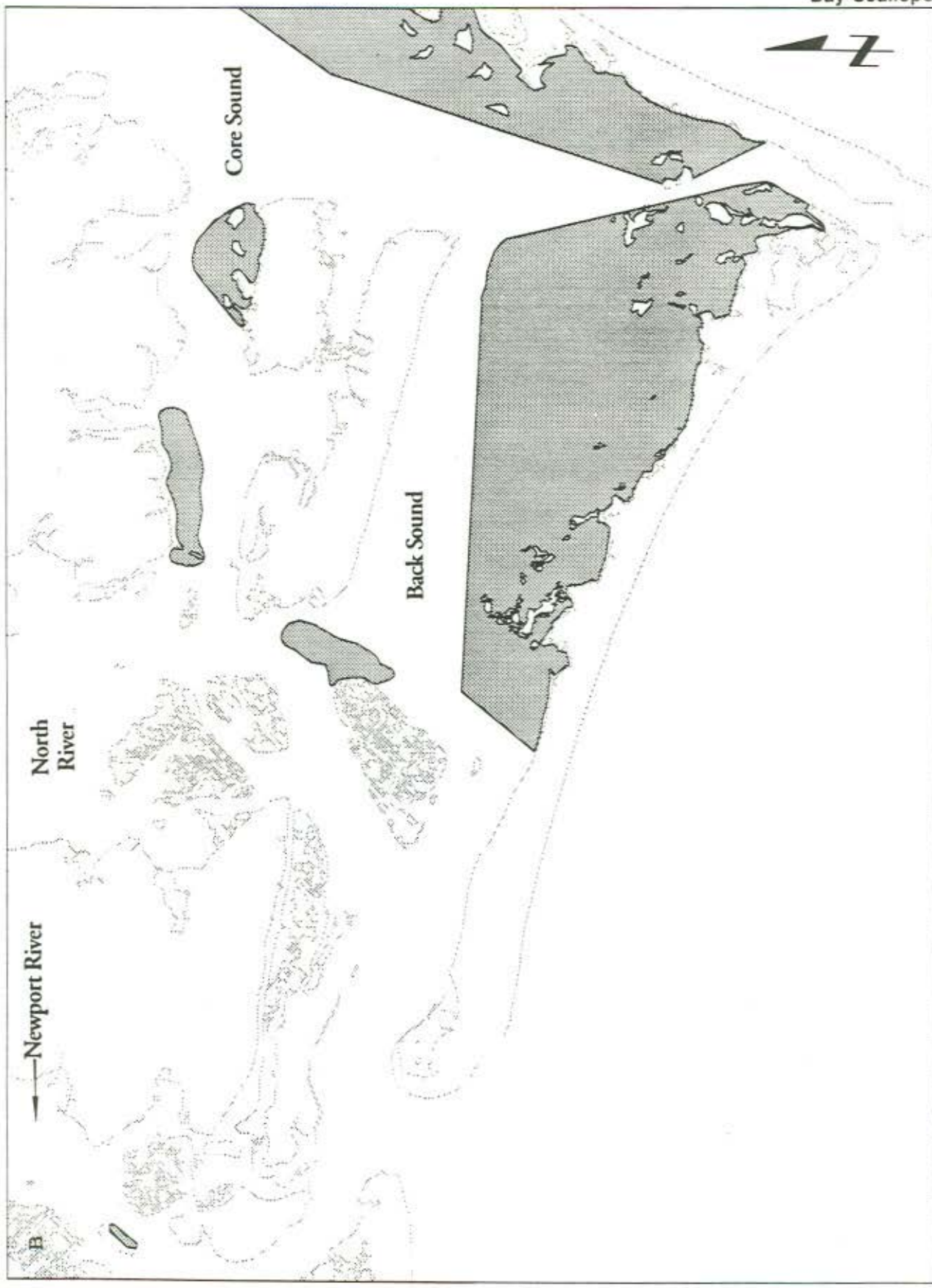


Figure 14. (continued)

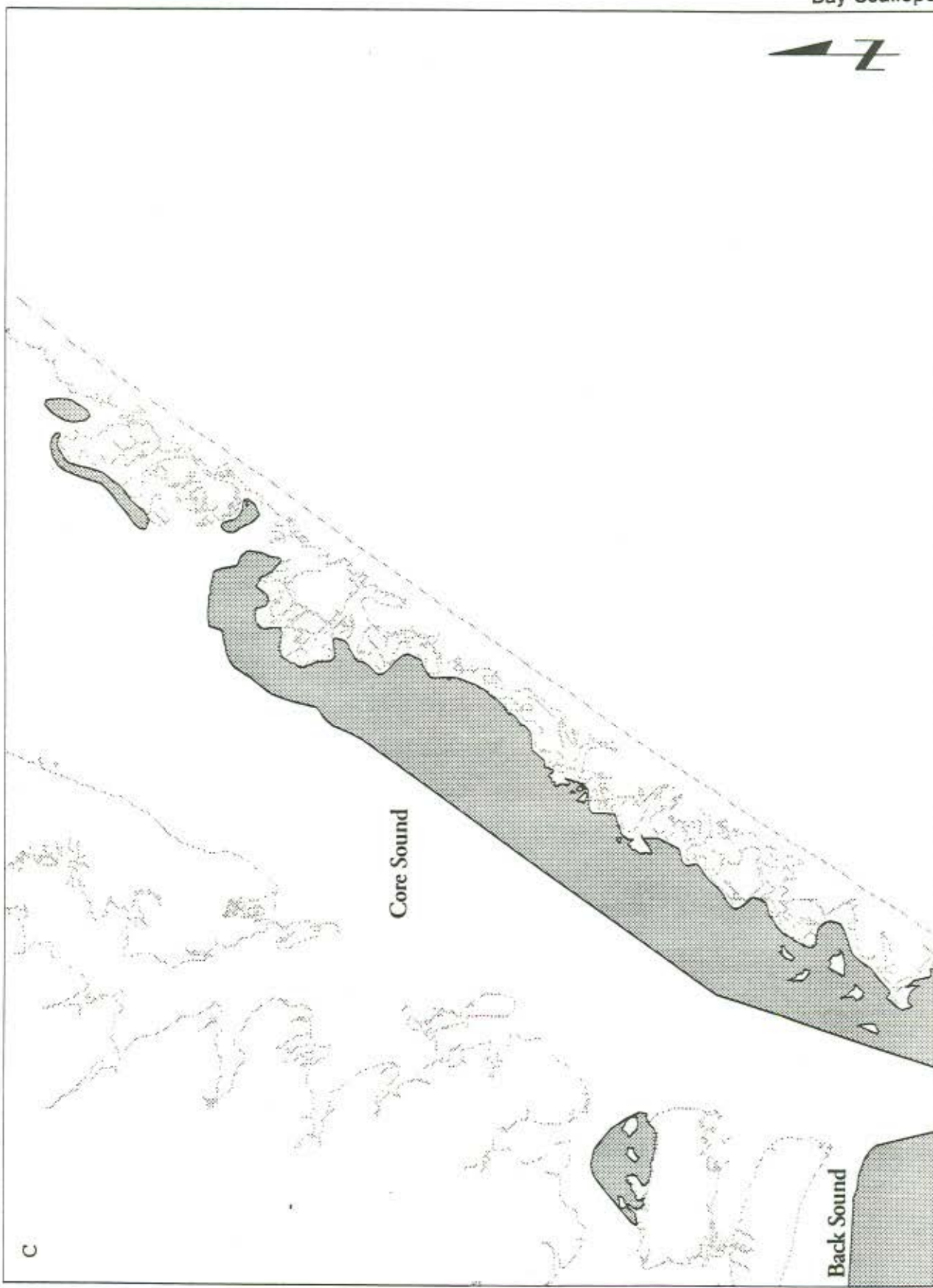


Figure 14. (continued)

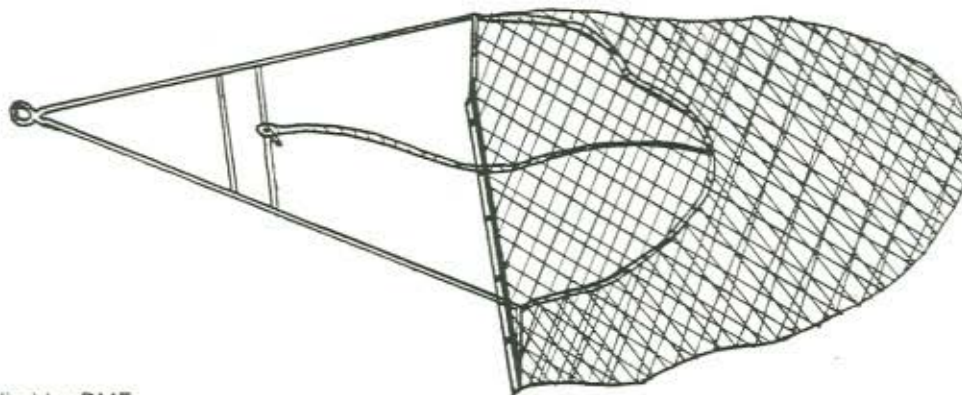


Figure 14. (continued)

Scallop Dredging

Description

A bay scallop dredge is a metal framework to which a baglike pocket of nylon webbing or wire netting is attached (Figure 15). The bay scallop dredge is 3 to 4 feet long and 24 to 30 inches wide and is towed over the bottom by a boat. The entire weight of the dredge may not exceed 50 pounds. The lower edge of a dredge has a raking bar but no teeth. Teeth are unnecessary because scallops lie on the surface of the sediments and do not burrow like hard clams.



Supplied by DMF.

Figure 15. Bay scallop dredge.

Use

One to four dredges may be towed along the bottom behind a boat. As the dredge skims over the surface of the bottom, shellfish are forced into the basket. After a dredge has been towed for a period of time it is hauled on deck, either by hand or power winch depending on the size of the dredge, and the catch is emptied into the boat for culling.

Equipment and harvest restrictions for scallop dredging are summarized in Table 4.

Harvest Area

Principal shellfishing areas where scallop dredging is practiced include the eastern portions of Pamlico Sound from Hatteras to Avon and areas in Bogue, Back, and Core Sounds (Figure 16).

Sources

Dumont, W.H., and G.T. Sundstrom. 1961. *Commercial Fishing Gear of the United States*. Fish and Wildlife Circular 109. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Rounsefell, George A. 1975. *Ecology, Utilization, and Management of Marine Fisheries*. Saint Louis: The C.V. Mosby Company.

Table 4. Scallop Dredging—Restrictions and Regulations

Months Conducted
<p>Duration: Up to 4 days in December and between the second Monday in January and the last Friday in May (by proclamation 15A NCAC 3K .0501 (a)(b)).</p> <p>Peak: December-February</p>
Major Species Targeted
<p>Atlantic bay scallop <i>Argopecten irradians</i></p>
Equipment Restrictions or Specifications
<p>15A NCAC 3K .0503 .0503 Prohibited Bay Scallop Dredge</p> <p>It is unlawful to take bay scallops with dredges weighing more than 50 pounds or equipped with teeth. Any other instrument or device designed to drag the bottom to aid in the taking of bay scallops is also prohibited.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>
Harvest Restrictions
<p>15A NCAC 3K .0101 .0101 Prohibited Shellfish Areas/Activities</p> <p>.....</p> <p>(b) The Fisheries Director may, by proclamation, close areas to the taking of . . . scallops . . . in order to protect the shellfish populations for management purposes or for public health purposes not specified in (a) of this Rule.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p> <p>15A NCAC 3K .0501 .0501 Bay Scallops—Seasons and Harvest Limits</p> <p>(a) The Fisheries Director may, by proclamation, specify open seasons for the taking of bay scallops during the following periods:</p> <ol style="list-style-type: none"> (1) During the month of December for a total of not more than four days; (2) Between the second Monday in January and the last Friday in May. <p>(b) The Fisheries Director may impose any or all of the following restrictions during any open season specified:</p> <ol style="list-style-type: none"> (1) Specify number of days; (2) Specify areas; (3) Specify means and methods which may be employed in the taking; (4) Specify time period; and (5) Limit the quantity.

(continued)

Table 4. (continued)

Harvest Restrictions (continued)
<p>.0501 Bay Scallops—Seasons and Harvest Limits (continued)</p> <p>(c) For any season provided from December through May, it is unlawful to take more than 20 standard U.S. bushels per person per day or to exceed a total of 40 standard U.S. bushels per day in any combined fishing operation.</p> <p>(d) For any season provided from August 1 through September 15, it is unlawful to take more than 10 standard U.S. bushels per person per day or exceed a total of 20 standard U.S. bushels per day in any combined fishing operation.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>
<p>15A NCAC 3K .0502</p> <p>.0502 Taking Bay Scallops at Night and on Weekends</p> <p>It is unlawful to take bay scallops between sunset and sunrise, or on Saturdays or Sundays, except as provided in 15A NCAC 3K .0105 (c).</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>

Source: N.C. Marine Fisheries Commission, 1992.

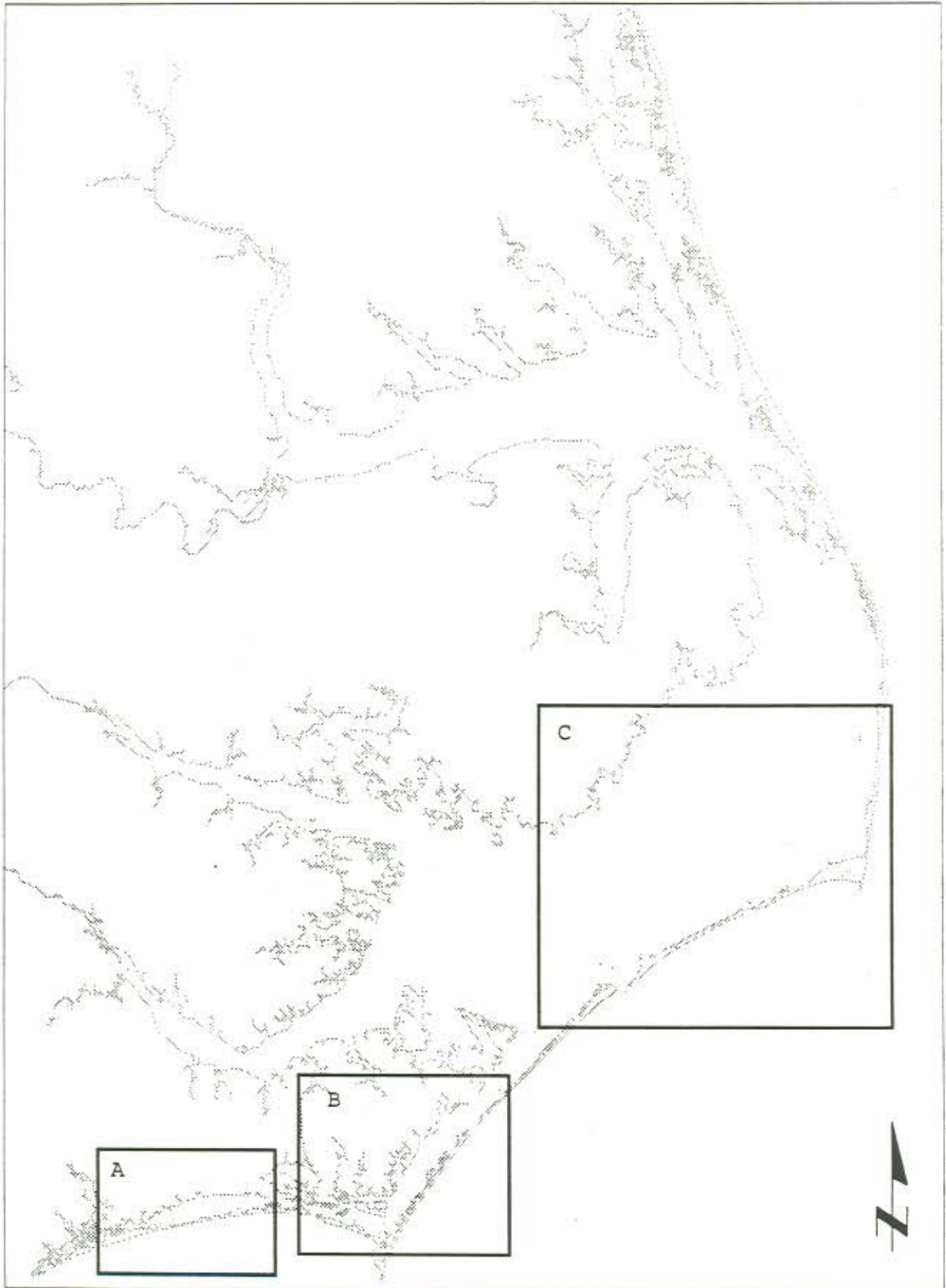


Figure 16. Scallop dredging harvest area.



Figure 16. (continued)

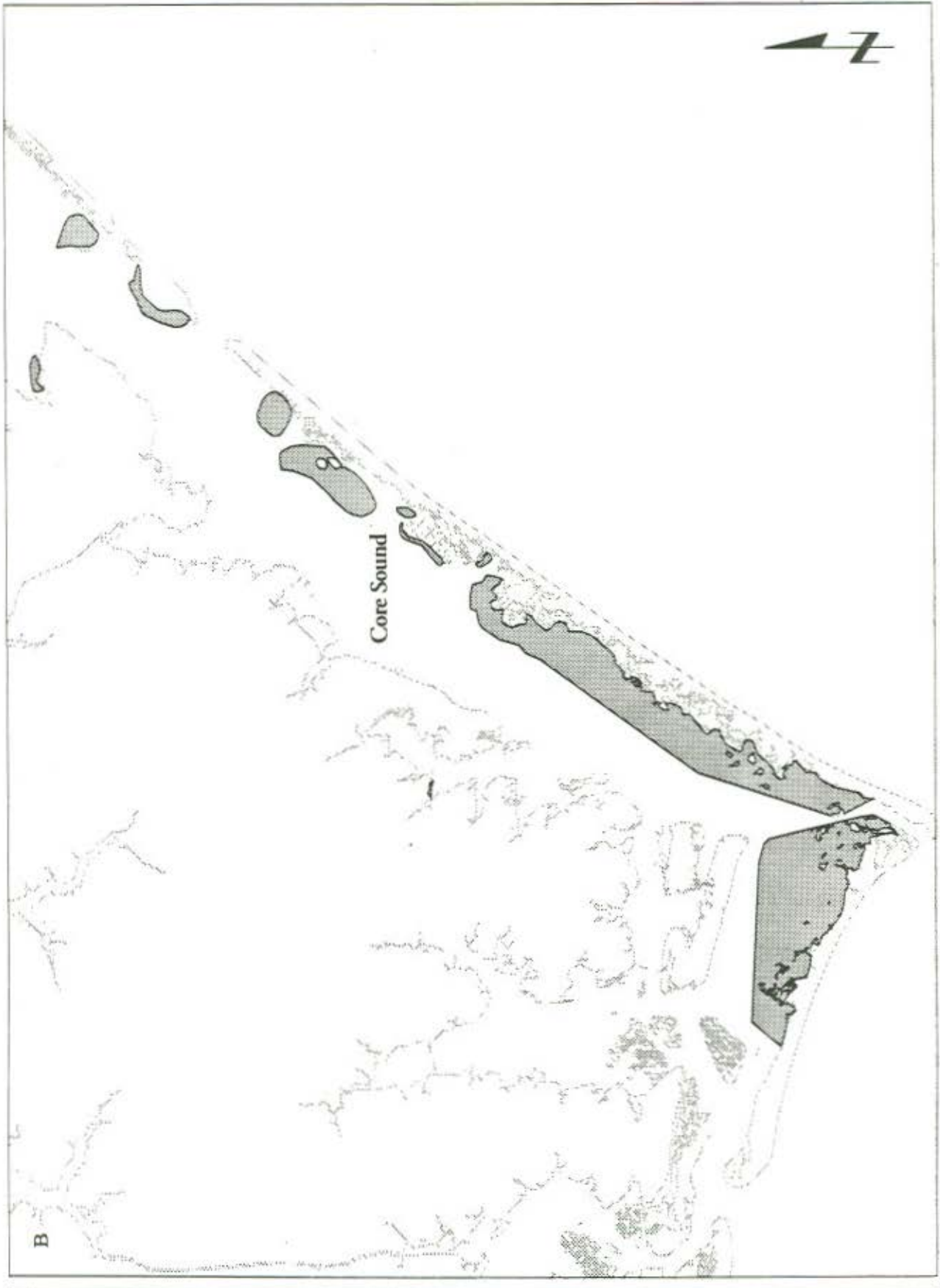


Figure 16. (continued)

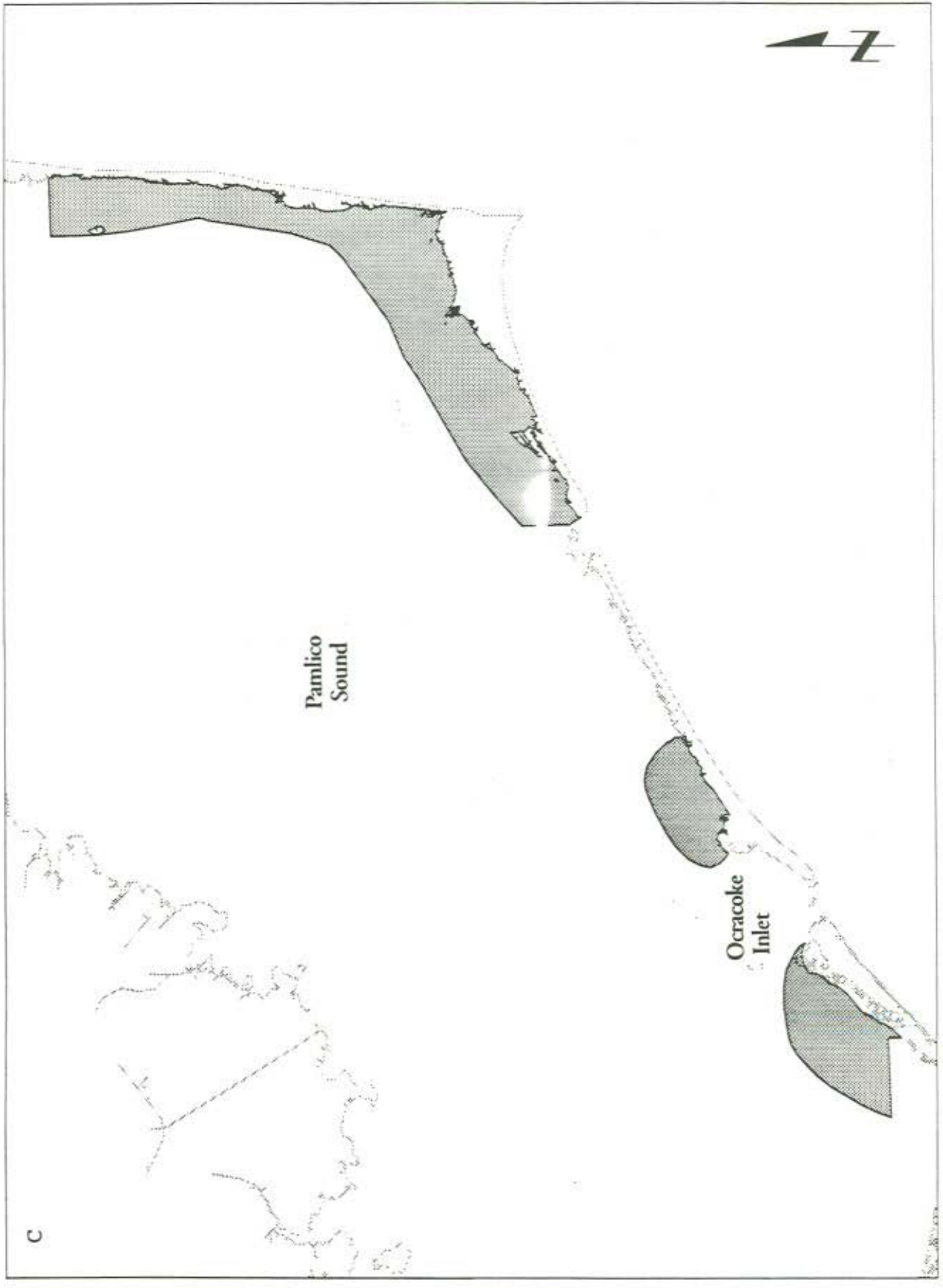


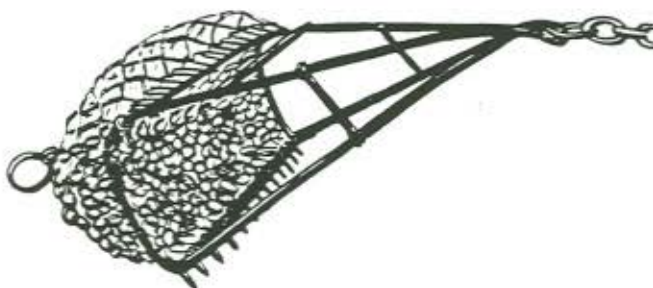
Figure 16. (continued)

Oyster Harvesting Practices

Oyster Dredging

Description

An oyster dredge is a mechanical harvesting device consisting of a metal framed basket with a bottom of connected iron rings and a top of nylon webbing (Figure 17). Sometimes the basket is made entirely of connected iron rings or entirely of nylon webbing. The frame is equipped with a raking bar, generally with teeth on the lower edge. An oyster dredge cannot weigh more than 100 pounds.



Source: Dumont and Sundstrom, 1961.

Figure 17. Oyster dredge.

Use

The heavily chained dredge is towed behind a boat for a period of time. The dredge is then retrieved using a hand or power winch and the catch is emptied into the boat and sorted.

Equipment and harvesting restrictions for oyster dredging are summarized in Table 5.

Harvest Area

The principal harvesting areas where oyster dredging is practiced include major portions of the Croatan, Roanoke, and Pamlico Sounds and major portions of the Pamlico and Neuse River Estuaries (Figure 18).

Source

Dumont, W.H., and G.T. Sundstrom. 1961. *Commercial Fishing Gear of the United States*. Fish and Wildlife Circular 109. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Table 5. Oyster Dredging—Restrictions and Regulations

Months Conducted
Duration: November 1 through March 31 or may be opened or closed by proclamation (Section 15A NCAC 3K .0201).
Peak: Beginning of season
Major Species Targeted
American oyster <i>Crassostrea virginica</i>
Equipment Restrictions or Specifications
<p>15A NCAC 3J .0303 .0303 Dredges and Mechanical Methods Prohibited</p> <p>(a) It is unlawful to use or have aboard a vessel any dredge weighing more than 100 pounds.</p> <p>(b) It is unlawful to use more than one dredge per vessel to take oysters . . . or to use any dredges or mechanical methods between sunset and sunrise.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>
Harvest Restrictions
<p>15A NCAC 3K .0101 .0101 Prohibited Shellfish Areas/Activities</p> <p>(a) It is unlawful to possess, sell, or take oysters . . . from areas which have been designated as prohibited (polluted) by proclamation by the Fisheries Director except as provided in 15A NCAC 3K .0103, .0104, and .0401. The Fisheries Director shall issue such proclamations upon notice by the Division of Health Services of the Department of Human Resources that duly adopted criteria for approved shellfish harvest areas have not been met. The Fisheries Director may reopen any such closed area upon notification from the Division of Environmental Health that duly adopted criteria for approved shellfish harvest areas have been met.</p> <p>Copies of these proclamations and maps of these areas are available upon request at the Division of Marine Fisheries, 3411 Arendell St., Morehead City, NC 28557; 919-726-7021.</p> <p>(b) The Fisheries Director may, by proclamation, close areas to the taking of oysters . . . in order to protect the shellfish populations for management purposes or for public health purposes not specified in (a) of this Rule.</p> <p>.....</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>

(continued)

Table 5. (continued)

Harvest Restrictions (continued)
<p>15A NCAC 3K .0103 .0103 Shellfish/Seed Management Areas</p> <p>(a) It is unlawful to take oysters . . . from any Shellfish Management Area which has been closed and posted, except that the Fisheries Director may, by proclamation, open specific areas to allow the taking of oysters . . . and may designate time, place, character, or dimensions of any method or equipment that may be employed.</p> <p>(b) It is unlawful to take oysters . . . from Seed Management Areas for planting on private bottoms without first obtaining a permit from the Fisheries Director.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>
<p>15A NCAC 3K .0106 .0106 Taking or Unloading Oysters and Clams on Sunday or at Night</p> <p>(a) It is unlawful to take oysters . . . on Sunday, except in accordance with 15A NCAC 3K .0105 (c), or between the hours of sunset and sunrise on any day.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>
<p>15A NCAC 3K .0201 .0201 Open Season and Possession Limit</p> <p>It is unlawful to take, buy, sell, or possess any oysters from public bottoms except during the open season which begins October 15 for hand harvest, and November 1 for mechanical methods and may extend through March 31. During any open season that may be allowed within the time periods stated herein, the Fisheries Director may, by proclamation, close and open the season or close and open any of the various waters to the taking of oysters and may impose any or all of the following restrictions:</p> <ol style="list-style-type: none"> (1) Specify number of days; (2) Specify areas; (3) Specify means and methods which may be employed in the taking; (4) Specify time period; and (5) Specify the quantity, but shall not exceed possession of more than 50 bushels aboard a vessel. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-201; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>
<p>15A NCAC 3K .0202 .0202 Size Limit and Culling Tolerance</p> <p>(a) It is unlawful to possess oysters which have accumulated dead shell, accumulated oyster cultch material, a shell length of less than three inches, or any combination thereof that exceeds a 10 percent tolerance limit by volume. In determining whether the tolerance limit is exceeded, the Fisheries Director and his agents are authorized and empowered to grade all, or any portion, or any combination of portions of the entire quantity being graded, and in cases of violations, may require seizure and return to public bottom or other disposition as authorized by law.</p>

(continued)

Table 5. (continued)

Harvest Restrictions (continued)
<p>.0202 Size Limit and Culling Tolerance (continued)</p> <p>(b) All oysters shall be culled by the catcher where harvested and all oysters of less than legal size, accumulated dead shell and culch material, shall be immediately returned to the bottom from which taken.</p> <p>(c) This Rule shall not apply to oysters imported from out-of-state solely for shucking at shucking houses which are currently certified for shucking and packing by the Division of Environmental Health and which hold a valid shucker-packer license.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>
<p>15A NCAC 3K .0204</p> <p>.0204 Dredges/Mechanical Methods Prohibited</p> <p>It is unlawful to use any dredge or other mechanical method to take oysters:</p> <ol style="list-style-type: none"> (1) In Pamlico Sound within the area described in 15A NCAC 3R .0008(a). (2) In Core Sound and its tributaries within the area described in 15A NCAC 3R .0008(b). (3) On any posted bottoms upon which oysters or shells have been planted by the state, unless such bottoms have been opened to the public and dredging permitted. (4) In any of the areas and their tributaries designated in 15A NCAC 3R .0008(c). <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>
<p>15A NCAC 3N .0004</p> <p>.0004 Prohibited Gear, Primary Nursery Areas</p> <p>It is unlawful to use any trawl net, long haul seine, swipe net, dredge or mechanical method for . . . oysters, for the purpose of taking any marine fishes in any of the primary nursery areas described in 15A NCAC 3R .0003.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>

(continued)

Table 5. (continued)

Harvest Restrictions (continued)

15A NCAC 3R .0008**.0008 Mechanical Methods Prohibited**

(a) It is unlawful to use mechanical methods to take oysters in Pamlico Sound, within the area bounded by a line beginning at a point on the north side of Swash Inlet 34°58'50"N—76°09'13"W; thence running 272°(M) 5,420 yards to a point in Wainwright Channel 34°59'30"N—76°12'22"W immediately east of the northern tip of Wainwright Island; thence 019°(M) 2,000 yards to red 4 second interval flashing beacon "2CS" 35°00'16"N—76°12'12"W; thence 033°(M) 2,900 yards to 4 second interval flashing beacon "HL" 35°01'35"N—76°11'27"W; thence 043°(M) 14,450 yards to a point in Pamlico Sound 35°07'06"N—76°06'54"W; from which point green 4 second interval flashing beacon "3" on Royal Shoal bears 005°(M) 6,000 yards; green 6 second interval flashing beacon "5" on Royal Shoal bears 325°(M) 6,220 yards; and a yellow 6 second interval flashing beacon on Royal Shoal bears 257°(M) 3,000 yards; thence 078°(M) 7,800 yards to green 2.5 second interval flashing beacon "9" 35°08'26"N—76°02'30"W in Nine Foot Shoal Channel; thence 067°(M) 3,640 yards to red 4 second interval flashing beacon "14BF" 35°09'21"N—76°00'39"W in Big Foot Slough Channel; thence 078°(M) 26,260 yards to a quick flashing beacon 35°14'00"N—75°45'50"W; southwest of Oliver Reef; thence 033°(M) 6,100 yards to 2.5 second interval flashing beacon "1" 35°16'46"N—75°44'16"W in Rollinson Channel; thence 079°(M) 13,920 yards to red 4 second interval flashing beacon "2" 35°19'02"N—75°36'19"W in Cape Channel; thence 038°(M) 8,800 yards to green 4 second interval flashing beacon "1" at 35°22'48"N—75°33'36"W in Avon Channel; thence 027°(M) 11,900 yards to a point on Gull Island at 35°28'27"N—75°31'21"W; thence 012°(M) 15,400 to 4 second interval flashing beacon "ICC" 35°36'00"N—75°31'12"W at Chicamacomico Channel; thence 331°(M) 8,600 yards to a point in Pamlico Sound at 35°39'21"N—75°34'24"W; thence 013°(M) 7,250 yards to a point in Pamlico Sound at 35°42'57"N—75°34'09"W; thence 045°(M) 7,200 yards to a point on the shore of Hatteras Island at 35°45'54"N—75°31'06"W; thence running southward with the shoreline of Hatteras Island to a point 35°11'30"N—75°44'48"W on the southwest end of Hatteras Island; thence 269°(M) 2,380 yards across Hatteras Inlet to a point 35°11'18"N—75°46'15"W on the northeast end of Ocracoke Island; thence southwest with the shoreline of Ocracoke Island to a point 35°03'54"N—76°00'54"W on the southwest end of Ocracoke Island; thence 268°(M) 2,220 yards across Ocracoke Inlet to a point 35°03'42"N—76°02'15"W on the northeast end of Portsmouth Island; thence running southwest with the shoreline of Portsmouth Island and Core Banks to a point on the north side of Swash Inlet 34°58'50"N—76°09'13"W, to the point of the beginning. This closure area will be in effect until October, 1993.

(b) It is unlawful to use mechanical methods to take oysters in Core Sound and its tributaries southwest of a line beginning at a point on the north side of Swash Inlet 34°58'50"N—76°09'13"W, and running 292°(M) to a point off Hog Island Reef 35°00'06"N—76°14'52"W.

(c) It is unlawful to use mechanical methods to take oysters in any of the following areas: Back Bay at Hog Island, North Bay, the Straits, Back Sound, North River, Newport River, Bogue Sound, White Oak River, New River, Lockwoods Folly River, Shallotte River, and Saucepan Creek (Brunswick County), except on private bottom by permit.

History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.

Source: N.C. Marine Fisheries Commission, 1992.



Figure 18. Oyster dredging harvest area.

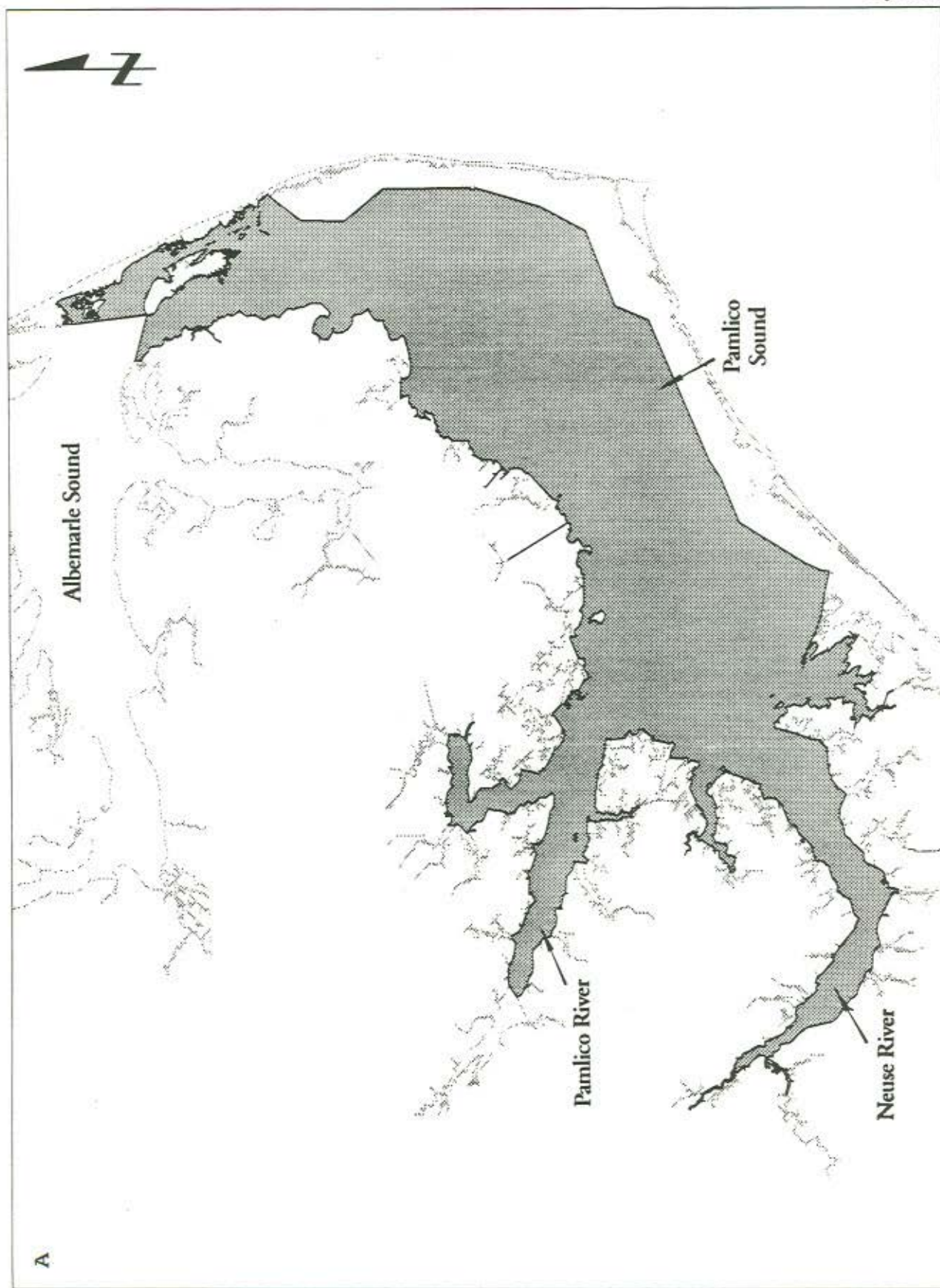


Figure 18. (continued)

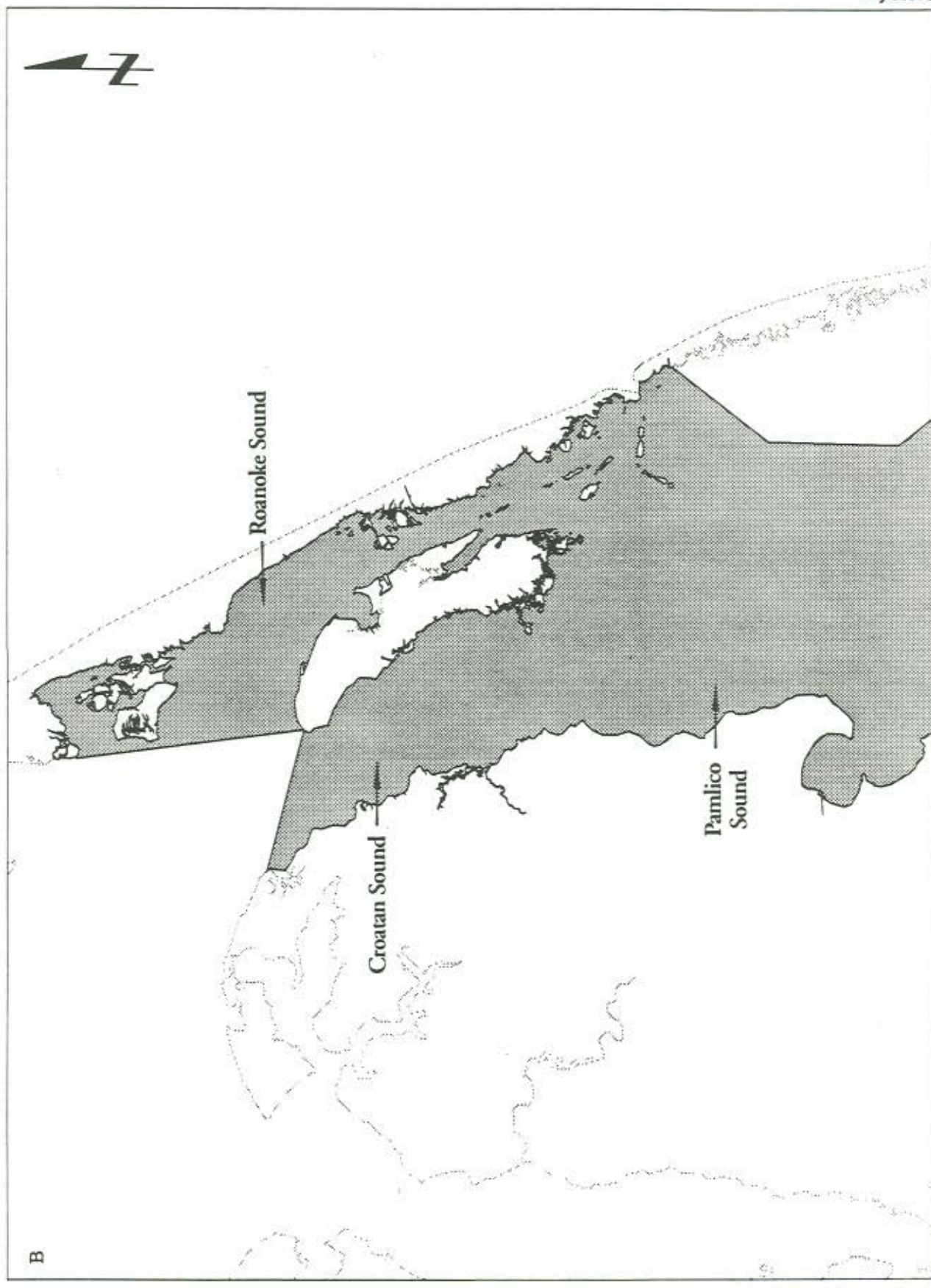


Figure 18. (continued)

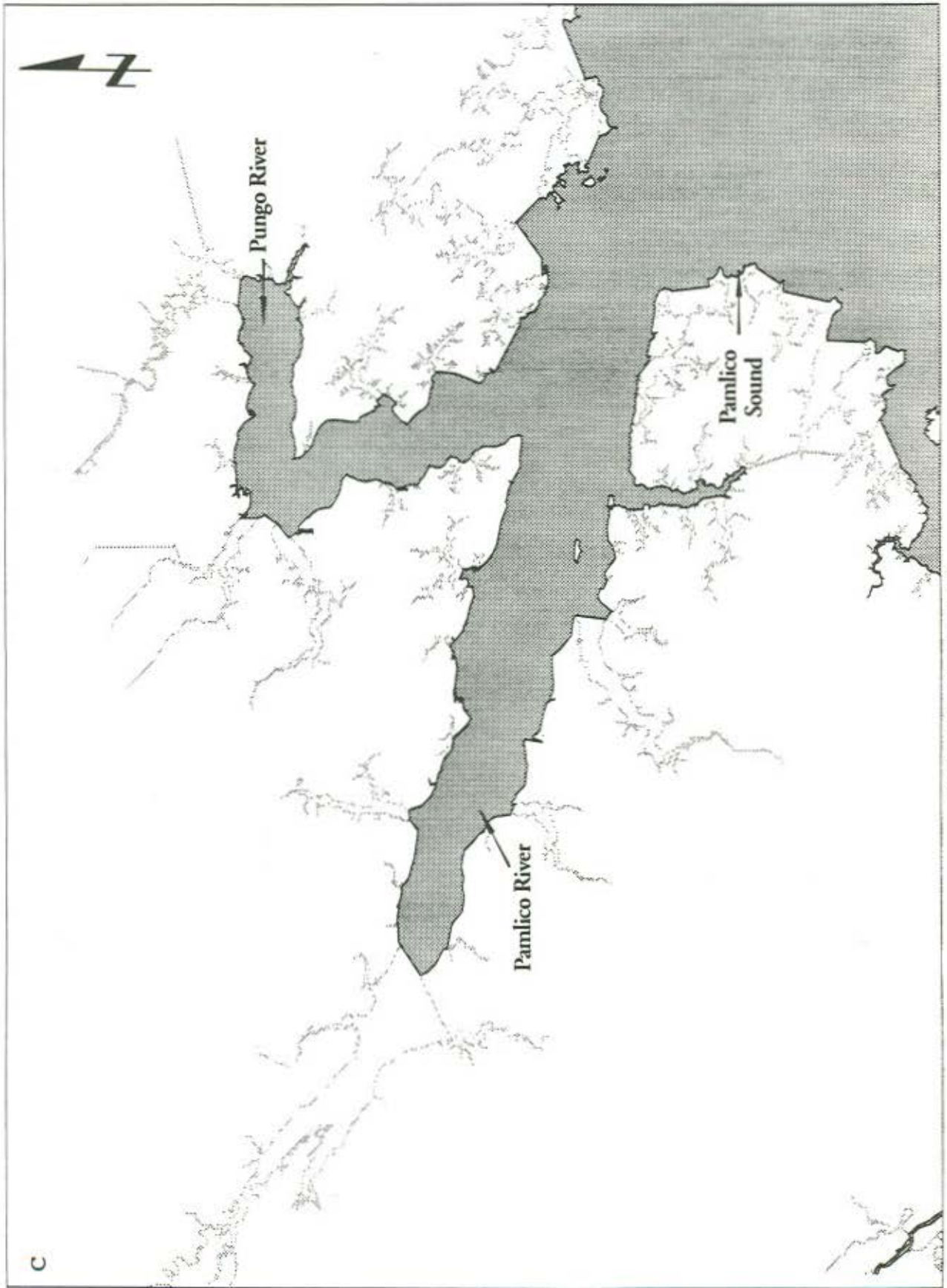


Figure 18. (continued)

OYSTER DREDGING

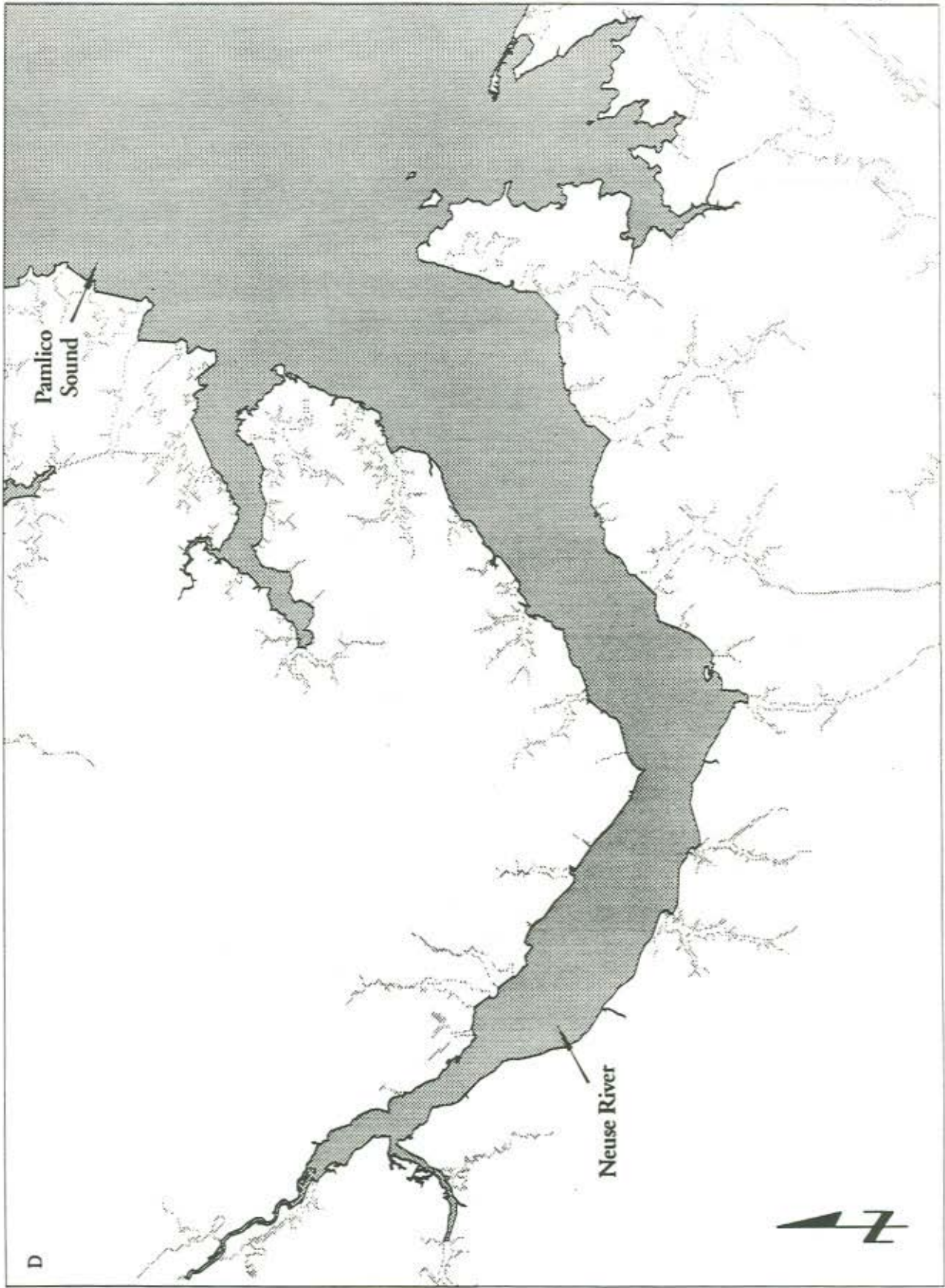


Figure 18. (continued)

Oyster Hand Collecting

Description

Oysters are collected by hand generally in shallow intertidal areas accessible at low tide to the harvesters by foot or boat (Figure 19).



Figure 19. Harvesting of oysters by hand.

Use

Oysters are collected at periods of low tide by pulling groups or "hands" of oysters from the substrate on which they are growing. The catch is sorted and small oysters (<3 inches), dead shells, and cultch are returned to the collection site.

Equipment and harvesting restrictions for all oyster hand harvesting practices are summarized in Table 6.

Harvest Area

Except where prohibited, oysters are generally hand collected in much of Core, Bogue, Pamlico, Croatan, and Roanoke Sounds. Hand harvesting occurs specifically along the shoreline proper in shallow intertidal areas (Figure 18).

Source

Dumont, W.H., and G.T. Sundstrom. 1961. *Commercial Fishing Gear of the United States*. Fish and Wildlife Circular 109. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Table 6. Oyster Hand-Harvesting Practices—Restrictions and Regulations

Months Conducted
Duration: Generally from October 15 through March 31, but may open or close by proclamation (Section 15A NCAC 3K .0201).
Peak: None
Major Species Targeted
American oyster <i>Crassostrea virginica</i>
Equipment Restrictions or Specifications
15A NCAC 3K .0102 .0102 Prohibited Rakes It is unlawful to use a rake more than 12 inches wide or weighing more than six pounds to take oysters. <i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i>
Harvest Restrictions
15A NCAC 3K .0101 .0101 Prohibited Shellfish Areas/Activities (a) It is unlawful to possess, sell, or take oysters . . . from areas which have been designated as prohibited (polluted) by proclamation by the Fisheries Director except as provided in 15A NCAC 3K .0103, .0104, and .0401. The Fisheries Director shall issue such proclamations upon notice by the Division of Health Services of the Department of Human Resources that duly adopted criteria for approved shellfish harvest areas have not been met. The Fisheries Director may reopen any such closed area upon notification from the Division of Environmental Health that duly adopted criteria for approved shellfish harvest areas have been met. Copies of these proclamations and maps of these areas are available upon request at the Division of Marine Fisheries, 3411 Arendell St., Morehead City, NC 28557; 919-726-7021. (b) The Fisheries Director may, by proclamation, close areas to the taking of oysters . . . in order to protect the shellfish populations for management purposes or for public health purposes not specified in (a) of this Rule. <i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i>
15A NCAC 3K .0103 .0103 Shellfish/Seed Management Areas (a) It is unlawful to take oysters . . . from any Shellfish Management Area which has been closed and posted, except that the Fisheries Director may, by proclamation, open specific areas to allow the taking of oysters . . . and may designate time, place, character, or dimensions of any method or equipment that may be employed.

(continued)

Table 6. (continued)

Harvest Restrictions (continued)
<p>.0103 Shellfish/Seed Management Areas (continued)</p> <p>(b) It is unlawful to take oysters . . . from Seed Management Areas for planting on private bottoms without first obtaining a permit from the Fisheries Director.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>
<p>15A NCAC 3K .0105</p> <p>.0105 Non-Commercial Harvest of Shellfish</p> <p>(a) It is unlawful for individuals claiming exemption from the oyster . . . license required by G.S. 113-154, by reason of non-commercial harvest, to take more than:</p> <p>(1) One bushel of oysters per person per day, not to exceed two bushels per vessel per day,</p> <p>.....</p> <p>(b) A vessel license, as required by G.S. 113-152 for the use of commercial fishing equipment as defined in 15A NCAC 31 .0001 (b) (1) is not required for the non-commercial harvest of shellfish in accordance with limits in Paragraph (a) of this Rule.</p> <p>(c) It is unlawful to take oysters . . . on Sundays . . . except:</p> <p>(1) During open seasons, and</p> <p>(2) In accordance with limits outlined in Paragraph (a) of this Rule with or without license.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-152; 113-154; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. February 1, 1992; September 1, 1991.</i></p>
<p>15A NCAC 3K .0106</p> <p>.0106 Taking or Unloading Oysters and Clams on Sunday or at Night</p> <p>(a) It is unlawful to take oysters . . . on Sunday, except in accordance with 15A NCAC 3K .0105 (c), or between the hours of sunset and sunrise on any day.</p> <p>.....</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>
<p>15A NCAC 3K .0201</p> <p>.0201 Open Season and Possession Limit</p> <p>It is unlawful to take, buy, sell, or possess any oysters from public bottoms except during the open season which begins October 15 for hand harvest, and November 1 for mechanical methods and may extend through March 31. During any open season that may be allowed within the time periods stated herein, the Fisheries Director may, by proclamation, close and open the season or close and open any of the various waters to the taking of oysters and may impose any or all of the following restrictions:</p> <p>(1) Specify number of days;</p> <p>(2) Specify areas;</p> <p>(3) Specify means and methods which may be employed in the taking;</p> <p>(4) Specify time period; and</p> <p>(5) Specify the quantity, but shall not exceed possession of more than 50 bushels aboard a vessel.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-201; 113-221, 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>

(continued)

Table 6. (continued)

Harvest Restrictions (continued)
<p>15A NCAC 3K .0202 .0202 Size Limit and Culling Tolerance</p> <p>(a) It is unlawful to possess oysters which have accumulated dead shell, accumulated oyster cultch material, a shell length of less than three inches, or any combination thereof that exceeds a 10 percent tolerance limit by volume. In determining whether the tolerance limit is exceeded, the Fisheries Director and his agents are authorized and empowered to grade all, or any portion, or any combination of portions of the entire quantity being graded, and in cases of violations, may require seizure and return to public bottom or other disposition as authorized by law.</p> <p>(b) All oysters shall be culled by the catcher where harvested and all oysters of less than legal size, accumulated dead shell and cultch material, shall be immediately returned to the bottom from which taken.</p> <p>(c) This Rule shall not apply to oysters imported from out-of-state solely for shucking at shucking houses which are currently certified for shucking and packing by the Division of Environmental Health and which hold a valid shucker-packer license.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>

Source: N.C. Marine Fisheries Commission, 1992.

Oyster Raking

Description

An oyster rake is a hand harvesting device much like a garden rake except the teeth are longer and sharper. It is equipped with a wire mesh basket or an apron of net webbing that holds the catch (Figure 20). Oysters are taken with rakes in shallow waters up to 4 feet deep.



Source: Dumont and Sundstrom, 1961.

Figure 20. Types of oyster rakes.

Use

The rake is pulled toward the harvester so that the long tines dig into the substrate and dislodge the oysters. The catch is trapped in the wire mesh basket or net webbing at the base of the tines. The catch is emptied frequently into a basket or boat.

Equipment and harvesting restrictions for this practice are summarized in Table 6.

Harvest Area

Except where prohibited, oyster raking generally occurs in much of Core, Pamlico, Croatan, and Roanoke Sounds. Raking occurs in shallow areas along the shoreline proper (Figure 18).

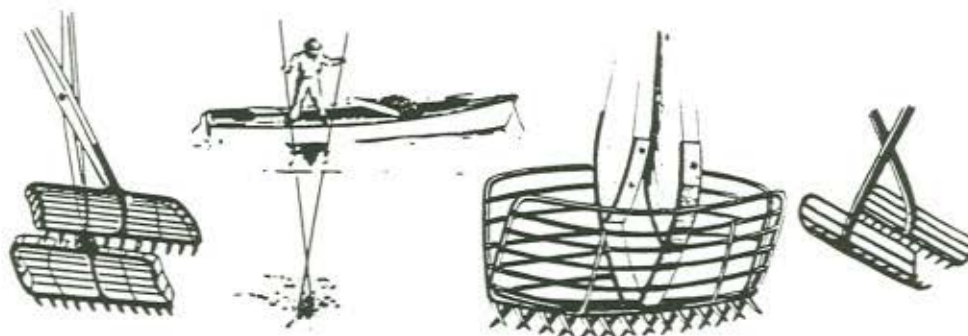
Source

Dumont, W.H., and G.T. Sundstrom. 1961. *Commercial Fishing Gear of the United States*. Fish and Wildlife Circular 109. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Oyster Tonging

Description

Oyster tongs are a hand harvesting device consisting of two long wooden handles (up to 20 feet long) joined like scissors with the fulcrum near the lower end (Figure 21). Attached to the end of each handle is a small metal basket with teeth on the bottom edge. A basket-like frame for holding the catch is attached to the back side of each rake.



Source: Dumont and Sundstrom, 1961.

Figure 21. Types of oyster tongs.

Use

Oyster harvesters generally operate tongs from a boat while standing. Tongs are lowered to the bottom and worked back and forth, the teeth digging out oysters and the baskets holding them. The tongs are raised to the surface frequently to empty the catch.

Equipment and harvesting restrictions for this hand harvesting practice are summarized in Table 6.

Harvest Area

Except where prohibited, oyster tonging occurs in much of the Core, Pamlico, Roanoke and Croatan Sounds and its tributaries that are too shallow for oyster dredging operations. Tonging is primarily performed in shallow waters along the shoreline (Figure 18).

Source

Dumont, W.H., and G.T. Sundstrom. 1961. *Commercial Fishing Gear of the United States*. Fish and Wildlife Circular 109. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

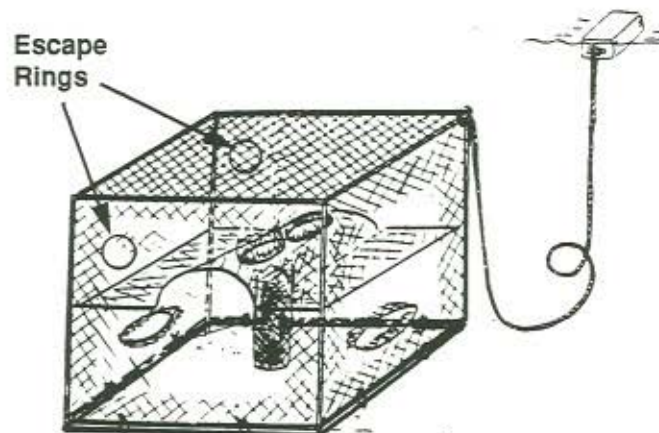
Blue Crab Harvesting Practices

Crab Pots

Description

A crab pot is a passive harvest device resembling a wire-mesh box measuring about 2 by 2 feet. The perimeter of the pot's base is usually weighted with reinforcing steel rod attached with hog rings or plastic ties and the pot has a buoy line that runs to the surface (Figure 22). The pot is divided into two chambers. Crabs enter the lower chamber through one of the funnel-shaped openings seeking the bait (e.g., fish or meat), which is enclosed in a small, wire mesh container in the center of the lower chamber. Unable to reach the bait, the crabs move into the upper chamber trying to find an approach avenue. Once in the upper chamber, escape is difficult. All pots must have at least two escape rings (at least 2-5/16 inches inside diameter) to permit the escape of undersized individuals.

Blue crabs are one of the most important commercially harvested species in terms of pounds landed, number of people involved in the fishery, processing volume, and total value. The A/P estuarine system produces 95 percent of the State catch (25 million pounds per year), and crab pots catch 95 percent of the crabs harvested. Estimates indicate that over half a million pots are currently in use.



Adapted from: Dumont and Sundstrom, 1961.

Figure 22. Crab pot.

Use

Pots are deployed from a boat and are retrieved by using the buoy line to raise the trap to the surface. Crabs are removed by spreading an opening in a seam along the top of the trap, inverting the pot, and shaking out the crabs. Bait (dead fish or meat scraps) is also replaced at this time. Fishermen often set a string of several pots near each other and retrieve them consecutively.

Equipment and harvesting restrictions for crab pots are summarized in Table 7.

Harvest Area

Crab pots are used throughout the A/P Study Area including Albemarle, Roanoke, and Croatan Sounds and their tributaries; selected portions of the Pamlico River and its tributaries; the Neuse River and its tributaries; Core, Back, and Bogue Sounds; and the Newport and North Rivers. Unlike many other types of harvest gear, crab pots may be deployed in primary and secondary nursery areas.

In addition to regulations, the areas where crab pots are deployed may also be restricted by proclamations issued by the Fisheries Director.

Note: A map of crab pot areas is under development by DMF staff.

Sources

Albemarle-Pamlico Estuarine Study. 1991. *Status and Trends Report*. Raleigh, NC.

Rounsefell, George A. *Ecology, Utilization, and Management of Marine Fisheries*. Saint Louis: The C. V. Mosby Company. 1975.

Tyler, J., and M. McKenzie. 1969. *To Catch a Million Fish: North Carolina Commercial Fishing Gear and Methods*. North Carolina Department of Conservation and Development, Division of Commercial and Sport Fishing, Raleigh, North Carolina.

Table 7. Crab Pots—Restrictions and Regulations

Months Conducted
Duration: Year round (excluding period from January 24-February 7)
Peak: May through October
Major Species Targeted
Blue crab <i>Callinectes sapidus</i>
Equipment Restrictions or Specifications
<p>15A NCAC 3J .0301 .0301 Crab, Eel, Fish, and Shrimp Pots</p> <p>(a) It is unlawful to use pots except during time periods and in areas specified herein:</p> <ol style="list-style-type: none"> (1) From November 1 through April 30 except that all pots shall be removed from internal waters from January 24 through February 7. The Fisheries Director may, by proclamation, reopen various waters to the use of pots after January 28 if it is determined that such waters are free of pots. (2) From May 1 through October 31, north and east of the Highway 58 Bridge at Emerald Isle in areas described in 15A NCAC 3R .0007, except that the Fisheries Director may, by proclamation, designate the areas in Wysocking Bay described in 15A NCAC 3R .0007 (4)(a) or any part thereof, and adjust designated areas in Long Shoal River for the use of pots during this time period. (3) From May 1 through October 31 in the Atlantic Ocean and west and south of the Highway 58 Bridge at Emerald Isle in areas and during time periods designated by the Fisheries Director by proclamation. <p>(b) It is unlawful to use pots in any navigation channel maintained and marked by State or Federal agencies.</p> <p>(c) It is unlawful to use pots unless each pot is marked by attaching a floating buoy which shall be of solid foam or other solid buoyant material and no less than five inches in diameter and no less than five inches in length. Buoys may be of any color except yellow. The owner shall always be identified on the attached buoy by using engraved buoys or by engraved metal or plastic tags attached to the buoy. Such identification shall include one of the following:</p> <ol style="list-style-type: none"> (1) owner's N.C. motorboat registration number; or (2) owner's U.S. vessel documentation name; or (3) owner's last name and initials. <p>(d) Pots attached to shore or a pier shall be exempt from (a)(2),(a)(3) and (c) of this Rule.</p> <p>.....</p> <p>(g) It is unlawful to use crab pots in coastal waters unless each pot contains no less than two escape rings that are at least 2-5/16 inches inside diameter and located in the opposite outside panels of the upper chamber of the pot. Peeler pots with a mesh size less than 1-1/2 inches shall be exempt from the cull ring requirement. The Fisheries Director may, by proclamation, exempt the escape ring requirement during the period November through March, and may impose any or all of the following restrictions:</p> <ol style="list-style-type: none"> (1) Specify areas, and (2) Specify time.

(continued)

Table 7. (continued)

Equipment Restrictions or Specifications (continued)
<p>.0301 Crab, Eel, Fish, and Shrimp Pots (continued)</p> <p>(h) It is unlawful to use more than one hundred fifty pots per vessel in Newport River.</p> <p>(i) Any pots found in violation of this Rule or 15A NCAC 3J .0302 may be removed by marine fisheries enforcement officers and disposed of in accordance with law.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991; Amended Eff. September 1, 1991.</i></p>
<p>15A NCAC 3J .0302</p> <p>.0302 Non-Commercial Use of Pots</p> <p>(a) Pots may be attached to shore or a pier any time of year with the exception of the closed clean-up period specified in 15A NCAC 3J .0301 (a)(1).</p> <p>(b) Pots attached to shore or a pier are not required to meet the buoy and identification requirements specified in 15A NCAC 3J .0301 (c), but must meet the minimum mesh length and escape ring requirements specified in 15A NCAC 3J .0301 (e), (f) and (g).</p> <p>(c) The license requirements of G.S. 113-152 apply if a vessel is used in connection with the use of pots.</p> <p>(d) All provisions of 15A NCAC 3J .0301 apply if pots are not attached to shore or a pier.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>
<p>15A NCAC 3L .0205</p> <p>.0205 Crab Spawning Sanctuaries</p> <p>(a) It is unlawful to use a trawl net or to take crabs with the use of commercial fishing equipment from the crab spawning sanctuaries described in 15A NCAC 3R .0010 from March 1 through August 31.</p> <p>(b) From September 1 through February 28, the Fisheries Director may, by proclamation, close the crab spawning sanctuaries and may impose any or all of the following restrictions:</p> <ol style="list-style-type: none"> (1) Specify number of days; (2) Specify areas; (3) Specify means and methods which may be employed in the taking; (4) Specify time period; (5) Limit the quantity. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>

(continued)

Table 7. (continued)

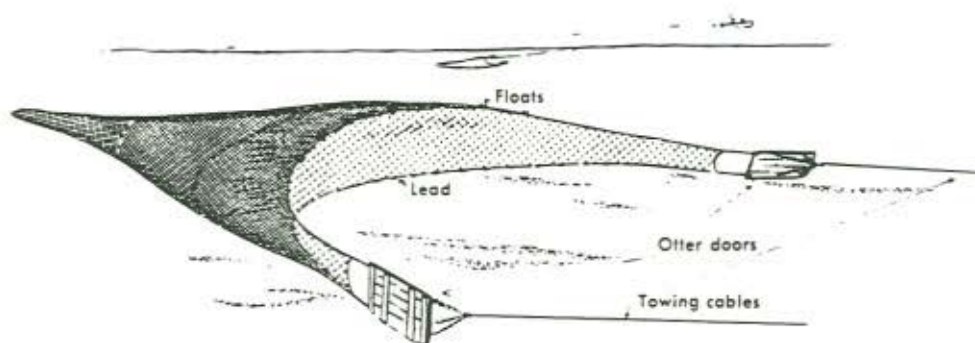
Harvest Restrictions
<p>15A NCAC 3L .0201 .0201 Size Limit and Culling Tolerance</p> <p>It is unlawful to possess hard crabs smaller than five inches from tip of spike to tip of spike except mature females and "peelers". Crabs shall be culled where harvested and all crabs less than legal size shall be immediately returned to the waters from which taken. "Peelers" shall be separated from the entire catch before reaching shore or dock. Tolerance of not more than 15 percent by number of any portion examined shall be allowed. In determining whether the proportion of undersized crabs exceeds the 15 percent tolerance limit, the Fisheries Director and his agents are authorized and empowered to grade all, or any portion, or any combination of portions of the entire quantity of crabs being graded, and may require seizure and return to the waters, or other disposition as authorized by law, of the entire quantity being graded, or of any portion thereof, if undersized crabs in excess of the tolerance limit are found.</p> <p><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>

Source: N.C. Marine Fisheries Commission, 1992.

Crab Trawling

Description

A trawl is a flattened cone-shaped net that is pulled by two towing cables behind a boat (Figure 23). An "otter" board is attached to each side of the net to spread the mouth of the net and keep it open during towing. The width of the net at the mouth may range from 30 to 75 feet. The mesh size of the body, wings, and cod (back) end must be, by proclamation, no less than 4 inches stretched mesh for taking hard crabs and no less than 2 inches for taking peeler crabs.



Source: Sundstrom, 1957.

Figure 23. Crab trawl.

Use

The crab trawl is lowered to the bottom and towed along behind a boat. The catch is swept into the mouth of the net and collected in the cod or back end. The trawl is retrieved periodically using power winches, and the catch is emptied into the boat for sorting.

Currently the crab trawl fishery is composed primarily of shrimp vessels in the 30- to 50-foot range that convert to crab trawling during nonshrimping seasons. The majority of vessels are double-rigged, pulling nets ranging from 28 to 32 feet in headrope length. There is some evidence of crab trawlers switching to four-barreled rigs in recent years. The Core Sound crab trawl fishery is composed primarily of single-rigged vessels under 30 feet long with 30-foot nets; if double-rigged, they pull two 35-foot nets.

Peeler crab trawls are generally much smaller trawls (16 to 20 feet in head rope length) that are pulled with small skiffs in shallow areas such as creeks and grass beds.

Equipment and harvest restrictions for crab trawls are summarized in Table 8.

Harvest Area

Crab trawling occurs primarily in Croatan, Roanoke, and Pamlico Sounds; the Pamlico, Pungo, Bay, and Neuse Rivers; and in Core, Back, and Bogue Sounds including the White Oak, Newport, and North Rivers (Figure 24). The eastern Pamlico Sound fishery occurs principally in the vicinity of Ocracoke, Hatteras, and Oregon inlets where mostly mature female crabs are harvested. The western Pamlico Sound and River fisheries take both crabs and flounder, which is permitted as an unlimited bycatch while using crab trawls.

Sources

Albemarle-Pamlico Estuarine Study. 1991. *Status and Trends Report*. Raleigh, NC.

Sundstrom, G.T. 1957. *Commercial Fishing Vessels and Gear*. Fish and Wildlife Circular 48. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Tyler, J., and M. McKenzie. 1969. *To Catch a Million Fish: North Carolina Commercial Fishing Gear and Methods*. North Carolina Department of Conservation and Development, Division of Commercial and Sport Fishing, Raleigh, North Carolina.

Table 8. Crab Trawling—Restrictions and Regulations

Months Conducted		
Duration: Year round		
Peak: February through June		
Major Species Targeted		
Blue crab <i>Callinectes sapidus</i>	Gulf flounder <i>P. albigutta</i>	Weakfish <i>Cynoscion regalis</i>
Southern flounder <i>Paralichthys lethostigma</i>	Atlantic croaker <i>Micropogonius undulatus</i>	Spot <i>Leiostomus xanthurus</i>
Summer flounder <i>P. dentatus</i>		
Equipment Restrictions or Specifications		
<p>15A NCAC 3J .0104 .0104 Trawl Nets</p> <p>(a) It is unlawful to use trawl nets for the taking of finfish in internal waters, except that it shall be permissible to take or possess finfish incidental to crab or shrimp trawling in accordance with the following limitations:</p> <ol style="list-style-type: none"> (1) It is unlawful to possess aboard a vessel while using a trawl in internal waters more than 1,000 pounds of finfish except flounder of legal size may be taken and possessed without limit in quantity in internal waters while engaged in crab trawling. (2) The Fisheries Director may, by proclamation, close any area to trawling for specific time periods in order to secure compliance of this Rule. <p>(b) It is unlawful to use trawl nets:</p> <ol style="list-style-type: none"> (1) For the taking of oysters; (2) In Albemarle Sound and its tributaries; (3) In that area of Shackleford Banks as described in 15A NCAC 3R .0006. <p>(c) Minimum mesh sizes for . . . crab trawls are presented in 15A NCAC 3L .0103 and .0202.</p> <p>(d) The Fisheries Director may, with prior consent of the Marine Fisheries Commission, by proclamation, require finfish excluder devices or codend modifications in trawl nets to reduce the catch of finfish that do not meet size limits or are unmarketable as individual foodfish by reason of size.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. February 1, 1991; Amended Eff. February 1, 1992.</i></p> <p>15A NCAC 3K .0203 .0203 Trawling Across Oyster Management Areas Prohibited</p> <p>It is unlawful to tow or pull a trawl net for any purpose across any oyster bed which has been planted and posted by the state.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1.</i></p>		

(continued)

Table 8. (continued)

Equipment Restrictions or Specifications (continued)
<p>15A NCAC 3L .0202 .0202 Crab Trawling</p> <p>(a) It is unlawful to take or possess aboard a vessel crabs taken by trawl in internal waters except in areas and during such times as the Fisheries Director may specify by proclamation.</p> <p>(b) It is unlawful to use any crab trawl with a mesh length of less than three inches for taking hard crabs, except that the Fisheries Director may, by proclamation, increase the minimum mesh length to not more than four inches.</p> <p>(c) It is unlawful to use trawls with a mesh length less than two inches or with a corkline exceeding 25 feet in length for taking soft or "peeler" crabs.</p> <p>(d) It is unlawful to take crabs with trawls between one hour after sunset on any Saturday and one hour before sunset on the following Sunday, except in the Atlantic Ocean.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>
<p>15A NCAC 3L .0205 .0205 Crab Spawning Sanctuaries</p> <p>(a) It is unlawful to use a trawl net or to take crabs with the use of commercial fishing equipment from the crab spawning sanctuaries described in 15A NCAC 3R .0010 from March 1 through August 31.</p> <p>(b) From September 1 through February 28, the Fisheries Director may, by proclamation, close the crab spawning sanctuaries and may impose any or all of the following restrictions:</p> <ol style="list-style-type: none"> (1) Specify number of days. (2) Specify areas; (3) Specify means and methods which may be employed in the taking; (4) Specify time period; (5) Limit the quantity. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>
<p>15A NCAC 3N .0004 .0004 Prohibited Gear, Primary Nursery Areas</p> <p>It is unlawful to use any trawl net, long haul seine, swipe net, dredge or mechanical method for clams or oysters, for the purpose of taking any marine fishes in any of the primary nursery areas described in 15A NCAC 3R .0003.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>
<p>15A NCAC 3N .0005 .0005 Prohibited Gear, Secondary Nursery Areas</p> <p>(a) It is unlawful to use trawl nets for any purpose in any of the permanent secondary nursery areas described in 15A NCAC 3R .0004.</p> <p>(b) It is unlawful to use trawl nets for any purpose in any of the special secondary nursery areas described in 15A NCAC 3P .0005, except that the Fisheries Director, may, by proclamation, open any or all of the special secondary nursery areas, or any portion thereof, listed in 15A NCAC 3R .0005 to shrimp or crab trawling from August 16 through May 14 subject to the provisions of 15A NCAC 3L .0100 and .0200.</p>

(continued)

Table 8. (continued)

Equipment Restrictions or Specifications (continued)
<p>.0005 Prohibited Gear, Secondary Nursery Areas (continued) (c) Permanent and special secondary nursery areas described in 15A NCAC 3R .0004 and .0005 generally pertain to those areas located between the described line and the primary nursery area lines or Inland-Coastal boundary lines where applicable.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p> <p>15A NCAC 3R .0006 .0006 Trawl Nets Prohibited It is unlawful to use trawl nets in that area south of Shackleford Banks which is east of a line which begins at the navigation aid (buoy or beacon at the westward end of the Cape Lookout westernmost jetty and running thence N 06°45"E degrees (M) to the Harkers' Island water tower; The excluded area includes all of Cape Lookout Bight, that area west of the Bight but east of the line above that portion of Bardens Inlet which lies southwestward of a line which begins at the Cape Lookout Lighthouse and runs N 28°15'W degrees (M) to the southern end of Shackleford Banks.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>
Harvest Restrictions
<p>15A NCAC 3L .0201 .0201 Size Limit and Culling Tolerance It is unlawful to possess hard crabs smaller than five inches from tip of spike to tip of spike except mature females and "peelers". Crabs shall be culled where harvested and all crabs less than legal size shall be immediately returned to the waters from which taken. "Peelers" shall be separated from the entire catch before reaching shore or dock. Tolerance of not more than 15 percent by number of any portion examined shall be allowed. In determining whether the proportion of undersized crabs exceeds the 15 percent tolerance limit, the Fisheries Director and his agents are authorized and empowered to grade all, or any portion, or any combination of portions of the entire quantity of crabs being graded, and may require seizure and return to the waters, or other disposition as authorized by law, of the entire quantity being graded, or of any portion thereof, if undersized crabs in excess of the tolerance limit are found.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991;</i></p>

Source: N.C. Marine Fisheries Commission, 1992.

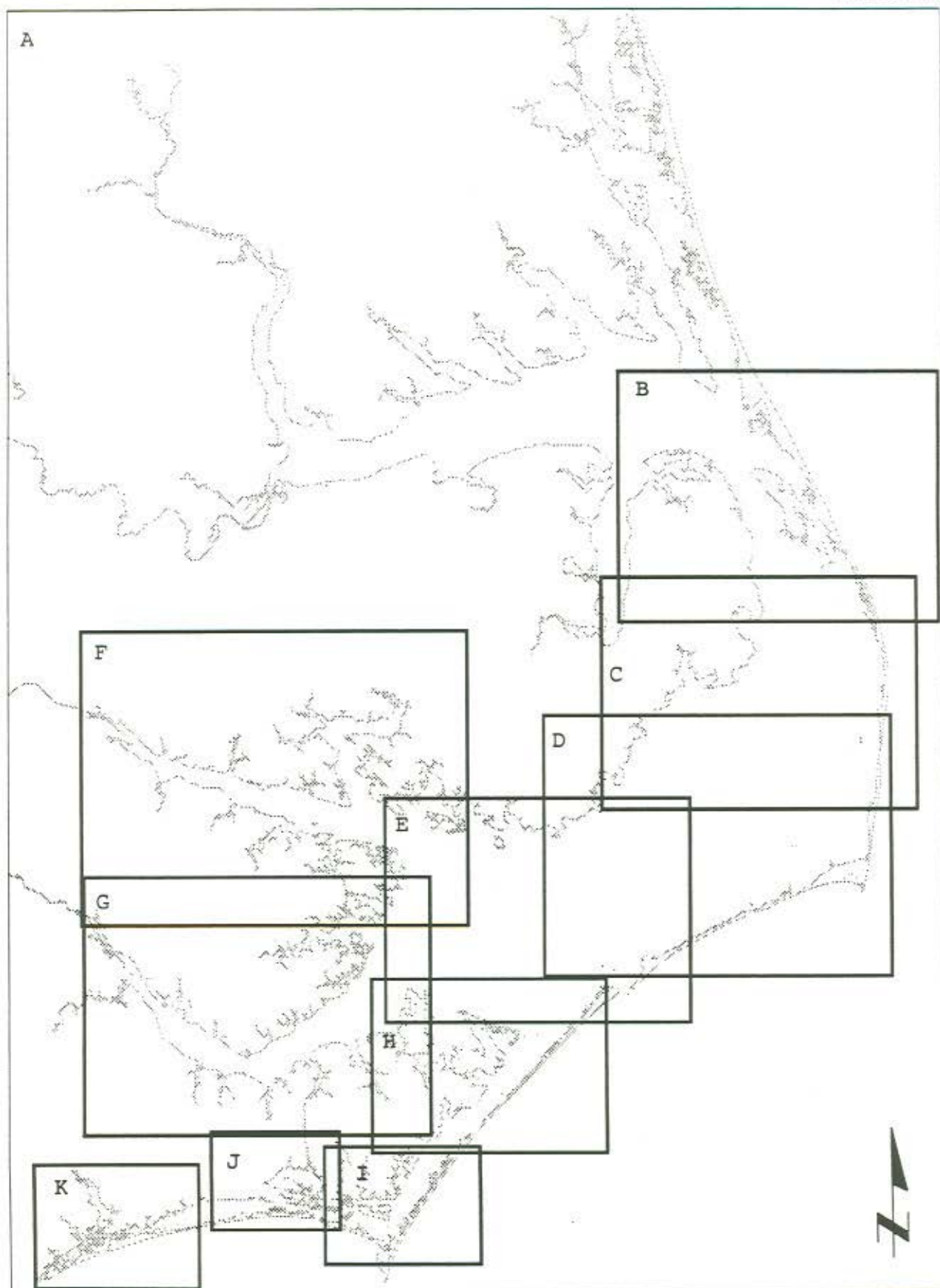


Figure 24. Crab trawling.

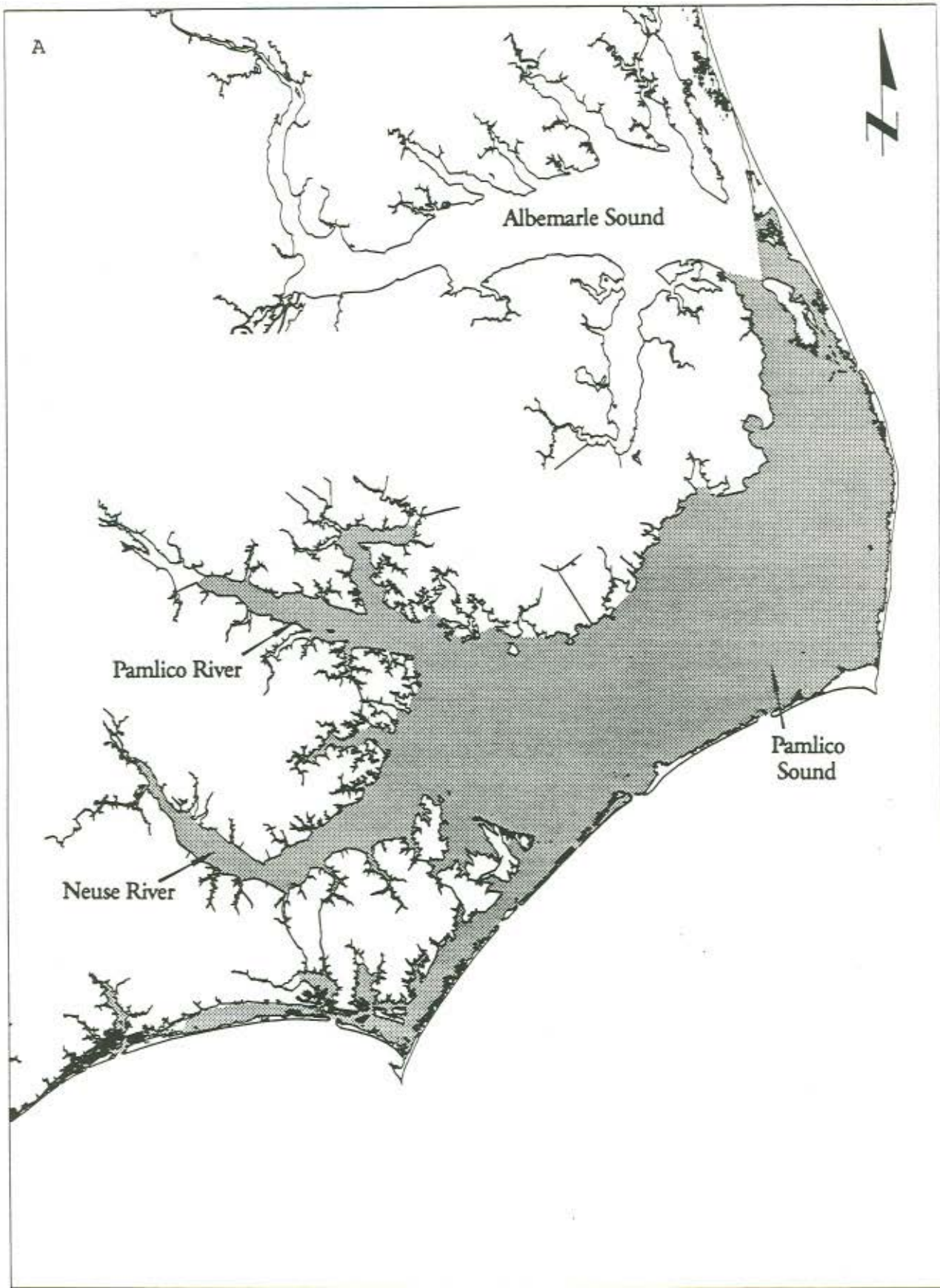


Figure 24. (continued)

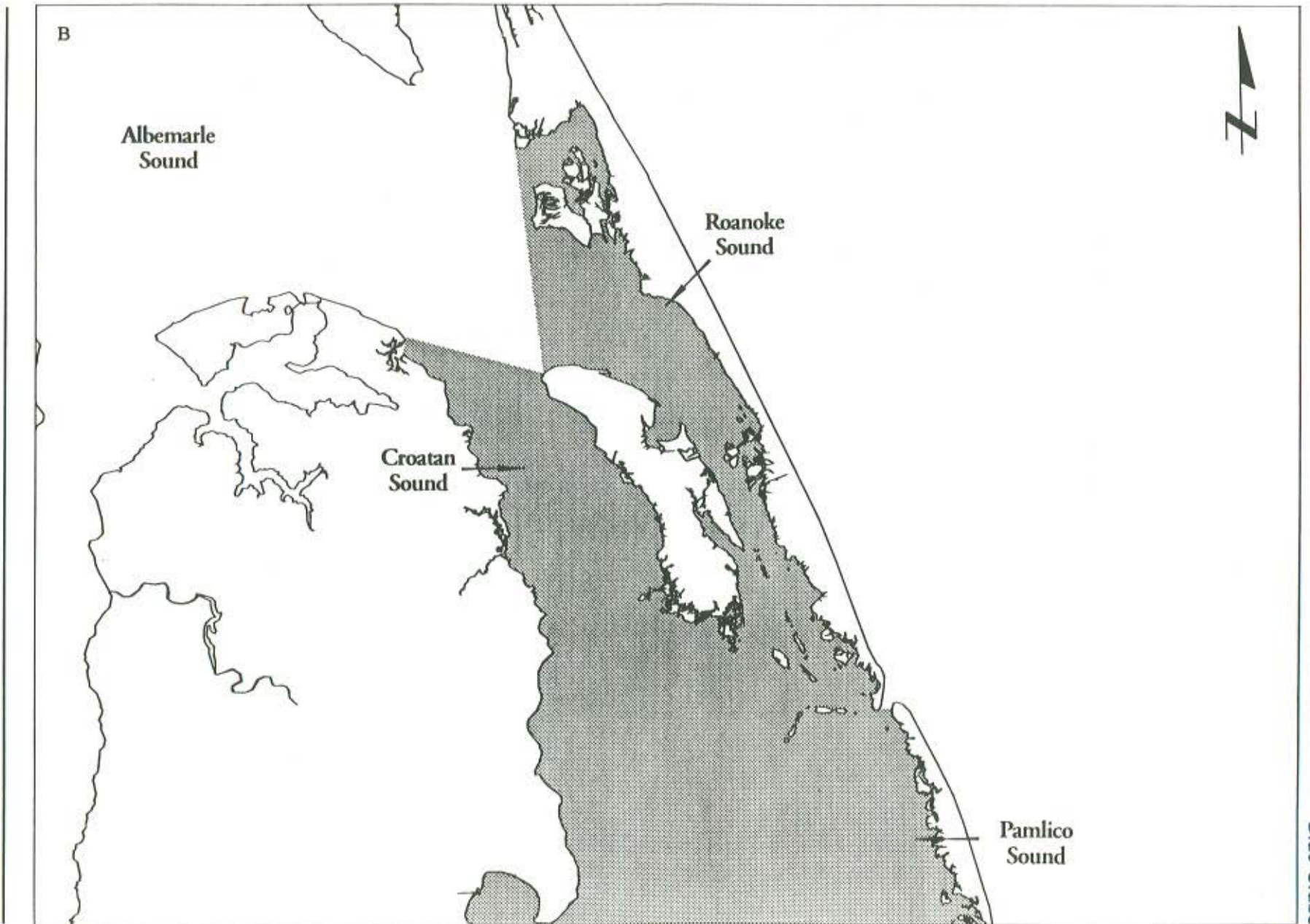


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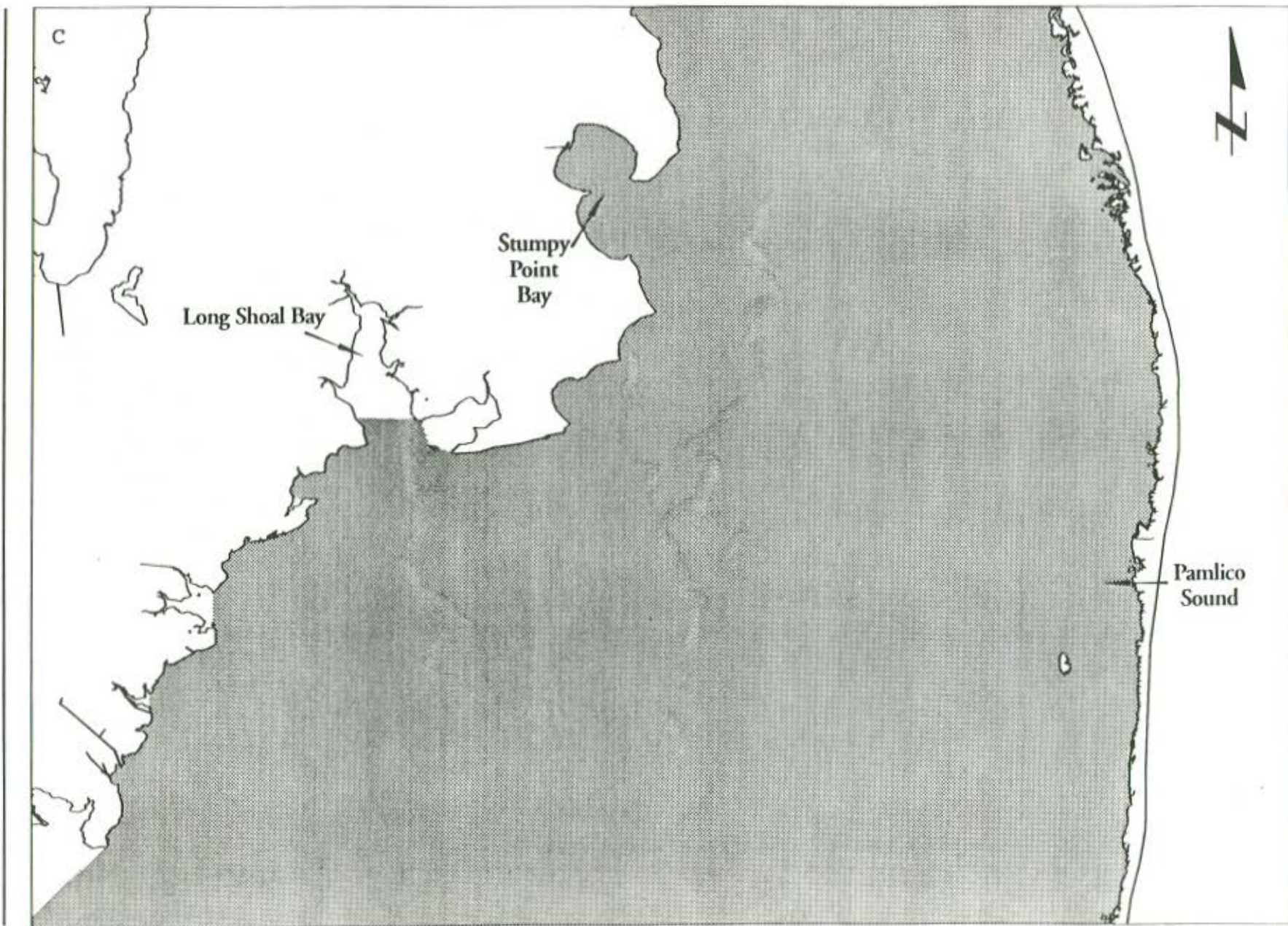


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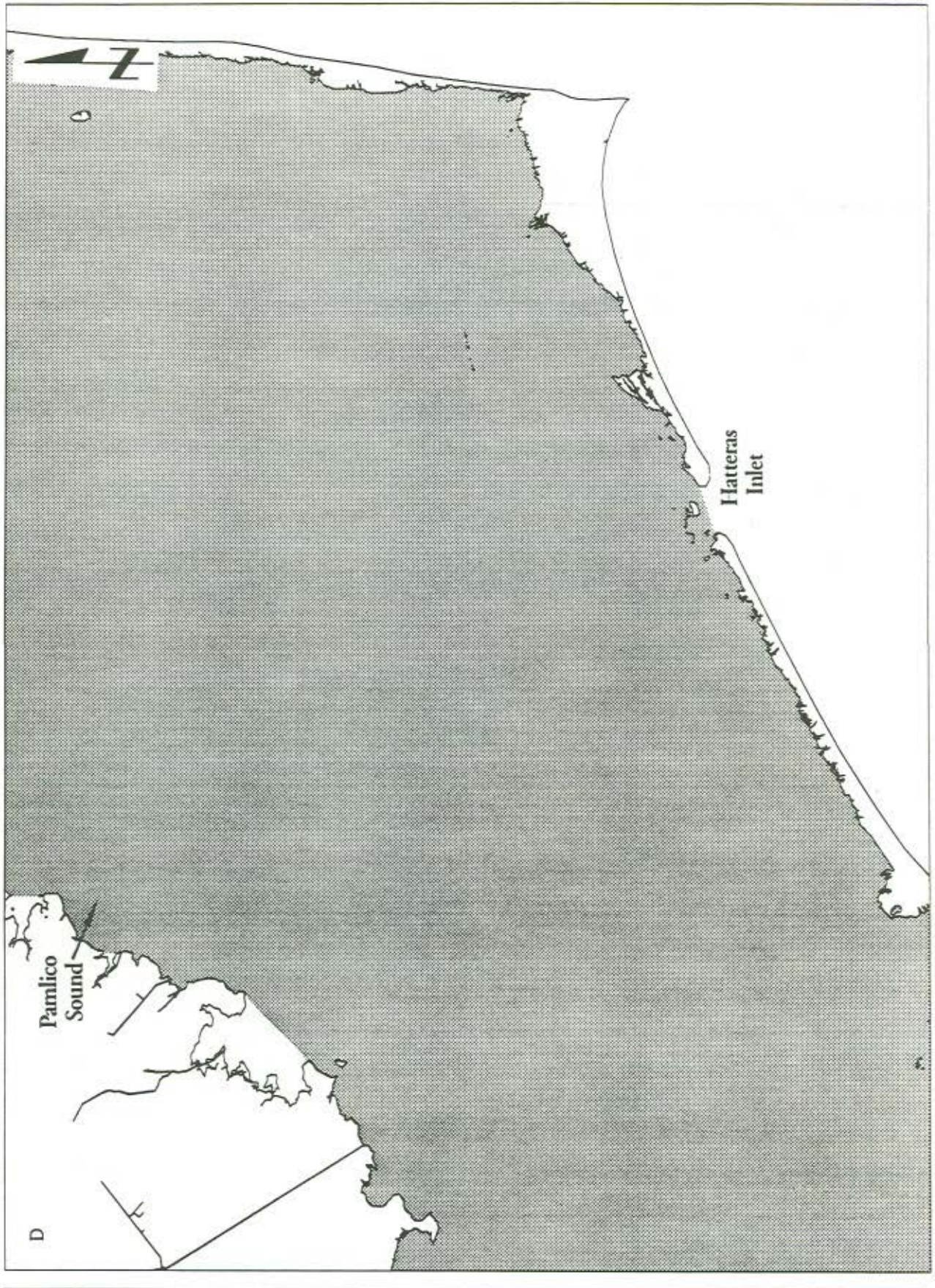


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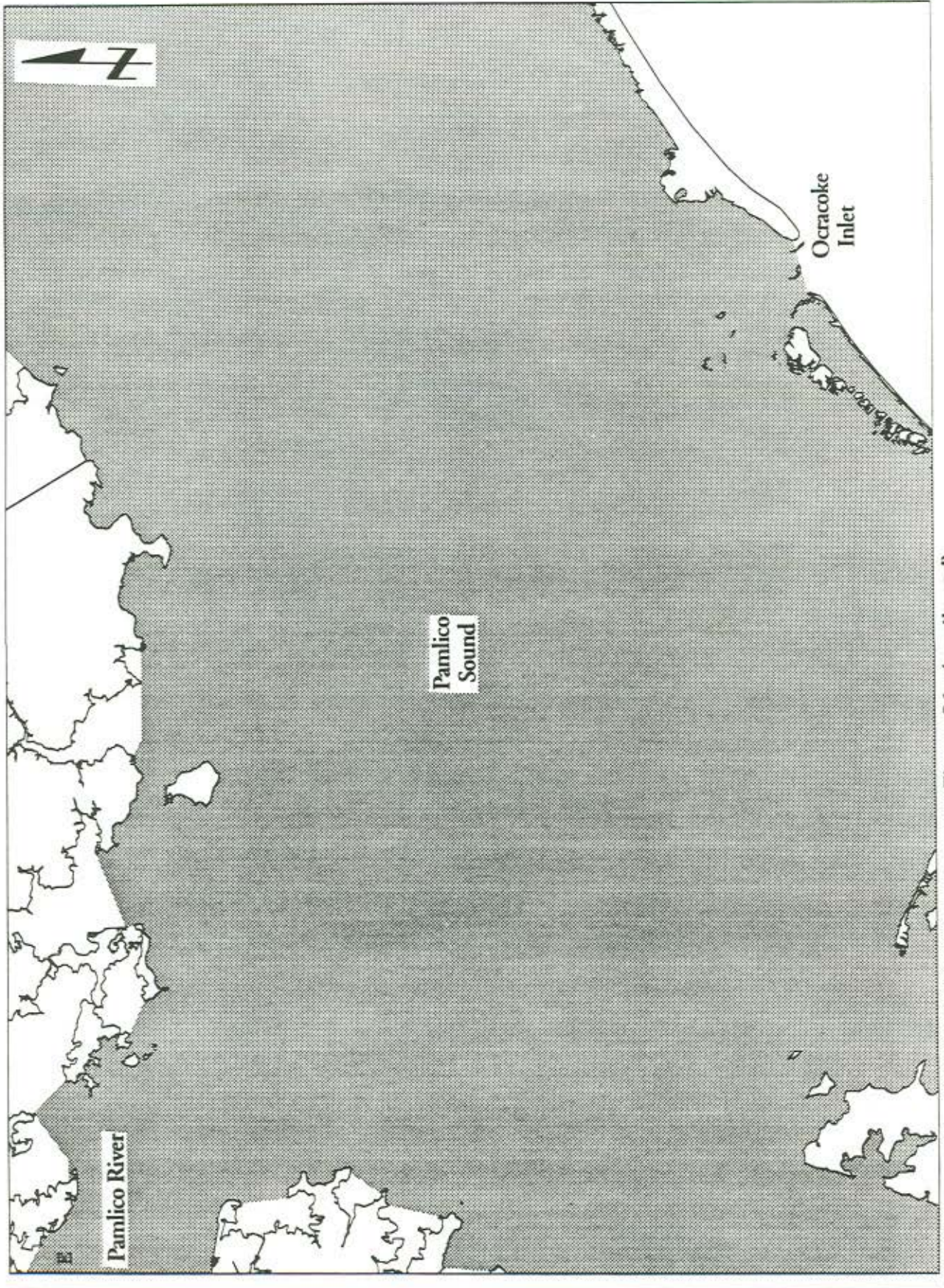


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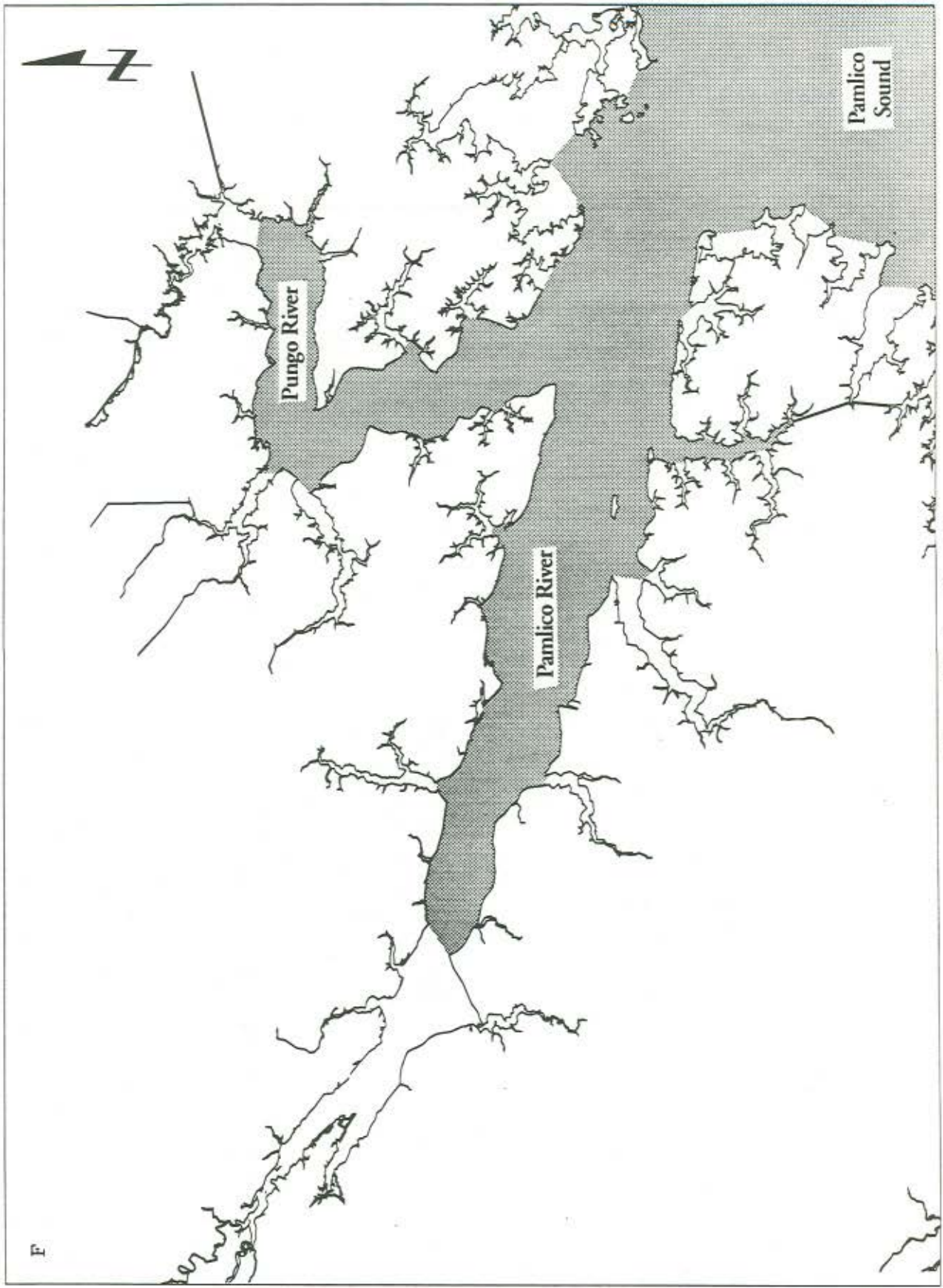


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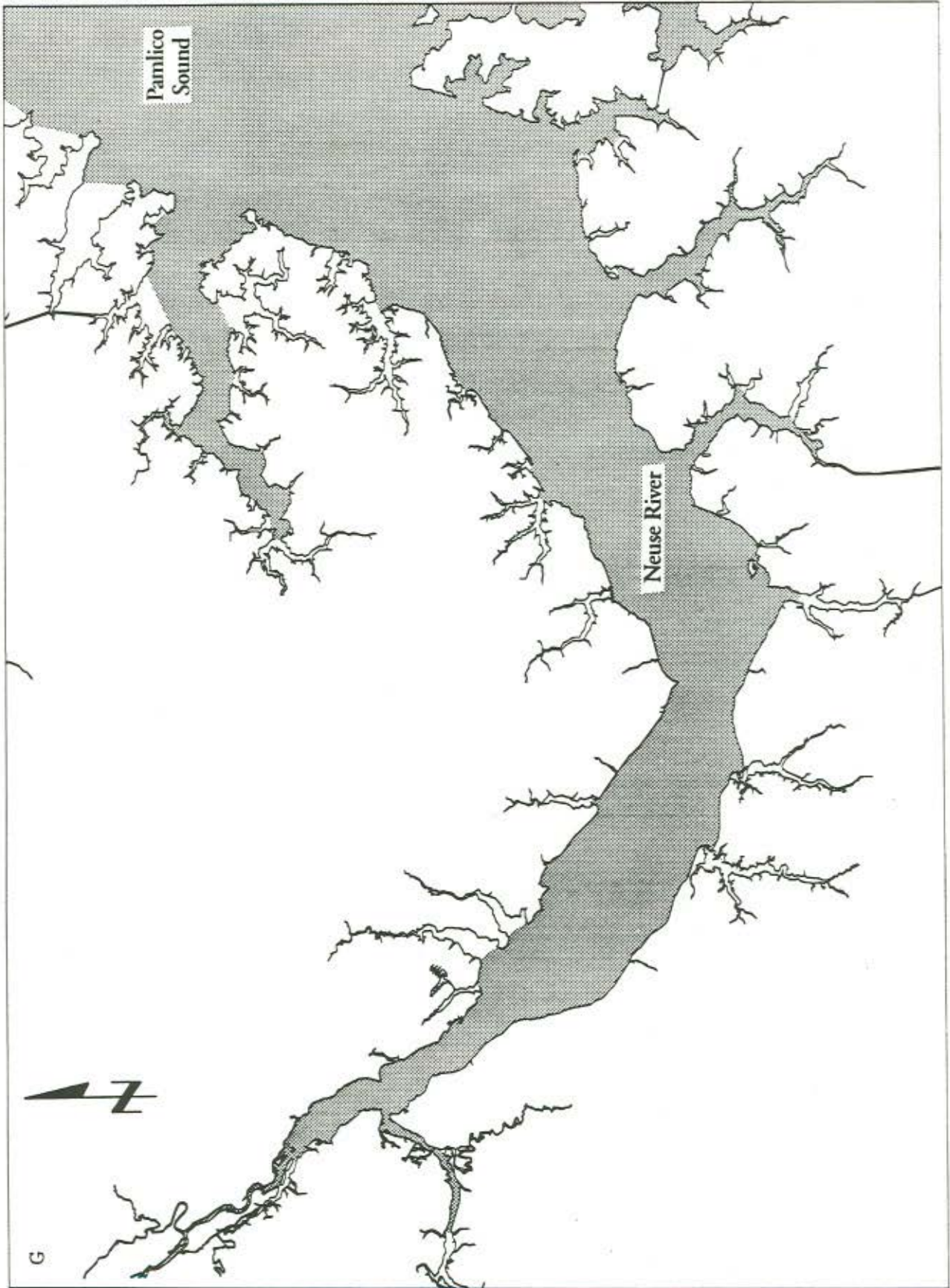


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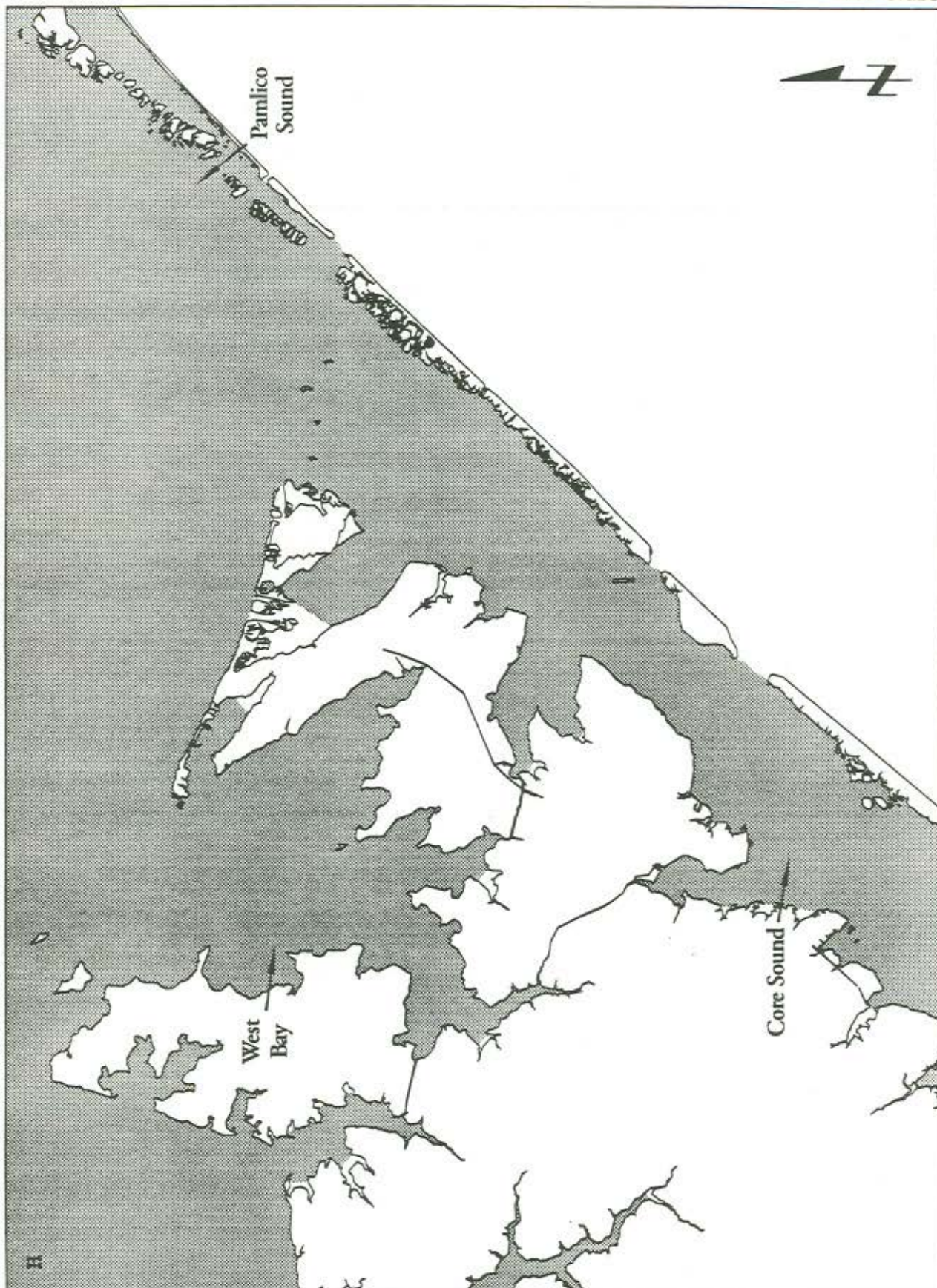


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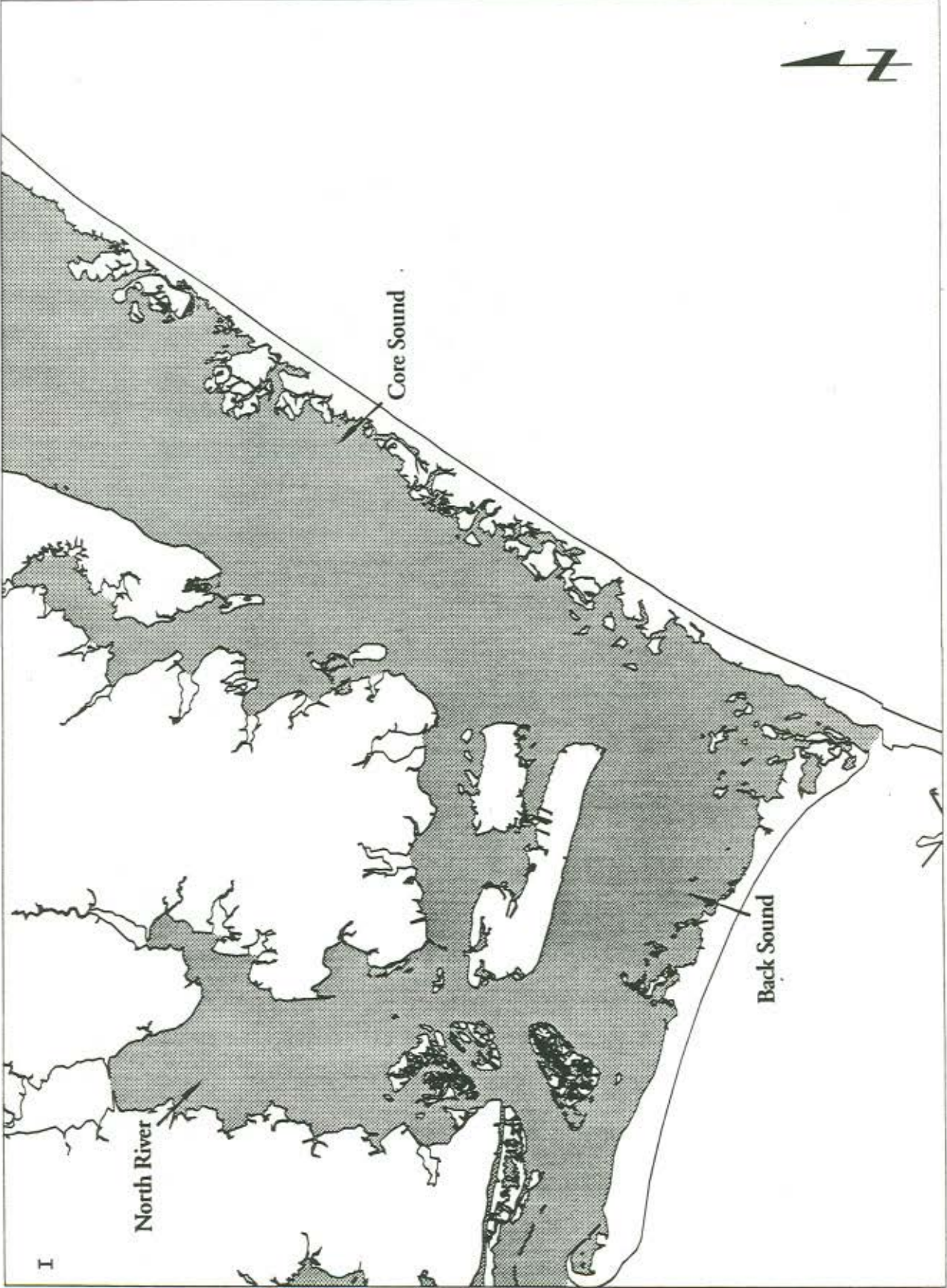


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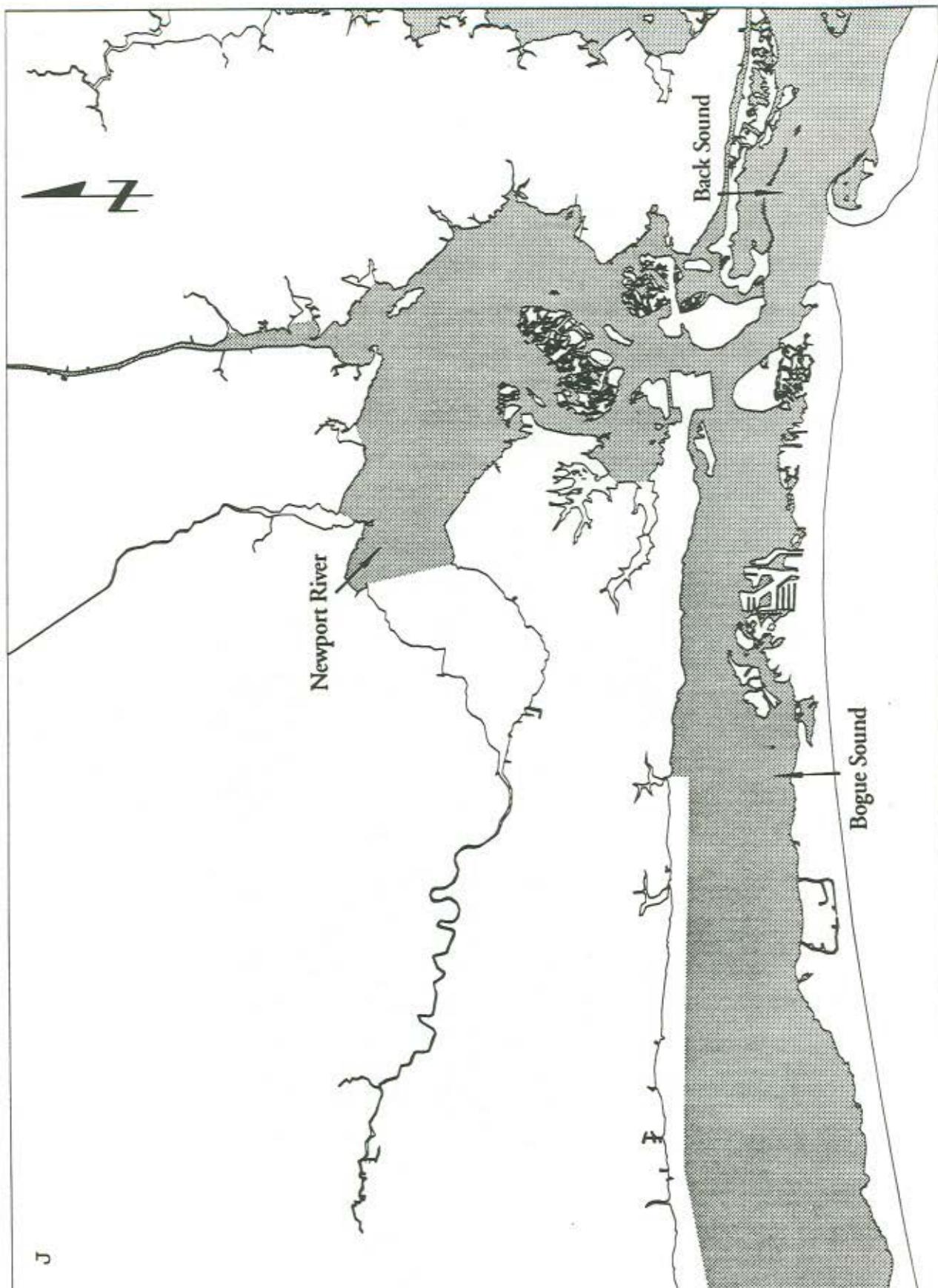


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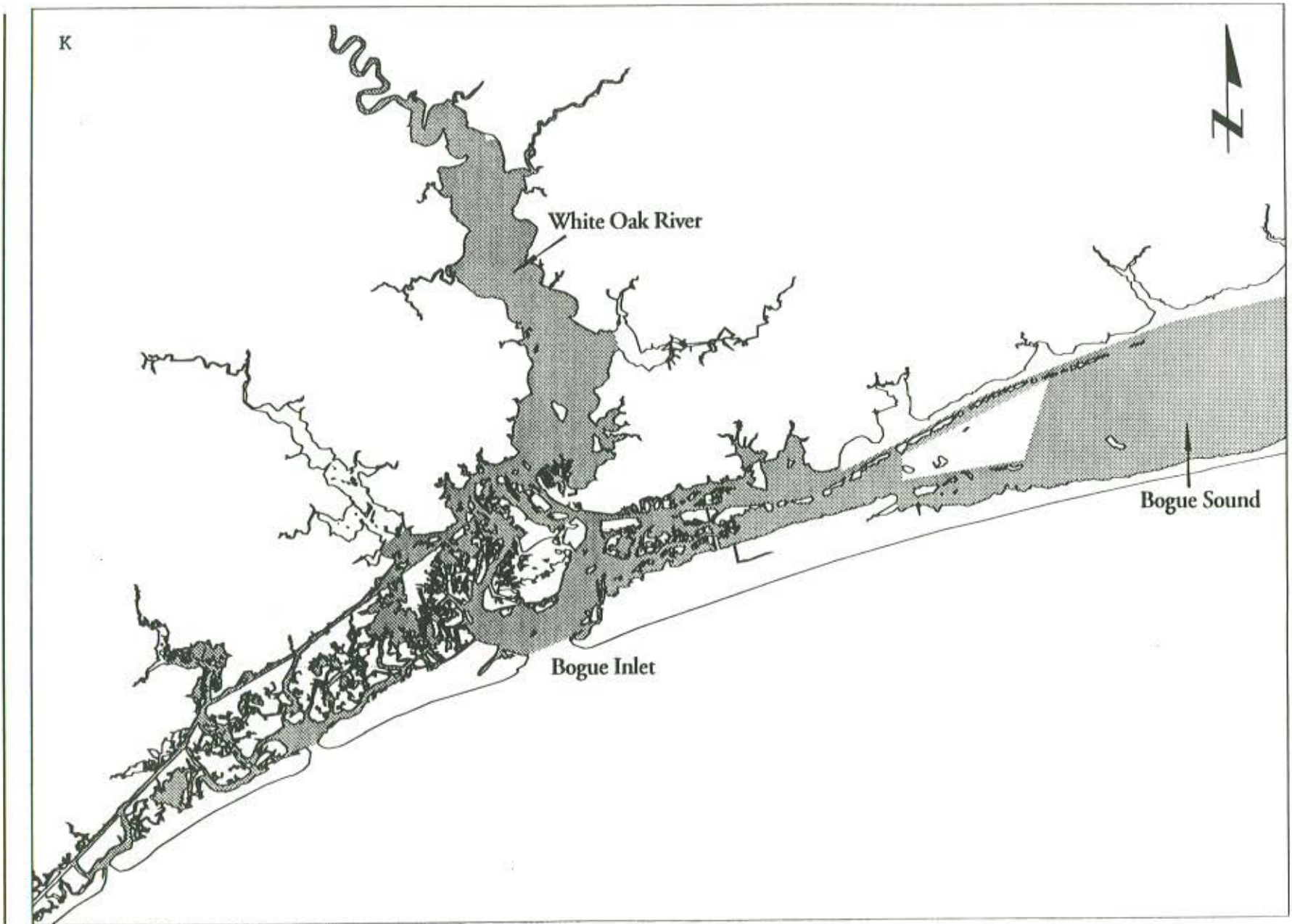
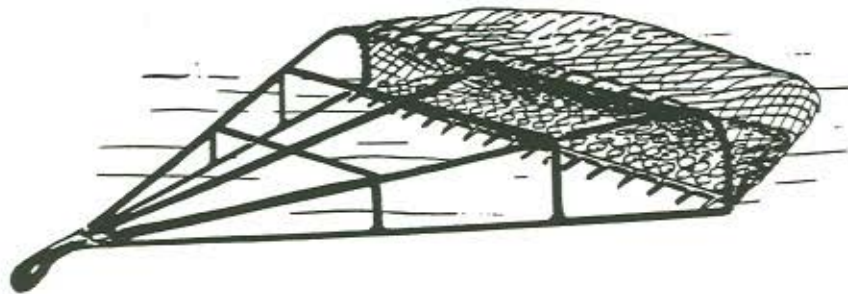


Figure 24. (continued)

Crab Dredging

Description

A crab dredge consists of a metal triangular or oblong shaped frame to which is attached a bag net made of iron rings or S-hooks (Figure 25). The frame is equipped with a raking bar, generally with teeth on the lower edge. Crab dredging is an active collection method.



Source: Dumont and Sundstrom, 1961.

Figure 25. Crab dredge.

Use

The dredge is towed behind a boat for a period of time, then retrieved using a hand or power winch, and the catch is emptied into the boat for sorting.

Equipment and harvest restrictions for crab dredging are summarized in Table 9.

Harvest Area

Crabs may be harvested by dredge only from January 1 through March 1 in one selected area of northeast Pamlico Sound (Figure 26). This harvest area and season are specified by regulations 15A NCAC 3R .0009 and 3L .0203.

Sources

Dumont, W.H., and G.T. Sundstrom. 1961. *Commercial Fishing Gear of the United States*. Fish and Wildlife Circular 109. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Table 9. Crab Dredging—Restrictions and Regulations

Months Conducted
Duration: January 1 through March 1 Peak: February
Major Species Targeted
Blue crab <i>Callinectes sapidus</i>
Equipment Restrictions or Specifications
<p>15A NCAC 3J .0303 .0303 Dredges and Mechanical Methods Prohibited</p> <p>(a) It is unlawful to use or have aboard a vessel any dredge weighing more than 100 pounds.</p> <p>(b) It is unlawful to use more than one dredge per vessel to take . . . crabs or to use any dredges or mechanical methods between sunset and sunrise.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p> <p>15A NCAC 3L .0203 .0203 Crab Dredging</p> <p>(a) It is unlawful to take crabs with dredges except:</p> <p>(1) From January 1 through March 1 in the area of Pamlico Sound described in 15A NCAC 3R .0009.</p> <p>(2) Crabs may be taken incidental to lawful oyster dredging operations provided the weight of the crabs shall not exceed:</p> <p>(A) 50 percent of the total weight of the combined oyster and crab catch; or</p> <p>(B) 500 pounds, whichever is less.</p> <p>(b) It is unlawful to take crabs with dredges between sunset and sunrise and between sunset on any Saturday and sunrise on the following Monday, except in the Atlantic Ocean.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p> <p>15A NCAC 3L .0205 .0205 Crab Spawning Sanctuaries</p> <p>(a) It is unlawful to use a trawl net or to take crabs with the use of commercial fishing equipment from the crab spawning sanctuaries described in 15A NCAC 3R .0010 from March 1 through August 31.</p>

(continued)

Table 9. (continued)

Equipment Restrictions or Specifications (continued)
<p>.0205 Crab Spawning Sanctuaries (continued)</p> <p>(b) From September 1 through February 28, the Fisheries Director may, by proclamation, close the crab spawning sanctuaries and may impose any or all of the following restrictions:</p> <ol style="list-style-type: none"> (1) Specify number of days. (2) Specify areas; (3) Specify means and methods which may be employed in the taking; (4) Specify time period; (5) Limit the quantity. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>
<p>15A NCAC 3N .0004</p> <p>.0004 Prohibited Gear, Primary Nursery Areas</p> <p>It is unlawful to use any trawl net, long haul seine, swipe net, dredge, or mechanical method for clams or oysters for the purpose of taking any marine fishes in any of the primary nursery areas described in 15A NCAC 3R .0003.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>
<p>15A NCAC 3R .0009</p> <p>.0009 Taking Crabs with Dredges</p> <p>It is unlawful to take crabs with dredges except during the period January 1 through March 1 within the area in Pamlico Sound bounded by a line beginning at a point on Sandy Point 35° 37' 35" N — 75° 43' 46" W running 008° 10.1 nautical miles to a point on shore 35° 47' 45" N — 75° 43' 56" W; thence 051° (M) 1.75 nautical miles to a white daybeacon 35° 49' 03" N — 75° 42' 28" W; thence 098° (M) 7 nautical miles to the Bodie Island Lighthouse, thence 157° (M) 3.6 nautical miles to the Oregon Inlet Coast Guard Station flasher; thence 182° (M) 9.7 nautical miles to Flasher No. 3 at Chicamacomico Channel 35° 36' 21" N — 75° 30' 00" W; thence 285° (M) 11.3 nautical miles to the point of beginning.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>

(continued)

Table 9. (continued)

Harvest Restrictions
<p data-bbox="270 357 522 385">15A NCAC 3L .0201</p> <p data-bbox="270 389 766 417">.0201 Size Limit and Culling Tolerance</p> <p data-bbox="270 421 1430 736">It is unlawful to possess hard crabs smaller than five inches from tip of spike to tip of spike except mature females and "peelers." Crabs shall be culled where harvested and all crabs less than legal size shall be immediately returned to the waters from which taken. "Peelers" shall be separated from the entire catch before reaching shore or dock. Tolerance of not more than 15 percent by number of any portion examined shall be allowed. In determining whether the proportion of undersize crabs exceeds the 15 percent tolerance limit, the Fisheries Director and his agents are authorized and empowered to grade all, or any portion, or any combination of portions of the entire quantity of crabs being graded, and may require seizure and return to the waters, or other disposition as authorized by law, of the entire quantity being graded, or of any portion thereof, if undersized crabs in excess of the tolerance limit are found.</p> <p data-bbox="690 772 1458 821"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>

Source: N.C. Marine Fisheries Commission, 1992.

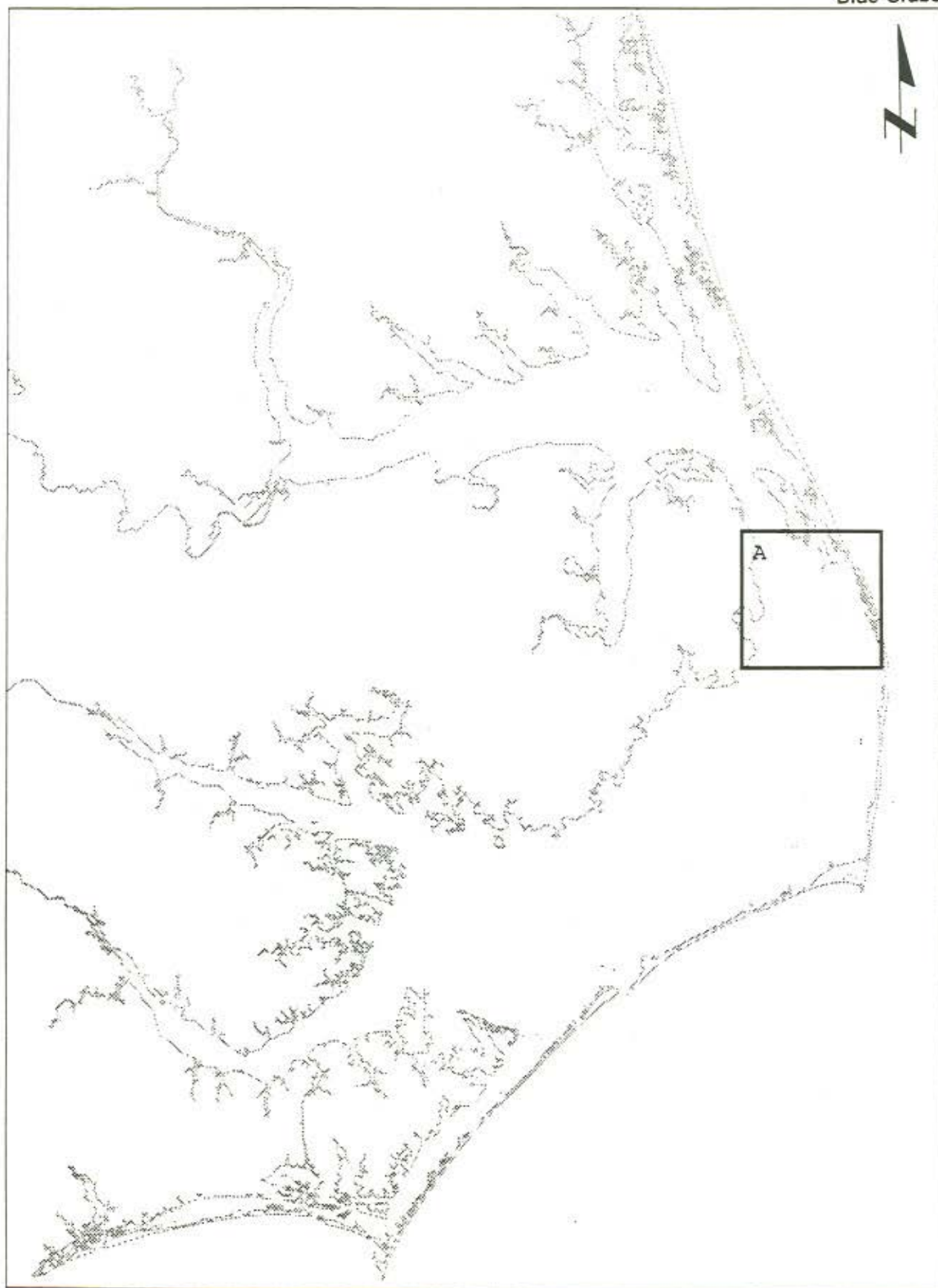


Figure 26. Crab dredging harvest area.

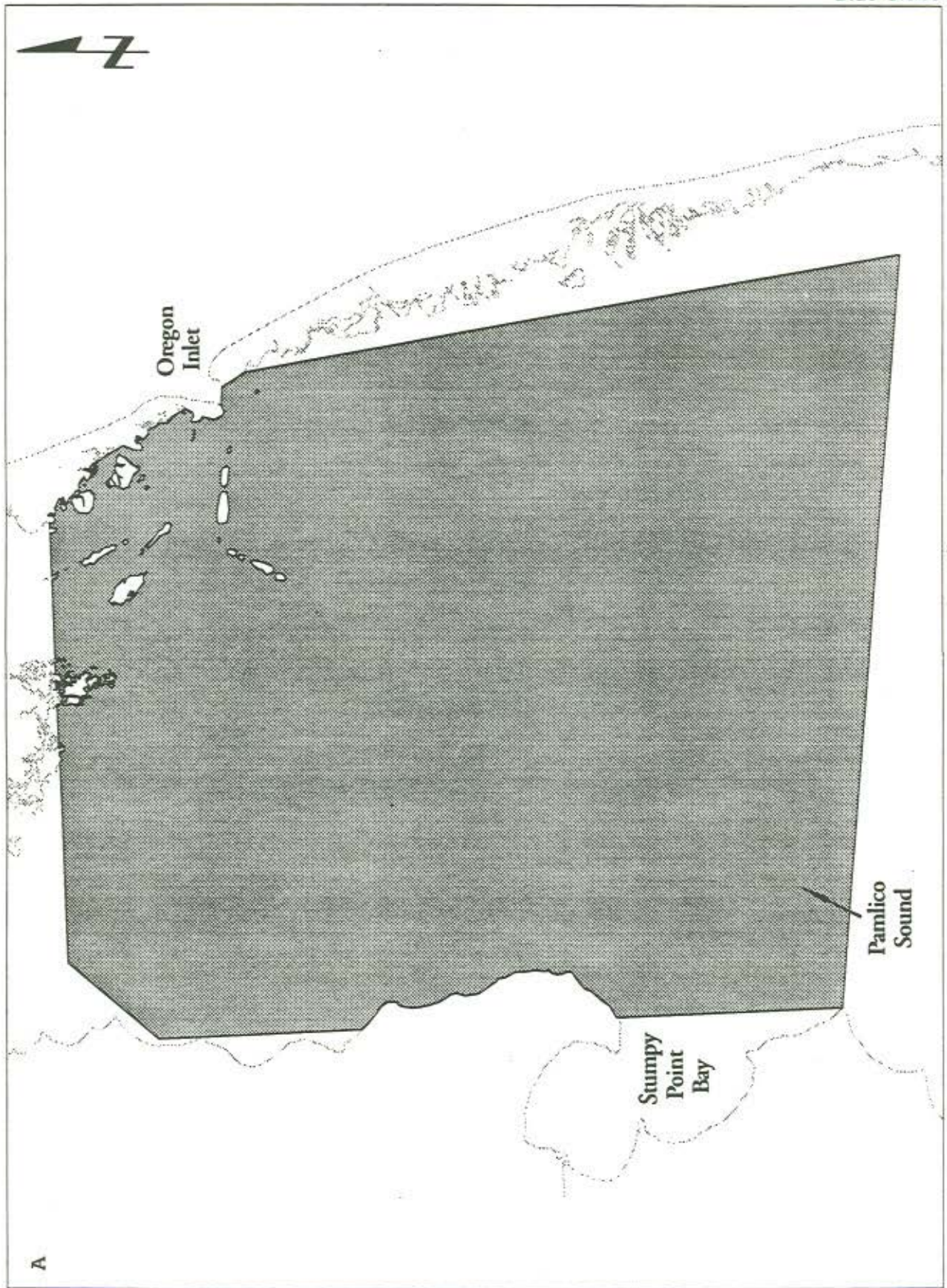


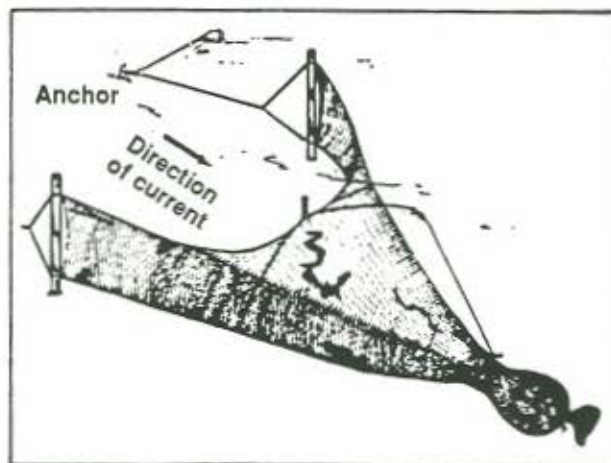
Figure 26. (continued)

Shrimp Harvesting Practices

Shrimp Channel Nets

Description

The channel net, which fishes the surface and middle depths rather than the lower depths, is similar in design to a trawl but is not pulled by a boat (Figure 27). This stationary net may be as much as 100 feet across the mouth, vary from 8 to 14 feet deep, and have a cod end that extends about 40 feet behind the wings. The wing and body meshes measure 1-1/4 inches stretched mesh and are constructed of No. 6 thread; the cod end meshes are 1-1/4 inch and are made of No. 9 thread. The foot and head ropes are at least 1/2 inch thick and the net is "taken up" one-third (i.e., 9 meshes occupy the space of 6).



Source: Guthrie, 1966.

Figure 27. Shrimp channel nets.

Accessory equipment includes a power boat, anchors, rope, staffs (stakes), buoys, and often a 14- to 16-foot skiff. The power boat is used for transportation to and from the fishing grounds, to carry and set channel-net anchors and, occasionally, to fish the net. The skiff, however, usually carries and fishes the net. Stock or plow-type anchors of 25 to 50 pounds are commonly used to hold the net in fishing position, although stakes driven into the bottom are frequently used for this purpose. The anchors are attached to bridles on each wing of the net by 100-foot (or longer) lengths of 1/2-inch rope. A 25-foot line suspended from a buoy is usually fastened to the shank of each anchor to help free it from the bottom. The mouth of the net is held open by three upright staffs (pine or gum saplings) between the foot and head ropes, usually one in the middle and one at each end. Accessory staffs are placed between the center and end staffs in wider nets. End staffs are 10 to 16 feet long and 4 to 6 inches in diameter at the bottom. The center staff is 16 to 18 feet long and 2 to 3 inches in diameter at the bottom. A rope of at least 1/4-inch diameter, buoyed by two or three corks, runs from the top of the center staff and encircles the bunt of the cod end. This line is used to cinch the bunt and lift the cod end out of the water. Neither corks nor leads are used on the head and foot ropes of most channel nets.

Use

The net is set only at night on an ebb tide. After a fishing site is selected, one anchor is lowered and the other is carried across the channel until the joined ropes are taut, at which point the second anchor is lowered and set. A minimum tidal current velocity of 2 knots is required for the effective use of the channel net. When the ebb tide has reached a minimum velocity of 1 or 2 knots, the buoy marking the joined anchor ropes is retrieved and the top end staff is tied to one anchor rope by means of the bridle and placed in the water. The tide is then allowed to pull the net from the boat. In sequence, the center staff is lowered and the cod end is thrown overboard so as not to foul on the bottom of the center staff. When the remaining end staff is tied to the other anchor rope and placed in the water, the net is then in fishing position. One of the anchors may have to be moved to properly align the net with the current.

The skiff is positioned over the cod end of the net by securing the bow to the rope leading from the center staff. When removing the catch, the fisherman first brings the cod end to the side of the boat by pulling on the center line, shaking the catch into the cod end in the process. He then lifts the cod end from the water, allows it to drain over the gunwale, pulls it aboard, and empties it into the boat. The cod end is then retied and returned to the water. Under normal conditions, the net is emptied about every 15 minutes.

About 1/2-hour before the tide slacks (i.e., at late ebb), the channel net is taken aboard by freeing one anchor and letting the net trail in the current. The boat is positioned broadside to the current while the staffs and net are pulled aboard. It is important that the net be removed from the water before the tide changes, otherwise it would turn inside out. Normally, the skiff with net and anchors is left behind to reserve the same fishing site for the next night.

Equipment and harvest restrictions for shrimp channel netting are summarized in Table 10.

Harvest Area

Nets are operated from early spring to early winter (depending on the shrimp species being harvested) in Bogue, Back, and Core Sounds, but primarily around Harkers Island (Figure 28).

Sources

Guthrie, James F. 1966. The channel net for shrimp in North Carolina. *Commercial Fisheries Review* 28(11):24-27. MFR No. 773. Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Tyler, J., and M. McKenzie. 1969. *To Catch a Million Fish: North Carolina Commercial Fishing Gear and Methods*. North Carolina Department of Conservation and Development, Division of Commercial and Sport Fishing, Raleigh, North Carolina.

Table 10. Shrimp Channel Netting—Restrictions and Regulations

Months Conducted		
Duration: Late June through October for brown shrimp April through June and September through November for pink shrimp Late August and may last through December for white shrimp		
Peak: June and July		
Major Species Targeted		
Brown shrimp <i>Penaeus aztecus</i>	Pink shrimp <i>P. duorarum</i>	White shrimp <i>P. setiferus</i>
Equipment Restrictions or Specifications		
<p>15A NCAC 3J .0106 .0106 Channel Nets</p> <p>(a) It is unlawful to use a channel net:</p> <ol style="list-style-type: none"> (1) Until the Fisheries Director specifies by proclamation, time periods and areas for the use of channel nets and other fixed nets for shrimping. (2) Without yellow light reflective tape on the top portion of each staff or stake and on any buoys located at either end of the net. (3) With any portion of the set including boats, anchors, cables, ropes or nets within 50 feet of the center line of the Intracoastal Waterway Channel. (4) In the middle third of any navigation channel marked by Corps of Engineers and/or U.S. Coast Guard. (5) Unless attended by the fisherman who shall be no more than 50 yards from the net at all times. <p>(b) It is unlawful to use or possess aboard a vessel any channel net with a corkline exceeding 40 yards.</p> <p>(c) It is unlawful to leave any channel net, channel net buoy, or channel net stakes in coastal fishing waters from December 1 through March 1.</p> <p>(d) It is unlawful to use floats or buoys of metallic material for marking a channel net set.</p> <p>(e) From March 2 through November 30, cables used in a channel net operation shall, when not attached to the net, be connected together and any attached buoy shall be connected by non-metal line.</p> <p>(f) It is unlawful to leave channel net buoys in coastal fishing waters without yellow light reflective tape on each buoy and without the owner's identification being clearly printed on each buoy. Such identification must include one of the following:</p> <ol style="list-style-type: none"> (1) Owner's N.C. motorboat registration number; or (2) Owner's U.S. vessel documentation name; or (3) Owner's last name and initials. <p>(g) It is unlawful to use any channel nets, anchors, lines, or buoys in such a manner as to constitute a hazard to navigation.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>		

(continued)

Table 10. (continued)

Equipment Restrictions or Specifications (continued)
<p>15A NCAC 3L .0103 .0103 Prohibited Nets and Mesh Sizes (a) It is unlawful to take shrimp with nets with mesh lengths less than the following: (2) Fixed nets, channel nets, float nets, butterfly nets, and hand seines—one and one-fourth inches; and (b) It is unlawful to take shrimp with a net constructed in such a manner as to contain an inner or outer liner of any mesh size. Net material used as chafing gear shall be no less than four inches mesh length except that chafing gear with small mesh may be used only on the bottom one-half of the tailbag. Such chafing gear shall not be tied in a manner that forms an additional tailbag.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>
Harvest Restrictions
<p>15A NCAC 3L .0101 .0101 Season It is unlawful to take shrimp with nets until the Fisheries Director, by proclamation, opens the season in various waters. Proclamations may specify any hours of day or night or both and any other conditions appropriate to management of the fishery. If sampling indicates primarily undersized shrimp or juveniles of any other species of major economic importance, the Fisheries Director may close such waters to shrimping and prohibit the use of nets for any purpose except cast nets as provided in 15A NCAC 3L .0102. Prominent landmarks or other permanent-type markers shall be considered when establishing closure lines even if such lines extend beyond the area of concern.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p> <p>15A NCAC 3L .0102 .0102 Weekend Shrimping Prohibited It is unlawful to take shrimp by any method between one hour after sunset on any Saturday and one hour before sunset on the following Sunday, except: (2) With the use of fixed and channel nets, hand seines, and cast nets.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>

Source: N.C. Marine Fisheries Commission, 1992.

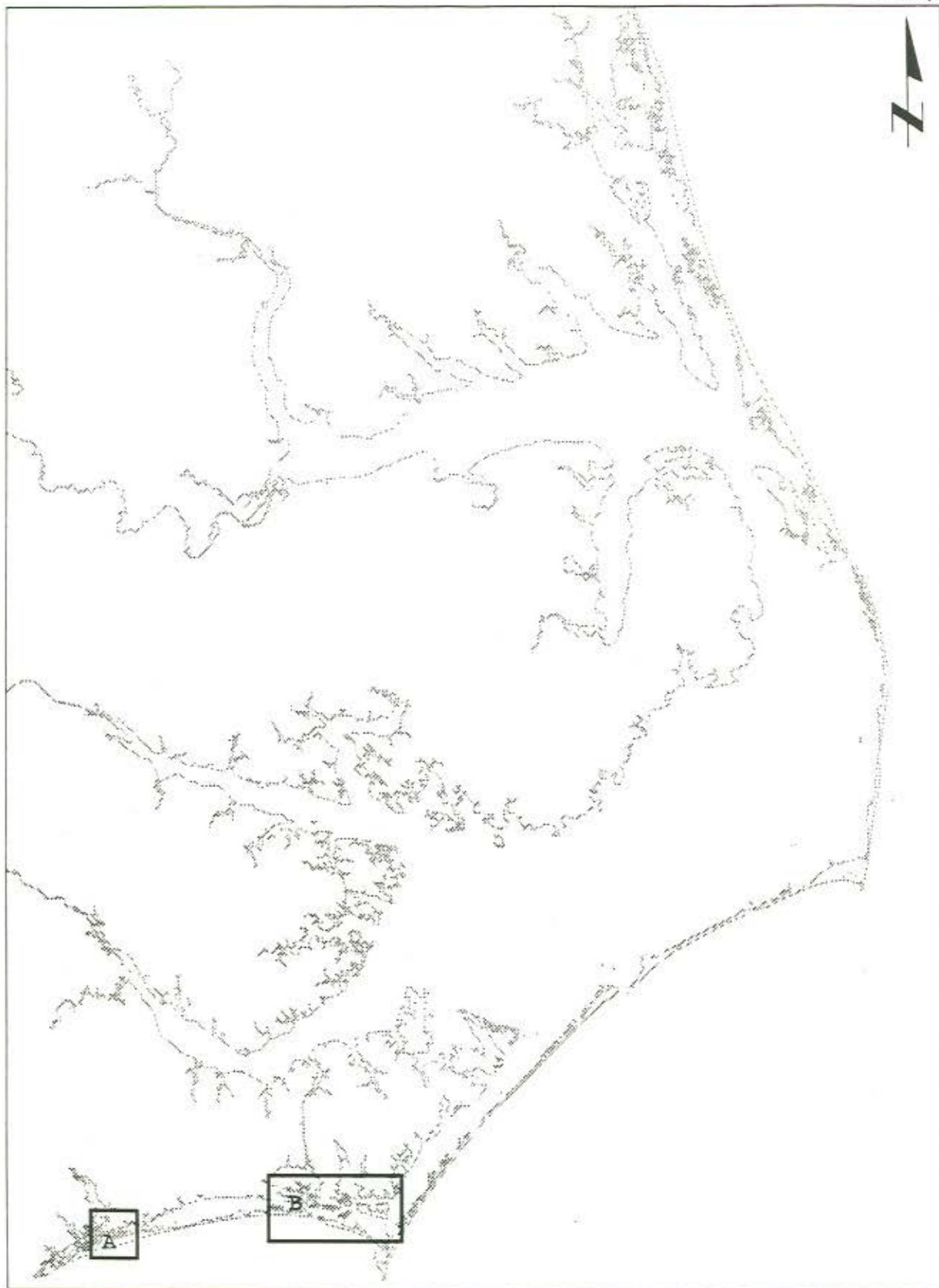


Figure 28. Shrimp channel net harvest area.

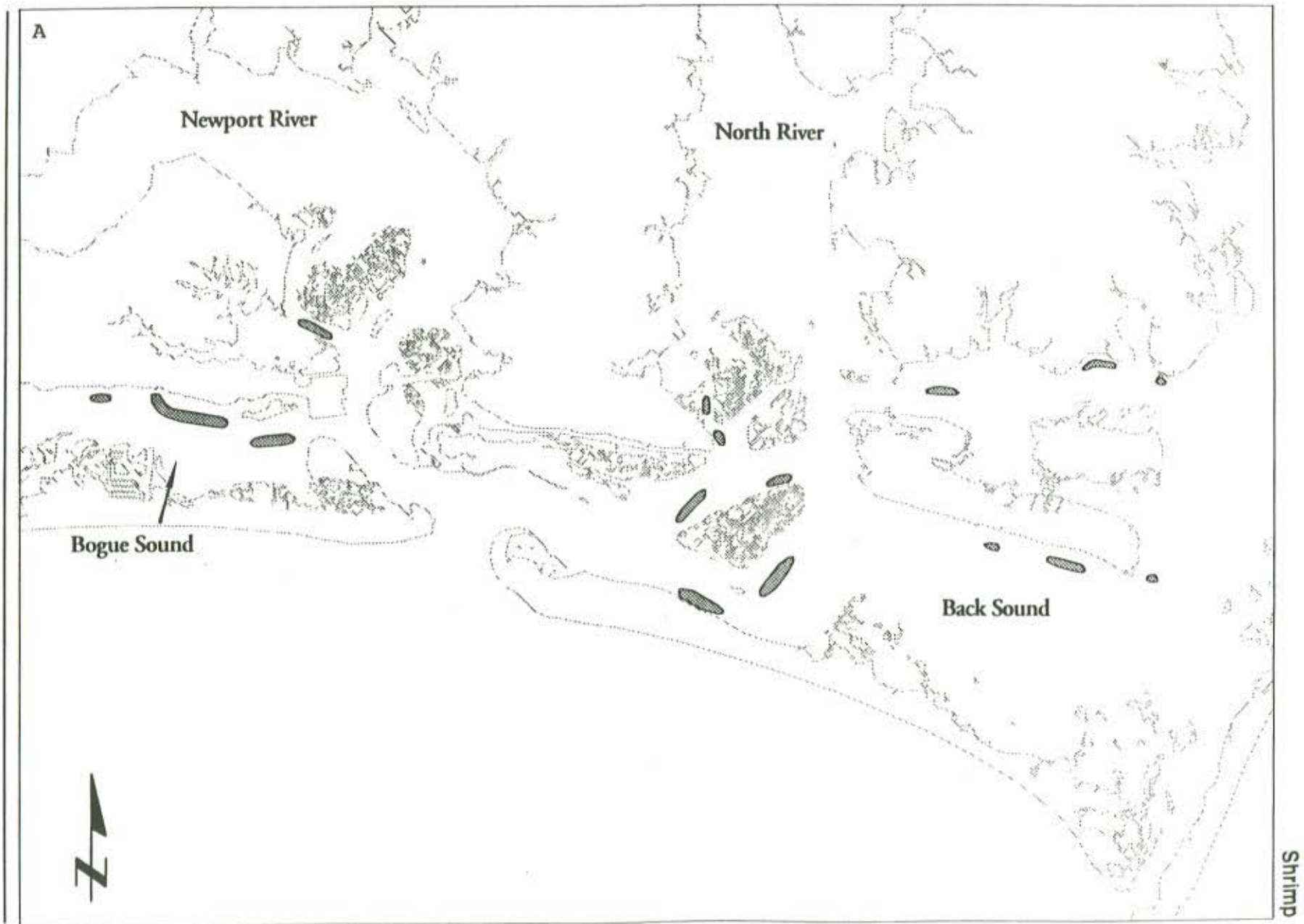


Figure 28. (continued)

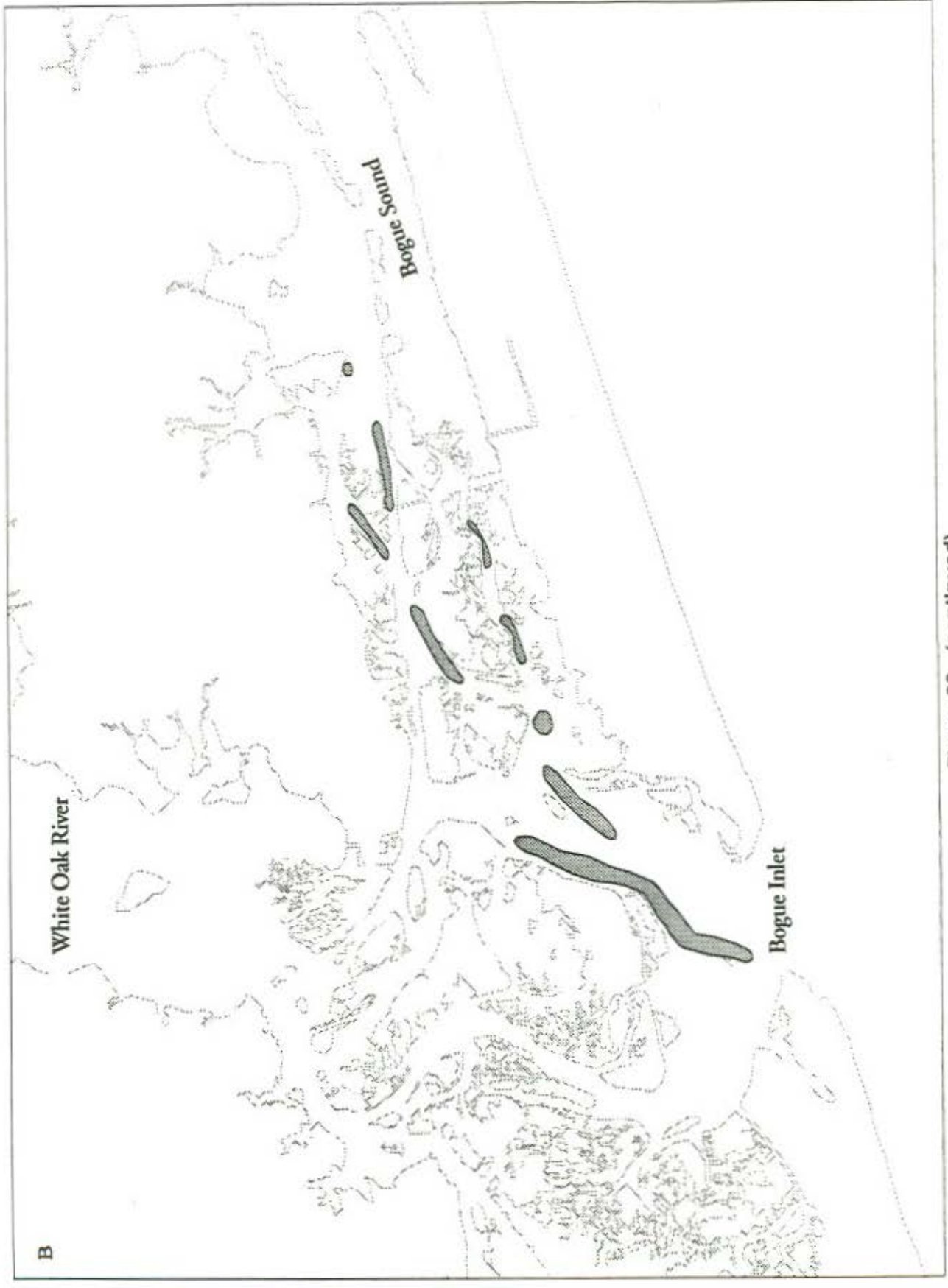


Figure 28. (continued)

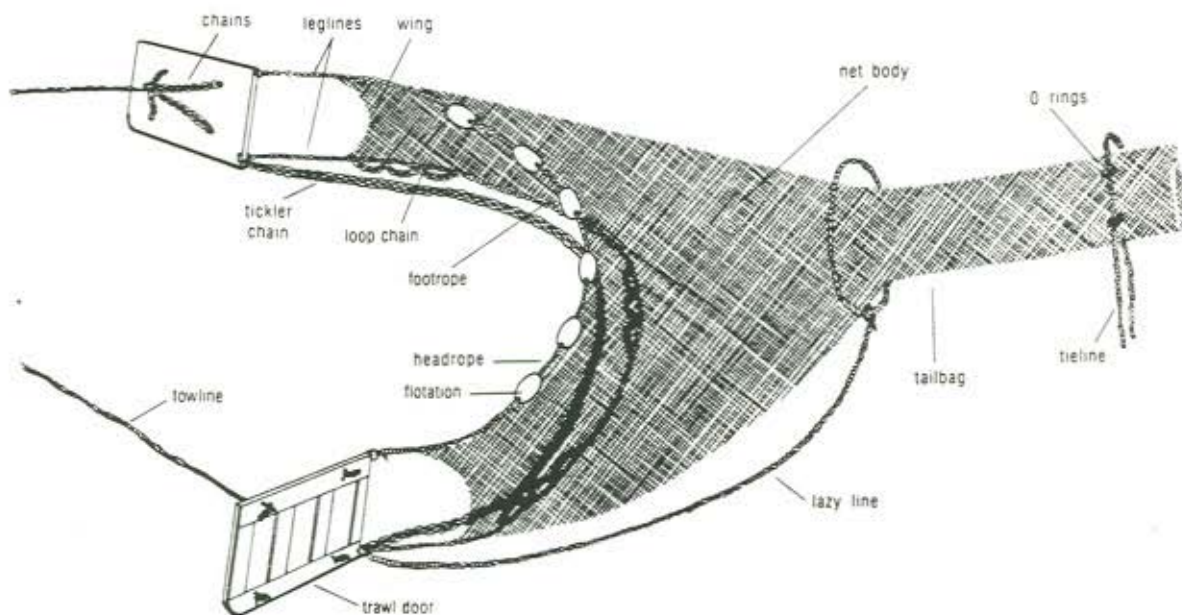
Shrimp Trawling

Description

The shrimp otter trawl is a device constructed of twine webbing (mesh length not less than 1-1/2 inches) that becomes funnel-shaped when towed along the bottom (Figure 29). Floats and weights are used to keep the mouth of the net open. The mouth width may range from 20 to 90 feet. To spread the mouth so that it will cover the largest possible area, each wing is fastened to an "otter" board or trawl "door." Each door is fitted with chains attached to a towing cable from the vessel. The resistance of the water to the forward motion of the boards, as they are towed at different angles, forces them to pull in opposite directions and thus keep the mouth of the net spread.

The shrimp trawl accounts for 95 percent of the shrimp harvest in the A/P estuarine system as well as a substantial finfish bycatch, which is usually discarded at sea. During the past decade, North Carolina shrimpers have harvested an average of 7 million pounds of shrimp (head-on) annually.

To reduce finfish bycatch during shrimp trawling operations, finfish excluder devices (FEDs) are now required by regulations (Figures 30 and 31).

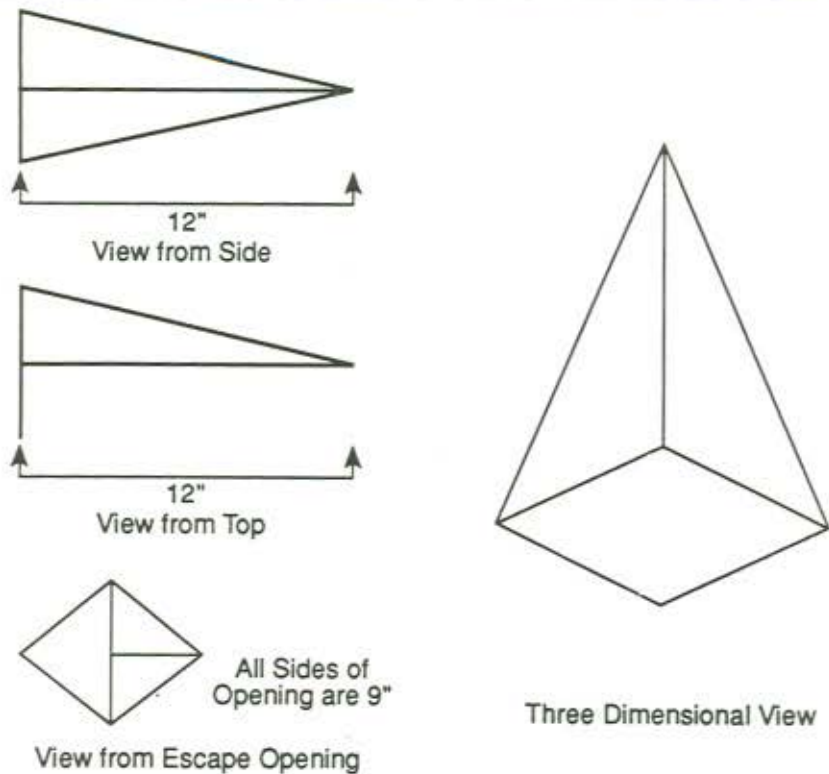


Source: Wescott, 1986.

Figure 29. Shrimp trawl.

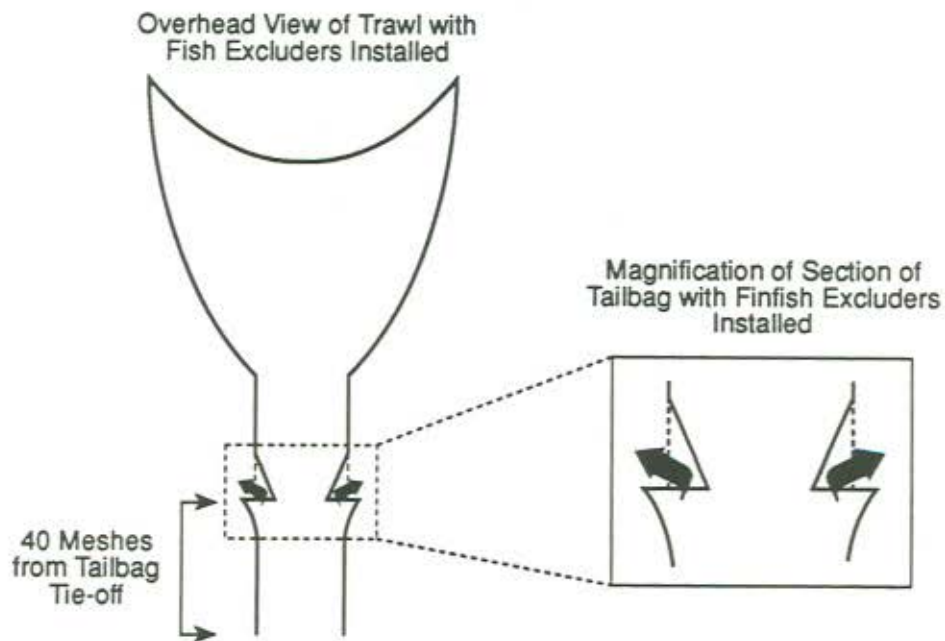
Use

The shrimp trawl is fished by being towed over the bottom behind a boat. In the shrimp fishery, 45- to 75-foot vessels can pull four nets (four-barrelled rigs) with a combined



Supplied by the Division of Marine Fisheries.

Figure 30. Various views of fish excluder device.



Supplied by the Division of Marine Fisheries.

Figure 31. Proper position of fish excluders in trawl.

headrope length of 120 to 160 feet. Four-barrelled rigs allow fishing vessels to pull two nets (towed one beside the other) from each outrigger. In Pamlico Sound, large vessels stay out 3 or 4 days and tow from 1 to 3 hours at a time. Smaller vessels make daily trips and employ shorter tow times. In the Core Sound area, the fishery occurs mainly at night, again with daily trips. In the southern area, fishing is conducted on a day-trip basis, mostly during daylight hours by full-time commercial fishermen. However, smaller recreational and part-time commercial trawlers are active throughout the State, mainly at night after completing their regular daytime jobs.

Habits of the three shrimp species (white, pink, and brown shrimp) and differences in the fishing grounds dictate different fishing strategies that vary by season and area. The majority of brown and pink shrimp are caught in flat trawls; white shrimp are captured using four-seam semi-balloon nets or tongue trawls. Trawling for pink shrimp is done primarily at night, brown shrimp are fished around the clock, and white shrimp are generally fished during daylight.

In December 1992, the National Marine Fisheries Service required shrimp vessels 25 feet long or longer working in the Atlantic Ocean year round to use turtle excluder devices (TEDs). Estuarine shrimp vessels are also required to use TEDs year round unless they adhere to towing time restrictions of 75 minutes or less (November 1 through March 31) and 55 minutes or less (April 1 through October 31). Four species of Atlantic sea turtles that are protected under the Endangered Species Act (loggerhead, green, Kemp's ridley, and leatherback) are found in North Carolina coastal waters.

Equipment and harvest restrictions for shrimp trawling are summarized in Table 11.

Harvest Area

Shrimp trawls are used primarily in Croatan, Roanoke, and Pamlico Sounds; the Pamlico, Pungo, Bay, and Neuse Rivers; and in Core, Back, and Bogue Sounds including the White Oak, Newport, and North Rivers. See Figure 32 for an overview of shrimp trawling area and Figure 24 for more detailed maps of trawling areas.

Sources

Albemarle-Pamlico Estuarine Study. 1991. *Status and Trends Report*. Raleigh, NC.

Dumont, W.H., and G.T. Sundstrom. 1961. *Commercial Fishing Gear of the United States*. Fish and Wildlife Circular 109. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Wescott, W. 1986. *A Guide to Recreational Shrimping*. UNC Sea Grant College Publication UNC-SG-86-07. Raleigh, NC.

Table 11. Shrimp Trawling—Restrictions and Regulations

Months Conducted	
Duration: Year round	Peak: June through October
Major Species Targeted	
Brown shrimp <i>Penaeus aztecus</i> Pink shrimp <i>P. duorarum</i>	White shrimp <i>P. setiferus</i>
Equipment Restrictions or Specifications	
<p>15A NCAC 3J .0104 .0104 Trawl Nets</p> <p>(a) It is unlawful to use trawl nets for the taking of finfish in internal waters, except that it shall be permissible to take or possess finfish incidental to crab or shrimp trawling in accordance with the following limitations:</p> <ol style="list-style-type: none"> (1) It is unlawful to possess aboard a vessel while using a trawl in internal waters more than 1,000 pounds of finfish except flounder of legal size may be taken and possessed without limit in quantity in internal waters while engaged in crab trawling. (2) The Fisheries Director may, by proclamation, close any area to trawling for specific time periods in order to secure compliance of this Rule. <p>(b) It is unlawful to use trawl nets:</p> <ol style="list-style-type: none"> (1) For the taking of oysters; (2) In Albemarle Sound and its tributaries; <p>.....</p> <p>(c) Minimum mesh sizes for shrimp . . . trawls are presented in 15A NCAC 3L .0103 and .0202.</p> <p>(d) The Fisheries Director may, with prior consent of the Marine Fisheries Commission, by proclamation, require finfish excluder devices or codend modifications in trawl nets to reduce the catch of finfish that do not meet size limits or are unmarketable as individual foodfish by reason of size.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. February 1, 1991; Amended Eff. February 1, 1992.</i></p> <p>15A NCAC 3K .0203 .0203 Trawling Across Oyster Management Areas Prohibited</p> <p>It is unlawful to tow or pull a trawl net for any purpose across any oyster bed which has been planted and posted by the state.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p> <p>15A NCAC 3L .0103 .0103 Prohibited Nets and Mesh Sizes</p> <p>(a) It is unlawful to take shrimp with nets with mesh lengths less than the following:</p> <ol style="list-style-type: none"> (1) Trawl net—one and one-half inches; <p>.....</p>	

(continued)

Table 11. (continued)

Equipment Restrictions or Specifications (continued)
<p>.0103 Prohibited Nets and Mesh Sizes (continued)</p>
<p>(b) It is unlawful to take shrimp with a net constructed in such a manner as to contain an inner or outer liner of any mesh size. Net material used as chafing gear shall be no less than four inches mesh length except that chafing gear with small mesh may be used only on the bottom one-half of the tailbag. Such chafing gear shall not be tied in a manner that forms an additional tailbag.</p>
<p><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>
<p>15A NCAC 3L .0205 .0205 Crab Spawning Sanctuaries</p>
<p>(a) It is unlawful to use a trawl net or to take crabs with the use of commercial fishing equipment from the crab spawning sanctuaries described in 15A NCAC 3R .0010 from March 1 through August 31.</p>
<p>(b) From September 1 through February 28, the Fisheries Director may, by proclamation, close the crab spawning sanctuaries and may impose any or all of the following restrictions:</p>
<ol style="list-style-type: none"> (1) Specify number of days; (2) Specify areas; (3) Specify means and methods which may be employed in the taking; (4) Specify time period; (5) Limit the quantity.
<p><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>
<p>15 NCAC 3N .0004 .0004 Prohibited Gear, Primary Nursery Areas</p>
<p>It is unlawful to use any trawl net, long haul seine, swipe net, dredge or mechanical method for clams or oysters for the purpose of taking any marine fishes in any of the primary nursery areas described in 15A NCAC 3R .0003.</p>
<p><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>
<p>15A NCAC 3N .0005 .0005 Prohibited Gear, Secondary Nursery Areas</p>
<p>(a) It is unlawful to use trawl nets for any purpose in any of the permanent secondary nursery areas described in 15A NCAC 3R.0004.</p>
<p>(b) It is unlawful to use trawl nets for any purpose in any of the special secondary nursery areas described in 15A NCAC 3P .0005, except that the Fisheries Director may, by proclamation, open any or all of the special secondary nursery areas, or any portion thereof, listed in 15A NCAC 3R .0005 to shrimp or crab trawling from August 16 through May 14 subject to the provisions of 15A NCAC 3L .0100 and .0200.</p>

(continued)

Table 11. (continued)

Equipment Restrictions or Specifications (continued)
<p>.0005 Prohibited Gear, Secondary Nursery Areas (continued) (c) Permanent and special secondary areas described in 15A NCAC 3R .0004 and .0005 generally pertain to those areas located between the described line and the primary nursery area lines or Inland-Coastal boundary lines where applicable.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p> <p>15A NCAC 3R .0006 .0006 Trawl Nets Prohibited It is unlawful to use trawl nets in that area south of Shackleford Banks which is east of a line which begins at the navigation aid (buoy or beacon) at the westward end of the Cape Lookout westernmost jetty and running thence N 06° 45"E degrees (M) to the Harkers' Island water tower; The excluded area includes all of Cape Lookout Bight, that area west of the Bight but east of the line above that portion of Bardens Inlet which lies southwestward of a line which begins at the Cape Lookout Lighthouse and runs N 28°15'W degrees (M) to the southern end of Shackleford Banks.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>
Harvest Restrictions
<p>15A NCAC 3L .0101 .0101 Season It is unlawful to take shrimp with nets until the Fisheries Director, by proclamation, opens the season in various waters. Proclamations may specify any hours of day or night or both and any other conditions appropriate to management of the fishery. If sampling indicates primarily undersized shrimp or juveniles of any other species of major economic importance, the Fisheries Director may close such waters to shrimping and prohibit the use of nets for any purpose except cast nets as provided in 15A NCAC 3L .0102. Prominent landmarks or other permanent-type markers shall be considered when establishing closure lines even if such lines extend beyond the area of concern.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p> <p>15A NCAC 3L .0102 .0102 Weekend Shrimping Prohibited It is unlawful to take shrimp by any method between one hour after sunset on any Saturday and one hour before sunset on the following Sunday, except:</p> <p style="text-align: center;">.</p> <p>(2) With the use of fixed and channel nets, hand seines, and cast nets.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>

(continued)

Table 11. (continued)

Harvest Restrictions (continued)
<p>15A NCAC 3M .0102 .0102 Unmarketable Food or Scrap Fish</p> <p>(a) It is unlawful to land or dispose of finfish as trash or scrap fish if in violation of minimum size or possession limits established by rule or proclamation.</p> <p>(b) It is unlawful to land or dispose of finfish as trash or scrap fish taken in connection with legitimate commercial fishing operations which are unmarketable as individual food fish by reason of size, except that a quantity not exceeding 5,000 pounds per vessel per day may be:</p> <ol style="list-style-type: none">(1) Landed and sold to a licensed finfish dealer, a licensed fish dehydrating plant or licensed finfish processing plant, and(2) Purchased or accepted by a licensed finfish dealer, a licensed fish dehydrating plant or licensed finfish processor. <p>Menhaden, herring, and gizzard shad are exempt from this Rule.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-185; 143B-289.4; Eff. January 1, 1991.</i></p>

Source: N.C. Marine Fisheries Commission, 1992.

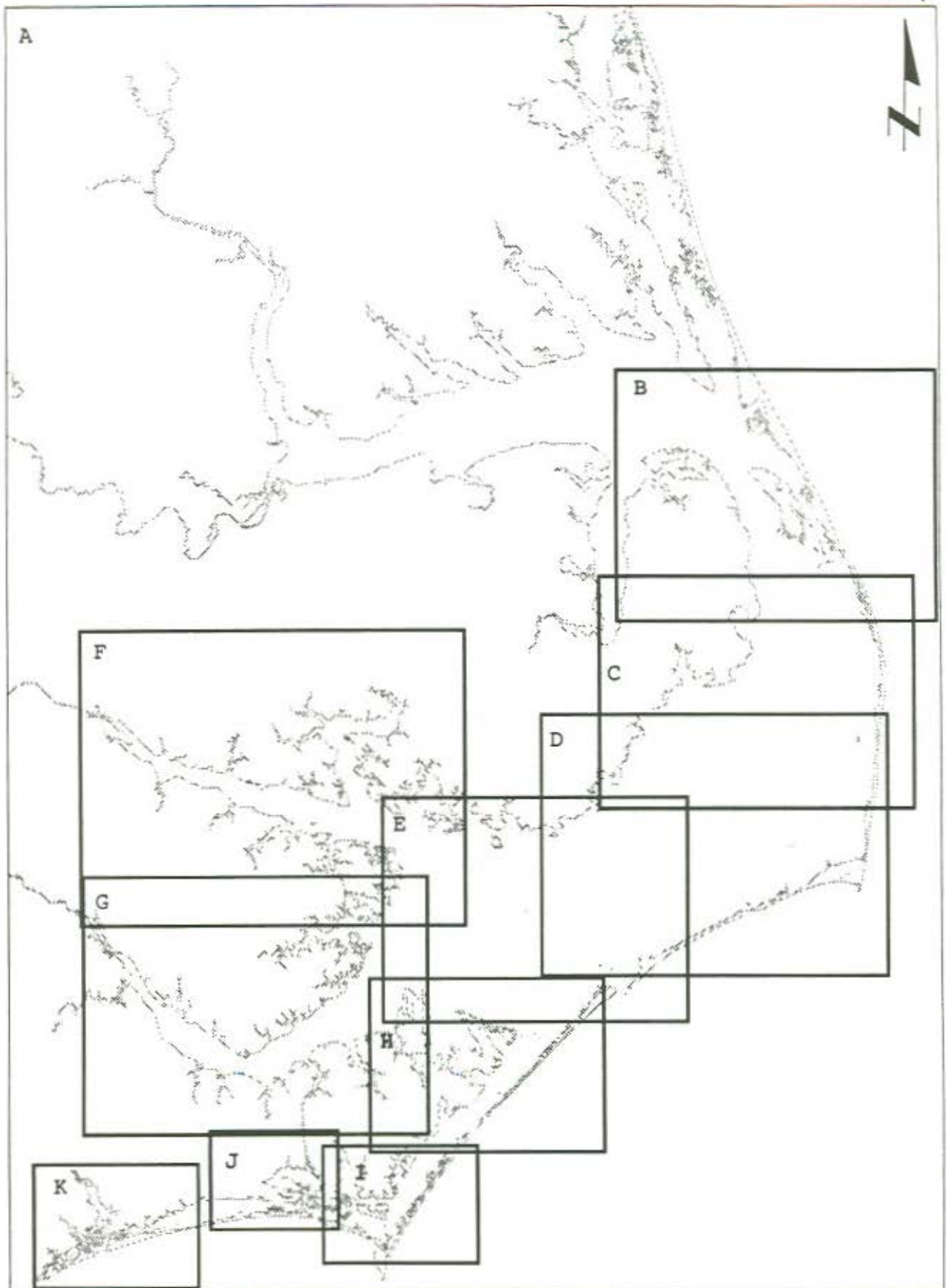


Figure 32. Shrimp trawling harvest area (see also Figure 24).

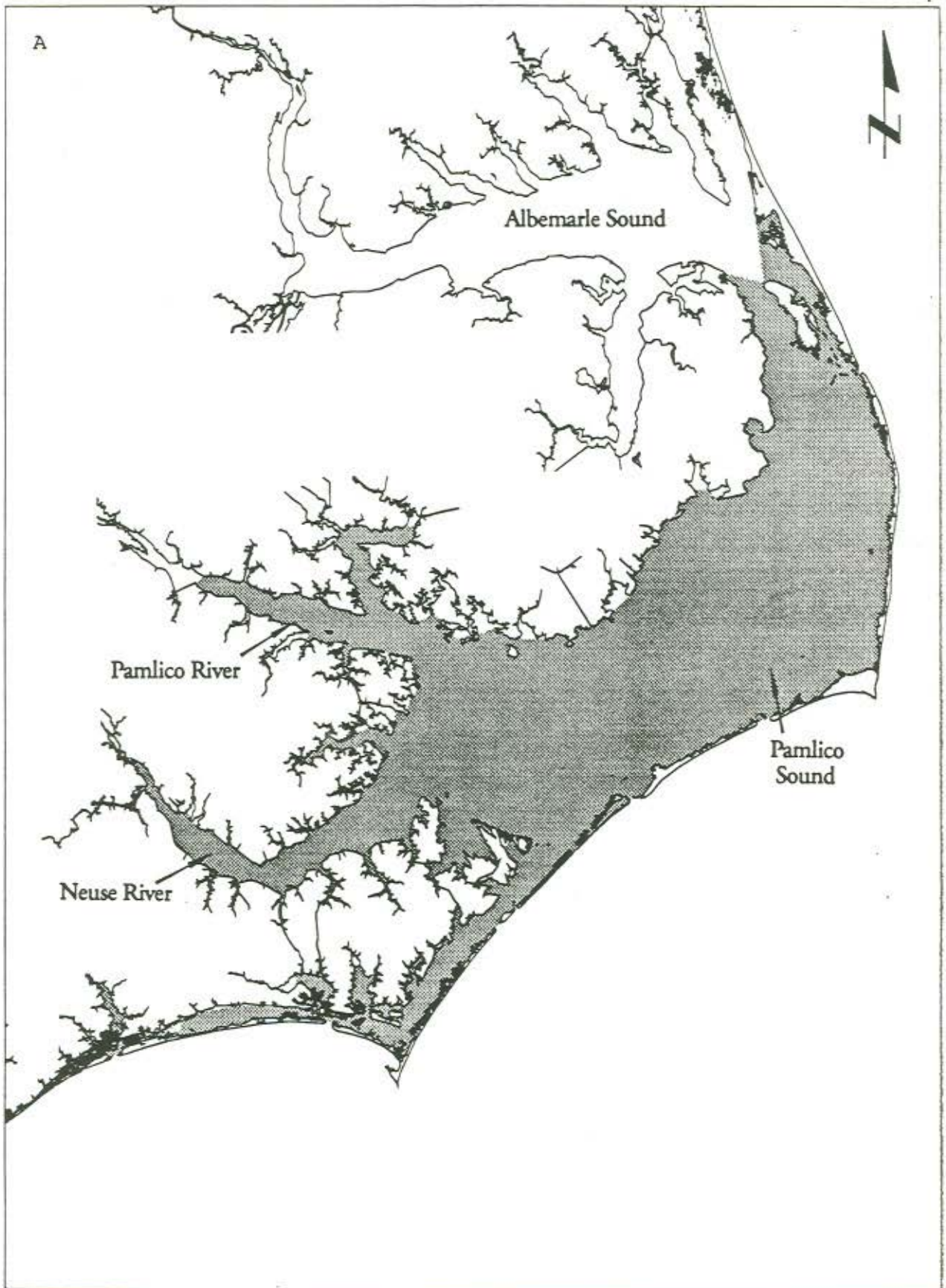


Figure 32. (continued)

***Finfish Harvesting
Practices***

FINFISH HARVESTING PRACTICES

Fishing gears described in this section are generally not identified by the individual species they target. Unlike most of the shellfishing gears, which target an individual species, finfishing gears harvest a variety of species in addition to the target species. Finfishing practices used in the A/P Study Area include both passive and active harvest methods.

Passive Harvest Methods

Passive harvest practices include gill netting, pound netting (targeting four different groups of finfish), fish pots (targeting various catfish species and the American eel), and trotline fishing for various catfish species. In passive harvesting practices, the fisherman deploys the equipment and generally monitors the equipment sometime later to harvest the catch.

Active Harvest Methods

Active harvest methods include those practices that generally require boats for deployment, such as long haul seining (including swipe netting) and hook-and-line fishing. In active harvesting practices, the fisherman is actively involved during the collection period from the time the equipment is deployed until the catch is harvested.

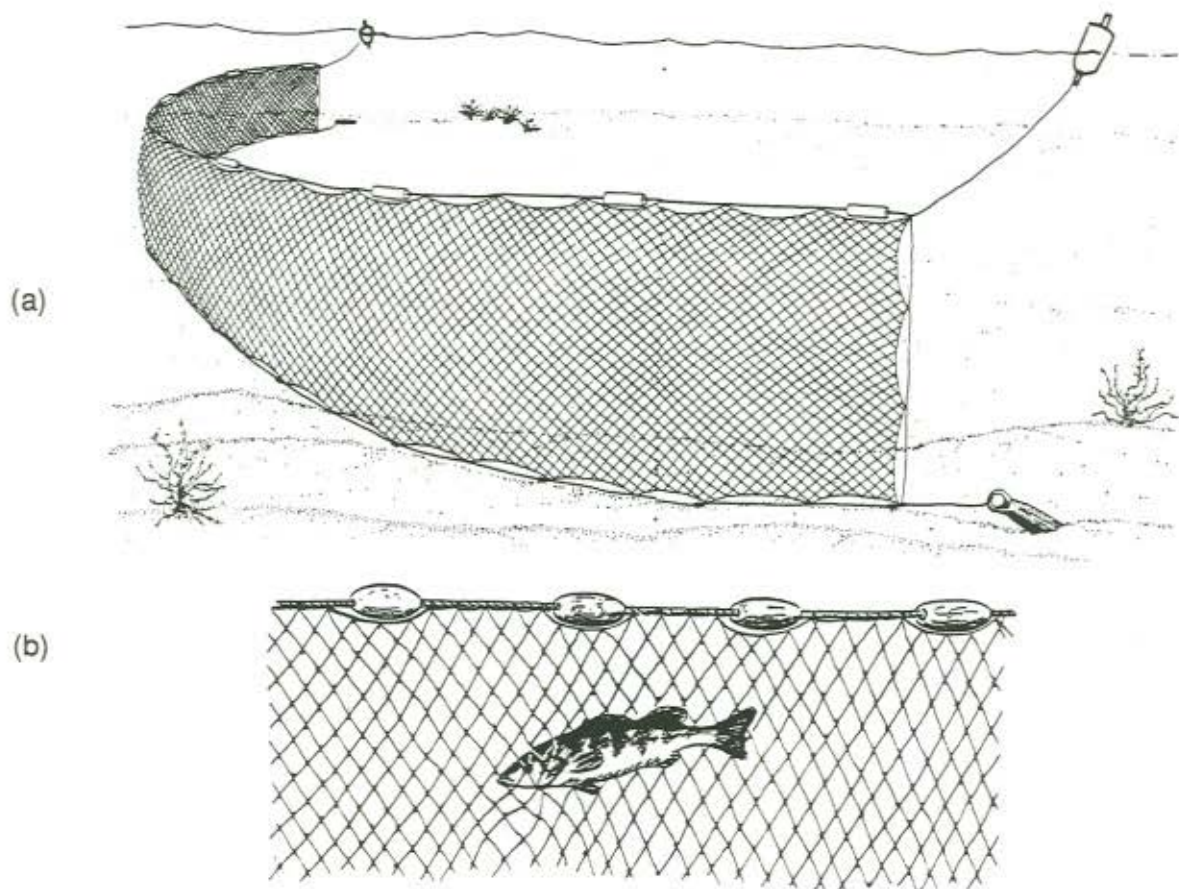
Passive Harvest Methods

Gill Netting (Sink [anchor] and drift gill netting)

Description

Sink (anchor) gill nets are stationary fishing nets consisting of an upright fence of monofilament netting that entraps fish in its mesh (not less than 2-1/2 inches stretched mesh) (Figure 33a). Fish swim into the net, and those of a size for which the net is designed can pass only part way through a single mesh. When the fish struggles to free itself, the mesh slips back over the gill cover and prevents the fish from escaping (Figure 33b). The fish is thus gilled and can swim neither forward nor backward.

Drift gill nets are similar to sink gill nets except they are movable nets that float with the current (Figure 33a).



Source: (a) Bahen et al., 1979; (b) Dumont and Sundstrom, 1961.

Figure 33. Gill nets: (a) gill net deployment and (b) fish entrapment.

Use

Sink or anchor gill nets are set in place by a boat and are secured to the bottom with anchors. These nets can be suspended at the surface, in midwater, or close to the bottom by controlling the number of buoy lines and the size and number of floats on the top and weights on the lead line. Anchor gill nets are periodically lifted from the water into an attending boat so that the catch may be removed.

Drift gill nets are free floating and are fished at the surface or at an intermediate depth. The gear is generally, but not always, set across the current and is attended by a boat into which the net is periodically lifted and the catch removed. River herring and shad are captured on their spawning migrations with this gear.

Gill nets are fished in a wide range of habitats and salinity ranges and thus collect a diversity of both freshwater and estuarine species. These nets are used for both commercial and recreational fishing.

Harvest Area

Sink gill nets are used throughout the A/P estuarine area except as restricted by regulations (Table 12). Sink gill nets are used in the Albemarle Sound system including the Chowan, Roanoke, Alligator, Perquimans, Pasquotank, and North Rivers; Currituck Sound south through Croatan and Roanoke Sounds; and throughout the Pamlico Sound to Core and Bogue Sounds and their tributaries.

Drift gill nets can be used throughout the A/P estuarine area except as restricted by regulations (Table 12). Drift gill nets are used primarily in the Roanoke, Middle, Cashie, Meherrin, and upper Chowan Rivers to harvest river herring. Drift gill netting is also employed in the Neuse and Tar-Pamlico River systems where currents allow the net to drift.

In addition to regulations, gill net harvest area and mesh size restrictions may be issued by proclamation of the Fisheries Director.

Sources

Albemarle-Pamlico Estuarine Study. 1991. *Status and Trends Report*. Raleigh, NC.

Bahen, J., M.D. Mordecai, and D. Dow. 1979. *How to Hang a Gill Net*. UNC Sea Grant College Program and University of New Hampshire/University of Maine Cooperative Institutional Sea Grant Program. UNC Sea Grant Publication 79-03. Raleigh, NC.

Dumont, W.H., and G.T. Sundstrom. 1961. *Commercial Fishing Gear of the United States*. Fish and Wildlife Circular 109. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

**Table 12. Sink Gill Netting—Restrictions and Regulations
(Anchor gill netting)**

Months Conducted		
<p>Duration: August through December—Southern flounder August through May—Bluefish, spotted trout, red drum, and weakfish February through April—Menhaden (bait), striped bass August through November—Mullet February through May—White perch, yellow perch, American shad, hickory shad, blueback herring, and alewife.</p> <p>Peak: September and November—Southern flounder March through May—Bluefish September through December—Spotted trout, red drum, and weakfish February through April—Menhaden (bait) September and October—Mullet February through April—Striped bass February through May—White perch, yellow perch, American shad, hickory shad, blueback herring, and alewife.</p>		
Major Species Targeted		
Striped bass <i>Morone saxatilis</i> White perch <i>M. americana</i> Southern flounder <i>Paralichthys lethostigma</i> Summer flounder <i>P. dentatus</i> Gulf flounder <i>P. albigutta</i> Yellow perch <i>Perca flavescens</i> American shad <i>Alosa sapidissima</i> Hickory shad <i>A. mediocris</i>	Blueback herring <i>A. aestivalis</i> Alewife <i>A. pseudoharengus</i> Spot <i>Leiostomus xanthurus</i> Atlantic croaker <i>Microponias undulatus</i> Red drum <i>Sciaenops ocellatus</i> Spotted seatrout <i>Cynoscion nebulosus</i> Weakfish <i>Cynoscion regalis</i> Brown bullhead <i>Ictalurus nebulosus</i>	Channel catfish <i>I. punctatus</i> White catfish <i>I. catus</i> Yellow bullhead <i>I. natalis</i> Striped mullet <i>Mugil cephalus</i> Bluefish <i>Pomatomus saltatrix</i> Atlantic menhaden <i>Brevoortia tyrannus</i>
Equipment Restrictions or Specifications		
<p>15A NCAC 3J .0101 .0101 Fixed or Stationary Nets It is unlawful to use or set fixed or stationary nets:</p> <ol style="list-style-type: none"> (1) In the channel of the Intracoastal Waterway or in any other location where it may constitute a hazard to navigation; (2) So as to block more than two-thirds of any natural or man-made waterway, sound, bay, creek, inlet or any other body of water; 		

(continued)

Table 12. (continued)

Equipment Restrictions or Specifications (continued)
<p>.0101 Fixed or Stationary Nets (continued)</p> <ul style="list-style-type: none"> (3) In the middle third of any marked navigation channel; (4) In the channel third of the following rivers; Roanoke, Cashie, Middle, Eastmost, Chowan, Little, Perquimans, Pasquotank, North, Alligator, Pungo, Pamlico, and Yeopim. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p> <p>15A NCAC 3J .0103</p> <p>.0103 Gill Nets, Identification, Restrictions</p> <p>(a) The Fisheries Director may, by proclamation, limit or prohibit the use of gill nets in coastal waters or any portion thereof, and/or impose any or all of the following restrictions on the use of gill nets:</p> <ul style="list-style-type: none"> (1) Specify area. (2) Specify season. (3) Specify gill net mesh length except that the mesh length shall not be less than 2½ inches. (4) Specify means/methods. (5) Specify gill net number and length. <p>(b) It is unlawful to use fixed or stationary gill nets in the Atlantic Ocean or any gill nets in internal waters unless such nets are marked by attaching to them at each end two separate yellow buoys which shall be of solid foam or other solid buoyant material no less than five inches in diameter and no less than five inches in length. Gill nets which are not connected together at the top line shall be considered as individual nets, requiring two buoys at the end of each individual net. Gill nets connected together at the topline shall be considered as a continuous net requiring two buoys at each of the continuous net. Any other marking buoys on gill nets shall be yellow except that one additional identification buoy of any color or any combination of colors may be used at either or both ends. The owner shall always be identified on a buoy on each end either by using engraved buoys or by attaching engraved metal or plastic tags to the buoys. Such identification shall include one of the following:</p> <ul style="list-style-type: none"> (1) Owner's N.C. motor boat registration number, or (2) Owner's U.S. vessel documentation name, or (3) Owner's last name and initials. <p>(c) It is unlawful to use gill nets:</p> <ul style="list-style-type: none"> (1) Within 200 yards of any pound net which is in use except in Chowan River as provided in 15A NCAC 3J .0203(7); (2) From March 1 through October 31 in the Intracoastal Waterway within 150 yards of any railroad or highway bridge.

(continued)

Table 12. (continued)

Equipment Restrictions or Specifications (continued)
<p>.0103 Gill Nets, Identification, Restrictions (continued)</p> <p>(d) It is unlawful to use gill nets within 100 feet either side of the center line of the Intracoastal Waterway Channel south of Quick Flasher No. 54 in Alligator River at the southern entrance to the Intracoastal Waterway to the South Carolina line, unless such net is used in accordance with the following conditions:</p> <ol style="list-style-type: none"> (1) No more than two gill nets per boat may be used at any one time; (2) Any net used must be attended by the fisherman from a boat who shall at no time be more than 100 yards from either net; and (3) Any individual setting such nets shall remove them, when necessary, in sufficient time to permit unrestricted boat navigation. <p>(e) It is unlawful to use drift gill nets in violation of 15A NCAC 3J .0101 (2) and Paragraph (c) of this Rule.</p> <p>(f) It is unlawful to use unattended gill nets or block or stop nets in the Atlantic Ocean within 300 yards of the beach from Beaufort Inlet to the South Carolina line from sunset Friday to sunrise Monday from Memorial Day through Labor Day.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>
<p>15A NCAC 3J .0203</p> <p>.0203 Chowan River and Its Tributaries</p> <p>In the Chowan River and its tributaries:</p> <ol style="list-style-type: none"> (1) It is unlawful to anchor the lead line of any net closer than 50 feet from shore except in the Meherrin River. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>
<p>15A NCAC 3J .0204</p> <p>.0204 Currituck Sound and Its Tributaries</p> <p>In Currituck Sound and its tributaries:</p> <ol style="list-style-type: none"> (1) It is unlawful to use any net . . .with more than one power boat. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1991.</i></p>

(continued)

Table 12. (continued)

Equipment Restrictions or Specifications (continued)
<p>15A NCAC 3I .0205 .0205 Roanoke; Cashie; Middle and Eastmost Rivers</p> <p>(2) Gill net restrictions: (year round)</p> <ul style="list-style-type: none"> • Pamlico River: Gill nets of two and one-half inch (2 1/2") stretched mesh to five inch (5") stretched mesh <u>must be attended at all times</u> west of a line beginning at a point on Maults Point 35°26'56"N—76°55'33"W; running 073°(M) to a point on Ragged Point 35°27'33"N—76°54'21"W. • Neuse River: Gill nets of five inch (5") stretched mesh and larger <u>may not be used</u> within one-half (1/2) mile of the shore between Adams Creek and Turnagain Bay. • Beaufort Inlet, Back Sound, Bogue Sound: Gill nets <u>may not be used in the following areas</u>: within 100 yards of the rock jetty on Shackelford Banks, Back Sound; within 100 yards of Fort Macon State Park; within the Coast Guard Base Fort Macon turning basin within Spooner's Creek.
Harvest Restrictions
<p>15A NCAC 3M .0202 .0202 Season, Size, and Harvest Limit: Internal Coastal Waters</p> <p>The Fisheries Director may, by proclamation, impose any or all the following restrictions on the taking of striped bass in internal coastal waters:</p> <ol style="list-style-type: none"> (1) Specify season or seasons: <ol style="list-style-type: none"> (a) for hook-and-line, (b) for commercial fishing equipment between October 1 and April 30. (2) Specify areas, (3) Specify quantity, but shall not exceed possession of more than three fish in any one day taken by hook-and-line, (4) Specify means/methods, (5) Specify size, but the minimum size specified shall not be less than 18 inches total length, (6) Require submission of statistical and biological data. <p>Fish that do not meet the minimum size limit specified by proclamation shall immediately be returned to the waters from which taken, regardless of condition.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. November 1, 1991.</i></p> <p>15A NCAC 3M .0203 .0203 Size and Creel Limit: Internal Coastal Waters</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Repealed Eff. November 1, 1991.</i></p>

(continued)

Table 12. (continued)

Harvest Restrictions (continued)
<p>15A NCAC 3M .0501 .0501 Red Drum</p> <p>(a) The Fisheries Director may, by proclamation, impose any or all of the following additional restrictions on the taking of red drum:</p> <ol style="list-style-type: none"> (1) Specify areas. (2) Specify seasons. (3) Specify quantity but shall not exceed possession of more than two fish over 32 inches total length in any one day. (4) Specify means/method. (5) Specify size but the minimum size specified shall not be less than 14 inches total length. <p>(b) It is unlawful to remove red drum from any type of net with the aid of any boat hook, gaff, spear, gig, or similar device.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>
<p>15A NCAC 3M .0503 .0503 Flounder</p> <p>(a) It is unlawful to possess flounder less than 13 inches in length.</p> <p>.....</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. February 1, 1992.</i></p>
<p>15A NCAC 3M .0504 .0504 Trout</p> <p>(a) Spotted seatrout (speckled trout). It is unlawful to possess spotted seatrout less than 12 inches in length.</p> <p>(b) Weakfish (gray trout). The Fisheries Director may, by proclamation, impose any or all of the following restrictions on the taking of weakfish:</p> <ol style="list-style-type: none"> (1) Specify areas. (2) Specify seasons. (3) Specify quantity. (4) Specify means/methods. (5) Specify size, but not greater than 12 inches. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. February 1, 1992.</i></p>

Source: N.C. Marine Fisheries Commission, 1992.

Flounder Pound Netting

Description

Pound nets are stationary gear that direct fish into enclosures or pounds by means of leads. They are used most effectively where fish regularly migrate through relatively narrow waterways. A pound net has three sections: the lead, the heart, and the pound (see Figure 34). The lead is a length of net generally extending out from shore and ending at the entrance to the pound, or trap, area. As many as two to six hearts, the intermediate area between the lead and the pound, guide fish through the funnel into the pound. The bottom of the pound is netting, which cuts off all avenues of escape.

By proclamation of the Fisheries Director under 15 NCAC 3J .0107, fishermen must install escape panels made of 5-3/4-inch stretched mesh webbing in the offshore corners of their pounds to release undersized flounder (less than 13 inches) (Figure 35).

Net mesh sizes for flounder pound nets are 4-inch stretched mesh for the pound, 4- to 5-inch stretched mesh for the heart, and 5- to 24-inch stretched mesh for the lead. The pound can measure 25 feet square; the heart, 60 feet; and the lead, 150 to 1,200 feet. Several pound nets are sometimes set in a continuous row so the entire distance covered may be more than a mile. Such long sets must have openings to permit navigation.

Use

Flounder pound nets are used to fish for paralichthed flounders primarily during the fall. Southern flounder account for over 80 percent of the flounder pound net catch, with Gulf flounder, harvest fish, red drum, and butterfish constituting 10 to 15 percent of the catch and summer flounder making up less than 1 percent of the catch. To remove their catch, fishermen maneuver their boat inside a pound, then gradually pull the side and bottom netting into their boat until the trapped fish are concentrated in a small portion of the net left in the water. The fish are then removed with hand-held dip nets.

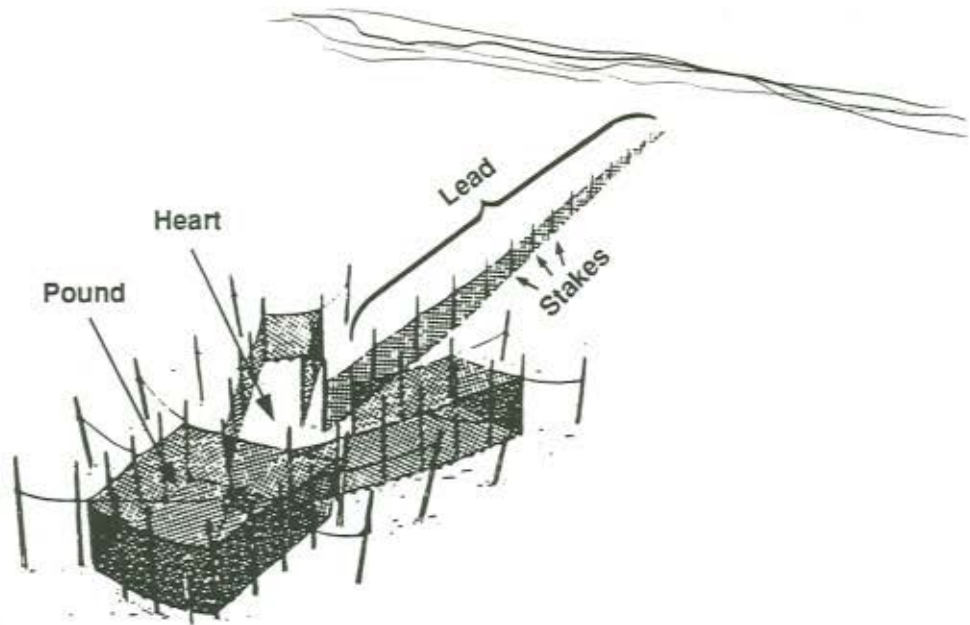
Equipment and harvesting restrictions for flounder pound netting are summarized in Table 13.

Harvest Area

Pound nets are used for flounder fishing principally in Core Sound and the eastern portion of Pamlico Sound behind the Outer Banks, the southeastern portion of Albemarle Sound, and the area around northwestern Roanoke Island (Figure 36).

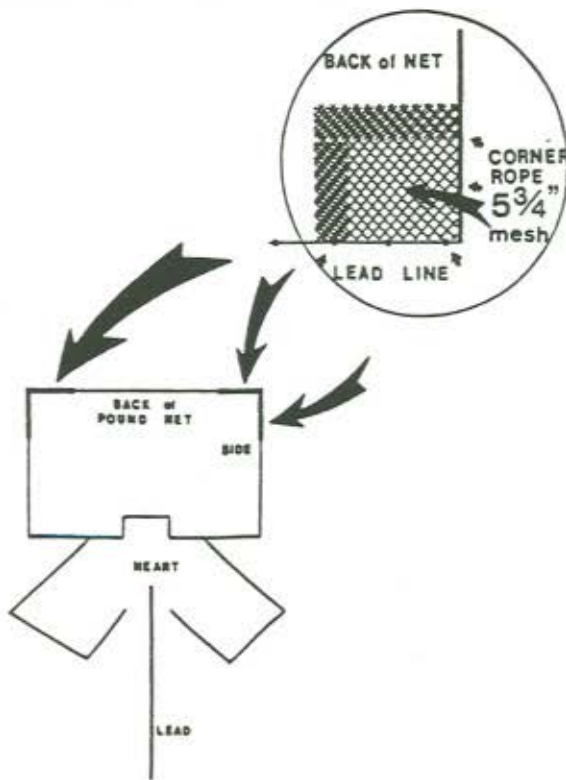
Sources

Sundstrom, G.T. 1957. *Commercial Fishing Vessels and Gear*. Fish and Wildlife Circular 48. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.



Source: Sundstrom, 1957.

Figure 34. Flounder pound net.



Provided by Division of Marine Fisheries.

Figure 35. Flounder escape panel.

Tyler, J., and M. McKenzie. 1969. *To Catch a Million Fish: North Carolina Commercial Fishing Gear and Methods*. North Carolina Department of Conservation and Development, Division of Commercial and Sport Fishing, Raleigh, North Carolina.

Table 13. Flounder Pound Netting—Restrictions and Regulations

Months Conducted		
Duration: September through December		
Peak: September through December		
Major Species Targeted		
Southern flounder <i>Paralichthys lethostigma</i>	Gulf flounder <i>P. albigutta</i>	Atlantic croaker <i>Micropogonias undulatus</i>
Summer flounder <i>P. dentatus</i>	Atlantic menhaden <i>Brevoortia tyrannus</i>	Spot <i>Leiostomus xanthurus</i>
Equipment Restrictions or Specifications		
<p>15A NCAC 3J .0101 .0101 Fixed or Stationary Nets It is unlawful to use or set fixed or stationary nets:</p> <ol style="list-style-type: none"> (1) In the channel of the Intracoastal Waterway or in any other location where it may constitute a hazard to navigation; (2) So as to block more than two-thirds of any natural or man-made waterway, sound, bay, creek, inlet or any other body of water; (3) In the middle third of any marked navigation channel; (4) In the channel third of the following rivers: Roanoke, Cashie, Middle, Eastmost, Chowan, Little, Perquimans, Pasquotank, North, Alligator, Pungo, Pamlico, and Yeopim. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>		
<p>15A NCAC 3J .0102 .0102 Nets or Net Stakes It is unlawful to use nets or net stakes:</p> <ol style="list-style-type: none"> (1) Within 150 yards of railroad or highway bridge crossing the Northeast Cape Fear River, New River, White Oak River, Trent River, Neuse River, Pamlico River, Roanoke River, and Alligator River; (2) Within 300 yards of any highway bridge crossing Albemarle Sound, Chowan River, Croatan Sound, Currituck Sound, and Roanoke Sound; (3) If such net stakes are of metallic material. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>		

(continued)

Table 13. (continued)

Equipment Restrictions or Specifications (continued)
<p data-bbox="250 348 505 380">15A NCAC 3J .0107</p> <p data-bbox="250 382 488 413">.0107 Pound Nets</p> <p data-bbox="250 415 1386 537">(a) It is unlawful to use pound . . . nets in internal coastal fishing waters without the owner's identification being clearly printed on a sign no less than six inches square, securely attached on an outside corner stake of each such net. Such identification must include one of the following:</p> <p data-bbox="354 539 1328 600">(1) For pound nets, the pound net permit number and the owner's last name and initials.</p> <p data-bbox="250 636 1377 726">Any pound . . . net or any part thereof found set in internal coastal fishing waters without proper identification will be in violation and may be removed and disposed of in accordance with law.</p> <p data-bbox="250 728 1398 1079">(b) It is unlawful to set pound nets, or any part thereof except location identification stakes at each end of new locations without first obtaining a Pound Net Permit from the Fisheries Director. Within 60 days of application, the Fisheries Director shall issue a public notice of intent to consider issuance of a Pound Net Permit for new locations, and may hold public meetings and approve or take other action which may include the denial of Pound Net Permits, deemed necessary to avoid potential user conflicts and to protect traditional uses of the area including construction or use of piers. The Fisheries Director's final decision to approve, deny, or modify the pound net permit application may be appealed by requesting in writing, within 20 days of notice of such action, an administrative hearing before the Marine Fisheries Commission. A Pound Net permit for a new location may be issued following evaluation by the Fisheries Director and will expire 365 days from the date of issue.</p> <p data-bbox="250 1081 1398 1457">(c) It is unlawful to set pound nets in previously registered or permitted locations without first obtaining a Pound Net Permit for each location from the Fisheries Director. Such permits will expire 365 days from the date of issue. Failure to obtain a Pound Net Permit annually, or abandonment of pound net sets without removal of all stakes, shall constitute a violation and be grounds for refusal of any Pound Net Permit. Application for renewal of Pound Net Permits must be filed not less than 10 days prior to expiration and will not be processed unless filed by the prior registrant. When an objection to a renewal is filed during the term of the permit, the Fisheries Director shall review and may deny the permit renewal under the criteria for issuance of new Pound Net Permits. Failure to use a pound net site within 60 days of issuance of a Pound Net Permit shall also constitute a violation and be grounds for refusal and/or revocation of other Pound Net Permits. It is unlawful to abandon a pound net set without removal of all stakes.</p> <p data-bbox="250 1459 1403 1556">(d) It is unlawful to use a pound net without leaving a marked navigational opening of at least 25 feet at the end of every third pound. Such openings shall be marked with international orange signs at least six inches square.</p> <p data-bbox="250 1558 1354 1719">(e) It is unlawful to set a pound net, pound net stakes, or other related equipment in internal coastal fishing waters without yellow light reflective tape or devices on each pound. The light reflective tape or devices must be affixed to a stake of a least three inches in diameter on the offshore end of each pound, must cover a vertical distance not less than twelve inches, and must be visible from a vessel when approached from all directions.</p> <p data-bbox="250 1722 1398 1782">(f) In Core Sound, the Fisheries Director shall by proclamation designate areas for the use of pound . . . nets.</p>

(continued)

Table 13. (continued)

Equipment Restrictions or Specifications (continued)
<p>.0107 Pound Nets (continued)</p> <p>(g) In Pamlico Sound, it is unlawful to set a pound net, pound net stakes, or any other related equipment without radar reflective metallic material and yellow light reflective tape or devices on each end of the pound net set. The radar reflective material and the light reflective tape or devices must be affixed to a stake of at least three inches in diameter, must cover a vertical distance of not less than 12 inches, and must be detectable by radar and light from a vessel when approached from all directions. Light reflective tape or devices may be affixed to the radar reflective material.</p> <p>(h) The Fisheries Director may, by proclamation, between August 1 and January 31, require escape panels in pound nets and may impose any or all of the following restrictions on the use of escape panels:</p> <ol style="list-style-type: none"> (1) Specify size, number, and location. (2) Specify mesh length, but not more than six inches. (3) Specify time and/or season. (4) Specify areas. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991; January 1, 1991.</i></p>
<p>15A NCAC 3J .0203</p> <p>.0203 Chowan River and Its Tributaries</p> <p>In the Chowan River and its tributaries:</p> <ol style="list-style-type: none"> (1) It is unlawful to anchor the lead line of any net closer than 50 feet from shore except in the Meherrin River. (2) It is unlawful to use pound nets in any tributary creek or within 150 yards of the mouth of any such tributary creek of the Chowan River. (3) It is unlawful to set a pound net within 200 yards parallel to any other pound net in the Chowan River. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>
<p>15A NCAC 3J .0204</p> <p>.0204 Currituck Sound and Its Tributaries</p> <p>In Currituck Sound and its tributaries:</p> <ol style="list-style-type: none"> (1) It is unlawful to use any net or seine with more than one power boat. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>

(continued)

Table 13. (continued)

Harvest Restrictions
<p>15A NCAC 3M .0102 .0102 Unmarketable Food or Scrap Fish</p> <p>(a) It is unlawful to land or dispose of finfish as trash or scrap fish if in violation of minimum size or possession limits established by rule or proclamation.</p> <p>(b) It is unlawful to land or dispose of finfish as trash or scrap fish taken in connection with legitimate commercial fishing operations which are unmarketable as individual food fish by reason of size, except that a quantity not exceeding 5,000 pounds per vessel per day may be:</p> <ol style="list-style-type: none"> (1) Landed and sold to a licensed finfish dealer, a licensed fish dehydrating plant or licensed finfish processing plant, and (2) Purchased or accepted by a licensed finfish dealer, a licensed fish dehydrating plant or licensed finfish processor. <p>Menhaden, herring, and gizzard shad are exempt from this Rule.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-185; 143B-289.4; Eff. January 1, 1991.</i></p>
<p>15A NCAC 3M .0503 .0503 Flounder</p> <p>(a) It is unlawful to possess flounder less than 13 inches in length.</p> <p>.....</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>

Source: N.C. Marine Fisheries Commission, 1992.

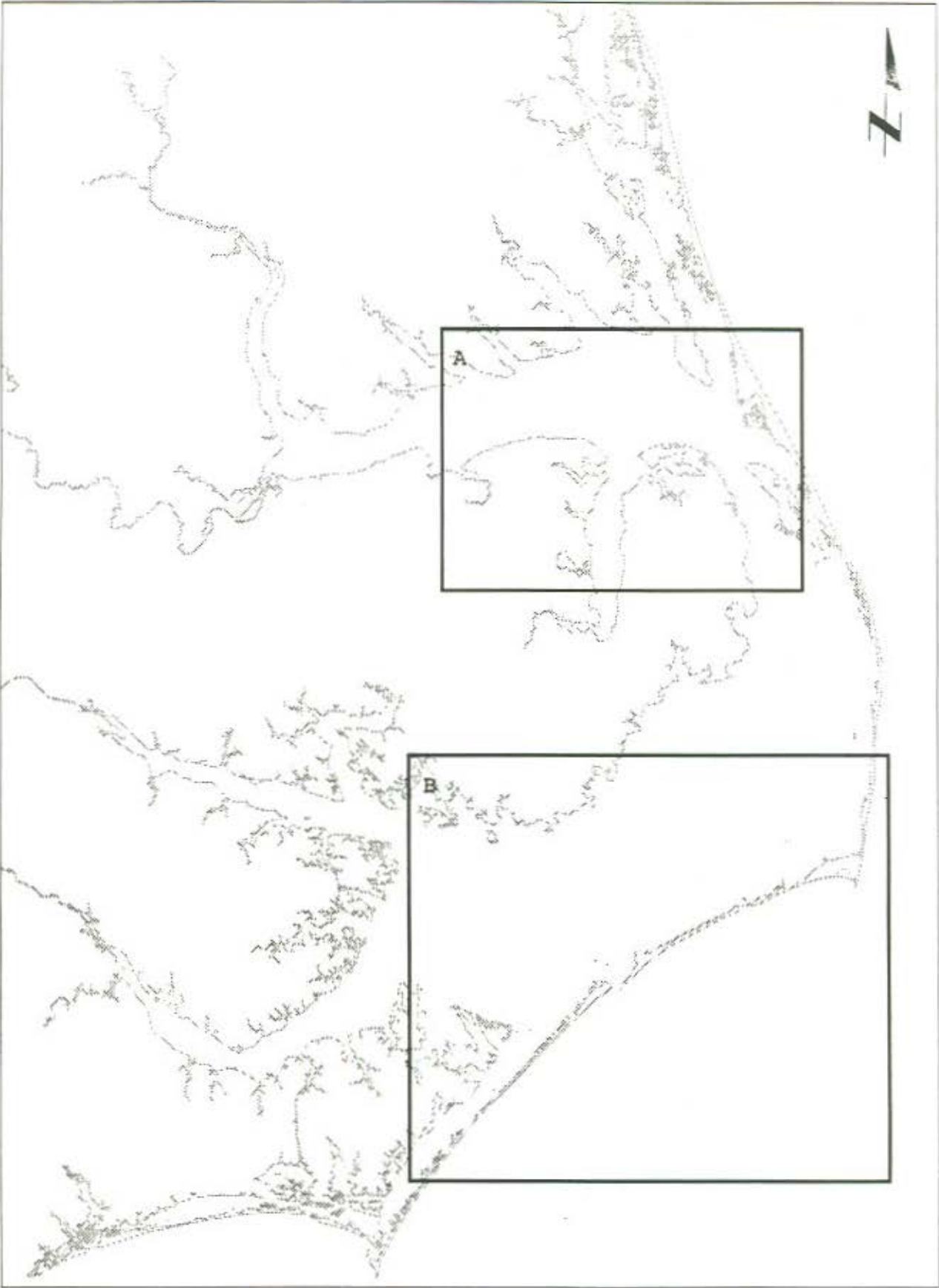


Figure 36. Flounder pound netting harvest area.

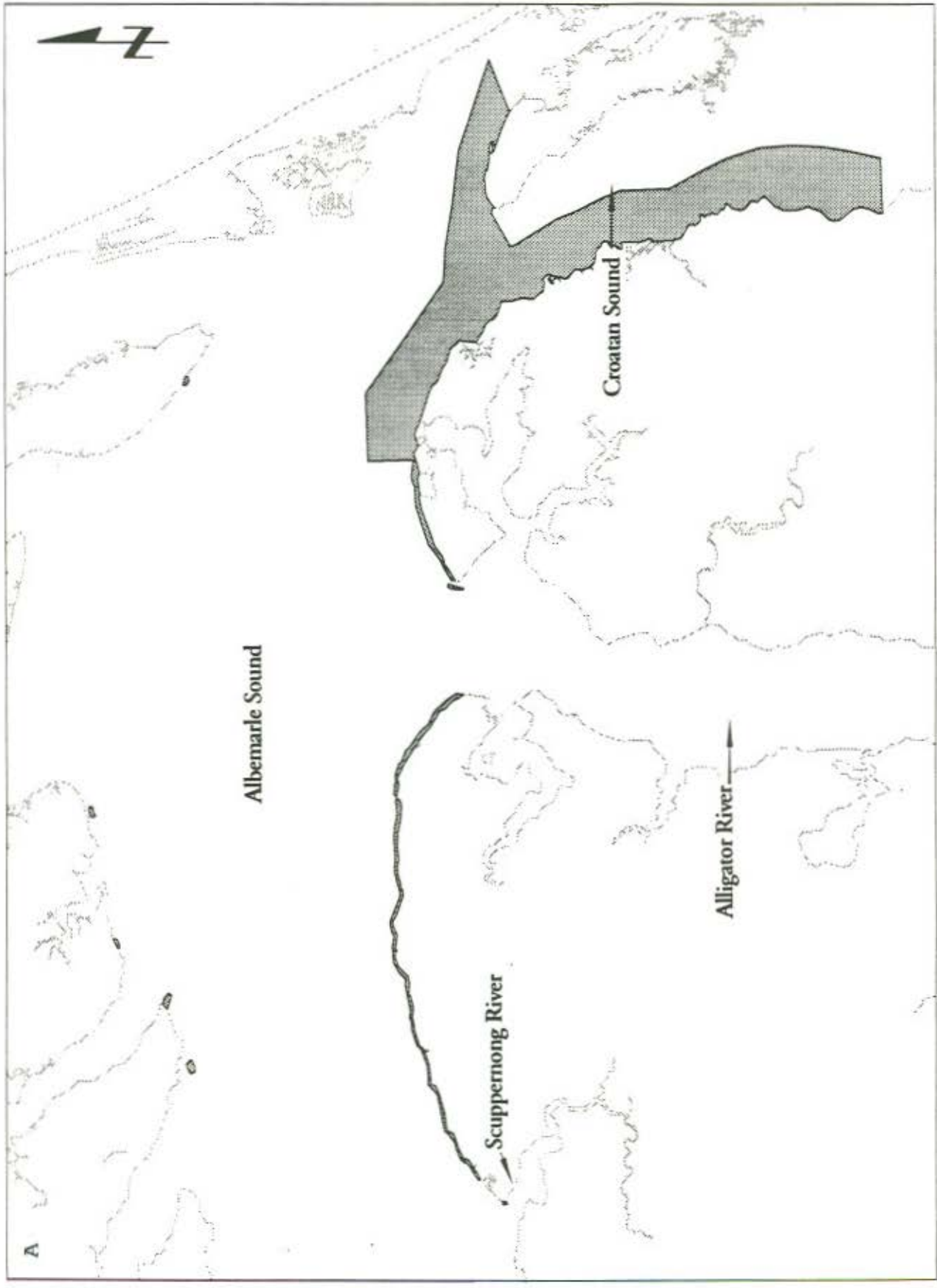


Figure 36. (continued)

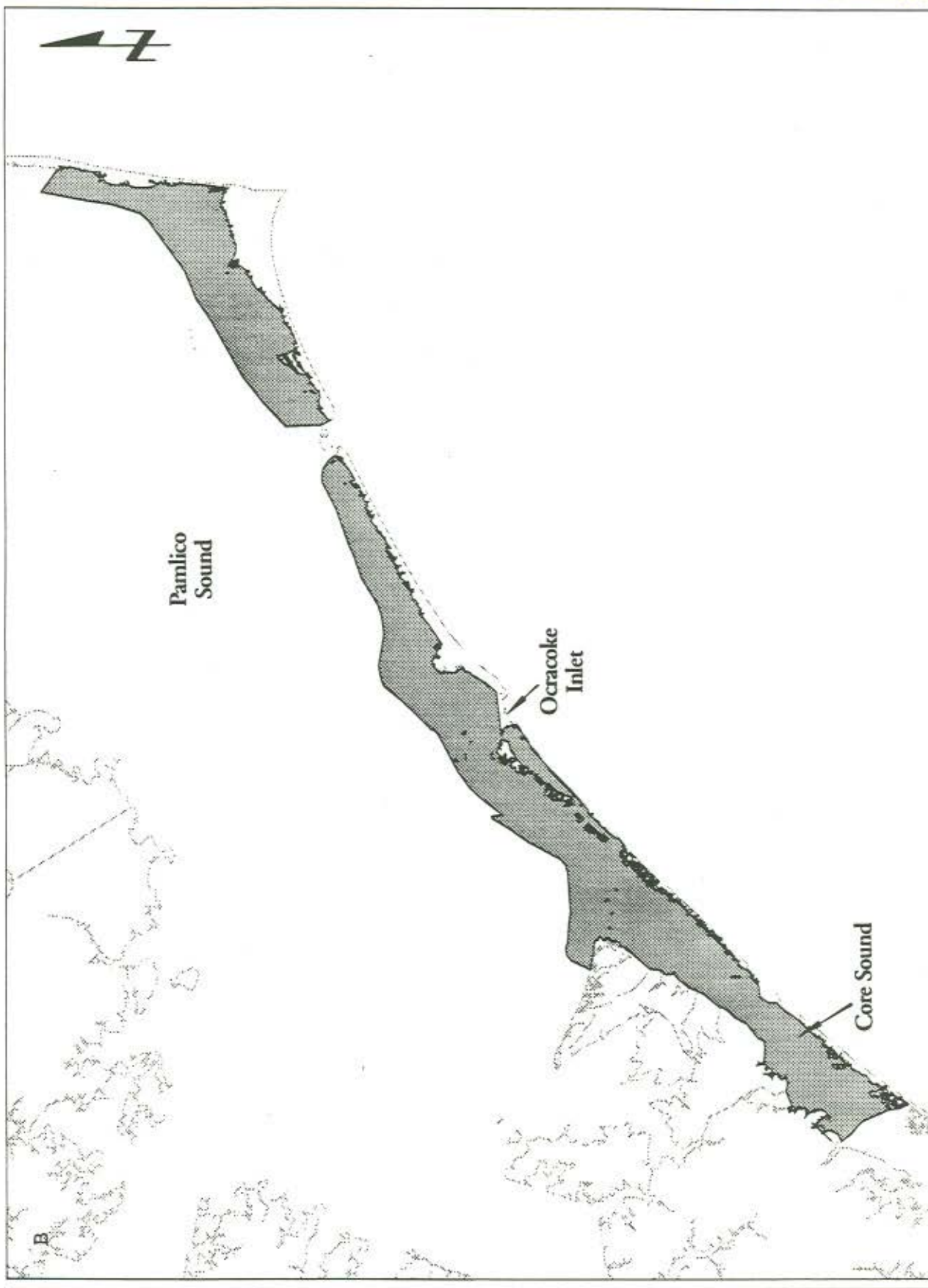


Figure 36. (continued)

Bait Fish Pound Netting

Description

Pound nets are stationary gear that direct fish into enclosures or pounds by means of leads. They are used most effectively where fish regularly migrate through relatively narrow waterways. A pound net has three sections: the lead, the heart, and the pound (see Figure 34). The lead is a length of net generally extending out from shore and ending at the entrance to the pound, or trap, area. As many as two to six hearts, the intermediate area between the lead and the pound, guide fish through the funnel into the pound. The bottom of the pound is netting, which cuts off all avenues of escape.

Net mesh sizes for bait fish pound nets are 1- to 3-inch stretched mesh for the pound, 1- to 3-inch stretched mesh for the heart, and 1-to 3-inch stretched mesh for the lead. The pound can measure 15 by 30 feet; the heart, 60 to 150 feet; and the lead, 200 to 700 feet. Net dimensions may vary locally (specifically Dare County). Several pound nets are sometimes set in a continuous row so the entire distance covered may be more than a mile. Such long sets must have openings to permit navigation.

Use

To remove their catch, fishermen maneuver their boat inside a pound, then gradually pull the side and bottom netting into their boat until the trapped fish are concentrated in a small portion of the net left in the water. The fish are then removed with hand-held dip nets.

Equipment and harvesting restrictions for bait fish pound netting are summarized in Table 14.

Harvest Area

Pound nets are used for collecting bait fish in (1) three distinct areas of the A/P Study Area -- the northeastern portion of Pamlico Sound, near Roanoke Island, and areas in northeast Albemarle Sound; (2) the Pamlico River Estuary including the Pungo River and adjacent bays in western Pamlico Sound; and (3) the Neuse River Estuary, eastern portions of West Bay, and northeastern portions of Core Sound (Figure 37).

Sources

Sundstrom, G.T. 1957. *Commercial Fishing Vessels and Gear*. Fish and Wildlife Circular 48. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Tyler, J., and M. McKenzie. 1969. *To Catch a Million Fish: North Carolina Commercial Fishing Gear and Methods*. North Carolina Department of Conservation and Development, Division of Commercial and Sport Fishing, Raleigh, North Carolina.

Table 14. Bait Fish Pound Netting—Restrictions and Regulations

Months Conducted		
Duration: March through November		
Peak: June through September		
Major Species Targeted		
Atlantic menhaden <i>Brevoortia tyrannus</i>	Spot <i>Leiostomus xanthurus</i>	Silver perch <i>Bairdiella chrysura</i>
Atlantic croaker <i>Micropogonias undulatus</i>		
Equipment Restrictions or Specifications		
<p>15A NCAC 3J .0101 .0101 Fixed or Stationary Nets It is unlawful to use or set fixed or stationary nets:</p> <ol style="list-style-type: none"> (1) In the channel of the Intracoastal Waterway or in any other location where it may constitute a hazard to navigation; (2) So as to block more than two-thirds of any natural or man-made waterway, sound, bay, creek, inlet or any other body of water; (3) In the middle third of any marked navigation channel; (4) In the channel third of the following rivers: Roanoke, Cashie, Middle, Eastmost, Chowan, Little, Perquimans, Pasquotank, North, Alligator, Pungo, Pamlico, and Yeopim. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>		
<p>15A NCAC 3J .0102 .0102 Nets or Net Stakes It is unlawful to use nets or net stakes:</p> <ol style="list-style-type: none"> (1) Within 150 yards of railroad or highway bridge crossing the Northeast Cape Fear River, New River, White Oak River, Trent River, Neuse River, Pamlico River, Roanoke River, and Alligator River; (2) Within 300 yards of any highway bridge crossing Albemarle Sound, Chowan River, Croatan Sound, Currituck Sound, and Roanoke Sound; (3) If such net stakes are of metallic material. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>		

(continued)

Table 14. (continued)

Equipment Restrictions or Specifications (continued)
<p>15A NCAC 3J .0107 .0107 Pound Nets</p> <p>(a) It is unlawful to use pound . . . nets in internal coastal fishing waters without the owner's identification being clearly printed on a sign no less than six inches square, securely attached on an outside corner stake of each such net. Such identification must include one of the following:</p> <p>(1) For pound nets, the pound net permit number and the owner's last name and initials. </p> <p>Any pound . . . net or any part thereof found set in internal coastal fishing waters without proper identification will be in violation and may be removed and disposed of in accordance with law.</p> <p>(b) It is unlawful to set pound nets, or any part thereof except location identification stakes at each end of new locations without first obtaining a Pound Net Permit from the Fisheries Director. Within 60 days of application, the Fisheries Director shall issue a public notice of intent to consider issuance of a Pound Net Permit for new locations, and may hold public meetings and approve or take other action which may include the denial of Pound Net Permits, deemed necessary to avoid potential user conflicts and to protect traditional uses of the area including construction or use of piers. The Fisheries Director's final decision to approve, deny, or modify the pound net permit application may be appealed by requesting in writing, within 20 days of notice of such action, an administrative hearing before the Marine Fisheries Commission. A Pound Net permit for a new location may be issued following evaluation by the Fisheries Director and will expire 365 days from the date of issue.</p> <p>(c) It is unlawful to set pound nets in previously registered or permitted locations without first obtaining a Pound Net Permit for each location from the Fisheries Director. Such permits will expire 365 days from the date of issue. Failure to obtain a Pound Net Permit annually, or abandonment of pound net sets without removal of all stakes, shall constitute a violation and be grounds for refusal of any Pound Net Permit. Application for renewal of Pound Net Permits must be filed not less than 10 days prior to expiration and will not be processed unless filed by the prior registrant. When an objection to a renewal is filed during the term of the permit, the Fisheries Director shall review and may deny the permit renewal under the criteria for issuance of new Pound Net Permits. Failure to use a pound net site within 60 days of issuance of a Pound Net Permit shall also constitute a violation and be grounds for refusal and/or revocation of other Pound Net Permits. It is unlawful to abandon a pound net set without removal of all stakes.</p> <p>(d) It is unlawful to use a pound net without leaving a marked navigational opening of at least 25 feet at the end of every third pound. Such openings shall be marked with international orange signs at least six inches square.</p> <p>(e) It is unlawful to set a pound net, pound net stakes, or other related equipment in internal coastal fishing waters without yellow light reflective tape or devices on each pound. The light reflective tape or devices must be affixed to a stake of at least three inches in diameter on the offshore end of each pound, must cover a vertical distance not less than twelve inches, and must be visible from a vessel when approached from all directions.</p> <p>(f) In Core Sound, the Fisheries Director shall by proclamation designate areas for the use of pound . . . nets.</p>

(continued)

Table 14. (continued)

Equipment Restrictions or Specifications (continued)
<p>.0107 Pound Nets (continued)</p> <p>(g) In Pamlico Sound, it is unlawful to set a pound net, pound net stakes, or any other related equipment without radar reflective metallic material and yellow light reflective tape or devices on each end of the pound net set. The radar reflective material and the light reflective tape or devices must be affixed to a stake of at least three inches in diameter, must cover a vertical distance of not less than 12 inches, and must be detectable by radar and light from a vessel when approached from all directions. Light reflective tape or devices may be affixed to the radar reflective material.</p> <p>(h) The Fisheries Director may, by proclamation, between August 1 and January 31, require escape panels in pound nets and may impose any or all of the following restrictions on the use of escape panels:</p> <ol style="list-style-type: none"> (1) Specify size, number, and location. (2) Specify mesh length, but not more than six inches. (3) Specify time and/or season. (4) Specify areas. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991; January 1, 1991.</i></p>
<p>15A NCAC 3J .0203</p> <p>.0203 Chowan River and Its Tributaries</p> <p>In the Chowan River and its tributaries:</p> <ol style="list-style-type: none"> (1) It is unlawful to anchor the lead line of any net closer than 50 feet from shore except in the Meherrin River. (2) It is unlawful to use pound nets in any tributary creek or within 150 yards of the mouth of any such tributary creek of the Chowan River. (3) It is unlawful to set a pound net within 200 yards parallel to any other pound net in the Chowan River. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>
<p>15A NCAC 3J .0204</p> <p>.0204 Currituck Sound and Its Tributaries</p> <p>In Currituck Sound and its tributaries:</p> <ol style="list-style-type: none"> (1) It is unlawful to use any net or seine with more than one power boat. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>

(continued)

Table 14. (continued)

Harvest Restrictions
<p>15A NCAC 3M .0102 .0102 Unmarketable Food or Scrap Fish</p> <p>(a) It is unlawful to land or dispose of finfish as trash or scrap fish if in violation of minimum size or possession limits established by rule or proclamation.</p> <p>(b) It is unlawful to land or dispose of finfish as trash or scrap fish taken in connection with legitimate commercial fishing operations which are unmarketable as individual food fish by reason of size, except that a quantity not exceeding 5,000 pounds per vessel per day may be:</p> <ol style="list-style-type: none">(1) Landed and sold to a licensed finfish dealer, a licensed fish dehydrating plant or licensed finfish processing plant, and(2) Purchased or accepted by a licensed finfish dealer, a licensed fish dehydrating plant or licensed finfish processor. <p>Menhaden, herring, and gizzard shad are exempt from this Rule.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-185; 143B-289.4; Eff. January 1, 1991.</i></p>

Source: N.C. Marine Fisheries Commission, 1992.

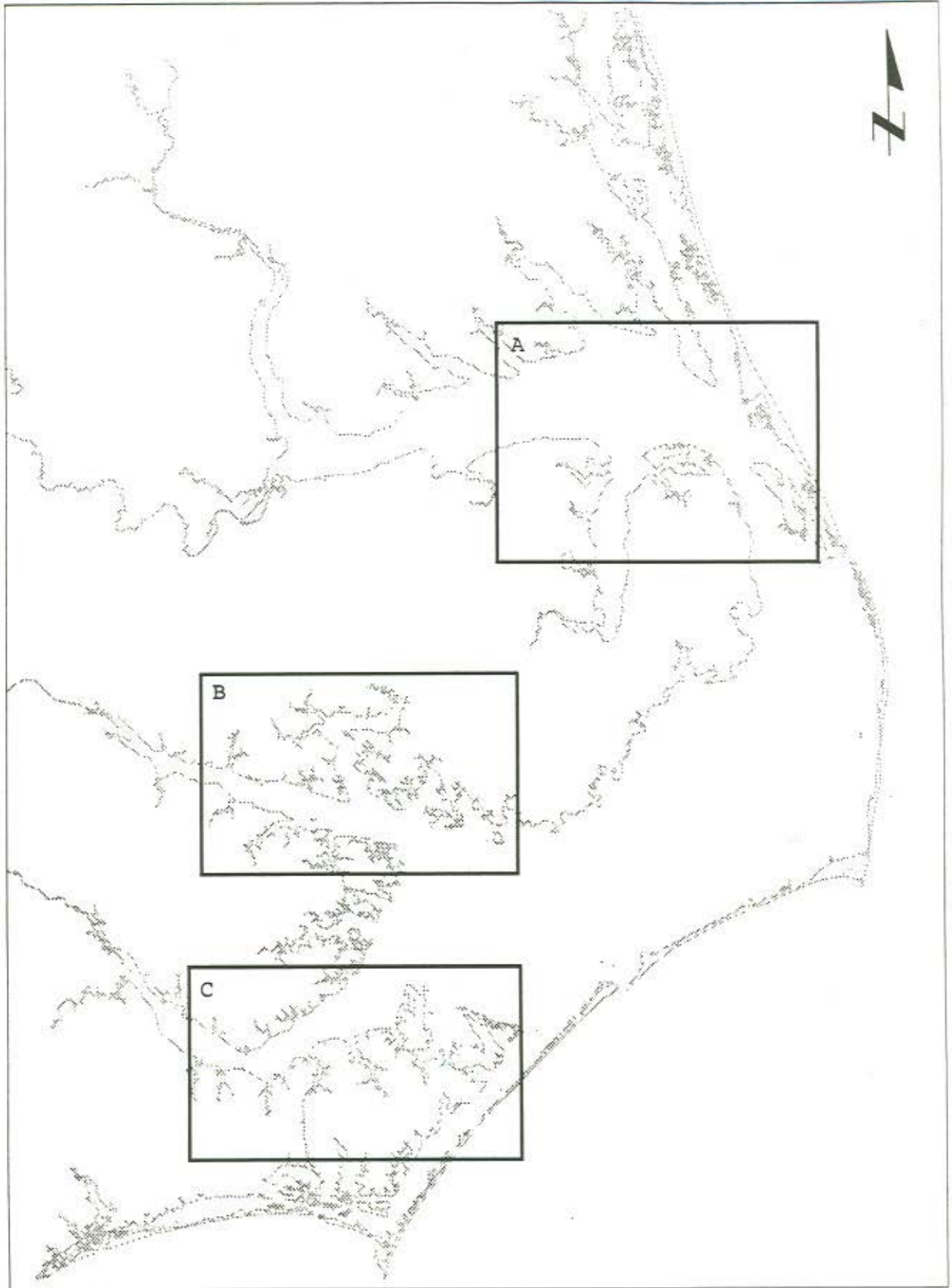


Figure 37. Bait fish pound netting harvest area.

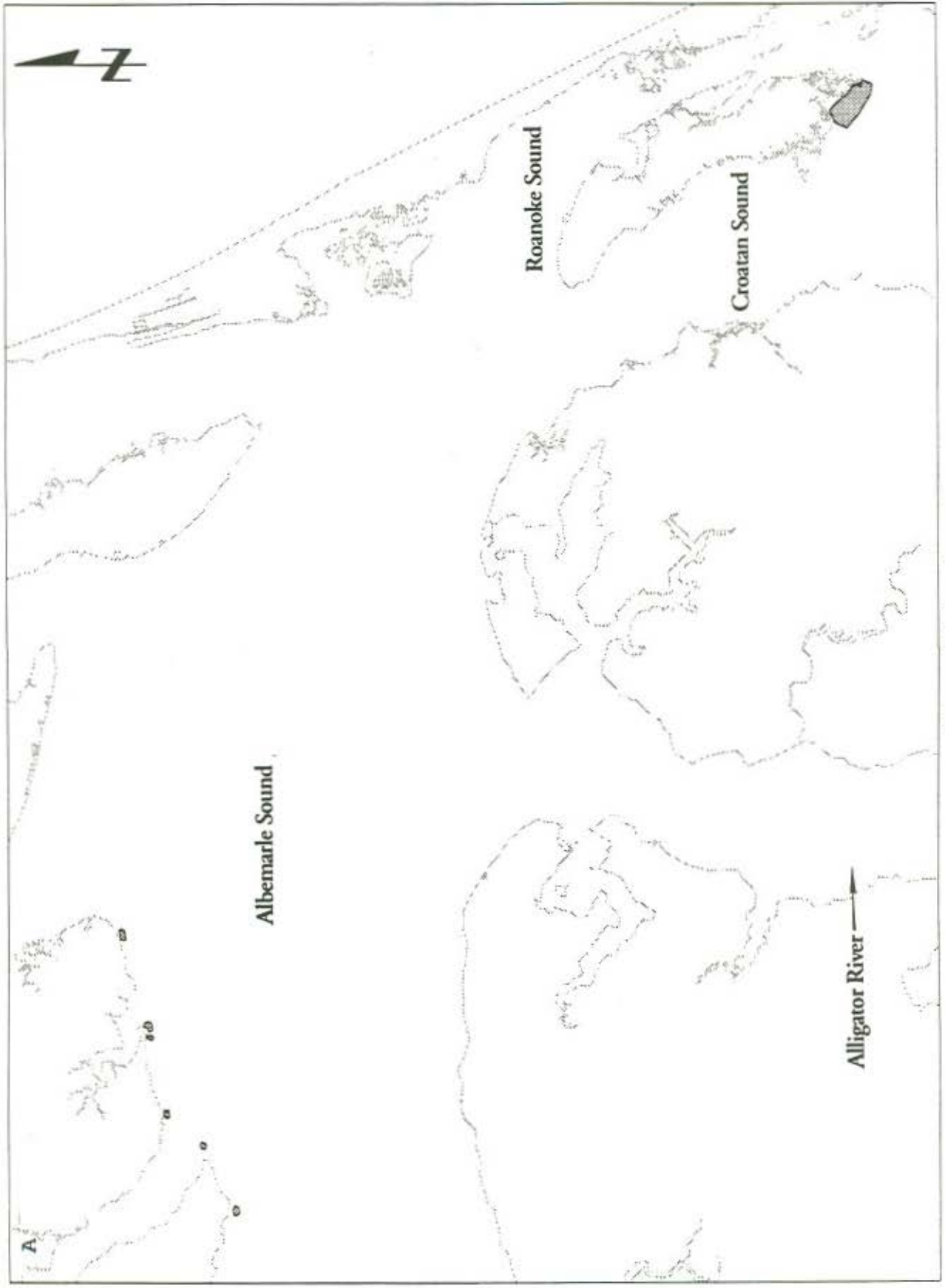


Figure 37. (continued)

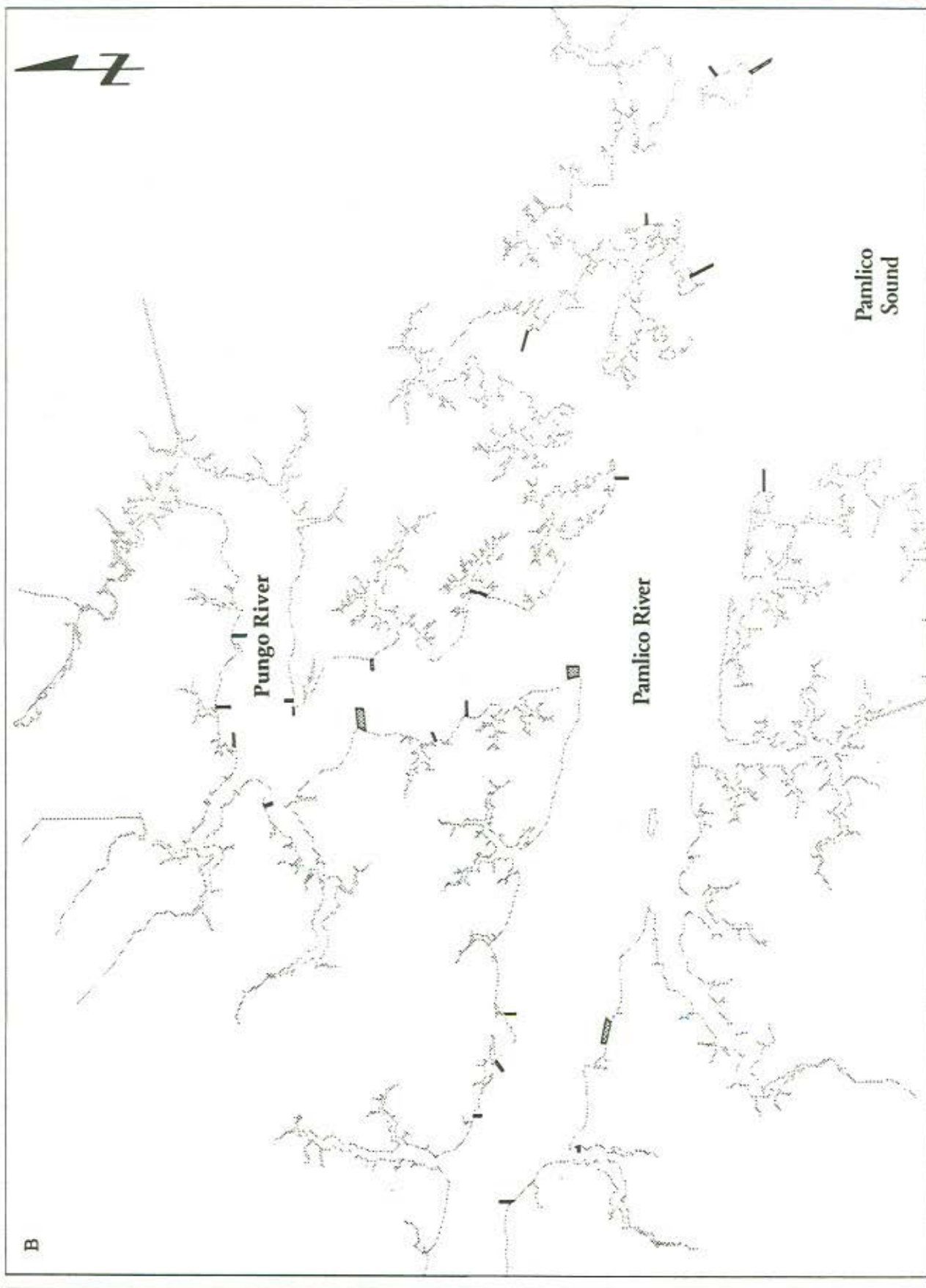


Figure 37. (continued)

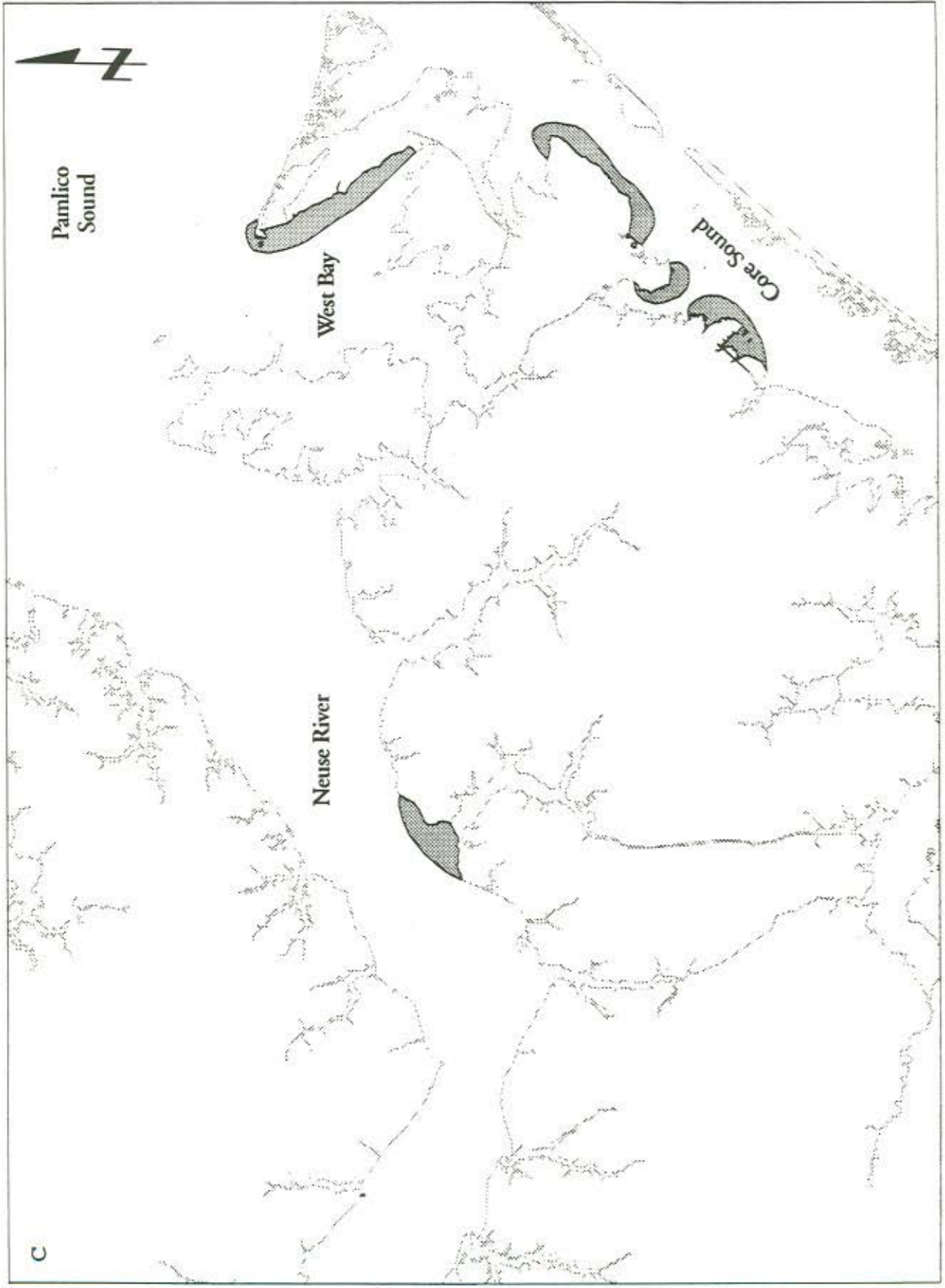


Figure 37. (continued)

River Herring Pound Netting

Description

Pound nets are stationary gear that direct fish into enclosures or pounds by means of leads (Figure 34). They are used where fish migrate regularly through relatively narrow waterways. A pound net has three sections: the lead, the heart, and the pound. The lead is a length of net generally extending out from shore and ending at the entrance to the pound, or trap, area. As many as two to six hearts, the intermediate area between the lead and the pound, serve to guide fish through the funnel into the pound. The bottom of the pound is enclosed netting, cutting off all avenues of escape.

Net mesh sizes for river herring pound nets are 1-3/4- to 4-inch stretched mesh for the pound, 3-inch stretched mesh for the heart, and up to 5-inch stretched mesh for the lead. The pound can measure 20 by 50 feet; the heart, 60 to 150 feet; and the lead, 100 to 900 feet. Several pound nets can be set in a continuous row. Such long sets must have openings to permit navigation.

Use

River herring pound nets are used to catch primarily Blueback herring and alewife, collectively known as river herring, migrating to and from the spawning areas during the spring. However, American shad, striped bass, white perch, catfish, and gizzard shad are also taken. To remove their catch, fishermen maneuver their boat inside a pound, then gradually pull the side and bottom netting into their boat until the trapped fish are concentrated in a small portion of the net left in the water. The fish are then removed with hand-held dip nets.

Equipment and harvesting restrictions for river herring pound nets are summarized in Table 15.

Harvest Area

Historically, river herring pound nets were set along the shores of Croatan Sound and Albemarle Sound and most of its tributaries. More recently, the majority of pound nets have been set in rivers, principally the Chowan, Roanoke, Cashie, Alligator, Pasquotank, Perquimans, Scuppernong Rivers, and in Currituck Sound (Figure 38).

Sources

Sundstrom, G.T. 1957. *Commercial Fishing Vessels and Gear*. Fish and Wildlife Circular 48. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Tyler, J., and M. McKenzie. 1969. *To Catch a Million Fish: North Carolina Commercial Fishing Gear and Methods*. North Carolina Department of Conservation and Development, Division of Commercial and Sport Fishing, Raleigh, North Carolina.

Table 15. River Herring Pound Netting—Restrictions and Regulations

Months Conducted		
Duration: Mid-March through May		
Peak: Mid-March through May		
Major Species Targeted		
Blueback herring <i>Alosa aestivalis</i>	Gizzard shad <i>Dorosoma cepedianum</i>	Channel catfish <i>I. punctatus</i>
Alewife <i>A. pseudoharengus</i>	White perch <i>Morone americana</i>	White catfish <i>I. catus</i>
Hickory shad <i>A. mediocris</i>	Striped bass <i>M. saxatilis</i>	Yellow bullhead <i>I. natalis</i>
American shad <i>A. sapidissima</i>	Brown bullhead <i>Ictalurus nebulosus</i>	
Equipment Restrictions or Specifications		
<p>15A NCAC 3J .0101 .0101 Fixed or Stationary Nets It is unlawful to use or set fixed or stationary nets:</p> <ol style="list-style-type: none"> (1) In the channel of the Intracoastal Waterway or in any other location where it may constitute a hazard to navigation; (2) So as to block more than two-thirds of any natural or man-made waterway, sound, bay, creek, inlet or any other body of water; (3) In the middle third of any marked navigation channel; (4) In the channel third of the following rivers: Roanoke, Cashie, Middle, Eastmost, Chowan, Little, Perquimans, Pasquotank, North, Alligator, Pungo, Pamlico, and Yeopim. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>		
<p>15A NCAC 3J .0102 .0102 Nets or Net Stakes It is unlawful to use nets or net stakes:</p> <ol style="list-style-type: none"> (1) Within 150 yards of railroad or highway bridge crossing the Northeast Cape Fear River, New River, White Oak River, Trent River, Neuse River, Pamlico River, Roanoke River, and Alligator River; (2) Within 300 yards of any highway bridge crossing Albemarle Sound, Chowan River, Croatan Sound, Currituck Sound, and Roanoke Sound; (3) If such net stakes are of metallic material. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>		

(continued)

Table 15. (continued)

Equipment Restrictions or Specifications (continued)
<p>15A NCAC 3J .0107 .0107 Pound Nets</p> <p>(a) It is unlawful to use pound . . . nets in internal coastal fishing waters without the owner's identification being clearly printed on a sign no less than six inches square, securely attached on an outside corner stake of each such net. Such identification must include one of the following:</p> <p>(1) For pound nets, the pound net permit number and the owner's last name and initials.</p> <p>.....</p> <p>Any pound . . . net or any part thereof found set in internal coastal fishing waters without proper identification will be in violation and may be removed and disposed of in accordance with law.</p> <p>(b) It is unlawful to set pound nets, or any part thereof except location identification stakes at each end of new locations without first obtaining a Pound Net Permit from the Fisheries Director. Within 60 days of application, the Fisheries Director shall issue a public notice of intent to consider issuance of a Pound Net Permit for new locations, and may hold public meetings and approve or take other action which may include the denial of Pound Net Permits, deemed necessary to avoid potential user conflicts and to protect traditional uses of the area including construction or use of piers. The Fisheries Director's final decision to approve, deny, or modify the pound net permit application may be appealed by requesting in writing, within 20 days of notice of such action, an administrative hearing before the Marine Fisheries commission. A Pound Net permit for a new location may be issued following evaluation by the Fisheries Director and will expire 365 days from the date of issue.</p> <p>(c) It is unlawful to set pound nets in previously registered or permitted locations without first obtaining a Pound Net Permit for each location from the Fisheries Director. Such permits will expire 365 days from the date of issue. Failure to obtain a Pound Net Permit annually, or abandonment of pound net sets without removal of all stakes, shall constitute a violation and be grounds for refusal of any Pound Net Permit. Application for renewal of Pound Net Permits must be filed not less than 10 days prior to expiration and will not be processed unless filed by the prior registrant. When an objection to a renewal is filed during the term of the permit, the Fisheries Director shall review and may deny the permit renewal under the criteria for issuance of new Pound Net Permits. Failure to use a pound net site within 60 days of issuance of a Pound Net Permit shall also constitute a violation and be grounds for refusal and/or revocation of other Pound Net Permits. It is unlawful to abandon a pound net set without removal of all stakes.</p> <p>(d) It is unlawful to use a pound net without leaving a marked navigational opening of at least 25 feet at the end of every third pound. Such openings shall be marked with international orange signs at least six inches square.</p> <p>(e) It is unlawful to set a pound net, pound net stakes, or other related equipment in internal coastal fishing waters without yellow light reflective tape or devices on each pound. The light reflective tape or devices must be affixed to a stake of at least three inches in diameter on the offshore end of each pound, must cover a vertical distance not less than twelve inches, and must be visible from a vessel when approached from all directions.</p> <p>(f) In Core Sound, the Fisheries Director shall by proclamation designate areas for the use of pound . . . nets.</p>

(continued)

Table 15. (continued)

Equipment Restrictions or Specifications (continued)
<p>.0107 Pound Nets (continued)</p> <p>(g) In Pamlico Sound, it is unlawful to set a pound net, pound net stakes, or any other related equipment without radar reflective metallic material and yellow light reflective tape or devices on each end of the pound net set. The radar reflective material and the light reflective tape or devices must be affixed to a stake of at least three inches in diameter, must cover a vertical distance of not less than 12 inches, and must be detectable by radar and light from a vessel when approached from all directions. Light reflective tape or devices may be affixed to the radar reflective material.</p> <p>(h) The Fisheries Director may, by proclamation, between August 1 and January 31, require escape panels in pound nets and may impose any or all of the following restrictions on the use of escape panels:</p> <ol style="list-style-type: none"> (1) Specify size, number, and location. (2) Specify mesh length, but not more than six inches. (3) Specify time and/or season. (4) Specify areas. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991; January 1, 1991.</i></p>
<p>15A NCAC 3J .0203</p> <p>.0203 Chowan River and Its Tributaries</p> <p>In the Chowan River and its tributaries:</p> <ol style="list-style-type: none"> (1) It is unlawful to anchor the lead line of any net closer than 50 feet from shore except in the Meherrin River. (2) It is unlawful to use pound nets in any tributary creek or within 150 yards of the mouth of any such tributary creek of the Chowan River. (3) It is unlawful to set a pound net within 200 yards parallel to any other pound net in the Chowan River. <p>.....</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. Spetember 1, 1991.</i></p>
<p>15A NCAC 3J .0204</p> <p>.0204 Currituck Sound and Its Tributaries</p> <p>In Currituck Sound and its tributaries:</p> <ol style="list-style-type: none"> (1) It is unlawful to use any net or seine with more than one power boat. <p>.....</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>

(continued)

Table 15. (continued)

Harvest Restrictions
<p>15A NCAC 3M .0202 .0202 Season Size, and Harvest Limit: Internal Coastal Waters The Fisheries Director may, by proclamation, impose any or all the following restrictions on the taking of striped bass in internal coastal waters:</p> <ol style="list-style-type: none"> (1) Specify season or seasons: <ol style="list-style-type: none"> (a) for hook-and-line, (b) for commercial fishing equipment between October 1 and April 30. (2) Specify areas, (3) Specify quantity, but shall not exceed possession of more than three fish in any one day taken by hook-and-line, (4) Specify means/methods, (5) Specify size, but the minimum size specified shall not be less than 18 inches total length, (6) Require submission of statistical and biological data. <p>Fish that do not meet the minimum size limit specified by proclamation shall immediately be returned to the waters from which taken regardless of condition.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. November 1, 1991.</i></p>
<p>15A NCAC 3M .0203 .0203 Size and Creel Limit: Internal Coastal Waters</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Repealed Eff. November 1, 1991.</i></p>
<p>15A NCAC 3M .0501 .0501 Red Drum</p> <p>(a) The Fisheries Director may, by proclamation, impose any or all of the following additional restrictions on the taking of red drum:</p> <ol style="list-style-type: none"> (1) Specify areas. (2) Specify seasons. (3) Specify quantity, but shall not exceed possession of more than two fish over 32 inches total length in any one day. (4) Specify means/method. (5) Specify size, but the minimum size specified shall not be less than 14 inches total length. <p>(b) It is unlawful to remove red drum from any type of net with the aid of any boat hook, gaff, spear, gig, or similar device.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>

(continued)

Table 15. (continued)

Harvest Restrictions (continued)
<p>15A NCAC 3M .0503 .0503 Flounder (a) It is unlawful to possess flounder less than 13 inches in length. </p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. February 1, 1992.</i></p>
<p>15A NCAC 3M .0504 .0504 Trout (a) Spotted seatrout (speckled trout). It is unlawful to possess spotted seatrout less than 12 inches in length. (b) Weakfish (gray trout). The Fisheries Director may, by proclamation, impose any or all of the following restrictions on the taking of weakfish: (1) Specify areas. (2) Specify seasons. (3) Specify quantity. (4) Specify means/methods. (5) Specify size, but not greater than 12 inches.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. February 1, 1992.</i></p>

Source: N.C. Marine Fisheries Commission, 1992.

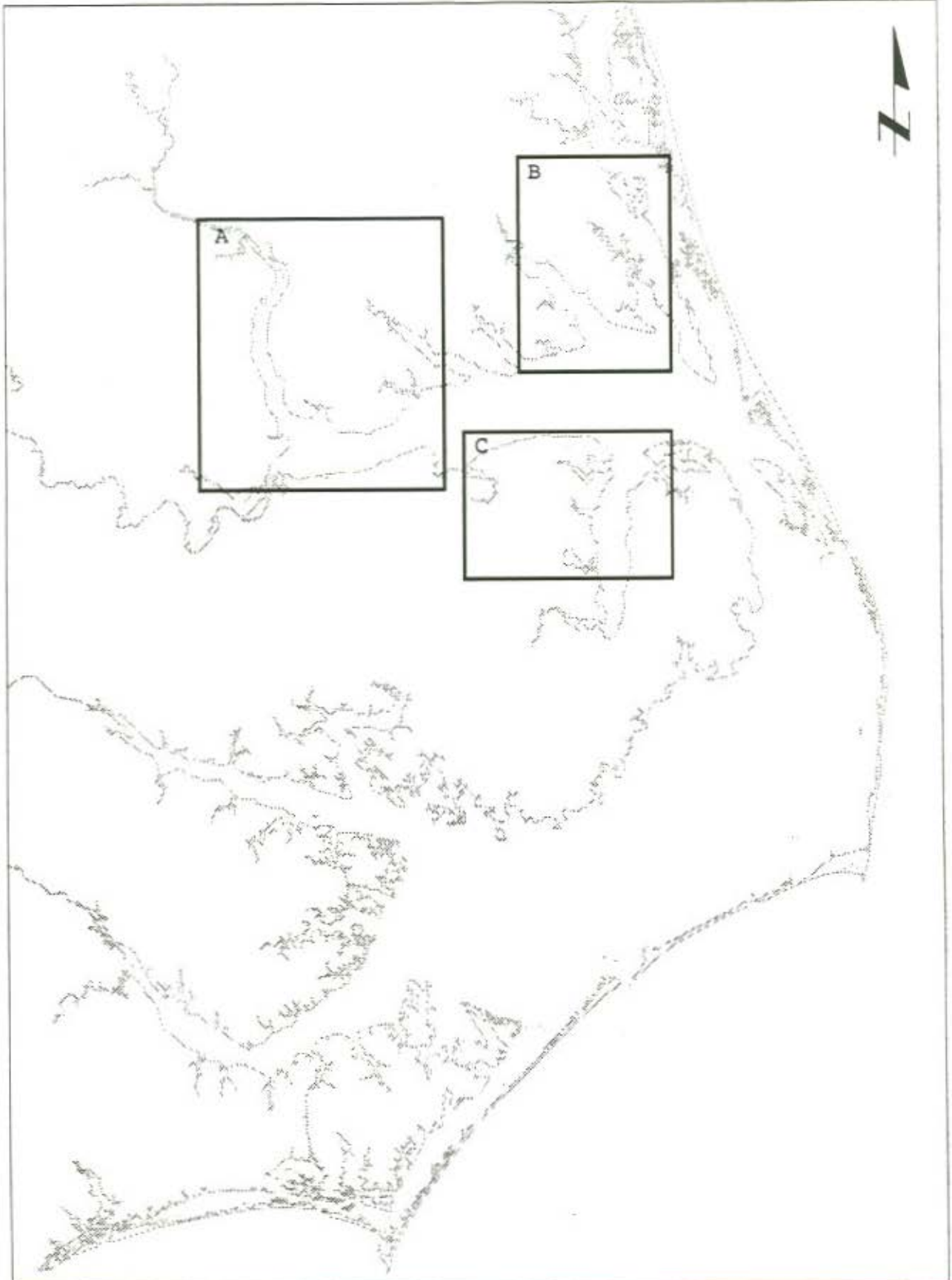


Figure 38. River herring pound netting harvest area.

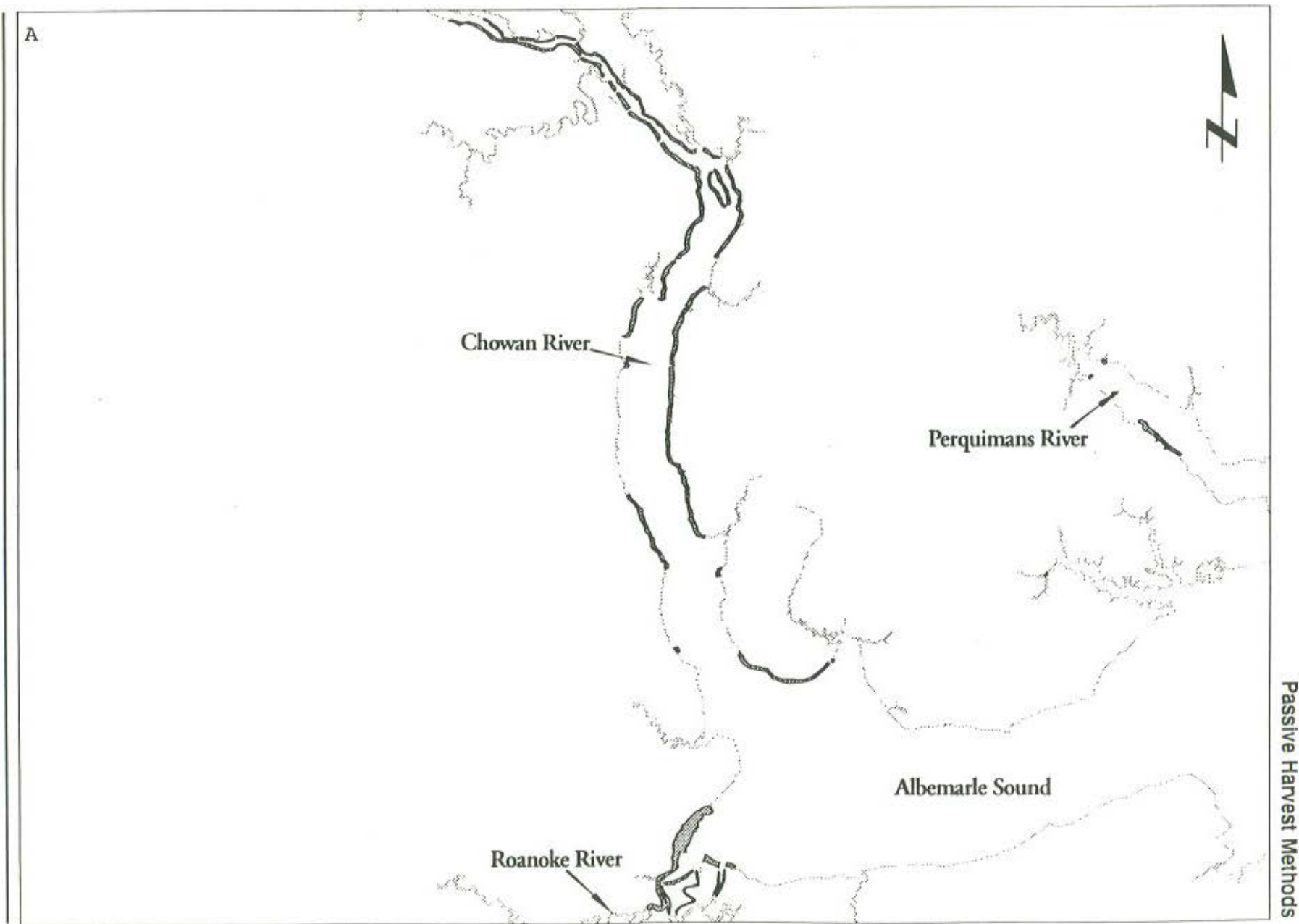


Figure 38. (continued)

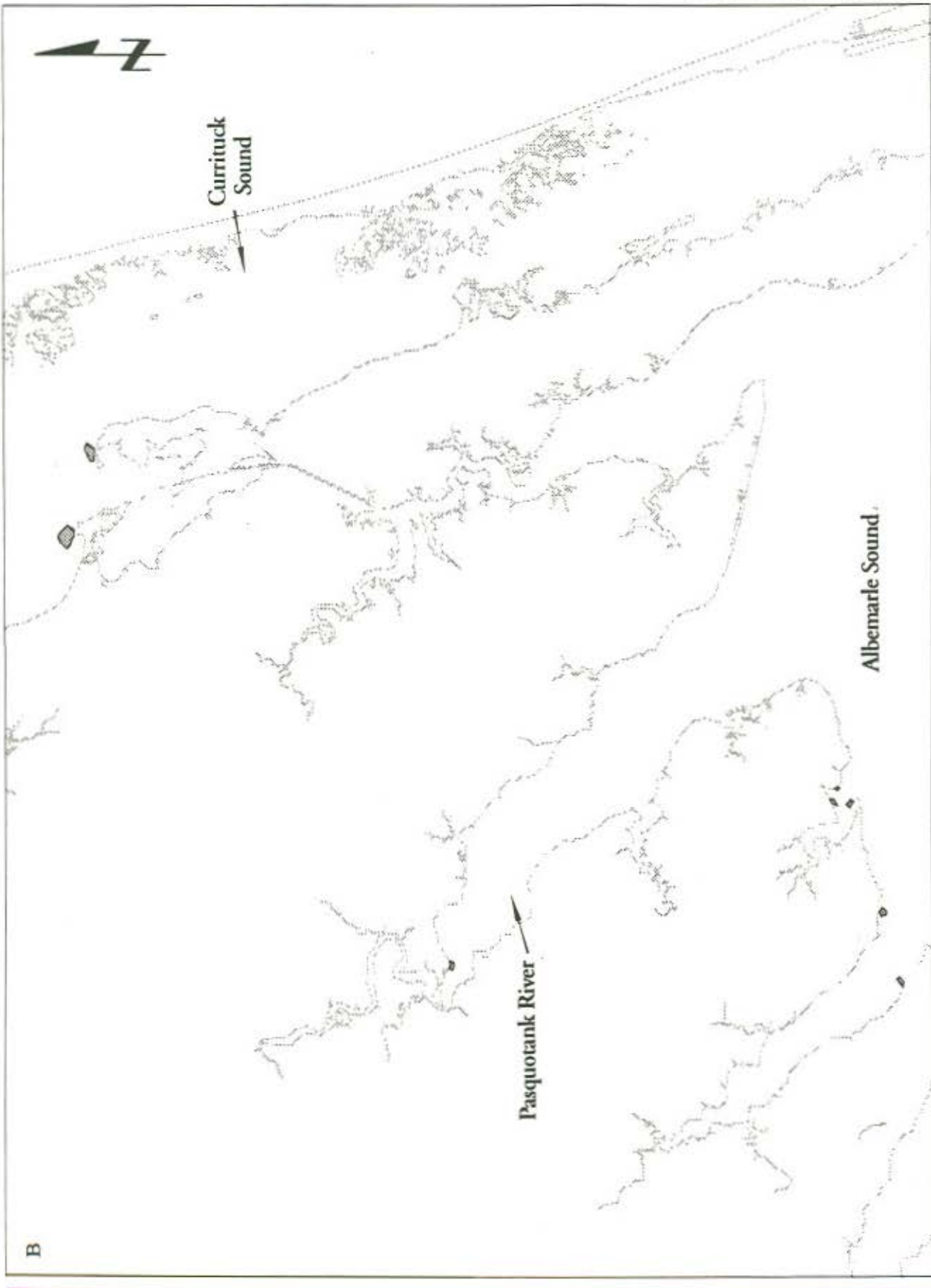


Figure 38. (continued)

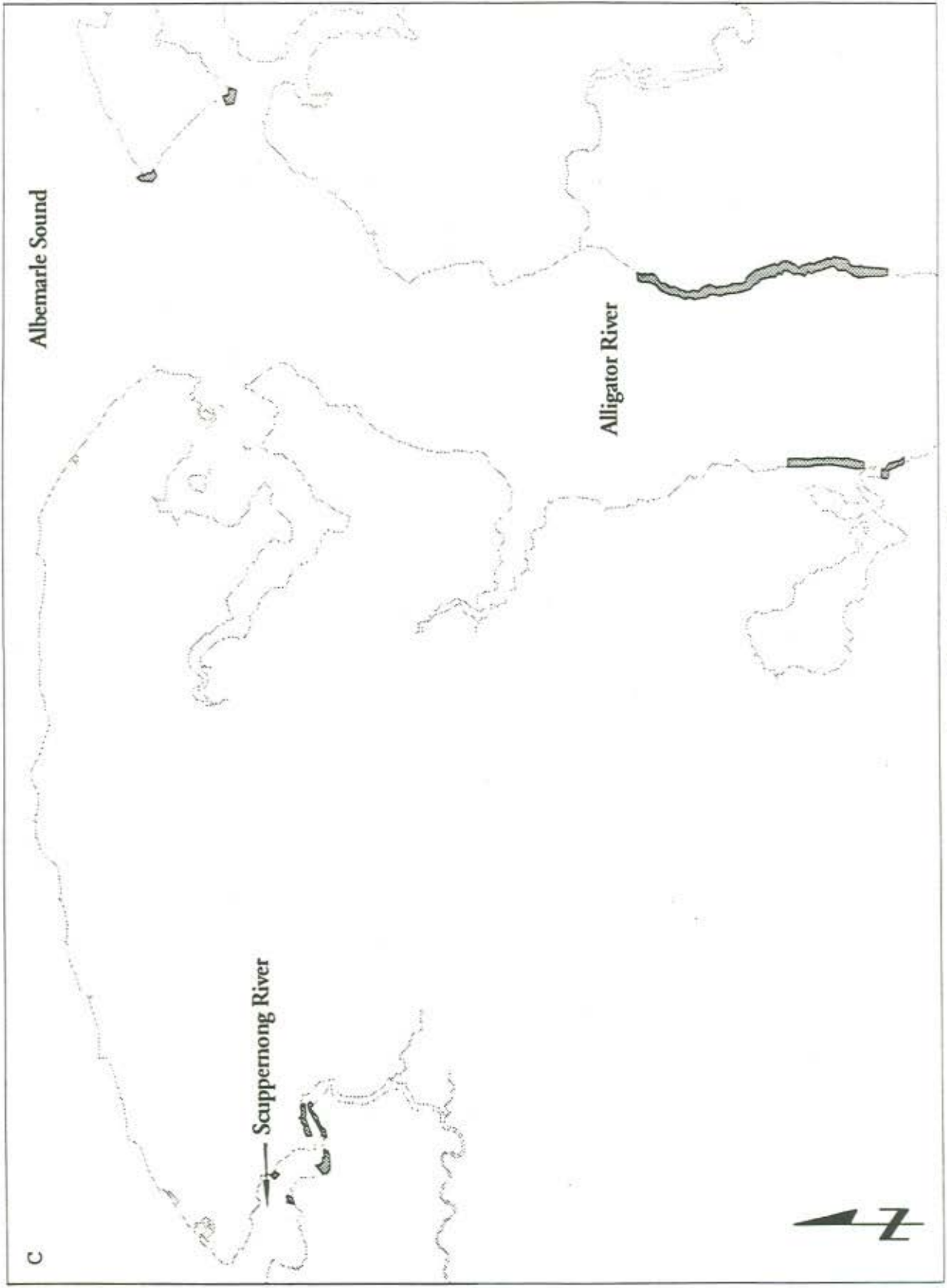


Figure 38. (continued)

Sciaenid Pound Netting

Description

Pound nets are stationary gear that direct fish into enclosures or pounds by means of leads (Figure 34). A pound net has three sections: the lead, the heart, and the pound. The lead is a length of net extending out from the shore and ending at the entrance to the pound, or trap area. As many as two to six hearts, the intermediate area between the lead and the pound, guide the fish through the funnel into the pound. The bottom of the pound is enclosed netting, which cuts off all avenues of escape.

Net mesh sizes for sciaenid pound nets are 1-3/4-inch stretched mesh for the pound, 2-inch stretched mesh for the heart, and 6-inch stretched mesh for the lead. The pound can measure 40 by 40 feet; the heart, 75 to 120 feet; and the lead, 900 to 1,500 feet. Several pound nets are sometimes set in a continuous row perpendicular to the shore covering a distance of more than a mile. Such long sets must have openings to permit navigation.

Use

Sciaenid pound nets are used to fish primarily for Atlantic croaker, spot, and weakfish although menhaden, bluefish, harvestfish, butterfish and Spanish mackerel, all nontargeted species, are often captured. To remove their catch, fishermen maneuver their boat inside a pound, then gradually pull the side and bottom netting into their boat until the trapped fish are concentrated in a small portion of the net left in the water. The fish are then removed with hand-held dip nets.

Equipment and harvesting restrictions for sciaenid pound netting are summarized in Table 16.

Harvest Area

Pound nets are used for sciaenid fishing along the Outer Banks in Pamlico Sound between Hatteras and Avon, with the majority of nets northeast of Hatteras Inlet (Figure 39). Sciaenid pound netting occurs in depths of 16 to 20 feet over muddy bottoms from May until late September or October.

Sources

Sundstrom, G.T. 1957. *Commercial Fishing Vessels and Gear*. Fish and Wildlife Circular 48. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Tyler, J., and M. McKenzie. 1969. *To Catch a Million Fish: North Carolina Commercial Fishing Gear and Methods*. North Carolina Department of Conservation and Development, Division of Commercial and Sport Fishing, Raleigh, North Carolina.

Table 16. Sciaenid Pound Netting—Restrictions and Regulations

Months Conducted		
Duration: May through October		
Peak: None		
Major Species Targeted		
Atlantic croaker <i>Micropogonias undulatus</i>	Spanish mackerel <i>Scomberomorus maculatus</i>	Southern flounder <i>Paralichthys lethostigma</i>
Spot <i>Leiostomus xanthurus</i>	Harvestfish <i>Peprilus triacanthus</i>	Summer flounder <i>P. dentatus</i>
Weakfish <i>Cynoscion regalis</i>	Butterfish <i>P. alepidotus</i>	Gulf flounder <i>P. albigutta</i>
Bluefish <i>Pomatomus saltatrix</i>	Atlantic menhaden <i>Brevoortia tyrannus</i>	
Equipment Restrictions or Specifications		
<p>15A NCAC 3J .0101 .0101 Fixed or Stationary Nets It is unlawful to use or set fixed or stationary nets:</p> <ol style="list-style-type: none"> (1) In the channel of the Intracoastal Waterway or in any other location where it may constitute a hazard to navigation; (2) So as to block more than two-thirds of any natural or man-made waterway, sound, bay, creek, inlet or any other body of water; (3) In the middle third of any marked navigation channel; (4) In the channel third of the following rivers: Roanoke, Cashie, Middle, Eastmost, Chowan, Little, Perquimans, Pasquotank, North, Alligator, Pungo, Pamlico, and Yeopim. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>		
<p>15A NCAC 3J .0102 .0102 Nets or Net Stakes It is unlawful to use nets or net stakes:</p> <ol style="list-style-type: none"> (1) Within 150 yards of railroad or highway bridge crossing the Northeast Cape Fear River, New River, White Oak River, Trent River, Neuse River, Pamlico River, Roanoke River, and Alligator River; (2) Within 300 yards of any highway bridge crossing Albemarle Sound, Chowan River, Croatan Sound, Currituck Sound, and Roanoke Sound; (3) If such net stakes are of metallic material. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>		

(continued)

Table 16. (continued)

Equipment Restrictions or Specifications (continued)
15A NCAC 3J .0107
.0107 Pound Nets
(a) It is unlawful to use pound . . . nets in internal coastal fishing waters without the owner's identification being clearly printed on a sign no less than six inches square, securely attached on an outside corner stake of each such net. Such identification must include one of the following:
(1) For pound nets, the pound net permit number and the owner's last name and initials.
. Any pound . . . net or any part thereof found set in internal coastal fishing waters without proper identification will be in violation and may be removed and disposed of in accordance with law.
(b) It is unlawful to set pound nets, or any part thereof except location identification stakes at each end of new locations without first obtaining a Pound Net Permit from the Fisheries Director. Within 60 days of application, the Fisheries Director shall issue a public notice of intent to consider issuance of a Pound Net Permit for new locations, and may hold public meetings and approve or take other action which may include the denial of Pound Net Permits, deemed necessary to avoid potential user conflicts and to protect traditional uses of the area including construction or use of piers. The Fisheries Director's final decision to approve, deny, or modify the pound net permit application may be appealed by requesting in writing, within 20 days of notice of such action, an administrative hearing before the Marine Fisheries Commission. A Pound Net permit for a new location may be issued following evaluation by the Fisheries Director and will expire 365 days from the date of issue.
(c) It is unlawful to set pound nets in previously registered or permitted locations without first obtaining a Pound Net Permit for each location from the Fisheries Director. Such permits will expire 365 days from the date of issue. Failure to obtain a Pound Net Permit annually, or abandonment of pound net sets without removal of all stakes, shall constitute a violation and be grounds for refusal of any Pound Net Permit. Application for renewal of Pound Net Permits must be filed not less than 10 days prior to expiration and will not be processed unless filed by the prior registrant. When an objection to a renewal is filed during the term of the permit, the Fisheries Director shall review and may deny the permit renewal under the criteria for issuance of new Pound Net Permits. Failure to use a pound net site within 60 days of issuance of a Pound Net Permit shall also constitute a violation and be grounds for refusal and/or revocation of other Pound Net Permits. It is unlawful to abandon a pound net set without removal of all stakes.
(d) It is unlawful to use a pound net without leaving a marked navigational opening of at least 25 feet at the end of every third pound. Such openings shall be marked with international orange signs at least six inches square.
(e) It is unlawful to set a pound net, pound net stakes, or other related equipment in internal coastal fishing waters without yellow light reflective tape or devices on each pound. The light reflective tape or devices must be affixed to a stake of at least three inches in diameter on the offshore end of each pound, must cover a vertical distance not less than twelve inches, and must be visible from a vessel when approached from all directions.
(f) In Core Sound, the Fisheries Director shall by proclamation designate areas for the use of pound . . . nets.

(continued)

Table 16. (continued)

Equipment Restrictions or Specifications (continued)
<p>.0107 Pound Nets (continued)</p> <p>(g) In Pamlico Sound, it is unlawful to set a pound net, pound net stakes, or any other related equipment without radar reflective metallic material and yellow light reflective tape or devices on each end of the pound net set. The radar reflective material and the light reflective tape or devices must be affixed to a stake of at least three inches in diameter, must cover a vertical distance of not less than 12 inches, and must be detectable by radar and light from a vessel when approached from all directions. Light reflective tape or devices may be affixed to the radar reflective material.</p> <p>(h) The Fisheries Director may, by proclamation, between August 1 and January 31, require escape panels in pound nets and may impose any or all of the following restrictions on the use of escape panels:</p> <ol style="list-style-type: none"> (1) Specify size, number, and location. (2) Specify mesh length, but not more than six inches. (3) Specify time and/or season. (4) Specify areas. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991; January 1, 1991.</i></p>
Harvest Restrictions
<p>15A NCAC 3M .0202</p> <p>.0202 Season, Size and Harvest Limit: Internal Coastal Waters</p> <p>The Fisheries Director may, by proclamation, impose any or all the following restrictions on the taking of striped bass in internal coastal waters:</p> <ol style="list-style-type: none"> (1) Specify season or seasons: <ol style="list-style-type: none"> (a) for hook-and-line, (b) for commercial fishing equipment between October 1 and April 30. (2) Specify areas, (3) Specify quantity, but shall not exceed possession of more than three fish in any one day taken by hook-and-line, (4) Specify means/methods, (5) Specify size, but the minimum size specified shall not be less than 18 inches total length, (6) Require submission of statistical and biological data. <p>Fish that do not meet the minimum size limit specified by proclamation shall immediately be returned to the waters from which taken regardless of condition.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. November 1, 1991.</i></p>

(continued)

Table 16. (continued)

Harvest Restrictions (continued)
<p>15A NCAC 3M .0501 .0501 Red Drum</p> <p>(a) The Fisheries Director may, by proclamation, impose any or all of the following additional restrictions on the taking of red drum:</p> <ol style="list-style-type: none"> (1) Specify areas. (2) Specify seasons. (3) Specify quantity, but shall not exceed possession of more than two fish over 32 inches total length in any one day. (4) Specify means/method. (5) Specify size, but the minimum size specified shall not be less than 14 inches total length. <p>(b) It is unlawful to remove red drum from any type of net with the aid of any boat hook, gaff, spear, gig, or similar device.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>
<p>15A NCAC 3M .0503 .0503 Flounder</p> <p>(a) It is unlawful to possess flounder less than 13 inches in length.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. February 1, 1992.</i></p>
<p>15A NCAC 3M .0504 .0504 Trout</p> <p>(a) Spotted seatrout (speckled trout). It is unlawful to possess spotted seatrout less than 12 inches in length.</p> <p>(b) Weakfish (gray trout). The Fisheries Director may, by proclamation, impose any or all of the following restrictions on the taking of weakfish:</p> <ol style="list-style-type: none"> (1) Specify areas. (2) Specify seasons. (3) Specify quantity. (4) Specify means/methods. (5) Specify size, but not greater than 12 inches. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. February 1, 1992.</i></p>

Source: N.C. Marine Fisheries Commission, 1992.



Figure 39. Sciaenid pound netting harvest area.

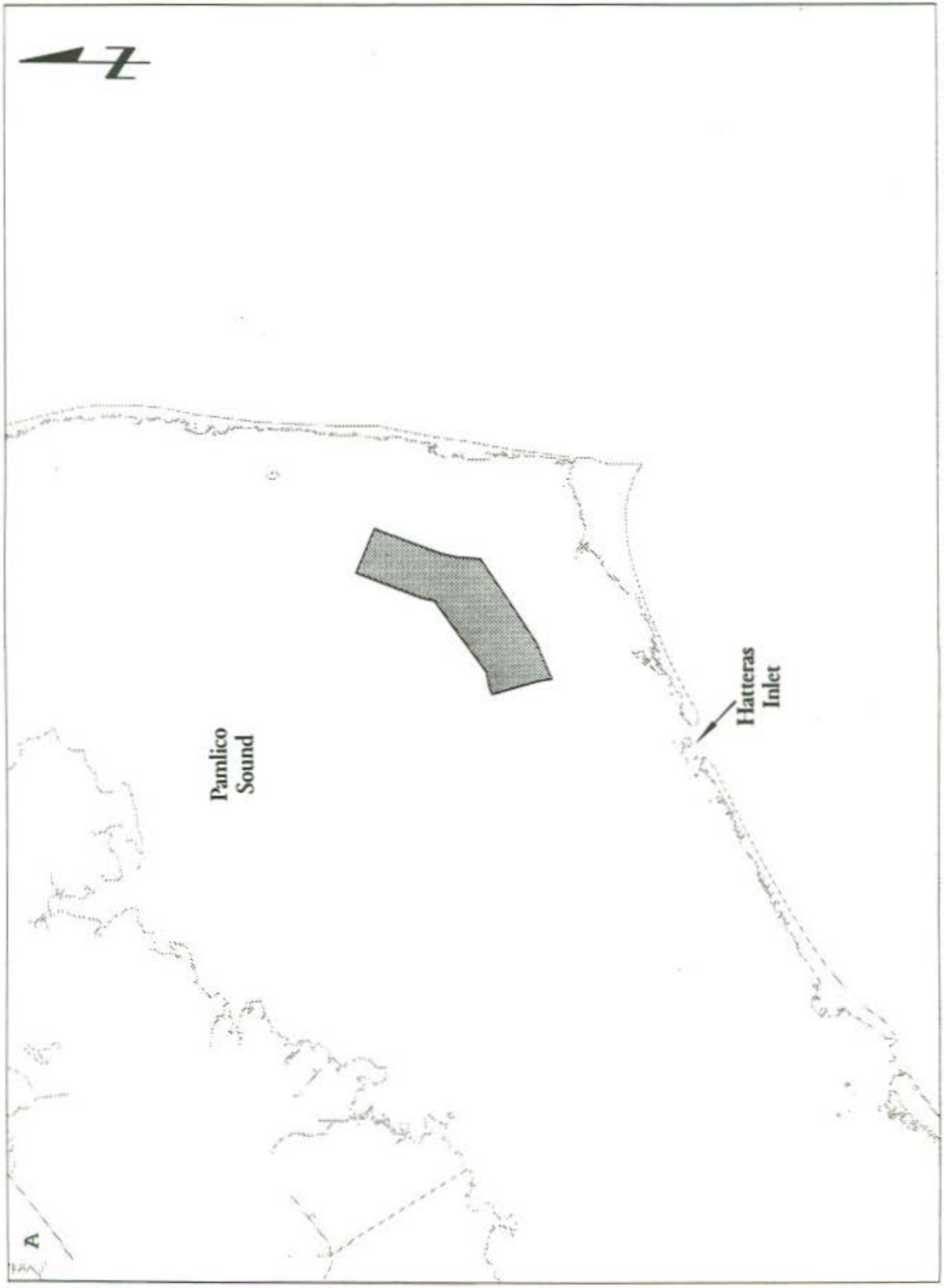
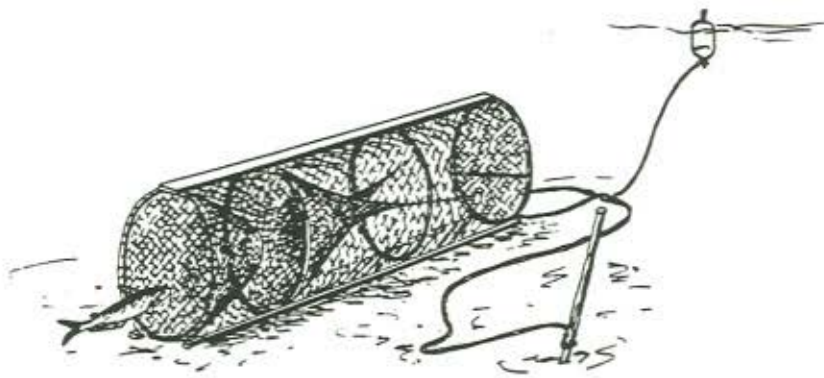


Figure 39. (continued)

Catfish Pots

Description

A catfish pot is a small wire trap (Figure 40) made up of one or more conical tunnels, through which fish travel to reach the bait (e.g., fish or meat) and from which escape is difficult. Many of the pots have small openings to permit the escape of undersized catch. A catfish pot also may be made of wooden lathe supports or wood or metal hoops covered with galvanized wire.



Source: Dumont and Sundstrom, 1961.

Figure 40. Catfish pots.

Use

Pots may be fished singly, each with a separate buoy line, or several pots may be fished together attached to one long line. Catfish are removed by spreading an opening in a seam along the top of the trap, inverting the trap, and shaking the fish out.

Equipment and harvest restrictions for catfish pots are summarized in Table 17.

Harvest Area

Catfish pots are fished primarily in the tributary rivers of Albemarle Sound including the Alligator, Pasquotank, Perquimans, Yeopim, Little, Scuppernong, Roanoke, and Chowan Rivers, and in Batchelor and Bulls Bays (Figure 41). In addition to regulations, the harvest areas for catfish pots may also be set by proclamation of the Fisheries Director.

Sources

Dumont, W.H., and G.T. Sundstrom. 1961. *Commercial Fishing Gear of the United States*. Fish and Wildlife Circular 109. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Rounsefell, George A. *Ecology, Utilization, and Management of Marine Fisheries*. Saint Louis: The C.V. Mosby Company. 1975.

Tyler, J., and M. McKenzie. 1969. *To Catch a Million Fish: North Carolina Commercial Fishing Gear and Methods*. North Carolina Department of Conservation and Development, Division of Commercial and Sport Fishing, Raleigh, North Carolina.

Table 17. Catfish Pots—Restrictions and Regulations

Months Conducted	
Duration: Year round	
Peak: None	
Major Species Targeted	
White catfish <i>Ictalurus catus</i>	Yellow bullhead <i>I. natalis</i>
Channel catfish <i>I. punctatus</i>	Brown bullhead <i>I. nebulosus</i>
Equipment Restrictions or Specifications	
<p>15A NCAC 3J .0301 .0301 Crab, Eel, Fish and Shrimp Pots</p> <p>(a) It is unlawful to use pots except during time periods and in areas specified herein:</p> <p>(1) From November 1 through April 30 except that all pots shall be removed from internal waters from January 24 through February 7. The Fisheries Director may, by proclamation, reopen various waters to the use of pots after January 28 if it is determined that such waters are free of pots.</p> <p>(2) From May 1 through October 31, north and east of the Highway 58 Bridge at Emerald Isle in areas described in 15A NCAC 3R .0007, except that the Fisheries Director may, by proclamation, designate the areas in Wysocking Bay described in 15A NCAC 3R .0007 (4) (a) and adjust designated areas in Long Shoal River for the use of pots during this time period.</p> <p>(b) It is unlawful to use pots in any navigation channel maintained and marked by State or Federal agencies.</p> <p>(c) It is unlawful to use pots unless each pot is marked by attaching a floating buoy which shall be of solid foam or other solid buoyant material and no less than five inches in length. Buoys may be of any color except yellow. The owner shall always be identified on the attached buoy by using engraved buoys or by engraved metal or plastic tags attached to the buoy. Such identification shall include one of the following:</p> <p>(1) Owner's N.C. motor boat registration number; or</p> <p>(2) Owner's U.S. vessel documentation name; or</p> <p>(3) Owner's last name and initials.</p> <p>.....</p> <p>(g) It is unlawful to use crab pots in coastal waters unless each pot contains no less than two escape rings that are at least 2 5/16 inches inside diameter and located in the opposite outside panels of the upper chamber of the pot. Peeler pots with a mesh size less than 1 1/2 inches shall be exempt from the cull ring requirement. The Fisheries Director may, by proclamation, exempt the escape ring requirement during the period November through March, and may impose any or all of the following restrictions:</p> <p>(1) Specify areas, and</p> <p>(2) Specify time.</p>	

(continued)

Table 17. Catfish Pots—Restrictions and Regulations (continued)

Equipment Restrictions or Specifications (continued)
<p>.0301 Crab, Eel, Fish and Shrimp Pots (continued)</p> <p>(h) It is unlawful to use more than one hundred fifty pots per vessel in Newport River.</p> <p>(i) Any pots found in violation of this Rule or 15A NCAC 3J .0302 may be removed by marine fisheries enforcement officers and disposed of in accordance with law.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p> <p>15A NCAC 3J .0302</p> <p>.0302 Non-Commercial Use of Pots</p> <p>(a) Pots may be attached to shore or a pier any time of year with the exception of the closed clean-up period specified in 15A NCAC 3J .0301 (a) (1).</p> <p>(b) Pots attached to shore or a pier are not required to meet the buoy and identification requirements specified in 15A NCAC 3J .0301(c), but must meet the minimum mesh length and escape ring requirements specified in 15A NCAC 3J .0301 (e), (f) and (g).</p> <p>(c) The license requirements of G.S. 113-152 apply if a vessel is used in connection with the use of pots.</p> <p>(d) All provisions of 15A NCAC 3J .0301 apply if pots are not attached to shore or a pier.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>
Harvest Restrictions
None

Source: N.C. Marine Fisheries Commission, 1992.

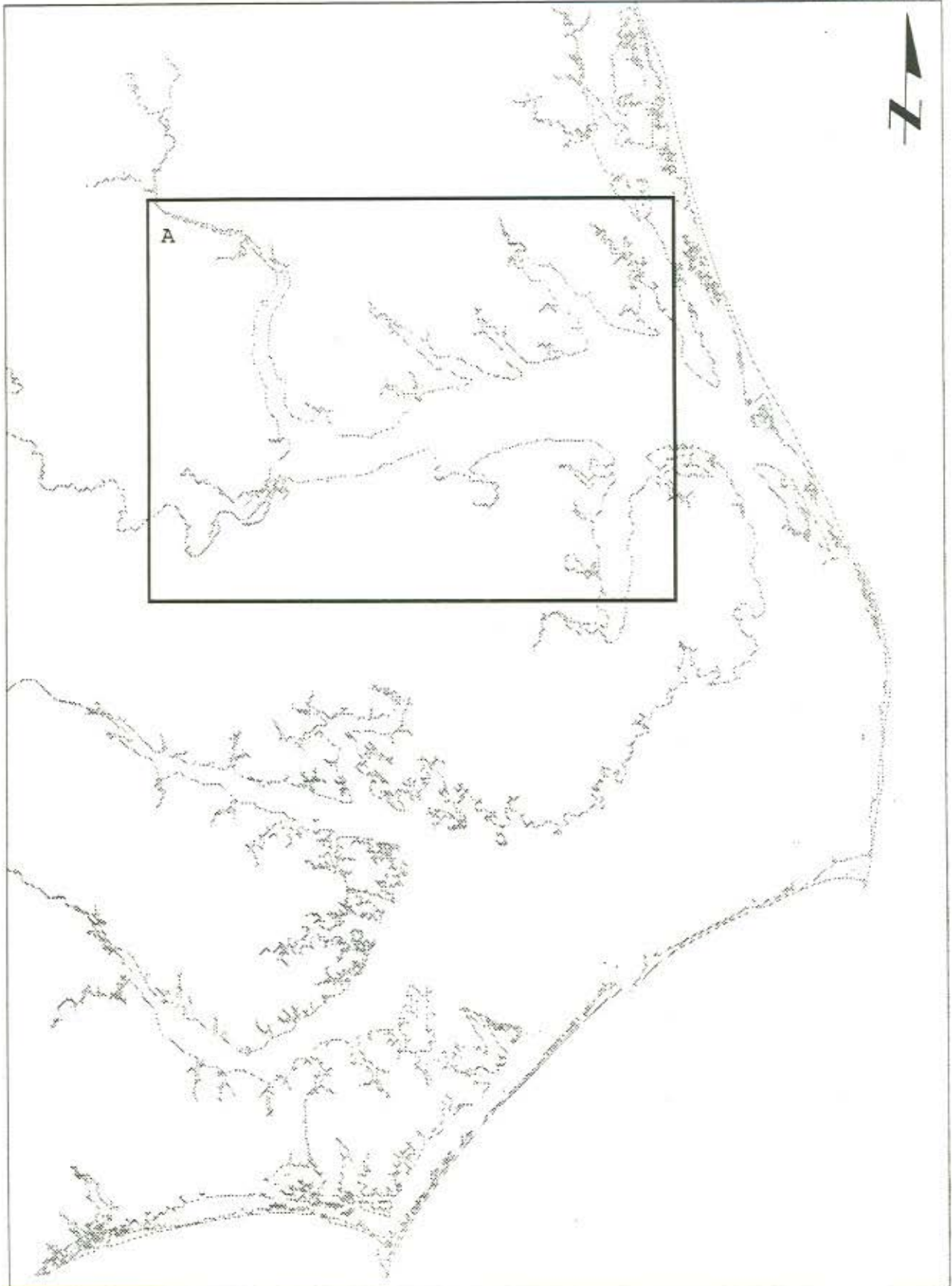


Figure 41. Catfish pot harvest area.

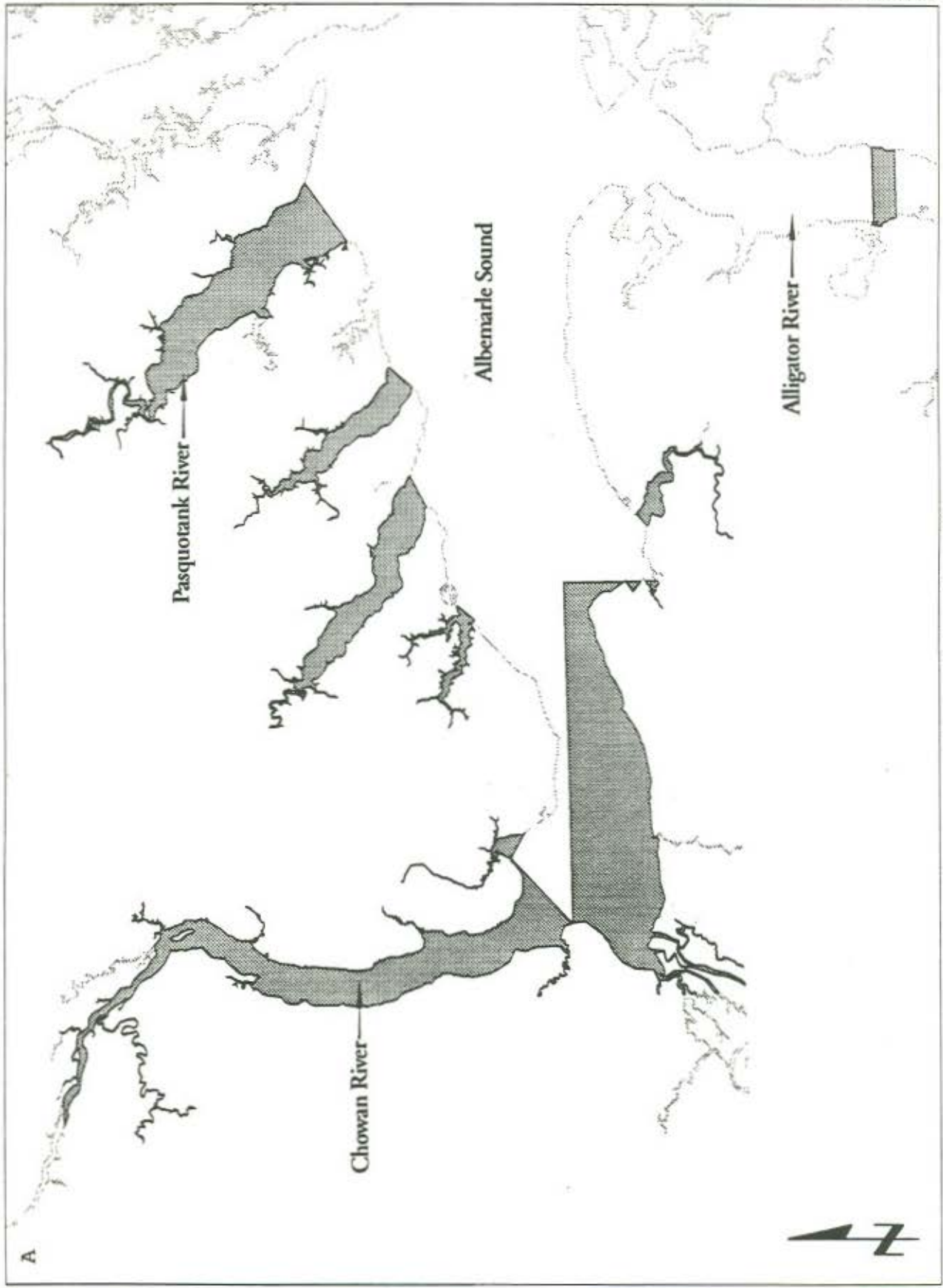


Figure 41. (continued)

Eel Pots

Description

An eel pot is a small wire trap (Figure 42) made up of one or more conical tunnels, through which eels travel to reach the bait (e.g., fish or meat) and from which escape is difficult. Many of the pots have small openings to permit the escape of undersized catch. An eel pot also may be made of wooden lathe supports or wood or metal hoops covered with galvanized wire.



Source: Dumont and Sundstrom, 1961.

Figure 42. Eel pot.

Use

Pots may be fished singly, each with a separate buoy line, or several pots may be fished together attached to one long line. Eels are removed by spreading an opening in a seam along the top of the trap, inverting the trap, and then shaking the fish out.

Equipment and harvest restrictions for eel pots are summarized in Table 18.

Harvest Area

Eel pots are used primarily in Albemarle Sound and its tributaries, including the Chowan, lower Roanoke, Alligator, Scuppernong, Little, North, Yeopim, Perquimans, and Pasquotank Rivers; Batchelor Bay; and in Currituck Sound (Figure 43). Eel pots are used to a lesser extent in the Tar-Pamlico and Neuse Rivers. In addition to regulations, the harvest area for eel pots may also be set by proclamation of the Fisheries Director.

Note: DMF will be developing maps for eel pot areas in the Tar-Pamlico and Neuse Rivers.

Sources

Dumont, W.H., and G.T. Sundstrom. 1961. *Commercial Fishing Gear of the United States*. Fish and Wildlife Circular 109. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Rounsefell, George A. *Ecology, Utilization, and Management of Marine Fisheries*. Saint Louis: The C. V. Mosby Company. 1975.

Tyler, J., and M. McKenzie. 1969. *To Catch a Million Fish: North Carolina Commercial Fishing Gear and Methods*. North Carolina Department of Conservation and Development, Division of Commercial and Sport Fishing, Raleigh, North Carolina.

Table 18. Eel Pots—Restrictions and Regulations

Months Conducted
Duration: November through May
Peak: None
Major Species Targeted
American eel <i>Anguilla rostrata</i>
Equipment Restrictions or Specifications
<p>15A NCAC 3J .0301 .0301 Crab, Eel, Fish and Shrimp Pots</p> <p>(a) It is unlawful to use pots except during time periods and in areas specified herein:</p> <ol style="list-style-type: none"> (1) From November 1 through April 30 except that all pots shall be removed from internal waters from January 24 through February 7. The Fisheries Director may, by proclamation, reopen various waters to the use of pots after January 28 if it is determined that such waters are free of pots. (2) From May 1 through October 31, north and east of the Highway 58 Bridge at Emerald Isle in areas described in 15A NCAC 3R .0007, except that the Fisheries Director may, by proclamation, designate the areas in Wysocking Bay described in 15A NCAC 3R .0007 (4) (a) and adjust designated areas in Long Shoal River for the use of pots during this time period. <p>(b) It is unlawful to use pots in any navigation channel maintained and marked by State or Federal agencies.</p> <p>(c) It is unlawful to use pots unless each pot is marked by attaching a floating buoy which shall be of solid foam or other solid buoyant material and no less than five inches in length. Buoys may be of any color except yellow. The owner shall always be identified on the attached buoy by using engraved buoys or by engraved metal or plastic tags attached to the buoy. Such identification shall include one of the following:</p> <ol style="list-style-type: none"> (1) Owner's N.C. motor boat registration number; or (2) Owner's U.S. vessel documentation name; or (3) Owner's last name and initials. <p>.....</p> <p>(f) It is unlawful to use eel pots with mesh sizes smaller than one inch by one-half inch unless such pots contain an escape panel that is at least 4" square with a mesh size of 1" x 1/2" located in the outside panel of the upper chamber of rectangular pots and in the rear portion of cylindrical pots, except that not more than two eel pots per fishing operation with a mesh of any size may be used to take eels for bait.</p> <p>.....</p> <p>(h) It is unlawful to use more than one hundred fifty pots per vessel in Newport River.</p> <p>(i) Any pots found in violation of this Rule or 15A NCAC 3J .0302 may be removed by marine fisheries enforcement officers and disposed of in accordance with law.</p>
<i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i>

(continued)

Table 18. (continued)

Equipment Restrictions or Specifications (continued)
<p>15A NCAC 3J .0302 .0302 Non-Commercial Use of Pots</p> <p>(a) Pots may be attached to shore or a pier any time of year with the exception of the closed clean-up period specified in 15A NCAC 3J .0301 (a) (1).</p> <p>(b) Pots attached to shore or a pier are not required to meet the buoy and identification requirements specified in 15A NCAC 3J .0301(c), but must meet the minimum mesh length and escape ring requirements specified in 15A NCAC 3J .0301 (e), (f) and (g).</p> <p>(c) The license requirements of G.S. 113-152 apply if a vessel is used in connection with the use of pots.</p> <p>(d) All provisions of 15A NCAC 3J .0301 apply if pots are not attached to shore or a pier.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>
Harvest Restrictions
None

Source: N.C. Marine Fisheries Commission, 1992.

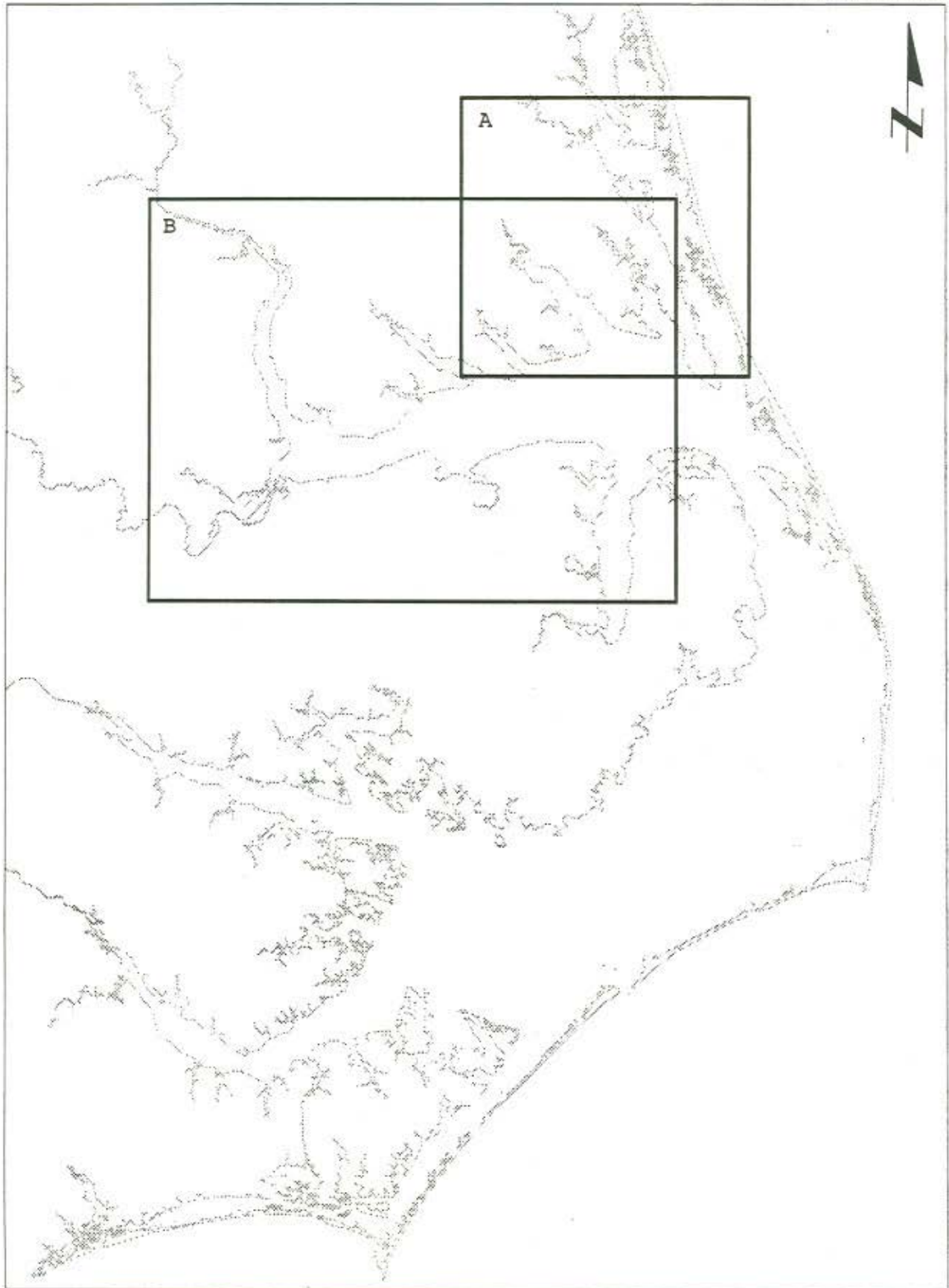


Figure 43. Eel pot harvest area.

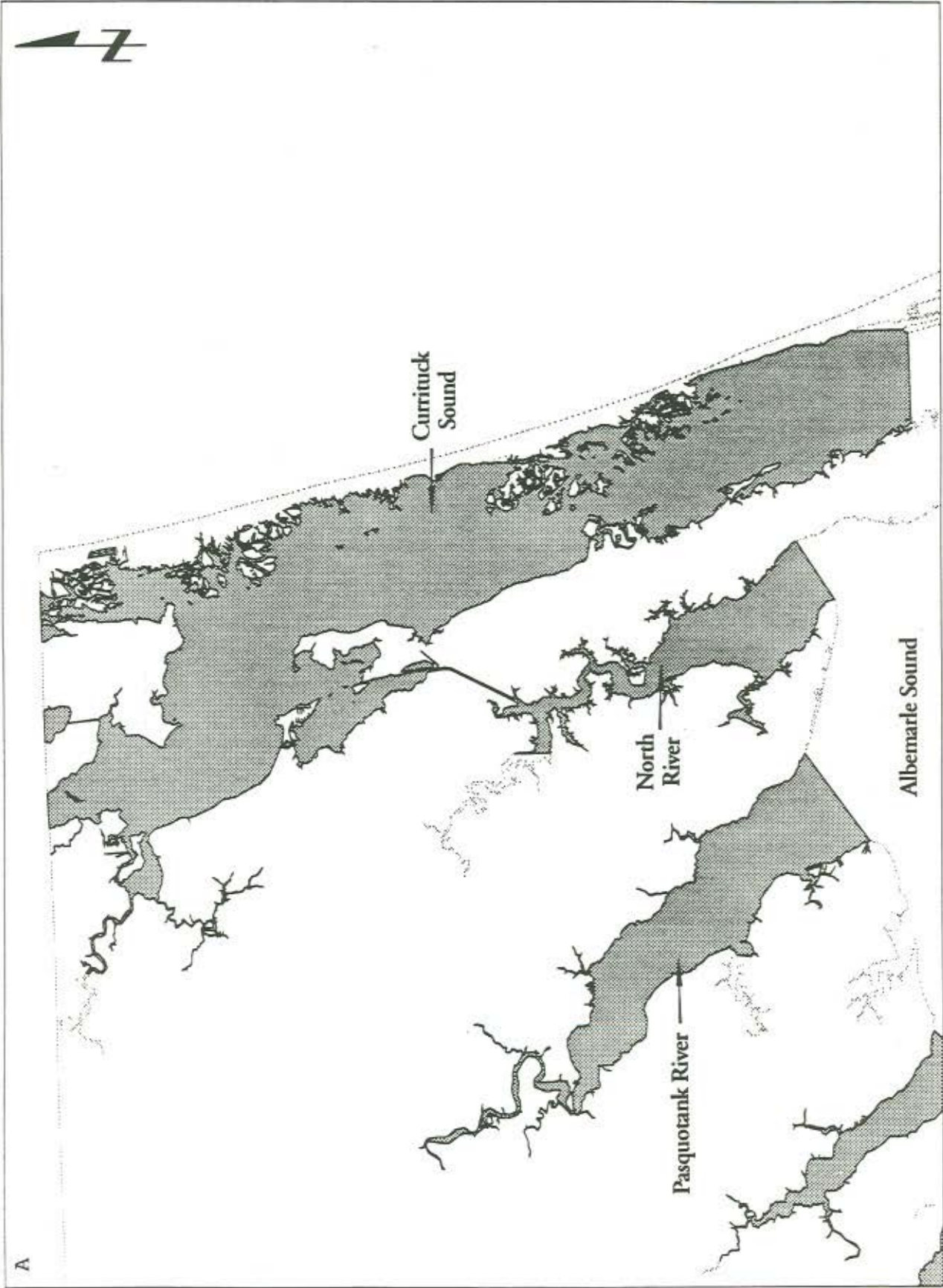


Figure 43. (continued)

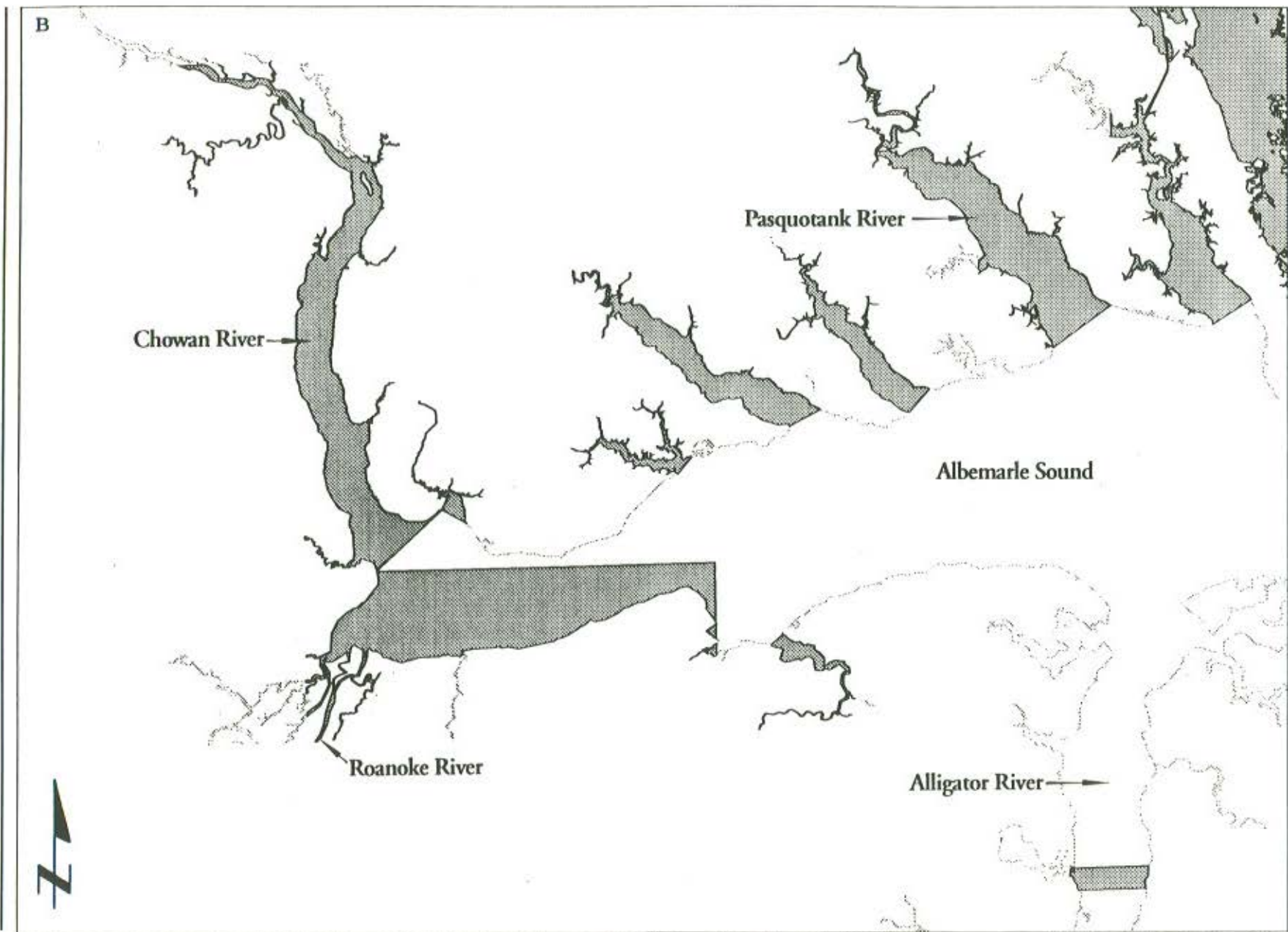
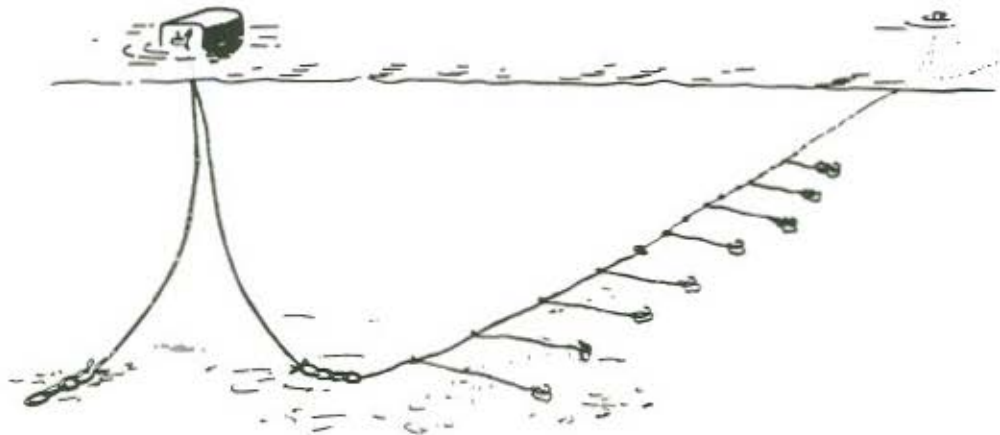


Figure 43. (continued)

Trotline Fishing

Description

A trotline is a long horizontal main line strung out between two wooden poles or from a river bank to midstream (Figure 44). Leaders with hooks are attached at intervals and baited. As many as 100 hooks can be used. Each end is anchored and buoyed. As the line is being set into the water, bait is fastened to each hook.



Adapted from: Dumont and Sundstrom, 1961.

Figure 44. Trotline fishing.

Use

The trotline is deployed from a boat by lowering one end of the line to the bottom and slowly paying out the line. As the line is payed out, each hook is baited until all hooks are baited. A fisherman checks his trotline for fish one or more times a day by moving his boat slowly along the line and pulling the buoyed end into the boat. As the line comes to the surface, the fisherman removes the hooked fish, rebaits the hooks as necessary, and puts the line overboard.

Equipment and harvest restrictions for trotlines are summarized in Table 19.

Harvest Area

Fish trotlines are used principally in western Albemarle Sound and in the Chowan, lower Roanoke, Scuppernong, Yeopim, Pasquotank, Little, and Perquimans Rivers (Figure 45).

Sources

- Dumont, W.H., and G.T. Sundstrom. 1961. *Commercial Fishing Gear of the United States*. Fish and Wildlife Circular 109. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.
- Rounsefell, George A. 1975. *Ecology, Utilization, and Management of Marine Fisheries*. Saint Louis: The C.V. Mosby Company.
- Tyler, J., and M. McKenzie. 1969. *To Catch a Million Fish: North Carolina Commercial Fishing Gear and Methods*. North Carolina Department of Conservation and Development, Division of Commercial and Sport Fishing, Raleigh, North Carolina.

Table 19. Trotline Fishing—Restrictions and Regulations

Months Conducted	
Duration: Year round	
Peak: None	
Major Species Targeted	
White catfish <i>Ictalurus catus</i>	Yellow bullhead <i>I. natalis</i>
Channel catfish <i>I. punctatus</i>	Brown bullhead <i>I. nebulosus</i>
Equipment Restrictions or Specifications	
<p>15A NCAC 3J .0203 .0203 Chowan River and Its Tributaries In the Chowan River and its tributaries:</p> <p>(5) It is unlawful to set a trotline within 100 yards of a pound net from February 1 through May 31.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Ammended Eff. September 1, 1991.</i></p>	
Harvest Restrictions	
None	

Source: N.C. Marine Fisheries Commission, 1992.

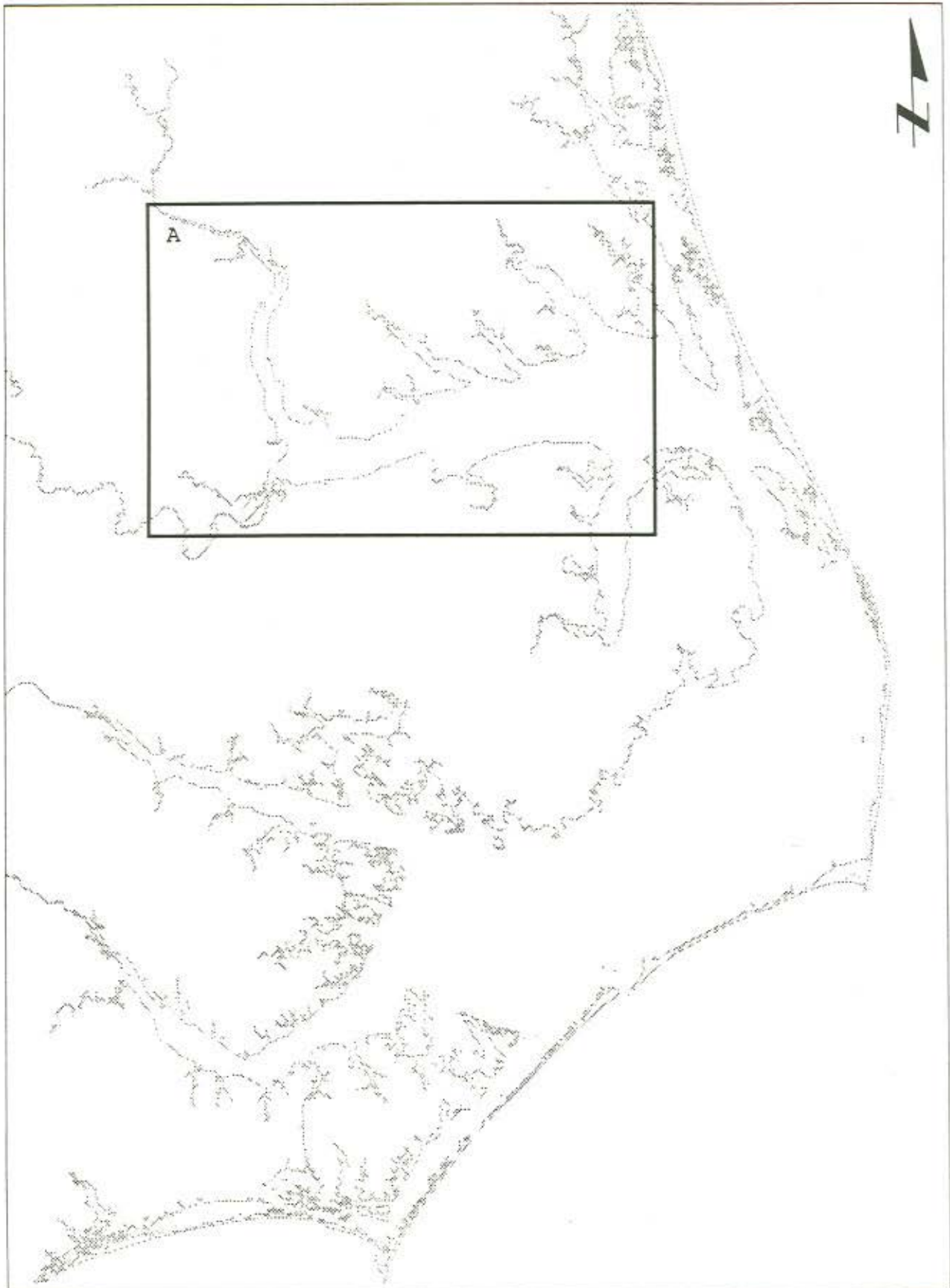


Figure 45. Trotline fishing harvest area.

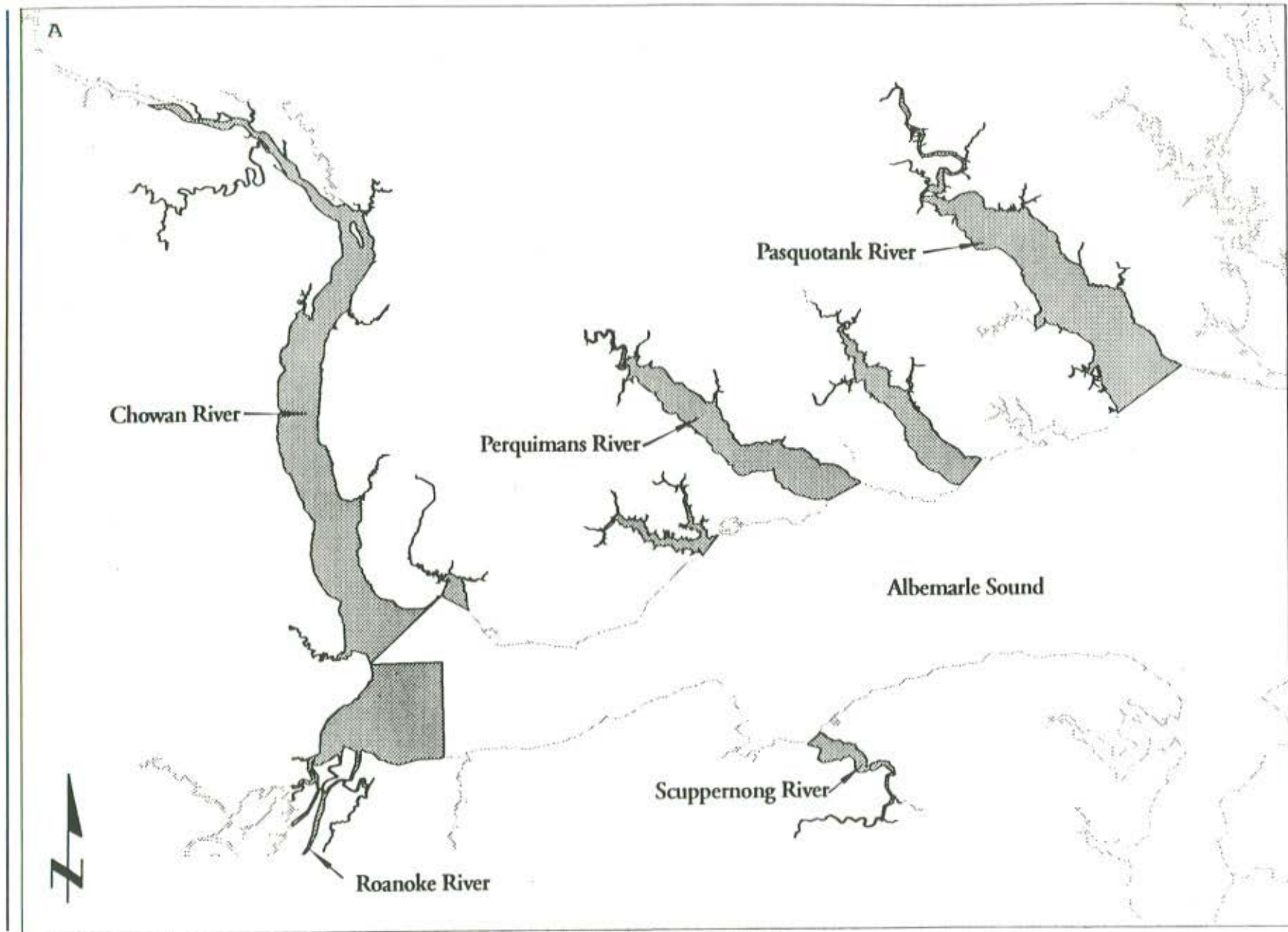


Figure 45. (continued)

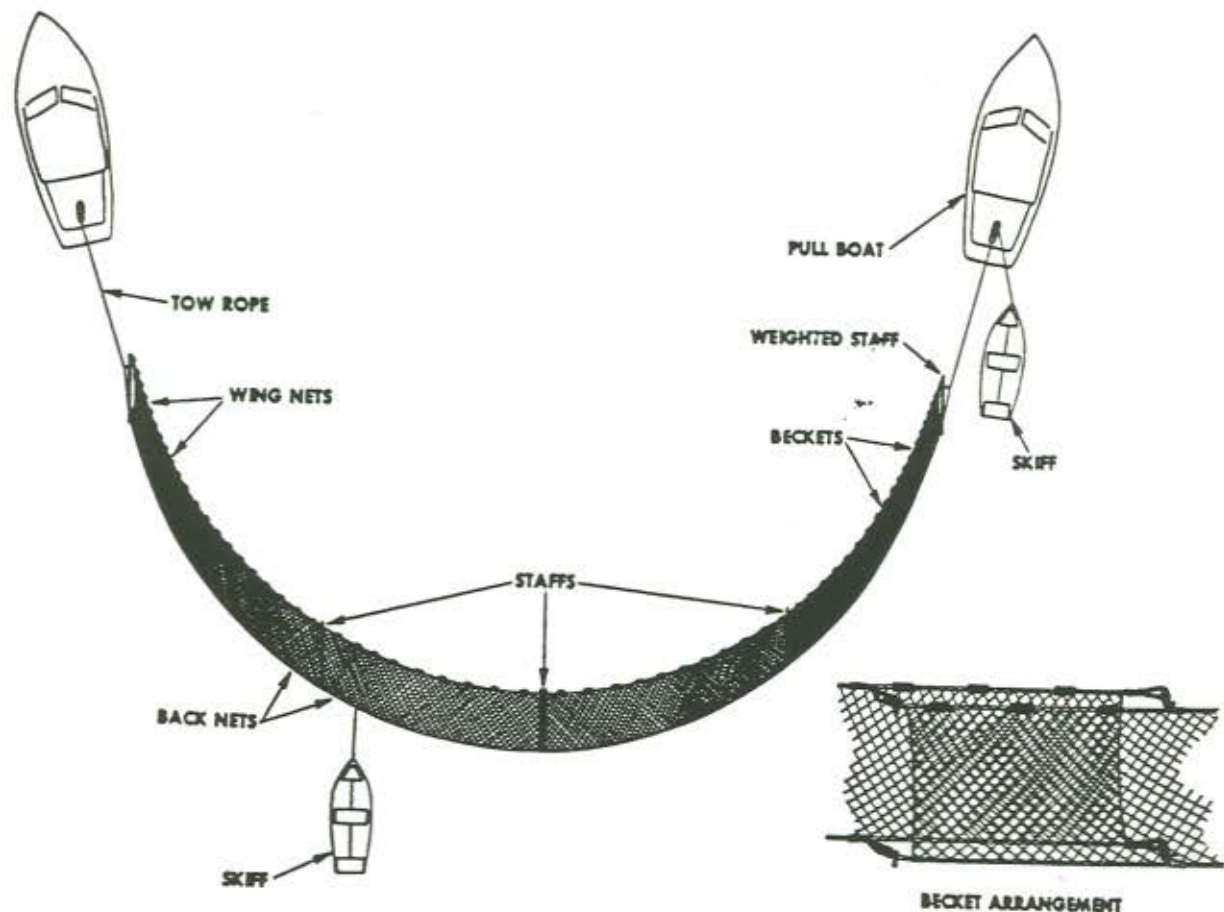


Active Harvest Methods

Long-Haul Seining (and Swipe Netting)

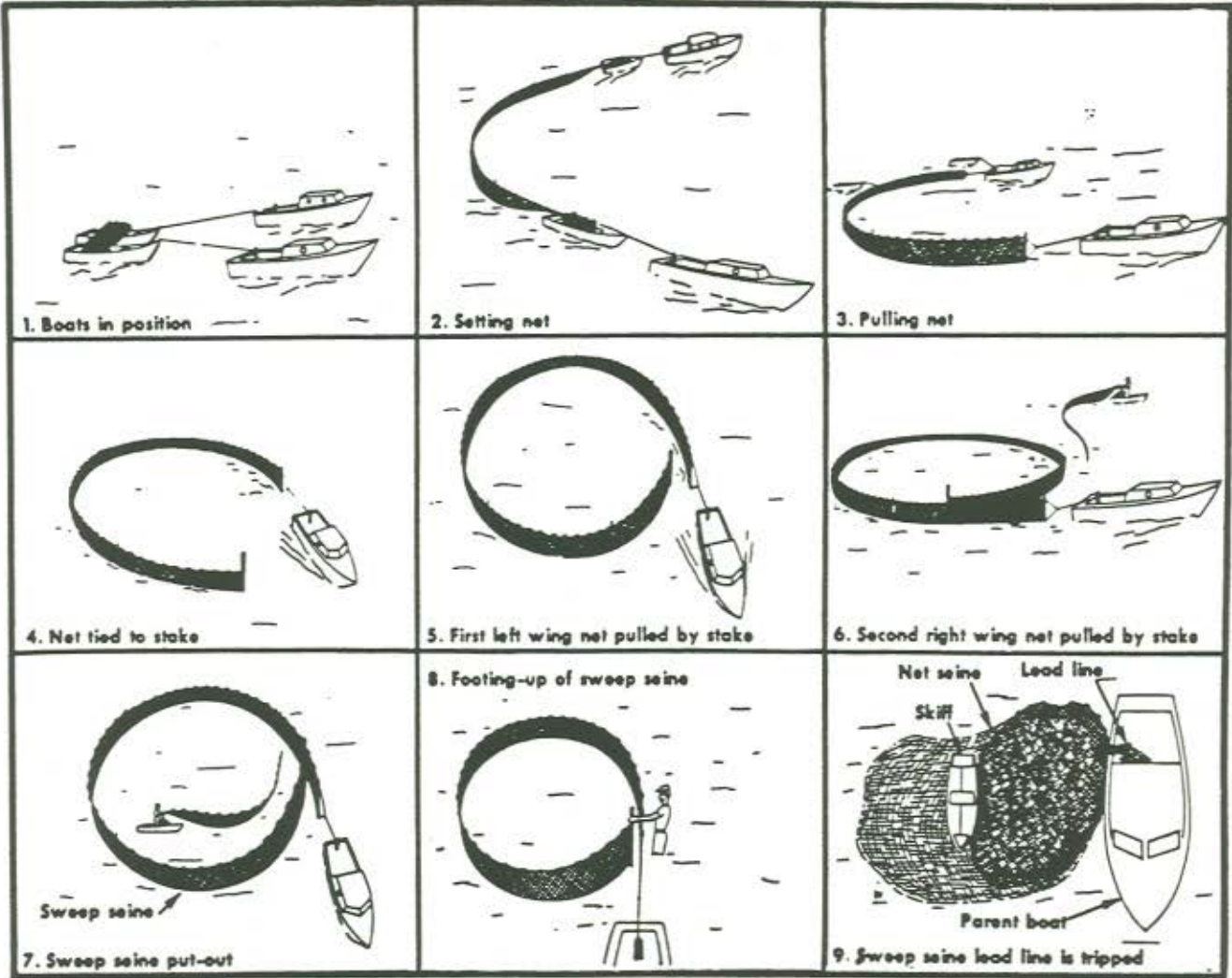
Description

In long-haul fishing, a 1,000- to 1,800-yard 6-foot deep (or deeper) net is pulled between two boats for up to 5 miles before the fish are encircled and concentrated by pulling the net around a stake (see Figures 46 and 47). The long-haul net is divided into six or eight wing and back nets that are 100 to 150 yards long. A floating buoy is attached to each section to alert vessels to the presence of the underwater net. The two center back nets have a staff on each end where the two halves of the long-haul net are joined. The wing nets are put together by attachment sections called beckets that are overlapped (see insert to Figure 46). A 7-foot staff, weighted on the bottom, is attached to each end of a 6-foot-deep long-haul net and a 75-foot tow rope is attached from the staff to a pull boat. The length of the staff is determined by the depth of the net.



Source: Guthrie et al., 1973.

Figure 46. Components of a long-haul net.



Source: Guthrie et al., 1973.

Figure 47. Sequence of long-haul fishing.

In long-haul fishing, two 20- to 45-foot pull boats and two skiffs about 18 to 24 feet long and 7 feet wide, which are used to carry the nets, are required. A four- to six-person crew is generally needed. At the end of the haul, a 75-yard-long sweep seine is put overboard to hold the fish.

Use

This fishing operation starts out with the two pull boats floating side by side in the water (Figure 47). Each boat has a skiff tied off the stern in which is loaded half of a complete long haul seine. Crew members connect the two halves. The pull boats separate and travel straight away from one another. Net is payed out from each skiff. When the net is all out, the boats turn toward the same direction and pull the seine. The two boats come together again after pulling the seine for a distance. The resulting circle of net is pulled smaller and smaller. After all sections of the net have been taken up, the sweep seine is used to hold the fish. Captured fish are dip-netted into the boat.

Swipe netting is a modified method of long-hauling that uses a smaller net called a "swiper." The net consists of one-half of a regular long-haul gear (two wing and two back nets) with a sweep seine attached to the rear staff of the second back net. One end of the net is tied to a stake and the other end is pulled in a wide circle back to the stake (Figure 48). Swipe netting covers a small area and thus the catch is smaller than long-haul catches. However, swipe netting can be done by a three-person crew with only one pull boat and one skiff, and several hauls can be made in one day.

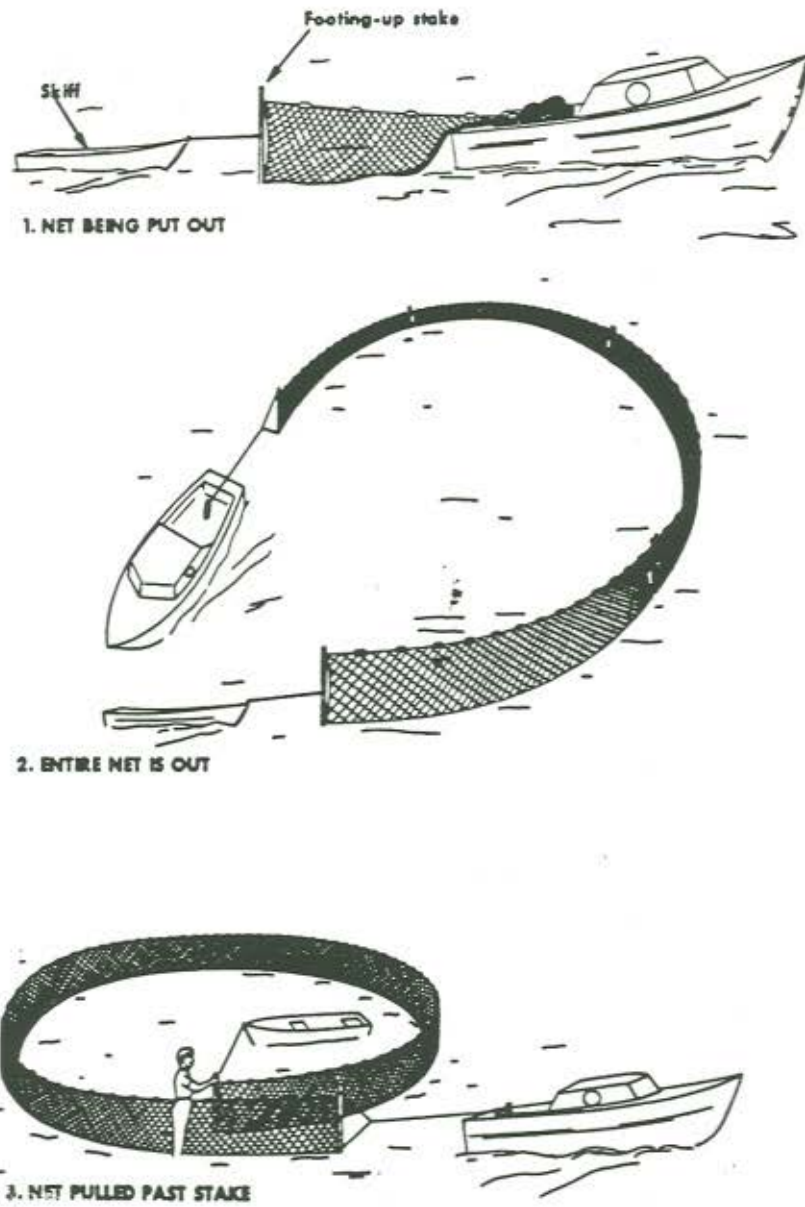
The long-haul seining fishery predominantly targets Atlantic croaker, spot, weakfish, menhaden, and pinfish while pigfish, bluefish, Southern kingfish, and spotted seatrout account for minor portions of the total catch.

Equipment and harvest restrictions for long-haul seining and swipe netting are summarized in Table 20.

Harvest Area

Long-haul fishing is practiced in two areas of the A/P Study Area: (1) Croatan and Roanoke Sounds and northern and eastern portions of Pamlico Sound (along the Outer Banks) in portions of the Pamlico River Estuary including the Pungo River and adjacent areas of western Pamlico Sound; and (2) in portions of the Neuse River Estuary, West Bay, Core Sound, Back Sound, and the North River (Figure 49). Swiper nets have almost completely replaced the traditional long-haul nets in portions of Pamlico Sound.

There are two centers of activity for the long-haul seining fishery: one in northern Pamlico Sound/Croatan Sound and one in southern Pamlico Sound/Core Sound. The southern fishery uses the traditional method of fishing in relatively shallow waters (4-9 feet deep) near shoals and harvests primarily spot. The northern fishery nets fish in deeper water (12-18 feet deep) and harvests primarily Atlantic croaker.



Source: Guthrie et al., 1973.

Figure 48. Sequence of swiper-net fishing methods.

Sources

- Guthrie, James F., Richard L. Kroger, Herbert R. Gordy, and Curtis W. Lewis. 1973. The long-haul fishery of North Carolina. *Marine Fisheries Review* 35(12):27-33. MFR Paper 1024. Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.
- Tyler, J., and M. McKenzie. 1969. *To Catch a Million Fish: North Carolina Commercial Fishing Gear and Methods*. North Carolina Department of Conservation and Development, Division of Commercial and Sport Fishing, Raleigh, North Carolina.

**Table 20. Long-Haul Seining and Swipe Netting—
Restrictions and Regulations**

Months Conducted		
Duration: February through November		
Peak: May through October		
Major Species Targeted		
Atlantic croaker <i>Micropogonias undulatus</i>	Harvestfish <i>Peprilus alepidotus</i>	Gulf flounder <i>P. albigutta</i>
Spot <i>Leiostomus xanthurus</i>	Red drum <i>Sciaenops ocellatus</i>	Southern kingfish <i>Menticirrhus americanus</i>
Weakfish <i>Cynoscion regalis</i>	Pigfish <i>Orthopristis chrysopterus</i>	Gulf kingfish <i>M. littoralis</i>
Spotted seatrout <i>C. nebulosus</i>	Southern flounder <i>Paralichthys lethostigma</i>	Northern kingfish <i>M. saxatilis</i>
Bluefish <i>Pomatomus saltatrix</i>	Summer flounder <i>P. dentatus</i>	Atlantic menhaden <i>Brevoortia tyrannus</i>
		Pinfish <i>Lagodon rhomboides</i>
Equipment Restrictions or Specifications		
<p>15A NCAC 3J .0108 .0108 Nets Pulled By More Than One Boat It is unlawful to pull or tow a net with more than one boat except in long-haul fishing operations.</p> <p align="right"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>		
<p>15A NCAC 3J .0109 .0109 Long-haul Fishing Operations, Identification Requirements It is unlawful to tow or pull a net in a long-haul or swipe net fishing operation:</p> <ol style="list-style-type: none"> (1) Without a floating buoy attached a minimum of every 100 yards along the cork line. The buoy shall be international orange and shall be no less than 5 inches in diameter and no less than 11 inches in length; and (2) Without a flag, square in shape, international orange in color, at least 24 inches by 24 inches in size, flying in the rigging so as to be visible when approaching the vessel from any direction. <p align="right"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991.</i></p>		

(continued)

Table 20. (continued)

Equipment Restrictions or Specifications (continued)
<p>15A NCAC 3J .0204 .0204 Currituck Sound and Its Tributaries In Currituck Sound and its tributaries:</p> <ol style="list-style-type: none"> (1) It is unlawful to use any net or seine with more than one power boat. (2) It is unlawful to use any seine or haul net which is more than 900 yards in length or which has a mesh length of less than three inches. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p> <p>15 NCAC 3N .0004 .0004 Prohibited Gear, Primary Nursery Areas It is unlawful to use any trawl net, long haul seine, swipe net, dredge or mechanical method for clams or oysters for the purpose of taking any marine fishes in any of the primary nursery areas described in 15A NCAC 3R .0003.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>
Harvest Restrictions
<p>15A NCAC 3M .0102 .0102 Unmarketable Food or Scrap Fish</p> <ol style="list-style-type: none"> (a) It is unlawful to land or dispose of finfish as trash or scrap fish if in violation of minimum size or possession limits established by rule or proclamation. (b) It is unlawful to land or dispose of finfish as trash or scrap fish taken in connection with legitimate commercial fishing operations which are unmarketable as individual food fish by reason of size, except that a quantity not exceeding 5,000 pounds per vessel per day may be: <ol style="list-style-type: none"> (1) Landed and sold to a licensed finfish dealer, a licensed fish dehydrating plant or licensed finfish processing plant, and (2) Purchased or accepted by a licensed finfish dealer, a licensed fish dehydrating plant or licensed finfish processor. <p>Menhaden, herring, and gizzard shad are exempt from this Rule.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-185; 143B-289.4; Eff. January 1, 1991.</i></p>

Source: N.C. Marine Fisheries Commission, 1992.

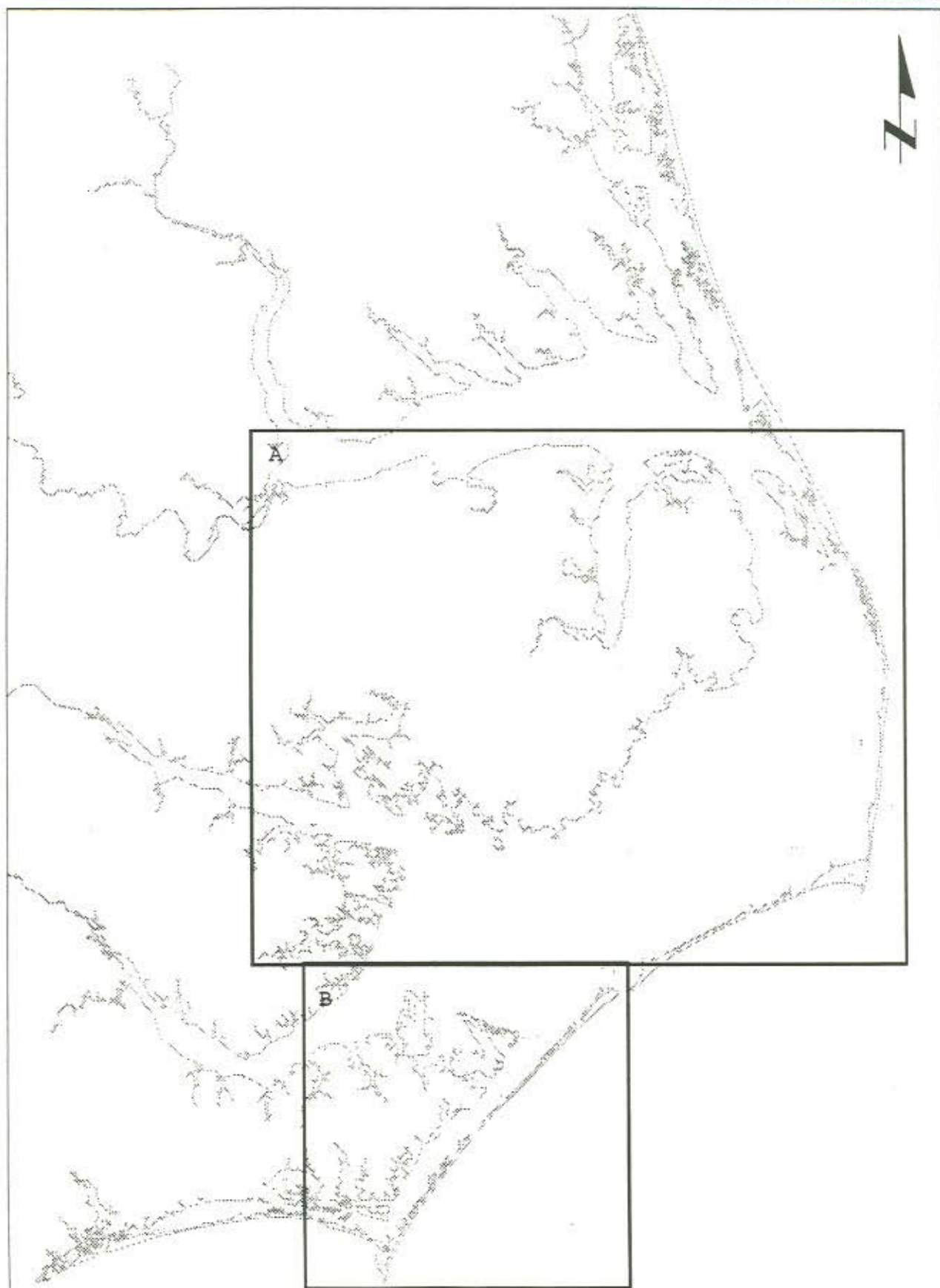


Figure 49. Long-haul seining harvest area.

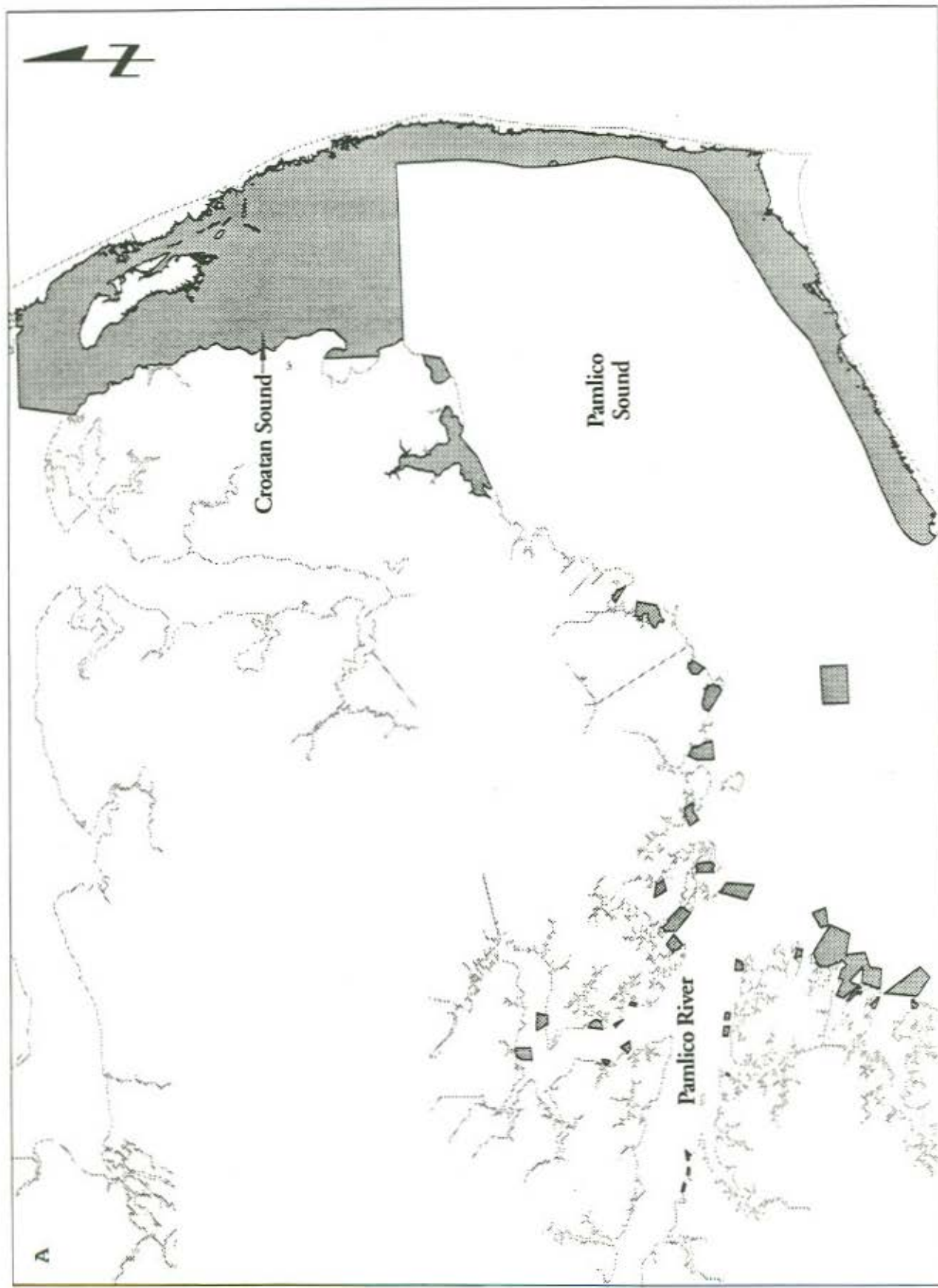


Figure 49. (continued)

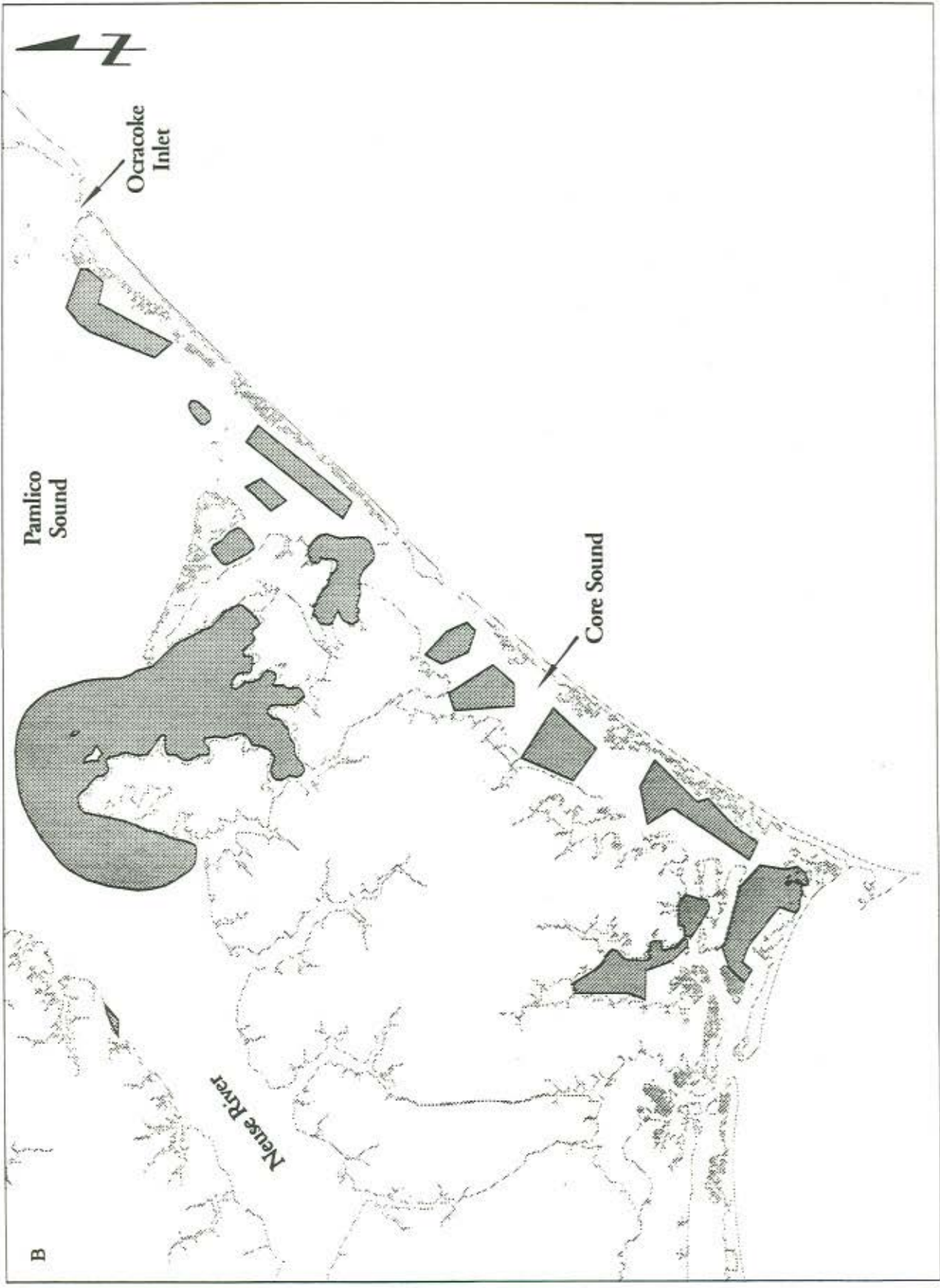


Figure 49. (continued)

Hook-and-Line Fishing

Description

Fish may be caught with hook-and-line gear ranging from bamboo poles to sophisticated rod and reels using artificial lures or bait.

Both commercial and recreational hook-and-line fishermen in the A/P estuarine system catch a wide variety of finfish species. Eight species (Atlantic croaker, pigfish [*Orthopristis chrysoptera*], summer flounder, pinfish, weakfish, spot, spotted seatrout, and bluefish) constituted 81 percent of the total recreational catch during 1988.

Use

Hook-and-line fishing gear may be deployed from the shoreline, river bank, fishing piers, docks, bridges, or from private fishing or party boats.

Equipment and harvest restrictions for hook-and-line fishing are summarized in Table 21.

Harvest Area

Hook-and-line fishing may be conducted throughout the Albemarle-Pamlico area but is subject to all fishing restrictions or proclamations imposed for season, size, and catch limit as prescribed by the *North Carolina Fisheries Rules for Coastal Waters*, as well as by proclamations issued by the Fisheries Director.

Sources

Albemarle-Pamlico Estuarine Study. 1991. Status and Trends Report. Raleigh, NC.

Sundstrom, G.T. 1957. *Commercial Fishing Vessels and Gear*. Fish and Wildlife Circular 48. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.

Table 21. Hook-and-Line Estuarine Fishing—Restrictions and Regulations

Months Conducted		
Duration:	Year round	
Peak:	June through October	
Major Species Targeted		
Bluefish <i>Pomatomus saltatrix</i>	Weakfish <i>C. regalis</i>	White catfish <i>I. catus</i>
Spot <i>Leiostomus xanthurus</i>	Southern kingfish <i>Menticirrhus americanus</i>	Yellow bullhead <i>I. natalis</i>
Atlantic croaker <i>Micropogonias undulatus</i>	Gulf kingfish <i>M. littoralis</i>	Pinfish <i>Lagodon rhomboides</i>
Southern flounder <i>Paralichthys lethostigma</i>	Northern kingfish <i>M. saxatilis</i>	Spanish mackerel <i>Scomberomorus maculatus</i>
Summer flounder <i>P. dentatus</i>	Red drum <i>Sciaenops ocellatus</i>	Striped bass <i>Morone saxatilis</i>
Gulf flounder <i>P. albigutta</i>	Brown bullhead <i>Ictalurus nebulosus</i>	White perch <i>M. americana</i>
Spotted seatrout <i>Cynoscion nebulosus</i>	Channel catfish <i>I. punctatus</i>	Yellow perch <i>Perca flavescens</i>
Equipment Restrictions or Specifications		
None		
Harvest Restrictions		
<p>15A NCAC 3M .0101 .0101 Mutilated Finfish</p> <p>It is unlawful to possess aboard a vessel or while engaged in fishing from the shore or a pier any species of finfish which is subject to a size or harvest restriction without having head and tail attached.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-185; 143B-289.4; Eff. January 1, 1991.</i></p>		
<p>15A NCAC 3M .0102 .0102 Unmarketable Food or Scrap Fish</p> <p>(a) It is unlawful to land or dispose of finfish as trash or scrap fish if in violation of minimum size or possession limits established by rule or proclamation.</p> <p>(b) It is unlawful to land or dispose of finfish as trash or scrap fish taken in connection with legitimate commercial fishing operations which are unmarketable as individual food fish by reason of size, except that a quantity not exceeding 5,000 pounds per vessel per day may be:</p> <ol style="list-style-type: none"> (1) Landed and sold to a licensed finfish dealer, a licensed fish dehydrating plant or licensed finfish processing plant, and (2) Purchased or accepted by a licensed finfish dealer, a licensed fish dehydrating plant or licensed finfish processor. <p>Menhaden, herring, and gizzard shad are exempt from this Rule.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-185; 143B-289.4; Eff. January 1, 1991.</i></p>		

(continued)

Table 21. (continued)

Harvest Restrictions (continued)
<p>15A NCAC 3M .0201 .0201 General</p> <p>(a) Striped bass is defined as striped bass (<i>Morone saxatilis</i>) and its hybrids taken in coastal and joint waters.</p> <p>(b) Hook-and-line fishing equipment is not commercial fishing equipment in the striped bass fishery. It is unlawful to sell or purchase striped bass taken by hook-and-line. Striped bass taken legally with hook-and-line may be possessed and transported.</p> <p>(c) It is unlawful to possess striped bass imported from other states less than 18 inches long (total length).</p> <p>(d) It is unlawful to buy, sell, transport, or possess striped bass except:</p> <p style="padding-left: 20px;">(1) During the open season in internal coastal waters established in 15A NCAC 3M .0202, or</p> <p style="padding-left: 20px;">.....</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>
<p>15 NCAC 3M .0202 .0202 Season, Size, and Harvest Limit: Internal Coastal Waters</p> <p>The Fisheries Director may, by proclamation, impose any or all the following restrictions on the taking of striped bass in internal coastal waters:</p> <p>(1) Specify season or seasons:</p> <p style="padding-left: 20px;">(a) for hook-and-line fishing.</p> <p style="padding-left: 20px;">(b) for commercial fishing equipment between October 1 and April 30.</p> <p>(2) Specify areas,</p> <p>(3) Specify quantity, but shall not exceed possession of more than three fish in any one day taken by hook-and-line.</p> <p>(4) Specify means/methods.</p> <p>(5) Specify size, but the minimum size specified shall not be less than 18 inches total length.</p> <p>(6) Require submission of statistical and biological data.</p> <p>Fish that do not meet the minimum size limit specified by proclamation shall immediately be returned to the waters from which taken regardless of condition.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. November 1, 1991.</i></p>

(continued)

Table 21. (continued)

Harvest Restrictions (continued)
<p>15A NCAC 3M .0300 Spanish and King Mackerel .0301 Harvest Limit</p> <p>It is unlawful to possess aboard or land from a vessel, or combination of vessels that form a single operation, more than 3,500 pounds of Spanish or King Mackerel, in the aggregate, in any one day. The Fisheries Director may, by proclamation, impose any or all of the following restrictions on the taking of Spanish and/or King Mackerel:</p> <ol style="list-style-type: none"> (1) Specify areas. (2) Specify seasons. (3) Specify quantity. (4) Specify means/method. (5) Specify size. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>
<p>15A NCAC 3M .0501 .0501 Red Drum</p> <p>(a) The Fisheries Director may, by proclamation, impose any or all of the following additional restrictions on the taking of red drum:</p> <ol style="list-style-type: none"> (1) Specify areas. (2) Specify seasons. (3) Specify quantity, but shall not exceed possession of more than two fish over 32 inches total length in any one day. (4) Specify means/methods. (5) Specify size, but the minimum size specified shall not be less than 14 inches total length. <p>(b) It is unlawful to remove red drum from any type of net with the aid of any boat hook, gaff, spear, gig, or similar device.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. September 1, 1991.</i></p>
<p>15A NCAC 3M .0502 .0502 Mullet</p> <p>The Fisheries Director may, by proclamation, impose any or all of the following restrictions on the taking of mullet:</p> <ol style="list-style-type: none"> (1) Specify season, (2) Specify areas, (3) Specify quantity, (4) Specify means/methods, (5) Specify size. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991.</i></p>

(continued)

Table 21. (continued)

Harvest Restrictions (continued)
<p>15A NCAC 3M .0503 .0503 Flounder</p> <p>(a) It is unlawful to possess flounder less than 13 inches in length.</p> <p>(b) The Fisheries Director may, by proclamation:</p> <ol style="list-style-type: none"> (1) Establish fishing gear specifications for trawls used within three nautical miles of the beach from October 1 through April 30 in order to protect small flounder, and <p>.....</p> <p>It is unlawful to violate the provisions of any proclamation issued under this authority.</p> <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991, Amended Eff. February 1, 1992.</i></p>
<p>15A NCAC 3M .0504 .0504 Trout</p> <p>(a) Spotted seatrout (speckled trout). It is unlawful to possess spotted seatrout less than 12 inches in length.</p> <p>(b) Weakfish (gray trout). The Fisheries Director may, by proclamation, impose any or all of the following restrictions on the taking of weakfish:</p> <ol style="list-style-type: none"> (1) Specify areas. (2) Specify seasons. (3) Specify quantity. (4) Specify means/methods. (5) Specify size, but not greater than 12 inches. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 143B-289.4; Eff. January 1, 1991; Amended Eff. February 1, 1992.</i></p>
<p>15A NCAC 3M .0507 .0507 Hook-and-Line Fishing Restricted</p> <p>The Fisheries Director may, by proclamation, establish size and harvest limit restrictions for the following species taken by hook-and-line:</p> <ol style="list-style-type: none"> (1) Blue marlin; (2) White marlin; (3) Sailfish; (4) Cobia; (5) Dolphin; (6) Bluefish; (7) Spotted seatrout; (8) Tunas; and (9) Flounder. <p style="text-align: right;"><i>History Note: Statutory Authority G.S. 113-134; 113-182; 113-221; 143B-289.4; Eff. January 1, 1991; Amended Eff. February 1, 1992; September 1, 1991.</i></p>

Source: N.C. Marine Fisheries Commission, 1992.

References

References

- Albemarle-Pamlico Estuarine Study. 1991. Status and Trends Report. Raleigh, NC.
- Bahen, J., M.D. Mordecai, and D. Dow. 1979. How to Hang a Gill Net. UNC Sea Grant Publication 79-03. UNC Sea Grant College Program and the University of New Hampshire/University of Maine Cooperative Institutional Sea Grant Program. Raleigh, NC.
- Dumont, W.H., and G.T. Sundstrom. 1961. *Commercial Fishing Gear of the United States*. Fish and Wildlife Circular 109. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.
- Epperly, S.P., and S.W. Ross. 1986. Characterization of the North Carolina Pamlico-Albemarle Complex. National Oceanic and Atmospheric Administration. Technical Memorandum NMFS-SEFC-175. Beaufort, NC.
- Guthrie, J.F. 1966. The channel net for shrimp in North Carolina. *Commercial Fisheries Review* 28(11):24-27. MFR No. 773. Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.
- Guthrie, J.F., R.L. Kroger, H.R. Gordy, and C.W. Lewis. 1973. The Long-Haul Fishery of North Carolina. *Marine Fisheries Review* 35(12):27-33. MFR Paper 1024. Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.
- Guthrie, J.F., and C.W. Lewis. 1982. The Clam-Kicking Fishery of North Carolina. *Marine Fisheries Review* 44(1):16-21.
- N.C. Marine Fisheries Commission. 1992. North Carolina Fisheries Rules for Coastal Waters. Division of Marine Fisheries, Morehead City, NC.
- Rounsefell, George A. 1975. *Ecology, Utilization, and Management of Marine Fisheries*. Saint Louis: The C.V. Mosby Company.
- Street, Michael W. 1976. *Comprehensive Report on the Hard Clam (*Mercenaria mercenaria*) Industry in North Carolina*.
- Sundstrom, G.T. 1957. *Commercial Fishing Vessels and Gear*. Fish and Wildlife Circular 48. Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC.
- Tyler, J., and M. McKenzie. 1969. *To Catch a Million Fish: North Carolina Commercial Fishing Gear and Methods*. North Carolina Department of Conservation and Development, Division of Commercial and Sport Fishing, Raleigh, North Carolina.
- Westcott, W. 1986. *A Guide to Recreational Shrimping*. UNC Sea Grant College Publication UNC-SG-86-07. Raleigh, NC.

