

**Summary of Piping Plover (*Charadrius melodus*) Breeding Success and
Tern Nesting Status on Nauset Spit and North Beach, Orleans
Massachusetts 2000**

By Jason Lusier



Submitted to:

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&

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&

**Dr. Scott Melvin
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Submitted by:

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Introduction:

This report documents the nesting success of the piping plover (*Charadrius melodus*) in the town of Orleans, MA. These birds nest on the ocean side of the town in two locations – Nauset Spit and Orleans North Beach (see maps on pages 15 and 16 in Appendix C for the area of detail). Nests were located and monitored. When the breeding adults laid 4 eggs, predator exclosures were erected around the nests. Not all nests were exclosed due to predation before being able to exclose them. Once the eggs hatched, the chicks were monitored to keep track of how many survive and become fledglings. Piping plovers typically fledge between 25 and 30 days after they've hatched. The following is a report describing the exclosures used, the devastating noreaster of June 6th and 7th, and the status of terns nesting in Orleans. The appendices that follow contain summaries of field observations, the number of breeding pairs present, the number of eggs laid and hatched, the number of chicks that fledged, two maps of the nesting areas, copies of the piping plover and tern census forms sent to the Massachusetts Division of Fisheries and Wildlife, and a list of all the birds observed in the Nauset Beach area.

The Exclosures:

The exclosures consist of many integral parts in order to be sure they are sturdy enough and that they appropriately keep out predators. The main part of the exclosure is a large cage-like metal fencing 4 feet high and 35 feet long. It is pulled together into a circular shape and buried 4 inches into the ground, making the exclosure 44 inches high

off the ground. Five wooden stakes are used to support the enclosure. Zip ties are used to attach the stakes to the enclosure to assure strength. A fruit netting is used as a cover for the top. The netting is tied down to the enclosure in several places with twist ties.

It was discovered part way through the season that it was not appropriate for all nests being enclosed to have a fruit net covering. Nests that were laid in the dunes and/or in vegetation – American beach grass (*Ammophila breviligulata*) and/or beach pea (*Lathyrus japonicus*) – were enclosed with no fruit net covering. It was found that the breeding adults defending these nests would escape the nest by flying up and out rather than walking away. It would seem that these birds could not see an approaching predator as well through the vegetation, so flying up and out of the nesting area would be necessary to successfully escape.

It was decided to remove covers from nests in this position when a bird was directly affected. The female from nest ONB-2 (Orleans North Beach) got her wing caught in the fruit net covering on May 25. The covering was then removed and fortunately the bird recovered.

There was one mortality caused by an enclosure. It should be noted that this nest was not in any sort of vegetation. After the heavy June 6th Noreaster that destroyed many nests, the female from nest NS-11 (Nauset Spit) got her feet caught in the netting and unfortunately was not found soon enough. She died June 8.

The June 6th – 7th Noreaster:

On June 6th and 7th, the combination of over a twelve-foot high tide and the attack of strong northeastern winds from a noreaster devastated the nesting attempts of the piping plovers. There were 13 nests on Nauset Spit, 3 of which had already hatched. The storm's strong tide completely washed over the spit. There were a total of 6 chicks on the spit before the noreaster, and surprisingly enough, 5 of those chicks survived the storm. All of the 10 nests remaining were washed over by the tide and buried in the sand. June 8th, NS-5 hatched. The eggs were buried in sand, yet 3 of the 4 eggs in the nest hatched. The pair at NS-10 recovered 3 of their eggs and successfully hatched them 21 days later. Only three of the 8 nests destroyed by this storm did not reneest (NS-4, NS-7, & NS-11), the other 5 did.

South on Orleans North Beach did not look any better. There were 6 nests prior to the storm, 4 of which were washed over by the tide. Three of those four nests failed. ONB-1b recovered their eggs and successfully hatched all four eggs 19 days later. Two of the three nests destroyed by this storm reneested and successfully hatched eggs. The pair from ONB-6 disappeared.

Tern Nesting:

Each year a tern census is conducted for Nauset Spit and Orleans North Beach combined. Data are reported to the Massachusetts Division of Fisheries and Wildlife on the *2000 Massachusetts Tern Census Form* found on page 27 in Appendix E. One count

is conducted within a census window of June 5-20 and is called the A-Count. Roseate terns (*Sterna dougallii*), common terns (*Sterna hirundo*), arctic terns (*Sterna paradisaea*), least terns (*Sterna antillarum*), laughing gulls (*Larus atricilla*), and black skimmers (*Rynchops niger*) are censused. The A-Count was conducted June 21 (a day late of the census window) and only 1 nesting pair of least terns was found on Nauset Spit. No nesting activity of the aforementioned species was apparent in the Orleans North Beach area. A few days prior to the count, many nesting pairs of laughing gulls, common terns, least terns, and 1 nesting pair of black skimmers were present on Nauset Spit. This large tern colony very suddenly evacuated the area. There was mass predation apparent in the area with many decapitated birds present. This would indicate the possible presence of a great-horned owl (*Bubo virginianus*).

As part of the tern census, a second count, the B-Count, was conducted for certain species outside the census window (after June 20). The B-Count was conducted on July 16. There was no new nesting activity of roseate terns, arctic terns, or black skimmers; however, 33 least terns were counted on Nauset Spit. Using the adult count method of survey, it was determined that an estimated 26.4 nesting pairs were present ($33 \text{ adults} * .8 = 26.4 \text{ pairs}$).

Appendix A

Summary of Field Observations



Summary of Field Observations:

The following lists are summaries of field observations made for each nest. Failed is defined ultimately as not having fledged chicks, which in some cases may more proximately mean not having hatched eggs. Fledged is defined as being 25 days or older and the chicks were determined fledged when witnessed in flight.

Nauset Spit

NS-1

4/29 found & completed with 3 eggs
5/1 exclosed
5/29 all 3 eggs hatched
5/29-6/3 3 chicks present
6/4-6/27 2 chicks present
6/28 2 chicks fledged

NS-2

4/29 found completed with 4 eggs
5/1 exclosed
5/26 all 4 eggs hatched
5/26-5/27 no observations were made
5/28-6/5 1 chick present
6/6 noreastern; 1 chick disappeared - declared failed

NS-2b

6/25 found completed with 4 eggs
6/26 exclosed
7/16 all 4 eggs hatched
7/16-7/20 3 chicks present
7/21-7/22 2 chicks present
7/23-7/24 1 chick present
7/25-8/6 no chicks observed - declared failed

NS-3

5/6 found completed with 3 eggs
5/13 exclosed
5/31 all 3 eggs hatched
5/31-6/10 3 chicks present (survived the 6/6 noreastern)
6/11-6/27 2 chicks present
6/28 2 chicks fledged

NS-4

5/7 found with 1 egg
5/15 completed with 4 eggs
5/17 exclosed
6/6 washed out by noreastern - declared failed

NS-5

5/7 found with 2 eggs
5/12 completed with 4 eggs
5/13 exclosed
6/6 washed over by noreastern
6/8 3 of the 4 eggs hatched
6/9-6/10 no observations were made
6/11-6/16 no chicks were seen
6/17-7/3 1 chick present
7/4 1 chick fledged

NS-6

5/7 found with 2 eggs
5/12 completed with 4 eggs
5/13 exclosed
6/6 washed out by noreastern - declared failed

NS-6b

6/16 found with 1 egg
6/19 completed with 3 eggs
6/19 exclosed
7/16 all 3 eggs hatched
7/16-7/18 3 chicks present
7/19-7/23 2 chicks present
7/24 1 chick present
7/25-7/28 no observations were made
7/29-8/9 1 chick present
8/10 1 chick fledged

NS-7

5/14 found with 3 eggs
5/15 completed with 4 eggs
5/17 exclosed
6/6 washed out by noreastern - declared failed

NS-8

5/14 found completed with 4 eggs & exclosed
6/6 washed out by noreastern - declared failed

NS-8b

6/17 found with 1 egg
6/21 completed with 3 eggs & exclosed
7/15 all 3 eggs hatched
7/15-7/20 3 chicks present
7/21-7/24 2 chicks present
7/25-7/28 no observations were made
7/29 no chicks present
7/30-8/4 no observations were made
8/5-8/6 no chicks present - declared failed

NS-9

5/15 found completed with 4 eggs
5/17 exclosed
6/6 washed out by noreastern - declared failed

NS-9b

6/19 found with 2 eggs
6/21 completed with 4 eggs & exclosed
7/16 3 of the 4 eggs hatched
7/16-7/18 3 chicks present
7/19-7/24 2 chicks present
7/25-7/28 no observations were made
7/29 2 chicks present
7/30-8/4 no observations were made
8/5-8/9 no chicks present - declared failed

NS-10

5/31 found with 3 eggs & exclosed
6/3 completed with 4 eggs
6/29 3 of the 4 eggs hatched
6/30-7/1 no observations were made
7/2-7/12 2 chicks present
7/13-7/25 1 chick present
7/26 1 chick fledged

NS-11

5/31 found with 3 eggs & exclosed
6/2 completed with 4 eggs
6/6 washed over by noreastern - declared failed
6/8 female caught in cover - mortality

NS-12

5/31 found with 2 eggs
6/1 exclosed
6/4 completed with 4 eggs
6/6 washed out by noreastern - declared failed

NS-12b

6/25 found completed with 4 eggs
6/26 exclosed
7/14 3 of the 4 eggs hatched
7/14-7/21 3 chicks present
7/22-7/24 no chicks present
7/25-7/28 no observations were made
7/29 no chicks present
7/30-8/4 no observations were made
8/5-8/6 no chicks present - declared failed

NS-13

5/31 found completed with 4 eggs & exclosed
6/6 washed out by noreastern - declared failed

NS-13b

6/15 found with 1 egg
6/20 predated by crow; no eggshell fragments observed - declared failed

Orleans North Beach

ONB-1

5/18 found with 3 eggs
5/19 completed with 4 eggs
5/20 predated by gull; no eggshell fragment observed - declared failed

ONB-1b

5/28 found with 2 eggs
5/30 exclosed
6/1 completed with 4 eggs
6/27 all 4 eggs hatched
6/27-7/3 3 chicks present
7/4-7/21 2 chicks present
7/22 2 chicks fledged

ONB-2

5/22 found completed with 4 eggs & exclosed
5/25 female caught in cover; removed cover; female recovered
6/14 abandoned - declared failed

ONB-3

5/28 found with 4 eggs & exclosed
5/29 completed with 5 eggs
6/19 abandoned - declared failed

ONB-4

5/30 found with 1 egg
6/1 predated suspected gull - declared failed

ONB-5

5/30 found with 2 eggs
6/1 exclosed
6/3 nest moved by tide; enlarged exclosure
6/6 washed out by noreaster - declared failed

ONB-5b

6/16 found with 2 eggs & exclosed
6/18 completed with 4 eggs
7/15 all 4 eggs hatched
7/15-7/24 2 chicks present
7/25-7/27 no observations were made
7/28-7/29 1 chick present
7/30-8/4 no observations were made
8/5-8/8 1 chick present
8/9 1 chick fledged

ONB-6

6/1 found completed with 4 eggs & exclosed
6/6 washed out by noreaster - declared failed

ONB-7

6/3 found with 3 eggs
6/4 completed with 4 eggs & exclosed
6/6 washed out by noreaster - declared failed

ONB-7b

6/18 found with 3 eggs
6/19 completed with 4 eggs & exclosed
7/18 3 of the 4 eggs hatched
7/18-7/21 3 chicks present
7/22 2 chicks present
7/23-7/24 no chicks seen
7/25-7/27 no observations were made
7/28 found 1 dead chick; no other chicks seen
7/29 no chicks seen
7/30-8/4 no observations were made
8/5-8/9 no chicks seen - declared failed

Appendix B

Tables:

Table #1: 2000 Piping Plover Nest List
for Nauset Spit and Orleans North Beachpage 13

Table #2: Abundance and Productivity of Piping Plovers
on Nauset Spit and Orleans North Beachpage 14

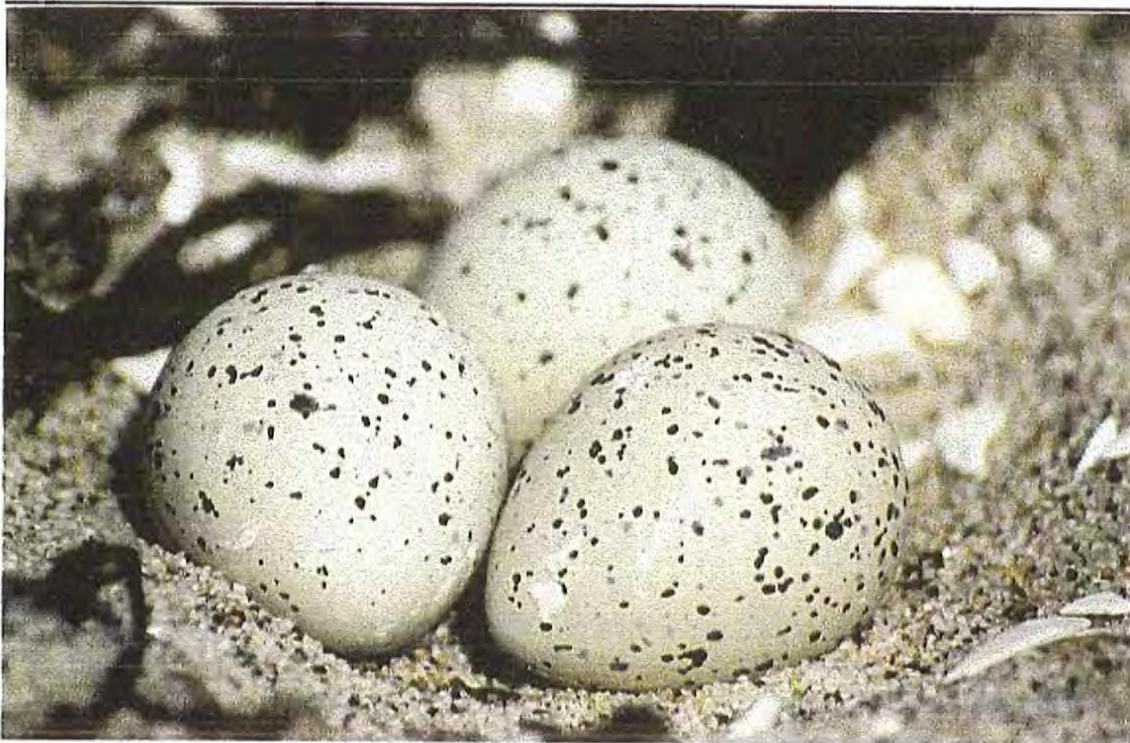


Table #1: 2000 Piping Plover Nest List for Nauset Spit and Orleans North Beach

NS = Nauset Spit
ONB = Orleans North Beach

Nest	Location	Found (#)	Complete	Exclosed	Exp. Hatch	Hatch Date	Fledge (#)	Notes
NS-1	S of 5	4/29 (3)	<=4/29 (3)	5/1	<=5/24	5/29	5/28 (2)	
NS-2	post 6	4/29 (4)	<=4/29	5/1	<=5/24	5/26	*****	noreaster 6/6
NS-2b	post 6	6/25 (4)	<=6/25	6/26	<=7/23	7/16	*****	disappearance of chicks unknown
NS-3	2 N of 2	5/6 (3)	<=5/6 (3)	5/13	<=6/3	5/31	5/28 (2)	
NS-4	S of 4	5/7 (1)	5/15	5/17	6/12	*****	*****	washed out - noreaster 6/6
NS-5	1 N of 5	5/7 (2)	5/12	5/13	<=6/10	5/6	7/4 (1)	washed over - noreaster 6/6; 1 egg failed
NS-6	N of 7	5/7 (2)	5/12	5/13	<=6/10	*****	*****	washed out - noreaster 6/6
NS-6b	post 7	6/15 (1)	6/19 (3)	6/19	7/17	7/15	8/19 (1)	
NS-7	1 N of 1	5/14 (3)	5/15	5/17	<=6/12	*****	*****	washed out - noreaster 6/6
NS-8	end	5/14 (4)	<=5/14	5/14	<=6/11	*****	*****	washed out - noreaster 6/6
NS-8b	2 S of end	6/17 (1)	6/21 (3)	6/21	7/19	7/15	*****	disappearance of chicks unknown
NS-9	1.5 S of 8	5/15 (4)	<=5/15	5/17	<=6/12	*****	*****	washed out - noreaster 6/6
NS-9b	2 S of 8	6/19 (2)	6/21	6/21	7/19	7/16	*****	1 egg failed; disappearance of chicks unknown
NS-10	1 S of 6	5/31 (3)	6/3	5/31	7/1	5/29	7/26 (1)	washed over - noreaster 6/6; 1 egg failed; disappearance of chicks unknown
NS-11	1 S of 9	5/31 (3)	6/2	5/31	6/30	*****	*****	washed out - noreaster 6/6; female caught in cover = mortality 6/8
NS-12	2 N of 4	5/31 (2)	6/4	6/1	7/2	*****	*****	washed out - noreaster 6/6
NS-12b	2 N of 4	6/25 (4)	<=6/25	6/26	<=7/23	7/14	*****	1 egg failed; disappearance of chicks unknown
NS-13	S of 1	5/31 (4)	<=5/31	5/31	<=6/27	*****	*****	washed out - noreaster 6/6
NS-13b	washover	6/15 (1)	*****	*****	*****	*****	*****	predated - confirmed crow 6/20; prints detected w/in 1" of nest; no eggshell fragments observed

ONB-1	S of 2	5/18 (3)	5/19	*****	6/15	*****	*****	predated - confirmed gull 5/20; prints detected w/in 5" of nest; no eggshell fragments observed
ONB-1b	S of 2	5/28 (2)	6/1	5/30	5/29	5/27	7/22 (2)	washed over - noreaster 6/6; removed cover 5/5
ONB-2	S of pouchet	5/22 (4)	<=5/22	5/22	<=6/19	*****	*****	female got caught in cover; removed cover 5/25; abandoned ~6/14 suspected presence of predator
ONB-3	S of ONB-2	5/28 (4)	5/29 (5)	5/28	6/26	*****	*****	no cover; abandoned ~6/19 suspected presence of predator
ONB-4	N of ONB-5	5/30 (1)	*****	*****	*****	*****	*****	predated - 6/1; suspected gull; tracks washed out from rain night before
ONB-5	N of 1	5/30 (2)	*****	6/1	*****	*****	*****	nest moved by tide; enlarged enclosure 6/3; washed out - noreaster 6/6
ONB-5b	N of 1	5/15 (2)	6/18	6/16	7/16	7/15	5/19 (1)	egg cover
ONB-6	S of 5	6/1 (4)	<=6/1	6/1	<=6/29	*****	*****	washed out - noreaster 6/6
ONB-7	4 S of 3	6/3 (3)	6/4	6/4	7/2	*****	*****	washed out - noreaster 6/6
ONB-7b	5 S of ONB-1b	6/18 (3)	6/19	6/19	7/17	7/18	*****	no cover; 1 egg failed; found 1 dead chick - cause unknown

***** = completed

Table #2: Abundance and Productivity of Piping Plovers on Nauset Spit and Orleans North Beach

	<i>Nauset Spit (NS)</i>	<i>Orleans North Beach (ONB)</i>	<i>Total</i>
Nests			
Total # of Pairs	13	7	20
Total # of Nesting Attempts	19	10	29
Total Successful (%)*	10 (52.7%)	3 (30%)	13 (44.9%)
Eggs			
Total # of Eggs Laid	69	36	105
Total # of Eggs Hatched (%)	32 (46.4%)	11 (30.6%)	43 (41.0%)
Chicks			
Total # of Chicks Fledged (%)	7 (21.9%)	3 (27.3%)	10 (23.3%)
Fledge Rate / Pair**	.54 chicks per pair	.43 chicks per pair	.50 chicks per pair

*Successful is defined as a nest having 1 or more eggs hatch.

**The Fledge Rate per Pair is the total number of chicks fledged, divided by the total number of pairs with fledging data, even if those fledging data were zero.

Appendix C

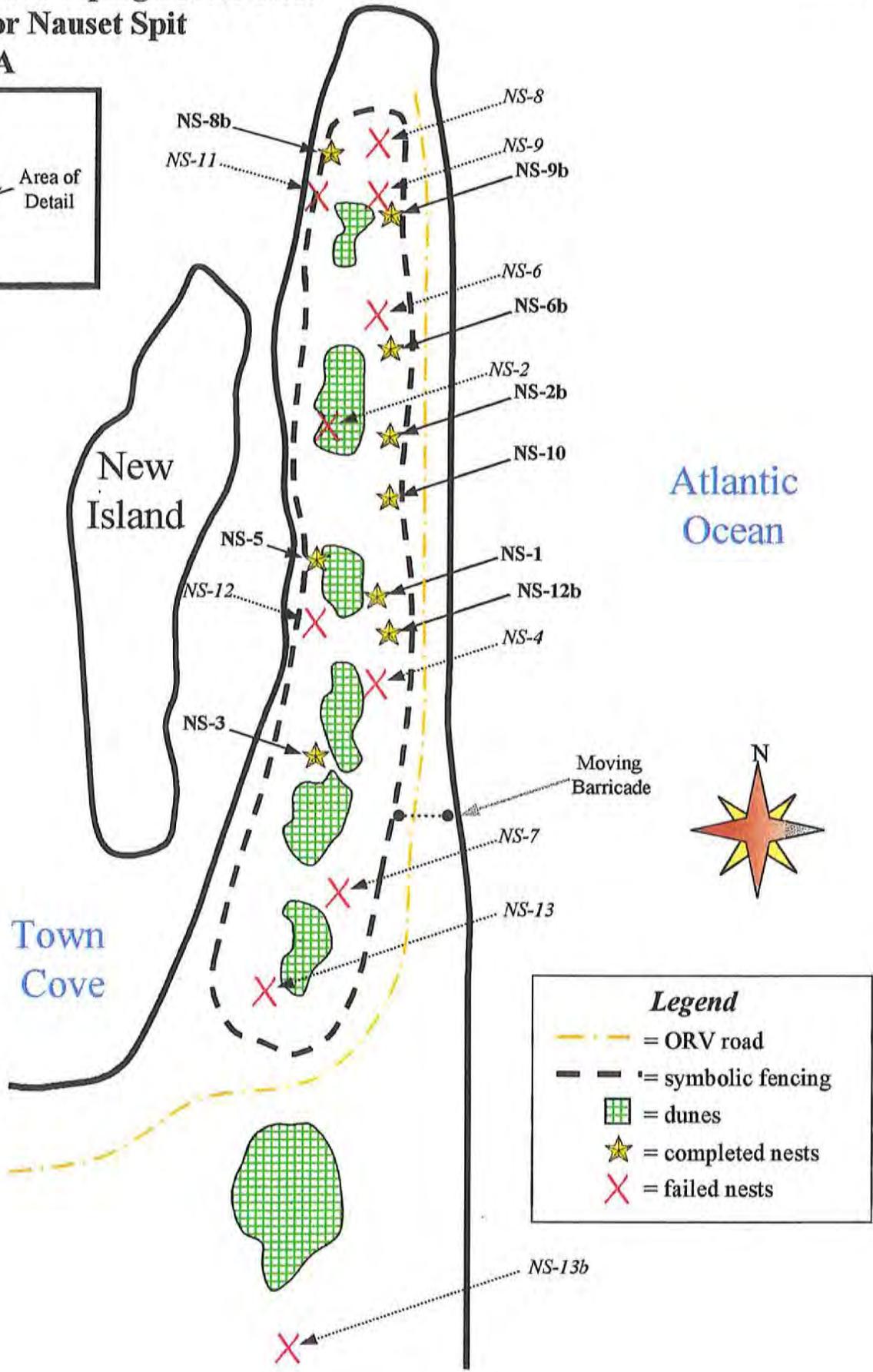
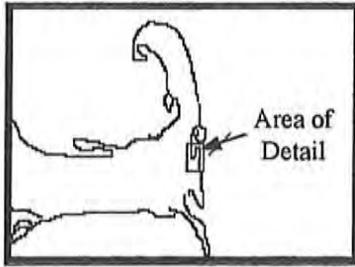
Maps:

Figure #1 – 2000 Piping Plover Nest Locations
for Nauset Spit.....page 16

Figure #2 – 2000 Piping Plover Nest Locations
for Orleans Norrh Beach.....page 17



Figure #1. 2000 Piping Plover Nest Locations for Nauset Spit
Orleans, MA

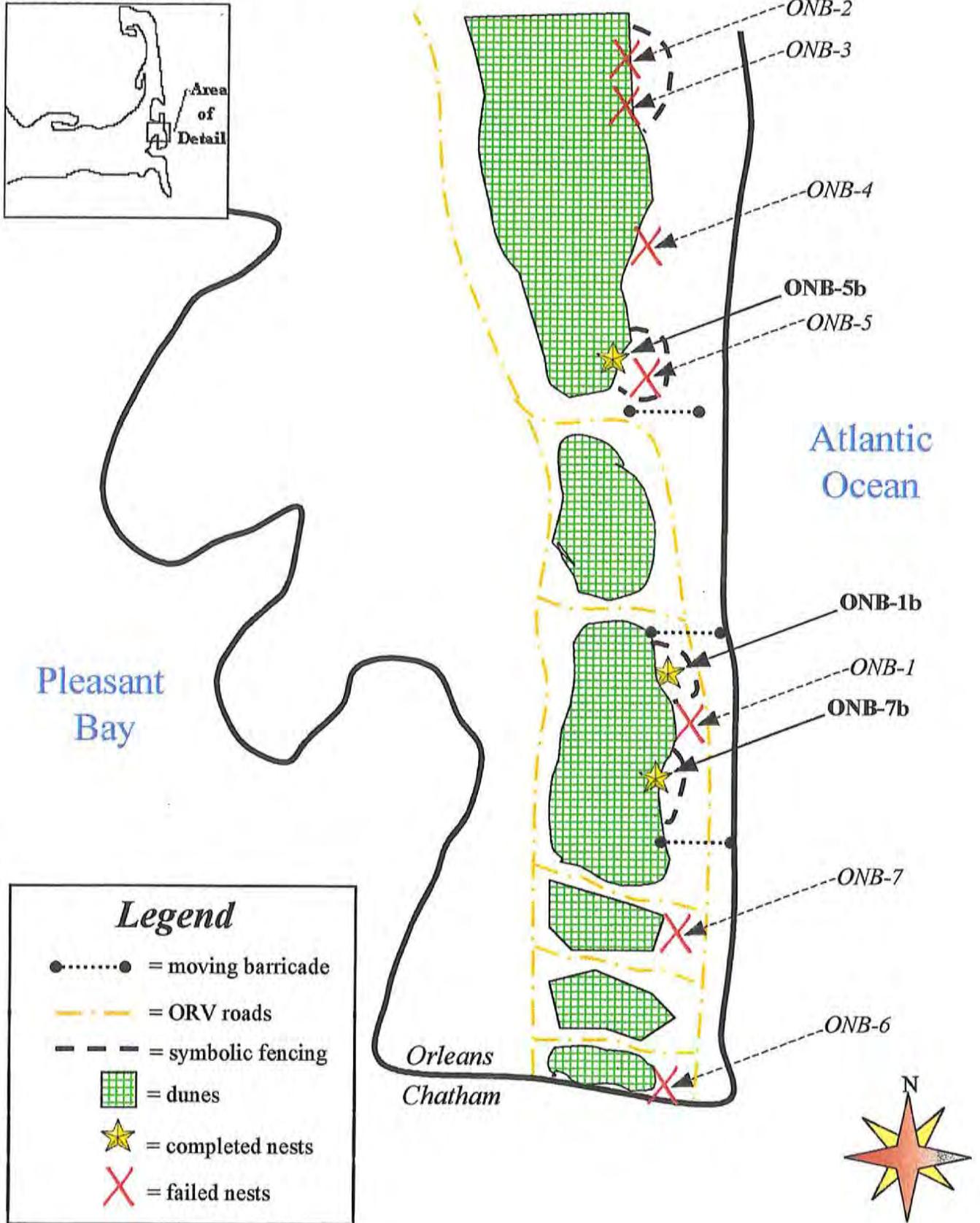


Legend

- = ORV road
- = symbolic fencing
- = dunes
- = completed nests
- = failed nests



**Figure #2: 2000 Piping Plover Nest Locations for Orleans North Beach
Orleans, MA**



Appendix D

Charts

Chart #1: Piping Plover Productivity on Nauset Spit.....page 19

Chart #2: Piping Plover Productivity on Orleans North Beach.....page 20

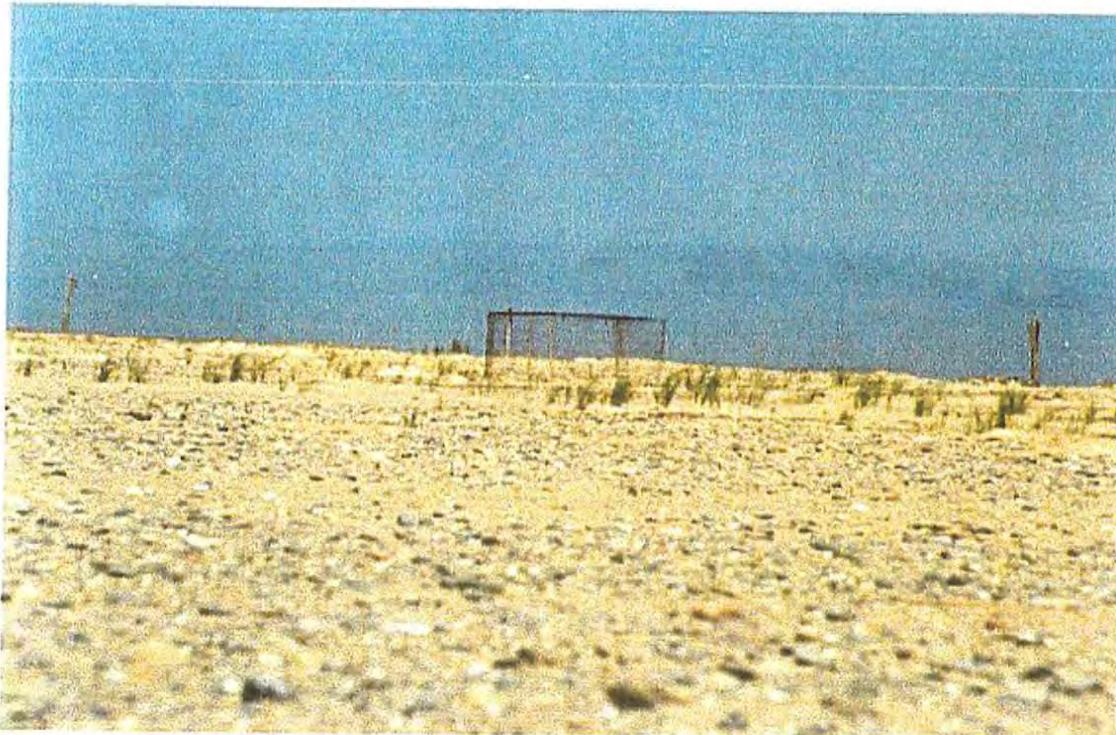


Chart #1: Piping Plover Productivity on Nauset Spit

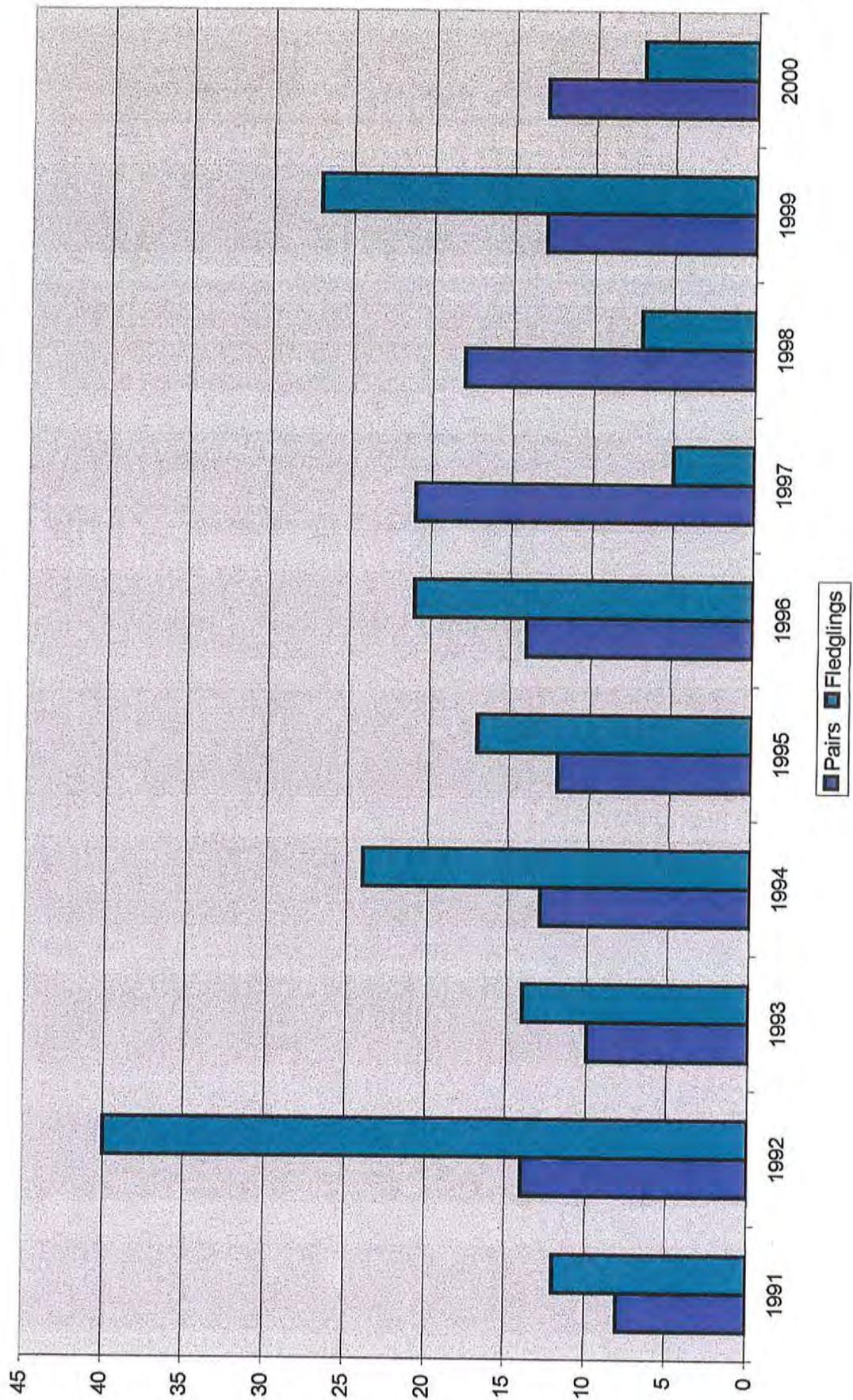
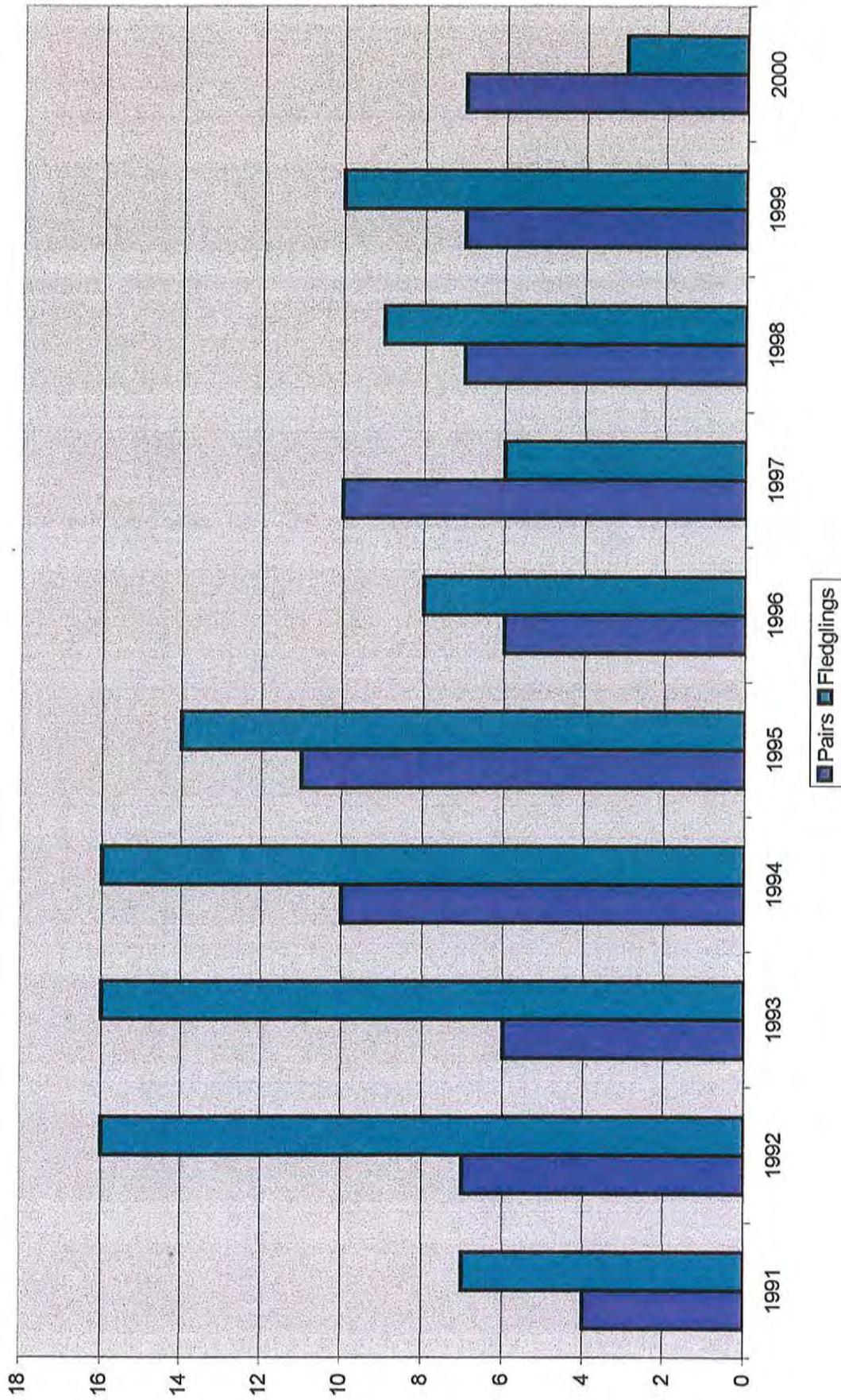


Chart #2: Piping Plover Productivity for Orleans North Beach



Appendix E

Census Forms:

Form #1 – Massachusetts Piping Plover Census Form.....pages 22-26

Form #2 – 2000 Massachusetts Tern Census From.....pages 27-28



Year: 2000
 Observer/Agency: Sason Luscier and Kerry Collier
 Site Name: Lausset Spit
 Town: Orleans
 Ownership: Town

Address: Orleans Park Dept.
18 Bay Ridge Lane - P.O. Box 122
Orleans 02653 Telephone: (508) 240-3775

Census Remarks:

	Index Count	Total Count
No. of Pairs	13	13
Unpaired Adults	-	-

Month	Average # of visits to site per week
April	4-5
May	6
June	6
July	6

Indicate type(s) of enclosure design(s) used:

Exclusion Design	A	B	C
Shape	Circular		
Diameter/Length of Side	10'		
Size of Wire Mesh	9" X 4"		
Height Above Ground	44"		
Depth Buried	4"		
Cover Material	netting		
Cover Spacing/Mesh Size	1/2" X 1/2"		

Other Management Undertaken or Needed/Remarks: no dogs allowed in nesting areas; symbolic fencing used around entire nesting area; no pedestrians or vehicles allowed w/in 50 feet of nests; areas closed to ORV's 2 days prior to hatching til chicks fledged

Page 1 of 2

Pair No.	Nest No.	Number of Eggs/Chicks			Date clutch was:				Exclosure	
		Laid	Hatched	Fledged	Found (#eggs?)	Completed	Hatched or Failed	Y/N	Design(A,B,...)	Date Installed
NS-1	NS-1	3	3	2	4/29 (3)	4/29	Hatched 5/29	Y	A	5/1
NS-2	NS-2	4	4	0	4/29 (4)	4/29	Hatched 5/26	Y	A NO cover	5/1
NS-2	NS-2b	4	4	0	6/25 (4)	6/25	Hatched 7/16	Y	A	6/26
NS-3	NS-3	3	3	2	5/6 (3)	5/6	Hatched 5/31	Y	A	5/13
NS-4	NS-4	4	0	0	5/7 (1)	5/15	Failed 6/6	Y	A	5/17
NS-5	NS-5	4	3	1	5/7 (2)	5/12	Hatched 6/8	Y	A	5/13
NS-6	NS-6	4	0	0	5/7 (2)	5/12	Failed 6/6	Y	A	5/13
NS-6	NS-6b	3	3	1	6/16 (1)	6/19	Hatched 7/16	Y	A	6/19
NS-7	NS-7	4	0	0	5/14 (3)	5/15	Failed 6/6	Y	A	5/17
NS-8	NS-8	4	0	0	5/14 (4)	5/14	Failed 6/6	Y	A	5/14

Nest No.	Cause of Egg Mortality/Evidence	Cause of Chick Mortality/Evidence
NS-2	NA	disappeared after no rears tern 6/6
NS-2b	NA	UNKNOWN
NS-4	washed out by no rears tern 6/6	NA
NS-6	washed out by no rears tern 6/6	NA
NS-7	washed out by no rears tern 6/6	NA
NS-8	washed out by no rears tern 6/6	NA

WARNING: This is a copy of the site that shows locations of all nests and water that did not exist

Pair No.	Nest No.	Number of Eggs/Chicks			Date clutch was:				Exclosure		
		Laid	Hatched	Fledged	Found (#eggs?)	Completed	Hatched or Failed	Y/N	Design(A,B,...)	Date Installed	
US-8	US-8b	3	3	0	6/17 (1)	6/21	Hatched 7/5	Y	A	6/21	
US-9	US-9	4	0	0	5/15 (4)	5/15	Failed 6/6	Y	A	5/17	
US-9	US-9b	4	3	0	6/19 (2)	6/21	Hatched 7/16	Y	A	6/21	
US-10	US-10	4	3	1	5/31 (3)	6/3	Hatched 6/29	Y	A	5/31	
US-11	US-11	4	0	0	5/31 (3)	6/2	Failed 6/6	Y	A	5/31	
US-12	US-12	4	0	0	5/31 (2)	6/4	Failed 6/6	Y	A	6/1	
US-12	US-12b	4	3	0	6/25 (4)	6/25	Hatched 7/14	Y	A	6/26	
US-13	US-13	4	0	0	5/31 (4)	5/31	Failed 6/6	Y	A	5/31	
US-13	US-13b	3	0	0	6/15 (1)	—	Failed 6/20	N	—	—	

Nest No.	Cause of Egg Mortality/Evidence	Cause of Chick Mortality/Evidence
US-8b	NA	unknown
US-9	washed out by woeaster n 6/6	NA
US-9b	1 egg failed	unknown
US-11	washed out by woeaster n 6/6	NA
US-12	washed out by woeaster n 6/6	NA
US-12b	1 egg failed	unknown
US-13	washed out by woeaster n 6/6	NA
US-13b	predated by crow 6/20; prints w/in 1" of nest	NA

***Please attach a copy of a map of this site that shows locations of nests and pairs that did not nest.

Year: 2000

Site Name: Orleans North Beach

Town: Orleans

Ownership: Town

Observer/Agency: Susan Lusier and Kerry Collier

Address: Orleans Park Dept.

18 Bay Ridge Lane - P.O. Box 122

Orleans 02653 Telephone: (508) 240-3775

Census Results:	Index Count	Total Count
No. of Pairs	7	7
Unpaired Adults	-	-

Census Remarks:

Month	Average # of visits to site per week
April	4-5
May	6
June	6
July	6

Indicate type(s) of enclosure design(s) used:

Exclosure Design	A	B	C
Shape	Circular	same	
Diameter/Length of Side	10'	same	
Size of Wire Mesh	8" X 4"	same	
Height Above Ground	44"	same	
Depth Buried	4"	same	
Cover Material	netting	NO COVER	
Cover Spacing/Mesh Size	1/2" X 1/2"	NO COVER	

Other Management Undertaken or Needed/Remarks: NO dogs allowed in nesting areas; symbolic fencing used around entire nesting area; NO pedestrians or vehicles allowed w/in 50 feet of nests; areas closed to ORV's 2 days prior to hatching til chicks fledged

Pair No.	Nest No.	Number of Eggs/Chicks				Date clutch was:				Exclosure		
		Laid	Hatched	Fledged	Found (#eggs?)	Completed	Hatched or Failed	Y/N	Design(A,B,...)	Date Installed		
OUB-1	OUB-1	4	0	0	5/18(3)	5/19	Failed 5/20	N	—	—		
OUB-1	OUB-1b	4	4	0	5/28(2)	6/1	Hatched 6/27	Y	B	5/30		
OUB-2	OUB-2	4	0	0	5/22(4)	5/22	Failed 6/14	Y	B	5/29		
OUB-3	OUB-3	5	0	0	5/28(4)	5/29	Failed 6/19	Y	B	5/28		
OUB-4	OUB-4	1	0	0	5/30(1)	—	Failed 6/1	N	—	—		
OUB-5	OUB-5	2	0	0	5/30(2)	—	Failed 6/6	Y	A added w/eggs	6/1		
OUB-5	OUB-5b	4	4	1	6/16(2)	6/18	Hatched 7/15	Y	B	6/16		
OUB-6	OUB-6	4	0	0	6/1(4)	6/1	Failed 6/6	Y	A	6/1		
OUB-7	OUB-7	4	0	0	6/3(3)	6/4	Failed 6/6	Y	A	6/4		
OUB-7	OUB-7b	4	3	0	6/18(3)	6/19	Hatched 7/18	Y	B	6/19		

Nest No.	Cause of Egg Mortality/Evidence	Cause of Chick Mortality/Evidence
OUB-1	Predated by gull 5/20; prints detected w/in 5" of nest	NA
OUB-2	Nest abandoned ~ 6/14	NA
OUB-3	Nest abandoned ~ 6/19	NA
OUB-4	Predated 6/1; suspected gull tracks washed by rain	NA
OUB-5	washed out by westerly 6/6	NA
OUB-6	washed out by westerly 6/6	NA
OUB-7	washed out by westerly 6/6	NA
OUB-7b	1 egg failed	unknown; 1 dead chick found - cause not apparent

***Please attach a copy of a map of this site that shows locations of all nests and pairs that did not nest.

Colony Name: Nauset-Orleans (Chatham line north to Nauset Harbor Inlet)
 Colony Number: 352009

Observer/Agency: Jason Lusier / Orleans Park Dept.
 Street: 18 Bay Ridge Ln P.O. Box 199

Town: Orleans
 Ownershp: Town of Orleans

Town: Orleans
 Zip: 02653 Telephone: (508) 240-3775

***PLEASE read the instructions on the reverse of this form before filling out.

Species Code	A-Count			B-Count			P	Remarks: (e.g., evidence of predation, tide or storm washout, human disturbance, etc.) *INDICATE (if known) DATE OF FIRST EGGS LAID AND FIRST EGGS HATCHED.		
	Date	No. Pairs	M	Q	Date	No. Pairs			M	Q
ROST	6/21	0	NC	HC	7/16	0	AC	HC	0	
COTE	6/21	0	NC	HC					1	many birds were seen present 4 days prior to A-count - mass predation apparent (suspected great-horned owl) - whole colony evacuated ≈ 6/19
ARTE	6/21	0	NC	HC	7/16	0	AC	HC	0	
LETE	6/21	1	NC	HC	7/16	33 X .8 = 26.4	AC	LC	2	many birds were present 4 days prior to A-count - mass predation apparent - whole colony evacuated ± 6/19
LAGU	6/21	0	NC	HC					1	were a few pairs prior to colony evacuating
BLSK	6/21	0	NC	HC	7/16	0	AC	HC	1	1 pair w/a nest present prior to whole tern colony evacuating
OTHER										

Instructions for completing the Massachusetts Tern Census Form

For census methodologies consult the *Massachusetts Tern & Plover Handbook: a manual for stewards.*

Colony Name and Colony Number are provided according to *Erwin and Korschen(1979)*. Complete a separate form for each colony visited, even if no birds are found. If a previously unreported colony location is discovered, attach a photocopy of a labeled U.S.G.S. topographical map pinpointing the exact location of colony.

Species Codes:

ROST = Roseate Tern
COTE = Common Tern

ARTE = Arctic Tern
LETE = Least Tern

LAGU = Laughing Gull
BLSK = Black Skimmer

Other Codes:

M = Method of Survey

NC = Nest Count (1 nest = 1 pair)
EC = Partial nest count(extrapolated)
AC = Adult Count (multiplied by 0.8 = estimated number of pairs)

Q = Quality of Survey

LC = Low Confidence
RC = Reasonable Confidence
HC = High Confidence

P = Productivity Estimate

0 = None
1 = Poor
2 = Fair to Good
3 = Excellent

Nests (or scrapes) should contain at least one egg in order to be counted. Also, a nest should be counted if it is apparent that eggs have hatched and/or the chicks are away from the nest. Do not count empty scrapes or nests that are obviously abandoned. Remember, nests represent pairs and all results should be expressed as "numbers of pairs".

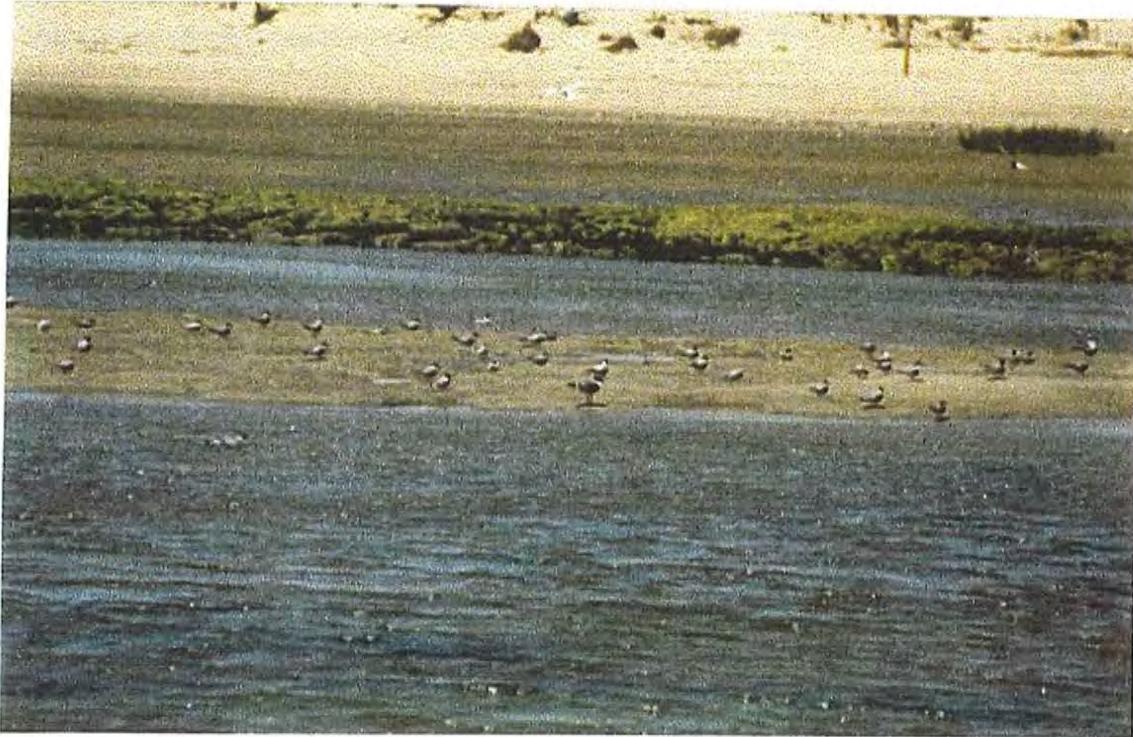
REMINDER: REPORT ALL NEGATIVE RESULTS

(Negative results are important to document visitation of a site even though no nesting birds may have been found.)

Species Code	A-Count	B-Count
ROST	All "A-Counts" are taken within the census window of June 5 - 20 Time as closely as possible to the date of first hatch, approximately 23 days after the first eggs are laid.	All "B-Counts" are taken outside the census window; after June 20 Time exactly 25 days after first count.
COTE	Time as closely as possible to the date of first hatch, approximately 23 days after the first eggs are laid (usually 6-8 days before ROST).	No "B-Count" is required.
ARTE	Time census to coincide with that of the other species in colony such as common tern or least tern.	Another census should be taken to reflect any additional pairs that appear after June 20.
LETE	Visit colony frequently during the count period and report maximum number of nests/incubating birds counted on any one day.	Conduct a "B-Count" if there is a significant change in numbers from the "A-Count".
LAGU	Time count coincident with COTE count.	No "B-Count" is required.
BLSK	Time count coincident with COTE count.	Another census should be taken to reflect any additional pairs that appear after June 20.

Appendix F

Bird List



<u>AOU Common Names</u>	<u>Comments</u>
Common Loon	seen occasionally
Northern Gannet	6/20/00 - 1 imature washed up somewhat injured
Double-crested Cormorant	seen daily
Snowy Egret	seen often feeding in wetlands south of Nauset Spit
Great Blue Heron	seen rarely
Glossy Ibis	7/2/00 - 11 observed on Nauset Spit flying north
Canada Goose	seen rarely
Mallard	nesting activity in marsh near Pochet area
Common Eider	seen occasionally
White-winged Scoter	3 seen resting on Nauset Spit often
Surf Scoter	seen rarely
Osprey	1 nest at nesting platform near Pochet area
Northern Harrier	seen often foraging in marsh at Pleasant Bay
Black-bellied Plover	present at end of spring & late July into August
Piping Plover	seen daily
Semipalmated Plover	present late July into August
American Oystercatcher	nesting activity in Chatham; seen often
Willet	seen daily
Greater Yellowlegs	present late July into August
Ruddy Turnstone	present late July into August
Red Knot	present late July into August
Sanderling	seen daily
Short-billed Dowitcher	present late July into August
Laughing Gull	seen daily
Bonaparte's Gull	seen rarely
Ring-billed Gull	seen daily
Herring Gull	seen daily
Great Black-backed Gull	seen daily
Roseate Tern	nesting activity on New Island
Common Tern	seen daily
Arctic Tern	nesting activity on New Island
Least Tern	seen daily
Black Skimmer	seen daily
Mourning Dove	seen daily
Ruby-throated Hummingbird	seen rarely
Northern Flicker	seen rarely
Eastern Kingbird	seen daily
Blue Jay	seen occasionally
American Crow	seen daily

Horned Lark	seen daily
Tree Swallow	seen daily
Barn Swallow	seen daily
Black-capped Chickadee	seen rarely
American Robin	seen often
Gray Catbird	seen daily
Northern Mockingbird	seen daily
Cedar Waxwing	7/29/00 - 2 birds seen in tree at edge of marsh south of Nauset Spit
Common Yellowthroat	seen rarely
Song Sparrow	seen often
Northern Cardinal	seen daily
Red-winged Blackbird	nesting activity late spring/early summer in marsh at Pleasant Bay
Common Grackle	seen often
House Finch	seen occasionally
American Goldfinch	seen daily
House Sparrow	seen daily

**Summary of Piping Plover (*Charadrius melodus*) Breeding Success and
Tern Nesting Status on Nauset Spit and North Beach, Orleans
Massachusetts 2001**

**Submitted to:
Paul Fulcher
Park Superintendent
Orleans Park Department
Orleans, MA 02653**

**Orleans Conservation Commission
Town Hall
Orleans, MA 02653**

**Dr. Scott Melvin
Natural Heritage and Endangered Species Program
Massachusetts Department of Fisheries and Wildlife
Westboro, MA 01851**

**Submitted by:
Cathy Davis
Orleans Park Department
Orleans, MA 02653**

Introduction:

This document contains the summary of the 2001 breeding season for the Piping Plover (*Charadrius melodus*) on Nauset Beach, which consists of Nauset Spit and North Beach in the town of Orleans, Massachusetts. Enclosed are maps with locations of the nests, summaries of field notes, breeding pair and fledged chick updates, and tables which illustrate the productivity of the birds. Also included is a list of all the birds and other animals that were observed in the Nauset Beach area during the season.

Piping plovers return to traditional nesting areas beginning late March through early May. They nest on the ocean side of town on Nauset Spit and North Beach. They prefer the sandy substrate that a barrier beach has to offer, as they, as well as their eggs and chicks are cryptically colored to blend in to their surroundings. Nests are located and monitored. When 4 eggs were laid in a nest, an exclosure was constructed around the nest area. The exclosure consists of welded-wire caging that is 4 feet high and 35 feet long. This is pulled into a circular shape around the nest and then buried 4 inches in the sand. Fruit netting is tied down and used as a cover and wooden stakes give the exclosure standing power. Piping plovers generally walk into their nests, not fly, so this type of predation device seems to work well. The birds can fit through the individual openings in the caging. Once the exclosure is in place, we always check to make sure the bird returns to the nest. Occasionally a bird will reject the exclosure, and abandon the nest. Last year a mortality occurred when a female adult was trapped in the fruit netting, attempting to fly up and out. Luckily this did not happen in the 2001 season.

Tern Nesting:

Every year a tern census is conducted for the entire Nauset Beach area. The official forms required by MassWildlife are included in this report. Two counts are conducted. The first one is done during the census window of June 5-20 called the A-Count. A-Count was conducted on June 21st, one day late of the official count period and 45 *Least Tern* nests were counted. No other shorebird

nests were found at that time. B-Count is conducted after June 20th. B-Count was conducted on July 17th and 73 *Common Tern* nests were counted, along with 6 *Least Tern* nests. All of these tern nests were found on Nauset Spit. The Common Terns had been nesting on New Island, an island located close to Nauset Spit in Town Cove that the National Park Service monitors. Subsequently, the least tern colony was displaced by the recent movement of the common terns. Several groups of least terns then nested further south on the Spit, in much smaller colonies. Two least tern nests were found outside of the B-Count on North Beach, north of the barrier for vehicle traffic. Both of these nests were washed over by the tide.

July 4th Fireworks Incident

A large fireworks display was observed on the cove side of the Nauset Spit section of Nauset Beach. The display originated from a pedestrian walkway that purposely cuts through the symbolic fencing used to protect the shorebird habitat area. The closest piping plover nest [NS15] to this location was measured at roughly 900 feet. That nest had hatched June 28th, a week prior to the incident. Two chicks from that nest were observed July 3rd and were again seen on July 5th, the day after the fireworks display.

The least tern colony at the end of the spit, roughly one mile from where the fireworks originated seemed not to suffer in their overall numbers. Curiously enough, about one week later, a colony of common terns, numbering roughly 150+ were seen in the area where the least terns had once occupied. As mentioned earlier, these birds had moved over from New Island. The entire common tern colony that had relocated to the end of the spit was predated sometime over the weekend of July 28th and 29th. All of the eggs were gone and a few eggshell fragments were found. Mammal tracks were seen throughout the entire colony area. They were surmised to be that of a fox, or small coyote. Large gull prints were also observed. The common terns themselves were not seen on the spit, but were observed nearby on a large sandbar.

Summary of Field Observations:

The following are summaries of the field observations made for each nest during the season. Fledged is defined as being 25 days old or witnessed in flight of at least 50 feet. Failed is defined as not having fledged chicks, which also includes a nest that did not hatch or abandoned nests.

Snapshot of Nauset Spit:

23 chicks fledged out of 12 successful nests

5 nests failed – 2 were predated, 1 washed over, 1 buried in sand, 1 abandoned.

Nauset Spit

NS-1

- 5-2 found with 3 eggs
- 5-4 completed with 4 eggs & exclosed
- 5-30 4 chicks hatched–only 3 are mobile, 1 laying still, barely alive, located outside of enclosure–feathers are not completely covering back–not fully formed or possibly attacked?
- 5-31 3 chicks seen brooding under adult
- 6-3 2 chicks seen
- 6-6/8 3 chicks seen
- 6-14 1 chick seen
- 6-16/26 2 chicks seen
- 6-26 2 chicks fledged
- One chick continued to be seen into early August in this area.

NS-2

- 5-5 found with 3 eggs
- 5-8 completed with 4 eggs
- 5-9 exclosed
- 6-3 hole in one egg observed
- 6-4/5 no observations made
- 6-6 2 chicks seen
- 6-7/10 2 chicks seen

- 6-17/27 1 chick seen
- 6-28 2 chicks seen
- 6-29 2 chicks fledged
- 7-14 2 chicks seen--one had moth hanging out of its bill!

NS-3

- 5-5 found with 2 eggs
- 5-7 complete with 4 eggs
- 5-9 exclosed
- 5-30 eggs sanded in due to high winds--I dug them out.
- 6-1 buried again, but some tracks seen
- 6-2 nest abandoned--declared failed

NS-4

- 5-6 found with 1 egg
- 5-9 two eggs present
- 5-10 nest washed over--declared failed

NS-5

- 5-6 found with 1 egg
- 5-12 complete with 4 eggs
- 5-13 exclosed
- 6-7 3 new chicks and one egg in nest
- 6-8 2 chicks seen
- 6-10 2 chicks seen
- 6-14 3 chicks seen
- 6-21 2 chicks seen
- 6-25/26 1 chick seen
- 6-28/30 2 chicks seen
- 7-6 2 chicks seen/fledged
- Both chicks continued to be seen into early August in this area.

NS-6

- 5-8 found with 1 egg
- 5-10 2 eggs present
- 5-12 3 eggs present

- 5-13 nest predated--no eggshell fragments--RAIN--faint crow tracks in area.
- 5-13 declared failed

NS-7

- 5-9 found with 3 eggs
- 5-10 complete with 4 eggs
- 5-11 exclosed
- 5-11 crows seen in area & perched on exclosure
- 5-23 no birds or tracks present--very windy and heavy rain the previous day
- 5-23 saw birds and tracks later that day, but never seen on nest again
- 5-24 abandoned--declared failed

NS-8

- 5-11 found with 3 eggs
- 5-13 complete with 4 eggs and exclosed
- 6-7 1 chick in nest with adult, 2 chicks & adult feeding cove side
- 6-8 4 chicks seen
- 6-10 4 chicks seen
- 6-14 2 chicks seen
- 6-16 3 chicks seen
- 6-21 2 chicks seen
- 6-25 3 chicks seen
- 6-26 2 chicks seen
- 6-27/28 3 chicks seen
- 7-4 1 chick seen
- 7-5 2 chicks seen/fledged
- One chick continued to be seen through early August in this area.

NS-9

- 5-13 found with 1 egg
- 5-21 complete with 4 eggs
- 5-23 exclosed
- 6-16 3 new chicks and 1 egg in nest
- 6-17 2 chicks seen
- 6-20 2 chicks seen
- 6-21 4 chicks seen
- 6-27/30 2 chicks seen
- 7-3 3 chicks seen

- 7-10 4 chicks seen
- 7-13 4 chicks seen/fledged-seen flying

NS-10

- 5-20 found with 1 egg
- 5-26 complete with 4 eggs & exclosed
- 6-22 2 eggs/2 new chicks in nest-2pm
- 6-26 2 chicks seen
- 6-27/30 1 chick seen
- 7-3 2 chicks seen
- 7-7 1 chick seen
- 7-14 1 chick seen
- 7-19 1 chick seen/fledged

NS-11 (believed to be a renesting attempt of predated nest NS-6)

- 5-23 found with 1 egg
- 5-24 2 eggs present
- 5-26 predated-no eggshell fragments-gull tracks prevalent
- 5-26 declared failed

NS-12

- 5-23 found with 4 eggs
- 5-24 exclosed
- 6-1 crow tracks seen circling exclosure
- 6-17 1 egg & new chick in nest, 2 chicks feeding with adult north of nest
- 6-20 1 chick seen
- 6-21 2 chicks seen
- 6-26/28 2 chicks seen
- 7-3 2 chicks seen
- 7-6 2 chicks seen
- 7-11 2 chicks seen
- 7-14 2 chicks seen/fledged

NS-13

- 5-26 found with 1 egg
- 6-1 completed with 4 eggs & exclosed
- 6-26 3 new chicks & 1 egg in nest
- 6-27/28 2 chicks seen

- 7-4 2 chicks seen
- 7-6 2 chicks seen
- 7-10 3 chicks seen
- 7-12/13 1 chick seen
- 7-17 3 chicks seen
- 7-18/19 1 chick seen
- 7-20/21 2 chicks seen/fledged

NS-14

- 5-27 found with 3 eggs
- 5-29 completed with 4 eggs
- 6-1 exclosed
- 6-25 new chick near nest & one near exclosure–no sign of other two
- 7-4 1 chick seen
- 7-13 1 chick seen
- 7-18 1 chick seen
- 7-20 1 chick seen/fledged–seen briefly flying

NS-15

- 5-30 found with 1 egg
- 6-3 complete with 4 eggs & exclosed
- 6-29 3 chicks seen–1 stumbling a bit more than the others
- 6-30 3 chicks seen
- 7-3 2 chicks seen
- 7-5 2 chicks seen
- 7-6 1 chick seen
- 7-7 2 chicks seen
- 7-12 3 chicks seen
- 7-13 2 chicks seen
- 7-14 3 chicks seen
- 7-17/19 2 chicks seen
- 7-23 2 chicks seen/fledged

NS-16

- 6-3 found with 1 egg
- 6-9 complete with 4 eggs
- 6-10 exclosed
- 7-3 3 eggs hatched–one still in nest–it never hatches

- 7-4 2 chicks seen
- 7-6 1 chick seen
- 7-7 3 chicks seen
- 7-10 2 chicks seen
- 7-12/14 2 chicks seen
- 7-17/20 1 chick seen
- 7-23 1 chick seen
- 7-25 1 chick seen
- 7-28 1 chick seen/fledged

NS-17

- 6-3 found with 2 eggs
- 6-7 completed with 4 eggs
- 6-8 exclosed
- 7-3 3 eggs hatched-1 egg still in nest-it never hatches
- 7-4 2 chicks seen
- 7-6/7 3 chicks seen
- 7-10 3 chicks seen
- 7-12 3 chicks seen
- 7-18/19 1 chick seen
- 7-20 1 chick seen
- 7-23 1 chick seen
- 7-28 2 chicks seen/fledged

Snapshot of Orleans North Beach:

Nine chicks fledged out of 4 successful nests.

Three nests failed; 1 washed over, 1 abandoned, 1 unknown reason for failure.

Orleans North Beach

ONB-1

- 5-6 found with 1 egg
- 5-10 completed with 4 eggs
- 5-11 exclosed
- 6-6 early am-1 bird hatched & hole in another egg

- 6-7 3 chicks seen
- 6-8 moved ORV barricade south as chicks were traveling beyond barricade
- 6-10 3 chicks seen
- 6-11 4 chicks seen
- 6-14/15 3 chicks seen
- 6-16/17 2 chicks seen
- 6-20 4 chicks seen--moved barricade south again--chicks on the move.
- 6-21/22 3 chicks seen
- 6-25 2 chicks seen
- 6-27 2 chicks seen
- 6-30 3 chicks seen
- 7-3/7 3 chicks seen & fledged (7-1)
- Three chicks continued to be seen through mid-July in this area.

ONB-2

- 5-9 found with 2 eggs
- 5-9 staked off nesting area as it was very close to tire tracks.
- 5-10 nest washed over--declared failed.

ONB-2A (most likely renesters from above failed nest)

- 6-14 witnessed 2 chicks--nest was never discovered
- 6-15/16 2 chicks seen
- 6-20/21 2 chicks seen
- 6-26/27 2 chicks seen
- 6-28 1 chick seen
- 7-3/4 2 chicks seen
- 7-5 1 chick seen
- 7-6/7-7 2 chicks seen
- 7-10/12 2 chicks seen & fledged (7-9)
- One chick witnessed through the end of July in this area.

ONB-3

- 5-11 found with 1 egg
- 5-18 completed with 4 eggs & exclosed
- 6-16 3 chicks seen & 1 egg still in nest
- 6-17 4 chicks seen
- 6-20 4 chicks seen
- 6-21 3 chicks seen

- 6-22 2 chicks seen
- 6-25 3 chicks seen
- 6-27 4 chicks seen
- 6-28 3 chicks seen
- 6-30 3 chicks seen
- 7-3 3 chicks seen
- 7-4 4 chicks seen
- 7-7 3 chicks seen
- 7-10/11 3 chicks seen & fledged

ONB-4

- 5-11 found with 2 eggs
- 5-15 complete with 4 eggs
- 5-16 exclosed
- 6-10 late afternoon 2 mobile chicks/2 new ones in nest
- 6-11 3 chicks seen
- 6-14 2 chicks seen
- 6-15 4 chicks seen
- 6-16 3 chicks seen
- 6-20 3 chicks seen
- 6-21/22 4 chicks seen
- 6-25 2 chicks seen
- 6-26 1 chick seen
- 6-27 4 chicks seen
- 6-28/30 1 chick seen
- 7-4 1 chick seen
- 7-6/7 1 chick seen & fledged (7-5)
- One chick seen through end of July in this area.

ONB-5

- 6-3 found with 3 eggs
- 6-10 exclosed with 3 eggs--nest never had 4 eggs
- 6-16 abandoned--no tracks or adults seen for several days

ONB-6

- 6-15 found with 1 egg
- 7-17 3 chicks seen and 1 egg still in nest
- 7-19 3 chicks seen

- 7-20 3 chicks seen--very scattered, moving all over the place
- 7-23 3 chicks seen
- 7-24 3 chicks seen--one week old
- 7-24 last day that any trace of this family was seen--declared failed

Piping Plover Nests for 2001 Season									
NAUSET SPIT									
Nest	Location	Found (#)	Complete	Excused	Exp. Hatch	Hatch Date	Anticipated Fledge dt.	Fledge (#)	Notes.....
NS1	2 posts S of 4	5/5 (3)	4-May	4-May	29-May	30-May	22-Jun	2	3 chicks 5/30, 1 barely alive close to nest
NS2	1 post N of 5	5/5 (3)	8-May	9-May	2-Jun	4-Jun	29-Jun	2	6-3 hole in one egg--ready to hatch!!
NS3	1 stake S of 6	5/5 (2)	7-May	9-May					eggs sanded in 5-30, 1 dug'em out, 6-1 buried again
NS4	2 posts S of 8	5-6 (1)							2 eggs 5-9, washed over 5-10
NS5	1 stake N of 9	5-6 (1)	12-May	13-May	6-Jun	7-Jun	2-Jul	2	
NS6	3.5 posts N of 2	5-8 (1)							nest predated 5-13-no eggshell fragments
NS7	2.5 posts N of 4	5-9 (3)	10-May	11-May					abandoned 5-23 or 5-24
NS8	50 ft in at #8	5-11 (3)	13-May	13-May	7-Jun	7-Jun	2-Jul	2	
NS9	Bayside #7	5-13 (1)	21-May	23-May	15-Jun	16-Jun	11-Jul	4	
NS10	N of 5, 2 stakes in	5-20 (1)	26-May	26-May	20-Jun	22-Jun	17-Jul	1	
NS11	S of 3, post & stake	5-23 (1)	renest						2 eggs 5-24, predated 5-26-no eggshell fragments
NS12	6 posts S of CP	5-23 (4)	23-May	24-May	17-Jun	17-Jun	12-Jul	2	
NS13	S of 10, post & stake	5-26 (1)	1-Jun	1-Jun	26-Jun	26-Jun	21-Jul	2	on edge of least tern colony
NS14	S of 6, post & stake	5-27 (3)	29-May	1-Jun	22-Jun	25-Jun	20-Jul	1	
NS15	S, 3, post & 3stakes	5-30 (1)	3-Jun	3-Jun	28-Jun	28-Jun	23-Jul	2	
NS16	1 post N of 6	6-3 (1)	9-Jun	10-Jun	4-Jul	3-Jul	28-Jul	1	least terns, nest close to fencing-only 3 eggs hatched
NS17	post & stake S of 5	6-3 (2)	7-Jun	8-Jun	2-Jul	3-Jul	28-Jul	2	25 feet from fencing-only 3 eggs hatched
ORLEANS N. BEACH									
ONB1	S of 2, pole #13	5-6 (1)	10-May	11-May	4-Jun	6-Jun	1-Jul	3	
ONB2	N of 1	5-9 (2)							3 eggs 5-9, washed over 5-10
ONB2A	S of Pochet, N of 1	6-14(2 ch)	none			b4 6-14	9-Jul	2	not sure hatch date-saw 2 chicks 6-14
ONB3	S of 1, 6.5 posts	5-11 (1)	18-May	18-May	12-Jun	16-Jun	11-Jul	3	
ONB4	S of 2, post 9	5-11 (2)	15-May	16-May	9-Jun	10-Jun	5-Jul	1	
ONB5	S of 3, post 12dunes	6-9 (3)		10-Jun	4-Jul				found w/3eggs-lost one-never had 4
ONB6	S of Pochet, N of 1	6-15 (1)	21-Jun	22-Jun	16-Jul	16-Jul	11-Aug	0	0 S of Big Stick and N of DUNE sign, mid beach
**Grey shaded rows signal a failed nest									

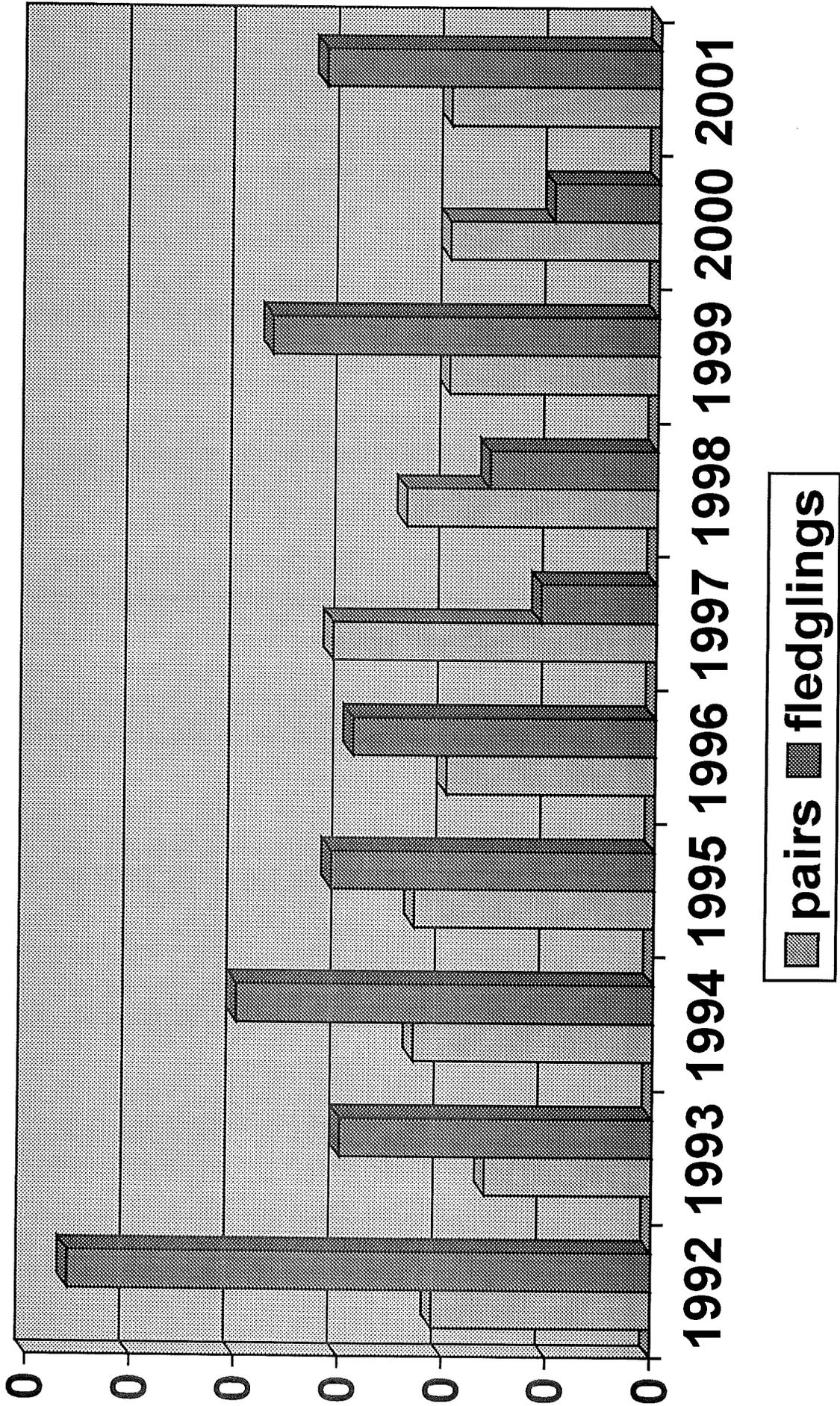
Abundance and Productivity of Piping Plovers on Nauset Beach

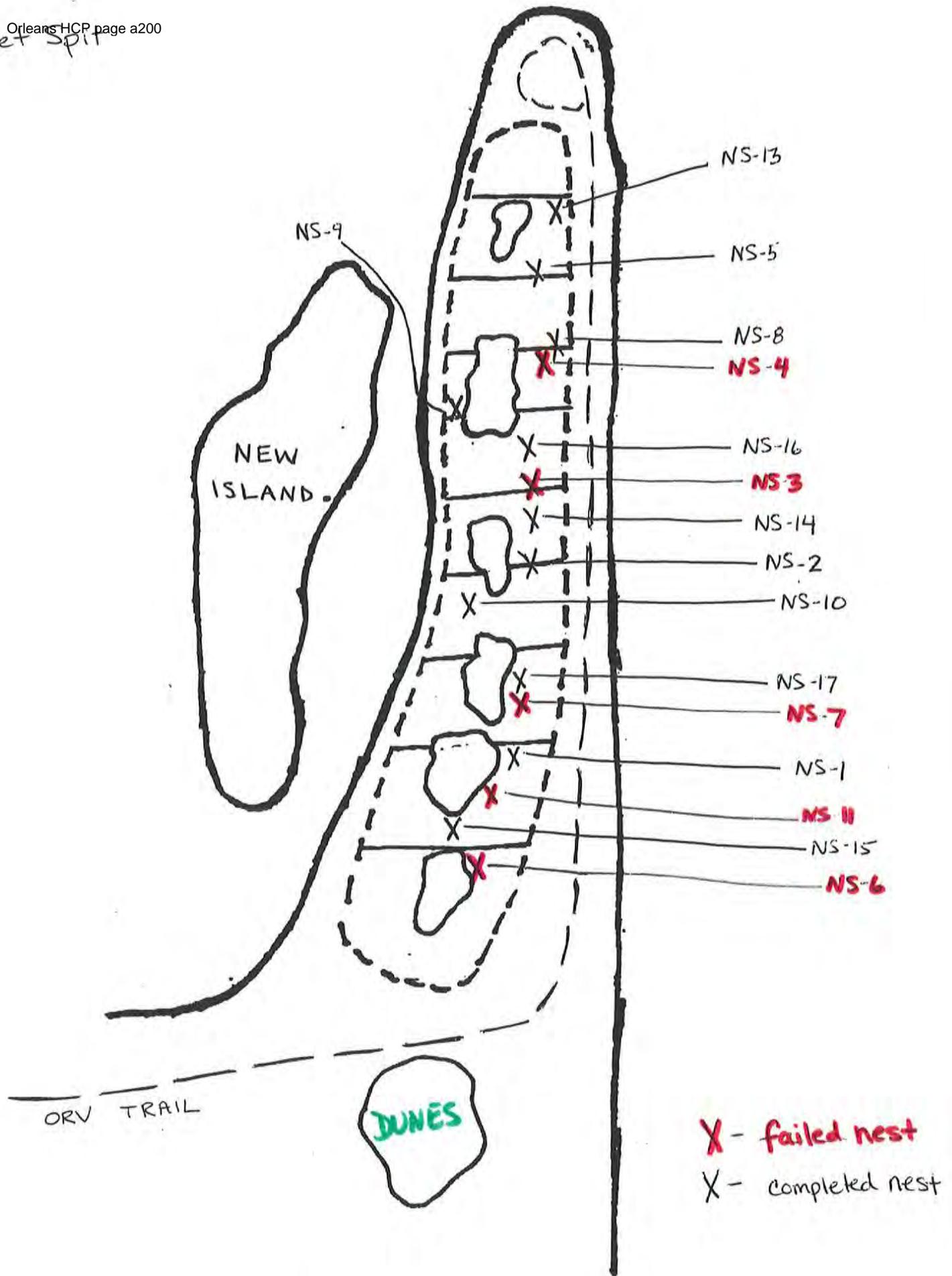
	Nauset Spit	Orleans North Beach	Total
total # of pairs	14	6	20
total # of nesting attempts	17	7	24
total successful nests (%)*	12 (71 %)	6 (86 %)	18 (75 %)
total # of eggs laid	65	21	86
total # of eggs hatched (%)	46 (71 %)	18 (86 %)	64 (74 %)
total # of chicks fledged (%)	23 (50 %)	9 (50 %)	32 (50 %)
fledge rate per pair**	1.64 chicks	1.5 chicks	1.6 chicks

*Successful in this instance means a nest that had one or more eggs hatch.

** Fledge rate per pair is the total number of chicks fledged divided by the total number of pairs.

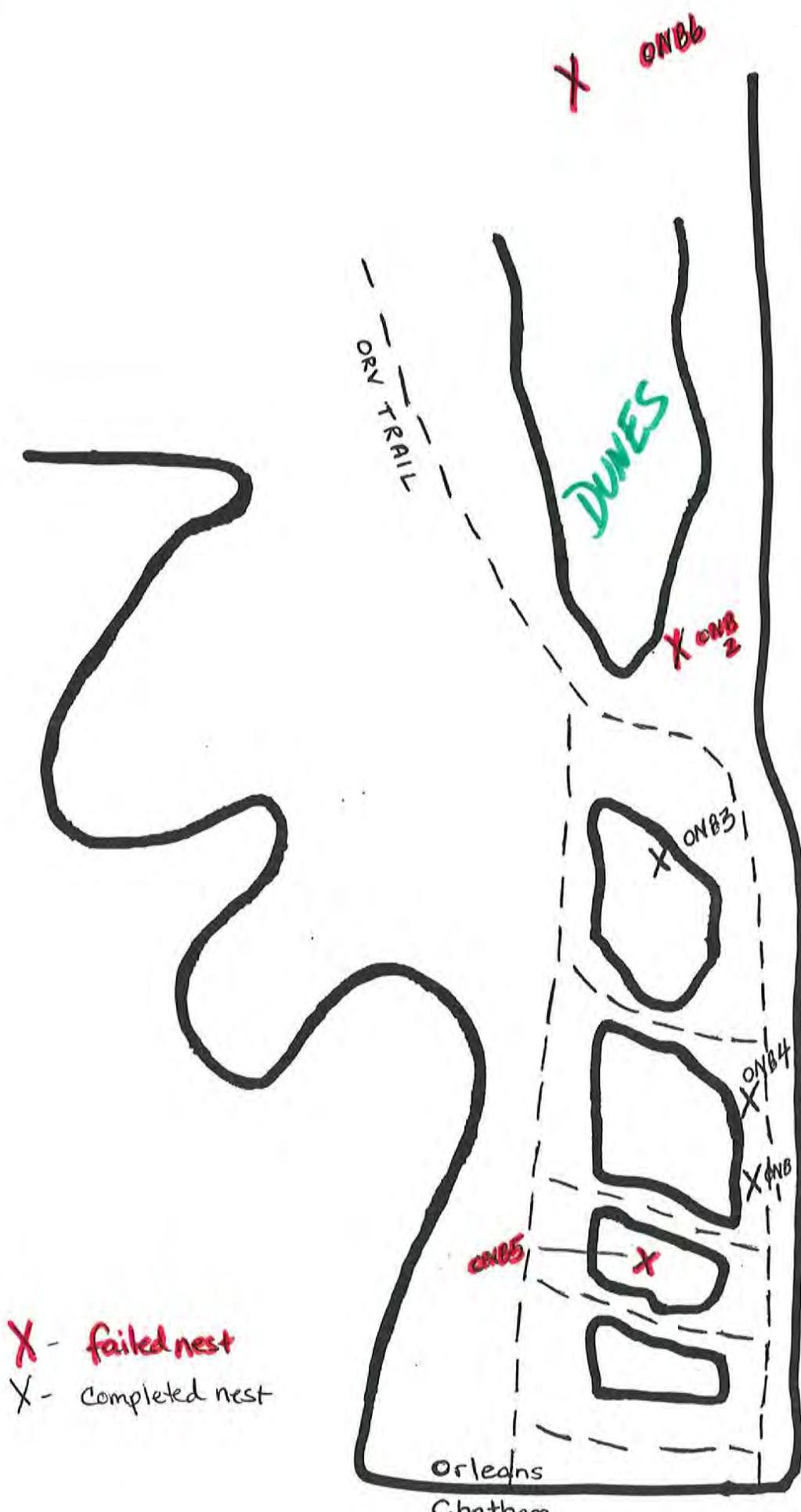
Piping Plover Productivity on Nauset Beach





X - NS-12

Orleans North Beach



X - failed nest
X - completed nest

Orleans
Chatham

MASSACHUSETTS PIPING PLOVER CENSUS FORM

Year: 201 Observer(s): Cathy Davis
 Site Name: Nauset Spit Agency: Orleans Park Department
 Town: Orleans Address: 18 Bay Ridge Lane P.O. Box 122
 Ownership: Town Orleans MA 02653
 Telephone: 508-240-3775 E-mail: _____

⇒ Please attach a map of this site that shows locations of all nests and pairs that did not nest.

Census Results:	Index Count ^a	Total Count ^b
No. of Pairs	14	14
Unpaired Adults	—	—

Notes on pairs that did not nest (include dates present, activities)/(Census remarks):
 List pairs not present during Index Count:

Month	Average # of visits to site per week
April	3
May	5
June	5
July	5

Indicate type(s) of enclosure design(s) used:

Enclosure Design	A	B	C
Shape	Circular		
Diameter/Length of side	10'		
Size of wire mesh	2" x 4"		
Total Height	48"		
Height above ground:	44"		
Depth buried:	4"		
Cover material	netting		
Cover spacing/Mesh size	1/2" x 1/2"		

Other management undertaken or needed/Remarks: No dogs allowed in nesting areas; symbolic fencing used around entire nesting area; no vehicles or pedestrians allowed within 50 ft of nests; area closed to ORV's one day prior to hatching til chicks are fledged.

^aThe Index Count includes those pairs seen during the Index Count period (last Saturday in May – first Sunday in June) and also those that may have been missed during the Index Count, but that must have been present then (based on laying or hatching dates).

^bTo be included in the Total Count, a pair must have been present at the site for ≥ 2 weeks and exhibiting courtship or territorial behavior during that period, if not actual nesting.

Site Name: Nauset Spit

Year: 2001

Observer(s): Cathy Davis

Page 2 of 3

Pair No.	Nest No.	No. eggs laid	No. eggs hatched ^c	No. chicks fledged ^d	Date clutch found	No. eggs when clutch found	Date clutch completed	Date nest hatched or failed ^c	Exclosure		
									Y/N	Design (A, B...)	Date installed
NS-1	NS-1	4	4	2			5-4	5-30	Y	A	5-4
NS-2	NS-2	4	4	2	5-3	3	5-8	6-4	Y	A	5-9
NS-3	NS-3	4	0	0	5-5	2	5-7	5-30	Y	A	5-9
NS-4	NS-4	2	0	0	5-6	1	0	5-10	N		
NS-5	NS-5	4	4	2	5-6	1	5-12	6-7	Y	A	5-13
NS-6	NS-6	1	0	0	5-8	1	0	5-13	N		
NS-7	NS-7	4	0	0	5-9	3	5-10	5-23	Y	A	5-11
NS-8	NS-8	4	4	2	5-11	3	5-13	6-17	Y	A	5-13
NS-9	NS-9	4	4	4	5-13	1	5-21	6-16	Y	A	5-23
NS-10	NS-10	4	4	1	5-20	1	5-26	6-22	Y	A	5-26

^c Indicate below the reasons for nest failure and egg/chick mortality (if known) and the evidence, or indicate "unknown." Attach additional sheets if necessary.
^d Chicks are considered "fledged" if they are ≥ 25 days old or are observed in flight for ≥ 50 ft., whichever occurs first.

Nest No.	Cause of egg mortality/Evidence	Nest No.	Cause of chick mortality/Evidence
NS-3	Sanded in due to high wind	NS-1	One dead chick observed close to nest 6/1 - appeared to have been attacked by avian predator or not fully formed yet.
NS-4	washed over		Unable to determine
NS-7	abandoned		

Site Name: Nauset Spit Year: 2001 Observer(s): Cathy Davis

Page 3 of 5

Pair No.	Nest No.	No. eggs laid	No. eggs hatched ^c	No. chicks fledged ^d	Date clutch found	No. eggs when clutch found	Date clutch completed	Date nest hatched or failed ^e	Exclosure		
									Y/N	Design (A, B...)	Date installed
NS-11	NS-11	2	0	0	5-23	1	0	5-26	N		
NS-12	NS-12	4	4	2	5-23	4	>5-23	6-17	Y	A	5-24
NS-13	NS-13	4	4	2	5-26	1	6-1	6-26	Y	A	6-1
NS-14	NS-14	4	4	1	5-27	3	5-29	6-25	Y	A	6-1
NS-15	NS-15	4	4	2	5-30	1	6-3	6-28	Y	A	6-3
NS-16	NS-16	4	4	1	6-3	1	6-9	7-3	Y	A	6-10
NS-17	NS-17	4	4	2	6-3	2	6-7	7-3	Y	A	6-8

^cIndicate below the reasons for nest failure and egg/chick mortality (if known) and the evidence, or indicate "unknown." Attach additional sheets if necessary.
^dChicks are considered "fledged" if they are ≥ 25 days old or are observed in flight for ≥ 50 ft., whichever occurs first.

Nest No.	Cause of egg mortality/Evidence	Nest No.	Cause of chick mortality/Evidence
NS-11	predated		

MASSACHUSETTS PIPING PLOVER CENSUS FORM

Year: 2011 Observer(s): Cathy Davis
 Site Name: Orleans North Beach Agency: Orleans Park Department
 Town: Orleans Address: 18 Bayridge Lane PO Box 122
 Ownership: Town Orleans MA 02653
 Telephone: 508-240-3775 E-mail: _____

⇒ Please attach a map of this site that shows locations of all nests and pairs that did not nest.

Census Results:	Index Count ^a	Total Count ^b
No. of Pairs	5	5
Unpaired Adults	1	1

Notes on pairs that did not nest (include dates present, activities)/Census remarks:
 List pairs not present during Index Count:
ONB6 - one egg found 6/15

Month	Average # of visits to site per week
April	3
May	5
June	5
July	5

Indicate type(s) of enclosure design(s) used:

Enclosure Design	A	B	C
Shape	Circular		
Diameter/Length of side	10'		
Size of wire mesh	2" x 4"		
Total Height	48"		
Height above ground:	44"		
Depth buried:	4"		
Cover material	netting		
Cover spacing/Mesh size	1/2" x 1/2"		

Other management undertaken or needed/Remarks:

No dogs allowed in nesting areas; symbolic fencing used around entire nesting area; no vehicles or pedestrians allowed within fifty feet of nests; area closed to DRU's one day prior to hatching until chicks are fledged.

^aThe Index Count includes those pairs seen during the Index Count period (last Saturday in May - first Sunday in June) and also those that may have been missed during the Index Count, but that must have been present then (based on laying or hatching dates).

^bTo be included in the Total Count, a pair must have been present at the site for ≥ 2 weeks and exhibiting courtship or territorial behavior during that period, if not actual nesting.

Site Name: Orleans North Beach Year: 2001 Observer(s): Cathy Davis

Page 2 of 2

Pair No.	Nest No.	No. eggs laid	No. eggs hatched ^c	No. chicks fledged ^d	Date clutch found	No. eggs when clutch found	Date clutch completed	Date nest hatched or failed ^e	Exclosure		
									Y/N	Design (A, B...)	Date installed
ONB-1	ONB-1	4	4	3	5-6	1	5-10	6-6	Y	A	5-11
ONB-2	ONB-2	3	0	0	5-9	2	0	5-10	N		
ONB2A	ONB2A	?	?	2	2 chicks seen 6-14	N/A	N/A	6-14	N		
ONB-3	ONB-3	4	4	3	5-11	1	5-18	6-16	Y	A	5-11
ONB-4	ONB-4	4	4	1	5-11	2	5-15	6-10	Y	A	5-16
ONB-5	ONB-5	3	0	0	6-9	3	—	6-16	Y	A	6-10
ONB-6	ONB-6	4	4	0	6-15	1	6-21	7-16	Y	A	6-22

^eIndicate below the reasons for nest failure and egg/chick mortality (if known) and the evidence, or indicate "unknown." Attach additional sheets if necessary.

^dChicks are considered "fledged" if they are ≥ 25 days old or are observed in flight for ≥ 50 ft., whichever occurs first.

Nest No.	Cause of egg mortality/Evidence	Nest No.	Cause of chick mortality/Evidence
ONB-2	washed over	ONB-6	no evidence seen - chicks never seen again
ONB-5	abandoned		after 7/24 - approximately one week old.
ONB-2A	nest never discovered - 2 chicks seen 6-14		

Instructions for completing the Massachusetts Tern Census Form

For census methodologies consult the *Massachusetts Tern & Plover Handbook: a manual for stewards.*

Colony Name and Colony Number are provided according to *Erwin and Korschgen (1979)*. Complete a separate form for each colony visited, even if no birds are found. If a previously unreported colony location is discovered, attach a photocopy of a labeled U.S.G.S. topographical map pinpointing the exact location of the colony.

Species Codes:

ROST = Roseate Tern
COTE = Common Tern

ARTE = Arctic Tern
LETE = Least Tern

LAGU = Laughing Gull
BLSK = Black Skimmer

Other Codes:

M = Method of Survey
 NC = Nest Count (1 nest = 1 pair)
 EC = Partial Nest Count (extrapolated)
 AC = Adult* Count (multiplied by 0.8 = estimated number of pairs)

Q = Quality of Survey
 LC = Low Confidence
 RC = Reasonable Confidence
 HC = High Confidence

P = Productivity Estimate
 0 = None
 1 = Poor
 2 = Fair to Good
 3 = Excellent

Nests (or scrapes) should contain at least one egg in order to be counted. Also, a nest should be counted if it is apparent that eggs have hatched and/or the chicks are away from the nest. Do not count empty scrapes or nests that are obviously abandoned. Remember, nests represent pairs and all results should be expressed as "numbers of pairs".

*If adults are present at the site but are not found or suspected to be nesting (e.g., if they are simply resting or feeding in the area), they should not be counted as nesting pairs.

REMINDER: REPORT ALL NEGATIVE RESULTS

(Negative results are important to document visitation of a site even though no nesting birds may have been found.)

Species Code	A-Count	B-Count
	All "A-Counts" are taken within the census window of June 5 - 20	All "B-Counts" are taken outside the census window; after June 20
ROST	Time as closely as possible to the date of first hatch, approximately 23 days after the first eggs are laid.	Time exactly <u>25</u> days after first count.
COTE	Time as closely as possible to the date of first hatch, approximately 23 days after the first eggs are laid (usually 6-8 days before ROST).	No "B-Count" is required.
ARTE	Time census to coincide with that of the other species in colony such as COTE or LETE .	Another census should be taken to reflect any additional pairs that appear after June 20.
LETE	Visit colony frequently during the count period and report maximum number of nests/incubating birds counted on any one day.	Conduct a "B-Count" if there is a significant change in numbers from the "A-Count".
LAGU	Time count coincident with COTE count.	No "B-Count" is required.
BLSK	Time count coincident with COTE count.	Another census should be taken to reflect any additional pairs that appear after June 20.

2001 Massachusetts Tern Census Form

Colony Name: Nauset - Orleans
 Colony Number: 352009
 Town: Orleans
 Ownership: Town

Observer/Agency: Cathy Davis / Orleans Park Dept.
 Street: 18 Bay Ridge Lane P.O. Box 122
 Town & State: Orleans MA Zip: 02653
 E-mail: _____ Telephone: 508-240-3775

⇒ PLEASE read the instructions on the reverse of this form before filling out. ⇐

Species Code	A-Count			B-Count			P	Remarks: (e.g., evidence of predation, tide or storm washout, human disturbance, etc.) *INDICATE (if known) DATE OF FIRST EGGS LAID AND FIRST EGGS HATCHED.	
	Date	No. Pairs	M	Q	Date	No. Pairs			M
ROST	6/21	0	NC	HC	7/17	0	NC	HC	
COTE	6/21	0	NC	HC	7/17	73	NC	HC	large group moved from New Island (NPS) to end of Nauset Spit + displaced the lead tern colony.
ARTE	6/21	0	NC	HC	7/17	0	NC	HC	
LETE	6/21	45	NC	HC	7/17	6	NC	HC	
LAGU	6/21	0	NC	HC					
BLSK	6/21	0	NC	HC	7/17	0	NC	HC	
OTHER									

Please forward completed form(s) no later than July 31 to Bradford G. Blodget, State Ornithologist, Massachusetts Division of Fisheries and Wildlife, Field Headquarters, Rte. 135, Westborough, MA 01581-3337. Telephone: (508)792-7270 x152 / Fax: (508)792-7275 / E-mail address for electronic filing: brad.blodget@state.ma.us

Animals and birds seen in the Nauset Beach Area during the season

Animals:

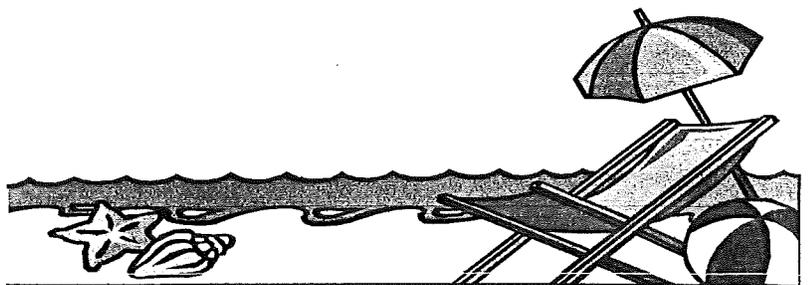
eastern coyote (1)
eastern cottontail rabbit (many)
eastern striped skunk
grey seals (many)
harbor seal
hooded seal
humpback whales (several)
juvenile red fox (1)
white-tailed deer (1)

Birds:

american crow
american goldfinch
american kestrel
american oystercatcher (pair nested on Nauset Spit, but nest was predated)
american robin
barn swallow
black skimmer
black-bellied plover
common eider
common grackle
common loon
common merganser
common tern
common bobwhite (heard often)
double-crested cormorant
dunlin
eastern kingbird
gray catbird
great blue heron
great egret

greater black-backed gull
greater yellowlegs
herring gull
horned lark
house sparrow
killdeer
laughing gull
least tern
least sandpiper
mute swan
northern cardinal
northern harrier
northern flicker
northern mockingbird
osprey

piping plover
redknot
red-winged blackbird
ring-billed gull
roseate tern
ruddy turnstone
sanderling
semipalmated plover
short-billed curlew
song sparrow
snowy egret
tree swallow
whimbrel
willet



Summary of Piping Plover Breeding Success and Tern Nesting Status
2002 Nesting Season
Nauset Beach, Orleans, Massachusetts

AUG 21 2003

Submitted to:

Paul Fulcher
Park Superintendent
Orleans Park Department
Orleans, MA 02653

Orleans Conservation Commission
Town Hall
Orleans, MA 02653

Dr. Scott Melvin
Natural Heritage and Endangered Species Program
Massachusetts Department of Fisheries and Wildlife
Westboro, MA 01851

Submitted by:

Cathy Davis
Shorebird Monitor
Orleans Parks Department
Orleans, MA 02653

Introduction

This document includes the summary of the 2002 breeding season for the Piping Plover population that resides on Nauset Beach. Nauset Beach consists of Nauset Spit to the north and Orleans North Beach to the south. Enclosed are maps with locations of the nests, summaries of field notes, tables illustrating productivity and breeding pair and fledged chick updates. Included is a list of all birds and mammals that were observed in the Nauset Beach area during the season.

Piping Plovers return to traditional nesting areas beginning late March through early May. In Orleans, they nest on the ocean side of town, Nauset Beach. They prefer the sandy substrate that a barrier beach has to offer, since the adults, as well as their eggs and chicks, are cryptically colored to perfectly blend in with their surroundings. Nests are located and monitored. When 4 eggs are laid in a nest, an enclosure is constructed around the nest area to protect the nest from predators. The enclosure consists of welded-wire caging that is 4 feet high and 35 feet long. This is pulled into a circular shape around the nest and then buried 4 inches in the sand. Light-weight fruit netting is tied down and used a cover from avian predators. Wooden stakes then give the enclosure standing power against the winds. The caging is wide enough for the diminutive plover to walk into and out of its nest, but not allowing access for other would-be predators. Piping Plovers generally walk, not fly, into their nests, so admittance is generally not inhibited for the birds.

Discovery of Adult Plover Mortality

On Wednesday May 29, 2002, an adult male Piping Plover was discovered dead *inside* an enclosure. This nest was located on Nauset Spit, NS5. I had checked on this nest the previous day, but with binoculars from a distance. At that time I could clearly see an incubating adult, but did not notice anything out of the ordinary.

Upon finding the deceased bird, I first looked for predator tracks or other clues as to what may have happened. There were no tracks nearby, and it had recently rained that morning. There was no sign of struggle with the netting and no blood on the bird or nearby area. The female was still incubating the eggs, but actively displayed while I was in the area. Other plover monitors have reported mortalities in enclosures this season. After conversing with the plover monitor in Chatham, who had seen Northern harriers actively harassing piping plovers within enclosures, I decided not to enclose any more nests. The last enclosures were erected June 3rd.

Tern Nesting

Each year a Tern census is conducted for the entire Nauset Beach area. The official forms required by MassWildlife are included in this report. Two counts are conducted. The first one is done during the census window of June 5-20 and is called A Count. In 2002 the A Count was conducted on June 20th and 2 Common Tern *nests* and nearly 63 Least Tern *pairs* were counted. B Count is conducted after June 20th. For the 2002 season, B Count was conducted July 14th, with only 6 Least Tern *nests* counted. All of these Tern nests were found on Nauset Spit. The nests of the Terns, as well as the Piping Plovers and one pair of American Oystercatchers were repeatedly predated by mammalian predators, namely fox, coyote and skunk. These birds repeatedly re-nested, but these too were predated.

American Oystercatcher Nesting

This year, the Coastal Waterbird Cooperators were asked to conduct a census of American Oystercatchers, which are now ranked as a *Species of High Concern* in the United States Shorebird Conservation Plan. The count period was the same as for the Piping Plover, June 1st through June 9th. One breeding pair was observed on Nauset Spit before and during this time. This pair attempted to nest twice, but unfortunately both times the nest was predated. Interestingly enough this pair nested in the midst of two Piping Plover nests, which themselves were quite close together. I was witness to an interesting scenario; an adult Piping Plover was seen chasing one of the American Oystercatchers nesting in the area. It was quite a sight seeing a small bird aggressively defending its territory to a bird much bigger in size.

In Conclusion

Overall, the 2002 shorebird nesting season was fair. We had a few less Piping Plover pairs return than the previous year, and the birds that did return displayed behavior that was not as typical as the season before. Many of the birds would run from their nests without a sound, as opposed to calling and displaying to distract the would-be predator. Nest predation was extremely high, especially by mammalian predators. I attribute this in part to a mild winter with many of the mammals surviving and reproducing. The Terns, both Common and Least were not successful in nesting on Nauset Spit, even though many attempts were made. I did witness immature birds of both species later in the season on the front beach and also in the flats on the bayside of Nauset Spit and over by New Island.

Summary of Field Observations

The following are summaries of the field observations for each piping plover nest during this season. Fledged is defined as being 25 days old or witnessed in flight of at least 50 feet. Failed is defined as not having fledged chicks, which also includes nests that did not hatch or were abandoned.

Snapshot of Nauset Spit

12 chicks fledged out of 6 successful nests. There were 22 nesting attempts. This number does include birds that renested. 16 nests failed - 12 were predated, 3 abandoned and 1 unknown cause.

Nauset Spit

NS-1

- 5-7 found with one egg
- 5-12 complete with 3 eggs (never laid 4th egg)
- 5-13 exclosed
- 6-11 not hatched yet & adult not seen incubating
- 6-12 one egg left in nest, 2 eggs gone - assume that they have hatched. 3rd egg never hatches - no sign anywhere of this brood.
- 6-13 searched all over for chicks - never find a trace of them or adults. Nest declared failed.

NS-2

- 5-10 found with one egg
- 5-16 complete with 4 eggs
- 5-19/20 no observations made
- 5-21 nest found predated - evidence of fresh plover & crow tracks seen in area. Nest declared failed.

NS-3

- 5-10 found with 2 eggs
- 5-14 complete with 4 eggs
- 5-15 exclosed
- 6-10 3 eggs hatch - 4th egg never hatches
- 6-12 3 chicks seen on the bayside
- 6-13 3 chicks seen
- 6-18 3 chicks seen
- 6-19 3 chicks seen

6-26 2 chicks seen
6-29 3 chicks seen
7-2 3 chicks seen
7-3 3 chicks seen
7-5 2 chicks seen - one witnessed in flight. Fledged.
7-9 2 chicks seen
7-10 2 chicks seen
7-11 2 chicks seen
7-14 1 chick seen
7-22 1 chick seen
7-26 1 chick seen

NS-4

5-11 1 egg found
5-18 complete with 4 eggs
5-21 exclosed
6-16 3 eggs hatch, 4th egg never hatches
6-18 2 chicks seen
6-23 2 chicks seen
6-26 1 chick seen
6-29 1 chick seen
7-5 2 chicks seen
7-10 2 chicks seen
7-12 2 chicks seen
7-17 2 chicks seen
7-26 2 chicks seen
8-7 2 chicks seen

NS-5

5-12 found with one egg
5-17 complete with 4 eggs
5-17 exclosed
5-29 Adult male mortality. Male found dead inside exclosure.
No apparent sings of struggle with netting, no tell-tale
tracks due to heavy rain. Most likely an avian predator.
6-3 nest abandoned and declared failed.

NS-6

5-14 found with 3 eggs
5-16 complete with 3 eggs, never a 4th egg
5-17 exclosed
6-10 all 3 eggs hatch

6-10 2 chicks seen ambulatory with adults, one chick still in enclosure
6-11 1 chick seen
6-19 1 chick seen
6-23 1 chick seen
6-29 1 chick seen
7-5 1 chick seen; 25 days old. Fledged.
7-11 1 chick seen
7-26 1 chick seen
8-1 1 chick seen

NS-7
5-15 found with 2 eggs
5-16 3 eggs present
5-19/20 no observations made
5-21 nest found predated. No tracks seen due to heavy rains.
Nest declared failed.

NS-8
5-17 found with 3 eggs
5-18 complete with 4 eggs.
5-19 exclosed
6-12 all 4 eggs hatch
6-13 4 chicks seen
6-18 1 chick seen
6-26 3 chicks seen
7-1 2 chicks seen
7-2 4 chicks seen
7-9 2 chicks seen. Fledged.
7-12 2 chicks seen resting together with adult.
7-17 2 chicks seen. One in flight.
7-22 1 chick seen
8-1 2 chicks seen
8-7 2 chicks seen

NS-9
5-16 found with 2 eggs
5-18 3 eggs present
5-19/20 no observations made
5-21 nest found predated. Small mammal tracks in area, most likely fox. Coyote tracks skirting area as well.
Nest declared failed.

NS-10

- 5-20 found with one egg by Lee Miller, Beach Director.
5-21 nest found predated. Very shaly-type sand. Cannot see any tracks nor signs of disturbance. Very high winds and rain the past few days. Nest declared failed.

NS-11

- 5-22 found with one egg
5-29 complete with 3 eggs
6-3 exclosed
6-14 high tide clearly went through exclosure and nest - eggs & adults all accounted for. Impressive!
6-26 nest hatched - 2 chicks seen - one egg still in nest
6-27 all 3 eggs have hatched
6-28 2 chicks seen
6-29 3 chicks seen
7-2 1 chick seen
7-6 1 chick seen
7-10 1 chick seen
7-12 1 chick seen
7-19 1 chick seen
7-22 1 chick seen. Fledged and in flight!
8-1 1 chick seen. Flew over to flats at New Island.
8-7 1 chick seen

NS-12

- 5-27 found with one egg
6-1 complete with 4 eggs
6-12 nest predated. Crow tracks lead into nest and all around area. Nest declared failed.

NS-13

- 5-27 found with one egg
5-30 complete with 4 eggs
6-8 nest found predated. Heavy rain previously. No sign of adults or tracks of any kind.
Nest declared failed.

NS-14

- 5-27 found with 3 eggs
5-28 exclosed with 3 eggs as birds were visibly disturbed by folks using walkway 20 feet from nest. Adults nowhere around. Relocated walkway as well.

**Nest abandoned sometime over 5-27/29. Most likely due to disturbance on walkway which had been relatively quiet when birds first laid eggs, but became much more heavily trafficked due to Memorial Day weekend.

Nest declared failed.

NS-15

5-29 4 eggs found hidden in dune grass. Unsure when complete, but no more than a day or two.

6-8 Nest found predated. Few eggshell fragments in nest. No visible tracks. High winds and rain recently.

Nest declared failed.

NS-16

5-30 found with 2 eggs

6-3 complete with 4 eggs

6-3 exclosed

6-16/17 no observations made. Storm surge tides very high 6-15.

6-18 eggs are starting to be sanded in. No sign of adults or any tracks. Tide came up to symbolic fencing, but still 50 feet from nest.

6-19 eggs definitely sanded in. No adults or tracks. Abandoned.

Nest declared failed.

NS-17

6-1 found with 3 eggs

6-3 complete with 4 eggs

6-3 exclosed

6-15 high tide clearly went through exclosure and nest, but all eggs and adults accounted for. wow.

6-30 all 4 eggs hatched

7-2 4 chicks seen

7-9 2 chicks seen

7-11 3 chicks seen

7-12 3 chicks seen

7-18 3 chicks seen

7-22 3 chicks seen

7-25 3 chicks seen. 25 days old today. Fledged.

8-7 3 chicks seen with adult

NS-18

- 6-11 found with 2 eggs
6-12 complete with 3 eggs- never a 4th egg. No enclosure as nest is in dune grass area and birds have flown up.
7-2 nest found predated. Not sure of tracks - maybe crow??
Nest declared failed.

NS-19

- 6-13 found with one egg, no adults present
**no other egg ever appears, nor do adults or tracks.
Nest declared failed.

NS-20

- 6-17 found with 3 eggs
6-20 complete with 4 eggs
7-10 found nest predated. Most likely skunk. Depression was dug out where nest was. Nest declared failed.

NS-21

- 6-18 found with 2 eggs
6-20 3 eggs present
6-23 complete with 4 eggs. Not enclosed as nest in dune area.
6-27 found nest predated. Fox tracks in area.
Nest declared failed.

NS-22

- 6-21 found with 3 eggs
6-30 found nest predated. Shaly area, difficult to see tracks.
Lone adult calling in area. Nest declared failed.

Snapshot of Orleans North Beach

3 chicks fledged out of 2 successful nests. 6 nests failed. 1 was abandoned, 3 were predated, 1 sanded in and 1 washed over.

Orleans North Beach

ONB-1

- 5-10 found with 2 eggs
5-14 found nest predated. Not sure of cause due to heavy rains and wind. Nest declared failed.

ONB-2

5-15 found with 2 eggs
5-17 no signs of adults or tracks
5-18 still no signs - pair seen a few posts north- no calling.
5-19/20 no observations made
5-21 eggs sanded in - nest abandoned and declared failed.

ONB-3

5-23 found with one egg under tuft of beach grass up in dunes
5-24 found nest predated- fox tracks in area.
Nest declared failed.

ONB-4

5-25 found with one egg
5-28 complete with 4 eggs
5-29 exclosed
6-16/17 no observations made
6-18 no sign of adults & no tracks at all. High tide came to about
20 feet from nest.
6-20 abandoned- no adults or tracks. Nest declared failed.

ONB-5

5-22 found with one egg
5-28 exclosed with 3 eggs
5-29 complete with 4 eggs
6-26 3 hatchlings and one egg in nest in the am. All eggs hatch.
6-27 3 chicks seen
6-28 3 chicks seen
7-2 3 chicks seen
7-3 2 chicks seen
7-5 2 chicks seen
7-6 3 chicks seen
7-9 3 chicks seen
7-12 3 chicks seen
7-17 1 chick seen
7-18 1 chick seen
7-19 1 chick seen
7-21 1 chick seen. Fledged.
7-22 1 chick seen
7-25 1 chick seen
7-26 1 chick seen

ONB-6

5-30 found with one egg
6-3 complete with 4 eggs
6-3 exclosed
6-30 all four eggs hatch
7-2 3 chicks seen
7-3 2 chicks seen
7-5 1 chick seen
7-6 2 chicks seen
7-9 2 chicks seen
7-12 1 chick seen
7-17 3 chicks seen
7-18 2 chicks seen
7-21 2 chicks seen
7-25 2 chick seen
7-26 2 chicks seen

ONB-7

6-14 found with 2 eggs
6-16/17 no observations made
6-18 found nest washed over due to high tides.
Nest declared failed.

ONB-8

6-22 found with 2 eggs
6-24 complete with 3 eggs
6-28 found nest predated. Fox tracks near nest site.
Nest declared failed.

Abundance & Productivity of Piping Plovers on Nauset Beach

	Nauset Spit	Orleans North Beach	Total
Total # of pairs	13	4	17
Total # of nesting attempts	22	8	30
Total successful nests (%)*	6 (28%)	2 (25%)	8 (27%)
Total # of eggs laid	73	22	95
Total # of eggs hatched (%)	22 (31%)	8 (37%)	30 (32%)
Total # of chicks fledged	9 (41%)	3 (38%)	12 (40%)
Fledge rate per pair**	.70 chicks	.75 chicks	.71 chicks

*Successful in this instance indicates a nest that had one or more eggs hatch.

**Fledge rate per pair is the total number of chicks fledged divided by the total number of pairs.

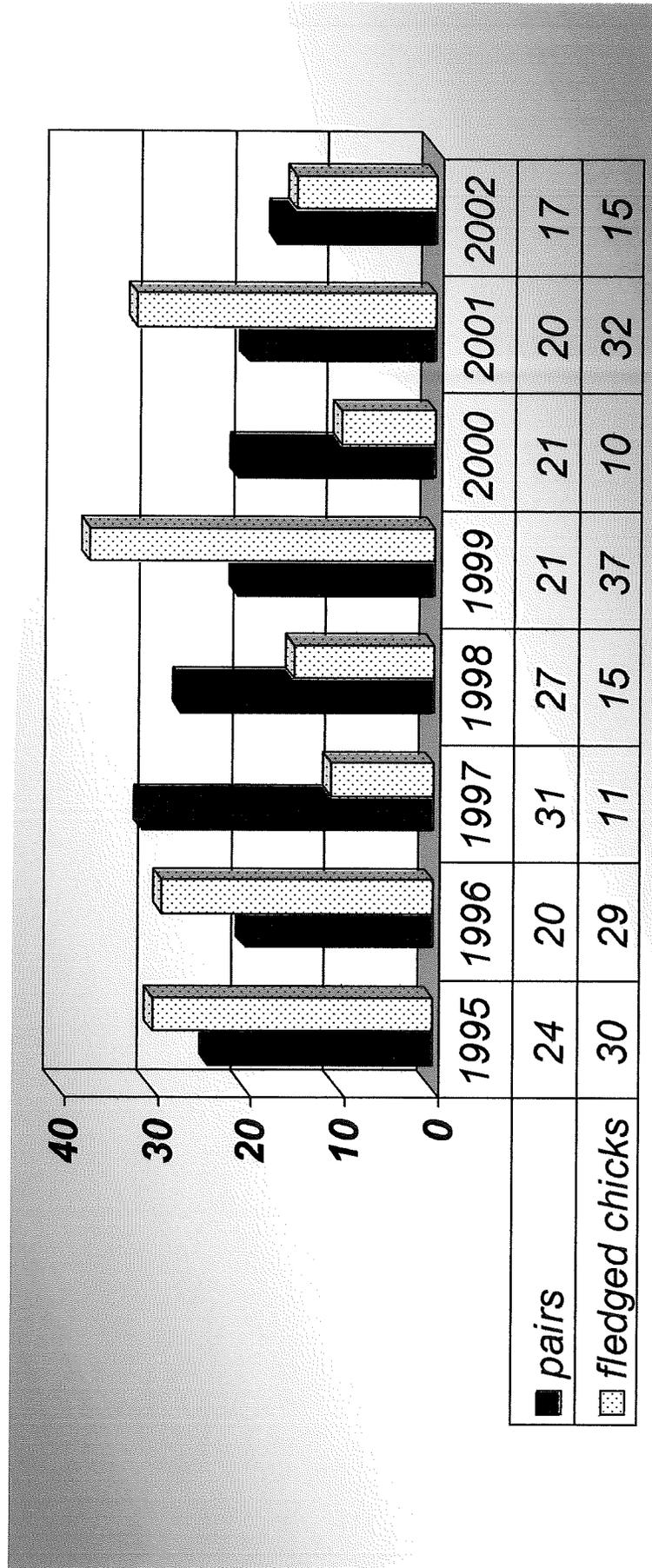
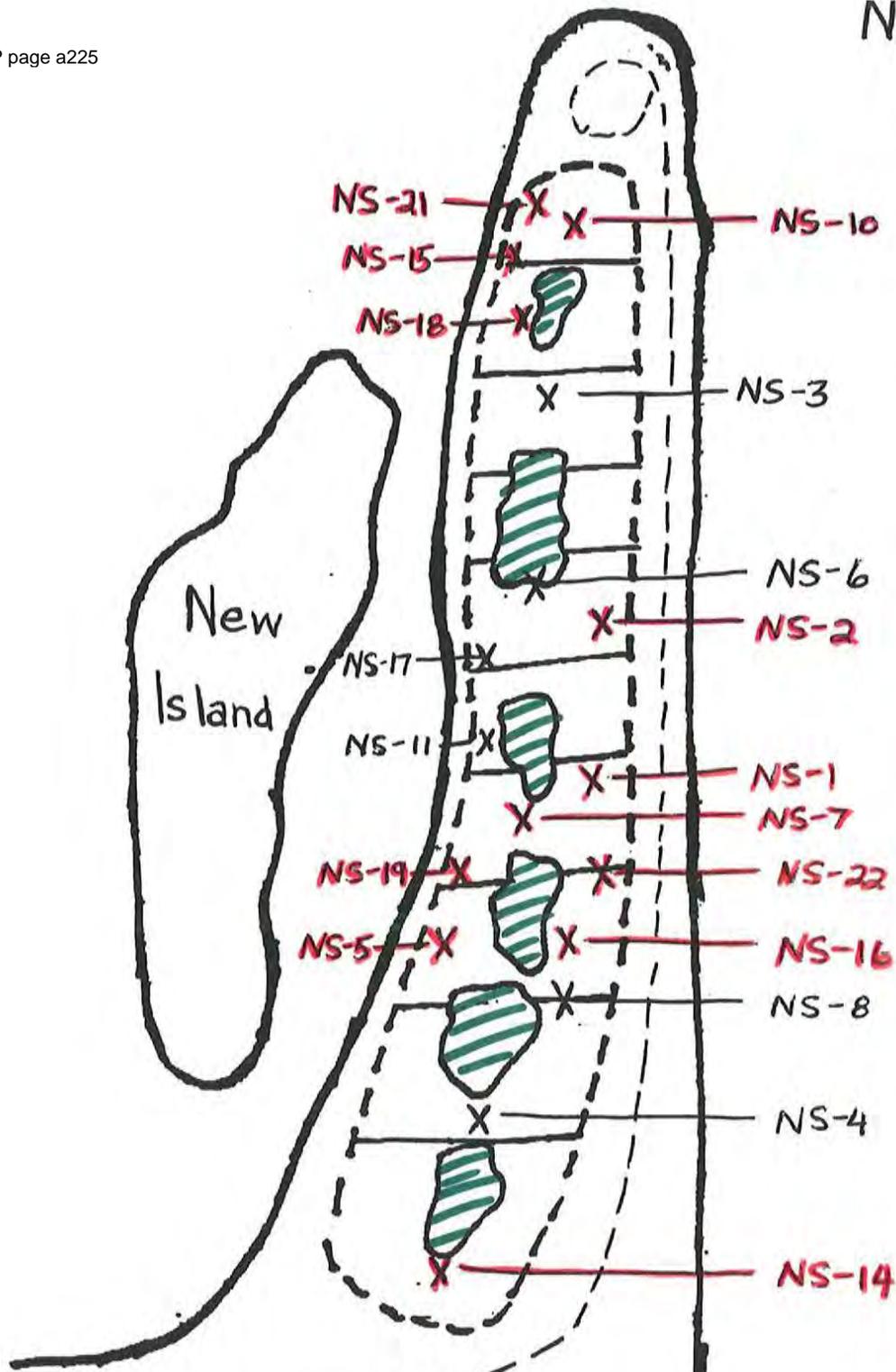


Chart 1: Productivity on Nauset Beach

Nauset Spit



X - NS-20

X - NS-13

X - NS-12

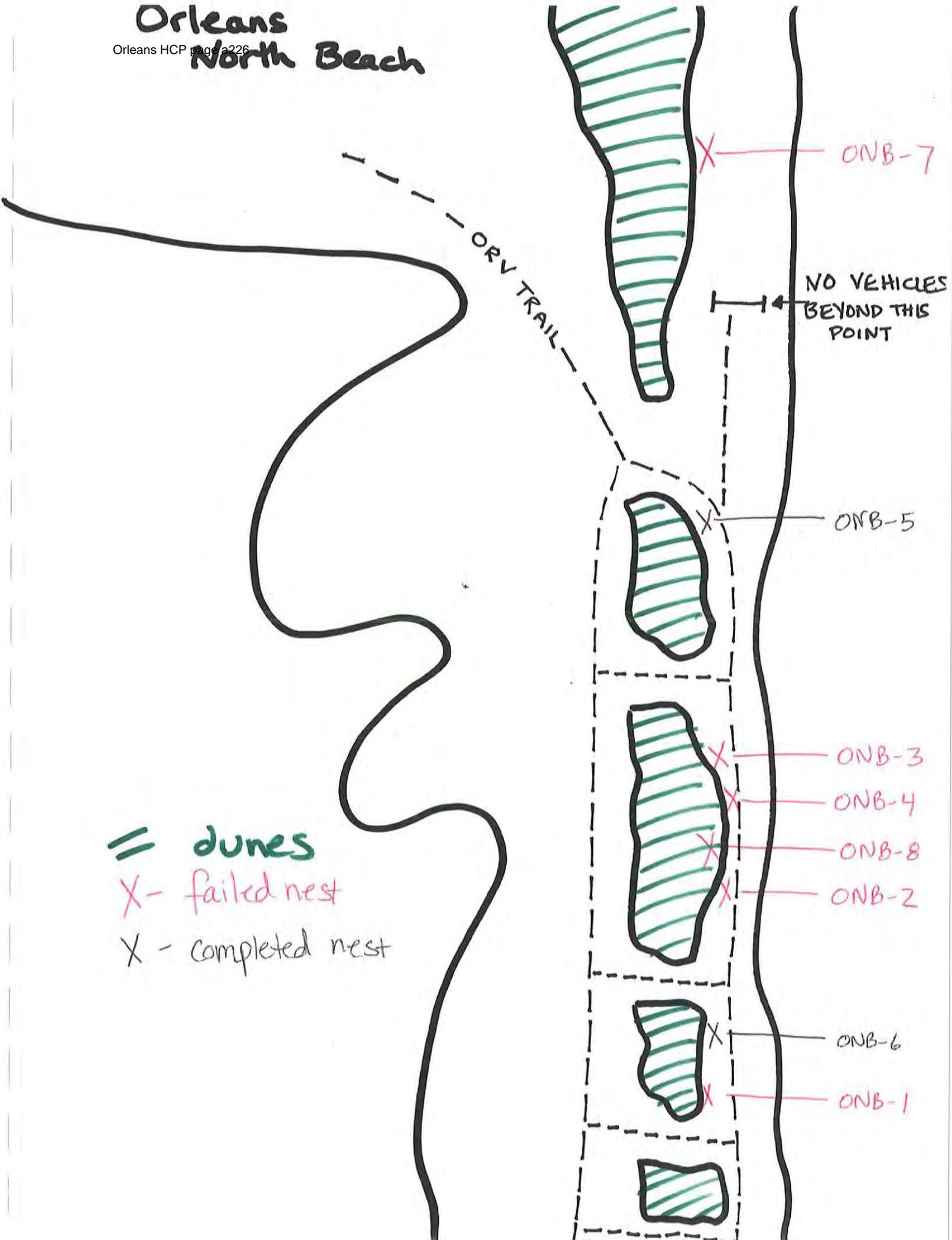
= dunes

X - failed nest

X - completed nest

Orleans North Beach

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= dunes

X - failed nest

X - completed nest

ONB-7

NO VEHICLES
BEYOND THIS
POINT

ONB-5

ONB-3

ONB-4

ONB-8

ONB-2

ONB-6

ONB-1

Year: 2002
 Site Name: Nauset Spit
 Town: Orleans
 Ownership: Town
 Observer(s): Cathy Davis
 Agency: Orleans Park Department
 Address: 18 Bayside Lane PO Box 122
Orleans MA 02653
 Telephone: 508-240-3775 E-mail: seedy32@hotmail.com

⇒ Please attach a map of this site that shows locations of all nests and pairs that did not nest.

Census Results:	Index Count ^a	Total Count ^b
No. of Pairs	12	13
Unpaired Adults	1	

Notes on pairs that did not nest (include dates present, activities)/Census remarks:
 * unpaired adult due to male mortality inside enclosure 5/29
 She was still present during index count period *
 List pairs not present during Index Count:

Month	Average # of visits to site per week
April	3-4
May	5
June	5
July	5

Indicate type(s) of enclosure design(s) used:

Enclosure Design	A	B	C
Shape			
Diameter/Length of side	Circular		
Size of wire mesh	10'		
Total Height	2" x 4"		
Height above ground:	48"		
Depth buried:	44"		
Cover material	4"		
Cover spacing/Mesh size	netting		
	1/2" x 1/2"		

Other management undertaken or needed/Remarks:

No dogs allowed in nesting areas; symbolic fencing used around entire nesting area; no vehicles or pedestrians allowed within fifty feet of nests; area closed to ORV's one day prior to hatching until chicks are fledged.

^aThe Index Count includes those pairs seen during the Index Count period

^bTo be included in the Total Count, a pair must have been present then (based on laying or hatching dates).

and also those that may have been missed during the

and exhibiting courtship or territorial behavior during that period, if not actual nesting.

Pair No.	Nest No.	No. eggs laid	No. eggs hatched ^c	No. chicks fledged ^d	Date clutch found	No. eggs when clutch found	Date clutch completed	Date nest hatched or failed ^e	Exposure		
									Y/N	Design (A, B...)	Date installed
NS-1	NS-1	3	2	0	5-7	1	5-12	6-6	Y	A	5-14
NS-2	NS-2	4	0	0	5-10	1	5-16	5-19	N		
NS-3	NS-3	4	3	2	5-10	2	5-14	6-10	Y	A	5-14
NS-4	NS-4	4	3	2	5-11	1	5-18	6-16	Y	A	5-21
NS-5	NS-5	4	0	0	5-11	1	5-17	5-29	Y	A	5-17
NS-6	NS-6	3	3	1	5-14	3	5-17	6-10	Y	A	5-17
NS-7	NS-7	2	0	0	5-14	2	0	5-19	N		
NS-8	NS-8	4	4	3	5-14	3	5-16	6-12	Y	A	5-17
NS-9	NS-9	2	0	0	5-15	2	0	5-19	N		
NS-10	NS-10	1	0	0	5-19	1	0	5-19	N		

^cIndicate below the reasons for nest failure and egg/chick mortality (if known) and the evidence, or indicate "unknown." Attach additional sheets if necessary.
^dChicks are considered "fledged" if they are ≥ 25 days old or are observed in flight for ≥ 50 ft, whichever occurs first.

Nest No.	Cause of egg mortality/Evidence	Nest No.	Cause of chick mortality/Evidence
NS-2	predated - crow tracks seen in area	NS-1	nest hatched 6/12, but no sign of chicks or adults after that date. declared failed.
NS-5	adult male found dead in enclosure - nest abandoned several days after		
NS-7	predated - Scrape intact - no tracks seen as heavy rains the day before.		
NS-9	predated - small mammal tracks nearby probably fox.		
NS-10	predated - Shaly-type sand so tracks cannot readily be seen - Also high winds & rain.		

Page of

Pair No.	Nest No.	No. eggs laid	No. eggs hatched ^c	No. chicks fledged ^d	Date clutch found	No. eggs when clutch found	Date clutch completed	Date nest hatched or failed ^c	Exclosure		
									Y/N	Design (A, B, ...)	Date installed
NS-11	NS-11	3	3	1	5-21	1	5-29	6-26	Y	A	6-3
NS-12	NS-12	4	0	0	5-27	1	6-1	6-13	N		
NS-13	NS-13	4	0	0	5-27	1	5-31	6-8	N		
NS-14	NS-14	3	0	0	5-27	3	—	5-29	Y	A	5-28
NS-15	NS-15	4	0	0	5-30	4	?	6-8	N		
NS-16	NS-16	4	0	0	5-30	2	6-3	6-16	Y	A	6-3
NS-17	NS-17	4	4	3	6-1	3	6-3	6-30	Y	A	6-3
NS-18	NS-18	3	0	0	6-11	2	6-13	7-2	N		
NS-19	NS-19	1	0	0	6-13	1	0	0	N		
NS-20	NS-20	4	0	0	6-18	3	6-20	7-10	N		

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^cIndicate below the reasons for nest failure and egg/chick mortality (if known) and the evidence, or indicate "unknown." Attach additional sheets if necessary.
^dChicks are considered "fledged" if they are ≥ 25 days old or are observed in flight for ≥ 50 ft., whichever occurs first.

Nest No.	Cause of egg mortality/Evidence	Nest No.	Cause of chick mortality/Evidence
NS-12	predated - crow tracks lead into nest & all around area.	NS-16	abandoned - high tides were within 50ft of nest, but not through it.
NS-13	predated - cannot tell by whom due to heavy rain previously.	NS-19	found with one egg - no other eggs ever appeared. no signs of adults or tracks either. ?
NS-14	abandoned - birds nested within 20ft of walkway which became busy over Memorial Day. Relocated walkway but birds abandoned.	NS-18	nest predated - possibly by crow?
NS-15	predated - few eggshell fragments in nest no visible tracks - high winds & rain	NS-20	nest predated - likely by skunk. Nest area dug completely out - no eggshell fragments

Page of

Pair No.	Nest No.	No. eggs laid	No. eggs hatched ^c	No. chicks fledged ^d	Date clutch found	No. eggs when clutch found	Date clutch completed	Date hatched or failed ^e	Exclosure	
									Y/N	Design (A, B...)
NS-21	NS-21	4	0	0	6-19	2	6-23	6-27	N	
NS-22	NS-22	3	0	0	6-20	3	?	6-29	N	

^cIndicate below the reasons for nest failure and egg/chick mortality (if known) and the evidence, or indicate "unknown." Attach additional sheets if necessary.
^dChicks are considered "fledged" if they are ≥ 25 days old or are observed in flight for ≥ 50 ft., whichever occurs first.

Nest No.	Cause of egg mortality/Evidence	Nest No.	Cause of chick mortality/Evidence
NS-21	nest predated - fox tracks in area		
NS-22	nest predated - Shaly sand area - very difficult to see tracks		

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Pair No.	Nest No.	No. eggs laid	No. eggs hatched ^c	No. chicks fledged ^d	Date clutch found	No. eggs when clutch found	Date clutch completed	Date nest hatched or failed ^e	Exclosure	
									Y/N	Design (A, B...)
ONB-1	ONB-1	2	0	0	5-10	2	0	5-14	N	
ONB-2	ONB-2	2	0	0	5-16	2	0	5-19	N	
ONB-3	ONB-3	1	0	0	5-21	1	0	5-22	N	
ONB-4	ONB-4	4	0	0	5-23	1	5-28	6-16	Y	A
ONB-5	ONB-5	4	4	1	5-23	1	5-30	6-26	Y	A
ONB-6	ONB-6	4	4	2	5-29	1	6-3	6-30	Y	A
ONB-7	ONB-7	2	0	0	6-13	2	0	6-16	N	
ONB-8	ONB-8	3	0	0	6-23	2	6-24	6-28	N	

^cIndicate below the reasons for nest failure and egg/chick mortality (if known) and the evidence, or indicate "unknown." Attach additional sheets if necessary.
^dChicks are considered "fledged" if they are ≥ 25 days old or are observed in flight for ≥ 50 ft., whichever occurs first.

Nest No.	Cause of egg mortality/Evidence	Nest No.	Cause of chick mortality/Evidence
ONB-1	predated - cannot tell the means due to heavy rains & wind	ONB-7	nest washed over due to high tides
ONB-2	abandoned - eggs sandied in. unsure of reason for abandonment	ONB-8	nest predated. fox tracks near nest site.
ONB-3	predated by small mammal (fox or skunk)		
ONB-4	abandoned after high tides came up about 20 feet from nest		

MASSACHUSETTS AMERICAN OYSTERCATCHER CENSUS FORM

Year: 2002

Site Name: Nauset - Orleans

Town: Orleans

Ownership: Town

Observer(s): Cathy Davis - Orleans

Affiliation: Orleans Park Department

Address: 18 Bayridge Lane / PO Box 122
Orleans MA 02653

Telephone: 508-240-3775 E-mail: seedy32@hotmail.com

⇒ *Please attach a map of this site that shows locations of all breeding pairs and nests.*

Total breeding pairs: One Total chicks fledged (30 days of age or able to fly): 0
Max number(s) of post-breeding birds (adults and fledged young) / date observed: _____

Please indicate which, if any, Oystercatcher nests, broods, or important habitat areas were not adequately protected from human disturbance or off-road vehicles by existing management for Piping Plovers and terns.
0

Comments; management undertaken/needed; clarification of census data:
- Both nesting attempts by this pair of Oystercatchers were well within the symbolic fencing. Nest was inbetween two piping plover nests. Mammalian predation is the most likely cause.

Colony Name: Newset - Orleans (Nest box N^o 1)
 Colony Number: 352009
 Town: Orleans
 Ownership: Town
 Observer/Agency: Cathy Davis / Orleans Park Dept.
 Street: 18 Bay Ridge Lane P.O. Box 122
 Town & State: Orleans MA Zip: 02653
 E-mail: Seedy32@hotmail.com Telephone: 508-240-3775

⇒ PLEASE read the instructions on the reverse of this form before filling out. ⇐

Species Code	A-Count			B-Count			P	Remarks: (e.g., evidence of predation, tide or storm washout, human disturbance, etc.) *INDICATE (if known) DATE OF FIRST EGGS LAID AND FIRST EGGS HATCHED.		
	Date	No. Pairs	M	Q	Date	No. Pairs			M	Q
ROST	6/20	0	NC	HC	7/14	0	NC	HC	0	
COTE	6/20	2	NC	HC					0	
ARTE	6/20	0	NC	HC	7/14	0	NC	HC	0	
LETE	6/20 (70x0.8)	62.4	AC	RC	7/14	6	NC	HC		* nests are repeatedly predated by mammals (skunk, fox + Coyote) * 7-26 * 1 least tern nest w/ egg remains *
LAGU	6/20	0	NC	HC					0	
BLSK	6/20	0	NC	HC	7/14	0	NC	HC	0	
OTHER										

Please forward completed form(s) no later than July 31 to Tern Census, Massachusetts Division of Fisheries and Wildlife, Field Headquarters, Rte. 135, Westborough, MA 01581-3337. Telephone: (508)792-7270 x312 / Fax: (508)792-7821 / E-mail address for electronic filing (please make sure all necessary information is included): carolyn.mostello@state.ma.us

Animals and birds seen in the Nauset Beach area during the season

Animals:

**Basking shark
Eastern cottontail rabbit
Eastern coyote
Eastern red fox
Eastern striped skunk**

**Grey seal
Harbor seal
Humpback whale
White-tailed deer**

Birds:

**American crow
American goldfinch
American kestrel
American oystercatcher
American robin
Barn swallow
Black skimmer
Black-bellied plover
Bohemian waxwing
Common bobwhite
Common eider
Common grackle
Common loon
Common merganser
Common tern
Double-crested cormorant
Dunlin
Eastern kingbird
Gray catbird
Great blue heron
Great egret
Greater black-backed gull
Greater yellowlegs
Herring gull
Horned lark
House sparrow**

**Killdeer
Laughing gull
Least sandpiper
Least tern
Mute swan
Northern cardinal
Northern harrier
Northern flicker
Northern mockingbird
Mute swan
Osprey
Piping plover
Redknot
Red-winged blackbird
Ring-billed gull
Snowy egret
Ruddy turnstone
Sanderling
Semipalmated plover
Short-billed curlew
Song sparrow
Tree swallow
Whimbrel
Wilson's storm petrel
Willet**

ABSTRACT

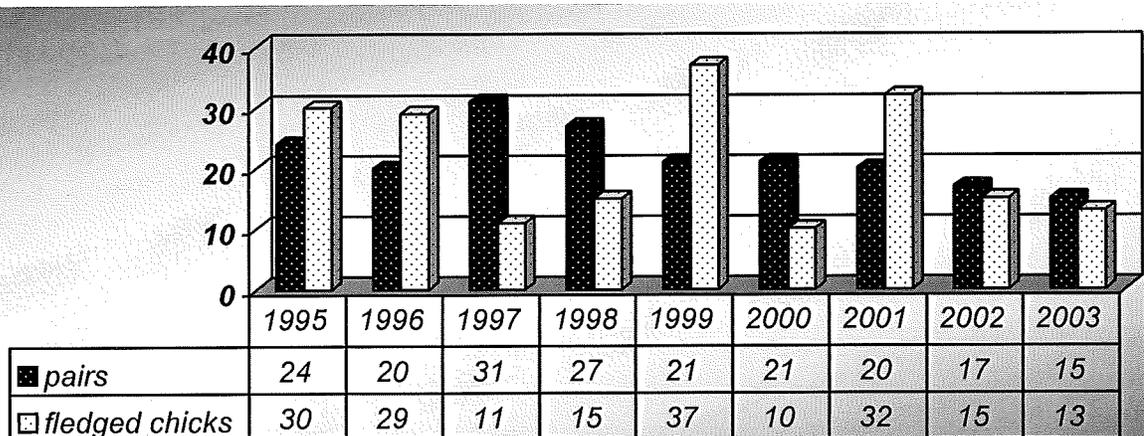
This is a summary of the 2003 Piping Plover and Waterbird nesting season for Nauset Beach. Piping Plovers (*Charadrius melodus*) were monitored at two separate beaches, Nauset Spit to the north and Orleans North Beach to the south. Observations began mid April. A total of 15 pairs were monitored at these two ocean sites. Egg laying began in the first week of May for Nauset Spit and the second week of May for Orleans North Beach. Overall hatching success was .31. Fledging success was .54. A total of 13 chicks fledged. Productivity was .87. (Refer to charts 1 and 2). Of 23 nesting attempts 16 failed. Thirteen nests were exclosed. Of these exclosed nests 7 (54%) were successful and 6 (46%) failed. Of these failures 2 were abandoned due to coyote harassment, 1 to a coyote digging under the exclosure and 3 were storm related. Unexclosed nests were lost to coyote (3), unknown (3), skunk (2), crow (1), and fox (1).

**CHART 1
PIPING PLOVER BREEDING SUCCESS**

SITE	PAIRS	1. NESTS	EGGS LAID	EGGS HATCHED	CHICKS FLEDGED	2. HATCHING SUCCESS	3. FLEDGING SUCCESS	4. PRODUCTIVITY
SPIT	11	16	52	9	9	0.17	1.00	.82
ONB	4	7	26	15	4	.57	.26	1.00
TOTAL	15	23	78	24	13	0.31	0.54	.87

1. INCLUDES RENESTS
2. TOTAL EGGS HATCHED/ TOTAL EGGS LAID = 0.31
3. TOTAL CHICKS FLEDGED/ TOTAL EGGS HATCHED = 0.54
4. TOTAL CHICKS FLEDGED/TOTAL PAIRS = 0.87

**CHART 2
PRODUCTIVITY ON NAUSET BEACH**



INTRODUCTION

Nauset Beach is owned and managed by the town of Orleans and located on the Atlantic Ocean. Within Nauset Beach is Nauset Spit and Orleans North Beach. There is also a section of Orleans North Beach called Pochet, which is located just south of the public beach; this section is a mile long. Being prime feeding and nesting grounds, these beaches are host to Piping Plovers, Least Terns, Roseate Terns, Common Terns, Arctic Terns, American Oystercatchers and Black Skimmers. Piping Plovers traditionally return to nesting sites late March through early May. Plovers prefer the sandy substrate that a barrier beach has to offer. Adults as well as chicks are cryptically colored to blend with their surroundings. In 1986, when the plover was federally listed as threatened species, the town of Orleans initiated active management and protective measures to protect these breeding birds. Included in Appendix I are the Massachusetts Census Forms for Piping Plovers, American Oystercatchers, and Terns.

NESTING AREAS

Since 1989 piping plovers have historically nested on two beaches within Nauset Beach. A total of 15 breeding pairs nested on Nauset Beach in 2003. Of these pairs, 11 nested on Nauset Spit and 4 nested on Orleans North Beach. This is a slight decline from 2002. ORV'S are allowed on both these beaches. (Graph 1 &2)

Nauset Spit

Nauset Spit is approximately 2 miles long and is frequented by Orleans residents only. No dogs are allowed on this beach. Symbolic fencing that consists of posts with clearly marked signage surrounds nesting areas; the entire fence is then closed off with a line of string attached to each post. Several walkways are in place for access to and from Nauset Cove. This activity was implemented in late April. To prevent chick mortality, areas with chicks due to hatch within 24 hours are closed off to vehicles by the placement of barriers. Several 6' posts are placed from symbolic fencing to the tide line. This barrier is kept in place for 25 days or until the chicks fledge.

Orleans North Beach

Orleans North Beach is located south of Nauset Spit and is approximately 3 ½ miles long. This beach is open to Orleans residents and the general public. Access to Orleans North Beach requires purchasing a sticker and viewing an informational video on rules and regulations. Nesting sites on Orleans North Beach are defined with 6' posts outlining the area. No string is used in the beginning of the season. This was completed in late April. Every other post is marked with signs. Dogs are permitted off leash and under voice control outside the nesting areas on this beach. Once a nest is found, symbolic fencing is put in place directing traffic away from the nest. One day before chicks are due to hatch a barrier consisting of several 6' posts with signage are put in place and remain until chicks are 25 days old or fledge. Dogs are not allowed in this barricaded area.

Pochet

Pochet is located just north of Orleans North Beach. This area has always been included with Orleans North Beach data. The Pochet area provides about a mile of excellent foraging and nesting habitat. This beach is frequented by residents of Pochet, an area in Orleans. Dogs are allowed on this beach under voice control. No vehicles are allowed. This year 1 pair of piping plovers nested on this beach, this nest was located high on the dune, as there is little habitat available early in the season for nesting. This nest was frequently monitored and only the male was observed. A brood of 4 chicks from Orleans North Beach traveled over a mile to this area in early July and ultimately fledged 2 chicks.

Tern Nesting

Each year a Tern census is conducted for the entire Nauset Beach area. The official forms required by Mass Wildlife are included in this report. Two counts were conducted. A-count was conducted during the census window of June 5-20. In 2003 the count was conducted on June 11th. Four Common Tern pairs and 56 Least Terns pairs were counted. B-count was conducted on July 15 and showed a decrease in Least Terns to 15 pairs. All nesting pairs were located on Nauset Spit. With repeated predation by a coyote, terns were forced to relocate to different sections of Nauset Spit. Several attempts at re-nesting were basically unsuccessful. A total of 10 nests remained on Nauset Spit on July 26th. Of these 10 nests, two chicks hatched on July 28th, one chick hatched on August 2, and two additional chicks hatched on August 4th. All of these chicks were last seen on August 11th. Fresh coyote tracks were found in the area as well as several Black-Backed Gulls.

American Oystercatchers

As in years past Coastal Waterbird Cooperators were asked to conduct a census of American Oystercatchers which are now ranked as a Species of High Concern in the United States Shorebird Conservation Plan. The count period for 2003 was conducted May 24th – June 1st, one week earlier than in past years. This census was done in the absence of the shore bird monitor and results are unreliable. Upon the monitors return, June 1st no Oystercatchers were observed nesting on Nauset Spit.

Nesting Results For Nauset Spit

The first returning pair of Plovers was observed on Nauset Spit March 23. An increase of pairs and courtship activity soon followed. Egg laying began in the first week of May and continued to the end of June. All nests were laid in sand. All 4 egg nests were exclosed. Eleven pairs ultimately nested on Nauset Spit with a total of 16 nests. Of these nests, 1 pair made 3 unsuccessful attempts, 2 pair renested successfully fledging a total of 7 chicks, 1 nest successfully fledged 2 chicks on it's first nesting attempt. One renest failed, as did 6 other nests whose pairs showed no attempt at renesting. The leading cause of predation on Nauset Spit was the presence of a coyote. This coyote was observed on several occasions systematically trotting through the colony of Terns and Plovers. On 23 July, it was observed at 11:30 A.M. swimming at mid-tide from New Island to Nauset Spit. Washover caused the demise of 2 nests, 1 succumbed to a skunk and 3 were lost of unknown causes. Figure 1 displays nesting data.

(Fig.1)

NESTING DATA FOR NAUSET SPIT

NEST NAME	# OF EGGS LAID	# OF EGGS HATCHED	# FLEDGED	CAUSE OF FAILURE
1	2	0	0	Skunk
1-A	4	0	0	Eggs sanded over
1-B	4	0	0	Wash over
2	3	0	0	Unknown
2-A	4	3	3	Evidence of coyote digging around enclosure on day of hatching
3	2	0	0	Unknown
4	3	0	0	Unknown
4A	4	4	4	
5	4	2	2	2 eggs disappeared 6 days before hatching
6	4	0	0	Abandoned, coyote digging around enclosure. Crow observed sitting on netting
6-a	3	0	0	Did not exclose due to "smart predator"
7	4	0	0	Removed enclosure "smart predator" in area
9	4	0	0	Coyote dug into enclosure
10	2	0	0	Coyote
11	1	0	0	Crow
12	4	0	0	Coyote
TOTAL	11	52	9	

Calculations

- Hatching success = total number eggs hatched/total number eggs laid = .17
- Fledging success = total number of chicks fledged/total number of eggs hatched = 1.0
- Productivity = total number of chicks fledged/total number of pairs = .82

Nesting results for Orleans North Beach

Egg laying began May 9th and continued until June 24th for Orleans North Beach. Four pair nested successfully after 7 attempts. Three of these attempts were unsuccessful, skunk, fox and a Nor'easter being the cause. Two pair renested successfully. Of these nests, one was found with four eggs high on a dune in a sparsely vegetated area. Throughout incubation and brooding only the male was observed. If the nest was unoccupied when monitored the male quickly came on the scene. Figure 2 displays nesting data.

(Fig.2)

NESTING DATA FOR ORLEANS NORTH BEACH

NEST NAME	# OF EGGS LAID	# OF EGGS HATCHED	# FLEDGED	CAUSE OF FAILURE
1	3	0	0	Skunk
1-A	4	4	0	Unknown
2	4	0	0	Nor'easter
2-A	3	0	0	Fox
2-B	4	4	0	Unknown
4	4	4	2	Chick mortality unknown
6	4	3	2	Chick mortality unknown
TOTAL	4	26	15	4

Calculations

1. Hatching success = total number eggs hatched/total number of eggs laid = .57
2. Fledging success = total number of chicks fledged/total number of eggs hatched = .26
3. Productivity = total number of chicks fledged/total number of pairs = 1.0

Roseate Mortality

On 6 July at approximately 11:30 am while patrolling Nauset Spit, a law enforcement officer recovered a dead Roseate Tern. The Roseate was found 8-10' from the northern barrier in section 8 of Nauset Spit. It was not in any recognizable vehicle track. Both legs on the Roseate were banded. Left leg band reads: 34/E9. Right leg band reads 1172-41934. Scott Melvin, state zoologist for Mass Fish and Wildlife was notified and the bird was placed in a freezer for pending necropsy. Refer to Incident Report in Appendix II.

Dogs Off Leash

A new ruling for Orleans North Beach in 2003 allowed dogs to be off leash and "under voice control". Tracks consistent to a dog, rather than a coyote were frequently observed within the symbolic fencing. On several occasions unleashed dogs were observed inside nesting areas and up and down the dunes. This action prompts owners to also enter restricted areas to retrieve their dogs who were not responding to voice command. Once chicks hatched, barricades were put in place. Dogs and their owners were observed inside this barricaded area. Barricades consist of up to 25 6' posts with clearly marked signage from the dune to the wrack line. This year several plovers were killed; there is documentation of domestic dogs killing piping plover chicks and harassing both plover adults, chicks and other wildlife. Data on the impact to both public safety and the environment needs to be documented and evaluated. More enforcement and public education is needed.

Unauthorized Vehicle Use

Each day 300 +/- vehicles are allowed access to Orleans North Beach. Access to the beach is limited when there are flightless chicks on the beach. In 2003 there were two incidences of vehicles inside the closed/restricted area of Orleans North Beach. On 2 July a vehicle drove around the barricade and through the restricted area where it proceeded to park. The park superintendent removed the sticker and then informed the owner that they would receive a letter in the mail explaining the length of the revocation and the appeal process. After initiating the appeal process the revocation was upheld.

The second infraction occurred 7 July at approximately 7:50am. While monitoring piping plovers the shorebird monitor observed a vehicle driving erratically inside the restricted area. The occupant proceeded to the barrier, removed a stake and exited the restricted area. The oversand permit was suspended for a year and a citation was issued for \$200.00. A thorough search was done for any chick mortality resulting from this infraction, none were found.

APPENDIX I

Massachusetts Census Forms

APPENDIX II

Incident Report

ABSTRACT

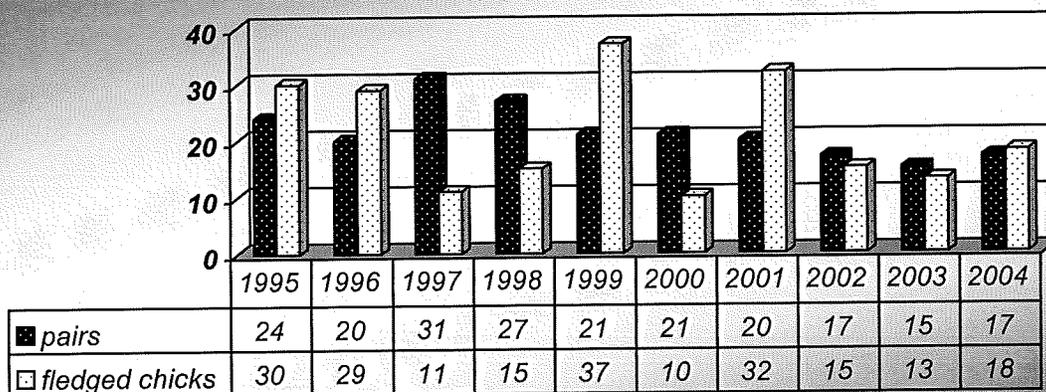
This is a summary of the 2004 Piping Plover and Waterbird nesting season for Nauset Beach. Piping Plovers (*Charadrius melodus*) were monitored at two separate beaches, Nauset Spit to the north and Orleans North Beach to the south. First returning plovers were observed April 3rd. A total of 17 pairs were monitored at these two ocean sites, an increase of 2 pairs from 2003. Egg laying began in the first week of May for both Nauset Spit and Orleans North Beach. Overall hatching success was .62. Fledging success was .36. A total of 18 chicks fledged. Productivity was 1.06 (Refer to charts 1 and 2). A total of 23 nests were established during the 2004-breeding season. Ten of these nests were successful on the first attempt. Four were lost to washover, two lost to coyote, two were abandoned, four were renests and one nest was vandalized.

**CHART 1
PIPING PLOVER BREEDING SUCCESS**

SITE	PAIRS	1. NESTS	EGGS LAID	EGGS HATCHED	CHICKS FLEDGED	2. HATCHING SUCCESS	3. FLEDGING SUCCESS	4. PRODUCTIVITY
SPIT	12	14	49	41	16	0.84	.39	1.33
ONB	5	9	32	9	2	.28	.22	.40
TOTAL	17	23	81	50	18	0.62	0.36	1.06

1. INCLUDES RENESTS
2. TOTAL EGGS HATCHED/ TOTAL EGGS LAID = 0.62
3. TOTAL CHICKS FLEDGED/ TOTAL EGGS HATCHED = 0.36
4. TOTAL CHICKS FLEDGED/TOTAL PAIRS = 1.06

**CHART 2
PRODUCTIVITY ON NAUSET BEACH**



INTRODUCTION

Nauset Beach is owned and managed by the town of Orleans and located on the Atlantic Ocean. Within Nauset Beach is Nauset Spit and Orleans North Beach. There is also a section of Orleans North Beach called Pochet, which is located just south of the public beach; this section is a mile long. Being prime feeding and nesting grounds, these beaches are host to Piping Plovers, Least Terns, Roseate Terns, Common Terns, Arctic Terns, American Oystercatchers and Black Skimmers. Piping Plovers traditionally return to nesting sites late March through early May. Plovers prefer the sandy substrate that a barrier beach has to offer. Adults as well as chicks are cryptically colored to blend with their surroundings. In 1986, when the plover was federally listed as threatened species, the town of Orleans initiated active management and protective measures to protect these breeding birds. Included in Appendix I are the Massachusetts Census Forms for Piping Plovers, American Oystercatchers, and Terns.

NESTING AREAS

Since 1989 piping plovers have historically nested on two beaches within Nauset Beach. A total of 17 breeding pairs nested on Nauset Beach in 2004. Of these pairs, 12 nested on Nauset Spit and 5 nested on Orleans North Beach. This is an increase of two pairs from 2003. ORV'S are allowed on both these beaches. (Graph 1 &2)

Nauset Spit

Nauset Spit is approximately 2 miles long and is frequented by Orleans residents only. No dogs are allowed on this beach. Symbolic fencing that consists of posts with clearly marked signage surrounds nesting areas; the entire fence is then closed off with a line of string attached to each post. Several walkways are in place for access to and from Nauset Cove. This activity was implemented in late April. To prevent chick mortality, areas with chicks due to hatch within 24 hours are closed off to vehicles by the placement of barriers. Several 6' posts are placed from symbolic fencing to the tide line. This barrier is kept in place for 25 days or until the chicks fledge.

Orleans North Beach

Orleans North Beach is located south of Nauset Spit and is approximately 3 ½ miles long. This beach is open to Orleans residents and the general public. Access to Orleans North Beach requires purchasing a sticker and viewing an informational video on rules and regulations. Nesting sites on Orleans North Beach are defined with 6' posts outlining the area. No string is used in the beginning of the season. This was completed in late April. Every fourth post is marked with signs. Dogs are permitted off leash and under voice control outside the nesting areas on this beach. Once a nest is found, symbolic fencing is put in place directing traffic away from the nest. One day before chicks are due to hatch a barrier consisting of several 6' posts with signage are put in place and remain until chicks are 25 days old or fledge. Dogs are not allowed in this barricaded area.

Pochet

Pochet is located just north of Orleans North Beach. This area has always been included with Orleans North Beach data. The Pochet area provides about a mile of excellent foraging and nesting habitat. This beach is frequented by residents of Pochet, an area in Orleans. Dogs are allowed on this beach under voice control. No vehicles are allowed. This year 2 pair of piping plovers nested on this beach. One pair lost 2 nests to wash over; the other pair lost 1 nest to wash over, re-nested and successfully fledged 2 chicks.

Tern Nesting

Each year a Tern census is conducted for the entire Nauset Beach area. The official forms required by Mass Wildlife are included in this report. Two counts were conducted. A-count was conducted during the census window of June 5-20. In 2004 the count was conducted on June 11th. 76 pair of Least tern was counted. B-count was conducted on July 6th and showed an increase in Least Terns to 170 pairs. All nesting pairs were located on Nauset Spit. No other tern species were observed during the A count or B count. High predation was likely due to the frequent presence of a coyote, as well as a large population of Black Backed Gulls. Skunk tracks were frequently observed during both counts. On August 12th for the first time in four years Nauset Spit fledged 4 least tern chicks.

American Oystercatchers

As in years past Coastal Waterbird Cooperators were asked to conduct a census of American Oystercatchers which are now ranked as a Species of High Concern in the United States Shorebird Conservation Plan. The count period for 2004 was conducted May 22 – 31. There were no Oystercatchers observed nesting on Nauset Spit, however on May 25th 29 Oystercatchers were observed feeding at low tide in Nauset cove. On June 4th 34 Oystercatchers were observed feeding in the cove.

Nesting Results For Nauset Spit

The first returning pair of Plovers was observed on Nauset Spit March. An increase of pairs and courtship activity soon followed. Egg laying began in the first week of May and continued to the end of June. Twelve nests were laid in sand, 1 in gravel and 1 in grass. Due to the presence of a coyote permission was given to exclose all nests when found with all exclosures being accepted. Twelve pairs ultimately nested on Nauset Spit with a total of 14 nests. Of these nests, 10 nested successfully on the first attempt. One pair abandoned 2 days prior to hatching date due to a skunk digging into the exclosure. A renest was not found. 2 pair renested with 1 pair fledging 1 chick.

NESTING DATA FOR NAUSET SPIT

NEST NAME	# OF EGGS LAID	# OF EGGS HATCHED	# FLEDGED	CAUSE OF FAILURE
1-A	4	4	3	
2-A	4	4	1	
3-A	1	0	0	Abandoned/coyote
3-B	3	3	0	Unknown
4-A	4	4	4	
5-A	4	0	0	Abandoned/skunk
6-A	4	4	4	
7-A	1	0	0	Coyote tracks up to nest
7-B	4	4	1	
8-A	4	4	0	Chicks and adults were constantly harassed by lone female plover
9-A	4	4	0	Gulls observed sitting on netting prior to hatching
10-A	4	3	3	
11-A	4	3	0	Gulls in area
12-A	4	4	0	Large population of gulls in area
TOTAL	49	41	16	

Calculations

- Hatching success = total number eggs hatched/total number eggs laid = .84
- Fledging success = total number of chicks fledged/total number of eggs hatched = .39
- Productivity = total number of chicks fledged/total number of pairs = 1.33

Egg laying began May 6^h and continued until the end of June on Orleans North Beach. 7 nests were laid in sand and 2 were laid in grass. Five pair nested on Orleans North Beach, two of which nested in the Pochet area. A sixth pair were observed copulating and scraping during the index count but failed to establish probably due to skunk, coyote and human disturbance. Of the five pair only 1 nested successfully on the first attempt. Two pair renested once, one pair renested twice and one nest was vandalized. This pair failed to renest. Two chicks were fledged from the Pochet area of Orleans North Beach.

(Fig.2)

NESTING DATA FOR ORLEANS NORTH BEACH

NEST NAME	# OF EGGS LAID	# OF EGGS HATCHED	# FLEDGED	CAUSE OF FAILURE
1-A	4	4	0	Unknown
2-A	4	0	0	Washover
2-B	3	0	0	Coyote tracks at nest
2-C	3	3	0	Avian predator observed in area
3-A	4	0	0	Washover
3-B	4	0	0	Washover
4-A	4	0	0	Washover
4-B	3	2	2	
5-A	3	0	0	Nest was vandalized
TOTAL	32	9	2	

Calculations

1. Hatching success = total number eggs hatched/total number of eggs laid = .28
2. Fledging success = total number of chicks fledged/total number of eggs hatched = .22
3. Productivity = total number of chicks fledged/total number of pairs = 0.40

Dogs Off Leash

A new ruling for Orleans North Beach in 2003 allowed dogs to be off leash and “under voice control”. Tracks consistent to a dog, rather than a coyote were frequently observed within the symbolic fencing. On several occasions unleashed dogs were observed inside nesting areas and up and down the dunes. This action prompts owners to also enter restricted areas to retrieve their dogs who were not responding to voice command. Dogs were also observed chasing birds feeding at low tide at Nauset Cove. Once chicks hatched barricades were put in place. Dogs and their owners were observed inside this barricaded area. Barricades consist of up to 25 6’ posts with clearly marked signage from the dune to the wrack line. Data on the impact to both public safety and the environment needs to be documented and evaluated. More enforcement and public education is needed.

Adult Mortality

On June 13th ONB nest # 1-A hatched 4 chicks after 32 days of incubation. On June 14th at 6:30 A.M. wings and part of an adult carcass were found at the northern edge of the enclosure. One dead chick was found 12’ east of the enclosure. Three chicks and a male adult were observed approximately 150’ south of the enclosure. Stakes had been removed from the northern end of symbolic fencing and vehicle tracks were evident. Skunk tracks were visible on the western end of the enclosure. Evidence of human and dog disturbance was visible. In addition to all these disturbances a peregrine falcon had previously been spotting in the Chatham area.

Unauthorized Vehicle Use

Each day 300 + vehicles are allowed access to Orleans North Beach. Access to the beach is limited when there are flightless chicks on the beach. In 2004 there were 6 documented instances of vehicles inside the closed/restricted area of Orleans North Beach, of these 5 were suspended for 1 year.

On Sunday June 21st a vehicle caught fire on Orleans North Beach causing vehicles to drive through a barricade knocking down 8 stakes and establishing a trail, which several vehicles followed. ONB #1-A with 1 adult and 3 six day old chicks were inside this barrier and last observed on Friday July 18th. On Monday July 22nd the barricade was reestablished and a thorough search was made for chicks and one remaining adult. None were found.

All barricades that were installed were breached at least once.

Vandalized Nest

ONB nest # 5 was found and exclosed on June 8 with 2 eggs. On June 9th the nest was checked at 6:30 am. The plover was on the nest incubating 3 eggs. Nest was checked from afar also at 1:30pm the same day; the bird was again incubating. On June 10th at 7:40 am ONB nest # 5 was found vandalized. Netting was torn open, turf and a triangular piece of plywood with paint on it appeared to have been used to smash the eggs. 1 adult was near the exclosure defending the nest. The area was walked in search of a possible adult mortality. None was found. Paul Fulchure was immediately called. Heavy rain had fallen the previous evening.

Management Suggestions

In addition to posting ONB, stakes and string should also be installed in April to better establish a restricted area. Signage on every other post instead of every fourth post better explains the restricted area.

Due to the increase of human disturbance in restricted areas, law enforcement would benefit on review of the definition of “taking” and it’s resulting penalties.

Signage at town landings prohibiting dogs on Nauset Spit.

Increased awareness and attentiveness of available law enforcement on Orleans North Beach

Cause of Nest/Chick Failure for ONB

- ONB #1-A See **Adult Mortality** and **Unauthorized Vehicle Use**
- OBN #2-A 4 egg nest lost to wash over from nor'easter
- ONB #2-B Coyote tracks leading up to 3 egg nest
- ONB #2-C Peregrine Falcon observed at nesting site
- OBN # 3-A 4 egg nest lost to wash over from nor'easter
- ONB # 3-B 2 egg nest found at tide line, complete with 4 eggs and lost to tide
- ONB # 4-A 4 egg nest lost to wash over from nor'easter
- ONB # 5-A See **Vandalized Nest**

Cause of Nest/Chick Mortality for Nauset Spit

- NS # 3-A Coyote tracks in area of 1 egg nest probably led to abandonment. Pair renested.
- NS # 3-B Cause of chick mortality unknown.
- NS # 5-A Nest was abandoned 2 days prior to hatching due to skunks digging into enclosure. Pair failed to renest
- NS # 7-A Coyote tracks observed leading up to 1 egg nest. Pair renested successfully
- NS # 8-A Nest hatched 6-30 (33) days of incubation. A lone female was observed harassing incubating pair, harassment continued after hatching 4 chicks. After 4 days, 1 chick remained with 1 female adult, chick was last seen 7-16.
- NS # 9-A Cause of chick mortality likely due to large population of black backed gulls in area. 12 gulls were observed perched on top of enclosure prior to hatching.
- NS # 11-A Large population of black backed gulls observed in area.
- NS # 12-A Large population of black backed gulls observed in area.



*Summary of Piping Plover Breeding Success and
Tern Nesting Status
2005 Nesting Season
Nauset Beach, Orleans, Massachusetts*

Submitted to:

Paul Fulcher
Parks & Beaches Superintendent
Orleans Parks & Beaches Department
Orleans, MA 02653

Orleans Conservation Commission
Town Hall
Orleans, MA 02653

Dr. Scott Melvin
Natural Heritage and Endangered Species Program
Massachusetts Department of Fisheries and Wildlife
Westboro, MA 01851

Submitted by:

Barbara Walsh
Shorebird Monitor
Orleans Parks & Beaches Department
Orleans, MA 02653

ABSTRACT

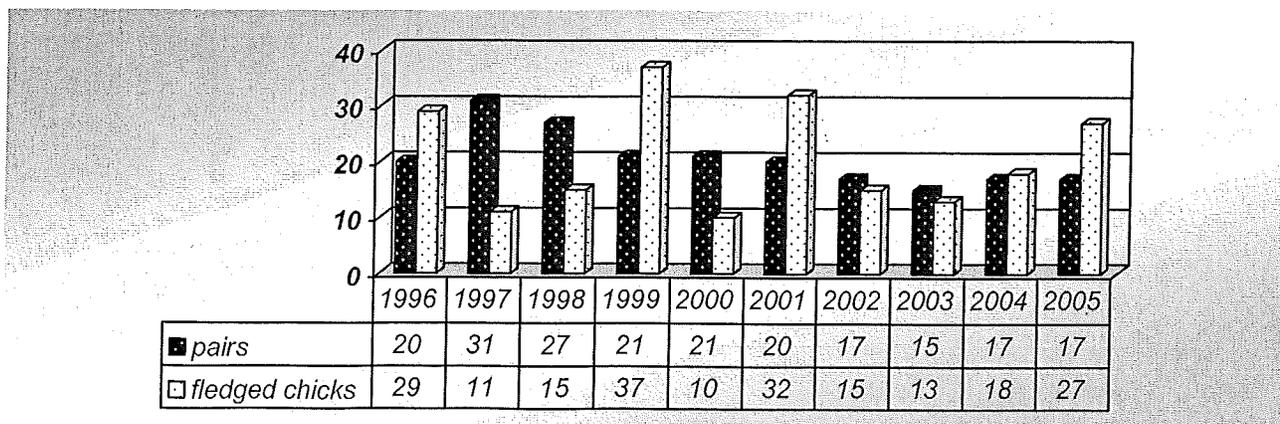
This is a summary of the 2005 Piping Plover and Waterbird nesting season for Nauset Beach. Piping Plovers (*Charadrius melodus*) were monitored at two separate beaches, Nauset Spit to the north and Orleans North Beach to the south. First returning plovers were observed in late March. A total of 17 pairs were monitored at these two ocean sites. Egg laying began in the first week of May for Nauset Spit. Two pair exhibited breeding behavior on Orleans North Beach; both pairs were unsuccessful in establishing a nest. Overall hatching success was .96 Fledging success was .34. A total of 27 chicks fledged. Productivity was 1.59 (Refer to charts 1 and 2). A total of 26 nests were established during the 2005-breeding season. Five nests were lost to a Nor'easter on May 7th and five were lost to a Nor'easter on May 24th. Six nests were successful on their first attempt. Four were successful on their second attempt and three were successful on their third attempt. Two nests were abandoned.

**CHART 1
PIPING PLOVER BREEDING SUCCESS**

SITE	PAIRS	1. NESTS	EGGS LAID	EGGS HATCHED	CHICKS FLEDGED	2. HATCHING SUCCESS	3. FLEDGING SUCCESS	4. PRODUCTIVITY
SPIT	15	26	83	80	27	0.96	.34	1.80
ONB	2	0	0	0	0	.00	.00	.00
TOTAL	17	26	83	80	27	0.96	0.34	1.59

1. INCLUDES RENESTS
2. TOTAL EGGS HATCHED/ TOTAL EGGS LAID = 0.96
3. TOTAL CHICKS FLEDGED/ TOTAL EGGS HATCHED = 0.34
4. TOTAL CHICKS FLEDGED/TOTAL PAIRS = 1.59

**CHART 2
PRODUCTIVITY ON NAUSET BEACH**



INTRODUCTION

Nauset Beach is owned and managed by the Town of Orleans and is located on the Atlantic Ocean. Within Nauset Beach is Nauset Spit and Orleans North Beach. There is also a section of Orleans North Beach called Pochet, which is located just south of the public beach; this section is a mile long. Being prime feeding and nesting grounds, these beaches are host to Piping Plovers, Least Terns, Roseate Terns, Common Terns, Arctic Terns, American Oystercatchers and Black Skimmers. Piping Plovers traditionally return to nesting sites late March through early May. Plovers prefer the sandy substrate that a barrier beach has to offer. Adults as well as chicks are cryptically colored to blend with their surroundings. In 1986, when the plover was federally listed as threatened species, the Town of Orleans initiated active management and protective measures to protect these breeding birds. Included in this report are the Massachusetts Census Forms for Piping Plovers, American Oystercatchers, and Terns.

NESTING AREAS

Since 1989 piping plovers have historically nested on two beaches within Nauset Beach. A total of 15 breeding pairs nested on Nauset Beach in 2005. Of these pairs, 14 pairs nested on Nauset Spit, and 1 pair nested on New Island, which is owned by the National Park Service. Because of the proximity of New Island to Nauset Spit, this pair has been entered into the Nauset Beach count. Two pair exhibited breeding activity on Orleans North Beach but failed to establish a nest. ORV'S are allowed on both Nauset Spit and Orleans North Beach.

NAUSET SPIT

Nauset Spit is approximately 2 miles long. ORV traffic is allowed and limited to Orleans residents only. Dogs are not allowed on this beach from March 15th to September 15th. Symbolic fencing that consists of posts with clearly marked signage surrounds nesting areas. The entire fence is then closed off with a line of string attached to each post. Several walkways are in place for access to and from Nauset Cove. This activity was implemented in late April. To prevent chick mortality, areas with chicks due to hatch within 24 hours are closed off to vehicles by the placement of barriers. Several 6' posts are placed from symbolic fencing to the tide line. This barrier is kept in place for 25 days or until the chicks fledge.

ORLEANS NORTH BEACH

Orleans North Beach is located south of Nauset Spit and is approximately 5 miles long. This beach is open to Orleans residents and the general public. Access to Orleans North Beach requires purchasing a sticker and viewing an informational video on rules and regulations. Nesting sites on Orleans North Beach are defined with 6' posts and 5' stakes outlining the area. This symbolic fencing is then strung to better outline the area. This was completed in late April. Every post is marked with signage. One day before chicks are due to hatch a barrier consisting of several 6' posts with signage are put in place and remain until chicks are 25 days old or fledge. Dogs are not allowed in this barricaded area.

POCHET

Pochet is located just north of Orleans North Beach. This area has always been included with Orleans North Beach data. The Pochet area provides about a mile of excellent foraging and nesting habitat. This beach is frequented by residents of Pochet, an area in Orleans. Dogs are allowed on this beach under voice control. No vehicles are allowed. This past winter a blizzard caused a wash over of approximately 720' creating excellent habitat for piping plovers. One pair of Piping Plovers were exhibiting breeding activity in this area, they were not successful.

PIPING PLOVER NESTING RESULTS

NESTING RESULTS FOR NAUSET SPIT

The first returning pair of Plovers was observed on Nauset Spit in late March. An increase of pairs and courtship activity soon followed. Egg laying began in the first week of May and continued to the end of June. Due to the presence of a coyote, permission was given to *enclose* all nests when found. All enclosures were accepted. Fourteen pairs ultimately nested on Nauset Spit with a total of 25 nests. One nest was found on New Island, which is owned by Cape Cod National Seashore. Because of the proximity of New Island this nest is being included with Nauset Spit data. Of these nests, 7 were successful on their first attempt, 5 on their second attempt, and 3 on their third attempt.

CAUSE OF NEST/CHICK MORTALITY FOR NAUSET SPIT

- NS# 1-A 3 egg nest lost to a May 7th Nor'easter
 NS# 1-B loss of 1 chick unknown
- NS# 2-A 1 egg nest lost to a May 7th Nor'easter
 NS# 2-B 3 egg nest lost to a May 24th Nor'easter
- NS# 3-A 1 egg nest lost to a May 7th Nor'easter
 NS# 3-B 4 egg nest lost to a May 24th Nor'easter
 NS# 3-C loss of 1 chick unknown
- NS# 4-A 3 egg nest lost to a May 24th Nor'easter
 NS# 4-B loss of 2 chicks unknown
- NS# 5-A 1 egg nest lost to a May 7th Nor'easter
 NS# 5-B 4 egg nest lost to a May 24th Nor'easter
- NS# 6-A 4 egg nest lost to a May 4th Nor'easter
 NS# 6-B loss of 1 chick unknown
- NS# 7-A loss of 2 chicks unknown
- NS# 8-A 1 egg nest lost to a May 24th Nor'easter
 NS# 8-B loss of 1 chick unknown
- NS# 9-A nest was abandoned after 3 chicks hatched possibly due to a large Flag flying close to ~~ex~~closure. Loss of 3 chicks unknown.

CONTINUATION CAUSE OF NEST/CHICK MORTALITY FOR NAUSET SPIT

- NS# 10-A loss of 2 chicks unknown
- NS# 11-A 4 egg nest lost to abandonment due to crow harassment
- NS# 11-B 3 egg nest lost to abandonment due to possible crow harassment
Adult mortality found 20' from exclosure, Harrier observed two weeks later in area.
- NS# 12-A nest abandoned after two chicks hatched. A kite was observed flying over exclosure by a beach patron during hatching. A kite was later found near the exclosure.
- NS# 13-A 4 egg nest was abandoned due to gull harassment
- NS# 14-A loss of 1 chick unknown
- NS# 15-A 1 chick found dead possibly from a Black Backed Gull

MASSACHUSETTS PIPING PLOVER CENSUS FORM

Year: 2005
 Site Name: Nauset Spit
 Town: Orleans
 Ownership: Town
 Observer(s): Barbara Walsh
 Agency: Orleans Parks and Beaches Department
 Address: 18 Bayridge Lane P.O. Box 122
Orleans, MA 02653

Telephone: _____ E-mail: _____

⇒ Please attach a map of this site that shows locations of all nests and pairs that did not nest.

Census Results:	Index Count ^a	Total Count ^b
No. of Pairs	15	15
Unpaired Adults		

Notes on pairs that did not nest (include dates present, activities)/Census remarks:

 List pairs not present during Index Count:

Month	Average # of visits to site per week
April	5
May	5
June	5
July	5

Indicate type(s) of exclosure design(s) used:

Exclosure Design	A	B	C
Shape	Circular		
Diameter/Length of side	10'		
Size of wire mesh	2" x 4"		
Total Height	48"		
Height above ground:	44"		
Depth buried:	4"		
Cover material	netting		
Cover spacing/Mesh size	1/2" x 1/2"		

Other management undertaken or needed/Remarks:

^aThe Index Count includes those pairs seen during the Index Count period (1-9 June) and also those that may have been missed during the Index Count, but that must have been present then (based on laying or hatching dates).
^bTo be included in the Total Count, a pair must have been present at the site for ≥ 2 weeks and exhibiting courtship or territorial behavior during that period, if not actual nesting.

Site Name: Mauset Spit Year: 2005 Observer(s): Barbara Walsh

Page 1 of 3

Pair No.	Nest No.	No. eggs laid	No. eggs hatched ^c	No. chicks fledged ^d	Date clutch found	No. eggs when clutch found	Date clutch completed	Date nest hatched or failed ^e	Exclosure		
									Y/N	Design (A, B...)	Date installed
NS#1	1-A	3	0	0	5-2	1	-	5-7	Y	A	5-3
	1-B	4	4	3	6-6	1	6-11	7-6	Y	A	6-6
	2-A	1	0	0	5-3	1	-	5-7	Y	A	5-4
NS#2	2-B	3	0	0	5-18	1	-	5-27	Y	A	5-18
	2-C	3	3	3	6-3	2	6-9	7-6	Y	A	6-4
	3-A	1	0	0	5-4	1	-	5-7	Y	A	5-4
NS#3	3-B	4	0	0	5-18	3	5-20	5-24	Y	A	5-18
	3-C	4	4	3	6-14	4	-	7-5	Y	A	6-14
	4-A	3	0	0	5-4	1	-	5-24	Y	A	5-4
NS#4	4-B	3	3	1	6-14	3	-	7-10	Y	A	6-14

^cIndicate below the reasons for nest failure and egg/chick mortality (if known) and the evidence, or indicate "unknown." Attach additional sheets if necessary.
^dChicks are considered "fledged" if they are ≥ 25 days old or are observed in flight for ≥ 50 ft., whichever occurs first.

Nest No.	Cause of egg mortality/Evidence	Nest No.	Cause of chick mortality/Evidence
1-A	} Nor 'Easter's	1-B	} unknown Large population of Black-Backed Gull
2-A		3-C	
2-B		4-B	
3-A			
3-B			
4-A			

Site Name: Nauset Spit

Year: 2005

Observer(s): Barbara Walsh

Page 2 of 3

Pair No.	Nest No.	No. eggs laid	No. eggs hatched ^c	No. chicks fledged ^d	Date clutch found	No. eggs when clutch found	Date clutch completed	Date nest hatched or failed ^e	Enclosure		
									Y/N	Design (A, B...)	Date installed
NS#5	5-A	1	0	0	5-4	1	-	5-7	Y	A	5-5
	5-B	4	0	0	5-23	4		5-24	N		
	5-C	4	4	4	6-2	1	6-7	7-2	Y	A	6-2
NS#6	6-A	4	0	0	5-4	4		5-7	Y	A	5-5
	6-B	4	4	3	6-16	4		7-1	Y	A	6-16
NS#7	7-A	4	4	2	5-18	3	5-20	6-17	Y	A	5-18
NS#8	8-A	1	0	0	5-23	1		5-24	N		
	8-B	4	4	3	6-1	1	6-7	7-2	Y	A	6-2
NS#9	9-A	4	3	0	6-2	1	6-8	7-3	Y	A	6-2
NS#10	10-A	4	4	2	6-3	1	6-10	7-5	Y	A	6-3

^cIndicate below the reasons for nest failure and egg/chick mortality (if known) and the evidence, or indicate "unknown." Attach additional sheets if necessary.
^dChicks are considered "fledged" if they are ≥ 25 days old or are observed in flight for ≥ 50 ft., whichever occurs first.

Nest No.	Cause of egg mortality/Evidence	Nest No.	Cause of chick mortality/Evidence
5-A	} Nor' Easter	6-B	} unknown
5-B		7-A	
6-A		8-B	
8-A		10-A	
9-A	25' Flag was found Flying close to enclosure on July 4 th 1 egg hatched 7-3 & chicks were last observed 7-19 1 egg hatched 7-4 1 egg hatched 7-5	9-A	unknown

Send forms to: Scott Melvin, MassWildlife, Rte. 135, Westborough, MA 01581. Telephone: (508) 792-7270 x. 150 / Fax: (508) 792-7275

Site Name: Nauset Spit

Year: 2005

Observer(s): Barbara Walsh

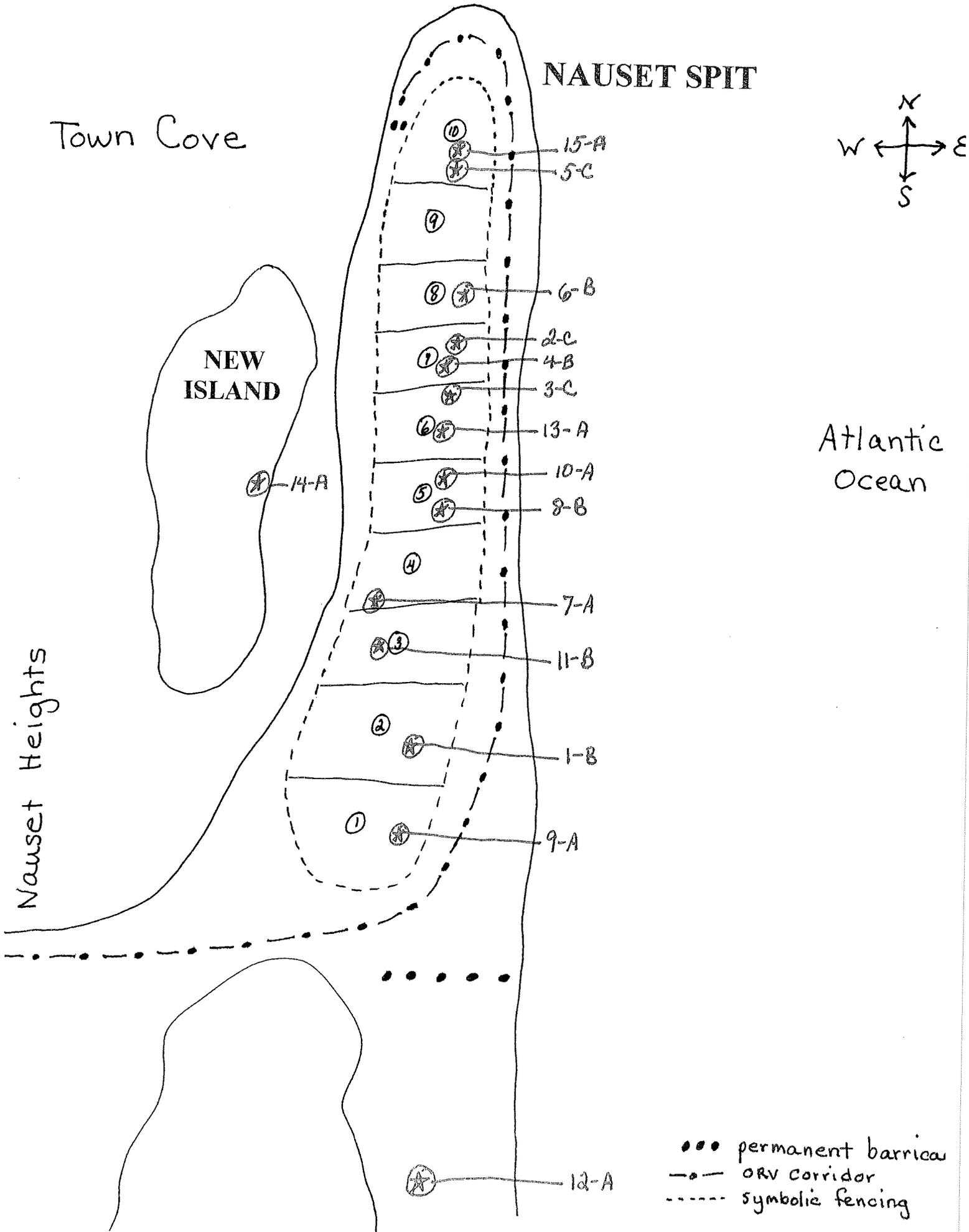
Page 3 of 3

Pair No.	Nest No.	No. eggs laid	No. eggs hatched ^c	No. chicks fledged ^d	Date clutch found	No. eggs when clutch found	Date clutch completed	Date nest hatched or failed ^c	Exclosure		
									Y/N	Design (A, B...)	Date installed
NS#11	11-A	4	0	0	6-3	1	6-7	6-22	Y	A	6-3
	11-B	3	0	0	6-27	2	6-28	7-15	Y	A	6-27
NS#12	12-A	4	2	0	6-5	1	6-11	7-6	Y	A	6-5
NS#13	13-A	4	0	0	6-3	2	6-7	6-24	Y	A	6-3
NS#14	14-A	2	2	1	6-9	2		7-2	Y	A	6-9
NS#15	15-A	3	3	2	6-23	3		7-10	Y	A	6-23

^c Indicate below the reasons for nest failure and egg/chick mortality (if known) and the evidence, or indicate "unknown." Attach additional sheets if necessary.
^d Chicks are considered "fledged" if they are ≥ 25 days old or are observed in flight for ≥ 50 ft., whichever occurs first.

Nest No.	Cause of egg mortality/Evidence	Nest No.	Cause of chick mortality/Evidence
#11-A	Abandoned	12-A	UNKNOWN
11-B	crow harassment	14-A	UNKNOWN
	Abandoned crow harassment. 1 adult mortality possibly Harrier.	15-A	5 day old chick found in open, sandy area. Large population of Black Backed Gulls in area.
12-A	Kite was observed flying over exclosure on day of hatching		
13-A	Gull harassment abandoned		
14-A	Nest was on NEW ISLAND Property of CONS		

Send forms to: Scott Melvin, Mass Wildlife, Rte. 135, Westborough, MA 01581. Telephone: (508) 792-7270 x. 150 / Fax: (508) 792-7275



NESTING RESULTS FOR ORLEANS NORTH BEACH

Two pair of piping plovers was observed for a two-week period exhibiting breeding behavior on Orleans North Beach. One pair on beach 2 of Orleans North Beach failed to establish a nest. Orleans North Beach also includes the area of Pochet, in this area another pair exhibiting breeding behavior failed to establish a nest.

CAUSE OF NEST/CHICK FAILURE FOR ONB

For reasons unknown, two pair of piping plovers failed to establish a nest on Orleans North Beach.

MASSACHUSETTS PIPING PLOVER CENSUS FORM

Year: 2005
 Site Name: Orleans North Beach
 Town: Orleans
 Ownership: Orleans

Observers: Barbara Walsh
 Agency:
 Address:
 Telephone:
 Email:

Please mail a hard copy of a map of this site that shows locations of all nests and pairs that did not nest.

Census remarks/notes on any pairs that did not nest (dates present, behavior):
Pairs were observed exhibiting breeding behavior but did not nest.

List pairs, if any, not present during Index Count:

Census results:

No. of pairs	
Index Count ^a	Total Count ^b
<u>1</u>	<u>2</u>

Monitoring effort:

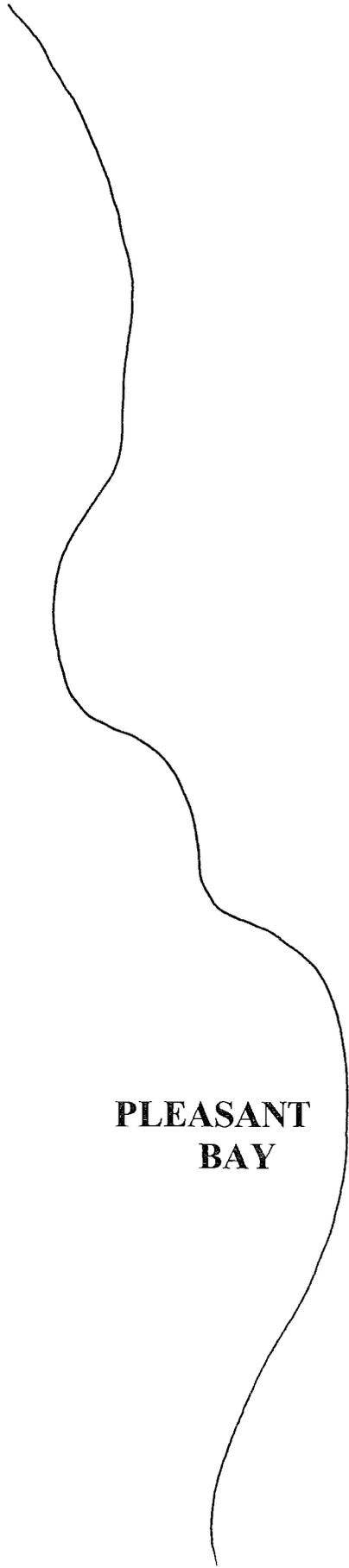
Month	Avg. no. of visits to site per week
April	<u>5</u>
May	<u>5</u>
June	<u>5</u>
July	<u>4</u>

Exclosure Design	A	B	C
Shape			
Diameter/Length of side			
Size of wire mesh			
Total Height			
Height above ground:			
Depth buried:			
Cover material			
Cover spacing/Mesh size			

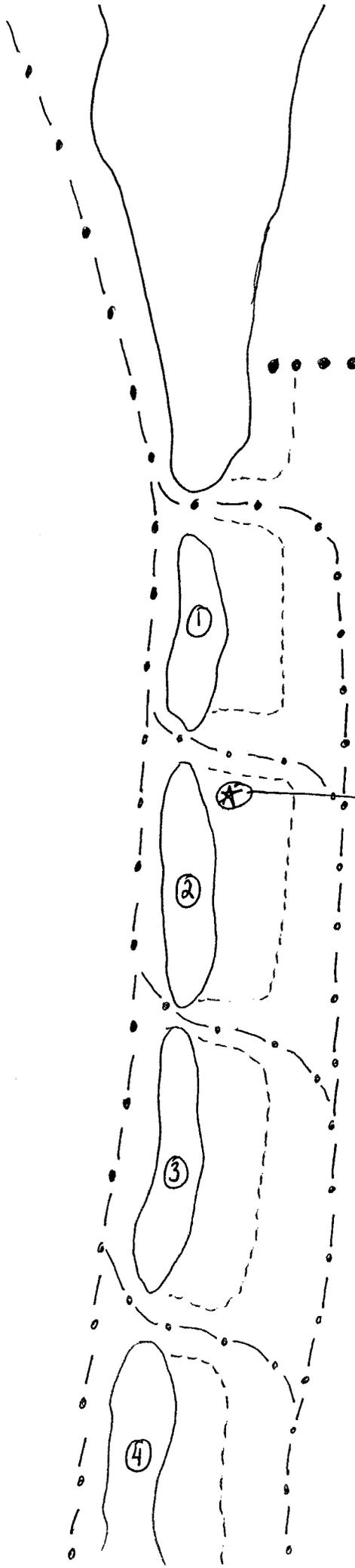
Other management undertaken or needed/Remarks:

^aThe Index Count includes pairs seen during the Index Count period (1-9 June), as well as pairs not detected then, but that must have been present based on subsequent laying or hatching dates.
^bTo be included in the Total Count, a pair must have been present at the site for > 2 weeks and have exhibited courtship or territorial behavior during that period, if not actual nesting.
 Email or send forms to: Scott Melvin, *Mass Wildlife*, Rte. 135, Westborough, MA 01581. scott.melvin@state.ma.us. Tel: (508) 792-7270 x. 150 / Fax: (508) 792-7821

**ORLEANS
NORTH
BEACH**



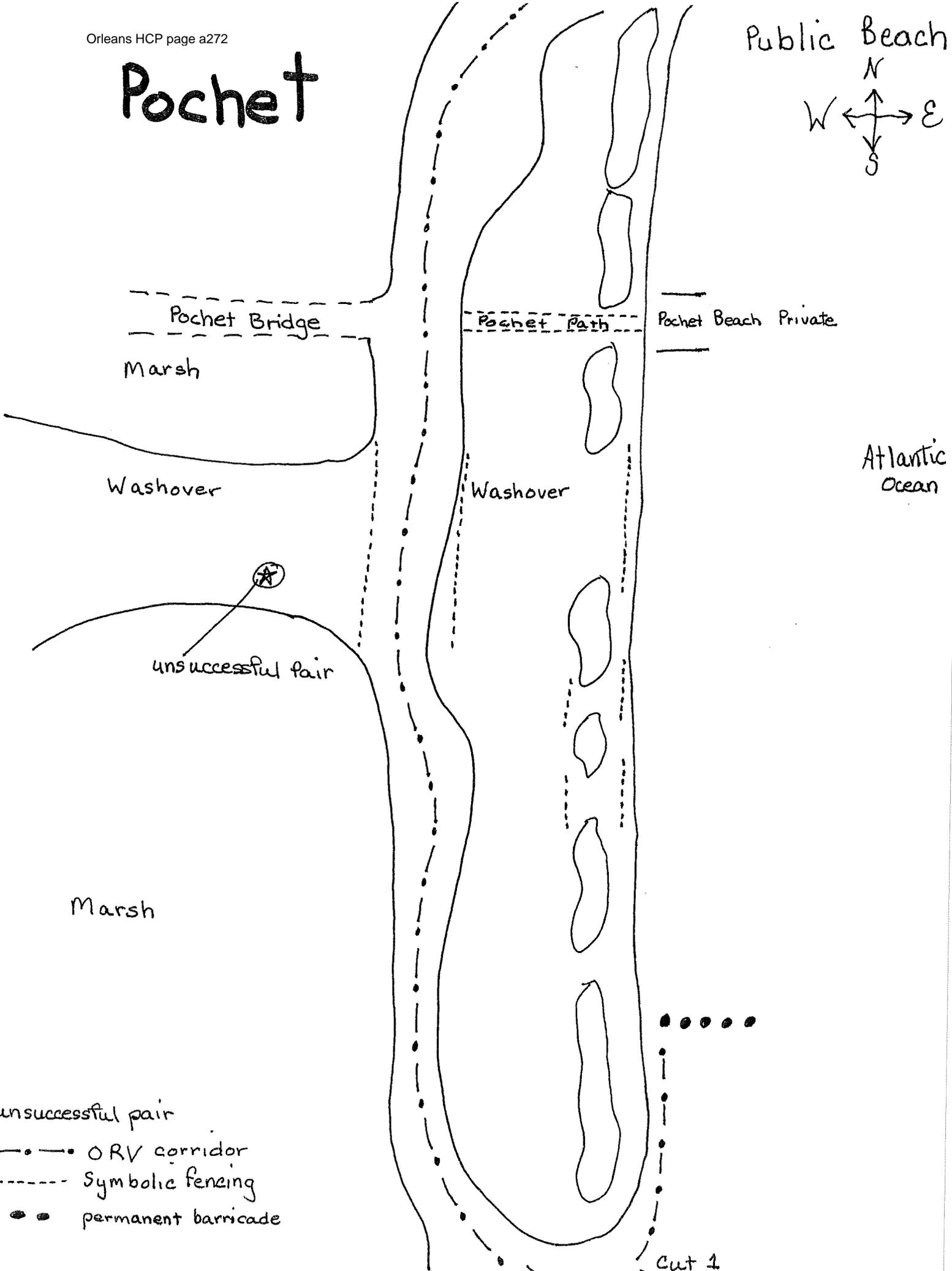
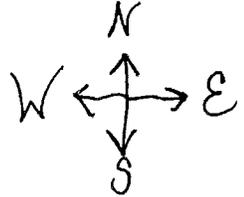
**PLEASANT
BAY**



unsuccessful pair

Pochet

Public Beach



- unsuccessful fair
- ORV corridor
- Symbolic fencing
- permanent barricade

**TERN &
OYSTERCATCHER
NESTING RESULTS**

TERN NESTING

Each year a Tern census is conducted for the entire Nauset Beach area. The official forms required by Mass Wildlife are included in this report. An A-count was conducted during the census window of June 5-20. In 2005 the count was conducted on June 15th. Ten pair of Least Terns was counted, this is a marked decrease from 2004. With no significant change in numbers, a B-count was not done. All nesting pairs were located on Nauset Spit. No other tern species were observed during the A-count. Predation was likely due to the frequent presence of a coyote, as well as a large population of Black Backed Gulls. On September 4th one least tern chick fledged from Nauset Spit.

AMERICAN OYSTERCATCHERS

As in years past Coastal Waterbird Cooperators were asked to conduct a census of American Oystercatchers which are now ranked as a Species of High Concern in the United States Shorebird Conservation Plan. The count period for 2005 was conducted May 22 – 31. One pair established a 1-egg nest on Nauset Spit. This nest was washed over on May 24th due to a Nor'easter. The pair did not re-nest.

Massachusetts Tern Census Form, Year 2005

Colony Name: Nauset - Orleans
 Colony Number: 352009
 Town: Orleans
 Ownership: Town of Orleans

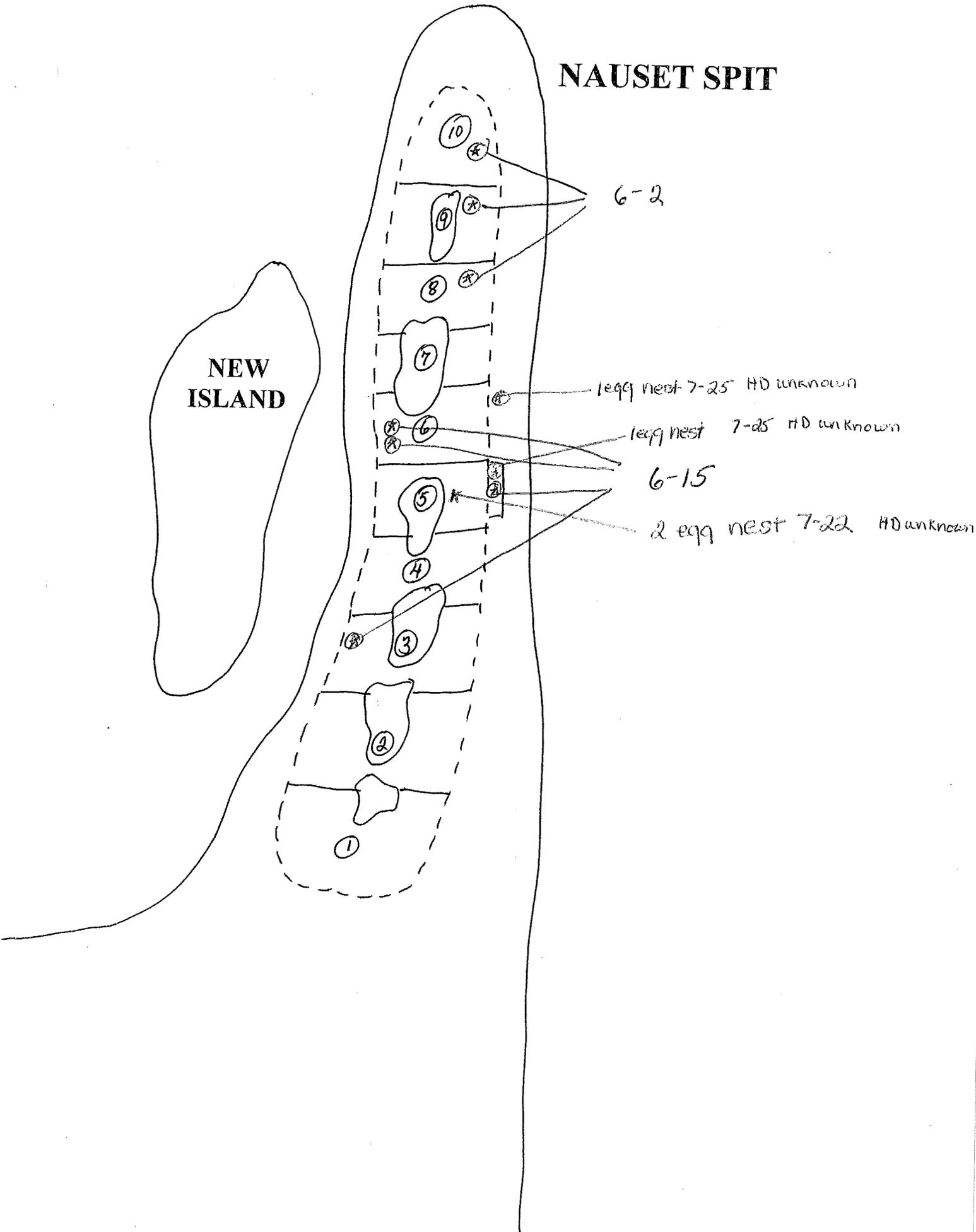
Observer/Agency: Barb Walsh
 Street: _____
 Town & State: _____ Zip: _____
 E-mail: JT.WALSH@CAPECOO.NET Telephone: 508340-0037

⇒ PLEASE read the instructions on the reverse of this form before filling out. ⇐

Species Code	A-Count			B-Count			P	Remarks: (e.g., evidence of predation, tide or storm washout, human disturbance, etc.) *INDICATE (if known) DATE OF FIRST EGGS LAID AND FIRST EGGS HATCHED.	
	Date	No. Pairs	M	Q	Date	No. Pairs			M
ROST	6-15	0	AC	RC	7-10	0	AC	RC	
COTE	6-15	0	AC	RC					
ARTE	6-15	0	AC	RC	7-10	0	AC	RC	
LETE	6-15	10	AC	RC					coyote tracks throughout nesting area huge population of Black-necked Gulls
LAGU	6-15	0	AC	RC					
BLSK	6-15	0	AC	RC	7-10	0	AC	RC	
OTHER									

NAUSET SPIT

NEW ISLAND



MASSACHUSETTS AMERICAN OYSTERCATCHER CENSUS FORM

Year: 2005

Site Name: Nauset Spit

Town: Orleans

Ownership: Town of Orleans

Observer(s): Barbara Walsh

Affiliation: _____

Address: _____

⇨ *Please attach a map of this site that shows locations of all breeding pairs and nests.*

Telephone: 508-240-0037 E-mail: JT@WALSH@CAPECOD.NET

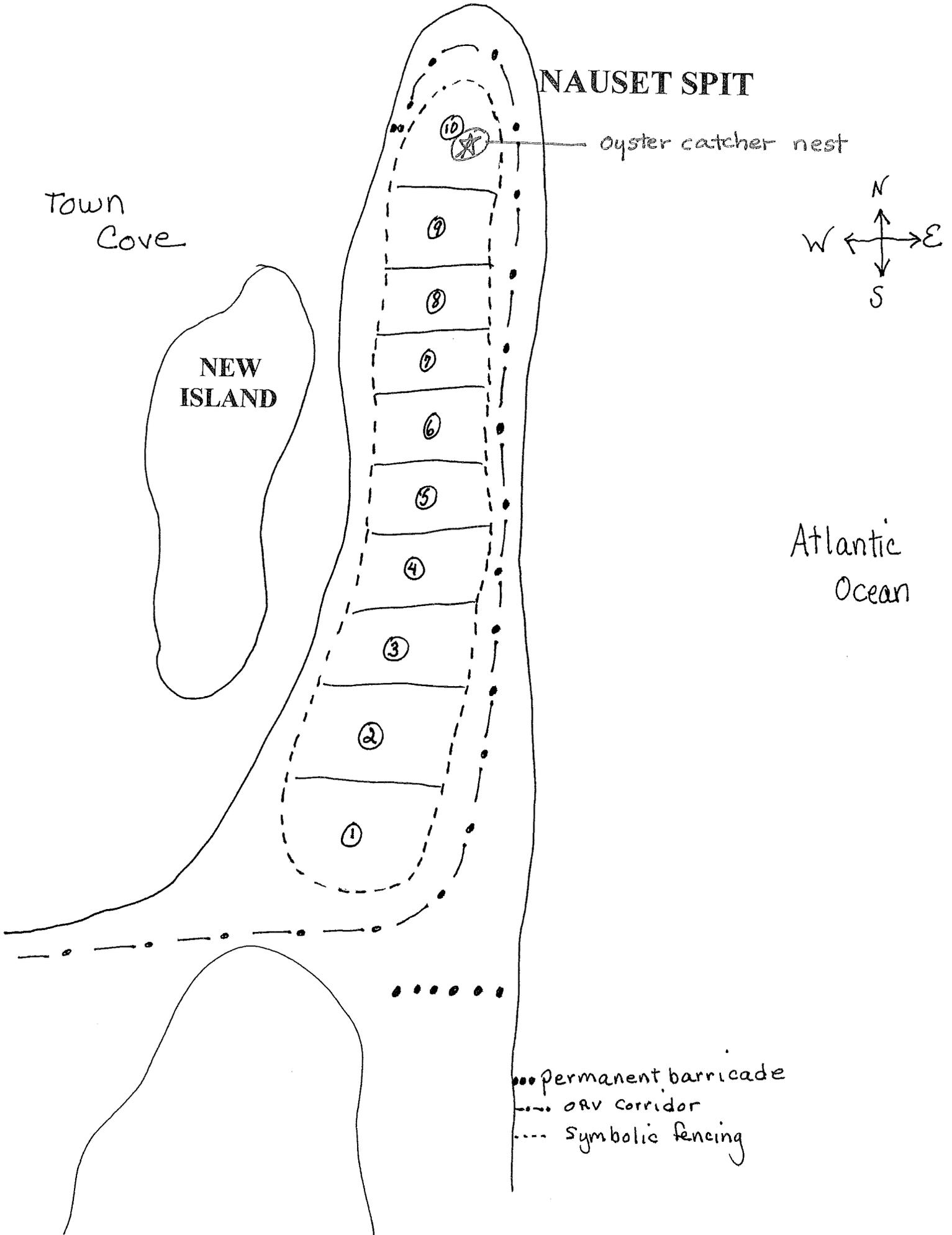
Total breeding pairs: 1 Total chicks fledged (30 days of age or able to fly): 0

Max number(s) of post-breeding birds (adults and fledged young) / date observed: 2 7-19-05

Please indicate which, if any, Oystercatcher nests, broods, or important habitat areas were not adequately protected from human disturbance or off-road vehicles by existing management for Piping Plovers and terns.

Comments; management undertaken/needed; clarification of census data:

1 egg nest lost to May 24th Nor' Easter pair failed to renest

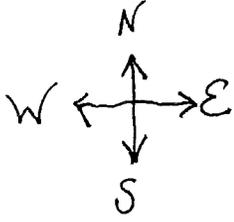


NAUSET SPIT

oyster catcher nest

Town
Cove

**NEW
ISLAND**



Atlantic
Ocean

- permanent barricade
- - - ORV corridor
- symbolic fencing

ADULT MORTALITY

On July 15th NS# 11-B with 3 eggs was found to be abandoned. Crow tracking was observed around the enclosure and in the area. On July 19th a dead adult plover was found 20' from the enclosure. The chest cavity was badly decomposed. The carcass of a dead willet was found 4' from the plover. Coyote and crow tracking were observed around the birds. On two occasions in early August a Harrier was observed in the area.

CHICK MORTALITY

On July 10th NS# 15-A hatched 3 chicks. On July 15th a dead chick was found in an open sandy area in section 10 of Nauset Spit. Tracking from a single plover led to and from the chick. A large population of Black Backed Gulls frequents this area of Nauset Spit. The Chick was recovered and given to Scott Melvin.

DOGS ON ORLEANS NORTH BEACH

In the past dogs were allowed on ONB under voice control. In November of 2004 the Board of Parks Commissioners of Orleans and Chatham, revisited the rules and regulations pertaining to dogs on the beach. A new ruling was designated as follows: "...All dogs must be on a leash of not more than 30' at all times, unless below the high tide mark, from May 15 through Labor Day. (This will be a zero tolerance enforcement issue.) Dogs are prohibited from areas closed to vehicle or human traffic for Piping Plover protection. In addition to any other penalties set forth in these regulations, any violations of this Section constituting a first offense is the automatic revocation of the offenders beach permit rights for a period of one (1) year..." Several beach permits were revoked because of dogs off leash.

DOGS ON NAUSET SPIT

Dogs are prohibited on Nauset Spit from March 15th to September 15th. Despite this rule, the shorebird monitor on Nauset Spit observed 49 dogs. The majority of these dogs with their owners access Nauset Spit by way of a public stairway at Nauset Heights. Several of these people are well aware of the rules and regulations pertaining to dogs. Dogs are also brought to the spit by way of boats. Once barricades are put in place for hatched chicks there is no patrol allowed by law enforcement on Nauset Spit. There is more than adequate signage alerting the public about dogs on the beach and why. This has become a constant chronic problem that needs to be addressed.

HUMAN DISTURBANCE

During the 2005 nesting season on Nauset Spit there were several instances of foot traffic through the nesting areas. Terns are particularly sensitive to this type of disturbance and will abandon a nesting site only to re-establish at another point on the beach delaying egg laying and incubation. This type of event happened several times. Several acts of vandalism were also observed on Nauset Spit in the Nauset Heights area, posts were removed and burned, signage was ripped off posts, stakes were snapped off, and string was cut on a daily basis. An undercover police officer was positioned on the beach, nothing was observed.

UNAUTHORIZED VEHICLE USE

Each day 300 + vehicles are allowed access to Nauset Beach. Access to the beach is limited when there are flightless chicks on the beach. In 2005 there was 1 documented instance of a vehicle inside the closed/restricted area of Nauset Spit. This vehicle has been suspended for 1 year. A thorough search was made for any chick mortalities, none were found.

MANAGEMENT SUGGESTIONS

Dogs should be banned from Orleans North Beach during the nesting season.

Signage should be installed at all town landings prohibiting dogs on Nauset Spit.

Law enforcement needs to be more active in giving citations to people who bring dogs on Nauset Spit.

An interpretive sign should be installed at Callanan's Pass in April to inform the public about nesting birds on Nauset Spit.

All beach staff should be educated on the rules and regulations pertaining to nesting plovers and terns.

Some type of law enforcement needs to be established for Nauset Spit when chicks have hatched and barricades are put in place.

ABSTRACT

This is a summary of the 2006 Piping Plover and Waterbird nesting season for Nauset Beach. Piping Plovers (*Charadrius melodus*) were monitored at three separate areas, Nauset Spit to the north, Pochet wash over to the south and further south, Orleans North Beach. First returning plovers were observed in late March. A total of 18 pairs were monitored at these three ocean sites. This is an increase of one pair from 2005. Egg laying began in the first week of May for Nauset Spit. Pochet wash over nests were established the second week in May. No activity was observed at Orleans North Beach. Overall hatching success was .46. Fledging success was .61. A total of 22 chicks fledged. Productivity was 1.22 (Refer to charts 1 and 2). A total of 24 nests were established during the 2006-breeding season. Four nests were lost to early May storms. Seven nests were successful on their first attempt. One was successful on the second attempt. Two nests lost all their chicks. Four nests were lost to a smart predator. Three nests were predated after exclosures were removed due to a smart predator. Three nests were lost to crow predation.

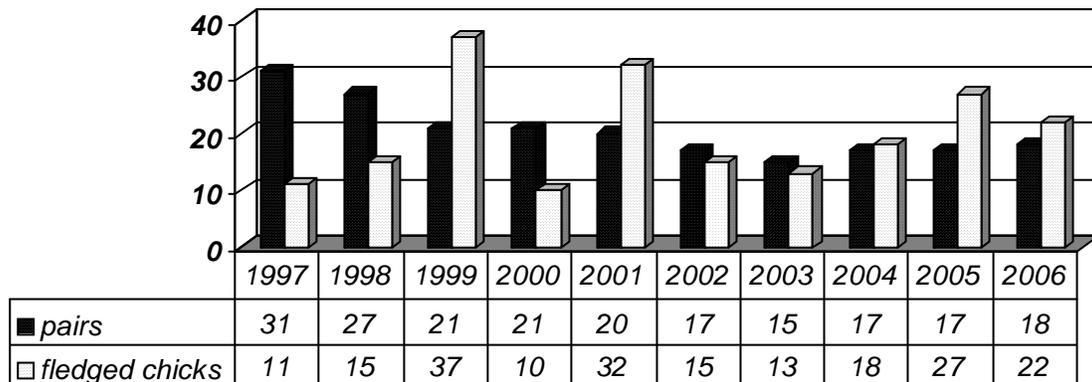
CHART 1

PIPING PLOVER BREEDING SUCCESS

SITE	PAIRS	1. NESTS	EGGS LAID	EGGS HATCHED	CHICKS FLEDGED	2. HATCHING SUCCESS	3. FLEDGING SUCCESS	4. PRODUCT- IVITY
SPIT	16	22	71	29	17	.41	.59	1.06
POCHET	2	2	8	7	5	.88	1.00	2.50
TOTAL	18	24	79	36	22	.46	.61	1.22

1. INCLUDES RENESTS
2. TOTAL EGGS HATCHED/ TOTAL EGGS LAID = 0.46
3. TOTAL CHICKS FLEDGED/ TOTAL EGGS HATCHED = 0.61
4. TOTAL CHICKS FLEDGED/TOTAL PAIRS = 1.22

CHART 2 PRODUCTIVITY ON NAUSET BEACH



INTRODUCTION

Nauset Beach is owned and managed by the Town of Orleans and is located on the Atlantic Ocean. Within Nauset Beach is Nauset Spit and Orleans North Beach. There is also a section of Orleans North Beach called Pochet, which is located just south of the public beach; this section is a mile long. Being prime feeding and nesting grounds, these beaches are host to Piping Plovers, Least Terns, Roseate Terns, Common Terns, Arctic Terns, American Oystercatchers and Black Skimmers. Piping Plovers traditionally return to nesting sites late March through early May. Plovers prefer the sandy substrate that a barrier beach has to offer. Adults as well as chicks are cryptically colored to blend with their surroundings. In 1986, when the plover was federally listed as threatened species, the Town of Orleans initiated active management and protective measures to protect these breeding birds. Included in this report are the Massachusetts Census Forms for Piping Plovers, American Oystercatchers, and Terns.

NESTING AREAS

Since 1989 piping plovers have historically nested at three different areas within Nauset Beach. A total of 18 breeding pairs nested on Nauset Beach in 2006. Of these pairs, 16 pairs nested on Nauset Spit, and 2 pair successfully nested at the Pochet wash over. No nests were established at Orleans North Beach.

Nauset Spit

Nauset Spit is approximately 2 ½ miles long. ORV traffic is allowed and limited to Orleans residents only. Dogs are not allowed on this beach from March 15th to September 15th. Symbolic fencing that consists of posts with clearly marked signage surrounds nesting areas. The entire fence is then closed off with a line of string attached to each post. Several walkways are in place for access to and from Nauset Cove. This activity was implemented in late April. To prevent chick mortality, areas with chicks due to hatch within 24 hours are closed off to vehicles by the placement of barriers. Several 6' posts are placed from symbolic fencing to the tide line. This barrier is kept in place for 25 days or until the chicks fledge.

Orleans North Beach

Orleans North Beach is located south of Nauset Spit and is approximately 3 ½ miles long. This beach is open to Orleans residents and the general public. Access to Orleans North Beach requires purchasing a sticker and viewing an informational video on rules and regulations. Nesting sites on Orleans North Beach are defined with 6' posts and 5' stakes outlining the area. This symbolic fencing is then strung to better outline the area. This was completed in late April. Every post is marked with signage. One day before chicks are due to hatch a barrier consisting of several 6' posts with signage are put in place and remain until chicks are 25 days old or fledge. Dogs are not allowed in this barricaded area.

Pochet

Pochet is located approximately 1 1/2 miles south of Nauset Spit and ¼ of a mile from the gated entrance for all Off Road Vehicles. The Pochet area provides about a mile of excellent foraging and nesting habitat. A winter blizzard in 2005 created a wash over of approximately 855' north to south and 789' east to west. This created a pristine habitat for piping plovers and least terns. Two pair of piping plovers successfully nested in this area and fifty least tern nests were monitored. For the first time in history the Orleans Park Commissioners at their June 14th meeting voted to close the entire south end of Nauset Beach to all Off Road Vehicles including camp owners. This was done in compliance with the Federal and State Endangered Species Act Laws. The area was closed to Off Road Vehicles at 12:01 a.m. June 22nd and re-opened July 25th.

Tern Nesting

Least Terns returned to Nauset Spit May 15th. Symbolic fencing was extended due to accretion at the tip of Nauset spit. Both least terns and piping plovers attempted to nest in this area. Egg laying began during the last week in May. Almost all of these nesting attempts were predated causing most pairs to re-nest with some shifting of nesting locations. Egg predation continued. Two chicks were observed July 17th for 4 days only. Predation was likely due to a large population of black backed gulls. Coyote tracks were also observed.

Each year a Tern census is conducted for the entire Nauset Beach area. The official forms required by Mass Wildlife are included in the report. An A-count for Nauset Spit was conducted during the census window of June 5-20. In 2006 the count was conducted on June 12th. 14 pair of Least tern was counted, this is a slight increase from 2005. No other tern species were observed during the A-count. With no significant change in numbers a "B" count was not done.

The Pochet area fared much better. Pochet wash over provides excellent habitat for Least Terns. An "A" count was completed for the Pochet area on June 20th with 8 pair observed. Due to a marked increase a "B" count was conducted on July 13 with 50 nests being counted. Terns continued to lay eggs until early August. Plastic construction fencing was put in place and the ORV corridor was re-routed around the tern colony. Of these nests approximately 20 chicks were fledged. No other species of Tern were observed. There were no terns observed at Orleans North Beach.

American Oystercatchers

As in years past Coastal Waterbird Cooperators were asked to conduct a census of American Oystercatchers which are now ranked as a Species of High Concern in the United States Shorebird Conservation Plan. The count period for 2006 was conducted May 22nd-May 31st. One pair established a nest in early June; this nest was complete with 3 eggs on May 4th. The nest was abandoned after a storm on May 22. A re-nest produced one chick that was found dead above the tide line July 21st. This chick appeared to be about 4 weeks old. The cause of this mortality is unknown.

Nesting Results For Nauset Spit

The first returning pair of plovers was observed on Nauset Spit in late March. An increase of pairs and courtship activity soon followed. Egg laying began in the first week of May and continued to the end of June. All nests were exclosed and all exclosures were accepted. Sixteen pairs ultimately nested on Nauset Spit with a total of 22 nests. Of these nests, 5 were successful on their first attempt and 1 on their second attempt. One pair was unsuccessful and did not re-nest.

On June 25th it was observed that a 'smart predator' had penetrated 4 exclosed nests. Tracking at the outer edge of the exclosure was consistent with skunk although no tracking was visible inside the exclosure. Evidence of a predator inside the exclosure was most likely eradicated due to a wind storm the previous day. Skunk tracking observed on the 25th could have been the predator returning to a known food source. No adult mortalities were found. The decision was made to take down the remaining 5 exclosures. Of these 5 nests, 3 were predated and 2 each hatched 3 chicks, none of these chicks survived. Some attempts at re-nesting were observed they were all unsuccessful.

Cause of Nest/Chick Mortality for Nauset Spit

NS# 1-A	4 egg nest abandoned after May 22 nd storm
NS# 1-B	4 egg nest lost to crow after exclosure was removed due to a smart predator
NS# 2-A	4 egg nest abandoned after May 14 th storm
NS# 2-B	loss of 2 chicks unknown
NS# 3-A	4 egg abandoned after June 7 th storm
NS# 3-B	3 egg nest lost June 25 th to a smart predator
NS# 5-A	1 egg nest abandoned after a May 12 th storm
NS# 5-B	4 egg nest lost June 25 th to a smart predator
NS# 6-A	loss of 3 chicks unknown
NS# 8-A	2 egg nest lost May 25 th to a crow
NS# 8-B	3 egg nest lost after exclosure was removed due to a smart predator
NS# 10-A	1 egg nest lost to black backed gull
NS#13-A	4 egg nest abandoned after June 8 th storm
NS#13-B	4 egg nest lost to a smart predator
NS#14-A	3 egg nest lost June 26 th to coyote after exclosure was removed due to a smart predator
NS#15-A	loss of 3 chicks unknown
NS#16-A	2 egg nest lost to a smart predator

Nesting results for Orleans North Beach

On May 24th scrapes were observed at beaches 2 and 3 of Orleans North Beach. No plovers were observed during the entire nesting season.

Nesting Results for Pochet

An 855' X 789' wash over at Pochet was established after a winter blizzard in 2005. This same blizzard also created several smaller wash overs just south of the larger one. One pair of piping plovers (P#2-A) established a 4 egg nest in the main wash over area. Two chicks were fledged from this nest. Approximately 100 yards south in a smaller wash over area a second pair of plovers (P#1-A) established a 4 egg nest. Three chicks hatched and fledged from this nest. Two days after hatching, P#1-A moved their 3 chicks to the large wash over area where they remained until fledging. Both pairs with their chicks utilized the entire wash over area feeding at the ocean and inlet tide line, new wrack line and old wrack line. Both sides of the inlet provided excellent concealment for chicks in the grasses.

Cause of Chick Mortality For Pochet

P#2-A loss of 2 chicks unknown

Dogs On Orleans North Beach

In the past dogs were allowed on ONB under voice control. In November of 2004 the Board of Parks Commissioners revisited the rules and regulations pertaining to dogs on the beach. A new ruling was designated as follows: " All dogs must be on a leash of not more than 30' at all times, unless below the high tide mark, from May 15 through Labor Day. (This will be a zero tolerance enforcement issue.) Dogs are prohibited from areas closed to vehicle or human traffic for Piping Plover protection. In addition to any other penalties set forth in these regulations, any violations of this Section constituting a first offense is the automatic revocation of the offenders beach permit rights for a period of one (1) year."

Dogs on Nauset Spit

Dogs are prohibited on Nauset Spit from March 15th to September 15th. Despite this rule, the shorebird monitor on Nauset Spit observed numerous dogs. Several of these dogs with their owners access Nauset Spit by way of a public stairway at Nauset Heights. The majority of these people are well aware of the rules and regulations pertaining to dogs. Dogs are also brought to the spit by way of boats. Once barricades are put in place for hatched chicks there is no patrol allowed by law enforcement on Nauset Spit. There is more than adequate signage alerting the public about dogs on the beach and why. This has become a constant chronic problem that has not been addressed. Despite calls from the shorebird monitor to law enforcement about dogs on the cove side of Nauset Heights not one dog owner was given a citation. Without a clear message of zero tolerance this problem continues.

Human Disturbance

During the 2006 nesting season on Nauset Spit there were several instances of foot traffic through the nesting areas. Terns are particularly sensitive to this type of disturbance and will abandon a nesting site only to re-establish at another point on the beach delaying egg laying and incubation. This type of event happened several times. Nesting areas on Nauset Spit are clearly marked with symbolic fencing encompassed with string and signage at every post.

Several acts of vandalism were also observed on Nauset Spit in the Nauset Heights area. As early as April 24th, posts were removed and burned, signage was ripped off posts, stakes were snapped off, established pathways destroyed, and string was cut on a daily basis. This has been a problem observed for the last 4 years by the current shorebird monitor. This vandalism has increased to a daily occurrence and needs to be addressed.

Unauthorized Vehicle Use

Each day 300 + vehicles are allowed access to Nauset Beach. Access to the beach is limited when there are flightless chicks on the beach. In 2006 there were several instances of vehicles inside the closed/restricted area of Nauset Spit. A thorough search was made each time for any chick/adult mortalities, none were found.

Management Suggestions

Dogs should be banned from Orleans North Beach during the nesting season.

Signage should be installed at all town landings prohibiting dogs on Nauset Spit.

Law enforcement needs to be active in giving citations to people who bring dogs on Nauset Spit from Nauset Heights.

Daily patrolling of Nauset Heights area is essential.

Patrolling of trained law enforcement needs to be established beyond the barricades for Nauset Spit.

All beach staff should be educated on the rules and regulations pertaining to nesting plovers and terns.

MASSACHUSETTS PIPING PLOVER CENSUS FORM

Year: 2007

Site Name: Naussett Beach

Town: Orleans

Ownership: Town of Orleans

⇒ Please attach a map of this site that shows locations of all nests and pairs that did not nest.

Observer(s): Nathaniel Dodson, Paul Fidler, Pat Johnson, Elizabeth Horan

Agency: Orleans Parks and Beaches

Address: 17 Bay Ridge Lane PO Box 122

Orleans Ma, 02653-0102

Telephone: 508-240-3775

Email: pfidler@townoforleans.ma.us

Census Results:	Index Count ^a	Total Count ^b
No. of Pairs	21	23
Unpaired Adults	0	1

Notes on pairs that did not nest (include dates present, activities)/Census remarks:
 As of 2/1 Two pairs one seen by SB-6 No nest result
 one ~~pair~~ N/S not ~~seen~~ Mowbray did not show up elsewhere
 Unpaired

List pairs not present during Index Count:
 All pairs were present at some point

Month	Average # of visits to site per week
April	5/wk
May	5/wk
June	5/wk
July	5/wk

Indicate type(s) of enclosure design(s) used:

Enclosure Design	A	B	C
Shape	Circular		
Diameter/Length of side	10 ft		
Size of wire mesh	2x4 in		
Total Height	4 ft		
Height above ground:	3.5 ft		
Depth buried:	1.5 ft		
Cover material	Mesh Netting		
Cover spacing/Mesh size	3x8 size		

Other management undertaken or needed/Remarks:

Symalite fencing was used in all areas and was moved/11 holes in nest discovered & provide extra protection
 Off Road access was denied June 25 Aug 3 on 30th beach, all 1st 2 miles of N/S pit closed June 6 - April
 Days denied starting May April 1 - Naussett spit May 1 30th beach, pedesters kept out of symalite fenced areas
 Pedesters kept out of symalite fenced areas
 Exlosures discontinued after early problem with census. Crows were abundant this year

^aThe Index Count includes those pairs seen during the Index Count period (1-9 June) and also those that may have been missed during the Index Count, but that must have been present then (based on laying or hatching dates).

^bTo be included in the Total Count, a pair must have been present at the site for ≥ 2 weeks and exhibiting courtship or territorial behavior during that period, if not actual nesting.

Site Name: New nest Beach Orleans Year: 2007 Observer(s): Nat Osburn, Pat Johnson, Elizabeth Horner, Paul Felsky

Page 1 of 9

Pair No.	Nest No.	No. eggs laid	No. eggs hatched ^e	No. chicks fledged ^d	Date clutch found	No. eggs when clutch found	Date clutch completed	Date nest hatched or failed ^e	Enclosure		
									Design (A, B...)	Date installed	
1	N/S-1	4	0	0	5/11	2	5/11	F 5/19	Y	A	5/13
	N/S-1A	4	3	3	5/28	1	6/2	H-6/28	N		
2	N/S-2	4	0	0	5/7	2	5/13	F 5/20	Y	A	5/13
	N/S-2A	4	0	0	5/25	1	6/2	F-6/21	N		
3	N/S-3	4	0	0	5/11	3	5/13	F 5/20	Y	A	5/14
	N/S-3A	4	0	0	6/1	1	6/6	F 6/21	N		
4	N/S-4	4	0	0	5/11	3	5/13	F 5/18	Y	A	5/17
	N/S-4A	1	0	0	6/1	1	-	F 6/2	N		
5	N/S-5	3	0	0	5/11	1	5/15 ^{30%}	F 5/19	Y	A	5/17
6	N/S-6	4	0	0	5/14	3	5/16	F 5/19	Y	A	5/13

^eIndicate below the reasons for nest failure and egg/chick mortality (if known) and the evidence, or indicate "unknown." Attach additional sheets if necessary.
^dChicks are considered "fledged" if they are ≥ 25 days old or are observed in flight for ≥ 50 ft, whichever occurs first.

egg

Nest No.	Cause of egg mortality/Evidence	Nest No.	Cause of egg mortality/Evidence
N/S 1	Crows seen on top of enclosure (Nest abandoned)		
N/S 2	Storm overwash North east		
N/S 2A	Fox Track seen around nest Depression	N/S 5	Storm overwash from North West Did not renew (could have moved to new site)
N/S 3	Storm overwash North east		
N/S 3A	Fox Track seen around nest Depression	N/S 6	Crows seen on enclosure (abandoned) Did not renew (could have moved to new site)
N/S 4	Crows seen in Area (No other Fox Tracks)		
N/S 4A	Unknown		

Site Name: Newset Beach Orleans NEAR 0111 Year: 2007 Observer(s): Walter DeWitt, Pat Johnson, Elizabeth Heger, Paul Felder

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Pair No.	Nest No.	No. eggs laid	No. eggs hatched ^c	No. chicks fledged ^d	Date clutch found	No. eggs when clutch found	Date clutch completed	Date nest hatched or failed ^e	Enclosure		
									Y/N	Design (A, B...)	Date installed
7	N/S 7	3	3	3	5/07	2	5/12	H-C/19	Y	A	5/13
8	N/S 8	4	4	1	5/23	4	Unknown	H-C/13	N		
9	N/S 9	4	0	0	5/24	2	5/28	F-C/21	N		
10	N/S 10	4	4	2	5/25	4	Unknown	H-C/17	N		
11	N/S 11	4	0	0	5/28	1	6/2	F-C/21	N		
12	N/S 12	4	4	0	5/28	2	5/31	F-C/14	N		
13	N/S 13	4	0	0	5/28	2	5/31	F-C/5	N		
14	N/S 13	4	3	3	6/23	3	6/25	H-C/27	N		
	N/S 14	2	0	0	5/28	1	-	F-C/1	N		
	N/S 14A	3	0	0	6/07	1	6/13	F-C/21	N		

^cIndicate below the reasons for nest failure and egg/chick mortality (if known) and the evidence, or indicate "unknown." Attach additional sheets if necessary.
^dChicks are considered "fledged" if they are ≥ 25 days old or are observed in flight for ≥ 50 ft, whichever occurs first.

Nest No.	Cause of egg mortality/Evidence	Nest No.	Cause of chick mortality/Evidence	
			Chick mortality	Evidence
9	Fox Tracks around Nest Depression	12		
11	Fox Tracks around Nest Depression	13		Chicks disappeared overnight (No sign)
14	Unknown			Unknown
14A	Coyote Tracks seen in Area			

Site Name: Norfolk Beach Orleans Year: 2002 Observer(s): Walt Adams Pat Johnson Elizabeth Hoey Paul Elderley

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Pair No.	Nest No.	No. eggs laid	No. eggs hatched ^c	No. chicks fledged ^d	Date clutch found	No. eggs when clutch found	Date clutch completed	Date nest hatched or failed ^e	Enclosure	
									Design (A, B...)	Date installed
1	S/B-1	3	0	-	5/17	3	5/19	F 6/14	N	
	S/B-1A	3	0	-	6/20	2	6/25	F 7/8	N	
2	S/B-2	4	3	3	5/21	1	5/29	H 6/23	N	7-15
3	S/B-3	4	0	0	6/2	1	6/7	F 6/11	N	
	S/B-3A	4	3	3	6/23	4	Unknown	H 7/6	N	8-3
4	S/D-4	4	0	-	6/2	2	6/5	F 6/14	N	
5	S/B-5	4	0	0	6/30	4	Unknown	F 7/3	N	
	C									

^dIndicate below the reasons for nest failure and egg/chick mortality (if known) and the evidence, or indicate "unknown." Attach additional sheets if necessary.
^eChicks are considered "fledged" if they are ≥ 25 days old or are observed in flight for ≥ 50 ft., whichever occurs first.

Nest No.	Cause of egg mortality/Evidence	Nest No.	Cause of chick mortality/Evidence
1	S/B-1 Washed North easter		
	S/B-1A Predation (Raccoon tracks)		
3	S/B-3 Washed North easter		
4	S/B-4 Unknown		
5	Did not Rerest (Parasitic Fleas in Area in June)		
C	Did not Rerest (Parasitic Fleas in Area) (in June)		