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SHORE WHALING FOR RIGHT
WHALES IN THE NORTHEASTERN UNITED STATES

by

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ABSTRACT

As part of a broad review of the history of exploitation of right whales, Eubalaena glacialis, in the western North Atlantic, this study attempted to document the removals by shore whalers along the U.S. Atlantic coast, Maine to Florida. In addition to an extensive literature search, which included coverage of some relevant series of newspapers, we searched sources for information on shore whaling. Data extracted from published reviews of shore whaling in New England, New York and New Jersey were tabulated along with data from sources not previously used or cited. The resulting catch tables provide a crude and incomplete summary of removals, by area and year.

There is little useful record of shore-based catches of right whales from the coasts of Maine and New Hampshire. However, there is an extensive record of shore whaling in Massachusetts, including Cape Cod, Nantucket and Martha's Vineyard. Shore whaling certainly had begun in Massachusetts Bay by 1668, and it is likely that right whales were hunted at Cape Cod at least sporadically well before this, perhaps even as early as the 1620s or 1630s. Though the peak in catches of right whales in Massachusetts waters appears to have been reached before 1725, the development of pelagic whaling by vessels based in New England ensured that local interest in and competence at whaling was maintained until the early twentieth century. Shore whaling as a separate enterprise seems to have declined at Cape Cod, Martha's Vineyard and Nantucket by the end of the eighteenth century, but opportunistic catches were made by the distant-water whalers and those who hunted fin whales, Balaenoptera physalus, and humpbacks, Megaptera novaeangliae, in Cape Cod

waters during the last quarter of the nineteenth century. Right whales were hunted in Narragansett Bay, Rhode Island, as early as 1662, and some desultory whaling for right whales continued in Rhode Island until at least 1828. Shore whaling may have begun in Connecticut as early as the middle of the seventeenth century, and it continued until at least 1718. Some new information is presented on Long Island shore whaling, which spanned the approximate period of 1650-1924 (Reeves and Mitchell, 1986a). A Dutch whaling colony was established near Cape Henlopen, Delaware, in 1631, and a major shore whaling enterprise was developed by British Columbia in Delaware Bay and along the New Jersey shore. Although this fishery apparently was most profitable at around the beginning of the eighteenth century, shore whaling continued in New Jersey until at least the 1820s.

There is some confusion about exactly when whaling began in certain areas, and about whether certain records pertain to whales which died from natural causes or to whales which died from wounds inflicted by whalers. "Drift" whales, or whales which died at sea and became stranded, were prized by Native Americans as well as by early colonists. It has been suggested that the salvaging of drift whales was the earliest form of "whaling" on the U.S. east coast. If by "whaling" some early authors meant the utilization of drift whales, the actual times of initiation of whaling from boats might be confused. Numerous early records of drift whales leave unanswered the question of whether the animals were harpooned or simply stranded because of natural factors.

There was no series of records which could be used to make a reliable estimate of hunting loss. A loss rate factor of 1.2, derived from previous studies and considered conservative, was applied to the catch statistics.

The whaling data suggest that right whales occupied coastal waters south of Virginia only during winter and spring (January through May). They were also present in Delaware Bay and along the New Jersey coast mainly during winter and spring. The right whale season appears to have extended across a somewhat greater part of the year in Long Island and New England, although in both these areas the peak period was December-May. Thus, right whales were most abundant in the area from Massachusetts to Florida during December-May, and they appear to have been essentially absent from nearshore waters during summer and fall (June-October).

Shore whaling for right whales was particularly intensive in the eastern United States from about 1685 to 1730. Though it has been suggested that the War of Independence, 1776-1783, caused a reduction in whaling effort alongshore, allowing the stocks of whales an opportunity to recover, this conclusion may not be warranted.

The catch history for the western North Atlantic stock of right whales, as reconstructed to date, is incomplete, and any attempts to estimate early population size for comparison to the present population size must be made with caution. Beginning in the first half of the nineteenth century, there is better documentation for shore-based catches due to the availability of newspapers written for whaling readerships, and for pelagic catches due to the relatively large surviving sample of logbooks and journals. However, by this time the period of greatest catch of Northwest Atlantic right whales was long past.

Based on the incomplete cumulative kill during 1700-1709 (at least 245 right whales), there certainly were at least some hundreds of right whales in the western North Atlantic in the late seventeenth century. There is little doubt that the kill between Nova Scotia and Florida from 1680 to 1730 was

higher than could have been made from a whale population of a few hundred, which is the estimate for the western North Atlantic stock's size in recent years.

Further historical research should involve a more extensive newspaper search and broader regional coverage, particularly to take account of removals from the same whale stock in eastern Canadian waters.

INTRODUCTION

This study of shore whaling for right whales (Eubalaena glacialis) along the east coast of the United States is part of a broad review of the history of right whaling in the western North Atlantic. We previously compiled right whale catch data for the shore fishery on Long Island, New York (Reeves and Mitchell, 1986a), the American pelagic fishery in the North Atlantic during the late eighteenth and nineteenth centuries (Reeves and Mitchell, 1986b), the shore fishery on the Outer Banks of North Carolina (Reeves and Mitchell, 1987MS), and the desultory shore and pelagic whaling in the Bay of Fundy (Reeves and Barto, 1985).

One purpose of this work is to provide the basis for assessing early ("initial") abundance and trends in the population size through time, much as has been done for the eastern Pacific population of gray whales (Eschrichtius robustus) (Reilly, 1981MS) and the Bering Sea stock of bowhead whales (Balaena mysticetus) (Breiwick, Mitchell and Chapman, 1981; Breiwick and Mitchell, 1983; Breiwick, Eberhardt and Braham, 1984). The models used for such assessments require data, whether known or estimated, on fishing mortality by year. In their studies of gray whale and bowhead whale populations, the above authors used catch histories reconstructed from diffuse and often inadequate historical sources. For most years the subsistence and commercial kills could only be estimated, as there was no formal mechanism in place during the nineteenth century and much of the twentieth century for recording whale harvest data.

However formidable the tasks may have been of reconstructing the histories of gray whale and bowhead whale exploitation, that of reconstructing the history of right whale exploitation in the western North Atlantic is even more difficult. This is due in large part to the antiquity

of the fisheries involved. According to Allen (1916), right whales already had become scarce in New England by about 1725 due to overhunting. Much of the whaling for right whales before and after this date was undocumented or poorly documented. Some of the documentation that did exist has been lost or destroyed. That which has survived can be difficult to find.

The scope of the present paper focuses on shore whaling from Maine (ca 45°N) to Delaware (ca 38°30'N), i.e. the New England and mid-Atlantic states of the United States. Our main objective was to document as fully as possible the kill of right whales, beginning with the earliest settlement of these shores. We have tabulated (or otherwise cited) all catches of right whales and what were probably right whales (including whales secured and whales struck-but-lost) that have come to our attention. In addition to quantitative data on specific catches, we have sought qualitative information on whaling effort, whaling methods and techniques, whale product values and usage, and the general historical context. Such information can be the basis for estimating undocumented or poorly documented catches.

PREVIOUS LITERATURE

Starbuck's (1878) history of American whaling includes an important summary, largely from primary sources, of colonial shore whaling. Clark's (1887) review of the American whale fishery is derived in large part from Starbuck (1878) and other published sources but includes new information (via Earll and Atwood) on shore whaling in Maine, Massachusetts, and North Carolina (see Clark, 1887, p. 40). True (1904) gave a useful summary of early published accounts relating to whales and whaling along the east coast of North America, and Allen (1908) made a further review of this subject as it pertains specifically to the right whale.

Regional treatments of importance include Allen's (1916) monograph on the baleen whales of New England, Little's (1981) study of early shore whaling on Nantucket, Edwards and Rattray's (1932) account of whaling on Long Island (also see Reeves and Mitchell, 1986a), Lipton's (1975) review of whaling in New Jersey (also see Weiss, Kemble and Carre, 1974), and Brimley's (1894) short description of nineteenth-century whaling on Shackleford Banks, North Carolina (also see Stick, 1958; Reeves and Mitchell, 1987MS). Little (1981, pp. 15, 63) estimated the "maximum" whale catch per year, the dates of peaks in catch, and the duration of shore whaling at Cape Cod, Nantucket, Long Island, and Delaware Bay. We evaluate her estimates below.

Schevill, Watkins and Moore (1986) compared the frequency of their own observations of right whales made off Cape Cod since 1955 to the frequency of right whale records listed by Allen (1916) for the period 1620-1913. They concluded that the available evidence does not show right whales to be very much fewer in New England waters today than they were 350 years ago. They suggested that "the population of right whales passing near Cape Cod is at worst only slightly smaller now than it was in the 17th century". This is the only instance known to us in which historical data have been used in a quantitative manner to assess trends in the Northwest Atlantic right whale population. In the present paper we include a critical discussion of Schevill et al.'s (1986) views.

MATERIALS AND METHODS

We made an extensive search of the published literature. This included checking most of the sources used by the authors mentioned above. Newspapers were a major source of data. Systematic searches of newspapers over long

series of years generally were not attempted. Indexes were used whenever possible, including those for the: Brooklyn Daily Eagle, 1891-1902, New York Herald, 1913-18 (inc.), New York Evening Post, 1873-1921 (inc.), New York Tribune, 1862-65 and 1875-1906, New York Times, 1851-1893, 1905-1924, and Savannah (Georgia) Morning News, 1850-1875.

Allen's (1916) extensive review of information on baleen whales in New England included a newspaper search. We tried to deduce as much as we could concerning the nature and extent of his search. Judging by the sources cited throughout his text for all species, it would appear that Allen searched at least the Nantucket Journal, 1878-1899; Nantucket Inquirer, 1822-1864; and Nantucket Inquirer and Mirror, 1867-1909. Although some issues of the Provincetown Advocate, Boston Journal, Boston Daily Globe, Forest and Stream, Boston Semi Weekly Advertiser, Newburyport Herald, Boston Gazette, and Barnstable Patriot were cited by Allen, we have no reason to believe he searched long runs of these periodicals. We made our own search of the Nantucket newspapers.

We scanned all available issues of the Whalemen's Shipping List and Merchants' Transcript of New Bedford, 1843-1914, The Whaleman of New Bedford, 1854, the New Bedford Reporter and the Seaman's Weekly Visitor, 1846-1847, and The Mystic Pioneer, 1859-1861, for information on right whales along the North American east coast. In addition, we searched in an unsystematic way newspapers of coastal towns in areas where whaling was known or suspected to have occurred. We gave special attention to periods immediately preceding or following those dates on which whaling events were known to have been reported.

Our search of manuscript material included correspondence, diaries, and account books of companies and individuals involved in shore whaling. Whaling museums in New England were particularly useful sources in this search, though we inquired and looked for such documents in historical-society collections and local libraries as well.

RESULTS

What follows is a summary of information on shore whaling for right whales in the northeastern U.S., working state-by-state from north to south. Information is presented chronologically (from earliest to latest) for each state. For the most part, our narrative concentrates on information not covered in previous syntheses such as Allen's (1916) for New England (Maine to New York), Reeves and Mitchell's (1986a) for New York (especially Long Island), and Lipton's (1975) and Weiss et al.'s (1974) for New Jersey. However, data on catches from all sources are given in the summary tables and were used in the preparation of the monthly distribution plots and histograms.

Maine

Norton (1930) summarized the record of whaling along the Maine coast and found little evidence of the right whale's occurrence there. This is consistent with the negative findings of Allen (1916). The whaling that took place on this coast (and there was much of it, beginning as early as the seventeenth century and continuing at least sporadically until the early twentieth - Martin, 1975), seems to have been directed mostly at fin (Balaenoptera physalus) and humpback (Megaptera novaeangliae) whales, at least during the nineteenth century (Clark, 1887, p. 41; Goode, 1884, p. 27; Allen, 1916, p. 313; Mitchell and Reeves, 1983). Reeves and Barto (1985)

found little evidence of whaling in the Bay of Fundy, apart from cruises for humpbacks and fin whales made by New England whalers during the 1880's. A whale, probably a right whale, was taken in the bay and brought to Boston in August 1733 (Starbuck, 1878). Another likely right whale was taken in Head Harbour Passage near Eastport, Maine, in the late 1700's (Reeves and Barto, 1985). A whale, species unspecified, was shot at Surry, Maine, in late September 1865 after it became lodged between two reefs (Whalemens Shipping List 23[31]:3 October 1865). A right whale came ashore dead in Sheepscot Bay in the summer of 1919 (Norton, 1930).

New Hampshire

Allen (1916) mentioned nothing of shore whaling on the coast of New Hampshire. The only reference we found was to the capture of a 50-ft whale, with a head 16 ft broad, "shaped like that of the horse", and differing from "all others that have been seen by those acquainted with that species of fish", in the Piscataqua River in late June 1827 (The Corrector, Sag Harbor, N.Y., 30 June 1827, Vol. 6, No. 9). It is impossible to tell from the newspaper article whether this capture was made by whalemens or by fishermen.

Massachusetts Mainland, including Cape Cod

Some authors have insisted that shore whaling in the eastern United States began at Cape Cod, particularly at Provincetown (Freeman, 1862, p. 631; Shearman, 1876). At least one British expedition came to New England "to take whales" in the first quarter of the seventeenth century (Smith, 1624, p. 204), and some of the Plymouth settlers in 1620 apparently were equipped for whaling (Thacher, 1832, pp. 20-21). The master and mate of the Mayflower expressed their intention of hunting whales off Cape Cod in the winter of 1620-1621 (Anon., 1802, p. 204), but we do not know whether they in fact did so. Winthrop (1825, vol. 1, p. 157) noted that 3-4 whales were

"cast ashore" on Cape Cod in April 1635 and that this was a usual occurrence. The oil of at least one of the whales was tried out by the Massachusetts Bay colonists. Whether the whales "cast ashore" were drift whales (see below) harpooned but not secured by whalers is impossible to tell. The earliest unequivocal record of whaling by the Massachusetts colonists refers to the year 1668, when a man was killed while trying to secure a struck whale in Boston harbor (Bradstreet, 1855, p. 44).

We consider it very likely that the commercial exploitation of right whales began in New England well before 1650, the year when according to some authors the first private whaling company in America was licensed at Southampton on Long Island (Hedges et al., 1874, p. 70; Starbuck, 1878, pp. 9-10). Starbuck (1878, p. 6) noted:

As important as the pursuit of whaling seemed to have been considered by the first [New England] settlers, many years seem to have elapsed before it was followed as a business, though probably something was attempted in that direction prior to any recorded account that we have [emphasis added].

In his account of Dutch attempts to establish a whale fishery in Delaware Bay, Parr (1969, p. 124) indicated that David de Vries learned of the English "experimenting off the coast of New England with a limited kind of shore whaling" as early as the 1630s. They supposedly had trained selected Indians to serve as harpooners and oarsmen, in the absence of skilled Basques and Cape Verde islanders to fill these roles. Allen (1908, p. 314) claimed that "a few whales, in addition to stranded or drift whales, were taken in Massachusetts Bay as early as 1631...". In any event, shore whaling was certainly well established in Massachusetts by no later than the 1670s.

Josselyn (1833, p. 323) described Ipswich Bay in the early 1670s as a place "where they fish for Whales". Governor Hinckley's representation to the King on behalf of New Plymouth Colony in 1687 emphasized the relative importance of whale products in the economies of towns on the Cape (Coll. Mass. Hist. Soc., Series 4, Vol. V, p. 178):

There are also some small whales, or part of them, sometimes in some winters cast on our shore, - some whereof making, with much labor, seven or eight barrels of oil, and some between that and twenty, - which have been some help to the poor of those poor towns planted on the Cape, being the barrenest part of the country.

A resident of New Plymouth Colony proclaimed in 1688 that the people there had made "great profit by whale killing". He expected whaling to increase in importance, "now beaver and peltry fayle us" (Randolph quoted in Felt, 1849, p. 223).

Shore whaling remained a major industry in Massachusetts through the first half of the eighteenth century (Table 1). Cotton Mather (1912, p. 379) referred in his journal in 1716 to "our numerous tribe of Whale-Catchers". The people of New England chafed under the British colonial administration's policies toward whaling and disposal of whale products (e.g. see Coll. Mass. Hist. Soc., Series 5, Vol. VI, pp. 39*, 49*, 73* - 74*). Their complaints in the first decade of the eighteenth century resembled and coincided with those of the Long Island whalers against the latter's colonial government (cf. Reeves and Mitchell, 1986a).

Samuel Kempton (1712-1766, Ms.), a boat-builder in Plymouth and Dartmouth, referred in his ledger to transactions involving "a loade of whail bote" in 1724, "whail bone" in 1732 and 1734, and "oyl" in 1739. In 1727 the Boston News-Letter reported (Smith, 1922, p. 71):

We hear from the towns on the Cape that the whale-fishing has failed much among them this winter, as it has for several winters past, but having found out the way of going to sea upon that business, and having had much success in it, they are now fitting out several vessels to sail in the spring.

In March 1729 whalers were working out of Duxbury and Plymouth (Winsor, 1849, p. 350), probably hunting right whales in Cape Cod Bay.

According to an article in the Boston Postboy in 1739, the people of Provincetown regarded their winter's catch of "not more than seven or eight" whales as inadequate, and the seven or eight principal families made plans to move to Casco Bay (Smith, 1922, p. 247). In 1746 Douglass (1760, p. 59) reported only three or four whales were taken "in Cape Cod", and he claimed that Nantucket was the only whaling site. His conjecture was that the whales had been driven away from the coast:

... formerly for many successive years, they set in along shore by Cape-Cod, there was good whaling in boats, proper watchmen ashore by signals gave notice when a whale appeared; after some years they left this ground, and passed further off upon the banks at some distance from the shore, the whalers then used sloops with whale-boats aboard, and this fishery turned to good account: At present they seem in a great measure, to be drove off from these banks, and take their course in deep water, that is, in the ocean

In December 1756 a whale said to have been 75ft long was landed on "King's [Lynn] Beach" (The Corrector, Sag Harbor, N.Y., Vol. 8, No. 42, 13 February 1830). A man "rode into his mouth, in a chair drawn by a horse; and afterwards had two of his ribs set up for gate-posts at his house in Essex-st". This was probably a right whale.

In spite of their scarcity in New England during the middle of the nineteenth century, right whales were pursued at every opportunity. Charles W. Morgan (1841 MS) of New Bedford noted in his diary entry of 13 May 1841: .
 Went to Westport Point in company with many others to see two
 whales which had been caught off there day before. They were
 cutting one in - about 48 ft. long and will make about 40 bbls of
 oil (right whale). It was a curious sight and quantities of people
 were present from N. Bedford and surrounding country. The other
 was much smaller, perhaps 20 bbls.

These two whales were also mentioned in the New Bedford newspapers, indicating that they had first been seen "near the entrance of the harbor" at Westport on 11 May. They were chased by four or five boat crews. Estimated lengths of 50 ft and 25 ft were given, and the two whales were expected to produce about 1500 gallons of oil (equivalent to about 48 barrels, at 31.5 gallons per barrel) (New-Bedford Mercury, Friday, May 14, 1841, Vol. XXXIV, No. 46). Cursory mention of these whales is also made in the 12 May entry of Samuel Rodman's diary (Pease, ed., 1927, p. 220).

Referring to Provincetown, Freeman (1862, p. 623) wrote:

Even now, if peradventure one [whale] occasionally shows itself within the range of the practised sight of a seaman, no objection is made to the vicinage of the game, and it is almost sure to be 'brought to' by the unerring harpoon of the expert.

He added that the occasional sighting of a whale "of the larger kind" in Barnstable Bay, Wellfleet Bay, or Provincetown harbor was "the signal for sport that is generally successful" (Freeman, 1862, p. 655). Pelagic whaling vessels were sometimes delayed from departing Provincetown when their masters received news that whales had been sighted near Race Point (e.g. the R.E.

Cook and Seychelle in April 1853 - Whalemen's Shipping List 11[8]: 26 April 1853; the Rienzi in June 1857 - Whalemen's Shipping List 15[15]: 23 June 1857).

Captain N.E. Atwood of Provincetown made the following statement about right whales during the late 1860s (Allen, 1869, p. 202-203):

This well-known species is at times taken here; in former years they were much more frequent in their visits than now. Although a straggling specimen may be seen at any time, they are generally more common during the latter part of April and the early part of May.

That some Provincetown captures have been overlooked in the literature is suggested by Goode's (1884, p. 24) statement, apparently on the authority of Captain Atwood, that 2-3 right whales were killed near Provincetown after 1867 but before 1884. The only published Provincetown record we found for this period refers to a mother, accompanied by a calf, that was lanced but not secured in March 1870 (Allen, 1916, p. 137). Goode (1884, p. 24) stated that in the vicinity of Provincetown "years now often pass by without any [right whales] being seen".

There was an intensive fishery for balaenopterids (almost entirely Balaenoptera physalus and Megaptera novaeangliae) in Cape Cod and Massachusetts bays and in the Gulf of Maine during the period 1865-1895 (Clark, 1887, pp. 41-48; Allen, 1916; Mitchell and Reeves, 1983).

Steam-powered vessels and explosive harpoons and lances were used. It must be assumed that a close lookout was kept for right whales, both in Provincetown harbor, where many of the steamers were based, and in the areas where fin and humpback whales were found. Any right whales sighted would have been chased by these whalers.

Martha's Vineyard

Allen (1916, p. 167-168) reviewed some of the evidence of early whale processing and whaling at Martha's Vineyard. In addition, we found the following:

The right to "a Six and Twentyth part of fish and whale" was attached to property owned by Nicholas Butler of Edgartown, who died in 1671 (Banks, 1966b, p. 55). This practice of including claims to products from drift whales with the title to land, which continued until at least 1676, apparently grew out of purchase agreements made with Natives as early as 1658 (Banks, 1966a, p. 432). Banks (1966a, p. 432-433) regarded items listed in personal inventories in the late 1660s - barrels of oil, "great Kittells", and a large "Iron Pot" - as evidence that Vineyard residents were by that time making commercial use of whales. He noted that there were try houses at Holmes Hole "quite early" and at the Butler homestead before 1748.

John Butler and Thomas Lothrop were the first Vineyard whalers on record (though Allen, 1908, p. 314, stated that whaling began at Martha's Vineyard in 1652). They killed three whales in February 1703, and Banks (1966a, p. 434) reasoned:

That Butler had been engaged in this occupation for some time, and was an expert is amply evidenced by the number of his catches enumerated in one month, and we may conclude that it had been his business for a considerable time before 1700 even.

Shore whaling continued at Martha's Vineyard through at least the first quarter of the eighteenth century. A drift whale was brought ashore at Squibnocket in 1720 (Banks, 1966b, p. 44). In 1724 a Vineyard man, Pain Mayhew, Jr., agreed to make a joint whaling expedition in Barnstable Bay with

Jabez Lumbert of Barnstable (Banks, 1966a, p. 435). A six-man crew took a 26-barrel whale off Noman's Land in 1725 (Banks, 1966a, p. 435).

Nineteenth-century records overlooked by Allen (1916) include a 33-40 barrel right whale found dead between Edgartown and Provincetown in late March 1824 (Nantucket Inquirer, 5 April 1824). It was believed to have been the whale struck in mid-March by shore whalers from the south side of Martha's Vineyard. A right whale expected to produce 40-45 barrels of oil was taken near Edgartown on 25 March 1841 (New-Bedford Mercury, Friday, April 2, 1841, Vol. XXXIV, No. 40).

Nantucket

Allen's (1916, p. 163-167) account of shore whaling at Nantucket was derived largely from Macy (1835) and St. John de Crèvecoeur (1782) for the early years and from Allen's own search of Nantucket newspapers. The catches and evidence of whaling activity reported in those sources are summarized in Table 2. Little's (1981) search of archival documents has added to the record of Nantucket shore whaling during the seventeenth and eighteenth centuries. We re-examined some of her sources and have incorporated in our table new information from them as well as that given in her published paper. A few additional references to whaling on or near Nantucket have come to our attention:

In 1715 six sloops were whaling from Nantucket. Their production that year, 600 barrels of oil and 11,000 pounds of bone (Macy, as quoted in Coll. Mass. Hist. Soc., ser 1, vol. 3, p. 161), was worth £1100 sterling (Macy, 1835, p. 37). Because long-distance whaling cruises had not yet become commonplace for the colonists (the voyages by the sloops lasted no longer than about 6 weeks - Macy, 1835, p. 37), and shore whaling for right whales was still a rewarding enterprise at this time, we suspect the returns of

these six vessels came primarily from right whales. The first sperm whale (Physeter catodon) caught at sea by the Nantucket whalers supposedly was taken in about 1712 (Macy, 1835, p. 32), but sperm whales were known from the Massachusetts coast much earlier (Josselyn, 1672, 1833). Though Starbuck (1878, p. 168) referred to one New England whaling voyage to Davis Strait (up to 66°N) as early as 1732, Nantucket vessels did not begin visiting the northern regions where bowhead whales would have become mixed in the catch until about 1746 (Macy, 1835, p. 54). Converted at 40 barrels per whale, 600 barrels of oil would represent a secured catch of about 15 right whales. This would mean the whales produced a not-unreasonable average of 733 pounds of bone. Starbuck (1878, p. 168) surmised that the 1715 effort and catch by the Nantucket sloops "was probably for some years pretty constant". We know that they continued to catch right whales and sperm whales east of the Grand Bank and elsewhere through at least the 1760s (Reeves and Mitchell, 1986b).

Short cruises to Nantucket Shoals were made from time to time even during the heyday of Nantucket's distant-water whaling (e.g. 6-10 September 1825 by the sloop Sarah Porter [Nantucket Inquirer, 12 September 1825]; Mitchell and Reeves, 1983). Occasionally, pelagic whaling vessels in port would put to sea off Nantucket in pursuit of whales sighted near the island (e.g. mid-May 1827, the brig Quito [Nantucket Inquirer, 26 May 1827]; several vessels in April 1847 [Nantucket Inquirer, 21 April 1847]).

According to Macy (1835, p. 31) shore whaling continued at Nantucket until about 1760, after which time whales were taken by boats from shore "only occasionally". Most of the whales taken by these boats were right whales (Shearman, 1876).

An article entitled "The Whaling Business at Nantucket" appeared in The Corrector, Sag Harbor, 19 June 1852:

The recent close approach of whales to the island which has so thinned their ranks, has started 'off-shore fisherman', and three fine schooners are now fitting for the service. This is the old business of Nantucket over again. May it prove profitable and acceptable.

One of these schooners was the Hamilton, Captain Patterson, which sailed on 12 June for a whaling cruise on the shoals (The Corrector, Sag Harbor, N.Y., 26 June 1852, from N.B. Shipping List). The Hamilton took six humpbacks and struck but lost five more during the first three weeks of August 1852 on Nantucket Shoals (Allen, 1916, p. 137). It is unclear whether right whales were among those whales that appeared off the Nantucket coast in the early 1850s.

The occurrence of a "school" of right whales off Tuckernuck in April 1886, from which three were caught (a fourth was lost but later found dead and towed to New Bedford), was discussed by Allen (1916, p. 138) and again by Stackpole (1982). The latter author gave the year as 1887. However, we confirmed by reference to articles in the Nantucket Inquirer and Whalemen's Shipping List that the year was 1886. The record of a dead right whale being found in the sound and towed to Nantucket, where it was flensed alongside a schooner in April 1871 (Stackpole, 1982), was overlooked by Allen (1916).

Rhode Island

Allen (1916, p. 168-170) found relatively little evidence of shore whaling in Rhode Island. His notation that a bounty was offered, with unknown effect, on whale oil and whalebone in the colony in 1751 is given some perspective by the fact that a bounty of 5 shillings per barrel and one penny per pound, respectively, had already been offered for these commodities in 1731 (Arnold, 1860, p. 103; Potter and Rider, 1880, p. 31-32). The bounty

was renewed for ten years in 1738 but repealed in 1745 (Preston, 1932, p. 28). During the years 1733-1738 bounties were paid on 1,211 barrels of whale oil and 3,843 pounds of whalebone (equivalent to 30 right whales at 40 barrels of oil per whale). It is likely that the oil and baleen bountied at this time was principally from North Atlantic right whales. The sloop Pelican, owned by Benjamin Thurston, sailed out of Newport in 1733 and returned with 114 barrels of oil and 200 pounds of bone (Arnold, 1860, p. 110). Though the Pelican has been described as Rhode Island's "first regularly equipped" whaling vessel of which there is any record (Arnold, 1860, p. 110), a vessel from Rhode Island took a large sperm whale in May 1723 (Starbuck, 1878, p. 168).

The aborigines who lived on the shores of Rhode Island had a tradition of using the products of drift whales (Arnold, 1859, p. 85). Also, according to Arnold, whales were taken "often" with boats in Narragansett Bay before about 1750. The description of a whale being taken off Narragansett Bay in March 1662 (Sporri, 1677; see Bridenbaugh, 1974, appendix V, p. 144-145) is "among the earliest accounts of fastening to a whale with a whaleboat in colonial America" (Kugler, 1980, p. 8_n). These Narragansett Bay whalers attacked the whale in two boats, carrying crews of six or seven men, and they used the established European (Basque) technique of fastening to the whale with a harpoon and line. The March 1662 whale was a right whale, judging by Sporri's description:

This fish was fifty-five feet long and sixteen feet high; it had only two fins; the tail was broad. Its blubber was two feet thick The teeth, which are as much as six feet long and saw-like, are the whale-bone which is shipped to us [in Holland] (Bridenbaugh, 1974, p. 145).

Not surprisingly, the inventories of possessions of Rhode Island residents during the early 1700s occasionally included quantities of whalebone (e.g. Rogers, Carpenter and Field, 1894a, p. 249; 1894b, p. 119). Rhode Island merchant vessels sometimes carried oil to the West Indies (e.g. in 1723 - Preston, 1932, p. 26), but much of it could have been "the result of previous trading with neighboring colonies" (ibid., p. 28). The Rhode Island General Treasurer's accounts for 1723 indicate payment of £171 for 433 pounds of whalebone and 2½ tons of oil (Preston, 1932, p. 28).

Allen's (1916, p. 135) record of a right whale killed "off Providence" in 1828 (note that his source was the Nantucket Inquirer of 1 March 1828, not 22 February as given) can be further described from information in The Gazette, New London, Connecticut, 27 February 1828 (citing the Cadet of Providence; also see Clark, 1887, p. 48). The whale, "of the largest size", was chased by four whaleboats and twice harpooned on 18 February. It was finally killed near Newport on 19 February by Captain Potter of Newport. This whale probably was the one seen near the Providence lighthouse "some weeks since". Cope (1865; 1866) referred to the periotic bones of a large right whale from Newport, but he gave no further details to indicate whether this was a different specimen from that taken in 1828.

Connecticut

The coast of Connecticut appears not to have been a particularly favorable area for shore whaling. Nevertheless, there may have been more of such activity than is suggested by Allen's (1916, p. 170) brief account.

A widely quoted resolution of the Connecticut General Court in Hartford, dated 25 May 1647, states (Trumbull, 1850, p. 154):

Yf Mr. Whiting wth any others shall make tryall and p^rsecute
a designe for the takeing of Whale, w^{thin} these libertyes, and

if vppon tryall wth in the terme of two yeares, they shall like to goe on, noe others shalbe suffered to interrupt the, for the tearme of seauen yeares.

No evidence has survived to indicate whether Whiting et al. took up this offer of a monopoly on shore whaling.

Caulkins (1895, p. 638) took the listing of a whale boat in an enumeration of goods during the seventeenth century to imply that "excursions were sometimes made in pursuit of whales". Two early diaries kept by Connecticut residents attest to the validity of this inference. First, Hempstead's (1901, p. 72) detailed journal contains the following entry for 13 January 1718:

Comfort Davise hath hired my whale boat to go a whaling at fishers Island till ye twentieth of Next Month for 20s & he to Run the Resk of Sd boat & to pay 20s for her hire & if he Stays longer yn 30 if She be lost & they get nothing yn he is to pay me £3 & if they get a fish yn £03-10s-00d if She be not in a good Order as now he to make good.

The whale boat was returned on 18 February, but Hempstead made no comment about Davise's catch (ibid., p. 73).

The second of the two diaries, while much less detailed, contains considerably more intelligence on whaling (Miner and Miner, 1915). Manasseh Minor was a Stonington farmer in the late seventeenth and early eighteenth centuries. There is no reason to suppose he participated directly in whaling. He did, however, report on the activities of some whalers in his diary kept from 1696 to 1720 (Table 3). From these, it is clear that at least five men known to Minor were whalers. Their whaling season began as early as December and seems to have finished by the end of March. We can

infer from Minor's cryptic entries that some of the whalers (Robin, Abnar, Pelig, and Abel) were local men; others (Sam Hand and his associates) were from elsewhere, perhaps Long Island. At least three whales were taken on the Connecticut coast in early 1703 and one in March 1705.

The data in Minor's diary substantiate the comment by Hurd (1882, p. 677; reiterated by Wheeler, 1900, p. 131) that:

As early as 1701, and for several years thereafter, whales were taken and brought ashore at Wadawanuck [Stonington Point], the oil tried out and sold in Boston and the West Indies.

We listed previously several sightings and catches of right whales (and a sperm whale) in Long Island Sound (Reeves and Mitchell, 1986a, table 1). These did not include the 33 ft whale taken in Peconic Bay near Greenport in June 1850 (Caulkins, 1895, p. 639), which was probably a right whale. Nor did we include the sighting of a large (est. 60 ft) whale in Oyster Bay harbor in January 1835 (The Corrector, Sag Harbor, 16 January 1835, from the Long Island Farmer) or that of two large whales between New London lighthouse and Fishers Island in late January 1835 (Nantucket Inquirer, 4 February 1835). In the latter instance it was considered remarkable that "idle harpooners passing away their winter in New London" did not give chase. A whale seen for several days in New Haven harbor the first week of April 1824 was pursued by some "enterprising seamen" (Nantucket Inquirer, 12 April 1824). Watson (1855, Vol. 2, p. 429) noted that a "young" 60 ft whale was "chased, grounded, and used up" in New Haven harbor in May 1834. However, according to the Sag Harbor Corrector (13[5], 24 May 1834) and Nantucket Inquirer (10 May 1834, quoting from the New Haven Herald), the recent report of the capture of a whale in New Haven harbor was a "hoax".

A large right whale was seen in the sound, "nearly opposite New Haven", by the crew and passengers aboard the sloop Franklin in early December 1829. The crew members complained of not having the proper gear for attempting its capture (The Corrector, Sag Harbor, N.Y., Vol. 8, No. 33, 12 December 1829). A 27-barrel right whale was taken off Stonington in about 1840, and another in the same group was killed and towed to Montauk, New York (Linsley, 1842, p. 352_n; both noted by Reeves and Mitchell, 1986a, table 1). There is no way to tell whether the 6-8 whales seen blowing within 4 miles of Stonington in summer 1841 (Linsley, 1842, p. 352_n) were right whales or of some other species. A whale was seen near New London lighthouse about 22 April 1869 (Sag-Harbor Express, vol. 10, no. 44, 29 April 1869).

New York (Long Island)

We reconstructed much of the history of right whale hunting on the Long Island coast previously (Reeves and Mitchell, 1986a). Here we present additional information and data that have come to our attention since that chapter went to press (Table 4).

One of the earliest specific references to a Long Island whaling company concerns the fitting out of a small vessel by John Ogden in 1658, apparently at Southampton (Ross, 1902, p. 871). In addition to Southampton and Easthampton, which definitely had whaling companies as early as 1650 and 1651, respectively, Southold, on the Long Island Sound side of the island, had one in 1652 (Ross, 1902, p. 872). In our previous paper (Reeves and Mitchell, 1986a) we noted that there were at least 14 whaling companies active in 1687 from Quogue [or Ketchaponack] east. R.M. Bayles (in Ross, 1902, p. 872) listed 18 companies in 1690 from Mastic east. In 1699 Col. Smith, whose whaling company was based at Mastic, reported that he had cleared £500 sterling in a single year (Bayles, in Ross, 1902, p. 873).

Whale oil was valued at £1:10:0 per barrel in North Carolina in 1715 (Cain, 1981, p. xxii). If we assume the same value for New York in 1699 and that $\frac{4}{5}$ of Col. Smith's £500 was for oil (the other fifth being for whalebone), his estimated return would be 267 barrels. At 36 barrels per whale, this would represent a catch of about seven whales. Another way of calculating Col. Smith's catch would be to refer to Macy's report that 600 barrels of oil and 11,000 pounds of bone were worth £1100 at Nantucket in 1715 (see above). Our estimate that this might represent a catch of about 15 right whales is consistent with the suggestion that returns worth £500 in 1699 would represent a catch of about seven right whales. In 1726, 11 whales were killed at Southampton; six of them yielded 220 barrels of oil and 1,500 pounds of whalebone ($x = 37$ barrels, 250 pounds) (Bayles, in Ross, 1902, p. 873). This record was attributed to the season 1732/33 by Reeves and Mitchell (1986a, table 1).

Samuell Mulford made some whale oil and bone "without licence" late in 1705 (Headlam, 1930, p. 159). This can only be taken as corroborative evidence for the one whale estimated to have been taken that year on the basis of information in Mulford's diary (Reeves and Mitchell, 1986a). Eight licenses for "whale fishing" were issued by the Governor and Lieutenant Governor of New York in 1705-09 (Headlam, 1930, p. 159). This fact tends to support our conclusion that the Long Island whale fishery reached a peak in effort (and presumably catch) near or soon after the beginning of the eighteenth century (Reeves and Mitchell, 1986a).

In 1717 it was noted in a statement to the British Council of Trade and Plantations that "imports of whale oil and bone from New York have greatly decreased, owing to disputes with the Governor as to a duty demanded for whales caught there" (Headlam, 1930, p. 16). However, this claim was

disputed by Governor Hunter, who claimed that the whaling effort was constant or increasing on Long Island. The difference, according to Hunter, was that the products were being sold and exported from Boston rather than New York.

In our previous paper (Reeves and Mitchell, 1986a) we failed to note that according to Edwards and Rattray (1932, p. 232), the whaling station at Smith's Point alone averaged 20 whales per winter during the early eighteenth century. This would suggest that our estimate of 20-30 whales taken per year in the entire Long Island fishery between 1700 and 1725 was too low.

In our previous paper we gave little evidence of shore whaling on Long Island at the beginning of the nineteenth century. In fact, we had found no catch data from 1784, when the schooner Eagle cruised along the south shore, to about 1815, when whaling was definitely being conducted. However, Starr (1876, p. 72n) indicated that some whales were taken on the south coast of Long Island in the winter of 1801-1802 and that after being "much neglected", the whale fishery "has considerably increased".

Some whaling was done by the people of Staten Island. On 13 December 1705 a license was issued to Thomas Jones to take drift whales "on the gut joining Mr. Nicoll's land and the west end of Gravesend beach" (Leng and Davis, 1930, vol. II, p. 990). An unspecified quantity of oil and whalebone was taken on or prior to 26 March 1711 "on Mereck beach, Rockaway beach and at Nicoll's beach" (ibid.; also see Reeves and Mitchell, 1986a, table 1). Sometime in the spring of 1730 (before 9 April) Adam Mott, Joseph Carman and company of Staten Island petitioned for the oil and bone of a whale "wounded by them in the bay of New York, and afterwards cast ashore at Cape May" (Leng and Davis, 1930, vol. II, p. 991). The Staten Island Whaling Company, which was active during the 1830s, apparently was concerned with pelagic whaling rather than shore whaling (Freedman, Rooney, Heitowit and Carnivale, 1975).

A sloop sailed out of Moriches on the south coast of Long Island for whaling between Fire Island and Coney Island in 1831. It cruised daily for 40 days, calling each night at either Fire Island or Coney Island. Only one whale was sighted, and it was a finback, "a kind too lively to land with harpoons and lines" (Brooklyn Daily Eagle, 20 August 1899, p. 12).

Reeves and Mitchell (1986a) mentioned that they had no evidence of schooners whaling along the coast of Long Island after the 1850s. However, Weiss et al. (1974, p. 110) referred to a 40-barrel whale, worth \$2,000, taken by two schooners off that coast in March 1860. The vessels had been whaling between New Jersey and Long Island for a month. It is likely that this was a right whale, considering the month and locality of capture and the great value of the whale in spite of its modest oil yield.

An East Bay sloop, the Branch, cruised for "whales, leatherback turtles, sea serpents, devilfish, etc." between East Moriches and Gravesend Bay during August and (possibly) September 1899 (Brooklyn Daily Eagle, 20 August 1899, p. 12). We have no information on sightings or catches.

New Jersey, Delaware, and Pennsylvania

There are two recent reviews of whaling in New Jersey (Weiss et al., 1974; Lipton, 1975). These and other sources were used to compile a table of right whale catch records (Table 5).

The Dutch were probably the first Europeans to hunt whales in and near Delaware Bay, though the bay had been discovered and named (St. Christopher's Bay) by the Spanish in 1525. A Dutch colony (called Swanendael) was established near Cape Henlopen in 1631 for the express purpose of conducting a whale fishery (Parr, 1969, pp. 108-114).

The promise of a successful shore whaling enterprise was also a major inducement for the first British settlers to come to the New Jersey shore and

the mouth of Delaware Bay (Beesley, 1857, p. 171). Many of them came from Long Island (e.g. Williamson, 1951; Wood, 1968), where an organized whale fishery was active by 1650 and possibly earlier (Réeves and Mitchell, 1986a). It has been suggested that whalers from Connecticut and Long Island hunted whales along the coast of Cape May and in the mouth of Delaware Bay as early as 1638 (Alexander, 1975, p. 185). Licenses were granted to "companies" of shore whalers operating from Navesink and Sandy Hook south to Long Beach Island in 1668 and 1678 (Lipton, 1975, p. 18). William Penn referred to a well-established "whalery" at the mouth of Delaware Bay by 1683 (Watson, 1855, Vol. II, p. 428). A catch of 11 whales in one season suggests that the enterprise was very successful.

The earliest permanent European settlement in Cape May County is believed to have been established by whalers in about 1685 (Alexander, 1975, p. 185), by which year three companies were whaling in the mouth of Delaware Bay (Weiss et al., 1974, p. 15; Lipton, 1975, p. 5) and whales were being hunted "from Sandy Hook to the Delaware Cape" (Weiss et al., 1974, p. 32). Certainly by 1691 Cape May town, at Town Bank on the Bay shore, was recognized as "the residence of the whalers, consisting of a number of dwellings" (Beesley, 1857, p. 163). Beesley inferred from the close contiguity of the 15-20 houses shown on a contemporary map of Town Bank that the early whalers cooperated in an organized fishery. Another source indicates there were 13 houses in Cape May town in 1696 (Beesley, 1857, p. 177). Beesley (1857, p. 171) identified 21 individual whalers living in Cape May County before 1700, and he believed there were many others.

In 1692 the New Jersey Assembly asserted the province's prerogative to profit from all whales killed in Delaware Bay. Complaining that until then, the whaling had been "in so great a measure invaded by strangers and

foreigners" who exported the "oil and bone" without duty, the Assembly required that a tenth of the value of the oil from all whales killed in Delaware Bay "or on its shores" be paid to the governor. The West New Jersey Society, a group of London businessmen, tried to develop whaling in Cape May County during the early 1690s (Weiss et al., 1974, p. 21).

If Gabriel Thomas (1952), writing in 1698, can be believed, the Cape May whale fishery was very successful. "Great numbers" of whales and "prodigious" quantities of oil and whalebone were taken each year in Cape May County, according to Thomas.

A manuscript by Thomas Leaming, 1674-1723, provides some information on seventeenth-century whaling at Cape May (Beesley, 1857, p. 175-6; also see Lipton, 1975, p. 7). Leaming "went a whaling" in four consecutive winter seasons, 1694-1698. The first year he reported that eight whales were caught and the next year at least a cow and calf. The third season was apparently successful, but all we learn from Leaming is that he "made a great voyage". No hint is given about the catch in the fourth season.

There are some indications that the years when Thomas Leaming was whaling were near the peak of New Jersey shore whaling. His father Christopher had moved to Cape May from Long Island in about 1691 (Beesley, 1857, p. 176). When not whaling, Christopher Leaming worked as a cooper. This occupation was lucrative at the time because "the great number of whales caught in those days, made the demand and pay for casks certain". The "failure" of the Delaware Bay whale fishery apparently occurred soon after Leaming's death in 1696. The tract owners at Town Bank sold their land and left the area (Anon., 1976). Humphrey Hughes, a Long Island whaler who immigrated to Cape May County about 1689, sold his land which had been owned jointly with another whaler in about 1700 (Williamson, 1951).

Although the Cape May and Delaware Bay fishery may have been past its peak by the 1700s, whaling continued long after the turn of the century. John Peck was whaling at Pecks Beach (present-day Ocean City) in about 1700 (Darby, 1951). Oldmixon (1708) reported that a "whalery" still existed at the mouth of Delaware Bay, on both the Cape May side and the Cape Henlopen side. Apparently referring to the first half of the eighteenth century, Darby (1951, p. 137) claimed: "Whaling was still a flourishing industry, the whalers working from the shore in small open boats".

The diary of Aaron Leaming, Jr., includes the following entries for the month of February 1737 (Dickinson, 1979, p. 550): on the 4th "They kill a whale"; on the 22nd "The whalers chased the whales & struck two".

Whalers settled permanently on Long Beach Island as early as 1690, and their efforts to catch whales continued, possibly without any major interruption, through at least the 1820s (Lipton, 1975, p. 23-26). The average catch by one family (the Stephen Inman's) in the early 1820s was two or three whales per season (Watson, 1855, p. 547).

In a letter to his son Tucker in Dartmouth, Massachusetts, Philip Taber (1745MS) reported the recent arrival of George Sisson at Sandy Hook. Sisson and his associates were eager to "go off a whaling", and they wanted Taber's son to bring a whale boat and "som good hands" to aid their efforts. This letter has been taken as evidence that "New Bedford vessels were engaged in offshore whaling" (taken to mean pelagic whaling) in the 1740s (Littlefield, 1965, p. 5n). However, it seems more likely to us that these New Englanders planned to whale in New Jersey from shore. Such an interpretation would be consistent with that of Lipton (1975, p. 22-23).

The diary of Lewis Cresse (1968), who whaled along the New Jersey shore between Brigantine and Five Mile Beach at least from 1752 to 1766, mentions

numerous sightings; one whale struck and probably killed, but lost, and one secured in 1764; and four taken in 1765 (Table 6).

At the same time that Cresse was whaling along the coast of New Jersey, some Cape May whalers were exploring grounds farther south. Twelve men and two whaleboats sailed aboard the sloop Susannah in November 1753, bound for a winter of whaling along the Carolina coast (Smith, 1973, p. 34; Reeves and Mitchell, 1987MS, for a derivative summary). After some desultory whaling near Cape Lookout, the men established a whaling camp at Lockwood Folly Inlet, southern North Carolina. They returned to Cape May in March 1754, having had no success (Smith, 1973, p. 41). These men were essentially shore whalers, and we regard their expedition of 1753-54 as corroborative evidence that shore whaling around Cape May had become less profitable by this time.

In a notice written by Aaron Leaming, Jr., in 1772, whaling is said to have failed "long since" in Cape May County (Leaming, 1978). A whale was taken in 1723, another in 1731 (a "yearling"), and another in spring 1772 (another "yearling"). In this document, Leaming claimed no whales had been brought ashore during 1732-1771, in spite of the fact that some effort was maintained: "... they went a whaling on this beach every year for 40 years" after 1731. Up to 12 boats were involved. In 1772 Leaming guessed there were six or seven whaleboats still in use, each manned by a crew of six. It was Leaming's opinion that whaling had become nothing more than a pretext for the "whalers" to roam the beaches in pursuit of other game:

...Whaling seems to be the least part of their Errand. For they carry Guns and repair to the Beaches & Gun for Deer foxes Raccoons Ducks Gees &.

He was particularly incensed by the way their activities disturbed the range cattle kept on or near the beach.

We cannot account for the discrepancy in Leaming's two accounts regarding the dates of whale captures. He may have failed to mention the 1737 capture simply to strengthen his case against the whalers, or he may have forgotten exactly what year the last whale had been taken prior to 1772.

From 1810 to 1820 a crew of seven men led by Captain John Sprague of Manahawkin "followed whaling exclusively" (Clark, 1887, p. 48). They operated one whaleboat, launched from the beach, whenever a whale was sighted. Results were said to have been "fair".

In spring of 1820 whales were reported as "frequently seen in the neighborhood of Sandy-Hook" (Commercial Advertiser, N.Y., 15 May 1820). This prompted a crew to go whaling in the New York Bight in the Clinton, a pilot boat. At least three cruises were made, but as far as we know only one whale was taken. Though initially reported as a "young", 45-ft sperm whale (Centinel of Freedom, Newark, 16 May 1820) and cited as such by Weiss et al. (1974, p. 105), this whale, taken 13 May, almost certainly was a right whale (True American, Trenton, 5 June 1820; and see Weiss et al., 1974, p. 110). It was struck about 7 mi from Sandy Hook. Another large whale had been struck "on the bar" near Sandy Hook on 6 May; it escaped bearing two irons and towing 18 fathoms of line with a drag attached (Centinel of Freedom, 9 May 1820). Weiss et al. incorrectly stated that this whale was cut free "while it was being towed in". The whale was in fact towing the boat at the time of cutting, according to Weiss et al.'s source (ibid.). Weiss et al.'s conclusion that the whale secured on 13 May was the whale struck on 6 May is not supported by the information in their newspaper sources. Because it was encountered near shore in early May by whalers who would take a right whale a week later, we believe the whale struck but lost on 6 May was a right whale, and all or most of the 25-30 whales seen during the Clinton's second cruise

may have been right whales. The whale that washed ashore in Long Island Sound on 20 May 1820 may have been one of those struck a week or two earlier off Sandy Hook (Weiss et al., 1974, p. 18, 105).

As noted by Reeves and Mitchell (1986a), there was a brief spurt of whaling by vessels off Sandy Hook during 1822-23. The sloops Ocean of Sag Harbor and Hampton of Providence were involved, along with a smack or smacks from New London. In early April 1822 "another" large whale had been taken off Sandy Hook (Allen, 1916, p. 134; Nantucket Inquirer, 4 April 1822).

Although we believe the vessels cruising along the New Jersey and Long Island coasts were in search of right whales primarily, sperm whales were taken occasionally by whaleships off the New Jersey coast. For example, the ship Mansfield of Hudson arrived in New York on 21 March 1839, having encountered a large school of sperm whales off Cape May (Sag-Harbor Corrector, 27 March 1839). Five whales were killed, but two were lost because of darkness. The blubber was brought into port on the vessel's deck. The sperm whales were seen as the Mansfield was returning from a 21-month voyage to the South Atlantic (Starbuck, 1878, p. 342-343).

Shore whaling continued at Long Beach Island on at least a small scale through 1823. Watson (1877, Vol. II, appendix, p. 547) learned during a visit to the island in 1823 that the Inman family (comprised of 12 members at the time) had "never ceased to be whale catchers along this coast". They caught 2-3 whales, each producing 40-50 barrels, per year.

Earll (1887), in his review of New Jersey's fisheries in about 1880, failed to mention whaling. This can be taken as evidence that the regular, organized whale fishery had by then been discontinued. Those kills made along the New Jersey coast during the second half of the nineteenth century probably were the results of chance encounters rather than of a systematic

watch for whales. Fishermen from Long Branch "drove ashore" a 42 ft whale in May 1878, killing it with a scythe (New York Times, 12 May 1878). Judging by its expected oil yield (60 barrels) and the fact that it was identified in a newspaper account as a "Greenland whale", the whale probably was a right whale. The same article claimed that "several of the species have been seen off the coast recently".

A right whale with baleen 5 ft 9 inches long was captured in spring 1882 by "a crew of experienced Egg Harbor [N.J.] whalers" (Holder, 1883, p. 106). This event prompted a report in the New York Evening Post (24 October 1883). An old man had told the reporter that his great-grandfather "used to catch all the blubber he could tend to right off Long Branch [N.J.]". Apparently this particular whaler gave up whaling before the War of Independence (1776). The reporter claimed that after a century of little or no whaling, whales had by 1883 "grewed plenty again, and the old Jersey fishin' has revived". Probably referring to the Egg Harbor specimen of 1882, he noted that a right whale had been taken recently on the New Jersey coast and that "a regular crew of whalers...are in the business there". He added that "numbers of boats all down the coast make daily trips to sea in search of whales". This last statement is difficult to evaluate. At face value, it could be taken to suggest that shore whaling effort had increased during the early 1880s not only locally (near Egg Harbor) but along much of the New Jersey coast and southward. However, the only example given in support of the statement is a reference to Manigault's (in Holder, 1883) remark that several schooners were "now engaged in their [right whales'] pursuit" off South Carolina. As noted elsewhere (Reeves and Mitchell, 1987MS), we believe Manigault had in mind the New England vessels which were cruising in winter

for right whales on the Southeast U.S. Coast Ground from the mid-1870s through the 1880s (Reeves and Mitchell, 1986b).

During the first week of December 1886 a large whale was seen from time to time in the Delaware River. It died on about the 7th, apparently from being crushed between two ice floes (New York Times, 9 December 1886). The carcass was towed to Philadelphia, where the blubber and whalebone were removed. It was expected to be worth \$800. Considering the timing of the whale's appearance and the fact that its baleen was saved, it may well have been a right whale. Three whales seen close to shore off Cape May the first week of November 1893 drew a crowd of onlookers, and local fishermen made plans to attempt their capture on the 6th (New York Tribune, 6 November 1893, p. 1).

DISCUSSION

Drift Whales

The subject of drift whales arises frequently in the literature of colonial whaling. These were whales which died at sea and stranded, or drifted ashore. It is probably fair to assume that whales which came ashore alive were also considered drift whales. Ownership of the carcasses naturally became a contentious matter, and as a result court and tax records often refer to complaints and controversies over drift whales. The legal status of drift whales and the taxation measures applied to them in the colony of Old Plymouth through 1690 were discussed by and Pulsifer (1861). Much of this material was quoted and interpreted by Allen (1916). In some places, such as Sandwich in 1702, drift whales were donated in their entirety to the church (Freeman, 1862, p. 85). A part of each drift

whale was appropriated for the ministry at Eastham, beginning in 1662 (Freeman, 1862, p. 362).

Little and Andrews (1982) proposed that on Nantucket and Martha's Vineyard and along parts of the New England and Long Island coasts, Indians practiced "drift whaling" before the arrival of Europeans. By drift whaling they meant an organized effort to utilize the carcasses of stranded whales. It is possible, according to Little and Andrews (1982, p. 4), that in particularly favorable areas "drift whales were so numerous that no need had arisen to go to sea to kill them". Given that whales of many species, not only right whales, would then, as now, have come ashore from time to time in the absence of active whaling, the question arises as to how whaling came to influence the availability of drift whales. For our purposes, it is especially important to separate those whales that came ashore due to natural causes from those that were killed or injured, but not secured, by the whalers. The latter would be considered part of fishing mortality while the former would be part of natural mortality. There is also the problem of identifying drift whales to species. Judging by the pattern of recent strandings on the U.S. east coast, there is no reason to suppose a higher proportion of right whales would have become naturally stranded than fin whales, humpbacks, and other coastal cetaceans. So it would be unsafe to assume that all, or even most, drift whales in New England, Long Island and New Jersey were right whales. Moreover, when the whalers harpooned balaenopterids, they were more likely to lose them than they were to lose harpooned right whales. Thus, more balaenopterids may have been included among the struck whales that washed ashore than might be expected from the relative frequency with which they were pursued by the whalers.

Several authors have concluded that a high proportion of the drift whales mentioned in early records were casualties of whaling. Freeman (1862, p. 50) noted concerning drift whales in Cape Cod Bay:

So numerous were whales in the Bay, and such was the activity of the whalers, that instances were frequent of whales, escaping wounded from their pursuers and dying subsequently, being washed to the shores.

Allen (1916, pp. 145-154) and Little (1981) both concluded that "most drift whales of New England at that time [seventeenth century] had been harpooned and then lost at sea" (Little, 1981, p. 49).

In our tables of catches, we have not made all drift whales a part of fishing mortality. Rather, we looked for any evidence to suggest that a whale had been struck, e.g. that its salvaged carcass was claimed by a whaler, or that a harpoon was still embedded. Only when such evidence was available did we feel confident in listing the whale as taken by whalers. This procedure probably means that some whales were excluded from our catch summary (Figure 1) even though whalers caused their death. To some extent, this effect is offset by the possibility that some of the whales we did include as caught were in fact not right whales.

Loss Rate

Some hunting loss occurs in virtually all whaling operations. As a result, it is necessary to correct statistics on catch to account for this additional "hidden" fishing mortality. Some of such mortality is revealed by referring to drift whales and dead whales found at sea. However, there are clearly instances when a whale is killed or seriously injured but never secured. In addition, the finding of some of those struck-but-lost whales which were finally secured may not be reported in an extant written source.

We previously discussed the problem of accounting for hunting loss in the Long Island shore fishery and noted that the loss rate for this fishery probably was lower than the rates for pelagic whaling and for any whaling that involved species other than right whales (Reeves and Mitchell, 1986a). However, without a trustworthy record of whaling activities over a period of time, which includes information on all whales struck, taken, and found ("drift"), it is impossible to estimate the loss rate rigorously. We know from accounts like those of Dudley (1725) and Allen (1916, pp. 153-154) that there was substantial loss in the New England shore fishery. The finding and reporting of drift whales bearing evidence of encounters with whalers compensates to some degree for hunting loss, and we might suppose that in an enclosed area such as Cape Cod Bay the prospects of a lost whale's being found eventually was reasonably good. Winthrop (1892, p. 55), for example, noted the confidence of the whalers at Sandwich that the one lost whale of the three they killed in one day would "drive on shore in the bay".

We used a loss rate factor (LRF) of 1.2 (meaning 1 of every 6 whales killed or mortally wounded was lost) for correcting catch data from U.S. shore whaling during the seventeenth through early twentieth centuries (see "Trends in Population Abundance" below). This is lower than the LRFs calculated for pelagic whaling for right whales during the nineteenth century in the North Atlantic (1.25-1.57 - Reeves and Mitchell, 1986b) but consistent with our impression for the Long Island fishery in the latter half of the nineteenth century (Reeves and Mitchell, 1986a) and the Cape Lookout, N.C., fishery in the same period (Reeves and Mitchell, 1987MS). By applying any single LRF to the catch data over the 2-2½ centuries of shore whaling and across all the shore-whaling sites along the U.S. east coast, we run the risk of over- or underestimating fishing mortality, according to the technology in

use in a given area or during a given period. Though we recognize that the uniform application of an LRF of 1.2 is difficult to defend on the basis of a representative and consistently-reported set of whaling data, we also realize it would be misleading to estimate kills only by reference to secured catches. Since there is no doubt that the catch record as compiled in this and our other studies of right whale exploitation (Reeves and Mitchell, 1986a, b; 1987MS) is incomplete, for virtually all times and areas discussed, the conservative LRF of 1.2 still leaves the estimates of total kill as conservative. Our inclusion in the "secured" catch totals of drift whales bearing evidence of encounters with whalers (e.g. harpoons and lines still attached) leads to some double-counting of whales, since the LRF is applied to the secured catch totals. However, again, we feel the under-reporting of catches is so substantial that it offsets most such double-counting.

Whaling Seasons

On Figures 2a-1 we have shown the cumulative records of the right whale's occurrence, by month, using data from Reeves and Mitchell (1986a, b; 1987MS) and from this paper. The sample used for these figures consists of some 304 records for which the month is known; 651 available records could not be used because the month was not known. Each whale represents a "record", e.g. if 2 whales were seen together in one sighting in January we counted the event as 2 records for that month. No distinction is made here between whales seen or taken.

Allen's (1916, p. 140) conclusion that right whales are "practically absent from the New England waters during the summer and fall from early June until October" is generally borne out by our data. Allen (p. 143) proposed that after May the right whale population moved "off the Grand Banks and thence northeasterly, even to Iceland". He did not mention the summer

concentrations in the lower Bay of Fundy (Arnold and Gaskin, 1972; Kraus et al., 1982) and on the Scotian Shelf (Mitchell, Kozicki and Reeves, 1986). There is no certain evidence that these areas had the same relative importance to the right whale stock in Allen's and earlier times as they appear to have at present to the currently reduced stock. Allen's speculation that at least part of the population moved to an area east of the Grand Bank and possibly even to Denmark Strait (see Allen, 1972, p. 502) is, however, consistent with some of the whaling data compiled by Schevill and Moore (1983) and Reeves and Mitchell (1986b).

The overall pictures are similar for New England and Long Island. On Long Island, the whaling usually began in October or November and lasted until April or early May (Reeves and Mitchell, 1986a). Summer records are almost as rare for Long Island as they are for New England. Though they whaled through the winter, the whalers of Long Island did not consider the whales to be overwintering in their area. Rather, they believed the whales were always moving through, remaining in one spot for no more than a few days (similar to the spring observations off Cape Cod by Watkins and Schevill, 1982). At least toward the end of the nineteenth century, late winter was considered the best season for whaling at Long Island. At this time, the whales were believed by the whalers to be on a northward migration (Edwards and Rattray, 1932, p. 18).

By all accounts, the New Jersey and Delaware Bay whale fisheries were, like those in New England and New York, prosecuted principally during winter and early spring. The Dutch whale fishery in Delaware Bay lasted from December to March (Parr, 1969, p. 112). Thomas Leaming's seventeenth-century account refers to whaling as a winter and early spring activity, the season being finished by no later than the first of May (Beesley, 1857, p. 175-6).

Lewis Cresse's diary indicates that the whaling began as early as the end of January or early in February and lasted until as late as the middle of April, at least during the eighteenth century (Table 5). Watson (1855, vol. II, p. 547) indicated that February and March were the peak months of whaling at Long Beach Island. All the confirmed right whale records on Table 5 that include the month of occurrence are for March, April or May, with one exception (November). The evidence taken together suggests that some right whales overwintered in Delaware Bay and off the coast of New Jersey but that their numbers increased in February and March, perhaps as animals that wintered farther south began arriving on their passage to the north.

The data shown on Figures 2a-1 suggest that right whales were present alongshore south of Virginia (ca 36°N) only during the first 5 months of the calendar year, with the largest numbers seen and taken in February and March. With the exception of a few records for September and November, a similar pattern is suggested for the coast of New Jersey and Delaware Bay. The only area where a year-round presence of right whales is indicated is Long Island, although there are many more records for December-May than for June-November off Long Island. In New England, it appears that right whales began to arrive in October, reaching peak numbers in January, then maintaining a steady presence through May, with few remaining by June.

These limited data indicate that a migration of some kind takes place, as proposed by Allen (1916, p. 142; 1972, p. 502) and proven by the sight-resight work of Kraus et al. (1986b). However, this migration is not easily characterized from the historical records reviewed here. It appears that the right whale population's winter and spring distribution (December-May) includes various coastal areas from northern Florida to Massachusetts, and that in a given year only part of the population reaches

the southern portions of this range. There seems to be a spring nearshore migration bringing the southerly distributed component of the population to Cape Cod and environs by May. Virtually the entire population then disperses northward, so that by June and July right whales have become scarce in Cape Cod waters and south. The complete extent of the summer and fall distribution is unknown, though it certainly includes the northern Gulf of Maine and the Scotian Shelf. Some members of this population may reach the Gulf of St. Lawrence, Labrador Sea, and areas east and north of the Grand Bank. It remains to be seen whether the animals occupying different portions of the winter and summer ranges represent different sex or age classes, or perhaps family groups or "substocks".

Group Size

Because so many of the records of right whales are ambiguous concerning the number of individuals in a group, we chose not to analyze the historical records for trends in group size. Allen (1916, pp. 125-126) concluded that right whales off New England and Long Island were not particularly gregarious, being encountered principally alone or in groups of two or three. Almost half the sightings off Cape Cod by Watkins and Schevill (1982) between 1955 and 1980 involved groups of 2-6 whales. Allen (1916) regarded larger groups as adventitious. He seems not to have credited the record of a school of 25 whales being chased by the schooner Glide off Nantucket in April 1886 as other than anomalous. However, Watkins and Schevill (1982) reported even larger concentrations (30-70 individuals) seen near Cape Cod during April and May in recent years. Schevill et al. (1986) noted that the one-day kill of 29 [right] whales by the shore whalers of Cape Cod in 1700 implied the presence of a sizeable concentration of animals.

The interesting questions which we would like to be able to address are:
Was there a significant trend through time in the size of right whale

groups? And if so, can school size be taken as one indirect measure of the population's status? Though, as noted above, we do not consider our historical data base adequate for addressing these questions, it can be stated that the groups of several tens of whales reported during the past 20 years by Kraus et al. (1982), Watkins and Schevill (1982) and Mitchell et al. (1986) are as large as or larger than any reported in the early literature. Whether this means the population has recovered is a moot point.

Whaling Effort

In her study of the role of Indians in the development of shore whaling at Nantucket, Little (1981) estimated the years when shore whaling (as distinct from "drift whaling") began along various parts of the east coast: 1690 for Nantucket, 1688 "or just before" for Cape Cod, 1667 for Long Island, and 1680 for Cape May. Her starting dates for Cape Cod and Long Island are too late, according to our findings reviewed in this paper. Whaling was underway in Massachusetts, Cape Cod, and Narragansett bays well before 1688. In fact, it seems clear that by then the shore whale fishery had become well established and profitable in these areas. Allen (1908, p. 314) gave starting dates of 1631 for Massachusetts Bay, 1652 for Martha's Vineyard, and 1672 for Nantucket. There is also no reason to suppose Long Island shore whaling waited to begin until 1667, as whaling companies had been formed in at least three localities at the east end during the 1650s (Ross, 1902). Whaling along the New Jersey coast certainly began before 1680, though the settlement at Cape May apparently was not developed as a whaling center until the early 1680s.

Little (1981) also estimated the peak years of the shore fisheries at the various sites: Nantucket in 1726, Cape Cod in 1714-1724, Long Island in 1687-1707, and Cape May in 1707-1714. Though we accept Macy's (1835) claim

that the record catch of right whales occurred at Nantucket in 1726, it must also be acknowledged that shore whaling had been intensive on the island well before this time. The catch of an estimated 15 right whales by six sloops from Nantucket in 1715 (see above) may be taken as evidence that the whalers were already expanding their effort offshore to supplement the shore-based catch.

Our findings for Long Island (Reeves and Mitchell, 1986a; also see above) agree reasonably well with Little's conclusion that the peak in whaling effort and catch occurred there at or shortly after the beginning of the eighteenth century. Her estimate of 84 whales as a maximum catch is somewhat less than ours. Little reasoned that 28 whaling companies caught an average of 3 whales each in a good year, for a total of 84, and she noted that this number of whales, at 50 barrels each, would produce 4200 barrels of oil, which is not inconsistent with the return of 4,000 barrels listed for 1707 by Cornbury (1708, p. 59). Our calculated average yield for right whales killed off Long Island was 36 barrels; thus, our estimate of 111 whales taken in 1707 (Reeves and Mitchell, 1986a). Neither Little's 84 nor our 111 is corrected for hunting loss. An aspect of Little's analysis that is certainly in error is her statement that the Long Island shore fishery terminated by 1717. Though it does appear as if the annual catch had begun to decline by the 1720s, Long Island shore whaling continued with no major interruption for another two centuries.

The development of a whale fishery in New Jersey was closely connected to the fortunes of Long Island whaling, as many of the Cape May whalers were immigrants from Long Island. Thus, Little's conclusion that Cape May whaling began to reach a peak just as Long Island whaling began to decline is reasonable. However, there is considerable evidence suggesting that the Cape

May fishery was already flourishing in the 1690s. While New Jersey shore whaling certainly had declined by 1734, when Little considered it finished, it continued on some parts of the coast for another century.

Taken all together, the available evidence suggests that colonial whaling for right whales in the eastern United States was particularly intensive between about 1685 and 1730. During this time whales were hunted from shore and vessels in much of New England, Long Island, New Jersey, and North Carolina. It is important to note that whaling was underway for several decades before 1685, and that it continued for nearly two centuries after 1730. The trend toward distant-water whaling by American whalers in the late eighteenth and nineteenth centuries, and the switch to sperm, bowhead, and humpback whales as target species, did not necessarily give right whales a reprieve along the U.S. east coast. The pelagic whalers maintained an interest in taking any right whales encountered during cruises into and out of port, as well as those seen near the whaling centers between voyages. In addition, shore whaling persisted in some areas.

Whaling Effort during the War of Independence

The impact the War of Independence, 1776-1783, had on the western North Atlantic stock of right whales is difficult to gauge. Stackpole (1972, p. 4), referring to the years immediately following the war, stated:

Due to the war years the number of whales along the coast had increased, not having been hunted, and became easy prey for the newcomers. This brought a glut on the American market, especially in Boston, Philadelphia, Baltimore, New York, and Charleston

Though to which "coast" Stackpole's remark applied is unclear, there is every reason to believe whaling from vessels as well as boats along the American east coast was interrupted by the hostilities (Starbuck, 1878, p.

177). Thus, the stocks of right, humpback, and sperm whales in the western North Atlantic may have profited from the war to some degree. However, the stocks in distant seas would seem to have gained even more of a respite. The Nantucket whaling fleet had already extended its activity far to the north (Davis Strait, Strait of Belle Isle, Gulf of St. Lawrence) and south (Brazil Banks, Falkland Islands) before the war (Stackpole, 1953), but such long voyages would have become virtually impossible during the war. Starbuck (1878, p. 177-9) listed a number of whaling vessels as having filed bonds with the Massachusetts state treasurer during the period 1775-1783, but he had very little information on their returns or on where they whaled (if anywhere) during this period.

In 1779 or 1780 the whalers of Nantucket obtained permits from the British military authorities in New York "for a few vessels, about fifteen, to whale on our Coast, which were successful" (Rotch, 1916, p. 15). Apparently many of these vessels cruised "in Boston Bay and its vicinity" (ibid., p. 26). Twenty-four such permits were secured the following year (ibid., p. 27), and permits for 35 whaling vessels were granted by the Continental Congress to Nantucketers shortly before the treaty of peace was signed in 1783 (ibid., p. 34). It can only be assumed that what remained of Nantucket's whaling fleet after the first several years of war with Great Britain cruised at every opportunity in local waters. This concentration of activity would have made the war years particularly costly to the coastal stocks of whales, e.g. right whales.

Catch Levels

Any conclusions about the magnitude of removals from the right whale population prior to about the mid 1800s should be made with great caution. The records are far too fragmentary to support reliable and conclusive

quantitative assessments. With respect to pelagic whaling, the surviving sample of whaling journals and logbooks for the eighteenth century, when right whales may still have been relatively abundant on some grounds (e.g. east of the Grand Bank, in the Strait of Belle Isle and Gulf of St. Lawrence, and along the Labrador coast?) is pitifully small (Fonda, 1969; Sherman, Downey, Adams and Pasternack, 1986). Other primary sources, such as the Whalemen's Shipping List (WSL, 1843-1914), the Dennis Wood abstracts (Wood, n.d.MS), Starbuck (1878), and the Maury (1852) and Townsend (1935) charts, begin their detailed coverage of American pelagic whaling in the 1780s or later. The critical period between about 1715 and 1760 is essentially a blank as far as good primary sources of data are concerned. With respect to shore whaling, there is every reason to believe that a much higher catch was made by shore whalers between 1650 and the early 1800s than our tables (including those in this paper as well as those in Reeves and Mitchell, 1986a and 1987MS) show. The secondary sources, as well as a few primary sources, providing information on shore-based catches during the seventeenth and eighteenth centuries do so in a completely unsystematic way. For example, while Winthrop (1892, p. 55) tells us that whalers killed 29 whales in Cape Cod Bay in one day prior to 27 January 1700, we do not know how many more were killed on other days that winter. The context suggests that some were:

... all the boates round the bay killed twenty nine whales in one day, as som that came this week report; as I came by when I was there last one company had killed thre, two of which lay on Sandwich beach, which they kild the day before, and reckned they had kild another the same day, which they expected would driue on shore in the bay.

Considering that the peak season of the right whale's occurrence off the Massachusetts coast is during April and May (Schevill et al., 1986, figure 1) and that Winthrop's letter was written in late January, perhaps more were killed in the bay later in the season. It is not even possible to be certain that this was the greatest one-day catch in Cape Cod Bay during the height of shore whaling there, though Winthrop did describe the winter of 1699-1700 as a "favorable" one. Considering the amount of whaling effort required to account for 29 whales in one day, there must have been considerable numbers of whales caught at Cape Cod in the years immediately before and after 1700. Yet we found little documentation of such catches (Table 1).

The catch record is probably more nearly complete beginning in 1822, when the Nantucket Inquirer started publication. It may be reasonable to assume that most of the shore-based catches made in New England after this time would have been reported in one or several of the whaling-town newspapers (e.g., Nantucket's Inquirer or Journal, Sag Harbor's Corrector, New Bedford's Whalemen's Shipping List), though even this assumption is highly speculative. Only about a third of the dated records given by Allen (1916, p. 141) are from years before 1822, but this can hardly be taken to mean that twice as many observations of right whales were made in the century following 1821 than were made during the two centuries before that year. The increased frequency of Allen's reports over time, e.g. 9+ records 1800-1850 vs. 63 or more 1850-1900 according to Schevill et al. (1986), must be an artifact caused by documentation factors, at least to some extent. The statement by Schevill et al. (1986) that "the record back to 1620 is not really very different" from the record of sightings of right whales in Massachusetts coastal waters by Woods Hole Oceanographic Institution personnel since 1955 may be literally true. However, what is missing from

the statement is an acknowledgment that documentation procedures were totally different for the two sets of data. Allen's historical record, however "painstakingly compiled" (Schevill et al., 1986), must be considered, at least for years before 1822, little more than a collection of randomly-offered hints at what occurred in colonial and early post-colonial times. It cannot be compared, at face value, to the Woods Hole investigators' own careful and consistently documented record of observations over a 27-year period (1955-1981). It may be provocative to use Allen's partial record as a basis for suggesting "the population of right whales passing near Cape Cod is at worst only slightly smaller now than it was in the 17th century" (Schevill et al., 1986). However, we believe the kill of right whales throughout the western North Atlantic stock's range (Florida northward at least to Nova Scotia) was higher during the period 1680-1730 (see below) than could be made from the stock at its current size (estimated as a few hundred, at most - Kraus, 1985, pp. 3-4).

Schevill et al.'s suggestion that there are about as many right whales passing Cape Cod now as there were in early colonial times is an unlikely one. The supposed similarity in numbers seen off Cape Cod then and now might be explained in one of the following ways:

- (1) Right whales were never depleted in the western North Atlantic, as Allen (1908), Allen (1916, 1972), and others have alleged they were.
- (2) Right whales were depleted but have recovered to a level approaching their seventeenth-century abundance.
- (3) Cape Cod is the core of the population's distribution. As optimal habitat, it would have attracted and supported much of the remnant of the population that survived at the end of whaling. The recovering population would then expand to other, less optimal areas as the Cape

Cod region became saturated with right whales. If this were true, it would not be surprising to find right whales still scarce in other areas (e.g. off Long Island, in Delaware Bay) but in numbers approaching their historic levels off Cape Cod.

- (4) Right whales may have changed their pattern of distribution and movement in the western North Atlantic so that they are now more likely to be seen in Cape Cod waters but less likely to be seen in other former whaling areas than they were in colonial times.
- (5) Allen's (1916) record of observations off Cape Cod may so under-represent the actual frequency of observations that it is misleading to use it as an index for comparison with recent frequencies of observation.

We consider the last of these as the most likely explanation.

Trends in Population Abundance

Because it has been shown that individual right whales move between wintering grounds off the southeastern United States and summering grounds off southeastern Canada (Kraus et al., 1986b), the population of whales hunted over the entire area (Florida to Nova Scotia) can be regarded as one fishable stock. Thus, we have combined the documented catch from all parts of the U.S. east coast in estimating the cumulative fishing mortality, by decade (Figure 1). A loss rate factor of 1.2 has been applied to all these catch data. Though we recognize that the record is far from complete, the trends are at least plausible. The apparent increase in catch between 1840 and 1890 may be due in part to the steadily improving documentation over this period (more newspapers extant, large sample of pelagic whaling logbooks and journals available, etc.). It also may be due, at least in part, to a partial recovery by the whale stock, as suggested by Allen (1972, p. 503), or

to an increase in whaling effort in areas where right whales were likely to be encountered. As an example of the latter, the New England pelagic whalers "discovered" a small winter concentration of right whales off northern Florida, Georgia and South Carolina in the mid 1870s, then proceeded to hunt it intensively through the early 1880s (Reeves and Mitchell, 1986b). If better documentation were available for 1730-1840, it might fill in the gap and create a somewhat smoother downward sloping curve after 1730.

It is necessary to consider whether, over the long period from 1630 to 1910, changes occurred in whaling technology or techniques which would have affected the "fishing power" of the whale boats. In other words, can it be assumed that the catchability of right whales remained relatively constant? Or can much of the continued catch after, say, 1725 be explained by improvements in gear or methods which made right whales easier to detect, approach, or secure? Though whaling was, in general, a conservative business, important innovations were made (see Lytle, 1984; Mitchell, Reeves and Evely, 1986).

The emergence of the toggle iron in the middle of the nineteenth century was a major innovation which increased whaling efficiency (Lytle, 1984). Steam-powered vessels were used for catching and towing fin and humpback whales off Cape Cod in the 1880s. Both of these factors would have reduced the loss rate. Darting guns and shoulder guns also were developed in the middle of the nineteenth century. Their use before fastening to the whale might have increased the loss rate. The American whaleboat evolved over a long period, and there were many local variants (see Ansel, 1978); but there was no clearcut, major innovation in its design which could be regarded as a watershed in the efficiency of right whaling.

It had been our hope to gather enough data on catches, particularly for the colonial period, to make a useful cumulative catch estimate of the right whale population size in the seventeenth or eighteenth century. The peak decade of documented catch is 1700-09, when an estimated minimum of 245 right whales was killed. In previous historical studies of North Atlantic mysticetes we have assumed that the sum of removals during the peak decade of whaling would give a conservative, minimum estimate of "original" population size (Mitchell, 1977; Mitchell and Reeves, 1981; 1983). However, a requirement for making such estimates is a steep decline in availability (= abundance) immediately following the peak decade. If such a decline is not evident, then the possibility that the removals in the peak decade were more or less sustainable cannot be ruled out, and the population could have been considerably higher than the sum of ten years' catches.

The western North Atlantic right whale data as depicted in Figure 1 do not provide a clean basis for making a cumulative catch estimate. The "peak" occurs over a 50-year period. Given the incompleteness of the record, we have no reason to believe the true number killed was higher in 1700-09 than in the decades 1680-89 and 1720-29, or for that matter in the decades 1690-99 and 1710-19.

Without making series of extrapolations and interpolations to estimate removals for times and areas for which documentation is lacking, we can only conclude that there were at least some hundreds of right whales in the western North Atlantic during the late seventeenth century. This means we cannot disagree with Schevill et al. (1986) in their conclusion that "it may be that when the colonists began whaling, the [right] whale population in this area [Cape Cod] may not have been as large as has been supposed". It is, however, difficult to determine what is meant by "as has been supposed".

Gilmore and Danton (1985) recently referred to "the tens of thousands [of right whales] found off the New England coast before whaling". There is no reason to believe the population was this high, even taking into account the qualitative remarks from early sources which lead us to feel our histogram (Figure 1) greatly under-represents the actual take. Scheffer (1976) gave "50,000?" as a pre-commercial exploitation estimate of the world right whale population. This figure probably is more realistic than Mowat's (1972) world estimate of 200,000 (called "scientifically unfounded" by Mitchell, 1973). It is clear from their qualitative statements that earlier scholars of American whaling (Allen, 1908; Allen, 1916; 1972) believed right whales to have been "abundant" off New England in colonial times. It is, however, completely a matter of interpretation as to whether by this they meant in hundreds, thousands, or even tens of thousands.

FUTURE RESEARCH

Continued Reconstruction of Catch History - U.S. Coast

The catch history of right whales in the western North Atlantic (south of Canada) has now been reconstructed in as much detail as can be expected without a major additional commitment of resources. We have identified two further approaches which, though expensive, are likely to yield useful data. These are:

1. A broad, carefully designed survey of nineteenth-century newspapers. Our own sampling of U.S. east-coast newspapers has covered what we feel are the most obvious and readily available sources. However, there are certainly more records to be found in newspapers. Three principal obstacles stand in the way of finding them. First, most newspapers are not indexed, and many of the indexes that do exist are not sufficiently detailed to include the kind

of snippets that contain notices of a whale capture. Second, many eighteenth- and nineteenth-century newspapers have physically disappeared. Thus, even if all relevant surviving issues of east-coast newspapers could be located and examined, many gaps would remain in the available newspaper record. Finally, the process of searching newspapers for obscure references to whales is extremely time-consuming. It requires someone to sit for hours at a time, day after day, while maintaining a high level of concentration.

Another problem with newspaper articles is that they rarely provide the information needed to establish the species identity of the whale mentioned. Thus, some proportion of any sample of records from newspapers is rendered difficult or impossible to use in analyses.

2. In a previous study of the catch history of humpback whales in the western North Atlantic we used British colonial records to help estimate nineteenth- and early twentieth-century catches by American whalers in the West Indies (Mitchell and Reeves, 1983). The Bluebooks for St. Vincent contain data on the amount of whale oil and baleen exported, by year. We considered most of these exports to have been from humpbacks. A similar approach would be worth investigating for the British colonies on the east coast of North America. Our preliminary examination of reference books suggests that useful material on whale products does exist in British repositories. Such material is most likely to consist of records of oil and baleen imported into Great Britain or exported from the colonies during the seventeenth and eighteenth centuries. Product records for years before 1725 can be readily attributed to right whales, with some allowances made for the inclusion of products from naturally stranded whales and the occasionally-caught sperm, pilot, gray(?) and humpback (?) whales. For years after 1725 the attribution becomes more complicated, as pelagic whaling by

New Englanders brought much larger amounts of oil from sperm, pilot, humpback and other whales into the returns for Massachusetts, Rhode Island and Connecticut ports. The probability would be high that the whale products exported from Long Island, New Jersey and the Carolinas during the entire colonial era (until about 1776) were from right whales caught alongshore.

Like any further study of newspaper sources, the proposed search of British records for data on colonial whaling would be expensive, as it is labor-intensive and likely to require substantial travel. In our judgment, however, the cost-effectiveness of a carefully planned search of colonial records would be greater than that of a further newspaper search in North America.

Continued Reconstruction of Catch History - Canadian Coast

Direct evidence is lacking for a connection between the stock of right whales hunted along the Labrador coast and in the Strait of Belle Isle and Gulf of St. Lawrence and that hunted off New England and southward. If the right whales hunted in Canadian waters belonged to the same stock as those hunted seasonally along the U.S. coast south to Florida, then the catch history as reconstructed in this and our previous papers is still far from complete. Basque whalers shipped 14,000-18,000 barrels of whale oil from their camps along the Strait of Belle Isle in some years during the sixteenth century (Barkham, 1984). If half of the whales taken were right whales (c.f. Cumbaa, 1986), this production would suggest a landed catch of about 200 right whales per year.

A high priority of continuing research on right whales should be to gather and evaluate evidence relating to the stock affinities of right whales found in summer and fall across much of the Scotian Shelf (Mitchell et al., 1986), in the Gulf of St. Lawrence (Sergeant et al., 1970; Sears, 1979) and

off the coasts of Labrador and Newfoundland (Beamish, 1981; Mitchell et al., 1986; Reeves and Mitchell, 1986b). The few extant photographs of right whales in these areas (Sergeant et al., 1970, fig. 2; Beamish, 1981, fig. 3; Mitchell et al., 1986, fig. 2) should be compared with the large samples from more southerly regions (Kraus et al., 1986a), with a view to ascertaining any discernible modal differences in callosity features which might elucidate stock relationships. If there should prove to be one North American coastal stock of right whales distributed between Labrador and Florida, then it will be necessary to consider the possibility that the large stock of whales noted, for example, by the Plymouth pilgrims at Cape Cod in 1620 (Thacher, 1832, p. 20) had already been substantially reduced in its aggregate abundance from what it was when commercial whaling began on this side of the Atlantic.

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LITERATURE CITED

- Alexander, R.C. 1975. Cape May County Census. The Cape May County Magazine of History and Genealogy, Vol. 7, No. 3, p. 184-193.
- Allen, G.M. 1916. The whalebone whales of New England. Memoirs of the Boston Society of Natural History. Vol. 8, No. 2, p. 107-322 + pls. 8-16.
- Allen, G.M. 1972. Extinct and Vanishing Mammals of the Western Hemisphere with the Marine Species of all the Oceans. Special Publication No. 11, Cooper Square Publishers, Inc., New York, p. i - xvi + 1 - 620 + frontispiece.
- Allen, J.A. 1869. Catalogue of the mammals of Massachusetts: with a critical revision of the species. Harvard University, Bulletin of the Museum of Comparative Zoology, Vol. 1, No. 8, p. 143-252 + errata, 1 p.
- Allen, J.A. 1908. The North Atlantic right whale and its near allies. Bulletin of the American Museum of Natural History, Vol. 24, Art. 18, p. 277-329 + pls. 19-24.
- Anonymous. 1802. A relation or journal of a plantation settled at Plymouth in New England, and proceedings thereof: First printed in 1622, and abbreviated in Purchas's Pilgrims, Book X. Chap. IV. London. 1625. Collections of the Massachusetts Historical Society, Vol. 8, p. 203-239.
- Anonymous. 1976. March 1960 Bulletin for Sale! Elegant Plantation in Cape May! (Now North Cape May). The Cape May County Magazine of History and Genealogy, Vol. 7, No. 4, p. 365-366.
- Ansel, W.D. 1978. The Whaleboat: A study of design, construction and use form 1850 to 1970. Mystic, Connecticut, Mystic Seaport Museum Incorporated, p. [i]-[vi] + 1-147 + 8 folding (boat plans).

- Arnold, P.W. and D.E. Gaskin. 1972. Sight records of right whales (Eubalaena glacialis) and finback whales (Balaenoptera physalus) from the Lower Bay of Fundy. Journal of the Fisheries Research Board of Canada, Vol. 29, No. 10, p. 1477-1478.
- Arnold, S.G. 1859. History of the State of Rhode Island and Providence Plantations. Vol. I. 1636-1700. New York: D. Appleton & Company, 346 & 348 Broadway. London: 16 Little Britain. p. [i] - xii + 1-574.
- Arnold, S.G. 1860. History of the State of Rhode Island and Providence Plantations. From the settlement of the State, 1636, to the adoption of the Federal Constitution, 1790. In two volumes. Vol. II. 1700-1790. New York: D. Appleton & Company, 443 & 445 Broadway. London: 16 Little Britain. p. folding map + [i] - vi + [i] - iv + 1 - 592.
- Banks, C.E. 1966a. The History of Martha's Vineyard, Dukes County, Massachusetts. In three volumes. Volume I - General History. Edgartown, Published by the Dukes County Historical Society, p. 1-535.
- Banks, C.E. 1966b. The History of Martha's Vineyard, Dukes County, Massachusetts. In three volumes. Volume II - Town Annals. Edgartown, Published by the Dukes County Historical Society, p. frontis + 1-209 + 1-147 + 1-74 + 1-82 + 1-68 + 1-35 + 1-27 + 1-18 + illustrations.
- Barkham, S.H. 1984. The Basque whaling establishments in Labrador 1536-1632 - A summary. Arctic, Vol. 37, No. 4, p. 515-519.
- Beamish, P. 1981. Rare sighting of a right whale. The Journal of Cetacean Research, Vol. 2, p. 2.
- Beesley, M. 1857. Sketch of the early history of Cape May County, to accompany the geological report of the State of New Jersey for said county. Trenton: Printed at the office of the True American. p. [159] - 208 [issued separately].

- Bentley, W. 1911. The Diary of William Bentley, D.D. Pastor of The East Church, Salem, Massachusetts. Volume 3, January, 1803 - December, 1810. Salem, Mass., The Essex Institute, p. frontis + 1-601pp.
- Blacksmith [Nathaniel Starbuck, Jr.?]. 1683-1738MS. Account Book No. 128, Peter Foulger Museum, Nantucket.
- Bradstreet, S. 1855. Bradstreet's Journal. 1664-83. The New England Historical and Genealogical Register, Vol. 9, p. 43-51.
- Breiwick, J.M., L.L. Eberhardt and H.W. Braham. 1984. Population dynamics of western Arctic bowhead whales (Balaena mysticetus). Canadian Journal of Fisheries and Aquatic Sciences, Vol. 41, No. 3, p. 484-496.
- Breiwick, J.M. and E.D. Mitchell. 1983. Estimated initial population size of the Bering Sea stock of bowhead whales (Balaena mysticetus) from logbook and other catch data. Rep. int. Whal. Commn (Special Issue 5), p. 147-151.
- Breiwick, J.M., E.D. Mitchell and D.G. Chapman. 1981. Estimated initial population size of the Bering Sea stock of bowhead whale, Balaena mysticetus: an iterative method. Fishery Bulletin, Vol. 78, No. 4, p. 843-853.
- Bridenbaugh, C. 1974. Fat mutton and liberty of conscience: Society in Rhode Island, 1636-1690. Providence, Brown University Press. pp. xxiv + 157.
- Brimley, H.H. 1894. Whale fishing in North Carolina. The Bulletin of the North Carolina Department of Agriculture. Vol. 14, No. 7, p. 4-8.

- Cain, R.J. [Ed.]. 1981. North Carolina Higher-Court Minutes 1724-1730. The Colonial Records of North Carolina [Second Series], Volume VI. Department of Cultural Resources, Division of Archives and History, Raleigh, North Carolina. p. [i]-lxi + 1-791.
- Caulkins, F.M. 1895. History of New London, Connecticut. From the first survey of the coast in 1612, to 1860. New London: Published by H.D. Utley. p. frontis + [i]-xviii + 3-696.
- Clark, A.H. 1887. Part XV. The Whale-Fishery. 1. - History and present condition of the fishery. p. 3-218 In Goode, G.B. [Ed.], The Fisheries and Fishery Industries of the United States. Section V. History and Methods of the Fisheries. In two volumes, with an atlas of two hundred and fifty-five plates. Volume II. Washington, Government Printing Office, p. [i]-xx + 1-881.
- Cope, E.D. 1865. Note on a species of whale occurring on the coasts of the United States. Proceedings of the Academy of Natural Sciences of Philadelphia, Vol. 17, [Aug.], p. 168-169.
- Cope, E.D. 1866. Contribution to the history of the Cetacea, especially of the eastern American coasts. [Extracted from the Proceedings of the Academy of Natural Sciences of Philadelphia for 1865.] Philadelphia: Merrihew & Son, Printers, p. [1]-15.
- Cope, E.D. 1874. [Capture of a young Balaena cisarctica, near South Amboy, on May 30th.] Proceedings of the Academy of Natural Sciences of Philadelphia, 1874, p. 89-90.

- Cornbury, Lord. 1855 [1708]. Lord Cornbury to the Board of Trade. p. 55-61, Vol. 5 in O'Callaghan, E.B. [Ed.], Documents relative to the Colonial History of the State of New York; procured in Holland, England and France, by John Romeyn Brodhead, Esq., Agent, under and by virtue of an Act of the Legislature entitled "An Act to appoint an Agent to procure and transcribe Documents in Europe relative to the Colonial History of the State", passed May 2, 1839. [In 14 Volumes, 1853-1883] Albany: Weed, Parsons and Company, Printers. Vol. V. Transcripts of Documents in the Queen's State Paper Office; in the Office of the Privy Council; in the British Museum; and in the Library of the Archbishop of Canterbury at Lambeth, in London. London Documents: XVII-XXIV. 1707-1733. p. i-xix + 1-985.
- Crapo, W.W. 1876. Centennial In New Bedford. Historical Address by Hon. William W. Crapo, delivered on the occasion of the Celebration In New Bedford of the Fourth of July, 1876. To which are added an account of the celebration, and an appendix. New Bedford: E. Anthony & Sons, Printers to the City. p. 1-175.
- Cresse, L. 1968. The whaler's diary. The Cape May County Magazine of History and Genealogy, Vol. 6, No. 5, p. 277-287.
- Cumbaa, S.L. 1986. Archaeological evidence of the 16th century Basque right whale fishery in Labrador. Rep. int. Whal. Commn (Special Issue 10), p. xxx-xxx.
- Darby, B. 1951. The Ocean City story. The Cape May County Magazine of History and Genealogy, Vol. 3, No. 5, p. 135-145.
- Dickinson, K.A. 1979. Comments on Aaron Leaming, Jr. Diary - 1737. The Cape May County Magazine of History and Genealogy, Vol. 7, No. 7, p. 541-553.

- Douglass, W. 1760. A summary, historical and political, of the first planting, progressive improvements, and present state of the British settlements in North America. London, Printed for R. and J. Dodsley, in Pall-mall. Vol. 1, p. [i-ii] + i-viii + 1-568 + 1 folding map; Vol. 2, p. [i-ii] + i-iv + 1-416.
- Dudley, P. 1725. An Essay upon the Natural History of Whales, with a particular Account of the Ambergris found in the Sperma Ceti Whale. In a Letter to the Publisher, from the Honourable Paul Dudley, Esq.; F.R.S. Royal Society of London, Philosophical Transactions. Vol. 33, No. 387, p. 256-269.
- Earll, R.E. 1887. North Carolina and its Fisheries. Part XII, p. 475 - 497 In Goode, G.B. [Ed.], The Fisheries and Fishery Industries of the United States. Section II. A Geographical Review of the Fisheries Industries and Fishing Communities for the Year 1880. Washington, Government Printing Office, p. [i]-ix + [2]-787.
- Edwards, E.J. and J.E. Rattray. 1932. "Whale Off!". The Story of American Shore Whaling. New York, Frederick A. Stokes Company, p. i-xvi + 1-285 + frontis + 17 pls.
- Felt, J.B. 1834. History of Ipswich, Essex, and Hamilton. Cambridge: Printed by Charles Folsom. p. frontis + [i]-xv + errata + 1-377.
- Felt, J.B. 1849. Annals of Salem. Vol. II. Second Edition. Salem: Published by W. & S.B. Ives. Boston: - James Munroe & Co. p. frontis + [i]-[viii] + 1 pl. + 9-663.
- Fonda, D.C. Jr. 1969. Eighteenth Century Nantucket Whaling. As Compiled from the Original Logs and Journals of The Nantucket Atheneum and The Nantucket Whaling Museum. Privately Printed for the Author, Nantucket, 1969. p. 1-30.

- Freedman, D.M., D. Rooney, M. Heitowit and D. Carnivale. 1975. The Staten Island Whaling Company. *The Staten Island Historian*, Vol. 32, No. 2, p. 13-16.
- Freeman, F. 1858-1862. *The History of Cape Cod: The Annals of Barnstable County and of its several towns, including the district of Mashpee. In Two Volumes.* Boston. Printed For the Author, By Geo. C. Rand & Avery, 3 Cornhill. Vol. 1, 1858, p. 1-[804] + 15 pls. Vol. 2, 1862, p. 1-[804] + 17 pls.
- Gilmore, M. and C. Danton. 1985. Identification of North Atlantic right whales. Appendix V, p. 56-57 In Mayo, C., C. Carlson, P. Clapham and D. Mattila, Humpback whales of the southern Gulf of Maine. Provincetown, Massachusetts, Center for Coastal Studies, p. i-ii + 1-62.
- Goode, G.B. 1884. A. - The Whales and Porpoises. p. 7-32 of Part 1. Mammals. In Goode, G.B. [Ed.], *The Fisheries and Fishery Industries of the United States. Section I. Natural History of Useful Aquatic Mammals with an atlas of two hundred and seventy-seven plates.* Text. Washington, Government Printing Office, p. i-xxxiv + 3-895.
- Headlam, C. 1930. *Calendar of State Papers, Colonial Series, America and West Indies, August 1717 - December 1718 preserved in the Public Record Office.* London: Published by His Majesty's Stationery Office. p. [i]-lxviii + [1]-542.
- Hedges, H.P., W.S. Pelletreau and E.H. Foster. 1874. *The First Book of Records of the Town of Southampton with other Ancient Documents of historic value, Including all the writings in the Town Clerk's office from 1639 to 1660; transcribed with Notes and an Introduction by Wm. S. Pelletreau, and compiled by the undersigned Committee, chosen at Town Meeting, April 1st, 1873, and published at the expense of the Town, by its authority.* John H. Hunt, Book and Job Printer, Sag-Harbor, N.Y. p. frontis + I-V + [2nd.] frontis + I-XI + [i], errata + 1-177.

- Hempstead, J. 1901. The Diary of Joshua Hempstead of New London, Connecticut ... from September 1711 to November 1758 ... Collections of the New London County Historical Society, Vol. 1, p. [i]-xii + 1-750 + 2 unnumb. pls.
- Holder, J.B. 1883. Article VI - The Atlantic Right Whales: A Contribution, embracing an Examination of (1) The exterior characters and osteology of a cisarctic Right Whale - male. (2) The exterior characters of a cisarctic Right Whale - female. (3) The osteology of a cisarctic Right Whale - sex not known. To which is added a concise résumé of historical mention relating to the present and allied species. Bulletin of the American Museum of Natural History, Vol. 1, No. 4, p. 99-137 + pls. 10-13.
- Hurd, D.H. 1882. History of New London County, Connecticut, with biographical sketches of many of its pioneers and prominent men.
- Jennings, H.A. 1890. Provincetown or, Odds And Ends From The Tip End. A brief Historical Description of Provincetown, past and present; Old Records; Landing of the Pilgrims; Loss of the English Frigate Somerset; the Fire Department; J.C. Freeman Post 55, G.A.R.; Whales and Whaling; Codfishing; Public Buildings; A few Biographical Sketches, with Portraits; Incidents, Anecdotes, Stories of the Place, Etc., Etc., Etc. Illustrated with Thirty-Three Engravings. Entered according to Act of Congress, in the year 1890, by Herman A. Jennings, in the office of the Librarian of Congress, at Washington, D.C. p. 1-212.

- Josselyn, J. 1672. *New-Englands Rarities Discovered: In Birds, Beasts, Fishes, Serpents, and Plants of that Country. Together with The Physical and Chyrurgical Remedies where with the Natives constantly use to Cure their Distempers, Wounds, and Sores. Also A perfect Description of an Indian Squa, in all her Bravery; with a Poem not improperly conferr'd upon her. Lastly A Chronological Table of the most remarkable Passages in that Country amongst the English.* London, Printed for G. Widdowes at the Green Dragon in St. Pauls Church yard. p. [ii] + 1-114.
- Josselyn, J. 1833. *An account of two voyages to New-England.* Collections of the Massachusetts Historical Society, Ser. 3, Vol. 3, p. 211-354.
- Kempton, S. [and S. Kempton, Jr.?]. 1712-1766 MS. Ledger [account book]. Old Dartmouth Historical Society, New Bedford, Massachusetts. Mss 56, Series K, Sub-series 3, vol. 1.
- Kraus, S.D. 1985. A review of the status of right whales (Eubalaena glacialis) in the western North Atlantic with a summary of research and management needs. Final Report to the U.S. Marine Mammal Commission in fulfillment of Contract No. MM2910905-0. Report No. MMC-84/08. Reproduced by National Technical Information Service, Springfield, V A22161, PB-86-154143, p. [i-ii] + i-iv + 1-61.
- Kraus, S.D., K.E. Moore, C.E. Price, M.J. Crone, W.A. Watkins, H.E. Winn and J.H. Prescott. 1986a. The use of photographs to identify individual North Atlantic right whales (Eubalaena glacialis). Rep. int. Whal. Commn (Special Issue 10), p. xxx-xxx.
- Kraus, S.D., J.H. Prescott, A.R. Knowlton and G.S. Stone. 1986b. Migration and calving of right whales (Eubalaena glacialis) in the western North Atlantic. Rep. int. Whal. Commn (Special Issue 10), p. xxx-xxx.

- Kraus, S.D., J.H. Prescott, P.V. Turnbull and R.R. Reeves. 1982. Preliminary notes on the occurrence of the North Atlantic right whale, Eubalaena glacialis, in the Bay of Fundy. Rep. int. Whal. Commn 32, p. 407-411.
- Kugler, R.C. 1980. The whale oil trade 1750-1775. New Bedford, Massachusetts, Old Dartmouth Historical Sketch Number 79, p. [1]-[24].
- Leaming, A. Jr. 1978. An interesting document concerning the whaling industry and its decline. The Cape May County Magazine of History and Genealogy, Vol. 7, No. 6, p. 487-490.
- Leng, C.W. and W.T. Davis. 1930. Staten Island and its people: A history 1609-1929. New York, Lewis Historical Publishing Company, Inc. Volume 1, p. frontis + i-iv + 1-529 + pls.; Volume 2, p. frontis + 531-1060.
- Linsley, J.H. 1842. A catalogue of the Mammalia of Connecticut, arranged according to their natural families. The American Journal of Science and Arts. Vol. 43 (Oct.), p. 345-354.
- Lipton, B. 1975. Whaling days in New Jersey. The Newark Museum Quarterly, Vol. 26, Nos. 2 & 3, p. 1-72 + map (inside back cover).
- Little, E.A. 1981. The Indian contribution to along-shore whaling at Nantucket. Nantucket, MA 02554, Nantucket Historical Association, Nantucket Algonquian Studies # 8, p. 1-85 processed.
- Little, E.A. and J.C. Andrews. 1982. Drift whales at Nantucket: The kindness of Moshup. Man in the Northeast, Vol. 23, p. 17-38.
- Littlefield, L.A. 1965. Fitting out a whaler. Old Dartmouth Historical Sketch No. 14 - first published on June 22 - 1906. The Bulletin from Johnny Cake Hill, Summer 1965, p. 5-12.

- Lytle, T.G. 1984. Harpoons and other whalecraft. New Bedford, Massachusetts, The Old Dartmouth Historical Society Whaling Museum, p. [i]-xii + 1-256.
- Macy, O. 1835. The History of Nantucket; being a compendious account of the first settlement of the island by the English, together with the rise and progress of the Whale Fishery; and other historical facts relative to said island and its inhabitants. Boston: Hilliard, Gray, and Co. p. frontis + i-xii + 1-300 + 1-8.
- Macy, Richard. 1707 [1710?] - 1760MS. Account Book No. 422, Peter Foulger Museum, Nantucket.
- Martin, K.R. 1975. Whalemens and whaleships of Maine. A publication of The Marine Research Society of Bath, Maine. Brunswick, Maine, Harpswell Press, p. [1]-71.
- Mather, C. 1912. Diary of Cotton Mather 1709-1724. Boston, Massachusetts Historical Society, Massachusetts Historical Collections, 7th Series, Vol. 8.
- Maury, Matthew Fontaine. 1852. Whale Chart of the World, from materials in the Bureau of Ordnance and Hydrography. U.S. Naval Observatory, 1 sheet.
- Miner, F.D. and H. Miner. 1915. The diary of Manasseh Minor, Stonington, Conn. 1696-1720. [Published by the author, 150 copies.] p. 1-196.
- Mitchell, E. 1973. The status of the world's whales. Nature Canada, Vol. 2, No. 4, p. 9-25.
- Mitchell, E. 1977 MS. Initial population size of bowhead whale (Balaena mysticetus) stocks: cumulative catch estimates. International Whaling Commission, Scientific Committee, Canberra, Australia, June 1977, Paper SC/29/Doc. 33.

- Mitchell, E., V.M. Kozicki and R.R. Reeves. 1986. Sightings of right whales, Eubalaena glacialis, on the Scotian shelf, 1966-1972. Rep. int. Whal. Commn (Special Issue 10), p. xxx-xxx.
- Mitchell, E. and R.R. Reeves. 1981. Catch history and cumulative catch estimates of initial population size of cetaceans in the Eastern Canadian Arctic. Rep. int. Whal. Commn 31, p. 645-682.
- Mitchell, E. and R.R. Reeves. 1983. Catch history, abundance, and present status of Northwest Atlantic humpback whales. Rep. int. Whal. Commn (Special Issue 5), p. 153-212.
- Mitchell, E.D., R.R. Reeves and A. Evely. 1986. Bibliography of Whale Killing Techniques. Rep. int. Whal. Commn (Special Issue 7), p. [i-vi] + [1]-[161].
- Morgan, C.W. 1841 MS. [Diary of] Charles W. Morgan. Coll. 27, Vol. 2, G.W. Blunt White Library, Manuscripts Collection, Mystic Seaport Museum, Inc., Mystic, Connecticut.
- Mowat, F. 1972. A Whale for the Killing. McClelland and Stewart Limited, Toronto, p. 1-239.
- Norton, A.H. 1930. The mammals of Portland, Maine, and vicinity. Proceedings of the Portland Society of Natural History, Vol. 4, Part 1, p. 1-199.
- Oldmixon, J. 1708. The British Empire in America, containing the History of the Discovery, Settlement, Progress and present state of all the British colonies, on the Continent and Islands of America. With curious maps of the several places, done from the newest surveys. By Herman Moll, Geographer. In Two Volumes. London, Printed for John Nicholson at the King's Arms in Little Britain, Benjamin Tooke, at the Middle-Temple-Gate, Fleetstreet, and Richard Parker and Ralph Smith under the Piazza of the Royal Exchange. Vol. 1, p. i-[x1] + 1-412 + 5 fold. maps. Vol. 2, p. t.p. + 1-382 + [i-iii] + The Index to Both Volumes, p. [i-xxxii] + 3 fold. maps.

- Parr, C. M. 1969. The voyages of David DeVries: Navigator and adventurer. New York, Thomas Y. Crowell Company. p. [i]-[xiv] + 1-[282] + 16 pls.
- Pease, Z.W. [Ed.]. 1927. The Diary of Samuel Rodman. A New Bedford Chronicle of Thirty-Seven Years 1821-1859. New Bedford, Mass., Reynolds Printing Co. p. frontis + [1]-349.
- Potter, E.R. and S.S. Rider. 1880. Some account of the bills of credit or paper money of Rhode Island from the first issue in 1710, to the final issue, 1786. Providence, Sidney S. Rider, Rhode Island Historical Tracts. No. 8.
- Preston, H.W. 1932. Rhode Island and the sea. Providence, State of Rhode Island and Providence Plantations, Office of the Secretary of State, State Bureau of Information, p. 1-140.
- Pulsifer, D. [Ed.]. 1861. Laws. 1623-1682. Records of the Colony of New Plymouth in New England. Boston: From the Press of William White, Vol. 11.
- Reeves, R.R. and M.F. Barto. 1985. Whaling in the Bay of Fundy. Whalewatcher, Journal of the American Cetacean Society, Vol. 19, No. 4, p. 14-18.
- Reeves, R.R. and E. Mitchell. 1986a. History of the Long Island, New York, fishery for right whales, 1644 - 1924. Rep. int. Whal. Commn (Special Issue 10), p. xxx - xxx.
- Reeves, R.R. and E. Mitchell. 1986b. American pelagic whaling for right whales in the North Atlantic. Rep. int. Whal. Commn (Special Issue 10), p. xxx - xxx.
- Reeves, R.R. and E. Mitchell. 1987 MS. The history of whaling in and near North Carolina. Final Report submitted in partial fulfillment of the terms of Contract NA85-WC-C-06194 to: U.S. Department of Commerce, NOAA, National Marine Fisheries Service, Southeast Fisheries Center, Miami, Florida. p. xxx - xxx.

- Reilly, S.B. 1981 MS. Population assessment and population dynamics of the California gray whale (Eschrichtius robustus). Ph.D. dissertation, University of Washington, College of Fisheries, p. [i-iii] + [i]-xii + [1]-[266].
- Rhoads, S.N. 1903. The Mammals of Pennsylvania and New Jersey. Philadelphia, Privately published, 266 pp.
- Ross, P. 1902. A history of Long Island: From its earliest settlement to the present time. Vol. 1. New York and Chicago, The Lewis Publishing Company.
- Rogers, H., G.M. Carpenter and E. Field. 1894a. Early Records of the Town of Providence. Vol. 6. Printed under the authority of the City Council of Providence. vi + 328 pp.
- Rogers, H., G.M. Carpenter and E. Field. 1894b. Early Records of the Town of Providence. Vol. 7. Printed under the authority of the City of Providence. v + 264 pp.
- Rotch, W. 1916. Memorandum written by William Rotch in the eightieth year of his age. Boston and New York, Houghton Mifflin Company. p. frontis + [i]-[xiv] + 1-[89] + 8 pls.
- St. John de Crèvecoeur, J.H. 1782. Letters from an American Farmer; describing certain provincial situations, manners and customs, not generally known; and conveying some idea of the late and present interior circumstances of the British Colonies in North America. Written for the information of a Friend in England, by J. Hector St. John [de Crèvecoeur], A farmer in Pennsylvania. London, Printed for Thomas Davies in Russel Street, Covent-Garden, and Lockyer Davis in Holborn. p. [xvi] + 1-318.

- Scheffer, V.B. 1976. Exploring the lives of whales. National Geographic, Vol. 150, No. 6, p. 752-767.
- Schevill, W.E. and K.E. Moore. 1983. Townsend's unmapped North Atlantic right whales (Eubalaena glacialis). Breviora, No. 476, p. 1-8.
- Schevill, W.E., W.A. Watkins and K.E. Moore. 1986. Status of Eubalaena glacialis off Cape Cod. Rep. int. Whal. Commn (Special Issue 10), p. xxx-xxx.
- Sears, R. 1979. An occurrence of right whales (Eubalaena glacialis) on the North Shore of the Gulf of St. Lawrence. Le naturaliste canadien, revue d'écologie et de systématique, Vol. 106, nos 1-6, p. 567-568.
- Sergeant, D.E., A.W. Mansfield and B. Beck. 1970. Inshore records of Cetacea for Eastern Canada, 1949-68. Journal of the Fisheries Research Board of Canada, Vol. 27, No. 11, p. 1903-1915 + Figs. 4-5.
- Shearman, A., Jr. 1876. Memoranda in relation to the whale fishery and the commerce of New Bedford. pp. 67-70 In W.W. Crapo, Historical address...delivered on the occasion of the celebration in New Bedford of the Fourth of July, 1876. To which are added an account of the celebration, and an appendix. Centennial in New Bedford, New Bedford. 175 pp.
- Sherman, S.C., J.M. Downey, V.M. Adams and H. Pasternack. 1986. Whaling logbooks and journals 1613-1927: An inventory of manuscript records in public collections. New York and London, Garland Publishing, Inc. p. [i]-[xvi] + 1-469.
- Shurtleff, N.B. [Ed.]. 1854. Records of The Governor And Company of the Massachusetts Bay in New England. Vol. IV. - Part I. 1650-1660. Boston: From the Press of William White, Printer to the Commonwealth, p. [i]-[vii] + 1-518.

- Shurtleff, N.B. [Ed.]. 1855. Records of the Colony of New Plymouth in New England. Court Orders: Vol. IV. 1661-1668. Boston: From the Press of William White, Printer to the Commonwealth, 218 pp.
- Shurtleff, N.B. [Ed.]. 1957. Records of the Colony of New Plymouth in New England. Miscellaneous Records. 1633-1689. Boston: From the Press of William White, Printer to the Commonwealth, 283 pp.
- Sherman, S.C., J.M. Downey, V.M. Adams and H. Pasternack. 1986. Whaling logbooks and journals 1613-1927: An inventory of manuscript records in public collections. New York and London, Garland Publishing, Inc. p. [i]-[xvi] + 1-469.
- Smith, Capt. J. 1624. The Generall Historie of Virginia, New-England and the Summer Isles: with the names of the Adventurers, Planters, and Governours from their first beginning An^o 1584 to this present 1624. With the Proceedings of those Severall Colonies and the Accidents that befell them in all their Journyes and Discoveries. Also the Maps and Descriptions of all those Countryes, their Commodities, people, Government, Customes, and Religion yet knowne. Divided into six Bookes. By Captaine JOHN SMITH sometymes Governour in those Countryes & Admirall of New England. London. Printed by I.D. and I.H. for Michael Sparkes. Folio, p. [i - xviii] + 1-96 + 105-248 + [i] + 4 folding maps. [Facsimile copy used, published 1966 by the World Publishing Company, Cleveland, Ohio.]
- Smith, N.W.P. 1922. The Provincetown Book. Brockton, Mass., Tolman Print, Inc. p. 1-260.
- Smith, P.C.F. [Ed.]. 1973. The Journals of Ashley Bowen (1728-1813) of Marblehead. Publications of The Colonial Society of Massachusetts, Volume XLIV Collections. Boston, Published by the Society.

- Sporri, F.C. 1677. *Americanische Reiss-beschreibung Nach den Caribes Inseln, Und Neu-Engelland.* Zurich.
- Stackpole, E.A. 1953. *The Sea-Hunters. The New England Whalers During Two Centuries 1635-1835.* J.B. Lippincott Company, Philadelphia, New York. p. 1-510 + 16 pls.
- Stackpole, E.A. 1972. *Whales and Destiny. The Rivalry between America, France, and Britain for Control of the Southern Whale Fishery, 1785-1825.* The University of Massachusetts Press, p. i - xiv + 1-427.
- Stackpole, E.A. 1982. *The last whale-chase off Nantucket.* *Historic Nantucket*, Vol. 29, No. 3, p. 12-16.
- Starbuck, A. 1878. *History of the American Whale Fishery from its earliest inception to the year 1876.* Report of the U.S. Commission on Fish and Fisheries, Part 4, Washington. p. 1-768 + pls. 1-6.
- Starbuck, A. 1924. *The History of Nantucket County, Island and Town including genealogies of first settlers.* Boston: C.E. Goodspeed & Co. p. 1-871 + 4 folding maps.
- Starr, W.H. 1876. *A centennial historical sketch of the Town of New London.* New London: Power Press of George E. Starr. p. 1-96.
- Stick, D. 1958. *The Outer Banks of North Carolina 1584-1958.* The University of North Carolina Press, Chapel Hill. p. [i]-[xvi] + 1-352.
- Taber, P. 1745MS. [Letter from Philip Taber addressed to Tucker Taber, Dartmouth, Massachusetts], 6 December 1745, Sandy Hook, N.J. Old Dartmouth Historical Society, New Bedford, Massachusetts. Mss 56, Ser. T, Sub-series 5, folder 1.
- Thacher, J. 1832. *History of the Town of Plymouth; from its first settlement in 1620, to the year 1832.* Boston: Marsh, Capen & Lyon. p. i-xi + 12-382 + map + frontispiece.

- Thomas, G. 1952. [The Commodities of Cap-May-County are Oyl and Whale-Bone,... - Gabriel Thomas 1698).] The Cape May County Magazine of History and Genealogy, Vol. 3, No. 6, p. 227.
- Townsend, C.H. 1935. The distribution of certain whales as shown by logbook records of American whaleships. Scientific Contributions of the New York Zoological Society, Zoologica, Vol. 19, No. 1, p. 1-50 + pls. 1-4 [Maps].
- True, F.W. 1904. The Whalebone Whales of the Western North Atlantic compared with those occurring in European waters with some observations on the species of the North Pacific. City of Washington, Published by the Smithsonian Institution. Smithsonian Contributions to Knowledge, Vol. 33, p. i-xii + i-viii + 1-332 + pls. 1-50.
- Trumbull, J.H. 1850. The Public Records of the Colony of Connecticut, prior to the union with New Haven Colony, May, 1665; transcribed and published, (in accordance with a resolution of the General Assembly,) under the supervision of the Secretary of State, with occasional notes, and an appendix. Hartford: Brown & Parsons. p. [i]-[viii] + 1-604 + errata, 1 p.
- Watkins, W.A. and W.E. Schevill. 1982. Observations of right whales, Eubalaena glacialis, in Cape Cod waters. Fishery Bulletin, Vol. 80, No. 4, p. 875-880.

- Watson, J.F. 1855. *Annals of Philadelphia and Pennsylvania, in the olden time; being a collection of memoirs, anecdotes, and incidents of the city and its inhabitants, and of the earliest settlements of the island part of Pennsylvania, from the days of the founders. Intended to preserve the recollections of olden time, and to exhibit society in its changes of manners and customs, and the city and country in their local changes and improvements. Embellished with engravings, by T.H. Mumford. In Two Volumes. Parry and McMillan, Successors to A. Hart (late Carey and Hart). Vol. 1, p. i-vii + 1-591; Vol. 2, p. i-xvi + 1-609 + 22 unnumb. pls.*
- Weiss, H.B., H.R. Kemble and M.T. Carre. 1974. *Whaling in New Jersey. New Jersey Agricultural Society, Trenton, New Jersey. p. [i]-[x] + 1-148 + Errata Sheet.*
- Whalemen's Shipping List, and Merchants' Transcript. New Bedford, Mass. Vol. 1, no. 1 (17 March 1843) to Vol. 72, no. 52 (29 December 1914).
- Wheeler, R.A. 1900. *History of the Town of Stonington, County of New London, Connecticut, from its first settlement in 1649 to 1900, with a Genealogical Register of Stonington families. New London, Conn., Press of the Day Publishing Company, p. frontis + [i-vii] + 1-754.*
- Williamson, S. 1951. *The Hughes family of Cape May. The Cape May County Magazine of History and Genealogy, Vol. 3, No. 5, p. 177-179.*
- Winsor, J. 1849. *History of the Town of Duxbury, Massachusetts, with Genealogical Registers. Boston: Crosby & Nichols, Washington Street; Samuel G. Drake, Cornhill. p. frontis + [i]-viii + 9-360.*

- Winthrop, J. 1825. The History of New England from 1630 to 1649. By John Winthrop, Esq. first Governour of the Colony of the Massachusetts Bay. From his original manuscripts. With notes to illustrate the civil and ecclesiastical concerns, the geography, settlement and institutions of the country, and the lives and manners of the principal planters. Vol. 1 by James Savage. Boston: Printed by Phelps and Farnham. p. i-[xiv] + 1-424.
- Winthrop, W. 1892. [Letter from Wait Winthrop to his brother John Winthrop, dated 27 January 1699, Boston.] Collections of the Massachusetts Historical Society, Boston, 6th Series, Vol. 5, p. 54-55.
- Wood, D. No date. Dennis Wood Abstracts of Whaling Voyages. Vols. 1-5, 1831-1862. [Microfilm rolls 298 and 299, purchased from] New Bedford Free Public Library, New Bedford, Mass.
- Wood, H.E. II. 1968. Sagaponack whalers who settled Cape May County. The Cape May County Magazine of History and Genealogy, Vol. 6, No. 5, p. 272.

Table 1. Records of right whales from New England (excluding Nantucket). State is Massachusetts unless otherwise indicated.

Date	Locality	Whales					I.D. Certainty ¹	Comments	Sources
		Seen	Taken	Struck /Lost	Chased	Drift			
Dec. 1620	Cape Cod	+					1	"Large whales of the best kind for oil and bone".	Thacher, 1832, p. 20.
April 1635	Cape Cod					3-4	2	"Cast on shore".	Winthrop, 1825, p. 157.
1654	Weymouth					1	1	"Taken" or found.	Shurtleff, 1854, p. 191.
1662	Off Narragansett Bay		1				1		Sporri (1677 in Bridenbaugh, 1974, app. V, p. 144-145).
1662	Barnstable					1	1	Plymouth Colony received tax on a [drift?] whale.	Shurtleff, 1857, p. 165.
1665	Yarmouth					2	1	Taxes ordered paid on 2 [drift?] whales.	Shurtleff, 1855, p. 99.
1668	Boston Harbor			1			1		Bradstreet, 1855, p. 44
1672	Yarmouth					1	1	[damaged carcass].	Crapo, 1876, p. 66; Allen, 1916, p. 151.
Winter 1690	"Cape Cod harbour"		1				1	"Large".	Felt, 1849, p. 224; Starbuck, 1878, p. 18.
Winter 1691	Cape Cod		1				1		Felt, 1849, p. 224; Starbuck, 1878, p. 18.
1692	Edgartown		1				1	"Cast on shore"; supposedly having been killed by a harpooner, "on a whale design".	Starbuck, 1878, p. 18.

Table 1. Continued.

Date	Locality	Whales					I.D. Certainty ¹	Comments	Sources
		Seen	Taken	Struck /Lost	Chased	Drift			
1697	Yarmouth		2				1	Mother 55 ft. long and calf 20 ft. long.	Allen, 1916, p. 129, 133.
Winter 1699-1700 (before 27 January)	Cape Cod Bay		29+				1	29 in one day by all the boats working in the area.	Allen, 1916, p. 131.
February 1703	Martha's Vineyard		3				1	"Great whales, betwixt six and seven and eight foot bone."	Starbuck, 1878, p. 35; [erroneously attributed to 1793 by Crapo, 1876, p. 65, and subsequently Allen, 1908, p. 319].
Late in 1706, probably Dec.	Ipswich		Several				1		Felt, 1834, p. 109.
Early December 1707	Boston Harbor		1				1	40 ft. long.	Starbuck, 1878, p. 34; Allen, 1916, p. 133.
25 Nov. 1712	Duxbury				1		1	Boat chasing a whale, "all drowned".	Allen, 1916, p. 134.
1722-23	Vicinity of Salem					2	1	"Drift" whales, "claimants may prove their right [to the carcasses] before courts of the admiralty".	Felt, 1849, p. 224.
Spring 1723	Massachusetts Bay (?)		8				2	Brought into Boston by vessels from that port; some may have been sperm whales.	Starbuck, 1878, p. 168
1725	Noman's Land		1				1	26-barrel, by a 6-man crew.	Banks, 1966a, p. 435.

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Table 1. Continued.

Date	Locality	Whales					I.D. Certainty ¹	Comments	Sources
		Seen	Taken	Struck /Lost	Chased	Drift			
March 1736	Off Provincetown		1[-2?]				1	"Large", est. 100 barrels oil; taken "at sea" by a Provincetown vessel.	Allen, 1916, p. 134; Starbuck, 1878, p. 32, 158. [see Boston News-Letter, 18 March and 1 April 1736]
11 May 1736	40 leagues E. of Georges Bank			2			2	Could have been sperm whales, judging by location and circumstances.	Starbuck, 1878, p. 32 [see Boston News-Letter, 27 May 1736.
Up to 5 Jan., season of 1737-38	Provincetown		2				2	"Small".	Allen, 1916, pp. 158-59; Starbuck, 1878, pp. 32-33.
Up to Feb., season of 1737-38	Yarmouth		1				1	Baleen 8-9 ft. long; large	Allen, 1916, p. 159; Starbuck, 1878, pp. 32-33.
1738-39	Provincetown		6				2	"Small".	Allen, 1916, p. 159; Starbuck, 1878, pp. 32-33.
			1				1	"Large", baleen 6 ft. long.	Allen, 1916, p. 159; Starbuck, 1878, pp. 32-33.
1738-39	Sandwich		2				2	"Small".	Allen, 1916, p. 159; Starbuck, 1878, pp. 32-33.
1746	Cape Cod		"Not above three or four"				2		Douglass, 1760, p. 59.
10 Feb. 1755	Truro				1		2		Allen, 1916, p. 134.

Table 1. Continued.

Date	Locality	Whales					I.O. Cert- ainty ¹	Comments	Sources
		Seen	Taken	Struck /Lost	Chased	Drift			
Dec. 1756	King's [Lynn] Beach		1				2	75 ft., man "rode into his mouth, in a chair drawn by a horse"; 2 ribs were used for gate posts.	<u>The Corrector</u> , Sag Harbor, 13 Feb. 1830.
1770	Duxbury					1	2	Carcass found $\frac{1}{2}$ mi. from shore, being eaten by sharks, 16+ bbls.	Winsor, 1849, p. 86.
14 Jan. 1795	In Buzzards Bay				2		2	Two 40-bbl whales chased by "several" boats within 3 mi. of New Bedford.	<u>N. B. Medley</u> , 16 Jan. 1795.
4 Dec. 1808	Winter Island, near Salem					1	2	Found "in the offing"; "grounded", 60 ft.	Bentley, 1911, p. 400.
April 1822	Boston Bay			1			2	By a Cape Cod vessel; broke line and escaped.	Allen, 1916, pp. 134-5; <u>Nantucket Inquirer</u> 2(17): 25 April 1822.
March 1824	Martha's Vineyard		1				2	"Small". Found dead by schooner <u>Ruby</u> of Boston; blubber taken to Edgartown for trying out; made 33-40 barrels of oil; thought to have been struck by whalers operating from S side of island.	<u>Nantucket Inquirer</u> , 4(15): 5 April 1824.
5 April 1824	New Haven, Conn.				1[?]			In harbor, chased by local "enterprising seamen".	<u>Nantucket Inquirer</u> , 4(16): 12 April 1824.
19 Feb. 1828	Newport, R.I.		1				1	70 barrels oil, 44 ft. long, pursued by 4 boats and twice harpooned on 18 Feb.; finally taken by Capt. Potter of Newport.	Allen, 1916, p. 135; Clark, 1887, p. 48; <u>New London Gazette</u> , 27 Feb. 1828.

Table 1. Continued.

Date	Locality	Whales					I.D. Certainty ¹	Comments	Sources
		Seen	Taken	Struck /Lost	Chased	Drift			
11 April 1835	Off Provincetown		1				1	By schooner <u>Columbia</u> of Provincetown, expected to produce 75-80 bbls oil.	<u>New-Bedford Mercury</u>
1 Sept. 1838	Newburyport					1	1	Ca 40 ft.; found dead; ca 40 barrels oil.	Allen, 1916, p. 135, 140.
25 March 1841	Edgartown		1				2	40-45 bbl.	<u>New-Bedford Mercury</u> , 2 April 1841.
12 May 1841	Westport Point		2				1	Ca. 50 ft, 40 bbls; ca. 25ft., 20 bbls.; 4-5 boats chased; 1500 gallons oil expected.	Morgan, 1841MS; <u>New Bedford Mercury</u> , 14 May 1841.
11 May 1843	SE of Chatham (Great South Channel)		1					Very large. By schooner <u>Cordelia</u> of Provincetown; 125 barrels oil and 300 lb. baleen saved; 14 ft. baleen. Length of baleen and potential yield (supposedly ca. 1½ tons bone, ca. 300 bbls oil) suggest a bowhead.	Allen, 1916, p. 135; Jennings, 1890, pp. 193-4.
Mid-April 1848	Plymouth	+					1	"Considerable number" seen, chased by 5 vessels.	Allen, 1916, p. 136.
Late Jan. 1850	Provincetown Harbor		1				1	"Large".	Allen, 1916, p. 136.
Early Feb. 1850	Provincetown Harbor		1				1	"Large", 50 barrels oil.	Allen, 1916, p. 136.
June 1850	In Peconic Bay near Greenport, Long Island, N.Y.		1				2	35 ft.	Caulkins, 1895, p. 639n.

Table 1. Continued.

Date	Locality	Whales					I.D. Certainty ¹	Comments	Sources
		Seen	Taken	Struck /Lost	Chased	Drift			
1 Nov. 1850	Provincetown		1				1	"Large", 60 barrels oil.	Allen, 1916, p. 136; Clark, 1887, p. 41; Goode, 1884, p. 24n.
Mid-May 1852	Provincetown (in Massachusetts Bay)		1				1	"Large", 75 barrels oil, 8 ft. baleen.	Allen, 1916, p. 136.
Early Oct. 1852	Massachusetts Bay		2				2	By a Provincetown schooner.	Allen, 1916, p. 136.
April 1853	Provincetown Harbor		2	1?			2		Allen, 1916, pp. 136-7.
11 Dec. 1854	Provincetown		1				1	Drifted ashore mid-Dec. at Sandwich, 48 ft., 30-40 or 60 barrels; harpoon suggested it was Provincetown whale killed but lost on 11th.	Allen, 1916, p. 137; Nantucket Inquirer, 34(153): 25 Dec. 1854; <u>WSL 12(43): 26 Dec. 1854.</u>
Late Nov. 1858	Provincetown				1		1	One whale "several times fired at with harpoon guns, eventually escaped".	Allen, 1916, p. 137.
17-24 March 1860	Provincetown	Several	1				2	By Samuel Loper and others; "several" seen in harbor on March 18.	<u>WSL 18(3): 27 March 1860.</u>
April 1864 [Allen, 1883, referred to it as 1865]	Plymouth (but towed to Provincetown)		1				1	Large, 47-48 ft.; produced 80 [or 83] barrels, 14 gallons oil; 1001 lb baleen. Skeleton in Museum of Comparative Zoology; baleen 7ft. long.	Allen, 1916, p. 118, 137, 171; Allen, 1908, p. 322.
1867	Cape Cod Bay, near Provincetown		1				1	Large, 48 ft., 84 barrels oil, 1000 lbs baleen.	Goode, 1884, p. 24.

Table 1. Continued.

Date	Locality	Whales					I.D. Certainty ¹	Comments	Sources
		Seen	Taken	Struck /Lost	Chased	Drift			
1 March 1870	Provincetown Harbor	2		1			1	Mother and calf, cow struck; while lancing, the line had to be cut.	Allen, 1916, p. 137.
1887	Provincetown		1				1	Large, male, 47 ft.; 70 barrels oil.	Allen, 1916, p. 138.
20 May 1888	Provincetown (Massachusetts Bay)		2				1	Large, produced 170 barrels oil (one gave 80 bbls, 800 lbs baleen).	Allen, 1916, pp. 138-9, 171; <u>WSL</u> 46 (17): 29 May 1888.
May 1888	Provincetown		1				1	Large, found dead near Georges Bank; probably killed by steamer <u>A.B. Nickerson</u> ; 50 ft.	Allen, 1916, p. 139; <u>WSL</u> 46(17): 29 May 1888.
1 June 1888	Provincetown		1	1			1	Mother and calf. Mother 55-60 ft., produced 100 barrels oil, 1500 lb. baleen; "unusually large and fat"; calf sank; killed with bomb lances by steamer <u>A.B. Nickerson</u> . ²	Allen, 1916, pp. 130-1, 139, 143, 171; <u>WSL</u> 46(19): 12 June 1888.
1893	Tiverton, R.I.		1				2	Large, <u>ca.</u> 50 ft., stranded at Newport, R.I.	Allen, 1916, p. 139.
1894	Fort Adams, R.I. [check state?]		1				1	First seen off Conanicut Is. R.I.	Allen, 1916, p. 139.
October 1894	Boston Bay	1					1	Thought to have been the whale killed at Nahant the following March; may have overwintered in this area.	Allen, 1916, p. 139.

Table 1. Continued.

Date	Locality	Whales					I.D. Certainty ¹	Comments	Sources
		Seen	Taken	Struck /Lost	Chased	Drift			
Late March 1895	Nahant		1				1	Large, male, escaped towing gear; found dead on 1 April, 25 mi N. of Race Point; 42 ft, 50-60 bbl whale; 5½ ft. baleen.	Allen, 1916, p. 120, 139; True, 1904, p. 268.
15 Jan. 1909	Provincetown		1				1	Small, female, entangled in fish trap, killed with bomb lance; 10.59 m long; a "scrag".	Allen, 1916, plate 9, pp. 119, 140.
Spring 1910	Provincetown	1					1		Allen, 1916, p. 140.

¹ The certainty of our identification of the whales as right whales was evaluated according to the following criteria: 1 = whale was taken by shore whalers in 1725 or earlier; baleen at least 3 ft. long or considered worth saving; yield 40 barrels oil or more; whale clearly identified as a balaenid by our source (any one of these criteria is sufficient). 2 = whale was taken after 1725; no definite evidence it was a balaenid, but also no definite evidence that it was not. "The Right Whale and less often the Humpback, were the only species regularly hunted in our waters until the introduction of more deadly apparatus than the hand harpoon, so that it may usually be assumed that when 'whales' are mentioned in the old accounts as seen or pursued, the Right Whale is the species intended. Especially is this the case, since Finbacks or Humpbacks are usually so designated" (Allen, 1916, p. 132). No whale other than the bowhead has baleen longer than 3 ft. Though large sperm whales often yielded more than 40 barrels of oil, mysticetes other than balaenids rarely did, particularly when only the blubber was tried out (see Mitchell and Reeves, 1983, p. 188, for a discussion of humpback yields).

² Whalers also hunting fin whales at this time.

Table 2. Nantucket shore whaling. Citations for Little refer to Little (1981).

Date	Evidence of Whaling Activity	Whales			I.D. Certainty ¹	Source
		Seen	Taken	Drift		
14 May 1605	"Saw many whales, as we had two or three days before" at 41°20'.	2+			2	Little, p. 11
1686	Possible sale of products from drift whale by Indians.			1	2	Little, p. 32
1691	Possible sale of products from drift whale by Indians.			1	2	Little, p. 32
1691 - 1695	Four whaling stations active on S side.					Little, p. 19, 22
1696 - 1719 [or 1731]	Evidence of whaleboat building and whaleboat oar crafting on the island.					Little, tables 5, 6
1696 - 1733	Tools for whaling from boats in blacksmith's account book.					Little, table 7
1702 - 1723	Shore whaling stations active.					Little, p. 25
7th day, 11th month 1708	A "stunt".		1		1	Blacksmith, 1683-1738; also see Little, p. 11
1709	By this time, sloops carrying 2 whaleboats each were being used to whale on Nantucket Shoals.					Little, pp. 11-12
Winter 1710	A "cutter" paid for cutting blubber.		1[?]		1	Little, p. 8
1711	A "dryskin", a "yearling", and possibly a third "fat" whale taken. ³		2-3		1	Little, pp. 11, 75
1712	A sperm whale ("Spermaseta") caught. Supposedly the first of its species taken by Nantucket whalers; taken "accidentally some distance south of Nantucket".					Blacksmith, 1683-1738; Little, p. 12
ca 1712	"Triing of 2 barills of fat whale."		1[?]		1	Little, appendix 10
1713	A "dryskin" and possibly a second "fat" whale taken. ²		1-2		1	Little, pp. 11, 75

Table 2. Continued.

Date	Evidence of Whaling Activity	Whales			I.D. Certainty ¹	Source
		Seen	Taken	Drift		
1714	Reference to "the first whale".		1		1	Macy, 1707-1760
1715	References to "the first whall" and "the second whall".		2		1	Little, appendix 10, p. 76
1715			15(est.)			See text
1716	Dispute concerning role of Indians in whaling.					Anon., 1919
1717	Reference to "whaleing and fishing on this shore"; reference to "the vinyar whale" (attributed to 1714 by Little); "18 long bone sold".		1(+?)		1	Macy, 1707-1760; Little, pp. 75-76
1718	Complaint by Indians about their whaling returns.					Little, p. 70; Starbuck, 1924, p. 143
1718	Began whaling "out in the deep".					Little, p. 12
1726	28 boat crews of 6 men each.		86		2	Starbuck, 1924, p. 356; Macy, 1835, p. 31; Starbuck, 1878, p. 22
1726	ca 27-30 "whale houses" on Nantucket.					Little, p. 25
December 1727	A day's whaling trip.		1		2	Little, pp. 7, 70
1727	Share (lay) of 1 ⁷ / ₈ barrels oil indicates a whale was taken.		1		2	Little, p. 32, appendix 7
February 1729 or 1730	A whaling voyage in a whaleboat was made from Nantucket to Martha's Vineyard.					Little, pp. 7, 70
Late February 1731	Reference to "a whale day", indicating interest in shore whaling was alive.					Little, pp. 7-8

Table 2. Continued.

Date	Evidence of Whaling Activity	Whales			I.D. Certainty ¹	Source
		Seen	Taken	Drift		
1732	As many as 27 whaling "companies" may have been whaling alongshore.					Little, p. 33, appendix 2
1746 - 1750	At least a "cow & calf" taken.		2		2	Little, p. 16
1760	"Along-shore whaling continued at Nantucket until 1760." 28-30 max. no. of shore whaleboats at Nantucket.					Little, pp. 15-16
1775	Whale houses and look-out masts in place at Siasconset.					Little, p. 18
No date (before 1792)	30 whaleboats at sea S of Nantucket.					Little, p. 8
3 May 1796	A floating sperm whale found and towed by a sloop to Nantucket; made 50 bbls body oil and 35 head; sold for \$2689.					<u>N.B. Medley</u> , 6 and 20 May 1796
10, 19 April 1800	One large and one small, 31 and 16 barrels oil on 10 April. 30 barrels oil on 19 April.	+	3		1	Macy, 1835, pp. 150-1; Allen, 1916, pp. 129, 134
Early June 1854	"A large humpback or right whale" seen for several days, preparations made to chase it.	1			2	<u>The Whaleman</u> , New Bedford, 9 June 1854; <u>WSL</u> 12(15); 13 June 1854
10 November 1863	One whale seen, not chased.	1			1	Allen, 1916, p. 137
End November 1864	2 whales seen and chased.	2			1	Allen, 1916, p. 137
April 1871	Found dead in the sound; towed to Nantucket and flensed.			1	1	Stackpole, 1982
1st week November 1876	Large (40 bbl) whale chased.	1			1	Allen, 1916, pp. 137-38

Table 2. Continued.

Date	Evidence of Whaling Activity	Whales			I.D. Certainty ¹	Source
		Seen	Taken	Drift		
1 November 1877	A "large scrag whale" seen.	1			2	Allen, 1916, p. 138
Mid April 1886	Produced 125 barrels oil and 1500-2000 lb baleen, all told. One sank in 11 fathoms. Nantucket and Tuckernuck (one towed to New Bedford).		4		1	Allen, 1916, pp. 126-128, 138, 171; WSL 44(13):4 May 1886; Stackpole, 1982
Late April to early May 1886	Up to 25 whales seen near coast; chased by schooner <u>Glide</u> .	ca 25			1	Allen, 1916, p. 138
10 May 1886		1			1	Allen, 1916, p. 138
1st week April 1891	"Several" seen.	2+			1	Allen, 1916, p. 139
1-4 April 1897	"Several" seen and chased.	2+			1	Allen, pp. 139-140
ca 24 May 1913	S shore of Muskeget Island.	2			1	Allen, 1916, p. 140

¹ The certainty of our identification of the whales as right whales was evaluated according to the following criteria: 1=whale was taken by shore whalers in 1725 or earlier; baleen at least 3 ft long or considered worth saving; yield 40 barrels oil or more; whale clearly identified as a balaenid by our source (any one of these criteria is sufficient). 2=whale was taken after 1725; no definite evidence it was a balaenid, but also no definite evidence that it was not. See Table 1, footnote 1.

² Little (1981, e.g. p. 11) interpreted the listing "...fat whale..." in the account books she examined to refer to "fat" whales taken. However, we suspect that in the context it may have meant "whale fat". Thus, it should not necessarily be taken as evidence that an additional whale was caught.

Table 3. Entries referring to whales or whaling in Manasseh Minor's diary, 1696-1720 (Miner and Miner, 1915).

Date	Entry	Page of published diary
3 December 1697	Robin Abnar and pelig went a whalin.	26
17 October 1698	I went to fishars island for oyle.	31
14 December 1702	Abell went a whaling.	57
24 February 1703	Sam hand & Company cam hear.	59
25 February 1703	the whale brak their boat.	59
3 March 1703	...a whale broght on shore.	59
4 March 1703	...the boat lanchd.	59
5 March 1703	wee went to see the whale.	59
10 March 1703	a whale at wadawanvk.	59
16 March 1703	Abel came from whaling.	59
22 March 1703	Samvel hand came a whaling.	59
23 March 1703	killed 3 whals amongst them....	59
27 March 1703	Sam hand went to cut his great whale....	59
4 March 1705	...a whal killed.	75
8 March 1705	I sold one barill of sider to the whalmen....	75
4 August 1706	wee feched the whal boat....	94
14 August 1706	we went to fishas island in a whal boat.	94
22 April 1709	I feched the whal boat home.	115
21 December 1714	I broght oyle from SC.	120

Table 4. Information on Long Island shore whaling not included in Reeves and Mitchell (1986a, table 1). Where Reeves and Mitchell (1986a) is cited as one of the sources, the record itself was included in the previous table but the data presented here supplement or clarify those given earlier.

Date	Locality	Comments	Source
Early March 1895	Bridgehampton	Right whale chased by 2 boats.	<u>Brooklyn Daily Eagle</u> , 10 March 1895, p. 7
17 October 1895	Easthampton and Amagansett	Right whale and fin whale chased by 2 boats.	<u>East Hampton Star</u> , 18 October 1895; <u>Brooklyn Daily Eagle</u> , 19 October 1895, p. 7
4 November 1895	Gardiners Bay	Fin whale chased by 2 Greenport boats.	<u>Brooklyn Daily Eagle</u> , 4 November 1895
20 February 1897	Amagansett	40-ft right whale, produced less oil and bone than expected. Actual yield was 18 bbls, 375 lbs; expected yield had been 30 bbls, 600-700 lbs.	Reeves and Mitchell, 1986a; <u>Brooklyn Daily Eagle</u> , 26 February 1897, p. 4
Early December 1905	E of Fire Island Inlet	Capt. Tyson Dominy of Easthampton killed 3 finbacks; all sank.	<u>New York Tribune</u> , 11 December 1905, p. 8
March 1883	Amagansett	Large [right] whale struck and lost; carcass seen floating "miles off the shore" next day.	<u>New York Tribune</u> , 26 January 1885, p. 5
Winter 1883-84	Amagansett	No whales seen.	<u>New York Tribune</u> , 26 January 1885, p. 5
27 December 1893	Southampton	The large right whale was taken by 2 boats headed by Captains Rogers and Hubert White, "two retired Arctic whalers"; estimated worth: \$2,000.	Reeves and Mitchell, 1986a; <u>New York Tribune</u> , 28 December 1893, p. 5
22 March 1907	Amagansett	5 boats chased a whale.	<u>New York Sun</u> , 23 March 1907, p. 5

Table 4. Continued.

Date	Locality	Comments	Source
21 March 1911	Southampton	2 boats chased a "school" of whales.	<u>New York Tribune</u> , 22 March 1911, p. 14
7 April 1894	Amagansett	Large right whale, 50 ft long, baleen 7 ft, expected yield of at least 50 bbls.	<u>New York Tribune</u> , 8 April 1894, p. 1; <u>Brooklyn Daily Eagle</u> , 8 April 1894, p. 2; Reeves and Mitchell, 1986a
1853	Montauk and west	Schooner <u>Amulet</u> of Greenport had taken 3 [right] whales by 18 April; had seen whales 20 times.	<u>Whalemen's Shipping List</u> , 11(8): 26 April 1853.
4 September 1766	Coney Island	40 ft, expected to yield 70 bbls.	Weiss et al., 1974, p. 104.

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Table 5. Records of right whales from the coasts of Delaware, Pennsylvania and New Jersey.

Date	Locality	Whales					I.D. Certainty ¹	Comments	Sources
		Seen	Taken	Struck/Lost	Drift	Chased			
5 Dec. 1632	Near Cape Henlopen	1					2		Parr, 1969, p. 118
1-2 Jan. 1633	Well inside Delaware Bay	3					2		Parr, 1969, p. 125
1 Jan. - end of March 1633	Delaware Bay		7	10			1	32 barrels of oil; the 7 secured whales were the smallest of those struck.	Parr, 1969, pp. 127, 130
1646	North River	2					1	1 "grounded on an island".	Weiss et al., 1974, p. 103
1668 - 1671	Navesink				1		1	1 whale "cast ashore" and "delivered to" a whaling company.	Weiss et al., 1974, p. 16
ca 1683	Mouth of Delaware Bay		11				1		Watson, 1855, vol. 2, p. 428
1684	Near mouth of Delaware Bay		9	3			1	All before 4 April.	Weiss et al., 1974, p. 15
1685	Delaware Bay		1				1		Lipton, 1975, p. 11; Weiss et al., 1974, p. 24
1688	Delaware River up as far as Trenton Falls	1					2		Watson, 1855, vol. 2, p. 428
Winter 1693 - 1694	Cape May		8				1		Beesley, 1857, p. 175-6

Table 5. Continued.

Date	Locality	Whales					I.D. Certainty ¹	Comments	Sources
		Seen	Taken	Struck/ Lost	Drift	Chased			
Winter 1695 - 1696	Cape May		2				1	"Old cow and calf".	Beesley, 1857, p. 175-6
Winter 1696 - 1697	Cape May		+				1	"Made a great voyage".	Beesley, 1857, p. 175-6
Winter 1717 - 1718	Cape May Egg Harbor		6 12				1 1		Weiss et al., 1974, p. 22, 34 [The Boston Newsletter, 24 March 1718]
1730	North of Cape May		1				2	"Cow" whale, 50 ft long, stranded, apparently killed by local whalers.	Watson, 1855, vol. 2, p. 429
April 1733	Delaware River near Philadelphia					2	2	Cow and calf.	Watson, 1855, vol. 2, p. 429
February 1736	Cape May		2				2	40 barrels of oil.	Watson, 1855, vol. 2, p. 429
ca April 1742	Eastward of Cape May		2				1	ca 4½ ft bone, near 7 ft bone.	Lipton, 1975, p. 17. [Boston Gazette or Weekly Journal of May 11, 1742]; Weiss et al., 1974, p. 22
February 1744	Sandy Hook		1[?]				2	36 ft long, tail 10 ft broad.	Weiss et al., 1974, p. 104 [This old Monmouth of Ours, W.S. Horner, Freehold. 1932]
March 1752	"Briginteen" Beach		2				1	1 a yearling, 1 a stunt.	Table 6
Spring 1753	Cape May		6				2		Weiss et al., 1974, p. 22. [Sarah A. Thomas. Cape May Co. Mag. Hist. and Geneal June 1950, p. 118]

Table 5. Continued.

Date	Locality	Whales					I.D. Cert. ainty ¹	Comments	Sources
		Seen	Taken	Struck/ Lost	Drift	Chased			
February - April 1756	Pecks Beach	3+					2		Table 6
March - April 1757	Five Mile Beach, Cape May Co.	2+					2		Table 6
February - March 1759	Absecon	2+					2		Table 6
April 1764	Townsend's Inlet	2+	1	1		2+	1	Secured whale sank and was recovered 2 days later; 23 barrels oil, 230 lbs bone, 4 ft 8 in. long.	Table 6
February [and later] 1765	Pecks Beach (Ocean City), Ludlam's Beach (Cape May Co.)	"Plenty"	4				2		Table 6
January 1766	Pecks Beach	+					2		Table 6
1766	"Below the Narrows on the east side"				1		2	Cast ashore, 49 ft long.	Weiss et al., 1974, p. 104. [Journals of Capt. Montrossor. N.Y. Historical Society Collections, vol. 14, 1881]
September 1766	Coney Island		1				2	40 ft long, 70 barrels oil (expected); taken by 2 men from Elizabethtown, N. J., at Coney Island, N.Y.	Weiss et al., 1974, p. 104 [Proc. N.J. Hist. Soc., vol. 13, no. 4, 1928]
1782	Manasquan Beach		1				2	Found dead 15 Sept. with harpoon in carcass.	Weiss et al., 1974, p. 18, 104 [New Jersey Gazette, Oct. 9, 1782]

Table 5. Continued.

Date	Locality	Whales					I.D. Certainty ¹	Comments	Sources
		Seen	Taken	Struck/ Lost	Drift	Chased			
1792	Absecon Beach		1				2	Washed ashore at Absecon bearing 2-3 harpoons.	Weiss et al., 1974, p. 34 [Wilson, H. 1953. The Jersey Shore]
1803	Absecon Bar		1				1	Stranded or. Absecon Bar; had been struck and lost by Long Beach Island whalers.	Lipton, 1975, p. 17 [Kraft, B. R. 1960]; Weiss et al., 1974, p. 34, 104 [Wilson, H. 1953. The Jersey Shore]
1809	Delaware River near Chester, Pa.		1				2		Watson, 1855, vol. 2, p. 429; <u>contra</u> Weiss et al., 1974, p. 109
1813	Absecon Beach				1		2	Dead whale floated ashore.	Weiss et al., 1974, p. 104-5 [Diary of Samuel Mickle, in Notes on Old Gloucester County, N.J. F.H. Steward Ed., 1917, vol. 1, p. 197]
November 1814	Delaware River just below Trenton Bridge		1				1	22 ft long, 1 ft 8 in. baleen.	Weiss et al., 1974, p. 18, 105, 109, 111 [Sussex Register]; Rhoads, 1903, p. 11
6 May 1820	Sandy Hook			1			2		See text
13 May 1820	Sandy Hook		1				1		See text
20 May 1820	Sandy Hook(?)		1				2	Washed ashore in Long Island Sound, thought to have been harpooned earlier off Sandy Hook.	Weiss et al., 1974, p. 18, 105; see text
1824	Near Bayonne, N.J.				1		2	Washed ashore on 7 April, 52 ft or 58 ft long.	Weiss et al., 1974, p. 18, 105 - 06 [The Washington Whig, Bridgeton, N.J. Aug. 28, 1824]

Table 5. Continued.

Date	Locality	Whales					I.D. Certainty ¹	Comments	Sources
		Seen	Taken	Struck/ Lost	Drift	Chased			
End of March 1825	Cape May					+	2		Weiss et al., 1974, p. 22, [The Bridgeton Observer and Cumberland, Cape May and Salem Advertiser, April 2, 1825]
8 November 1861	Delaware River near Richmond	1					2	Swimming downstream.	Weiss et al., 1974, p. 106
1862	Delaware River near Philadelphia		1				1	37 ft.	Cope, 1865, 1866
ca 1864 - 1865	Raritan Bay		1[?]				1		<u>New York Times</u> , 15 March 1891
30 May 1874	Raritan River near Sayreville		1				1	48 ft, 4 ft baleen.	Cope, 1874, p. 89; Rhoads, 1903, p. 13
ca 10 May 1878	Long Bran		1				1	"A Greenland whale"; 42 ft, expected to produce 60 bbls oil.	<u>New York Times</u> , 12 May 1878
Spring 1882	Near Egg Harbor		1				1	"Shot with a rifle, hacked with an axe, and at last killed with a harpoon"; 48 ft, female.	Weiss et al., 1974, p. 110-11; Holder, 1883
1900 - 1910	Asbury Park				1		2	"Enormous whale was washed ashore."	Weiss et al., 1974, p. 107 [Postcard in Special Collections, Rutgers University Library]

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Table 6. Whaling data from Lewis Cresse's diary, 1752-1766. Source: Cresse (1968); some parts of the diary were quoted by Lipton (1975, pp. 15-16) and Weiss et al. (1974, pp. 26-28).

Year	Whaling season		Sightings	Struck/lost	Killed/secured	Whaling sites
	Start date	End date				
1752	?	?	?	?	1 "stunt" on 23 March; 1 "yearling" on <u>ca</u> 22 March	Brigonteen Beach
1753	1 March	1st wk April	?	0	0	Briginteen
1754	27 Feb.	9 April	0	0	0	Absecon
1755	7 March	8 April	"Saw Several Spouts at Several times but Concluded they was chiefly fin backs."	0	0	Briginteen
1756	24 Feb.	7 April	One in late Feb.; "several" in late March or early Apr.	0	0	Pecks beech
1757	4 March	15 April	"Saw Whales and Spouts Several times."	0	0	Five mile Beech
1758	3 April	18 April	0	0	0	"Rangd as far as briginteen."
1759	26 Feb.	26 March	"Saw Several Spouts."	0	0	Absecon
1760	4 March	2 April	0	0	0	Briginteen
1764	?	?	"Plenty" on 2 April; more on 9 April.	1; "it was generally agreed She would Die of the wound" (2 April).	1 killed 9 Apr., sank, came ashore 11 Apr. "west of the Dry inlet"; 23 bbls, 230 lbs bone (4 ft 8 in. long).	Five mile Beetch; Townsends Inlet

Table 6. Continued.

Year	Whaling season		Sightings	Struck/lost	Killed/secured	Whaling sites
	Start date	End date				
1765	February	?	"Plenty".	0	2 by Cresse's co.; 1 by them in coop. with Ludlams Beach co.; 1 by Ludlams Beach co. alone.	Seven Mile Beach; Peck Beach; Ludlams Beach
1766	28 Jan.	?	"Saw no whales onely Som Spouts."	0	0	Pecks Beach

FIGURE LEGENDS

- Figure 1. Number of right whales killed, by decade, Maine to Florida, 1630-1939. Data from Tables 1-6 and text of this paper, Reeves and Mitchell (1986a, b; 1987MS), and Reeves and Barto (1985). Documented secured catch has been multiplied by 1.2 to correct for hunting loss.
- Figure 2a-1. Frequency of occurrence of right whales, by month, in four regions: New England, Long Island, New Jersey and Delaware Bay, and North Carolina to Florida. Data from Tables 1-6 and text of this paper, Reeves and Mitchell (1986a, table 1), Reeves and Mitchell (1986b, table 3), and Reeves and Mitchell (1987MS, table 2).

RIGHT WHALE HUNTING MORTALITY

1630 - 1939

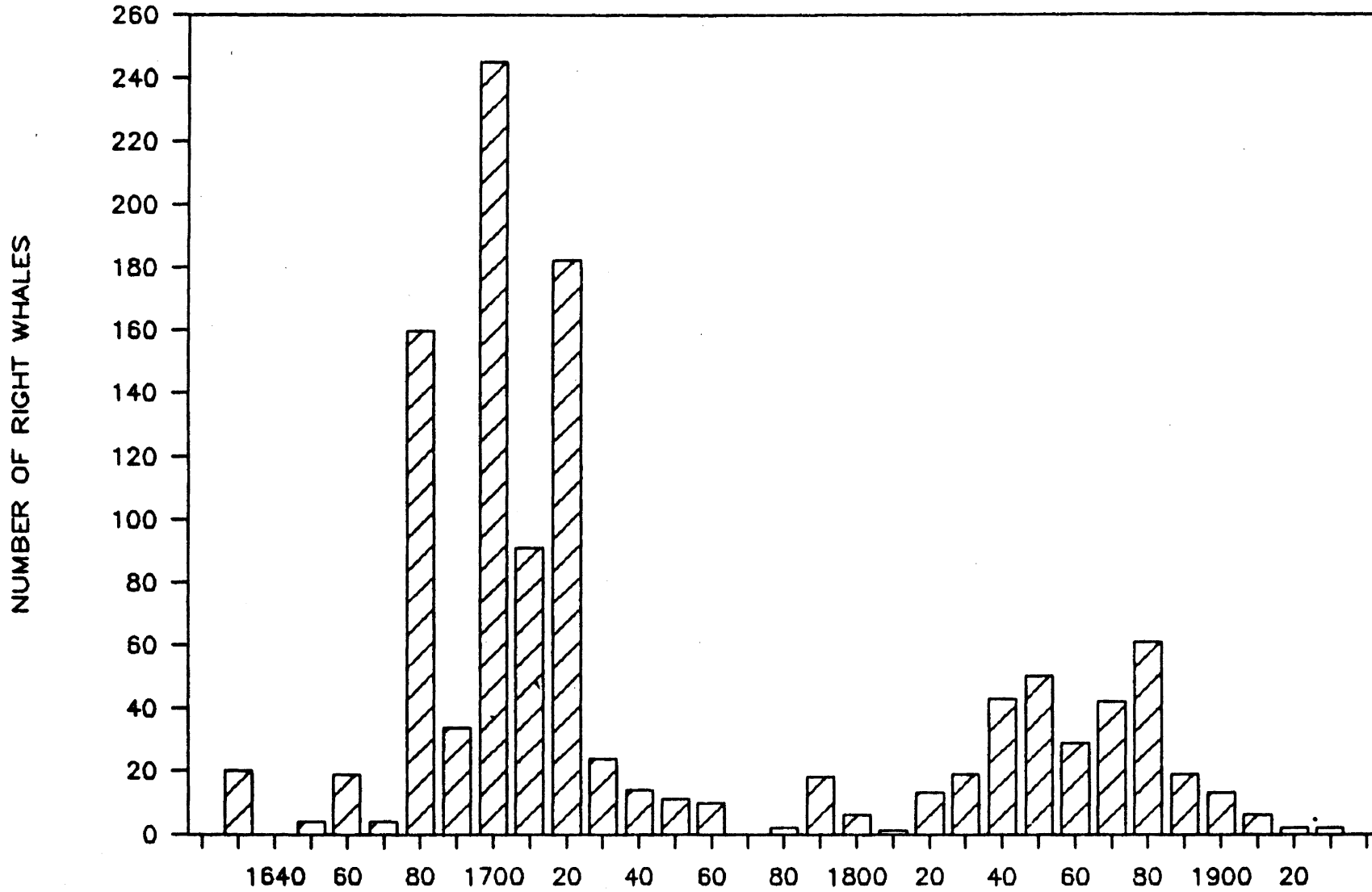
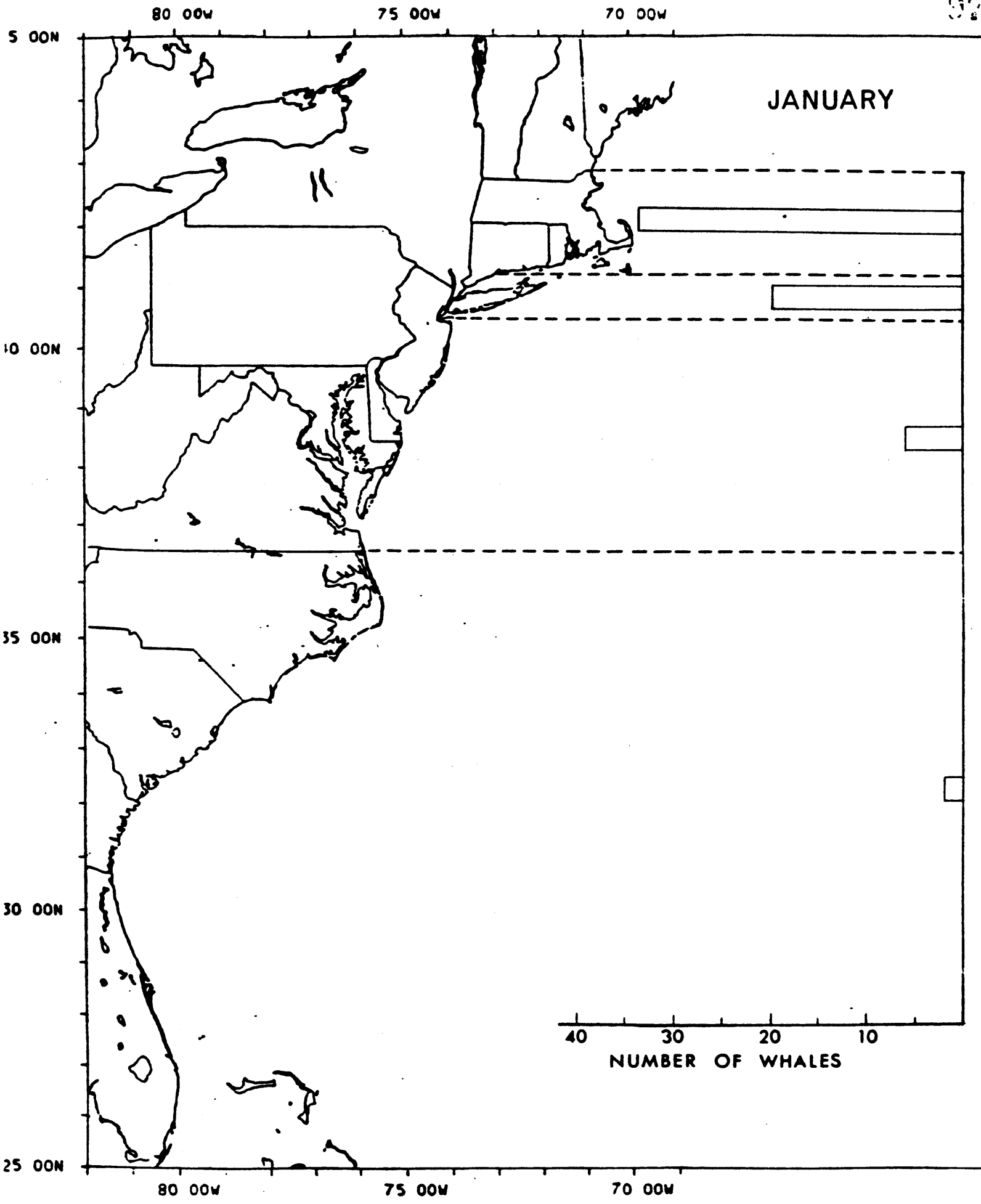
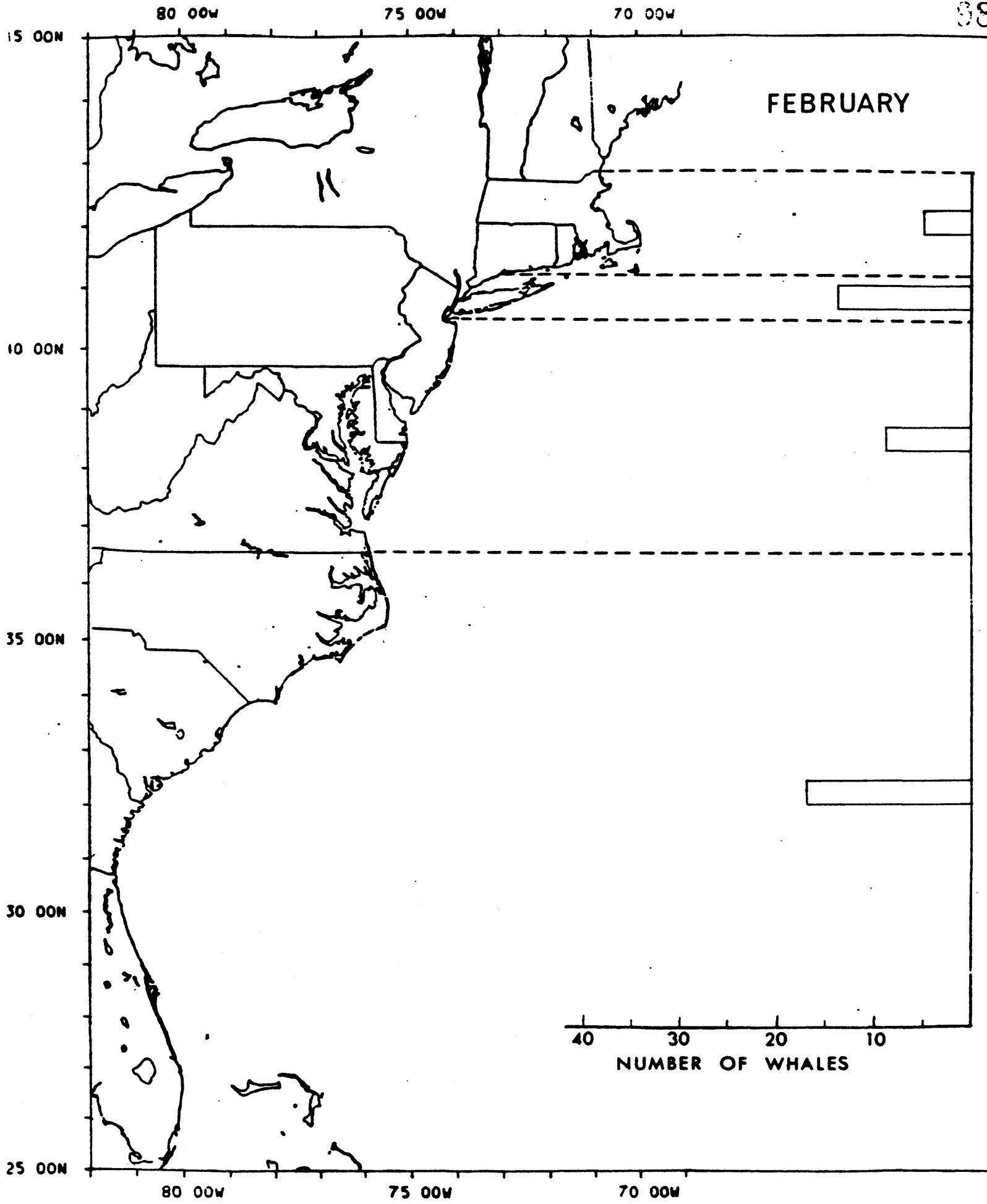


FIGURE 1



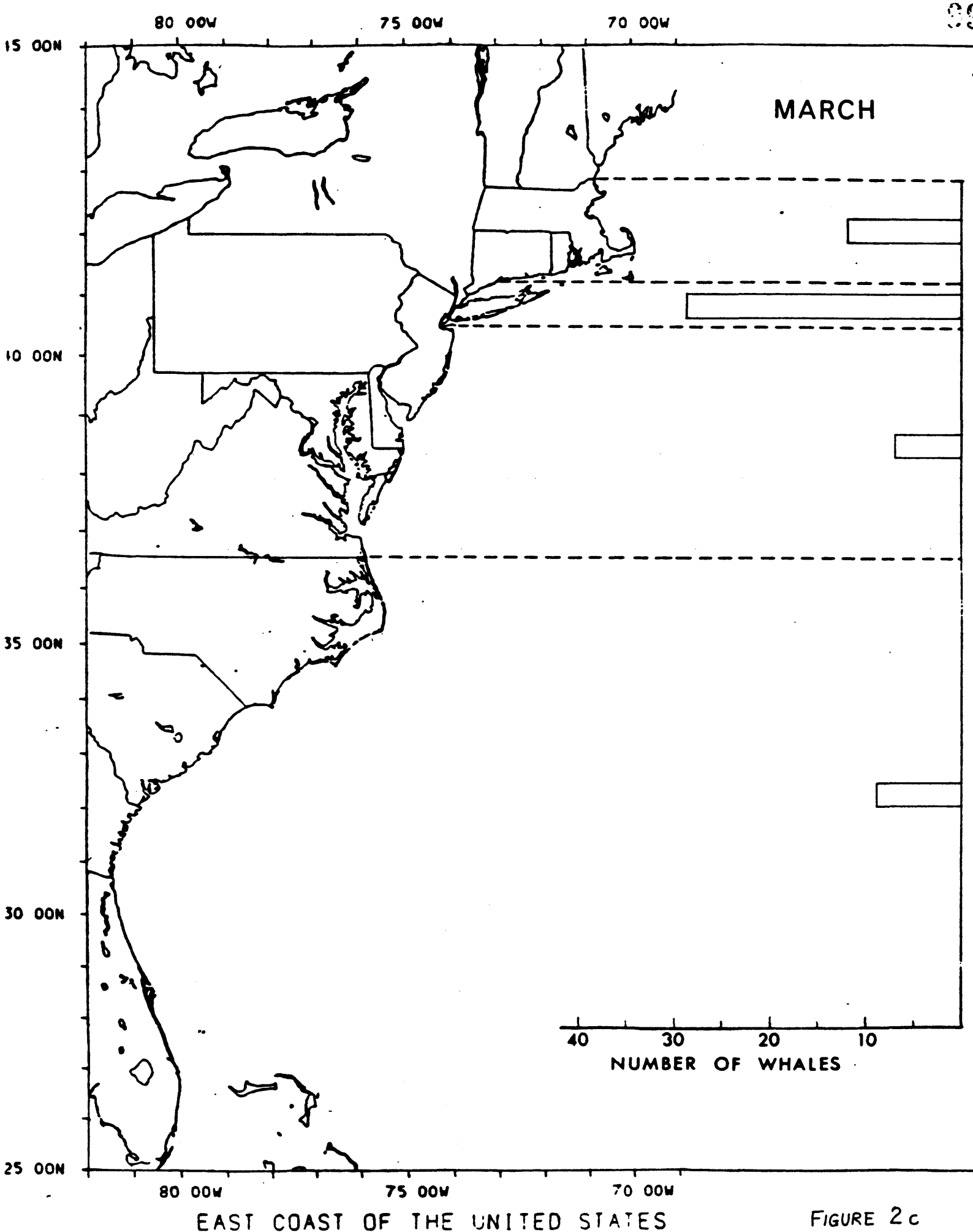
EAST COAST OF THE UNITED STATES

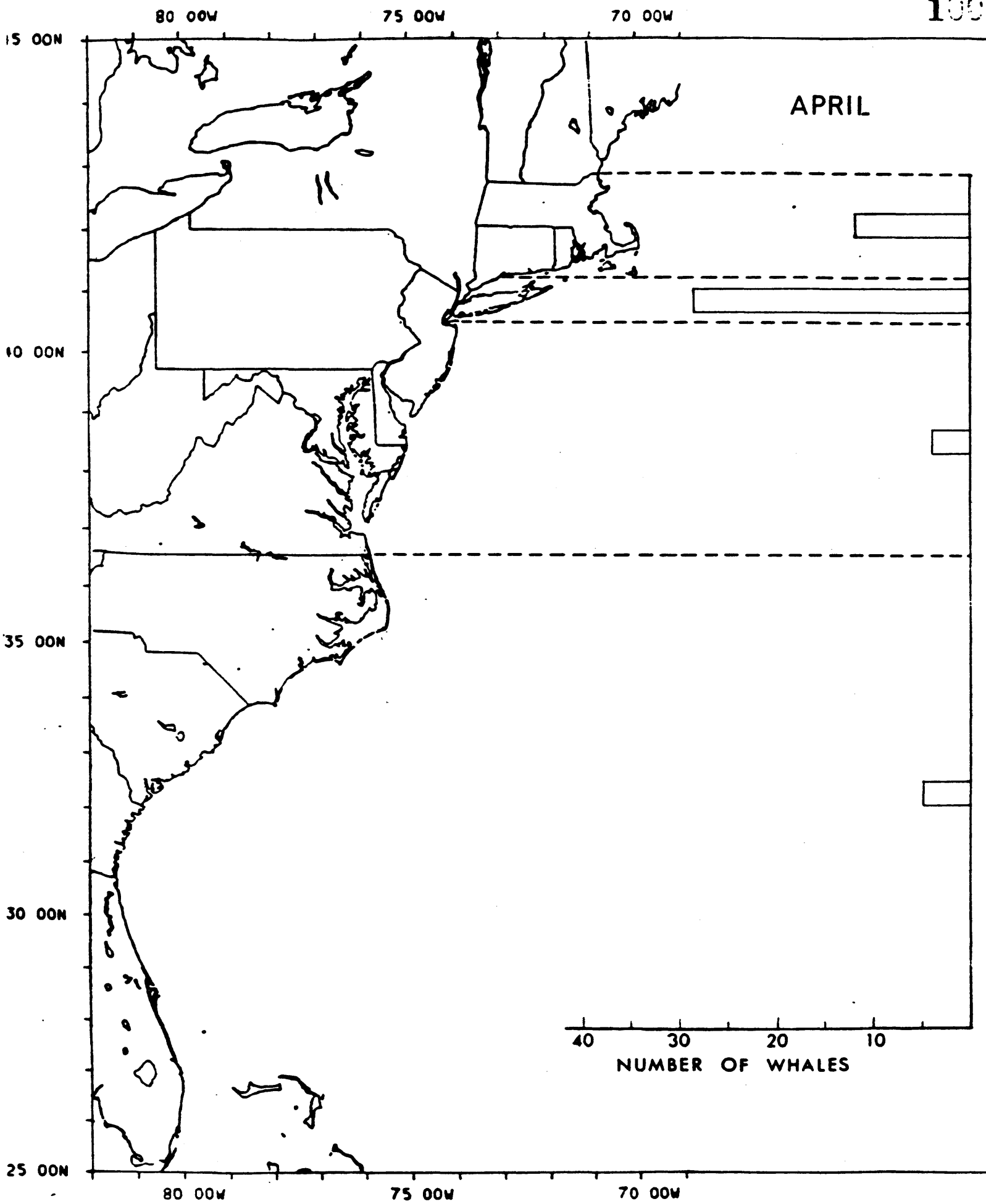
FIGURE 2a



EAST COAST OF THE UNITED STATES

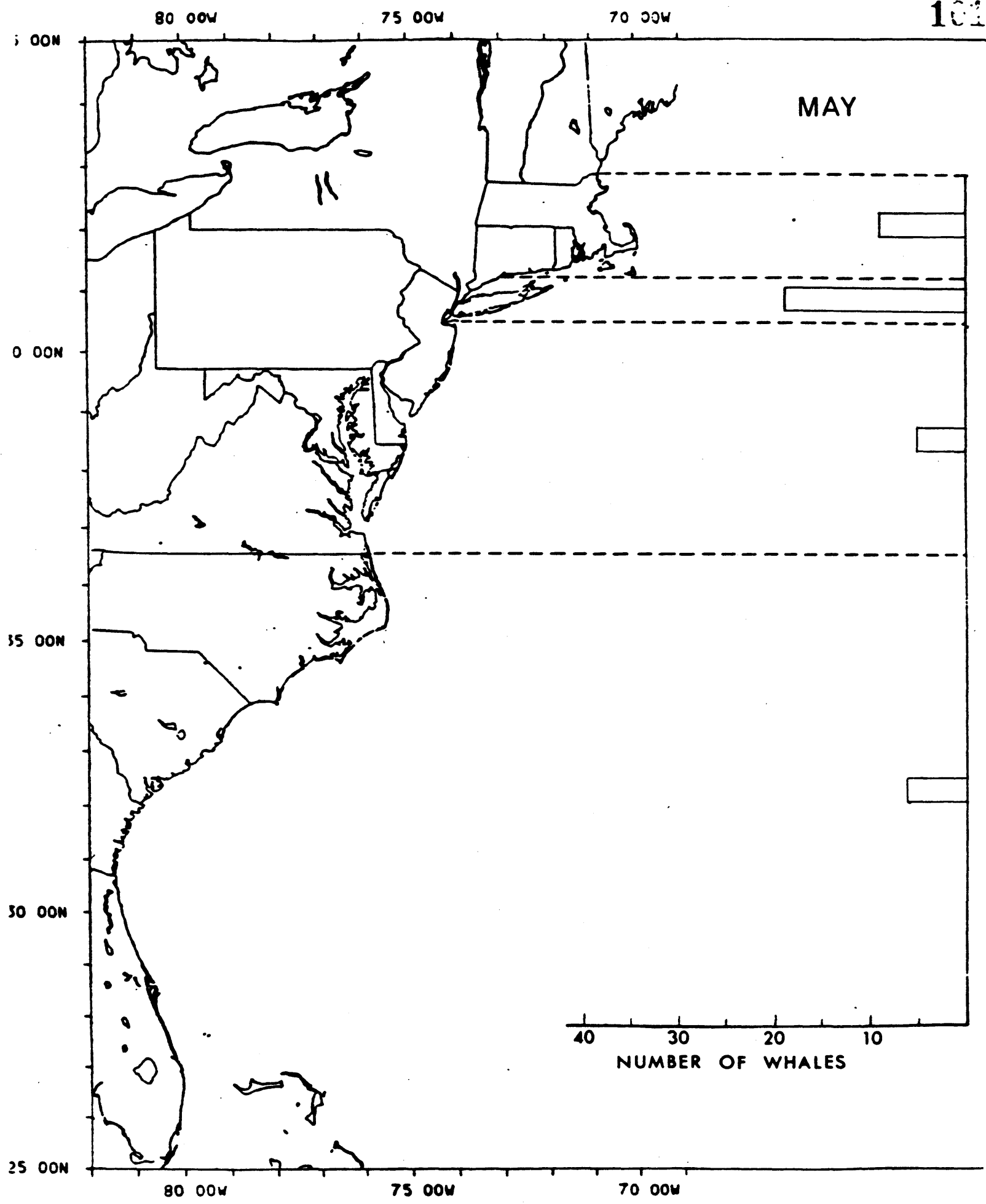
FIGURE 2b





EAST COAST OF THE UNITED STATES

FIGURE 2d



EAST COAST OF THE UNITED STATES

FIGURE 2e

80 00W

75 00W

70 00W

45 00N

JUNE

40 00N

35 00N

30 00N

25 00N

80 00W

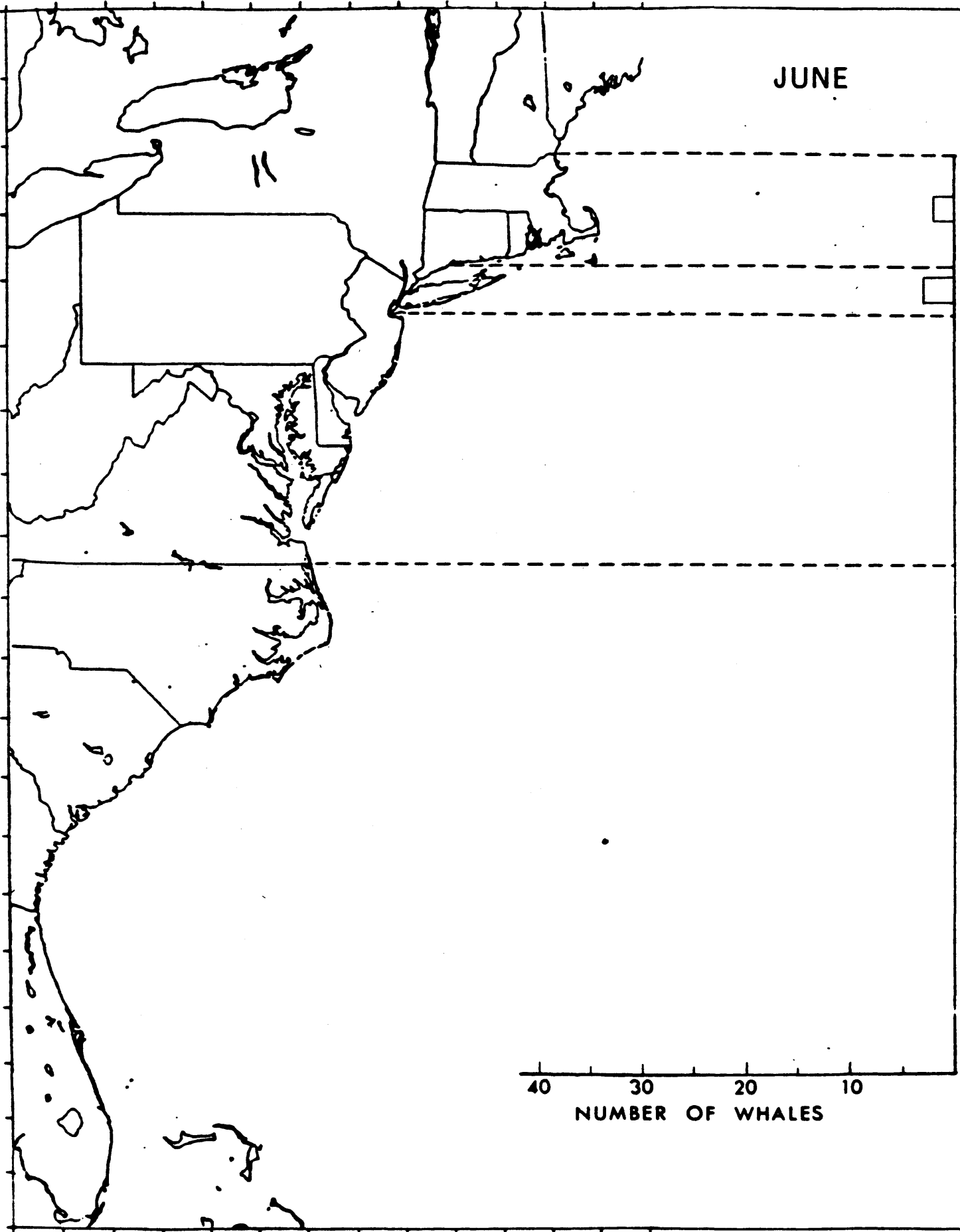
75 00W

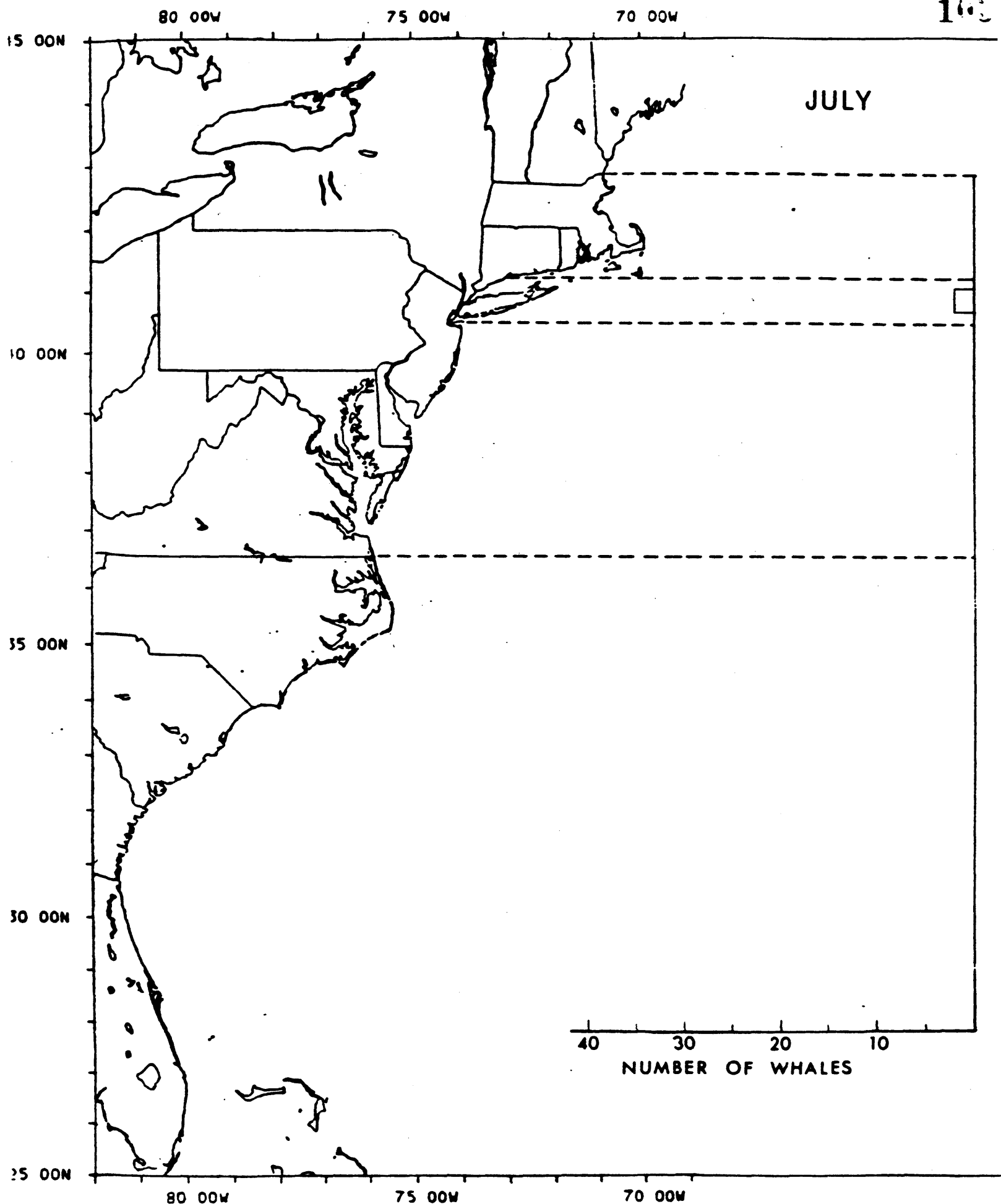
70 00W

40 30 20 10
NUMBER OF WHALES

EAST COAST OF THE UNITED STATES

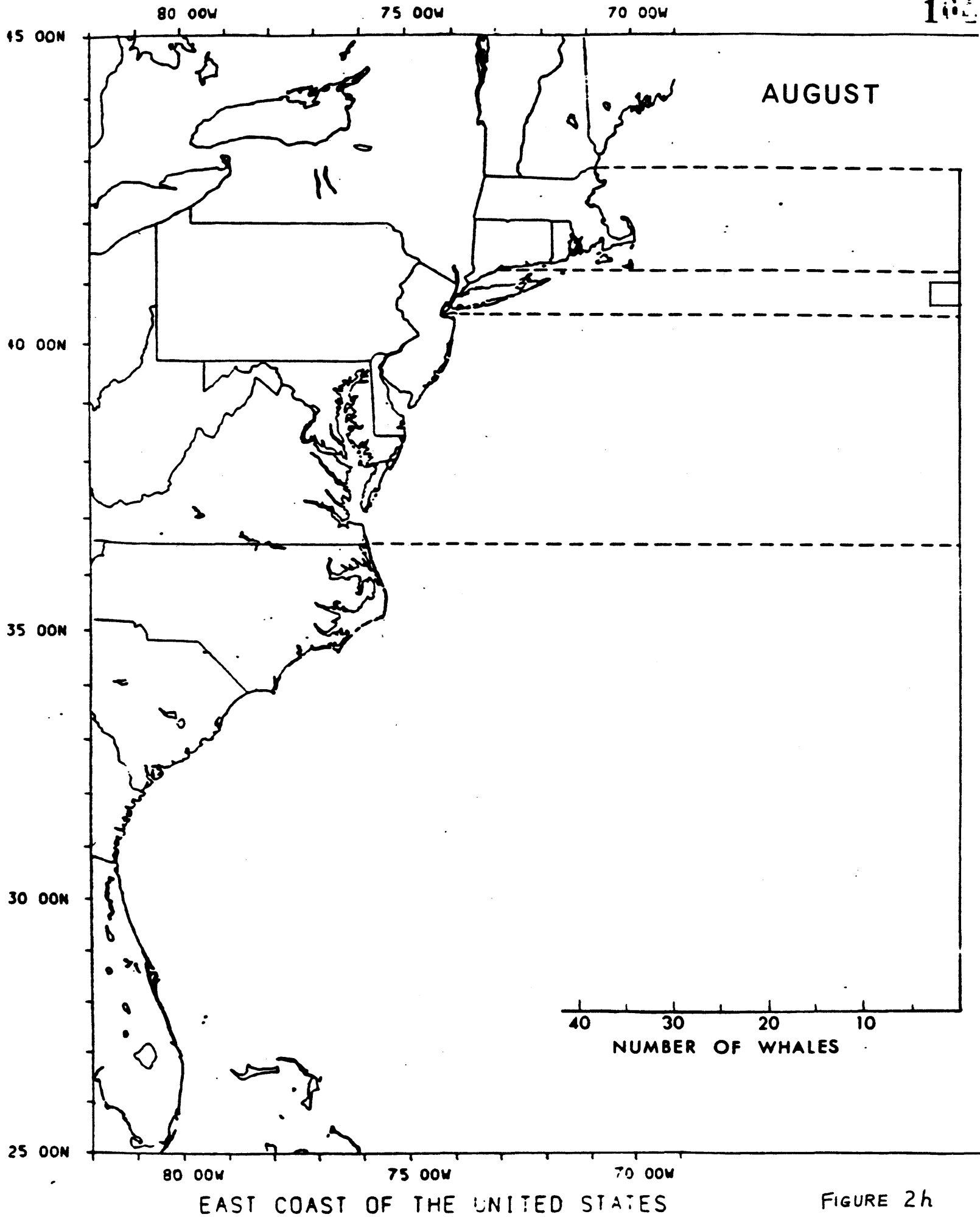
FIGURE 2f





EAST COAST OF THE UNITED STATES

FIGURE 2g

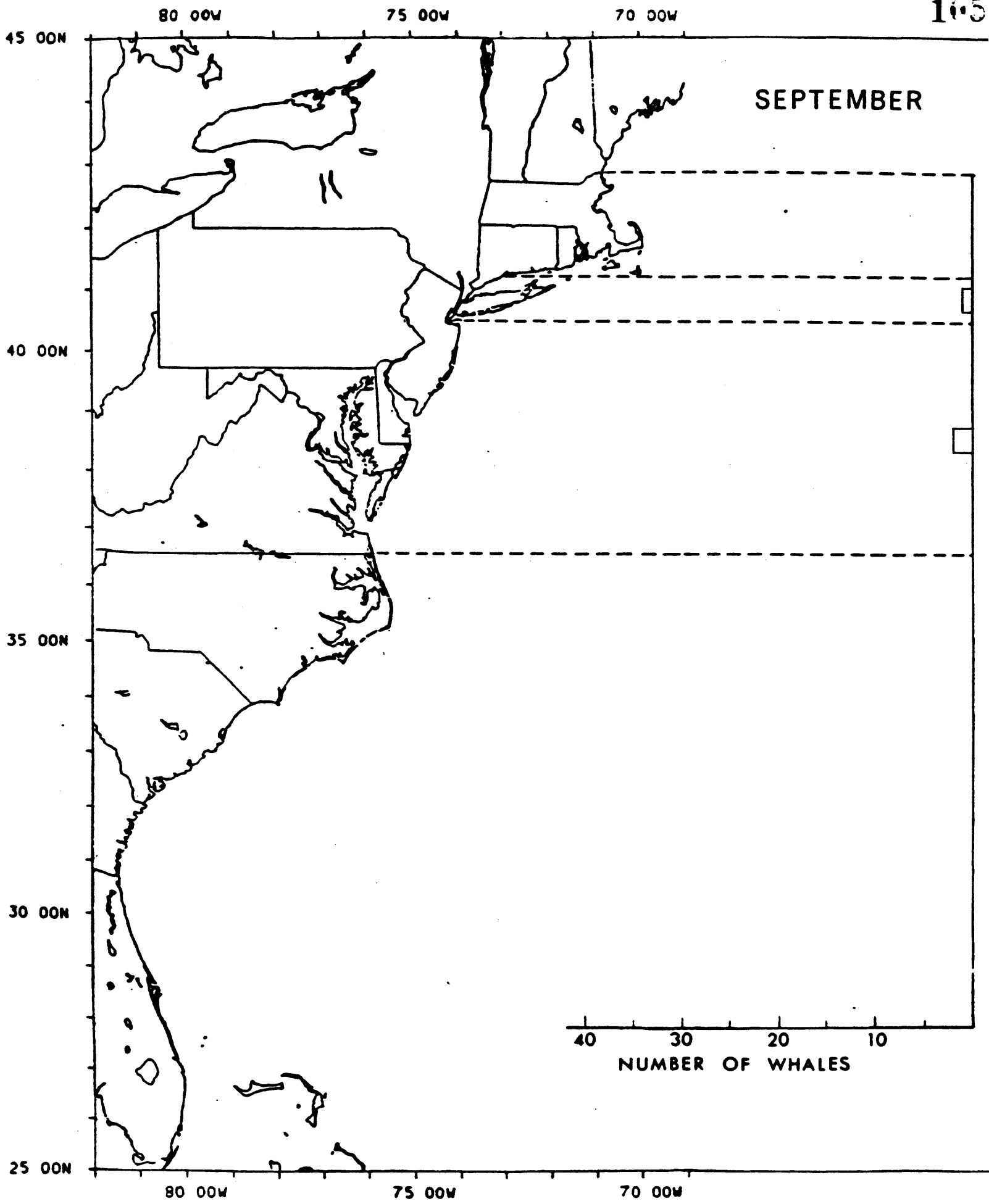


AUGUST

40 30 20 10
NUMBER OF WHALES

EAST COAST OF THE UNITED STATES

FIGURE 2h



EAST COAST OF THE UNITED STATES

FIGURE 2i

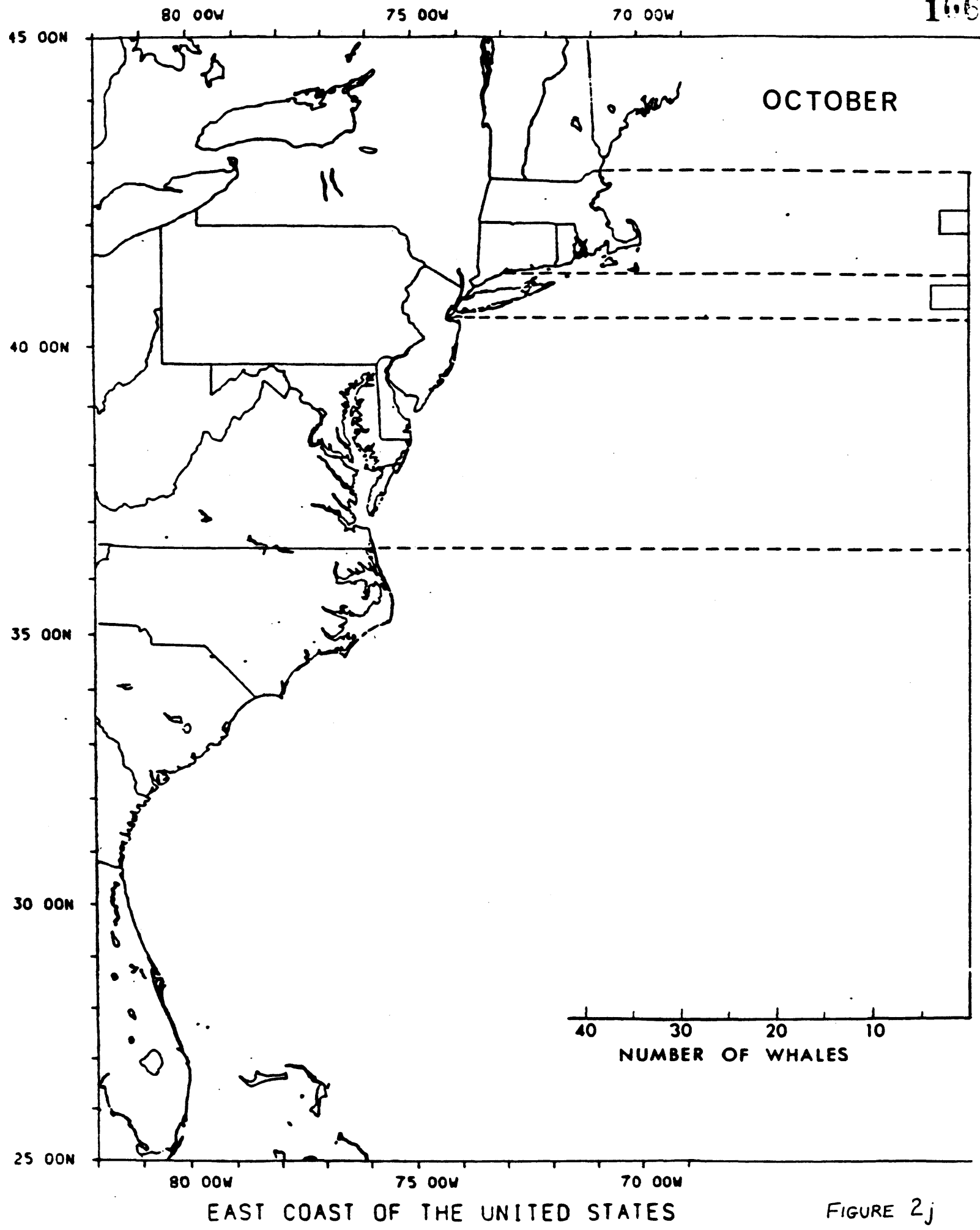
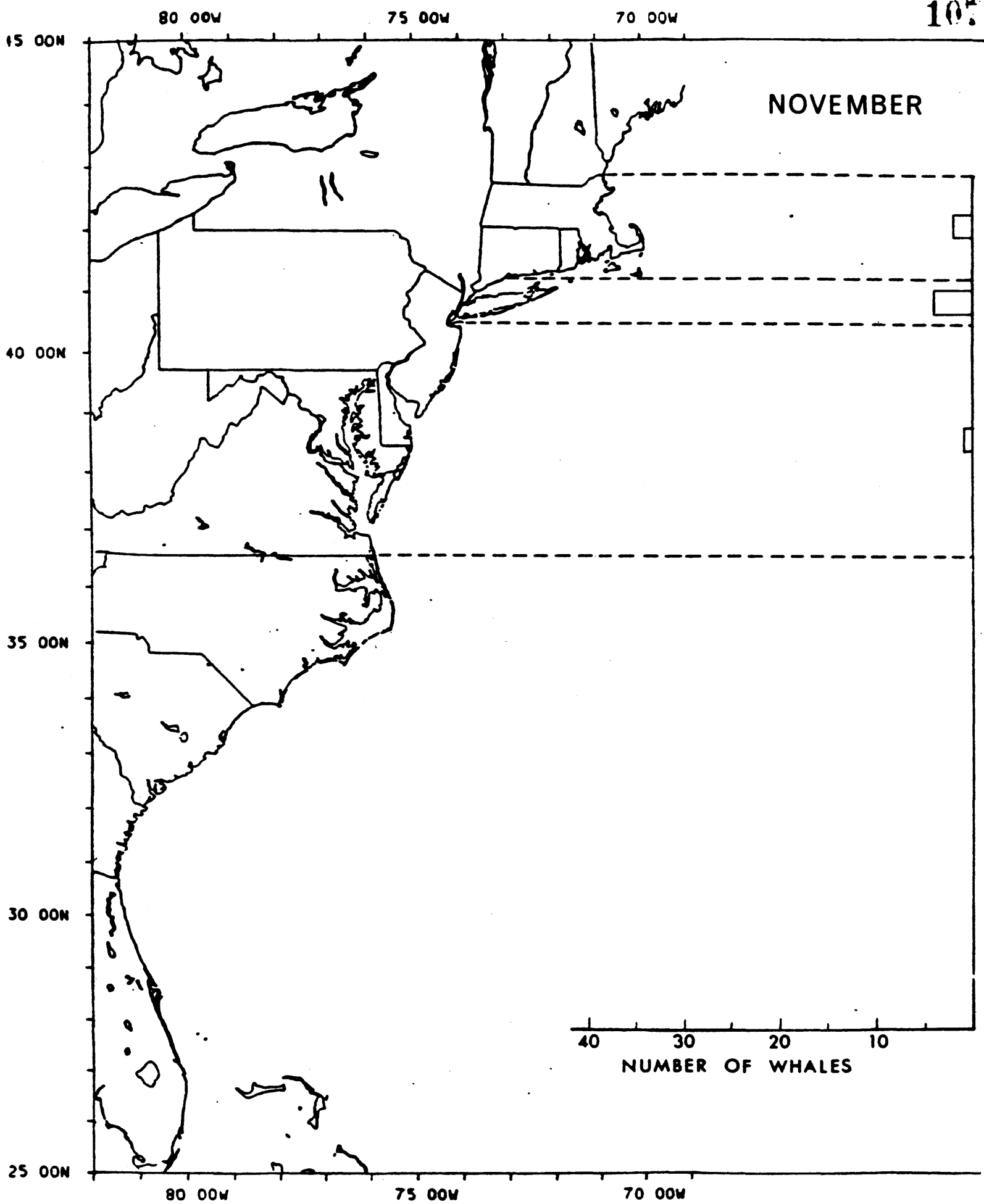


FIGURE 2j



EAST COAST OF THE UNITED STATES

FIGURE 2k

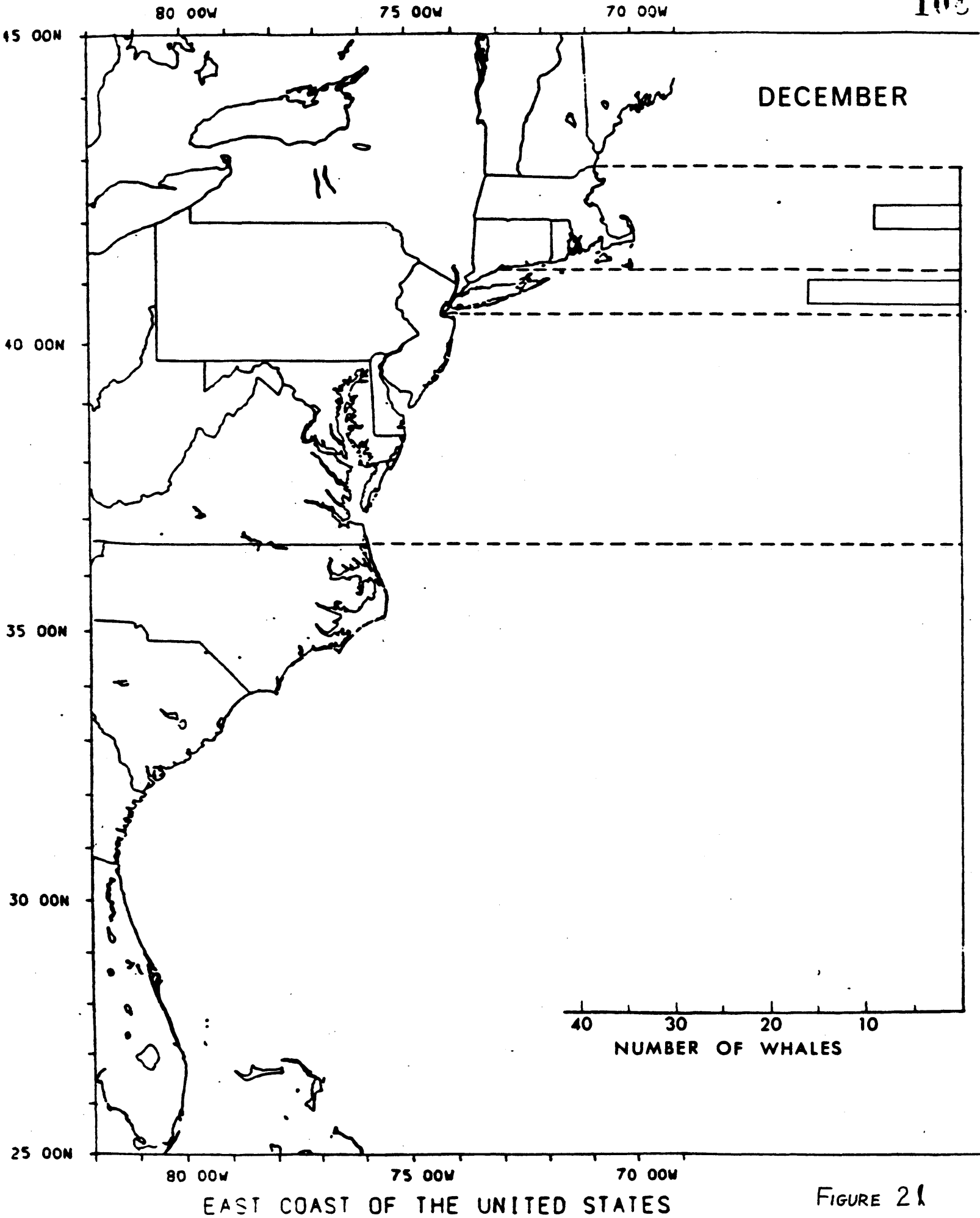


FIGURE 21