

REPORT ON NANTUCKET GREY SEALS, WINTER AND SPRING 1983

NATIONAL MARINE FISHERIES SERVICE  
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by

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REPORT ON NANTUCKET GREY SEALS, WINTER AND SPRING 1983.

ABSTRACT

National Marine Fisheries Service-supported surveys in winter and spring 1983 show that the Nantucket Sound grey seal population has continued to increase, from 22 individuals older than one year in 1982, to 28 in 1983, including 23 in the primary study area between Nantucket and Martha's Vineyard, and 5 at Monomoy Island. 11 breeding age females were identified, however males outnumbered females at all sites.

No whitecoat pups were located during the breeding season, despite aerial searches over a wide area of Nantucket Sound, from Monomoy to as far west as No Man's Land and the Elizabeth Islands. A minimum of 3 molted pups, not bearing Canadian tags and thus possibly of local or New England birth, were recorded in the study area. A Sable Island, Nova Scotia tagged pup which stranded at Nantucket in April later died in captivity.

1983 marking returns among Nantucket seals older than one year indicate a high proportion of recruitment from the Canadian stock at Sable Island. We may infer from the rate of immigration, and from evidence of population size and reproductive potential attained here in the past, that the local Nantucket stock could grow to at least 80 individuals in the next 10 years, given suitable habitat and freedom from human interference in the breeding season.

Recent physical changes at Southwest Point, Muskeget have improved it as a haulout site and, similarly, as a site where pupping could take place after waterfowl hunting ends in mid-January.

Wintering harbor seals showed a marked increase in numbers at Nantucket in 1983. A record of nearly 700 were counted in a single aerial census.

Future surveys are recommended to monitor grey seal populations and possible breeding grounds, both in Nantucket Sound and the Gulf of Maine.

## REPORT ON NANTUCKET GREY SEALS, WINTER AND SPRING 1983

Surveys of the Nantucket Sound grey seal (Halichoerus grypus) population were conducted in winter and spring 1983, with support from the National Marine Fisheries Service, Purchase Order No. NA-83-FB-A-00075. The purpose of the research was to assess the grey seals' stock size, composition, and reproductive success or potential, with particular reference to data from earlier surveys; also condition of the grey seals' habitat, and other environmental factors including weather, human impacts, and numbers of harbor seals (Phoca vitulina) in the area. Ground surveys were carried out at Esther Island and Muskeget, and twenty-one aerial surveys were flown to census the entire study area.

### Population size: historical and recent information.

New historical information on the population was acquired in 1983. Interviews with Nantucket residents who killed seals for bounty in the middle of the century disclosed that 19 grey seal pups were killed at Muskeget in one year in the early 1950's, and 14 in the following year.

Applying the 3.7 multiplier derived for the Sable Island, Nova Scotia grey seal colony, which is growing exponentially at an annual rate of 11.3% (Mansfield and Beck 1977), we can expect a Nantucket population increasing at the same rate and producing 19 pups to number about 70 individuals of one year and older. A less rapidly growing population or one which is stationary or declining would have a larger multiplier; thus 70, rather than the figure of 40-50 assumed in previous studies, may be considered a minimum estimate of the original Nantucket stock at its peak. Of course the impact on production of disturbance and culling is unknown for this or any other grey seal population.

After repeal of the bounty in 1962 the Nantucket grey seal population stood at 15-17 individuals. Three pups were born at Muskeget in 1963, but only single births were recorded there in subsequent years through 1970. From 1971 to 1979 no native pups were found, and the herd dwindled from 12 to 9. Then, in February 1980, a whitecoat pup was sighted at Muskeget and, in April 1980, 18 seals older than one year were counted, suggesting the population had begun to recover.

National Marine Fisheries Service-supported surveys in 1982 and 1983 confirmed this trend. The spring count of older seals was 22 in 1982, and 28 in 1983. The 1983 group included 11 females of breeding age; 15 males, 5-6 of which were juveniles; and 1-2 yearlings of undetermined sex.

### Seasonal trends

The accompanying table and Figure 1 give grey and harbor seal counts from 21 aerial surveys between late December 1982 and early May 1983. In the first month of winter 2 to 12 grey seals were recorded; then very few were seen from late January to the second week in February when numbers again began to rise, peaking in early April. The dates of high and low numbers fall within the range of dates recorded for these phenomena in other years. Figure 2 compares highest weekly aerial counts in 1982 and 1983, showing a similar seasonal pattern in both years. Although aerial counts from mid-April through early May 1983 show an apparent decline, grey seals were still present in the study area, and 15 were counted at Muskeget on 9 May in surface observation (see next section). After mid-May no more than 2 grey seals were sighted in the study area by either aerial or ground reconnaissance.

### Habitat

Most grey seals were found in 1983, as in other years, from the west end of Nantucket to Chappaquiddick, Martha's Vineyard. This year, also, small groups were seen regularly at North Monomoy, where there were only single sightings in 1982. In 1982 and 1983 Wasque Shoal was a favored grey seal haulout site, notably for large assemblies in the spring. Wasque was used whenever seas were calm enough to expose the sandbar. In 1983, however, the bar was smaller, and overwashed by southerly swells more frequently than in 1982, hence fewer large haulouts occurred there this year.

In 1983, for the first time in over a dozen years, grey seals hauled out regularly at Southwest Point, Muskeget, formerly a traditional pupping ground. The seals occupied the point particularly during inclement weather and rough sea conditions, when Wasque Shoal was flooded. Because aerial surveys were usually conducted in calm, fair weather, the importance of Muskeget is understated by the aerial data. The grey seals' renewed use of Southwest Point follows several years of near abandonment of it as a haulout site. During the 1970's the spit shifted shoreward, eroded, and filled adjacent channels so that seals no longer had the necessary deep water access. Now that the dune has stabilized a small channel has formed, and seals once again find the point attractive. The development of this sandspit is critical because of its potential as a pupping site.

No dry shoals were present northwest of Muskeget, and only very small ones northeast of the island. 1-3 grey seals were sometimes at the northeast shoals, and similar numbers were sighted at Esther Island and the Eel Point shoals, two sites primarily occupied by large herds of harbor seals during the winter and spring.

## Pups

There were no sightings of whitecoat pups, as direct evidence of whelping, at Muskeget or elsewhere in Nantucket Sound in 1983. Several aerial surveys were conducted over the study area during the breeding season\*, including two flights over Monomoy and No Mans Land, and one covering all shores of the Elizabeth Islands. Three molted pups were noted, which did not have Canadian tags and may have been born in the local or New England area. One of these, a female on Wasque Shoal in late January, was probably born nearby. The location of breeding places other than Muskeget (where no pups were found since 1980) remains a mystery. Because of the open winter, no ice floes were available for pupping in 1983.

The only whitecoat pup found in New England in 1983 stranded on an island off Port Clyde, Maine on 19 February. It died in transit to New England Aquarium and had not been autopsied as of this writing.

A tagged Sable Island pup stranded at Hull, Mass. on 28 February 1983. It was soaked in "oily substance" according to New England Aquarium where it died overnight. Another Sable Island pup stranded at Great Point, Nantucket on 21 April 1983. It was held overnight at the University of Massachusetts Field Station, then sent to the Aquarium. The pup was maintained there until 14 May when it was euthanized, having suffered tooth loss and bone degeneration in the lower jaw due to bacterial osteomyelitis.

## Brands, tags and natural markings

At Sable Island, the largest grey seal colony in the northwest Atlantic, Canadian scientists have, since 1969, carried out a program of marking pups which survive to weaning. In seven different years brands were applied to partial cohorts, with individual brands used in 1969 and 1970, and year brands in 1971-1974 and 1978. 3,699 pups out of cohorts totalling 8,311 (for these seven years only) were branded, that is, 44%. Since 1977 all surviving Sable pups were tagged. These marks have provided a valuable tool for investigations in Nantucket Sound. The brands are particularly useful as they are permanent. Tags, unfortunately, may be lost or become weathered; in any case none were spotted on live seals older than one year in the study area.

In addition, natural markings of grey seals are individually distinctive and apparently permanent. The investigator has photo-cataloged individual grey seals in Nantucket Sound since 1968, and in the Gulf of Maine since 1979.

Recognition of naturally and artificially marked seals in the Nantucket group is yielding important clues to an understanding of the population. For example, a group of 15 grey seals older than

\*Breeding occurs from mid-December to early February.

one year was observed at Muskeget in late March 1983; 4 of these bore Sable Island brands, and all 4 had been seen here in previous years. They included: an individually branded cow (#882), born in 1970, which Canadian scientist B. Beck reports has not appeared at Sable since it was a pup; a bull born in 1971, apparently first seen at Nantucket in March of that year; a cow born in 1972; and another cow born in 1978. Two other individuals in the group were recognized by natural markings only: a mature bull seen in previous years; and a mature female (cow F) which was seen throughout the study area each winter and spring since 1980, notably at Wasque Shoal in December 1981, when she appeared to be in advanced pregnancy. The same cow was also observed during the last three summers in Penobscot Bay, Maine.

### Immigration

If we look at the sample of grey seals observed at Muskeget in March 1983, and consider only those large enough to have been born up to and including 1978, i.e. 14 individuals; and if for the sake of simple argument we assume all were born only in the years of branding (i.e. 1969-1974, 1978); then, if this sample contained only Sable Island seals, we would expect to find 44%, or 6 individuals, branded. In fact 28%, 4 individuals, were branded. If we then, more realistically, assume the seals were born in any of the years 1969 to 1978, and add to our calculations the entirely unbranded cohorts of 1975-1977, totalling 4,802, the percentage of branded seals expected if all the sample derived from Sable is exactly 28%, 4 individuals. Obviously such reasoning cannot be carried any further, but it is clear that Sable Island has made a very substantial contribution to Nantucket's present potential breeding stock.

At least two tagged pups arrived in Massachusetts in 1983, as cited, showing that the influx continues. However both stranded, and many other tagged pups recorded in southern New England since 1977 stranded or were very thin, implying reduced first year survival among recent immigrants. One Sable Island tagged yearling was seen at Nantucket in January 1983.

### Human impacts

Grey seals and people were together at Muskeget on numerous occasions from fall 1982 through summer 1983. The seals tolerated the human presence well, and were not scared off the haulout except by closely approaching boats. Small boats are often taken to Muskeget in calm weather and are probably a factor in the seals' disappearance from the island in such conditions. Low flying aircraft, on the other hand, caused little anxiety among hauled out seals in 1983.

Muskeget is a traditional waterfowl hunting area, and in 1983 the season ended on January 15. People on the island January 14-16 reported grey seals on and around Southwest Point, but no pups. It is unlikely that pupping would occur here, if at all, prior to the season's end. Unfortunately in 1984 the goose season will last until January 20.

Two instances of adverse, though unintentional, human impacts were noted in 1983. The 1971 branded bull at Muskeget in late March was tangled in trawl netting, with polypropylene twine around the neck and nylon line around the girth. He appeared thin compared to the other seals possibly because the twine may have restricted swallowing of food. In late July a dead female grey seal was found at Muskeget. According to Nantucket Natural Resource Officer E. Metcalf, who inspected the carcass, it had a large spiral laceration on the rump; he believes this fatal injury was caused by a ship's propeller.

*Metcalf*

Harbor seals

Numbers of harbor seals wintering around Nantucket rose to a record 700 in 1983, well over the high of 450 in 1982. Although local harbor seal numbers, like those of the grey seals, usually peak in the spring in 1983 the main peak occurred in January, with a lesser one in February (see Figures 1 and 3). Over 400 were still present in early April, though numbers declined steadily after that, to a zero count in early May.

Harbor seals occupied Esther Island, the Eel Point shoals, and the Nantucket Harbor jetties almost exclusively. Their numbers may have deterred grey seals from using those sites, although individual greys, particularly of three years or younger, were on Esther Island or the Eel Point shoals several times in 1983. The extent to which harbor and grey seals may compete for food here is unknown. In Canada both species consume herring, cod, flounder, mackerel and squid. Skates are eaten only by grey seals, and alewives only by harbor seals (Mansfield and Beck 1977). The little information we have on seal food availability and preference in this area is discussed in the next section.

Food availability and preference

Food available to seals at Nantucket during the winter and spring may be limited in diversity, but probably not in abundance. Skates, which make up nearly 10% of the grey seal diet in Canada (Mansfield and Beck 1977), are plentiful here from fall through spring. Alewives (7% of the harbor seal diet in Canada) are present all winter in nearshore waters prior to their freshwater run which in 1983 began on 4 March. Sand lance (3% of Canada harbor seals' diet) are found here throughout the winter and spring. In

addition to these possible staples certain other species may be available in years of abundance. This winter Nantucket bay scallopers reported collecting many small flounder (Pleuronectidae) and occasional lumpfish in their drags. In mid-February the investigator saw a harbor seal consume a 10" diameter flat fish, either a flounder or skate.

Seven scat samples were taken from Esther Island on 31 March. These were most likely from some of the hundreds of harbor seals rather than the lone grey seal using the site at that time. Two of the scats contained otoliths of alewives only, while two others had only sand lance otoliths. The other three contained only bones, not yet identified.

### Discussion

A likely reason for diminished pupping in the study area in the late 1960's and following years is the death of mature females. One was shot in 1963, and the old cow which pupped at Muskeget in 1968 and 1970 (and undoubtedly in many other years) was not seen after 1971 and is presumed dead. Her demise might explain the 1970's void in pupping at Muskeget. If any of the grey seals born here in the 1960's have survived to breeding age they are certainly outnumbered in the population by immigrant recruits which would be expected to dominate the pattern of breeding behavior. Studies throughout the grey seals' range have shown that timing and location of breeding are determined by the actions of parturient females. The Canadian born cows in the present stock would not be "imprinted" on Muskeget and would not necessarily select it as a pupping site, particularly with Southwest Point in an eroded state.

The immigrant cows may not return to Sable Island (at least the 1970 Sable cow, #882, has not done so), but some may range away from Nantucket in the breeding season. Since 1978 whitecoat pups were reported at Provincetown, Nauset Beach, and West Yarmouth on Cape Cod; at Chappaquiddick, Martha's Vineyard; on ice outside Nantucket Harbor; and, once, at Muskeget. Such records indicate opportunism and mobility in the full-term pregnant cows of this area. Outside the breeding season local seals may travel some distance, as demonstrated by the summer sightings in Maine of Nantucket cow F.

In winter 1984 grey seals will probably congregate at Muskeget, having sojourned there often in 1983. However because waterfowl hunting may last until 20 January, it is unlikely that pups, if any, would be born there until after that date. We do not know whether cows can delay whelping, as some researchers have proposed; if there is hunting at Muskeget when a nearby cow comes due, she might well seek another site.

The pupping data of 30 years ago show reproductive potential which may yet emerge in the present population. The steady increase in grey seal numbers observed in the past four years is apparently from a combination of immigration and, probably to a lesser extent, local production. With two sources of new recruits the stock will likely continue to expand, and if it does so at the current rate may grow to 80 in 10 years.

It is recommended that the Nantucket Sound grey seal population be monitored in 1984, with attention to Muskeget, Wasque Shoal and Monomoy in the winter breeding season, and in the spring when large haulouts will indicate stock size and composition. Additionally, breeding season flights are recommended to cover other parts of the grey seals' New England range, such as lower Penobscot Bay, Maine, which is inhabited by a stable group of 15-25 from April to December at least. A whitecoat pup which stranded in Port Clyde, Maine in February 1983 suggests reproduction may be occurring in this group. Furthermore grey seal interchange between this area and Nantucket has been established.

#### Literature cited

Mansfield, A.W., and B. Beck. 1977. The grey seal in eastern Canada. Fish. Mar. Serv., Techn. Rept. 704, 81 pp.

1982-1983

WEATHER DATA COURTESY  
NANTUCKET FAA TOWER

AERIAL COUNTS OF SEALS

page 1

HG = Grey seals

PV = Harbor seals

27 Dec 82 7 Jan 83 14 Jan 83 21 Jan 83 22 Jan 83  
1340 - 1500 1130 - 1245 1600 - 1645 1045 - 1140 1100 - 1150

Location	HG	PV	HG	PV	HG	PV	HG	PV	HG	PV
Wasque Shoals	8	0	7	2	0	3	1	0	8	2
Muskeget	1	0	0	0	0	0	3	0	0	0
Tuckernuck (N)	0	5	0	6	3	0			0	3
Tuckernuck (S)	0	0	1	0	0	0	0	0	0	0
Esther Is.	0	46	0	130	0	100	0	10	3	138
Eel Pt. Shoals	0	60	0	14	0	0	0	1		
Nantucket Harbor Jetties	0	75	0	50	0	75	0	0		
Great Point	0	0	0	0						
Monomoy Cut	0	6								
North Beach Bar	0	500								
Nauset Inlet	0	0								
Billingsgate Is.	0	43								
TOTAL	9	735	8	202	3	178	4	11	10	143

(Nantucket 186)

Boston low tide 1424 1201 1737 1007 1103  
 Weather 42° F NNW 8 46° F SSW 15 34° F N8 26° F N18 33° F CALM  
 (SC = Sky cover) SC 6 SC 8 SC 7 SC 4 SC 10

1983

AERIAL COUNTS OF SEALS page 2

HG = Grey seals

PV = Harbor seals

25 Jan 83 30 Jan 83 2 Feb 83 6 Feb 83 13 Feb 83  
 1315 - 1410 0700 - 0845 0710 - 0900 1000 - 1115 1455 - 1540

Location	HG	PV	HG	PV	HG	PV	HG	PV	HG	PV
Wasque Shoals	0	0	0	0	0	0	0	0	3	0
Muskeget	0	0	0	0	0	0	0	0	0	0
Tuckernuck	0	2	0	0	0	2	0	0	0	0
Esther Is.	0	221	0	18	0	140	0	175	2	196
Eel Pt. Shoals	0	141	0	127	0	150	1	100	0	78
Nantucket Harbor Jetties	0	332	0	198	0	160			0	95
Great Pt.			0	0						
S. Monomoy			0	3			0	6		
North Beach Bar			1	730			0	400		
No Man's			0	7		59				
Gull Is.					0	0				
Weepeckets					0	2				
Lackey's Bay, Naushon					0	42				
TOTAL	0	696	1	1,083	0	555	1	681	5	369
Boston low tide		1315		0553		0833		1227		1750
Weather		43° F W18 SC 8		35° F SSW 5 SC 10		35° F E6 SC 8		30° F NE 10 SC 3		32° F W8 SC 0
				(Nantucket 345)		(Nant. 452)		(Nant. 275)		

1983

AERIAL COUNTS OF SEALS

page 3

HG = Grey seals

PV = Harbor seals

14 Feb 83	21 Feb 83	1 Mar 83	6 Mar 83	24 Mar 83
0645 - 0730	1030 - 1120	0830 - 0925	1000 - 1115	1255 - 1349
HG PV				

Location

Wasque Shoals	3	0	2	0	6	0	13	1	5	0
Muskeget	0	0	0	0	0	0	2	0	0	0
Tuckernuck	0	4	0	4	0	0	0	0	0	0
Esther Is.	0	95	1	270	0	135	0	170	0	96
Eel Pt. Shoals	1	175	3	216	0	160	0	267	0	105
Nantucket Harbor Jetties	0	106	0	95	0	100 est.			0	63
N. Monomoy - North Beach Bar							3	773		

TOTAL	4	380	6	585	6	395	18	1,211	5	264
Boston Low Tide	0601		1131		0627		1048		1320	
Weather	31° F SSW 8 SC 10		40° F SSW 10 SC 7		46° F SSE 8 SC 8		42° F SSW 10 SC 2		36° F WNW 18 SC 0	

(Nant. 438)

1983

AERIAL COUNTS OF SEALS

page 4

HG = Grey seals

PV = Harbor seals

2 Apr 83	5 Apr 83	6 Apr 83	12 Apr 83	23 Apr 83
1620 - 1705	1050 - 1140	1135 - 1255	0730 - 0820	1230 - 1335
HG	PV	HG	PV	HG
				PV

Location

Wasque Shoals	7	0	17	1	23	1	0	0	5	0
Muskeget	0	0	0	0	1	1	0	0	4	0
Tuckernuck	0	0	0	4	0	5	0	0	0	1
Esther Is.	1	75	0	231	0	37	0	117	0	6
Eel Pt. Shoals	0	30	0	127	0	156	1	107	0	0
Nantucket Harbor Jetties	0	1	0	60	0	40	0	15	0	12
Great Pt					0	0				
N. Monomoy - North Beach Bar					5	212				
TOTAL	8	106	18	422	29	452	1	239	9	19
Boston Low Tide	0827			1107		1205		0425		1402
Weather	41° F NE 10 SC 4		54° F NW-W 12 SC 0		52° F NW 12 SC 3		50° F NW 15 SC 0		52° F SW 11 SC 0	

(Nant. 240)

1983

AERIAL COUNTS OF SEALS

page 5

HG = Grey seals

PV = Harbor seals

6 May 83

1415 - 1510

HG PV

Location

Wasque Shoals

Muskeget

Tuckernuck

Esther Is.

Nantucket Harbor  
Jetties

TOTAL

Boston Low Tide

Weather

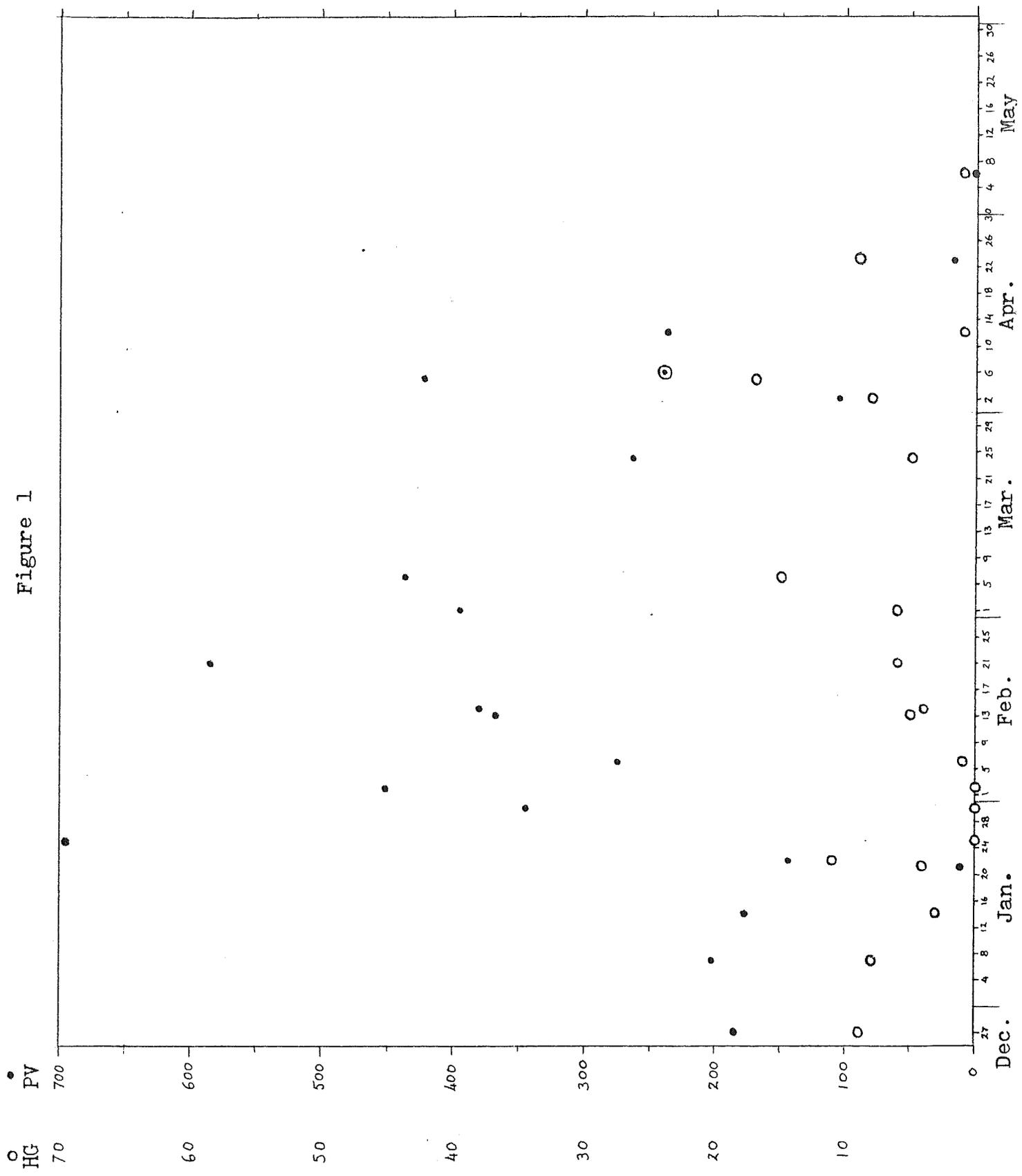
0	0
1	0
0	0
0	0
0	0
1	0

1219

55 F NNE 20  
SC 0

A pod of 14-15 Lagenorhynchus acutus, including 4 adult-young pairs, was observed about 300 yards north of the northwest shoal at Muskeget on this date.

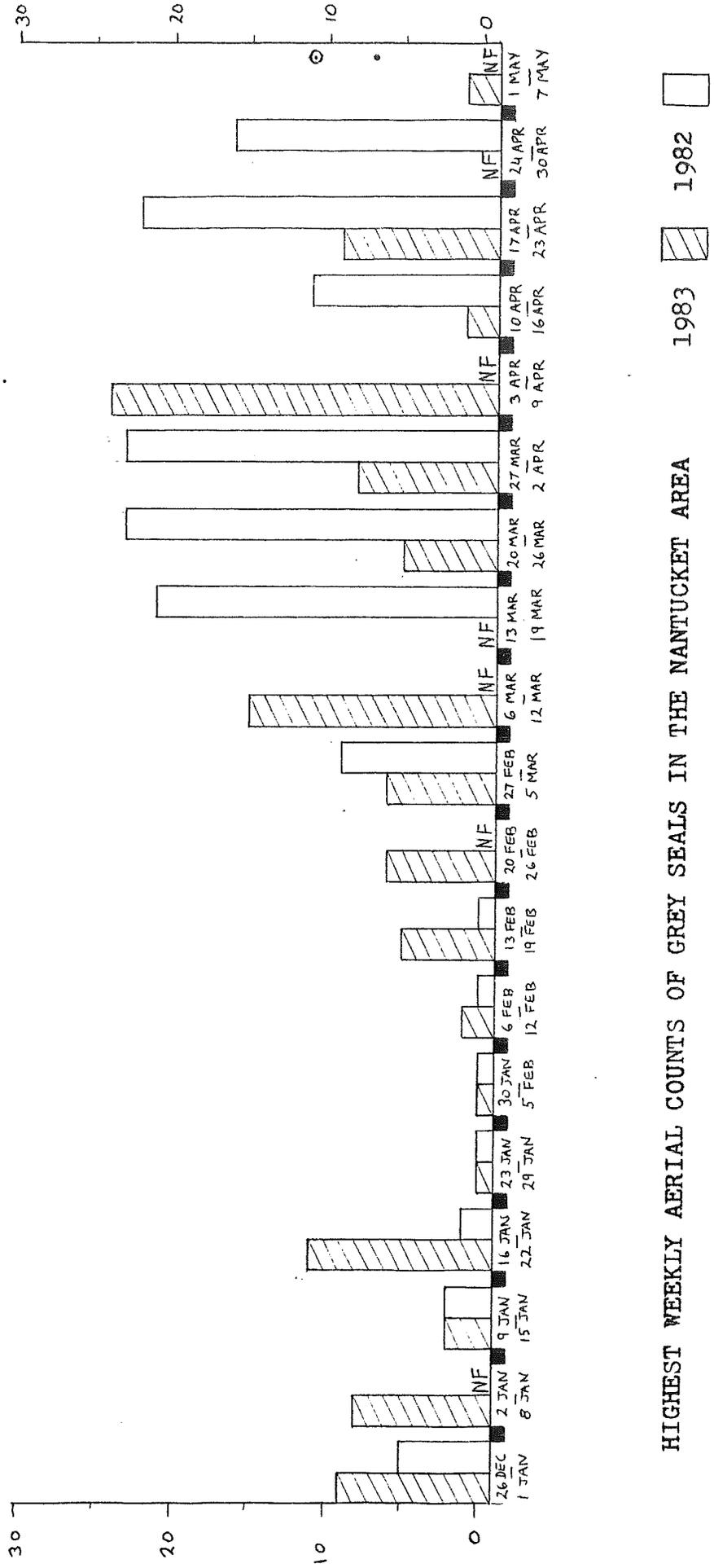
Figure 1



AERIAL COUNTS OF GREY SEALS (HG) AND HARBOR SEALS (PV) IN THE NANTUCKET AREA (INCLUDING WASQUE SHOALS), WINTER AND SPRING 1983. Monomoy counts are not included.

Figure 2

13 May 1982 •  
 22 May 1982 ○



HIGHEST WEEKLY AERIAL COUNTS OF GREY SEALS IN THE NANTUCKET AREA

INCLUDING WASQUE SHOALS, NOT INCLUDING MONOMOY

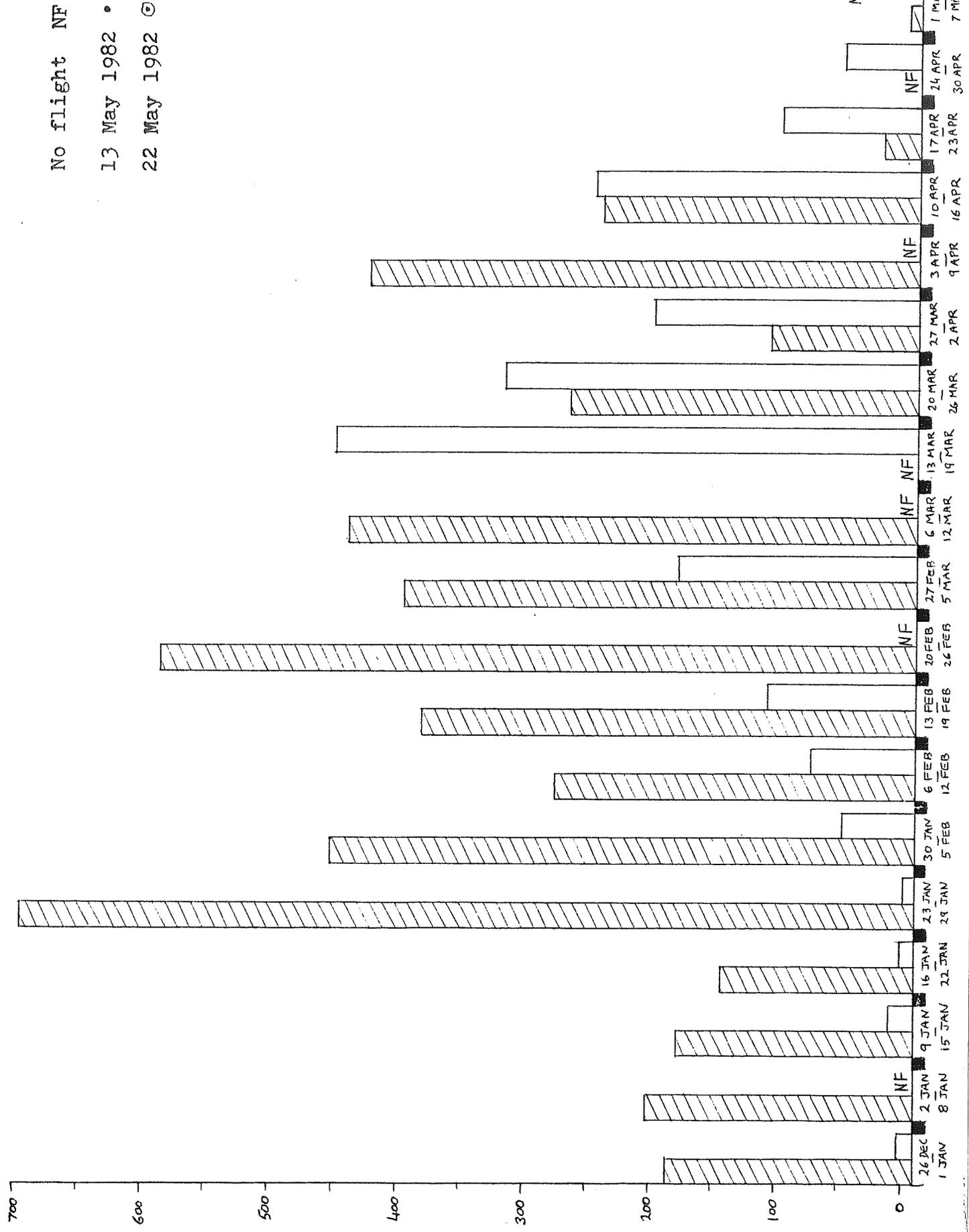
1983 1982

NF No flight

Figure 3

HIGHEST WEEKLY AERIAL COUNTS OF HARBOR SEALS IN THE NANTUCKET AREA

1983  1982 



No flight NF  
 13 May 1982 •  
 22 May 1982 ©