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RIGHT WHALE, EUBALAENA GLACIALIS,
SIGHTINGS IN CAPE COD WATERS.

by

1
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Right whale, Eubalaena glacialis, sightings in Cape Cod waters

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Right whale, Eubalaena glacialis, sightings in Cape Cod waters

William E. Schevill, Karen E. Moore, and William A. Watkins

Abstract

Sightings of right whales, Eubalaena glacialis, in Massachusetts waters have been recorded by workers at Woods Hole Oceanographic Institution since 1955. These observations do not represent a census, because emphasis was placed on studying the whales' underwater sounds and other activities. The number of yearly sightings varied from 2 to 165. Observations were made from aircraft, boats, and occasionally from shore.

Key Words:

Right whales

Eubalaena glacialis

Whale sightings

Since January 1955 we have recorded sightings of Eubalaena glacialis, the northern right whale, off Massachusetts. Our interest in these whales includes listening to and recording their vocal and other sounds, feeding and other behavior, and seasonal and geographic distribution. In general, we search until we find whales and then usually stay with them as long as possible. We do not try to count all the whales around, and so this record is not a census. This we emphasize, because in recent years others have been engaged in serious attempts at a census. The total sightings listed here tell only how many Eubalaena we observed while engaged in our studies. In each year we worked in the area both earlier and later than our right whale sightings. In 1957, 1967, 1968, 1969, and 1971 we have no sightings because of other activities which prevented our looking for whales.

Because of our strong acoustic interests, we prefer quiet weather for our boat work; rough seas, wind, and rain all interfere noisily with listening. Quiet weather is also favorable for aerial observation and photography. As a result, we have few sightings in bad weather, which further skews our counts away from a proper census.

It soon became apparent that we could sometimes distinguish individual Eubalaena by differences in the cephalic excrescences often called "callosities", and also by occasional irregularities in the skin color. Although the skin is generally nearly black, some of these whales have pale, even white, markings; occasionally these were enough to distinguish

individuals in small groups. The excrescences on the head seem more useful, since all Eubalaena have them. We have found some that we thought were recognizable over a few years. Other students (Klumov 1962; Payne 1974, 1976) have had the same experience, and have catalogued as many as several hundred individuals in other populations. It is not yet established how long these distinctive markings persist unchanged. It appears that the conspicuous patterns seen on the heads of Eubalaena are largely due to the presence of the brighter colored cyamids. These are not sessile, and seem to do an appreciable amount of wandering. While their distribution is related to the roughened areas of the excrescences, they are not inflexibly limited by these, and we suppose that the sharp and conspicuous outlines are subject to change in detail. It is also not established whether these cephalic patterns are individually unique.

Nevertheless, these patterns, and to a lesser extent the pigment variations, over short time spans and in small groups can be useful to observers trying to distinguish individual whales.

Eubalaena glacialis were numerous in these waters when Europeans came in the XVI century. Just how numerous seems impossible to determine. The best we can do is to utilize the chronicles painstakingly compiled by G.M. Allen (1916, pp. 131-141, 146, 158-160), although they contain little information on actual numbers of whales in the region. In December 1620 during the six weeks (21 Nov. to 26 Dec. 1620, new style) that the Mayflower lay in Cape Cod Hbr. (Provincetown), Bradford reported that "we saw daily great whales, of the best kind for oil and bone, come close aboard our ship, and, in fair weather, swim and play about us". Not much

in the way of actual numbers turns up until January 1700, when it was stated that "all the boats round [Cape Cod Bay] killed twenty nine whales in one day". This implies that a considerably larger number was there, but no figure for this is even hinted at, nor do we know the number of boats involved; we have the catch, but no data on the effort. The maximum number caught in a single day at Nantucket was eleven, and the record season's catch there was 86 whales in 1726. After this the local New England right whale fishery declined. By about 1730 these whales were reported as scarce, presumably from overfishing. Even after the fishing effort was reduced (and nearly terminated) these whales remained scarce, as they still are now after some 75 years of essentially no hunting. They have probably never been totally absent from our waters, even though we had not heard of them here between 1916 and 1955. It was undoubtedly a mistake to speak as we did of "The return of the right whale to New England waters" (Schevill 1959). It is tantalizing not to know how many whales had to be present to allow the Cape Cod Bay whalers of 1700 to kill 29 in one day. Their efficiency was surely not great enough for them to have made a comparable catch from the 25 or so that evaded the schooner Glide near Nantucket in April 1886, or from the 30 we saw in less than an hour in April 1959, and again on 4 May 1961, but perhaps they might have if faced with the more than 70 that we had on 13 April 1970.

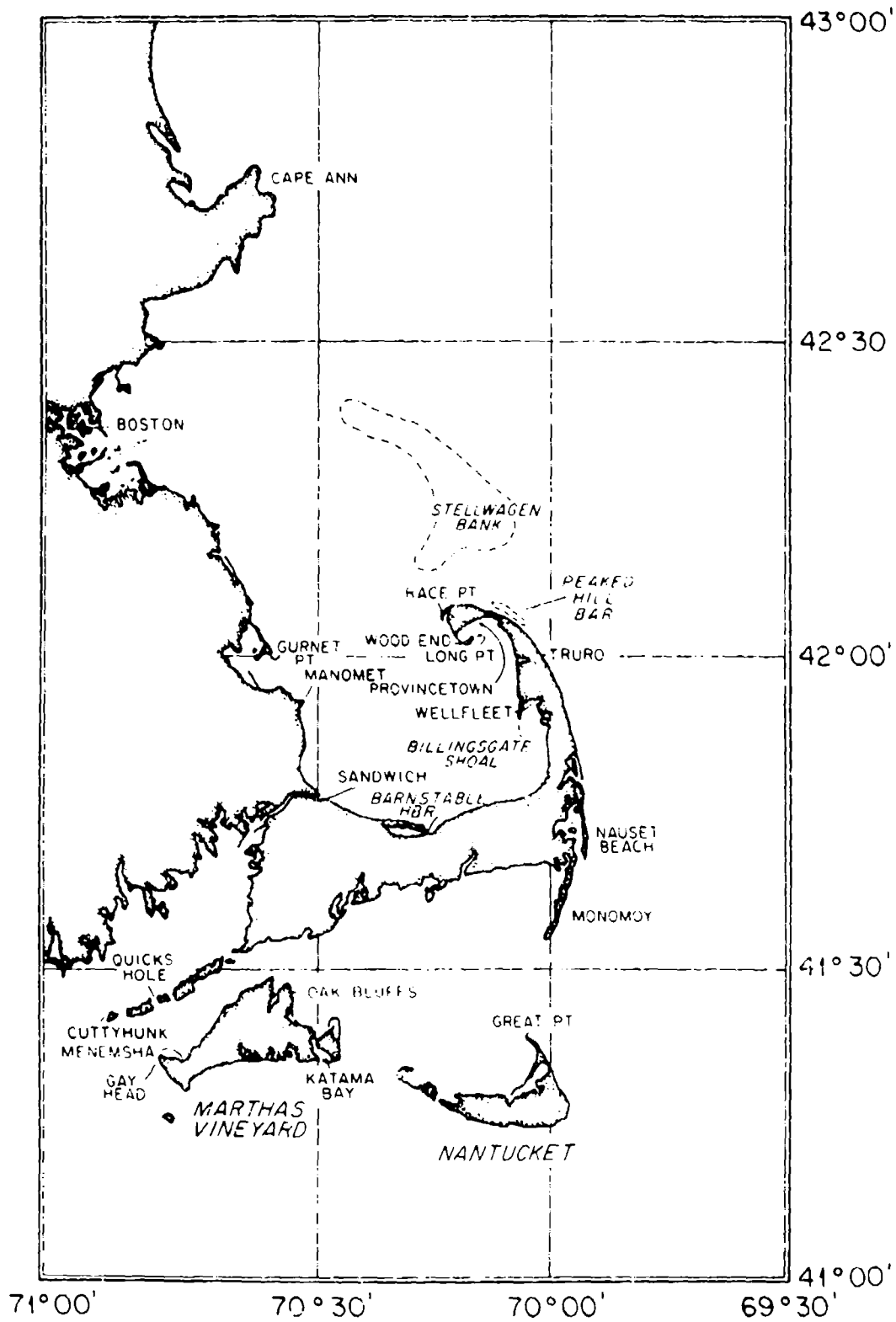
These and other questions are addressed in a paper in preparation.

The sighting localities here listed and indicated on the sketch map represent places where we found right whales; in some instances they are either the point of beginning or the point of ending of contacts lasting up to a few hours. In any event, these whales were never anchored, and usually underway.

We have been helped by many colleagues, of whom we especially mention Stanley E. Poole and Robert G. Weeks. Our work has been made possible through the continuing support of the Office of Naval Research, together with support in the past from the National Science Foundation.

LITERATURE CITED

- Allen, Glover M. 1916. Whalebone whales of New England. Mem. Boston Soc. N.H., 8, 2: 107-322.
- Klumov, S.K. 1962. Gladkie (yaponskie) kity Tichogo Okeana. [(Japanese) right whales in the Pacific Ocean.] Trudy Instituta Okeanologii (Akad. Nauk SSSR), 58: 202-297.
- Payne, Roger S. 1974. A playground for whales. Animal Kingdom (N.Y. Zool. Soc.), 77, 2: 7-12.
- Payne, Roger S. 1976. At home with right whales. National Geographic Mag., 149: 322-339.
- Schevill, William E. 1959. The return of the right whale to New England waters. Jour. Mammalogy, 40, 4: 639.



Cape Cod and vicinity, showing areas mentioned in Table 2.

Table 1. Summary of sightings of Eubalaena glacialis from Table 2. Repeaters (column D) are the same whales seen more than once.

A	B	C	D	E	F
Month	No. of days whales seen	Total seen	Total reduced by repeaters	Maximum seen in one group	Maximum seen on one day
1955	1	2	2	2	2
1956	4	24	6	6	6
1957					
1958	2	9	9	6	6
1959	16	73	51	7	30
1960	6	76	61	15	21
1961	13	165	131	8	32
1962	5	15	15	6	6
1963	2	5	5	2	4
1964	8	50	50	4	17
1965	6	21	20	3	5
1966	5	25	25	4	3
1967					
1968					
1969					
1970	1	70+	70+	30+	70+
1971					
1972	2	4	4	2	2
1973	6	13	13	5	3
1974	9	59	53	15	16
1975	14	33	28	5	7
1976	6	16	9	2	4
1977	10	21	16	7	7
1978	10	59	39	9	9
1979	9	26	13	3	4
1980	7	13	11	4	4
	149	756	641		

Table 2. Right whale (*Eubalaena glacialis*) sightings in Cape Cod waters 1955-1980

<u>Date</u>	<u>No.</u>	<u>Location</u> (<u>Distance in nautical miles</u>)	<u>Observation Platform</u> Ship=S; Aerial=A; Land=L
1955			
24 Jan.	2	2 mi. N Sandy Neck, Barnstable	A
1956			
3 Apr.	6	Menemsha Bight	S
4 Apr.	"	"	S
5 Apr.	"	"	S
6 Apr.	"	"	S
1958			
Apr.	3	Quicks Hole	S
May	6	S of Wood End	S
1959			
25 Mar.	1	1-1/2 mi NW Gay Head	S
Apr.	30	between Provincetown & Manomet	A
Apr.	3	between Quicks Hole and Menemsha	S
Apr.	1	"	S
Apr.	1	"	S
Apr.	1	"	S
Apr.	1	"	S
Apr.	1	"	S
Apr.	1	"	S
12 Apr.	4+	W of Provincetown	A
13 Apr.	3	"	A

1959 (Cont.)					
13 Apr.	2		8 mi WxN Race Pt.	A	
14 Apr.	5		Off Manomet	S	
15 Apr.	5+		4-5 mi N Sandwich	S	
16 Apr.	7+		1 mi W Billingsgate Shoal	A	
22 Apr.	2(1 calf)		4 mi N Barnstable Hbr.	A	
30 Apr.	4		W of Provincetown	A	
16 Aug.	2		1-1/2 mi W of Oak Bluffs	S	
1960					
8 Apr.	16+	(feeding)	1-3 mi off Wood End	A	
11 Apr.	5+	"	2-4 mi. " " "	A	
11 Apr.	5+	(courtship)	2-4 mi. SW " "	A	
20 Apr.	11		off Wood End	A	
20 Apr.	10+	(feeding)	" " "	A	
21 Apr.	15+		" " "	A	
2 May	6	(feeding)	4 mi S Wood End	A	
3 May	5	"	5 mi SE " "	A	
3 May	3(1 calf)		3/4 mi W " "	A	
1961					
28 Mar.	1		3-1/2 mi N Menemsha	S	
28 Mar.	15		Off Provincetown	S	
29 Mar.	1		Menemsha Bight	S	
4 Apr.	2		" "	A	
7 Apr.	10		Cape Cod Bay (general)	A	
9 Apr.	1		Menemsha Bight	S	
12 Apr.	13		Off Provincetown	A	
21 Apr.	8		" "	A	
25 Apr.	1		5 mi NE Sandwich	S	
25 Apr.	1		Cape Cod Bay (general)	S	
25 Apr.	2		" "	S	
26 Apr.	4	(2 feeding)	Off Wood End	S	
26 Apr.	2		" "	S	
26 Apr.	4		" "	S	

1961 (Cont.)				
27 Apr.	8	Off Wood End		S
28 Apr.	2 (1 calf)	Off Race Pt.		S
28 Apr.	1	" "		S
28 Apr.	5+ (feeding)	Off Wood End		A
28 Apr.	2	Off Sandwich		A
28 Apr.	2 (courtship)	3 mi NE Sandwich		A
4 May	32	Cape Cod Bay (general)		A
5 May	21	Off Provincetown		A
6 May	5	Off Wood End		S
7 May	5+	" "		S
11 May	1	7 mi SE Cape Ann		A
11 May	6 (1 feeding)	Off Race Pt.		A
23 May	5 (2 calves)	Cape Cod Bay (general)		A
23 May	1	3 mi off Billingsgate Shoal		A
24 May	4 (2 calves)	Cape Cod Bay (general)		A
1962				
11 Jan.	6	6 mi SW Wood End		A
26 Jan.	3	Billingsgate Shoal		A
12 Apr.	4	1/2 mi SE Wood End		A
7 May	1 (radio tagged)	1 mi S Long Pt.		A
8 May	1	Off Long Pt.		S
1963				
16 Apr.	2 (1 calf)	Off Billingsgate Shoal		A
16 Apr.	2	Off Manomet		A
3 May	1+	Cape Cod Bay (general)		A
1964				
18 Feb.	3	1-1/2 mi NNW Billingsgate Shoal		A
10 Apr.	2	Stellwagen Bank		A
10 Apr.	1	E of Stellwagen Bank		A
13 Apr.	2	2 mi off Wood End		A
13 Apr.	1	Off Race Pt.		A

Year	Date	Count	Location	Notes	Sex	
1964 (Cont.)	13 Apr.	1	S of Race Pt.		A	
	13 Apr.	2	Off Nauset Beach		A	
	13 Apr.	2	6 mi S Wood End		A	
	21 Apr.	4	2 mi N Sandwich	(feeding)	A	
	21 Apr.	4+	3 "	"	A	
	21 Apr.	1	4 "	"	A	
	21 Apr.	1	3 mi W Wood End		A	
	21 Apr.	1	1 mi W Wood End		A	
	21 Apr.	4	1 1/2 mi W "		A	
	21 Apr.	2	Off Long Pt.		A	
	28 Apr.	4	1 mi off Wood End		A	
	28 Apr.	2	5 mi off Billingsgate buoy		A	
	4 May	6	Cape Cod Bay (general)		A	
	6 May	2	Off Wood End		A	
	7 May	2	3-4 mi off Peaked Hill Bar		A	
	7 May	2+	W of Stellwagen Bank		A	
	7 May	1	2-3 mi off Peaked Hill Bar		A	
	1965	1 Apr.	2	7 mi NNW Race Pt.	(courtship)	A
		29 Apr.	1	2 mi off Truro	(feeding)	A
29 Apr.		2	Stellwagen Bank		A	
29 Apr.		2	1/2 mi off Race Pt.		A	
30 Apr.		1	100 meters off Race Pt.	(feeding along slick)	A	
30 Apr.		1	4 mi E Wellfleet		A	
30 Apr.		2	" "		A	
11 May		3+	25 mi " "		S	
12 May		1	" "		S	
12 May		1	20 mi NE Peaked Hill Bar		A	
13 May		1	7 mi E Nauset Beach		A	
13 May		2	32 mi E Truro		A	
13 May		1	43 mi E Wellfleet	(dying)	A	
13 May		1	25 mi NE Race Pt.		A	

1966									
20 Apr.	1	6 mi E Monomoy							A
20 Apr.	4	5 mi E Nauset Beach							A
3 May	2	Off Wood End							A
3 May	4	20 mi off Race Pt.							A
3 May	1	NE Truro							A
3 May	1	E Chatham							A
12 May	1	2 mi N Barnstable Hbr.							A
12 May	1	3 mi E Nauset Beach							A
12 May	1	12 mi NE Provincetown							A
12 May	2	2 mi SW Provincetown							A
17 May	1	100 meters S Wood End							A
17 May	4	5 mi off Billingsgate Shoal							A
18 May	2	E Manomet							A
1970									
13 Apr.	30+	Between Race Pt. and Manomet							S
13 Apr.	20+	" " "							S
13 Apr.	20+	" " "							S
1972									
1 May	1	1-1/2 mi NW Race Pt.							S
1 May	1	1/2 mi off beach, NE Race Pt.							S
2 May	2	Off Manomet							S
1973									
11 Mar.	1	Off Cuttyhunk							S
23 Apr.	4	Inside Wood End							A
30 Apr.	5	Off Wood End							A
30 Apr.	2	1-1/2 mi NW Race Pt.							A
30 Apr.	1	100 meters off beach, NE of Race Pt.							A
8 May	2	200 meters off Gay Head							S
14 May	1	5-6 mi W Race Pt.							A
17 May	2	1/2 mi W Billingsgate Shoal							A
1974									
12 Apr.	2	1 mi S Katama Bay							A
17 Apr.	1	2 mi W Wood End							A

Year	Date	Count	Location	Notes	
1974 (Cont.)	26 Apr.	2	3 mi N Barnstable Hbr.	A	
	26 Apr.	2	5 mi SW Wood End	A	
	26 Apr.	1	1-1/2 mi NE Race Pt.	A seen 17/IV/74	
	29 Apr.	1	2 mi NW Barnstable Hbr.	A	
	29 Apr.	2 (1 calf)	1 mi N Billingsgate buoy	A	
	29 Apr.	8+	S Wood End	A	
	1 May	10	Cape Cod Bay (general)	A	
	2 May	6+	4-6 mi S Wood End	S	
	2 May	3	1 mi SW Wood End	S	
	3 May	16	4-5 mi S Wood End	A+S	
	7 May	4+	E central Cape Cod Bay	S	
	14 May	1	4 mi N Billingsgate Shoal	A	
	1975	20 Jan.	3	Cape Cod Bay (general)	A
		24 Feb.	1	4-1/2 mi N Sandwich	S
		18 Mar.	5 (1 calf)	3-4 mi W Truro	A
		8 Apr.	2	1/2 mi SW of W end Nantucket I.	L
		9 Apr.	2	SE of W end Nantucket I.	A
15 Apr.		2	3 mi NE Gurnet Pt.	S	
18 Apr.		1	11 mi N Barnstable Hbr.	A	
30 Apr.		2	5-6 mi NE Race Pt.	A 1 seen 18/IV/75	
1 May		2 (feeding)	6 mi NNE Race Pt.	A 1 seen 18 and 30/IV/75	
8 May		4	15 mi NW Race Pt.	A	
8 May		1	5 mi N Race Pt.	A	
8 May		1	11 mi N Peaked Hill Bar	A	
8 May		1	9 mi N "	"	
12 May		1	S tip Monomoy	A+L dead	
26 Jun.		1	2 mi E Monomoy	A	
28 Jun.		2	1 mi S Cuttyhunk I.	S	
4 July		2 (courtship)	Off Menemsha	S	

Date	Observation	Location	Notes	Sex
1976				
24 Mar.	1	5 mi NW Billingsgate Shoal		A
5 Apr.	2 (1 calf)	" "		A
6 Apr.	2 (1 calf)	4 mi NW Barnstable Hbr.	seen 24/III/76 (cow alone)	A
15 Apr.	2 (1 calf)	5-7 mi NE Peaked Hill Bar		A
16 Apr.	1	On Wellfleet Beach	dead	L
19 Apr.	2 (1 calf)	NE Race Pt.		L
29 Apr.	2 (1 calf)	2 mi NW Billingsgate Shoal	seen 6/IV/76 and 24/III/76 (cow alone)	A
10 May	2 (1 calf) (cow feeding)	2 mi N Barnstable Hbr.	seen 29/IV/76, 6/IV/76, and 24/III/76 (cow alone)	A
4 Oct.	2	Off Provincetown Hbr.		S
1977				
21 Mar.	1	Near range buoys, Provincetown		A
28 Mar.	2 (1 calf)	1-1/2 mi SW Wood End		A
29 Mar.	2 (1 calf)	1 mi SE Race Pt.		L
30 Mar.	1	1 mi N Sandy Neck, Barnstable		S
3 Apr.	1 or 2	4 mi N " "		S
11 Apr.	2 (1 calf) (cow feeding)	2 mi N " "		A
11 Apr.	1 (feeding)	2-1/2 mi NE Race Pt.		A
12 Apr.	1	2 mi W Race Pt.		A
12 Apr.	1	" " "		A
13 Apr.	1	6 mi N Sandy Neck, Barnstable		A
21 Aug.	1	35 mi E Nauset Beach		S
26 Oct.	7	15 mi NNE Race Pt.		S
1978				
1 Mar.	5	Off Manomet		S
31 Mar.	4 (courtship)	5-6 mi SW Wood End		A
31 Mar.	2	8 mi SSW " "		A

seen 28/III/77
seen 11/IV/77

Year	Date	Count	Activity	Location	Notes	
1979 (Cont.)	5 Apr.	2		5-6 mi SW " "	A	
	15 Apr.	3	(feeding)	5 mi SSW " "	S	
	18 Apr.	9		5-1/2 mi ESE Gurnet Pt.	S	
	22 Apr.	1		7-1/2 mi NNW Race Pt.	S	
	23 Apr.	4+		3 mi N Race Pt.	S	
	23 Apr.	1		8 mi SSW Wood End	S	
	23 Apr.	1		6 mi NNW Billingsgate Shoal	S	
	24 Apr.	1	(feeding)	1 mi NNW Wood End	S	
	24 Apr.	1	"	5 mi NNW Billingsgate Shoal	S	
	29 Apr.	1		2 mi W Race Pt.	S	
	13 July	4+		60 mi E Truro	S	
	1979	15 Jan.	3	(lob-tailing)	Provincetown Hbr.	L
		28 Mar.	1		1 mi W Wood End	A
		28 Mar.	2		1-1/2 mi S Wood End	A
		17 Apr.	1		near beach, Race Pt.	S
1 May		2	(feeding)	1-1/2 mi NW Billingsgate Shoal	A	
2 May		2	"	" "	S	
3 May		2	"	3-1/2 mi NW " "	S	
16 Jun.		2	"	1-1/2 mi NW Race Pt.	S	
17 Jun.		1	"	" "	S	
20 Jun.		2	"	2 mi N " "	S	
20 Jun.		2	"	5 mi N Peaked Hill Bar	A	
1980		20 Feb.	4		1 mi S Race Pt.	L+S
		14 Apr.	1		1 mi NE Great Pt. (Nantucket I.)	A
		16 Apr.	2	(1 calf)	5-1/4 mi NNW Race Pt.	S
		17 Apr.	2	(1 calf)	4 mi NNW Race Pt.	A
	3 May	2	(1 calf)	1 mi SE Gurnet Pt.	S	
	4 May	1		12 mi N Barnstable Hbr.	S	
	10 May	1		1-3 mi N of northern edge of Stellwagen Bank	S	

seen 1/V/79
seen 1 and 2/V/79
seen 1/V/79

A seen 16/IV/80

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<p>Woods Hole Oceanographic Institution WHOI-81-50</p> <p>RIGHT WHALE, EUBALAEWA GLACIALIS. SIGHTINGS IN CAPE COD WATERS by William E. Schevill, Karen E. Moore, and William A. Watkins. 16 pages. June 1981. Prepared for the Office of Naval Research under Contract N00014-79-C-0071, NR 083-004.</p> <p>Sightings of right whales, Eubalena glacialis, in Massachusetts waters have been recorded by workers at Woods Hole Oceanographic Institution since 1955. These observations do not represent a census, because emphasis was placed on studying the whales' underwater sounds and other activities. The number of yearly sightings varied from 2 to 165. Observations were made from aircraft, boats, and occasionally from shore.</p>	<p>Woods Hole Oceanographic Institution WHOI-81-50</p> <p>RIGHT WHALE, EUBALAEWA GLACIALIS. SIGHTINGS IN CAPE COD WATERS by William E. Schevill, Karen E. Moore, and William A. Watkins. 16 pages. June 1981. Prepared for the Office of Naval Research under Contract N00014-79-C-0071, NR 083-004.</p> <p>Sightings of right whales, Eubalena glacialis, in Massachusetts waters have been recorded by workers at Woods Hole Oceanographic Institution since 1955. These observations do not represent a census, because emphasis was placed on studying the whales' underwater sounds and other activities. The number of yearly sightings varied from 2 to 165. Observations were made from aircraft, boats, and occasionally from shore.</p>	<p>1. Right whales 2. <u>Eubalena glacialis</u> 3. Whale sightings I. Schevill, William E. II. Moore, Karen E. III. Watkins, William A. IV. N00014-79-C-0071; NR 083-004</p> <p>This card is UNCLASSIFIED</p>	<p>1. Right whales 2. <u>Eubalena glacialis</u> 3. Whale sightings I. Schevill, William E. II. Moore, Karen E. III. Watkins, William A. IV. N00014-79-C-0071; NR 083-004</p> <p>This card is UNCLASSIFIED</p>
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