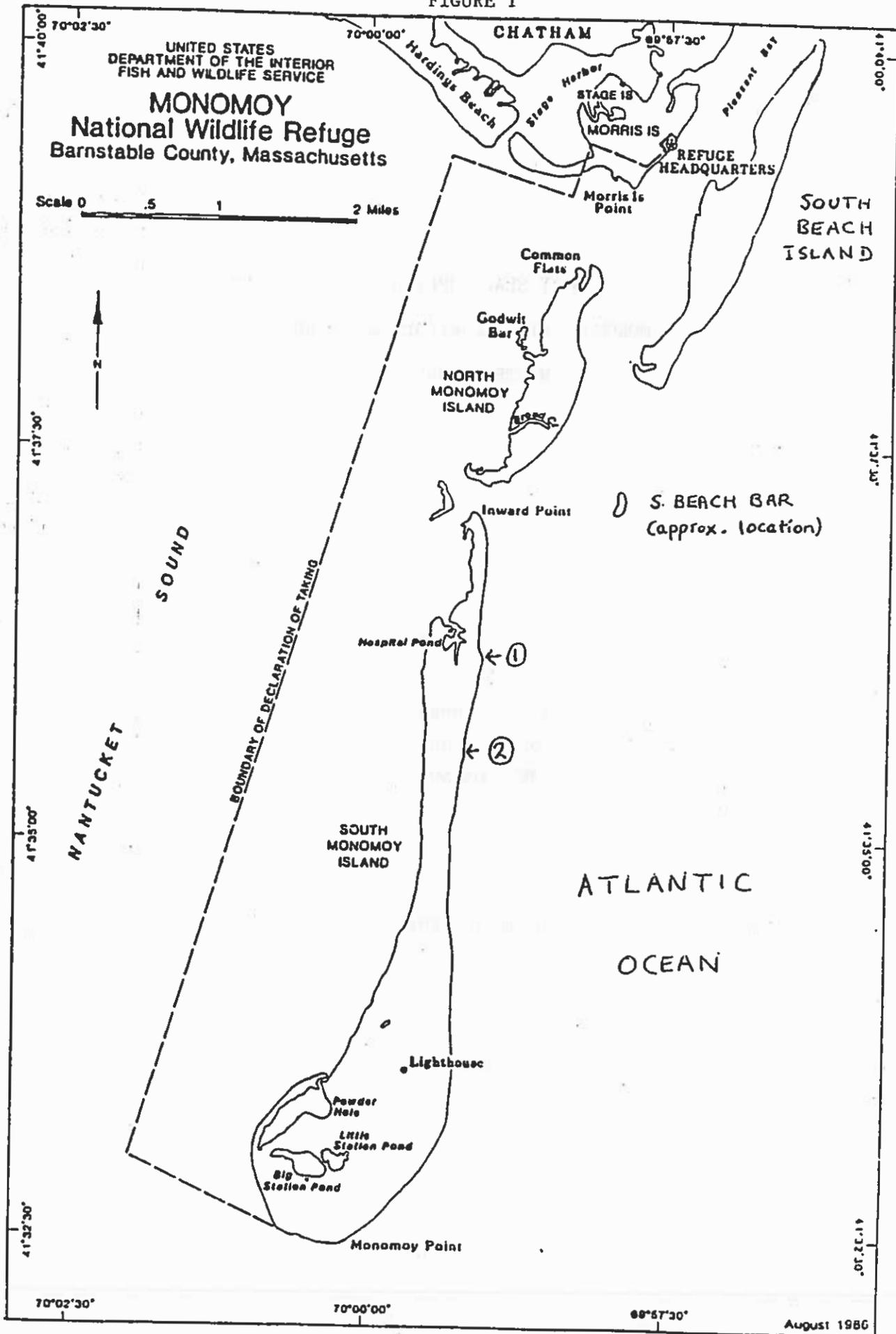


**GRAY SEAL PUPPING
AT MONOMOY NATIONAL WILDLIFE REFUGE
WINTER, 1991**

by
**Valerie Rough
Spruce Head
ME 04859**

September 1991

FIGURE 1



ABSTRACT

In 1990 Monomoy National Wildlife Refuge became the second known breeding site for gray seals (Halichoerus grypus) in New England, with the births of 6 pups in the Refuge itself and 3 others at neighboring South Beach Island. In 1991 pups again were born on the Refuge. Thus a pattern of consistent use may be developing, although none of the 1991 females were repeaters from 1990, based on a photo-identification study. Dispersal from the rapidly expanding population at Sable Island, Nova Scotia supplies New England with a breeding stock large enough to ensure more or less regular pupping in the Nantucket Sound area, including Monomoy, in the foreseeable future.

PURPOSE

The purpose of the present study was to track the onset of gray seal pupping at Monomoy in January 1991; to document the identity of the females, or cows, using photo-identification; and to compare the 1991 females with a catalog of females photographed in previous years at this and other New England locations. Individual females can be followed in time and space using this technique.

METHODS

In January and February 1991 gray seals at Monomoy Refuge were monitored by boat and from the National Weather Service tower at the Monomoy Refuge Headquarters. Boat observations took place on vessels operated by David Houghton and Chris Miller of the U.S. Fish and Wildlife Service (USFWS), and by the Cape Cod Museum of Natural History (CCMNH) and Massachusetts Audubon Society (MAS) in the course of scheduled wildlife tours. Valerie Rough conducted one aerial survey. Photographs by various persons were used to identify the individual gray seal females.

RESULTS

Cow-pup pairs are labelled alphabetically in order of birth of the pups.

Gray seals were seen in the Monomoy area as early as 10 October 1990, and were sighted regularly from early December onward. USFWS technician David Houghton reported 5-6 female grays, and 545 harbor seals (Phoca vitulina) on 8 December. On 1 January 1991 he saw 7 female and 2 male grays. On 5 January at South Beach Bar, a small islet about 1 mile east of the break between North and South Monomoy (see Figure 1), Houghton recorded 6 large females on the bar, and a fat, mature cow just coming out onto the beach. 3-4 large males and 3 juveniles were present also, and in the water were 75-100 harbor seals.

Peter Trull of CCMNH saw 3 gray seals in the water at the north end of South Monomoy (also called South Island) on 6 January, and 120 harbor seals at South Beach Bar. On 8 January Trull saw only a few harbor seals in the water.

On 10 January MAS reported 7 grays, probably females, on South Beach Bar, with 50 harbor seals. On 11 January Valerie Rough with Houghton and Chris Miller saw about 12 gray seals in the water on the west side of the Bar, playing. One large and 6-7 small females were observed. The only seal hauled out was a small harbor seal which appeared to be injured.

12 January brought a southeasterly storm. On 13 January Rough observed from the NWS tower and saw, 4 miles away, 50 seals, gray and harbor, on South Beach Bar, and 100-150 harbor seals on the north end of South Monomoy. On 14 January from the tower she noted 2 gray seals on the Bar, and 300-400 harbor seals on the north end of South Monomoy, with smaller gray seals playing at the water's edge.

On 15 January, with still no pups born, Rough took an aerial survey around all of Monomoy to see whether there might be gray seals at Powder Hole, near the south tip of the South Island. Weather conditions were ideal (clear, air temperature 42° F, light WSW wind) both for censussing and for the haulout of seals. Basking seals were strung out on the east side of the South Island from Inward Point south to the Hospital Pond area. There were 1,977 harbor seals, and 12 gray seals - a group of 8, and two pairs among the harbor seals (see Figure 2). Two other grays were in the water about half-way down the east side. No pups were spotted. The area around Powder Hole had shoaled up and was unsuitable for seals.

16 January brought an easterly storm, and 17 January huge ocean swells. On 18 January Houghton saw, on the east side of the South Island, about 15 grays, including several mature females, 4 bulls, and several juveniles, as well as 1,000-plus harbor seals. On 19 January, from the tower, Rough saw a long line of seals down the east side of the South Island.

On 20 January Robert Prescott of MAS saw gray seals, mostly in the water, 2 miles down the east side of the South Island. On 21 January, from the tower, Rough saw 2-3 gray seals on the edge of the strand, on the east side of South Island.

Then on 22 January, again from the tower, at 1050 am, she spotted a pup, with an adult showing in the surf zone, on the east shore of South Island. Trull confirmed this on a CCMNH trip the morning of 23 January, as did Houghton, Miller and Rough that afternoon. We saw the pup on the beach, and the cow, female A (see Catalog), with an attendant bull in the surf zone, all at Site 1 on the east shore (see Figure 1).

A 24 January USFWS cruise to South Island found 1,200-1,500 harbor seals with grays mixed in in the east shore. At the north end of the line of seals, at Site 1, were pup A high on the beach, and female A closer to the water, along with a mature bull. The female made several somewhat half-hearted attempts to drive the bull down the beach, pursuing him into the water on one

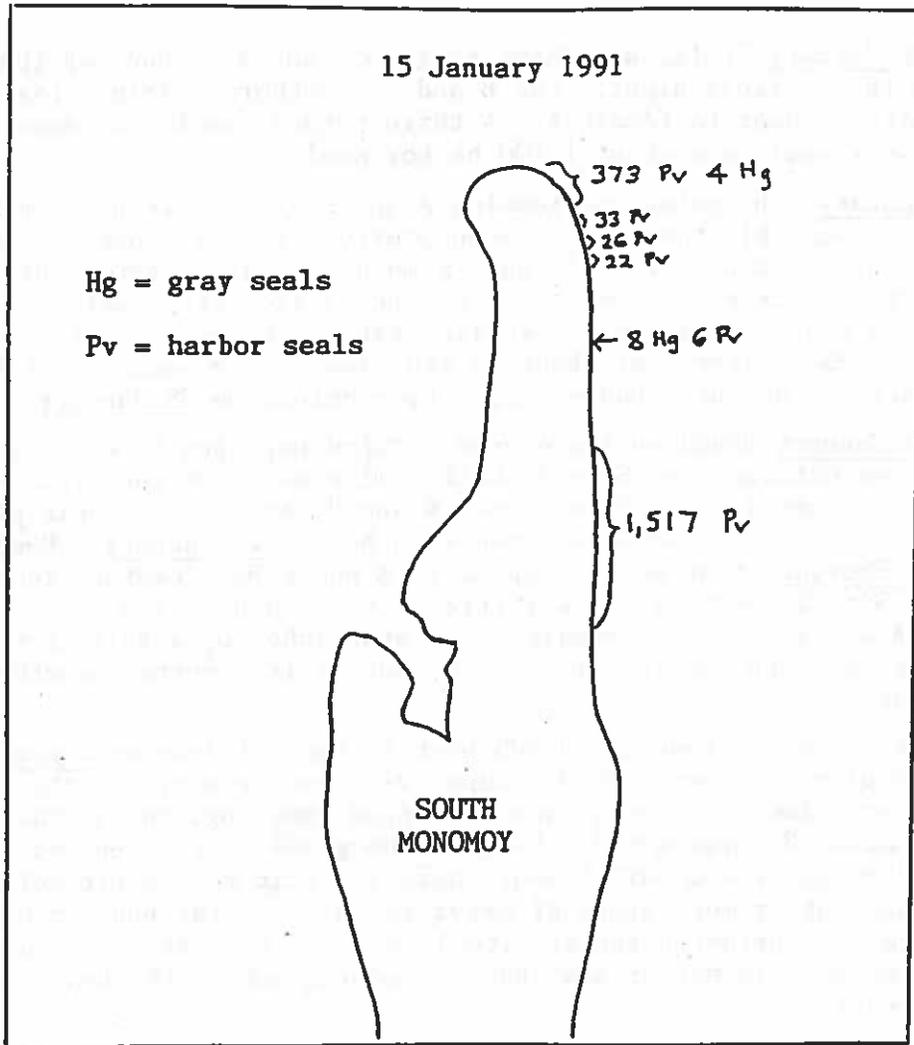


FIGURE 2

occasion. Near the end of our observations the female went towards the pup, leaving the male at the water's edge. Another female started to come out of the water onto the beach. With no uncertainty female A raced down to chase her away.

On 26 January Trull, and later Houghton, saw a second pup (pup B), probably born the previous night. Pup B and its mother, female B (see Catalog), were at Site 1, near to female A. A third rotund female was seen; also about 20 other gray seals and about 1,100 harbor seals.

27 January. Houghton saw females A and B with their pups at Site 1. A mature bull, possibly the same as seen previously, lay close to cow A, now evidently tolerated by her. A's pup, a male, had grown noticeably fat while pup B was thin, its white coat still stained yellow from amniotic fluid. Cow B bore a pink flipper tag, revealing her birthplace as Sable Island, Nova Scotia, in 1985. Altogether about 25 gray seals were seen, about half of them juveniles. Houghton had similar observations on 28 January.

On 29 January Houghton discovered a third pup, pup C, with its mother, female C (see Catalog), at Site 2, half a mile south of the first nursery at Site 1 (see Figure 1). At Site 1 cows A and B rested with their pups, and A's companion bull, the same one seen with her on 24 January. Houghton found on 4 February that mother-pup pairs A and C had reversed locations. C was now at Site 1, with pair B a little to the south in its original position; and A was at Site 2. Female C was approached by a bull, similar in size to the one seen earlier with cow A, but it is uncertain whether he was the same one.

Miller and Rough took the USFWS boat to South Island on 5 February. They saw 40-plus gray seals in 3 groups, with harbor seals on the periphery of the groups. Among the grays were a tagged yearling, and 3 others also with tags, about 3-4 years old. Many of the grays were juveniles. The coats of most had become dull brown, characteristic of the pre-molting stage. North of the southernmost group of grays was a lone, fat pup, probably A, at or near Site 2. Further north at Site 1 were pup B, with pup C to its north. Pup C is a male. Its mother was observed coming out on the beach, as a bull lay in the surf.

Miller reported that on 8 February all 3 pups were still with their mothers. On 9 February Houghton and Rough looked at a group of 10 gray seals on the east side of South Island. A very fat pup lay on the crest of the beach at the north end of this group. The mother, probably cow C, approached it while a bull waited lower on the beach. No other pups were seen this day. Houghton saw one pup and female together on 10 February, but saw no pups on 13 February. All but pup C would have been weaned by this date. On 22 February Miller reported 2 pups still in whitecoat in a group of older grays. These pups would have been weaned and abandoned by their mothers, and were resting on the beach awaiting the molt of their natal coats.

A final pup report for Cape Cod is that of an emaciated whitecoat in Wychmere Harbor, Harwich, on 24 February.

Trull saw gray seals mating at the end of South Beach Island in February. The exact date was unavailable. Prescott reported 9-10 pups molted out of whitecoat at Monomoy in the spring of 1991.

DISCUSSION

In contrast to January 1990 when the births of gray seal pups came as a surprise to observers, January 1991 was a long vigil of anticipation, almost resigned to disappointment when the first pup arrived on 22 January. At Sable Island, where the stock originates, the pupping season runs from about 25 December to about 10 February. However most pups are born in the second and third week of January, with 60% born by 21 January (Mansfield and Beck, 1977). The 1990 Monomoy pups fell into this pattern, but the 1991 pups were relatively late. Weather may be a factor in the timing of birth.

Chilling threatens survival in the newborn pup, and may occur if the fur is soaked before a subcutaneous blubber layer develops to insulate the body. Rain and immersion should be avoided in the first few days of life. Subfreezing temperatures (which preclude rain), or dry weather patterns would be optimal for the newborn's survival. The early first date of birth at Monomoy in 1990, about 5 January, may have been influenced by the record cold of December 1989; also there was no rain from 5 January until the afternoon of 8 January 1990. January 1991 was warmer than average, and fairly rainy in the first two weeks. However the first gray seal birth took place on the coldest day of the month (min 12° F, max 22° F). Pregnant females may be able to adjust the timing of delivery, or may travel to a particular area, to take advantage of weather conditions.

Once a female has pupped in an area others tend to follow suit, suggesting that social facilitation is also an important determinant of pupping behavior.

Another difference in 1991 is the location of the pupping. The 1990 pups were born at Inward Point, the north tip of South Monomoy, whereas the 1991 pups were born partway down the east side of the South Island. As in 1990 the haulout patterns of the large harbor seal population appeared to influence the gray seals' choice of location. The aerial survey of 15 January clearly showed the harbor seals' preference for the east shore of the South Island in January 1991, and this is where the gray seals pupped. In 1990 the harbor seals moved between Inward Point and the southern end of South Beach Island to the east, according to prevailing wind direction. In the second half of January 1991 the winds were predominantly westerly, with fewer days of southerly and southwest winds than in January 1990, so that a lee could be found on the east shore, but the relationship is not altogether clear-cut.

The seals on the east shore were less subject to human disturbance than when at Inward Point, as onshore swells and surf prevented boats from close approach to the shore. It is difficult to say whether previous disturbance may have led the seals to select the east shore as a haulout site.

Five of the nine cows who pupped in the Monomoy area in 1990 were identified with photographs. None of these was seen at Monomoy in 1991. One of the 1990 Monomoy cows, "Tern", pupped at Nantucket, New England's other gray seal breeding ground, in 1991. Another 1990 Monomoy cow, branded F305 (not F303 as previously reported) as a pup at Sable Island, did

not return to Monomoy in 1991, nor was it seen at Sable Island despite directed efforts there to census all seals of that brand series. All three 1991 Monomoy cows were photographed. 1991 female B carried a pink hindflipper tag indicating she was born at Sable Is. in 1985; she was probably pupping for the second time. The other females may have been ^{relatively} inexperienced breeders too, since they were drawn to the large concentration of harbor seals for breeding activity. At Nantucket, where some older females pupped in 1991, the grays are completely segregated from harbor seals.

CONCLUSION

For the second consecutive year gray seals pupped at Monomoy National Wildlife Refuge. Three pups were born, two identified as males, and all survived at least to weaning at about 17 days of age. One cow bore a 1986 Sable Island flipper tag, and was probably a first time pupper. The other females may have been inexperienced breeders also. None of the five cows identified at Monomoy in 1990 returned there in 1991, however one of them pupped this year at Nantucket, where several other pups were born.

Sable Island's increasing gray seal stock supplies a growing stream of recruits to the New England population. The seals will likely breed at Monomoy (and Nantucket) in future years. The Refuge should be monitored each year for the seals, beginning in late December, and photographs made of all mature females, covering both sides of the head and body. The photographs can then be added to and compared with the existing catalog of gray seal females seen at Monomoy and elsewhere in New England. All three 1991 Monomoy females were photographed and added to the catalog. Photo-identification has proven a valuable management tool for several cetacean species, and is useful as well for long-term studies of gray seals.

This study was made possible through the support of The Conservation and Research Foundation.

ACKNOWLEDGMENTS

I thank the U.S. Fish and Wildlife Service and technicians David Houghton and Chris Miller for enabling me and my assistant to visit the Monomoy Refuge. I am grateful to David Houghton, Chris Miller, Peter Trull, Don Reed and Bob Prescott for sharing data. Also I wish to thank David Houghton; Steve Heaslip and the Cape Cod Times; and Barry Donahue and The Cape Codder for providing photographs of the gray seals for the Catalog. The National Weather Service in Chatham kindly provided weather data.

I am very grateful for the support of The Conservation and Research Foundation which allowed me to participate in this study.

REFERENCES

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PHOTO-IDENTIFICATION OF BREEDING GRAY SEALS
AT MONOMOY NATIONAL WILDLIFE REFUGE.

Summary

The study of pupping gray seals at Monomoy National Wildlife Refuge, outlined in a Research/Management Study Proposal submitted on 27 December 1991, was curtailed as pupping did not occur at the Refuge in winter 1992. Two aerial surveys of the Refuge were made, on 12 and 19 January 1992.

Results

On 12 January 1992, as part of a survey of the Nantucket area, I flew over the east shore of South Monomoy at 0920, about 1 hour before low tide. The wind was northwest at 12 knots, and the sky was clear. Air temperature at Nantucket was 24°F. A small raft of eider ducks was southeast of Monomoy Point. On the southeast end of South Monomoy a fairly large, light-colored seal, probably a gray seal, was hauled out. About $\frac{1}{4}$ of the way up the east side a pair of gray seals was swimming side by side, heading north. About halfway up the east side was another such pair; a third pair was seen about $\frac{2}{3}$ of the way up the east side. From this point north to the cut were several hundred harbor seals in the water, evenly spread out. About 25 harbor seals were hauled out on a very small shoal between the north end of South Monomoy and South Beach Island.

On 19 January 1992 I flew over the east side of South Monomoy at 0940, about 1 hour before high tide. Air temperature was 12°F, the sky was mostly clear, and the wind was west northwest at 12 knots. There were flurries offshore to the east. No seals were hauled out. 200± harbor seals and 4 gray seals were in the water on the east side of the north end of South Monomoy.

No gray seal pups were found at Monomoy National Wildlife Refuge in winter 1992. Two females which pupped at Monomoy in 1991, Female B and Female C in the 1991 photocatalog, pupped at Nantucket in 1992. Female B, renamed "Moby", pupped there on 29-30 January 1992. Female C, renamed "Monce", pupped there on 23-24 January 1992. Tern, a female which pupped at Monomoy in 1990 and at Nantucket in 1991, did not reappear at Nantucket in 1992. A bull gray seal seen with the female 2-Spot at Monomoy on 27 January 1990, was seen at Nantucket on 29 January 1991 and on 27 January 1992. According to the Department of Fisheries and Oceans, Canada, the female branded F305, which pupped at Monomoy in 1990, was not seen at Sable Island in the 1991 or 1992 pupping seasons.

I hope to be able to carry out the photoidentification study in future years if pupping occurs at Monomoy Refuge.

3 November 1992

Valerie Rough
Spruce Head
ME 04859

copy to: Sharon Ware

David Houghton

The first female to pup at Monomoy in 1991, Female A, was resighted at Little Duck Is., ME, on 27 May 1992.

