310 CMR 10.99

Form 5

Commonwealth of Massachusetts

DEP File No. SE 54-723
(To be provided by DEP)

City/Town Orleans, MA

Applicant Town of Orleans

FILE COPY

Order of Conditions
Massachusetts Wetlands Protection Act
G.L. c. 131, §40

THE ORLEANS WETLAND PROTECTION BYLAW

From Orleans Conservation Commission

To Town of Orleans, Board of Selectmen (Acting as Park Commissioners)

(Name of Applicant)
Address 19 School Street, Orleans, MA 02653

(Name of property owner) Town of Orleans
Address 19 School Street, Orleans, MA 02653

This Order is issued and delivered as follows:

☐ by hand delivery to applicant or representative on _____ (date)

☒ by certified mail, return receipt requested on P 529 416 026 (2/13/91) (date)

This project is located at Nauset Spit, Callanan's Pass

Orleans Tax Assessor's Map Sheet No. 30 Parcel No. N/A

The property is recorded at the Registry of Barnstable

Book _____ Page _____

Certificate (if registered) _____

The Notice of Intent for this project was filed on December 21, 1990 January 14, 1991 (Amended) (date)

The public hearing was closed on January 23, 1991 (date)

Findings

The Orleans Conservation Commission has reviewed the above-referenced Notice of Intent and plans and has held a public hearing on the project. Based on the information available to the Commission at this time, the Commission has determined that the area on which the proposed work is to be done is significant to the following interests in accordance with the Presumptions of Significance set forth in the regulations for each Area Subject to Protection Under the Act and with the Orleans Wetland Protection Bylaw: (check as appropriate):

- ☐ Public water supply
- ☐ Private water supply
- ☐ Ground water supply
- ☒ Land containing shellfish
- ☒ Fisheries
- ☒ Protection of wildlife habitat
- ☒ Erosion & Sedimentation Control
- ☒ Recreation
- ☒ Aesthetics
- ☐ Agriculture
- ☐ Aquaculture
- ☒ Flood control
- ☒ Storm damage prevention
- ☒ Prevention of pollution

Total Filing Fee Submitted N/A State Share _____ (½ fee in excess of $25)

City/Town Share _____

Total Refund Due $ _____ City/Town Portion $ _____ (½ total) State Portion $ _____ (½ total)

FEB 13 1991

Therefore, the Orleans Conservation Commission hereby finds that the following conditions are necessary, in accordance with the Performance Standards set forth in the regulations, to protect those interests checked above. The Conservation Commission orders that all work shall be performed in accordance with said conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications or other proposals submitted with the Notice of Intent, the conditions shall control.

General Conditions

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. This Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state or local statutes, ordinances, by-laws or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   (a) the work is a maintenance dredging project as provided for in the Act; or
   (b) the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance and both that date and the special circumstances warranting the extended time period are set forth in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. Any fill used in connection with this project shall be clean fill, containing no trash, refuse, rubbish or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles or parts of any of the foregoing.
7. No work shall be undertaken until all administrative appeal periods from this Order have elapsed or, if such an appeal has been filed, until all proceedings before the Department have been completed.
8. No work shall be undertaken until the Final Order has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is to be done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order prior to commencement of the work.
9. A sign shall be displayed at the site not less than two square feet or more than three square feet in size bearing the words, "Massachusetts Department of Environmental Protection, File Number SE 54-723 clearly visible from the street and shall remain so displayed until construction is completed and a Certificate of Compliance has been granted.
10. Where the Department of Environmental Protection is requested to make a determination and to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before the Department.
11. Upon completion of the work described herein, the applicant shall forthwith request in writing that a Certificate of Compliance be issued stating that the work has been satisfactorily completed.
12. The work shall conform to the following plans and special conditions:

*

Plan of
ORV Routes &
Parking Area
on Nauset
Spit

Plans:

Title	Dated	Signed and Stamped by:	On File with:
Scale: 1" = 100'	January 7, 1991	Orleans Park Commissioners	ConsCom

This project is approved subject to the following and attached conditions:

Special Conditions (Use additional paper if necessary)

With the exception of the proposed temporary alternative crossovers to, and driving on, the Town Cove (West) side of Nauset Spit -
The above plan is approved subject to Conditions listed below for Town of Orleans Nauset Spit, Callanan's Pass, DEP Number SE 54-723.

13. In issuing this Order of Conditions, the Commission has relied on the information and data which the applicant has provided in connection with his application. If, subsequent to the issuance of this Order, such information and data prove to be false, incomplete, or inaccurate, this Order may be reviewed, modified or withdrawn in whole or in part, and/or the Commission may, in addition, institute appropriate legal proceedings.

14. Members of the Conservation Commission or its agents shall have the right to enter upon and inspect the premises to evaluate compliance with this Order of Conditions. The Conservation Commission reserves the right to require, following field inspection, additional information or resource protection measures.

15. Any substantial change made or intended to be made in the plans shall require the applicant to file a new Notice of Intent or to inquire of the Conservation Commission, in writing, and by certified mail, whether the change is so substantial as to require a new filing.

16. This Order and the general and special conditions are ongoing and do not expire with the issuance of a Certificate of Compliance.

(Leave Space Blank)

Issued By Orleans Conservation Commission

Signature(s)

This Order must be signed by a majority of the Conservation Commission.

On this Thirteenth day of February 19 91 before me personally appeared RICHARD Houghton to me known to be the person described in and who executed the foregoing instrument and acknowledged that he/she executed the same as his/her free act and deed.

Notary Public

My commission expires May 11, 1995

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land upon which the proposed work is to be done, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the Department of Environmental Protection to issue a Superseding Order, providing the request is made by certified mail or hand delivery to the Department, with the appropriate filing fee and Fee Transmittal Form as provided in 310 CMR 10.03(7), within ten days from the date of issuance of this Determination. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and the applicant.

Detach on dotted line and submit to the Orleans Conservation Commission prior to commencement of work.

To Orleans Conservation Commission Issuing Authority

Please be advised that the Order of Conditions for the project at Nauset Spit, Callanan's Pass

File Number SE 54-723 has been recorded at the Registry of Barnstable and

has been noted in the chain of title of the affected property in accordance with General Condition 8 on _____ 19____

If recorded land, the instrument number which identifies this transaction is _____

If registered land, the document number which identifies this transaction is _____

Signature _____ Applicant

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SPECIAL ORDER OF CONDITIONS RELATING TO ORV USE ON NAUSET SPIT

I. FINDINGS

A. THE ACTIVITY

The Orleans Conservation Commission finds, in accordance with the December 4, 1990 Superseding Determination of Applicability issued by the Massachusetts Department of Environmental Protection, that the activity for which the Town of Orleans seeks a permit under the provisions of State Wetland Protection Act MGL ch 131 Section 40 and the Town of Orleans Wetlands Protection Bylaw consists of the operation of ORV's on the Nauset Spit Barrier Beach system, 310 CMR 10.29. Although the permit request is narrowly defined to ORV use, where ORV use/management issues overlap pedestrian and boating uses, it is herein recognized by the Conservation Commission and the Park Commissioners that these uses will be controlled in a manner consistent with permitting requirements for the ORV use, i.e., signage, fencing, plantings, temporary closures, etc.

The Department of Environmental Protection further determined, and the Orleans Conservation Commission so finds, that the area in which the proposed activity will take place is a barrier beach, 310 CMR 10.29, a resource area which itself contains the following wetland resource areas: Land Subject to Coastal Storm Flowage (310 CMR 10.02(1)(d), Land Under the Ocean (310 CMR 10.25), Coastal Beaches(310 CMR 10.27), Coastal Dunes (310 CMR 10.28) Salt Marshes (310 CMR 10.32) and Rare Species Habitat (310 CMR 10.37).

The above cited regulations, provide that where the proposed activity involves alteration of a resource area, the issuing authority shall presume the resource area to be significant to the interests noted in the regulations governing that specific area unless that presumption is overcome by a clear showing otherwise. No such showing has been made. The Commission therefore adopts the presumptions of significance for the resource areas cited in the previous paragraph.

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B. PROJECT COMPLIANCE WITH MGL 131 ch. S.40 PERFORMANCE STANDARDS

Project compliance with MGL ch, 131 s.40 performance standards as cited in the attached regulations: Coastal Beaches, 310 CMR 10.27; Coastal Dunes, 310 CMR 10.28; Barrier Beaches, 310 CMR 10.19; and Rare Species Habitat, 310 CMR 10.37

The proposed project calls for the following activities designed to prevent adverse impact of ORV usage upon the resource areas of the Nauset Spit Barrier Beach cited above:

1. Placement of signage and wooden barrier posts, to be located as necessary to confine ORV traffic to defined access ways, to be maintained by hand, and spaced an average of 100 feet apart; signage to be attached to posts and/or fencing where possible, such posts to be placed in such a manner as not to disturb vegetative cover;

2. Placement of symbolic fencing and/or predator exclosures, as necessary, around potential nesting habitat and actual nesting and foraging sites;

3. Placement of fencing barriers for access closures and/or openings, as deemed necessary for tern and plover habitat, nesting, and foraging protection.

   The Commission finds that the above activities as controlled by the conditions herein meet the performance standards set forth in 10.27 (3),(6), and (7);10.28 (3),(5), and (6); 10.29 (3) and (4). See "Rare Species" for compliance with 10:27.

4. With regard to the primary activity proposed, ORV usage itself, the Commission finds the following:

   a. <u>Coastal Dunes</u> (310 CMR 10.28)

      i. <u>Evaluation of ORV Access and Egress Trail Location</u>

      The suggestion was made that the more southerly access trail be closed and that the more northerly egress trail be expanded to accommodate two way traffic using pullover/bypass areas. Field inspection of

the southerly access trail showed it to be sensitive to environmental concerns with respect to sinuosity and topography. Its layout was not believed to promote wind tunnelling and erosion or wave overwash. According to historical data, this showed the greatest stability in terms of shoreline migration over a 100 year period. Therefore, although the more northerly egress trail had initially been proposed to be expanded in width to accommodate two way traffic based on the closure of the more southerly trail, the record suggested that the existing layout and orientation characteristics of the more northerly trail should not be changed and that maintenance of the existing two trail system was preferable. The Commission, therefore finds, based on the testimony and references of record, that maintenance of the existing two ORV trail routes is appropriate, and meets the performance standards set forth in 310 CMR 10.28 as follows:

10.28 (3)(b) Use of existing access and egress corridors through the dunes will be restricted to corridors already without vegetation due to previous ORV use, and no further devegetation and consequent destabilization should occur given appropriate posting as required in the Special Orders.

10.28 (3)(c) It is recognized that the ongoing use of an ORV corridor may cause limited modification to small dune areas. However, the Commission credits testimony that due to the orientation, location , restriction in size, and proposed maintenance activities, no significant increase from storm or flood damage is anticipated.

10.28 (3)(d) No interference with landward movement of coastal dunes will occur since the Special Orders provide that no ORV traffic, with the possible exception of temporary alternate routes provided in response to plover and tern protection needs, will be permitted on the Cove (west) side of

the spit, toward which the landward movement is directed.

10.28 (3)(f) See section on Rare Species

ii. North/South Corridor

Given the Special Orders requiring that this corridor be a minimum of 15 feet seaward of the toe of the Coastal Dune, no change in vegetation should occur and the performance standards set forth in 10.28 (3)(b) and (c) should be met. (10.28(3) see section on Rare Species)

iii. Dune Enhancement

Concern was expressed that inappropriately located dune enhancement projects could adversely impact potential plover and tern habitat areas. Based on the testimony received, the Conservation Commission finds that specific delineation of dune enhancement areas on the present project plans should not be shown at this time. Rather, delineation of specific areas will be made by the Park Commissioners and their agents in consultation with the Conservation Commission and/or its agent based on wildlife habitat observations and reports presented to both agencies as required by the Order of Conditions.

b. Coastal Beaches (310 CMR 10.27 (3)(7)

The continued use of the existing ORV corridors may cause temporary limited impact to the profile (form) of the beach area. The Commission credits testimony that given the climatic and geologic characteristics of the Nauset Spit, these changes will not result in significantly increasing the potential for wind and wave erosion.

The Commission credits testimony that sediment disturbed by the passage of ORVs is not lost from the beach resource area and that significant sediment movement is not attributable to ORV use. Therefore it finds ORV use as proposed will not result in a significant decrease to beach volume and that such significant changes in beach volume

are more likely to be influenced by climatic and/or meteorologic factors (also see Rare Species 10.27(7).

II. SPECIAL CONDITIONS

A. PREAMBLE

The Orleans Conservation Commission, in setting the following Conditions, intends that they be flexible enough to reflect the needs of the changing environment they are designed to protect. The Nauset Barrier Beach system has been shown to be extremely dynamic over time. Significant changes in geomorphic form and wildlife habitat have occurred both prior to, and now during, recreational uses of this resource area. The challenge for this Commission is to manage the competing uses of this barrier beach system under the provisions of both the Massachusetts Wetlands Protection Act, MGL 131 Section 40 and the Town of Orleans Wetland Protection Bylaw, Chapter 160 of the Code of the Town of Orleans.

The following Conditions are designed to:

- protect coastal resource areas and identified wetland interests for the Nauset Barrier Beach system as it currently exists;

- allow for the ongoing recreational use of the barrier beach system, but at a lesser impact level than previously existed;

- require management of ORV use to be sensitive to any adverse environmental impact to the Nauset Barrier Beach system;

- require greater restrictions on ORV users with respect to environmental education, scheduled and unscheduled temporary closures of access routes, etc;

- require future management of the barrier beach system resource area to include hiring of specially qualified personnel to conduct detailed monitoring of and reporting on wildlife and wildlife habitat areas which will serve as basis

for modifying permitted management procedures/policies;

- require interdisciplinary and agency cooperation which will result in sensitive, flexible and responsive management of the barrier beach system.

B. RULES AND REGULATIONS

The Board of Selectmen, acting, and hereafter referred to, as the Park Commission, is responsible for implementing and enforcing Rules and Regulations for ORV use on Nauset Spit. These regulations shall be reviewed annually by the Conservation Commission and at a minimum require the following:

a) That the figure set for a maximum number of ORV's allowed on the beach at any one time be reduced from the 300 maximum permitted in 1990 to an initial figure of 200 for 1991 which may be subject to a downward revision dependent upon general beach or nesting considerations.

b) Posting of temporary closures due to tide conditions or nesting considerations.

c) Driving on the Town Cove (west) side to be prohibited (see Page 8).

d) Driving on the low beach to be permitted only during the winter season between the first Friday in November and the Friday before Memorial Day and at such other specially designated times and places to avoid disturbance of nesting birds.

e) Parking to be permitted seaward of a 37' corridor consisting of 15' from the toe of the dune, plus 12' for the vehicle track, plus a 10' margin between the vehicle track and parking area.

f) Closure of the beach between the hours of 11:00 PM and 6 AM except for active fishing. Driving in all but designated ORV corridors prohibited.

g) In posted areas near bird nesting or roosting areas, a speed limit of 5 mph.

h) No jet ski launching or landing.

i) No kite flying: March 15 - September 15.

j) No pets: March 15 - September 15.

k) All permittees to view educational film/slide presentation prior to issuance of and renewal of ORV permit.

l) Minimum permittable equipment standards including tire size and pressure as listed in regulations issued by Park Commissioners

m) Any other condition responsive to significant environmental changes and/or any conditions necessary to protect the Nauset Spit barrier beach system, the public health , safety and welfare of the users and/or property owners.

n) Such fines and penalties as the Park Commission may invoke.

o) Walking between the cove side and the ocean side to be prohibited in all but designated areas.

C. CLOSURE OF THE TOWN COVE (WEST) SIDE TO ORV TRAFFIC

In 1990, the Orleans Park Commission, on the recommendation of Dr. David Aubrey, coastal geologist with the Coastal Research Center of Woods Hole Oceanographic Institution and with the full concurrence of the Conservation Commission, closed the Town Cove side of the Nauset Spit to ORV traffic. Tidal flats and shellfish beds which adjoin the Town Cove side of the beach are extremely sensitive to ORV use, and ORV use should not be allowed in these resource areas under any circumstances. Barrier beaches migrate landward due to overwash events and consequent sand deposition of the barrier beach, 310 CMR 10.29(1). The operation of ORVs on the landward side of the beach could serve to inhibit dune formation through the formation of ruts and the crushing of ammophila rhizomes, stopping the landward migration of the inside, while the ocean side is continually eroded

by wave action. The net effect of these processes could be an ever narrower barrier spit, increasingly susceptible to overwash and inlet formation. This result would violate the performance standards for coastal dunes, which prohibit any modification of dune form that would increase the potential for storm or flood damage, or any interference with the landward or lateral movement of the dune, 310 CMR 10.28(3) and 10:29(3). Therefore, with the possible exception of temporary alternate routes as described below, the westerly (Town Cove) side of the barrier beach shall remain closed to ORVs except for emergency use by town officials.

D. TEMPORARY ALTERNATIVE ROUTES:

The applicant (Town of Orleans) has proposed that should the ORV corridor along the oceanside be closed to protect plovers foraging for food on that side, an alternate route along the Town Cove (west) side be approved on a temporary basis.

In answer to the concern that such temporary alternate routes could inhibit the landward migration of the barrier beach in violation of the performance standards and in CMR 10:28 and 10:29, the applicant has suggested that there is evidence relating to the seasonal climatic/meteorologic energy levels and historical storm or wind patterns documented during the summer months and evidence relating to the textural components (coarse sand and gravel) of the back shore area which would indicate it was unlikely that the limited seasonal use of proposed alternative routes, i.e., June, July and perhaps August, would result in increasing potential for storm and flood damage in violation of 310 CMR 10.28 (3)c or interfere with the landward movement of the dunes of the barrier spit in violation of 10.28 (3) (d) and 10.29 (3). Contradicting evidence was also offered.

However, the applicant has also suggested, and the Commission agrees, that the site specific delineation of temporary alternate routes is presently inappropriate. Therefore, the Commission makes no finding nor will it issue any orders as to the temporary alternate routes at this time.

When the need to protect specific habitat, nesting, and/or foraging sites by closure of the access routes

approved herein and shown on the plan of record is determined, the Town may file amended plans after consultation with its agents and the Conservation Commission or its agent and shall provide the Commission with information on such proposed temporary access routes including, but not limited to, delineation of the such proposed route or routes on the plan of record,an estimate of the duration of use, an estimate of the reduction or proposed reduction of daily vehicle traffic, a description of signage and fencing for such alternate ORV corridor, a description of proposed mitigating measures, etc. If the Commission finds that such plan meets the performance standards cited in the relevant regulations, the Commission may approve such temporary alternate ORV access route or routes.

E. RARE SPECIES

1. Project Compliance with Performance Standards

Based on the testimony provided by Massachusetts Natural Heritage Endangered Species Program, the Massachusetts Audubon Society and others, the Conservation Commission finds that a potential to alter the resource area which is part of the mapped habitat of State-listed species does exist. However, the Commission finds that the project as proposed and conditioned herein, inclusive of the hiring of a qualified habitat specialist and incorporation of temporary beach closure measures should provide the protection necessary so that no adverse effect on specified habitat sites will result.

The presumption that the maintenance activities requested in order to continue ORV use of Nauset Spit will adversely impact specified habitat sites, in the opinion of this Commission, has been overcome/rebutted/by the proposed species management plan as required by this Order of Conditions. This management plan will require, among other measures, observation and tracking of the plover and tern species to determine exact habitat sites, including foraging routes; will require temporary closures of the identified sites and routes to ORV and pedestrian use; and will provide emplacement of physical fencing and

predator barriers to afford habitat protection. The Commission, as issuing authority, therefore finds that the project as proposed and herein conditioned should not result in an adverse impact to specified habitat sites identified for plover and tern populations on Nauset Spit. If, however, these conditions prove inadequate to protect the wetland interests defined in MGL 131, Section 40 or to ensure that there is no adverse impact on rare species habitat as required by CMR 10:37, the Commission reserves the right to impose the necessary additional conditions and restrictions upon the use of ORVs on the Nauset Spit.

The Conservation Commission wishes here to note that the applicant, the Town of Orleans by its Selectmen serving as Park Commissioners, has, in fact, conducted a tern preservation project in cooperation with the Massachusetts Audubon Society which has contributed to the establishment of the largest least tern colony in New England. The Town has supported this preservation effort through the efforts of the Town's Parks Department under the direction of Paul Fulcher, Parks Superintendent with the financial support of the town. It now proposes to continue and broaden these efforts through the hiring of a plover habitat specialist to monitor the breeding, hatching, and fledging of the plovers, and by recognizing that temporary closures of the spit during critical plover breeding and fledging periods may be necessary.

2. <u>Plover Monitor</u>

The Park Commission, in cooperation with the Conservation Commission, shall be responsible for the hiring of a suitably qualified person to serve as a Piping Plover (and Tern) Habitat Analysis Specialist, hereafter referred to as "Monitor", responsible to the Park Superintendent. This person shall be selected by the Park Commissioners based on review of applicant qualifications and recommendations from the Conservation Commission, and will be required to participate in the site specific field training program developed and conducted cooperatively with the Massachusetts Division of Fisheries and Wildlife Natural

Heritage Program and the Cape Cod National Seashore Park experts on coastal bird habitats. Further, the Monitor shall cooperate and coordinate his/her activities with the Massachusetts Audubon Society Staff.

The Monitor will be employed annually from April 1 through August 31 to provide technical information relative to the habitat and characteristics of the Piping Plover and tern populations on Nauset Beach, and will be responsible for alerting the Park Superintendent and the Conservation Commission, or their designated agents, as to the need to temporarily close access to ORV traffic during plover nesting and fledgling activity periods. The Monitor will also be responsible for providing the Parks Commission and the Conservation Commission daily data on plover broods and tern nesting, and a season-end report relative to the Piping Plover population.

3. Limitation of access to prime nesting habitat areas

a. Vehicular Access

Parking in or vehicular access through identified plover and Least Tern habitat areas as shown on the attached map entitled "Approximate Rare Species Habitat", and as determined annually by the plover Monitor, shall be prohibited. This restriction will not necessarily prohibit vehicular access past (i.e. northward/southward) such areas if consistent with specific management guidelines.

b. Boater and Pedestrian Access

It has been the custom for many visitors to Nauset Spit to arrive by boat on the west or Town Cove side. Some remain on this west beach while others walk across the spit to the ocean side. This traffic is expected to increase as a result of increased ORV restrictions. Most boats land near the tip, beyond the dunes, the vegetation, and the

Least Tern colony, and they present a minimum threat to either birds or other resources. The other boaters, however, tend to come ashore in three areas where they must cross the dunes, either over the crest or through a washover area to reach the Atlantic side. Disturbance of the birds by these pedestrians may be minimized by: 1) Posts, signs and fencing to indicate closed areas and 2) installation of well-marked wooden walkways over the dunes in areas far from plover habitat. Since it is much easier to walk on these boardwalks than in the soft sand, pedestrians will be encouraged to use the designated walkways and thus they will help to protect dune form and vegetation as well as birds.

Pedestrians shall be excluded from existing washover areas in a manner which does not interfere with, or cause any adverse effect to, the ability of such washover areas to serve as nesting habitat for Piping Plover.

4. Piping Plovers

The beach management strategy for the plovers includes devoting highest priority to encouragement of the earliest arriving birds to nest as quickly and successfully as possible. This means minimizing human disturbance. The result in addition to a high reproductive success rate, may be to minimize the period during which the beach is closed to ORV use.

Spring Arrival (March 16 - April 30)

Piping Plovers return from their southern winter quarters to establish nesting territories along Cape Cod beaches in early spring.

Management - Prior to the arrival of Piping Plovers, potential nesting areas shall be visited by a person familiar with their habitat requirements to evaluate the natural changes that have occurred through the winter and to identify areas of suitable nesting habitat. The nesting habitat shall be posted, with endangered species

nesting area signs, prior to the arrival of plovers - no later than April 1 - to reduce the potential disturbance by beachgoers upon plovers establishing their nesting territories. Vehicular access into or through posted areas shall be prohibited, though vehicles may pass by such areas at this time.

Laying and Incubation of Eggs (April 20 - August 10)

Normally the nest, a shallow scrape in the sand, is placed at the toe of the dune, in a washover, or along the spring tide wrack line. The first of the sand-colored eggs is laid in late April and may contain a full clutch of 4 eggs a week after the first egg is laid. Then both adults incubate the eggs, alternating every few hours, for the next 28 days.

Management - when a nest is located with one to four eggs, a welded wire fence shall be placed around the nest, using a design recommended by the Massachusetts Division of Fisheries and Wildlife. Endangered species signs shall be placed outside the fenced area and strung off with twine to add additional protection from curious passersby. Vehicular access within the area strung off with twine shall be prohibited.

Before eggs hatch, it is necessary to close the beach and to level the ORV ruts to prevent an adverse effect on the young hatchlings. This must be accomplished within a 28 day period after incubation commences. If ruts are to be leveled by natural process, one week should be allowed, and the beach should be closed 21 days after the last egg is laid or the start of incubation. If ruts are to be leveled by hand, the beach could remain open a few additional days. If the monitor does not know when the last egg was laid or when incubation commenced, the beach should be shut down and ruts leveled immediately.

Due to the narrowness of the Nauset barrier beach,in some portions of plover habitat, the closure shall extend from the ocean side through the dunes to the cove side in a line 100 yards south of the location of the first nest

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encountered for outbound travel (i.e., the southerly most nest on the spit). The point of closure would be designated with posts, rope, and signs.

Hatching Eggs and Movement of Young (May 20-August 20)

Piping Plovers have precocial young, capable of walking and feeding themselves within 24 hours after hatching. The most vulnerable stage in their breeding cycle is the period when hatchlings are less than 10 days old when they accompany the adults in their feeding forages. Normally, all eggs in a clutch hatch within a 24-hour period between the hatching of the first and last eggs. The hatchlings then accompany the adults to feed on small invertebrates along the wrack line, toe of the dunes, and interdunal blowouts. During their first week the young usually do not wander more than 100 yards from their original nest site. They do not use the nest after the first couple of days from their hatch date, but depend on their cryptic coloration to blend in with their surroundings. If an adult plover sounds an alarm note, the young either run for cover beneath one of the adults or seek cover in vegetation, among stones, along the wrack line, or in a vehicle rut. Plover chicks over a week old may accompany the adults for greater distances, up to 1/4 mile, and spend increasingly more of their time foraging along the wrack line and out into the intertidal zone.

Management - Plover chicks on Nauset Spit may be seen foraging with adults in areas anywhere between the Cove and the ocean intertidal zones in areas where there is little vegetation to obstruct their movements. Because they may go from the ocean side to the cove side of the spit within minutes, using existing blowouts and overwash areas, they are vulnerable to vehicular travel at all times. Also, the ruts left by vehicles are known to trap young chicks that subsequently may be run over by another vehicle using the same ruts, or they remain trapped in the rut and die from exhaustion or found in the rut by a predator.

Therefore, temporary closures to vehicular traffic shall be required in habitat areas used by young foraging plovers. The size of this closure will vary depending on the data collected by the Monitor. The closure point of 100 yards south of hatched eggs shall be used until the Monitor can establish the perimeter of the total feeding range.

Fledging of the Young (June 28 - August 20)

Young plovers are capable of flying short distances within 30 days of their hatch date. Typically, these novice fliers remain with the adults foraging in the same general area for anywhere from a few days to the rest of the summer. Adults may lead fledged young to more remote portions of neighboring beaches if they are disturbed by recreation or predation.

Management - Once the Monitor has determined that the young have fledged or left the beach, the area may be reopened to vehicular traffic.

5. Least Terns

Nauset Spit has been home to the largest Least Tern nesting colony in New England for the past two years. This is largely due to the extensive nesting area available on the sand spit which has increased in its length annually since the storm in 1978. Another factor that has contributed significantly to the size of this colony is the placement of welded wire fence by the Massachusetts Audubon Society in cooperation with the Town of Orleans Parks Department, which has reduced disturbance to the birds by beachgoers and predators.

Spring Arrival (May 7 - July 10)

Least Terns return from their winter quarters in South America to establish nesting colonies ranging in size from a dozen pairs to over 1,000 pairs. Least Terns have historically used Nauset Spit, and data over the past 20 years shows that colony size has varied between 100 to 600 pairs nesting annually.

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Management - Prior to the arrival of the terns, welded wire fence, three or four feet in height, with 4" x 2" mesh shall be used to encircle the Least Tern nesting area based upon the prior year's data. On Nauset Beach the Least Tern Colony increased in size annually, and it is likely that the fence will have to be adjusted to encompass additional portions of the colony.

The side of fence running parallel to the ocean-side wrack line shall be as close to the mean high tide line as possible. This will ensure that nests near the wrack line are included and that chicks that wander or fly outside the colony are less likely to become trapped in ruts and be run over by subsequent traffic. Endangered species signs should be placed five feet inside the fence, one every 50 feet along the entire perimeter.

Laying and Incubation of Eggs (May 20 - August 5)

Most clutches of 2-3 eggs are laid in early June. The nests are simple scrapes in the sand or on bare stone between the wrack line and the toe of the dune, or in an open blow-out. Typically, Least Terns nest in colonies of 10 to 1,000 pairs.

The adults incubate the eggs for 21 days after the last egg is laid. It is not uncommon for Least Terns to lose nests to storms or high tides. Least Terns will attempt to discourage mammalian, avian, or human intruders who come near their nests by attacking in unison, calling loudly, and dropping their "white wash".

Management - Incubation is the most vulnerable stage for breeding Least Terns. The presence of people, dogs, kites, and predators too close to a colony causes the entire flock of nesters to leave their nests during the disturbance. If the disturbance lasts more than 15 minutes, the eggs may be destroyed by exposure to the sun, rain, or wind-blown sand. Therefore, it is critical that the Monitor for the colony adjust the perimeter of the fence and signs to include a buffer zone wide enough to prevent disturbance to incubating adults. Research has shown a minimum distance of 80 to 150 feet is needed between the outermost

nests in the colony and the protective barrier.

Hatching of Eggs and Movement of Young (June 9-August 25)

The 2 to 3 semiprecocial young are active within 24 hours of hatching. Least Tern young are fed by the adults. Although the young are capable of running within a week of hatching, they typically do not wander more than 15 feet from their nest depression during the first 10 days. However, at ages between 10 and 28 days they will run longer distances to flee an intruder or to find better locations for hiding or awaiting the return of adults with food. These older juveniles, over 14 days old, are often difficult to see. Their plumage is camouflaged, and they hide in vegetation and cover on the wrack line.

Managment - Dogs and feral cats shall be excluded from colonies using welded wire fence. The young terns, however, pass through the fence outside the colony. Typically, the young try to migrate toward the tidal zone to be fed by the adults. The young often become trapped in vehicle ruts and are run over by subsequent traffic. To reduce this problem, vehicles shall be directed to drive below the high tide line when possible. Fewer chicks go far from the colony and flattened sand in the tidal zone makes the chicks more visible. Also, a finer mesh plastic or wire fence can be used to discourage the young terns from migrating into areas where there are vehicles. This, however, must not be used if a pair of Piping Plovers has a nest or young in the area of the Least Tern colony, because plover young could get separated from adults or be excluded from their foraging areas. Also, a finer mesh plastic or wire fencing will not keep the young terns from migrating outside the colony once they are capable of flight.

Fledging of Young (July 9 - September 10)

Least Terns young are capable of weak flight about 28 days after hatching. Most young in a colony fledge in mid-to late July in Massachusetts, unless the colony has been abandoned because of by tides, storms, or predators and the survivors

renest. Once the young are capable fliers, after a week of practice, they are led by the adults further from the busy colony to quieter portions of beaches and sandbars. The young will even fly out to the fishing grounds where they rest on the water and wait to be fed. Most Least Terns have left their breeding grounds by September 10 for the long journey to South America.

Management- If vehicles are permitted near the Least Tern nesting area they pose a threat to the fledging terns during the day and night. The Monitor shall use signs, and twine if possible, to post the boundaries of the roosting area to restrict and slow traffic.

The Monitor of the colony will determine when the terns have left the nesting area. As long as Least Terns are landing in the fenced area, it is likely that they are still nesting or rearing young. Most Least Terns will have left Massachusetts by early September.

F. MANAGEMENT AND ANNUAL REVIEW

Management of the resource areas in terms of ongoing use, use restrictions, etc. will be the primary responsibility of the Park Commission and Park Department with provisions for annual review of management guidelines and personnel hirings to be made cooperatively with Conservation Commission input prior to April 1st.

As part of the overall ORV management plan, the Park Commission will instruct the Park department personnel to maintain the approved ORV corridors and to install posts fencings, and signage as indicated on the plan of record dated January 7, 1991 or as revised and subsequently approved by the Conservation Commission and will instruct the Park Department personnel to continue ongoing revegetaiton and nourishment efforts as described and approved by the Conservation Commission. These actions and the overall ORV management plan will be reviewed and approved annually by the Conservation Commission based upon the reports and recommendations resulting from the implementation of this Order of Conditions.

DEP # SE 54-723

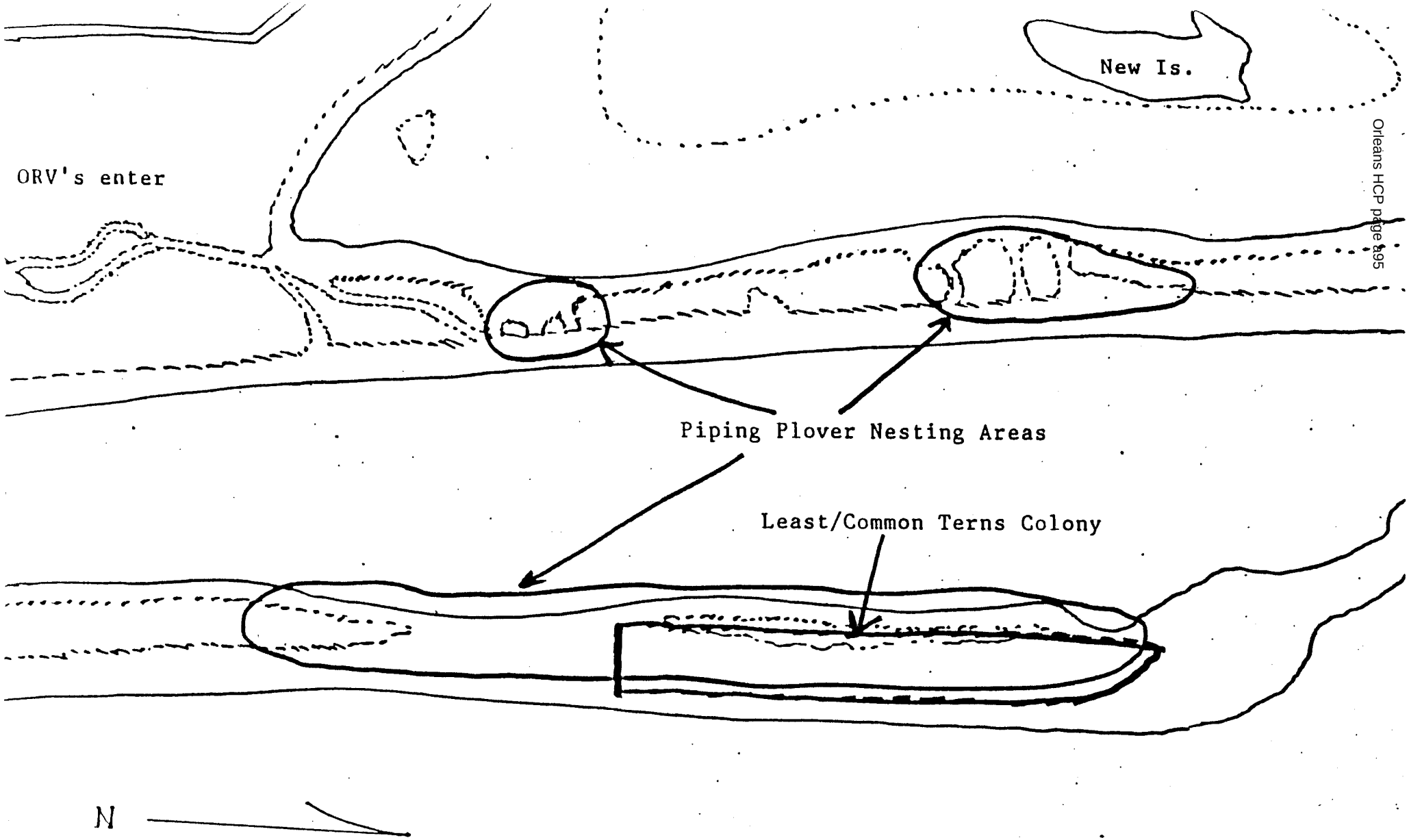
G. ENFORCEMENT

The Park Commission shall require additional enforcement patrol of the Nauset Spit ORV corridor to include expanded patrol coverage during off-peak usage, specifically weekday and pre-season periods. Should expanded patrol prove inadequate to protect the natural and wildlife resources which are the subject of this Order, the Conservation Commission may require additional enforcement.

Overall enforcement responsibility for management of the Nauset Barrier Beach system as described by the attached Order of Conditions is designated by state and local statutory requirements to Town of Orleans officials. In this instance, primary enforcement responsibility will be shared by the Conservation Commission, Park Commission, and their respective agents.

Piping Plover and Least Tern
Management Calendar - Approximate dates

ECOLOGY	MANAGEMENT
March	
16 First plovers return	15-31 Post known plover habitat
April	
28 First plover eggs laid	20 Fence and post known Least Tern areas 28 Fence and post each plover nest
May	
7 First Least Terns arrive 20 First Least Tern eggs laid 28 First plover eggs hatch	1-31 Continue to fence and post new plover nests 20 Discontinue ORV travel post early plover nests 25 Adjust Least Tern fence to include new changes
June	
1-6 Peak period of plover hatchings 9 First Least Tern eggs laid	1-30 Monitor feeding territory boundaries of plovers 1-30 Remove plover fences if not used by roosting plovers
July	
1-31 Peak of Least Tern hatching 1-6 Peak of plover fledging 9 First Least Terns fledge 21-31 Peak of Least Tern fledging	1-31 Direct traffic to pass Least Tern area in low tide zone when possible and enforce 5 mph speed limit 1-31 Re-open traffic when plovers have fledged 1-31 Continue to monitor foraging plovers
August	
1-31 Least Terns continue to fledge 1-20 Piping Plovers continue to fledge 15-31 Least Terns and plovers begin to migrate south	1-31 Continue to remove plover fence 1-31 Continue to monitor foraging plovers 1-31 Continue to maintain tern fence 1-31 Continue to direct traffic and enforce speed limits
September	
1-10 Least Terns continue to fledge and depart 1-10 Last plovers depart	10-15 Remove Least Tern fence 10-15 Remove all signs and symbollic fence 15-30 Prepare reports for conservation commission, parks, [illegible]



Approximate Rare Species Habitat
Based on 1990 Conditions

Nauset Spit Barrier Beach

(from Callanan's Pass to tip 2.1 mi.)
One inch = 515 feet

Hecker 1/91

10.27: Coastal Beaches

(1) Preamble. Coastal beaches, which are defined to include tidal flats, are significant to storm damage prevention, flood control and the protection of wildlife habitat. In addition, tidal flats are likely to be significant to the protection of marine fisheries and where there are shellfish, to land containing shellfish.*

Coastal beaches dissipate wave energy by their gentle slope, their permeability and their granular nature, which permit changes in beach form in response to changes in wave conditions.

Coastal beaches serve as a sediment source for dunes and subtidal areas. Steep storm waves cause beach sediment to move offshore, resulting in a gentler beach slope and greater energy dissipation. Less steep waves cause an onshore return of beach sediment, where it will be available to provide protection against future storm waves.

A coastal beach at any point serves as a sediment source for coastal areas downdrift from that point. The oblique approach of waves moves beach sediment alongshore in the general direction of wave action. Thus, the coastal beach is a body of sediment which is moving along the shore.

Coastal beaches serve the purposes of storm damage prevention and flood control by dissipating wave energy, by reducing the height of storm waves, and by providing sediment to supply other coastal features, including coastal dunes, land under the ocean and other coastal beaches. Interruptions of these natural processes by man-made structures reduce the ability of the coastal beach to perform these functions.

A number of birds also nest in the coastal berm, between the toe of a dune and the high tide line. In addition, isolated coastal beaches on small islands are important as haul out areas for harbor seals.

Tidal flats are likely to be significant to the protection of marine fisheries and wildlife habitat because they provide habitats for marine organisms such as polychaete worms and mollusks, which in turn are food sources for fisheries and migratory and wintering birds. Coastal beaches are extremely important in recycling of nutrients derived from storm drift and tidal action. Vegetative debris along the drift line is vital for resident and migratory shorebirds, which feed largely on invertebrates which eat the vegetation. Below the drift line in the lower intertidal zone are infauna (invertebrates such as mollusks and crustacea) which are also eaten by shore birds.

Tidal flats are also sites where organic and inorganic materials may become entrapped and then returned to the photosynthetic zone of the water column to support algae and other primary producers of the marine food web.

When a proposed project involves the dredging, filling, removing, or altering of a coastal beach, the issuing authority shall presume that the coastal beach is significant to the interests specified above. This presumption may be overcome only upon a clear showing that a coastal beach does not play a role in storm damage prevention, flood control, or protection of wildlife habitat, or that tidal flats do not play a role in the protection of marine fisheries or land containing shellfish, and if the issuing authority makes a written determination to such effect.

*For regulations concerning land containing shellfish see 310 CMR 10.34.

10.27: continued

When coastal beaches are determined to be significant to storm damage prevention or flood control, the following characteristics are critical to the protection of those interests:

(a) volume (quantity of sediments) and form, and

(b) the ability to respond to wave action.

When coastal beaches are significant to the protection of marine fisheries or wildlife habitat, the following characteristics are critical to the protection of those interests:

(a) distribution of sediment grain size,

(b) water circulation

(c) water quality, and

(d) relief and elevation.

When tidal flats are in a designated port area, 310 CMR 10.26(1) through 10.26(4) shall apply. When tidal flats are significant to land containing shellfish, 310 CMR 10.34(1) through 10.34(8) shall apply.

(2) Definitions.

(a) Coastal Beach means unconsolidated sediment subject to wave, tidal and coastal storm action which forms the gently sloping shore of a body of salt water and includes tidal flats. Coastal beaches extend from the mean low water line landward to the dune line, coastal bankline or the seaward edge of existing man-made structures, when these structures replace one of the above lines, whichever is closest to the ocean.

(b) "Tidal Flat" means any nearly level part of a coastal beach which usually extends from the mean low water line landward to the more steeply sloping face of the coastal beach or which may be separated from the beach by land under the ocean.

WHEN A COASTAL BEACH IS DETERMINED TO BE SIGNIFICANT TO STORM DAMAGE PREVENTION, FLOOD CONTROL, OR PROTECTION OF WILDLIFE HABITAT, THE FOLLOWING REGULATIONS SHALL APPLY:

(3) Any project on a coastal beach, except any project permitted under 310 CMR 10.30(3)(a), shall not have an adverse effect by increasing erosion, decreasing the volume or changing the form of any such coastal beach or an adjacent or downdrift coastal beach.

(4) Any groin, jetty, solid pier, or other such solid fill structure which will interfere with littoral drift, in addition to complying with 310 CMR 10.27(3), shall be constructed as follows:

(a) It shall be the minimum length and height demonstrated to be necessary to maintain beach form and volume. In evaluating necessity, coastal engineering, physical oceanographic and/or coastal geologic information shall be considered.

(b) Immediately after construction any groin shall be filled to entrapment capacity in height and length with sediment of grain size compatible with that of the adjacent beach.

(c) Jetties trapping littoral drift material shall contain a sand by-pass system to transfer sediments to the downdrift side of the inlet or shall be periodically redredged to provide beach nourishment to ensure that downdrift or adjacent beaches are not starved of sediments.

(5) Notwithstanding 310 CMR 10.27(3), beach nourishment with clean sediment of a grain size compatible with that on the existing beach may be permitted.

WHEN A TIDAL FLAT IS DETERMINED TO BE SIGNIFICANT TO MARINE FISHERIES OR THE PROTECTION OF WILDLIFE HABITAT, THE FOLLOWING REGULATION SHALL APPLY:

(6) In addition to complying with the requirements of 310 CMR 10.27 (3) and 10.27(4), a project on a tidal flat shall if water-dependent be designed and constructed, using best available measures, so as to minimize adverse effects, and if non-water-dependent, have no adverse effects, on marine fisheries and wildlife habitat caused by:

10.27: continued

(a) alterations in water circulation,
(b) alterations in the distribution of sediment grain size, and
(c) changes in water quality, including, but not limited to, other than natural fluctuations in the levels of dissolved oxygen, temperature or turbidity, or the addition of pollutants.

(7) Notwithstanding the provisions of 310 CMR 10.27(3) through 10.27(6), no project may be permitted which will have any adverse effect on specified habitat sites or rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.37.

10.28: Coastal Dunes

(1) Preamble. All coastal dunes are likely to be significant to storm damage prevention and flood control, and all coastal dunes on barrier beaches and the coastal dune closest to the coastal beach in any area are per se significant to storm damage prevention and flood control. Coastal dunes are also often significant to the protection of wildlife habitat.

Coastal dunes aid in storm damage prevention and flood control by supplying sand to coastal beaches. Coastal dunes protect inland coastal areas from storm damage and flooding by storm waves and storm elevated sea levels because such dunes are higher than the coastal beaches which they border. In order to protect this function, coastal dune volume must be maintained while allowing the coastal dune shape to conform to natural wind and water flow patterns.

Vegetation cover contributes to the growth and stability of coastal dunes by providing conditions favorable to sand deposition.

On retreating shorelines, the ability of the coastal dunes bordering the coastal beach to move landward at the rate of shoreline retreat allows these dunes to maintain their form and volume, which in turn promotes their function of protecting against storm damage or flooding.

A number of birds, most commonly terns and gulls, nest at the base or sides of dunes. In some dune systems other birds also nest in the interdunal area, the species being determined by the plant community structure, topography, and hydrologic regime of the area. In a few dune systems, wet meadows or vernal pool habitats occur, which serve as important feeding areas for a wide variety of bird species.

When a proposed project involves the dredging, filling, removal or alteration of a coastal dune, the issuing authority shall presume that the area is significant to the interests of storm damage prevention, flood control and the protection of wildlife habitat. This presumption may be overcome only upon a clear showing that a coastal dune does not play a role in storm damage prevention, flood control or the protection of wildlife habitat, and if the issuing authority makes a written determination to that effect.

When a coastal dune is significant to storm damage prevention, flood control or the protection of wildlife habitat, the following characteristics are critical to the protection of those interest(s):

(a) the ability of the dune to erode in response to coastal beach conditions;
(b) dune volume;
(c) dune form, which must be allowed to be changed by wind and natural water flow;
(d) vegetative cover;
(e) the ability of the dune to move landward or laterally; or
(f) the ability of the dune to continue serving as bird nesting habitat.

(2) Definition. Coastal Dune means any natural hill, mound or ridge of sediment landward of a coastal beach deposited by wind action or storm overwash. Coastal dune also means sediment deposited by artificial means and serving the purpose of storm damage prevention or flood control.

WHEN A COASTAL DUNE IS DETERMINED TO BE SIGNIFICANT TO STORM DAMAGE PREVENTION, FLOOD CONTROL OR THE PROTECTION OF WILDLIFE HABITAT, THE FOLLOWING REGULATIONS SHALL APPLY:

10.28: continued

(3) Any alteration of, or structure on, a coastal dune or within 100 feet of a coastal dune shall not have an adverse effect on the coastal dune by:

(a) affecting the ability of waves to remove sand from the dune;
(b) disturbing the vegetative cover so as to destabilize the dune;
(c) causing any modification of the dune form that would increase the potential for storm or flood damage;
(d) interfering with the landward or lateral movement of the dune;
(e) causing removal of sand from the dune artificially; or
(f) interfering with mapped or otherwise identified bird nesting habitat.

(4) Notwithstanding the provisions of 310 CMR 10.28(3), when a building already exists upon a coastal dune, a project accessory to the existing building may be permitted, provided that such work, using the best commercially available measures, minimizes the adverse effect on the coastal dune caused by the impacts listed in 310 CMR 10.28 (3)(b) through 10.28(3)(e). Such an accessory project may include, but is not limited to, a small shed or a small parking area for residences. It shall not include coastal engineering structures.

(5) The following projects may be permitted, provided that they adhere to the provisions of 310 CMR 10.28(3):

(a) pedestrian walkways, designed to minimize the disturbance to the vegetative cover and traditional bird nesting habitat;
(b) fencing and other devices designed to increase dune development; and
(c) plantings compatible with the natural vegetative cover.

(6) Notwithstanding the provisions of 310 CMR 10.28(3) through (5), no project may be permitted which will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.37.

10.29: Barrier Beaches

(1) Preamble. Barrier beaches are significant to storm damage prevention and flood control and are likely to be significant to the protection of marine fisheries and wildlife habitat and, where there are shellfish, the protection of land containing shellfish.*

Barrier beaches protect landward areas because they provide a buffer to storm waves and to sea levels elevated by storms. Barrier beaches protect from wave action such highly productive wetlands as salt marshes, estuaries, lagoons, salt ponds and fresh water marshes and ponds, which are in turn important to marine fisheries and protection of wildlife habitat. Barrier beaches and the dunes thereon are also important to the protection of wildlife habitat in the ways described in 310 CMR 10.27(1) (coastal beaches) and 10.28(1) (coastal dunes).

Barrier beaches are maintained by the alongshore movement of beach sediment caused by wave action. The coastal dunes and tidal flats on a barrier beach consist of sediment supplied by wind action, storm wave overwash and tidal inlet deposition. Barrier beaches in Massachusetts undergo a landward migration caused by the landward movement of sediment by wind, storm wave overwash and tidal current processes. The continuation of these processes maintains the volume of the landform which is necessary to carry out the storm and flood buffer function.

When a proposed project involves removal, filling, dredging or altering of a barrier beach, the issuing authority shall presume that the barrier beach, including all of its coastal dunes, is significant to the interest(s) specified above. This presumption may be overcome only upon a clear showing that a barrier beach, including all of its coastal dunes, does not play a role in storm damage prevention, flood control, or the protection of marine fisheries, wildlife habitat, or land containing shellfish, and if the issuing authority makes a written determination to such effect.

*For regulations concerning land containing shellfish see 310 CMR 10.34.

10.29: continued

When a barrier beach is significant to storm damage prevention and flood control, the characteristics of coastal beaches, tidal flats and coastal dunes listed in 310 CMR 10.27(1) and 10.28(1) and their ability to respond to wave action, including storm overwash sediment transport, are critical to the protection of the interests specified above.

(2) Definition. Barrier Beach means a narrow low-lying strip of land generally consisting of coastal beaches and coastal dunes extending roughly parallel to the trend of the coast. It is separated from the mainland by a narrow body of fresh, brackish or saline water or a marsh system. A barrier beach may be joined to the mainland at one or both ends.

(3) When a Barrier Beach is Determined to be Significant to Storm Damage Prevention, Flood Control, Marine Fisheries or Protection of Wildlife Habitat. 310 CMR 10.27(3) through 10.27(6) (coastal beaches) and 10.28(3) through 10.28(5) (coastal dunes) shall apply to the coastal beaches and to all coastal dunes which make up a barrier beach.

(4) Notwithstanding the provisions of 310 CMR 10.29(3), no project may be permitted which will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.37.

10.37: Rare Species

Ninety (90) days or less prior to the filing of a Notice of Intent, the applicant shall notify the Massachusetts Natural Heritage and Endangered Species Program (hereinafter referred to as the Program) certified mail or hand delivery (so that the Program will have received such notification prior to the filing of the

10.37: continued

Notice of Intent), of any proposed work which would alter a resource area identified on the most recent Estimated Habitat Map (if any) of state-listed vertebrate and invertebrate animal species occurrences in resource areas, provided to the conservation commission by the Program. Such map shall be based on the estimated geographical extent of the habitats of all such species for which a reported occurrence within the last 25 years has been accepted by the Program and incorporated into its official data base. Notification by the applicant to the Program shall include: a completed copy of Appendix A of a Notice of Intent (Form 3) or Abbreviated Notice of Intent (Form 4), as well as a copy of an 8 1/2" x 11" section of the USGS quadrangle map of the area, containing sufficient information for the Program to locate the precise boundaries of the portion(s) of the wetland resource area(s) to be altered.

Within 45 days of receipt by the Program of a fully completed Appendix A, or within 30 days of the filing of a Notice of Intent for which a fully completed Appendix A has been received by the Program in a timely manner (whichever comes first), the Program shall determine whether any state-listed species identified on the aforementioned map are likely to continue to be located on or near the site of the original occurrence and, if so, whether the area to be altered by the proposed project is in fact part of such species' habitat. Such determination shall be presumed by the issuing authority to be correct. Any proposed project which would alter a resource area that is not located on the most recent Estimated Habitat Map (if any) provided to the conservation commission, shall be presumed not to be within a rare species' habitat. Both of these presumptions are rebuttable and may be overcome upon a clear showing to the contrary. If the conservation commission fails to receive a response from the Program within 30 days of the filing of a Notice of Intent for which an Appendix A is or should have been filed in a timely manner, it shall issue its Order of Conditions based on available information; however, the fact that a proposed project would alter a resource area that is located on an Estimated Habitat Map shall not be considered sufficient evidence in itself that such project is in fact within the habitat of a rare species.

If the Program determines that a resource area which would be altered by a proposed project is in fact within the habitat of a state-listed species, it shall provide in writing to the applicant and (after a Notice of Intent has been filed by the applicant) to the Conservation Commission and the Department, the identification of the species whose habitat would be altered by the proposed project, and all other relevant information which the Program has regarding the species' location and habitat requirements, insofar as such information may assist the applicant and the issuing authority to determine whether the project is or can be designed so as to meet the performance standard set in this Section, below.

Notwithstanding 310 CMR 10.24(7) and 10.25 and 310 CMR 10.27 through 10.35, if a proposed project is found by the issuing authority to alter a resource area which is part of the habitat of a state-listed species, such project shall not be permitted to have any short or long term adverse effects on the habitat of the local population of that species. A determination of whether or not a proposed project will have such an adverse effect shall be made by the issuing authority. However, a written opinion of the Program on whether or not a proposed project will have such an adverse effect shall be presumed by the issuing authority to be correct. This presumption is rebuttable and may be overcome upon a clear showing to the contrary.

The conservation commission shall not issue an Order of Conditions under 310 CMR 10.05(6) regarding any project for which an Appendix A is required for at least 30 days after the filing of the Notice of Intent or Abbreviated Notice of Intent, unless the Program before such time period has elapsed has either determined that the resource area(s) which would be altered by the project is not in fact within the habitat of a state-listed species or, if it has determined that such resource area(s) is in fact within rare species habitat, rendered a written opinion as to whether the project will have an adverse effect on that habitat.

Notwithstanding any other provision of this Section, should an Environmental Impact Report be required for a proposed project under the Massachusetts Environmental Policy Act, as determined by 301 CMR 11.00 the performance standard established under this Section shall only apply to proposed projects which would alter the habitat of a rare species for which an occurrence has been entered into the official data base of the Massachusetts Natural Heritage and Endangered Species Program prior to the time that the Secretary of the Executive Office of Environmental Affairs has determined, in accordance with the provisions of 301 CMR 11.09(4), that a final Environmental Impact Report for that project adequately and properly complies with the Massachusetts Environmental Protection Act (unless, subsequent to that determination, the Secretary requires supplemental information concerning state-listed species, in

Town of Orleans: Nauset Barrier Beach System

This map is illustrative and intended for planning purposes only. Orleans Planning, 2013

photo base map: April, 2011

N W E S

0 1,400 2,800 5,600 Feet

Massachusetts Audubon Society

South Great Road
Lincoln, Massachusetts 01773
(617) 259-9500

RECEIVED
FEB 10 1992
ORLEANS CONSERVATION COMM.

TO: Orleans Conservation Commission
FROM: Scott Hecker, Director of Coastal Waterbird Program
RE: Orleans Parks Department Request for Changes in the Order of Conditions DEP #SE54-723.
DATE: February 10, 1992

Introduction: These comments and proposed changes were discussed at the February 6, 1992 public hearing in Orleans. I wish, at this time, to submit my comments with some changes in writing for your discussion and the record.

Page 13. Paragraph 12 (under Management)

Delete: "Before eggs hatch, it is necessary to close the beach to level the ORV ruts to prevent an adverse effect on the young hatchlings. This must be accomplished within a 28-day period after incubation commences. If ruts are to be leveled by natural process, one week should be allowed, and the beach should be closed 21 days after the last egg is laid or the start of incubation. If ruts are to be leveled by hand, the beach could remain open a few additional days. If the monitor does not know when the last egg was laid or when incubation commenced, the beach should be shut down and ruts leveled immediately."

Insert: It is necessary to close to vehicles, an area around the nest one week prior to hatching, in order to allow vehicle ruts to erode so they will not trap plover hatchlings. To calculate this date of closure the monitor should count 26 days from the date of the first egg. If the date of the first egg is unknown or cannot be calculated, the closure should go into effect no later than May 19 which is one week before the earliest hatch date recorded for Piping Plovers on the Outer Cape.

cc: Scott Melvin, Natural Heritage Program

Summary of Piping Plover (*Charadrius melodus*) Breeding Success on Nauset Spit and North Beach, Orleans And Chatham, Massachusetts 1998

SEP - 9 1998

Submitted to:

Paul O. Fulcher
Park Superintendent
Orleans Park Department
Orleans, MA 02653

And

Orleans Conservation Commission
Town Hall
Orleans, MA 02653

And

Dr. Scott M. Melvin
Natural Heritage and Endangered Species Program
Mass. Dept. of Fisheries and Wildlife
Westboro, MA 01581

Submitted by:

Kerry Collier and Meggan Eldredge
Orleans Park Department
Orleans, MA 02653

Introduction

This is a summary of the 1998 breeding success of the Piping Plover (*Charadrius melodus)* on Nauset Spit and North Beach in the towns of Orleans and Chatham, Massachusetts. This report contains tables illustrating the productivity rates of the birds, as well as summaries of Plover activity. It also contains maps displaying nest locations and charts comparing the productivity of previous years.

In 1997, exclosures had only been used for a few nests because there was reason to believe that predators were beginning to recognize and associate the white wire exclosures with a food source. For 1998, attempts were made to exclose all completed nests. Three of the nests were not exclosed: ONB-7 was not found until after the eggs hatched, NS-17 would not accept an exclosure and CNB-3 hatched before an exclosure could be erected. All of these unexclosed nests hatched. Unlike previous years, none of the exclosed nests were lost to depredation. In one instance, an adult from an exclosed nest was depredated, and the wing of the bird was found five feet from the exclosure. The eggs from that nest were abandoned.

Least Terns were observed attempting to nest on Nauset Spit in early May. Approximately six nests were found in early June, yet when the census was conducted only one of the nests had not been depredated. We believe gull activity and depredation disturbed the small Tern colony. One Least Tern chick was seen on June 23, but was not seen after that date.

Least Terns were also observed scraping and roosting late in the season in Chatham, on the South tip of North Beach. One nest was found on August 6. As of this writing, the eggs were still being incubated.

Abundance and Productivity of Piping Plovers on Nauset Spit, Orleans, MA, and North Beach, Orleans and Chatham, MA, 1998.

	Nauset Spit	North Beach Orleans	North Beach Chatham	TOTAL
Nests				
Pairs*	18	7	9	31 (34)
Total	20	8	9	37
Total Successful (%)**	13 (65)	5 (62.5)	7 (77.77)	25 (67.56)
Eggs				
Laid	70	23	31	124
Hatched (%)	45 (64.28)	19 (82.6)	24 (77.41)	88 (70.69)
Chicks				
Fledged (%)	7 (15.55)	9 (47.36)	13 (54.17)	29 (32.95)
Mean Fledge/Pair***	0.43	1.28	1.625	0.935

*Includes territorial pair who may have scraped, shown site fidelity, etc...but did not lay eggs.
** A successful nest is one that hatched 1 or more eggs.
*** Total no. of chicks fledged divided by the total no. of territorial pairs that were monitored closely enough to get fledging data for, even if fledging or breeding success for those pairs was zero.

Nesting Attempts on Nauset Spit
1998

Nest	Location	Found (#eggs)	Complete	Exclosed	Expected Hatch	Hatch Date	Fledge Date (#)	Notes
NS-1	1	5/1 (4)	<=5/1	5/27	<=5/29	X	X	Abandoned <=5/11
NS-1b	3 post S of 1	5/24 (3)	5/25	5/27	6/22	6/20	X	
NS-2	1 stake N of 1	5/2 (3)	5/11	X	X	X	X	washed out 5/14
NS-2b	1 post N of 1	5/24 (2)	5/27	5/27	6/24	6/21	X	
NS-3	1 post S of 2	5/9 (2)	5/11	5/17	6/9	6/8 (3)	X	lost 1 egg 5/14
NS-4	N of 2	5/9 (2)	X	X	X	X	X	washed out 5/14
NS-5	1 post S of 3	5/8 (3)	X	X	X	X	X	washed out 5/14
NS-5b	1 post S of 3	5/28 (4)	<=5/28	6/3	<=6/25	6/20	7/15 (3)	
NS-6	2 posts S of 4	5/2 (2)	5/9	5/11	6/7	6/6 (3)	X	lost 1 egg 5/14
NS-7	1 post N of 4	5/2 (4)	<=5/2	5/11	<=5/30	5/29 (3)	6/23 (1)	1 egg failed
NS-8	2 posts S of 3	5/14 (1)	X	X	X	X	X	abandoned 5/16
NS-9	N of 6	5/18 (4)	<=5/18	5/23	<=6/15	6/12 (2)	X	2 eggs failed
NS-10	S of 5	5/24 (4)	<=5/24	5/27	<=6/21	X	X	abandoned 6/12
NS-10b	S of 5	6/23 (1)	6/27	7/2	7/25	7/22 (3)	X	1 egg failed
NS-11	3	5/24 (3)	5/25	5/27	6/22	6/21	X	
NS-13	N of Calanans	5/24 (1)	5/30	6/3	6/27	6/25	X	
NS-14	S of pond	5/25 (3)	5/26	5/27	6/23	6/21	7/16 (3)	
NS-15	1 post S of 6	6/3 (4)	<=6/3	6/3	<=7/1	6/27	X	
NS-16	1 post N of 6	6/6 (1)	X	X	X	X	X	depredated 6/7
NS-17	3 N of 6	6/9 (1)	6/13 (3)	no	7/11	7/10 (3)	X	would not accept exclosure

Nesting Attempts on North Beach, Orleans
1998

Nest	Location	Found (#eggs)	Complete	Exclosed	Expected Hatch	Hatch Date	Fledge Date	Notes
ONB-1	N of 1	5/7 (1)	5/11	5/17	6/9	6/6	7/1 (2)	
ONB-2	5 posts S of 2	5/15 (1)	5/21	5/23	6/18	6/18	7/13 (3)	
ONB-3	12 posts N of 6	5/15 (1)	X	X	X	X	X	abandoned 5/17
ONB-4	5 posts N of 6	5/19 (1)	5/23	5/23	6/18	6/16	X	
ONB-4b	5 posts N of 6	6/25 (1)	X	X	X	X	X	depredated 6/29
ONB-5	S of Pochet	5/23 (3)	<=5/23 (3)	5/25	<=6/20	6/20 (3)	7/15 (2)	
ONB-6	1 post S of 3	5/25 (4)	<=5/25	5/26	<=6/22	X	X	adult depredated 6/9
ONB-7	S of Pochet	nest not found	5/20?	no	6/15	6/15	7/2 (2)	

Nestint Attempts on North Beach, Chatham
1998

Nest	Location	Found (#eggs)	Complete	Exclosed	Expected Hatch	Hatch Date	Fledge Date	Notes
CNB-1	N of 9	5/2 (3)	5/5	5/9	6/2	5/31	7/25 (2)	
CNB-2	3 posts S of 6	5/15 (4)	<=5/15	5/17	<=6/12	6/9	7/4 (3)	
CNB-3	S spit	5/19 (3)	<=5/19 (3)	no	<=6/16	6/7 (3)	7/2 (2)	
CNB-4	S of 10	5/26 (1)	X	X	X	X	X	abandoned <5/26
CNB-4b	S of 10	5/26 (4)	<=5/26	6/7	<=6/23	6/17 (3)	7/12 (2)	1 egg failed
CNB-5	S spit	5/29 (4)	<=5/29	6/7	<=6/26	6/15	7/10 (2)	
CNB-6	S spit	6/3 (1)	6/10 (3)	6/11	7/8	7/5 (3)	7/30 (2)	
CNB-7	3 post S of 10	6/7 (4)	<=6/7	6/9	<=7/5	X	X	abandoned 6/15
CNB-8	S spit	6/9 (4)	<=6/9	6/10	<=7/7	7/3 (3)	X	1 egg failed

Year: 1998

Site Name: Nauset Spit

Town: Orleans

Ownership:

Observer/Agency: Kerry Collier + Meggan Eldredge

Address: Orleans Park Department
Nauset Beach, Orleans

Telephone: (508) 240-3780

Census Results:	Index Count	Total Count
No. of Pairs	18	18
Unpaired Adults	1	1

Census Remarks:

Month	Average # of visits to site per week
April	2
May	5
June	5
July	5

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

Exclosure Design	A	B	C
Shape	Circular with wings	Circular, no wings	
Diameter/Length of Side	10 Foot diameter	same	
Size of Wire Mesh	5" x 2"	same	
Height Above Ground	4'	same	
Depth Buried	5"	same	
Cover Material	black Fruit netting	same	
Cover Spacing/Mesh Size	1/2" x 1/2"	same	

Other Management Undertaken or Needed/Remarks:

Symbolic Fencing around entire nesting area. No dogs allowed. No pedestrians with in 50 Feet of nests. Area closed to ORV traffic 2 days before expected hatch date.

Site Name: Nauset Spit Year: 1998 Observer: Kerry Collier + Meggan Eldredge

Page 1 of 3

Pair No.	Nest No.	Number of Eggs/Chicks: Laid	Hatched	Fledged	Date clutch was: Found (#eggs?)	Completed	Hatched or Failed	Exclosure: Y/N	Design(A,B,...)	Date Installed
NS-1	1	4	—	—	5/1 (4)	≤ 5/1	F 5/11	Y	B	5/5
NS-1b	2	4	4	—	5/24 (3)	5/25	H 6/20	Y	A	5/27
NS-2	1	4	—	—	5/2 (3)	5/3	F 5/14	N	—	—
NS-2b	2	4	4	—	5/24 (2)	5/27	H 6/21	Y	A	5/27
NS-3	1	4	3	—	5/9 (2)	5/11	H 6/8	Y	A	5/17
NS-4	1	2	—	—	5/9 (2)	—	F 5/14	—	—	—
NS-5	1	4	—	—	5/8 (3)	5/9	F 5/14	N	—	—
NS-5b	2	4	4	3	5/28 (4)	5/23	H 6/20	Y	A	6/3
NS-6	1	4	3	—	5/2 (2)	5/9	H 6/6	Y	B	5/9
NS-7	1	4	3	1	5/2 (4)	≤ 5/2	H 5/29	Y	B	5/9

Nest No.	Cause of Egg Mortality/Evidence	Cause of Chick Mortality/Evidence
NS-1	4 eggs were abandoned 5/11	
NS-2	washed out 5/14. Visible wrack line above nest.	
NS-3	Lost 1 egg to tide 5/14	
NS-4	washed out 5/14. Visible wrack line	
NS-5	washed out 5/14. Visible wrack line	
NS-6	1 egg Failed to hatch	
NS-7	1 egg Failed to hatch	

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te Name: Nauset Spit Year: 1998 Observer: Kerry Collier + Meggan Eldredge

Page 2 of 3

Pair No.	Nest No.	Number of Eggs/Chicks: Laid	Hatched	Fledged	Date clutch was: Found (#eggs?)	Completed	Hatched or Failed	Exclosure: Y/N	Design(A,B,...)	Date Installed
NS-8	1	1	—	—	5/14 (1)	—	F 5/16	N	—	—
NS-9	1	4	2	—	5/18 (4)	≤ 5/18	H 6/12	Y	A	5/23
NS-10	1	4	—	—	5/24 (4)	≤ 5/24	F 6/10	Y	B	5/27
NS-10b	2	4	3	—	6/23 (1)	6/27	H 7/22	Y	A	7/2
NS-11	1	4	4	—	5/24 (3)	5/25	H 6/21	Y	B	5/27
NS-13	1	4	4	—	5/24 (1)	5/30	H 6/25	Y	B	6/3
NS-14	1	4	4	3	5/25 (3)	5/26	H 6/21	Y	A	5/27
NS-15	1	4	4	—	6/3 (4)	≤ 6/3	H 6/27	Y	A	6/3
NS-16	1	1	—	—	6/6 (1)	—	F 6/9	N	—	—
NS-17	1	3	3	—	6/9 (1)	6/13	H 7/10	N	—	—

Nest No.	Cause of Egg Mortality/Evidence	Cause of Chick Mortality/Evidence
NS-8	1 egg abandoned 5/16.	
NS-9	2 eggs Failed to hatch.	
NS-10	abandoned 4 eggs on 6/10.	
NS-12	determined to be NS-2b.	
NS-16	Depredated. Gull tracks within 1 Foot of nest.	
NS-17	Would not accept exclosure on 6/18.	

Please attach a copy of

ite Name: Nauset Spit Year: 1998 Observer: Kerry Collier + Meggan Eldredge

Page 3 of 3

		Number of Eggs/Chicks			Date clutch was:			Exclosure		
Pair No.	Nest No.	Laid	Hatched	Fledged	Found (#eggs?)	Completed	Hatched or Failed	Y/N	Design(A,B,...)	Date Installed
NS-18	—	—	—	—	—	—	—	—	—	—
NS-19	—	—	—	—	—	—	—	—	—	—

Nest No.	Cause of Egg Mortality/Evidence	Cause of Chick Mortality/Evidence
NS-18	pair did not lay eggs	
NS-19	pair did not lay eggs.	

**Please attach a copy of a map of this site [illegible]

MASSACHUSETTS PIPING PLOVER CENSUS FORM

Year: 1998

Site Name: North Beach

Town: Orleans

Ownership:

Observer/Agency: Kerry Collier & Megan Eldredge

Address: Orleans Park Dept.
Nauset Beach

Telephone: 240-3780

Census Results:	Index Count	Total Count
No. of Pairs	4	7
Unpaired Adults	0	0

Census Remarks:

Month	Average # of visits to site per week
April	2
May	5
June	5
July	5

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

Exclosure Design	A	B	C
Shape	Circular w/wings	Circular, no wings	
Diameter/Length of Side	10' diameter	same	
Size of Wire Mesh	2" x 5"	same	
Height Above Ground	4'	same	
Depth Buried	5"	same	
Cover Material	Fruit netting	same	
Cover Spacing/Mesh Size	1/2"	same	

Other Management Undertaken or Needed/Remarks:

Symbolic fencing around each nest. Redirected ORV traffic around nests. No pedestrians within 50 feet of nest and 15 feet from the toe of the dune. Dogs must be on a leash 30 feet or less. Areas closest to vehicles and dogs 2 days before expected hatch date

Orleans CP page a116

Site Name: Orleans North Beach Year: 1998 Observer: Kerry Collier & Meggan Eldredge

Page 1 of 1

Pair No.	Nest No.	Number of Eggs/Chicks: Laid	Hatched	Fledged	Date clutch was: Found (#eggs?)	Completed	Hatched or Failed	Exclosure: Y/N	Design(A,B,...)	Date Installed
ONB-1	1	4	4	3	5/7 (1)	5/11	H 6/6	Y	A	5/17
ONB-2	1	4	4	3	5/15 (1)	5/21	H 6/18	Y	A	5/23
ONB-3	1	1	—	—	5/15 (1)	—	F 5/17	—	—	—
ONB-4	1	4	4	—	5/19 (1)	5/23	H 6/16	Y	A	5/23
ONB-4b	2	2	—	—	6/25 (1)	—	F 6/29	—	—	—
ONB-5	1	3	3	2	5/23 (3)	E 5/23	H 7/15	Y	A	5/25
ONB-6	1 **	4	—	—	5/25 (4)	E 5/25	F 6/9	Y	B	5/26
ONB-7	1	?	3	2	No	5/20?	H 6/15	N	—	—

Nest No.	Cause of Egg Mortality/Evidence	Cause of Chick Mortality/Evidence
ONB-3	egg was abandoned 5/17.	
ONB-4b	eggs were depredated 6/26, no tracks, unknown predator.	
ONB-6	eggs were abandoned, plover wing was found 5 feet from nest 6/9, unknown predator.	

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

MASSACHUSETTS PIPING PLOVER CENSUS FORM

Year: 1998

Site Name: North Beach

Town: Chatham

Ownership:

Observer/Agency: Kerry Collier & Meggan Eldredge

Address: Orleans Park Dept.
Nauset Beach

Telephone: (508) 240-3780

Census Results:	Index Count	Total Count
No. of Pairs	8	9
Unpaired Adults	1	0

Census Remarks:

Month	Average# of visits to site per week
April	2
May	5
June	5
July	5

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

Exclosure Design	A	B	C
Shape	Circular, with wings	Circular, no wings	
Diameter/Length of Side	10' diameter	Same	
Size of Wire Mesh	2" x 5"	same	
Height Above Ground	4'	same	
Depth Buried	5"	same	
Cover Material	Fruit netting	same	
Cover Spacing/Mesh Size	1/2"	same	

Other Management Undertaken or Needed/Remarks:

Symbolic fencing around each nest. Redirected ORV traffic around nests. No pedestrians within 50 feet of nest and 15 feet from toe of the dune. Dogs must be on leashes of 30 feet or less. Area closed to vehicles and dogs 2 days before expected hatch date.

orleans HCP page a118

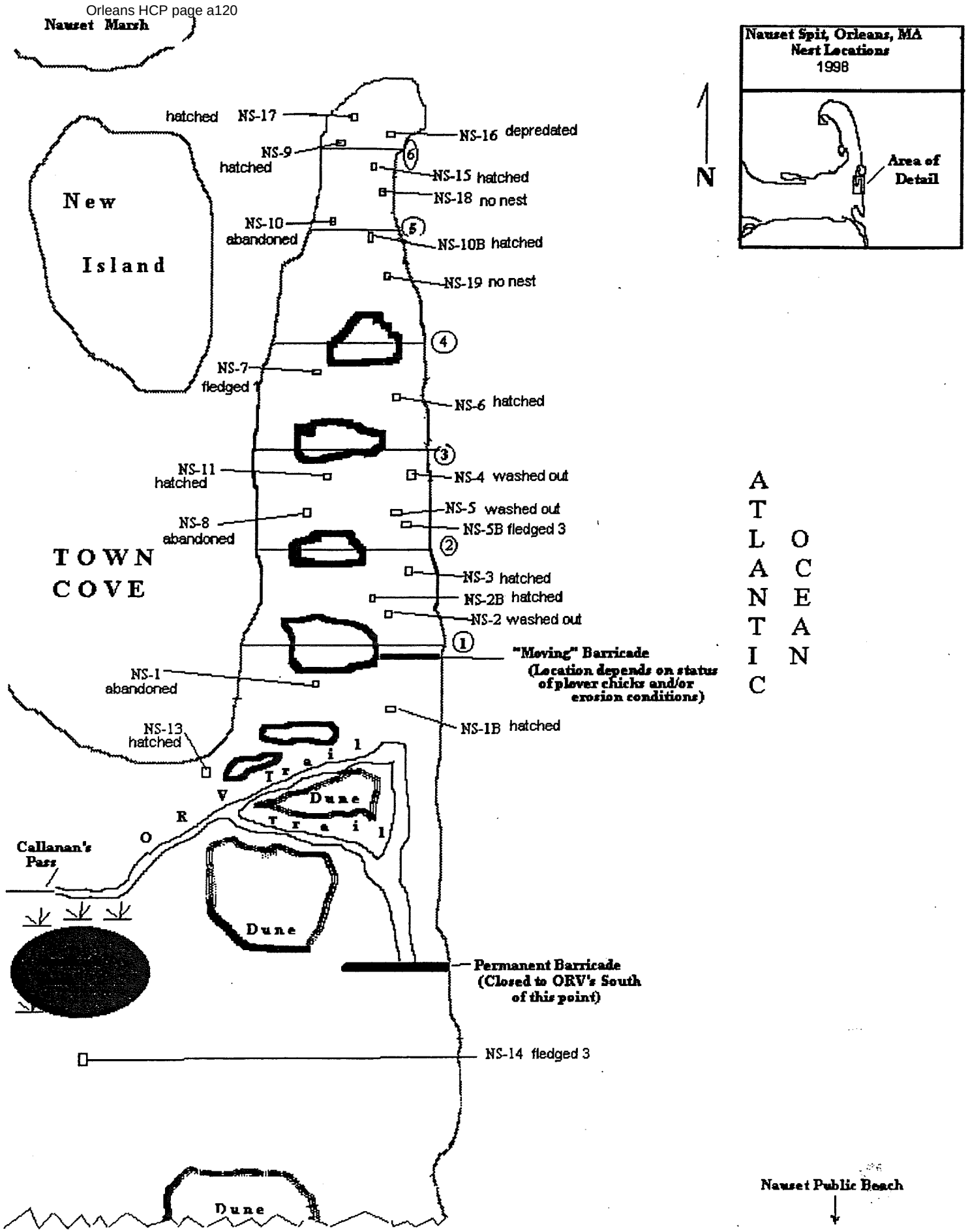
ite Name: North Beach, Chatham Year: 1998 Observer: Kerry Collier & Meggan Eldredge

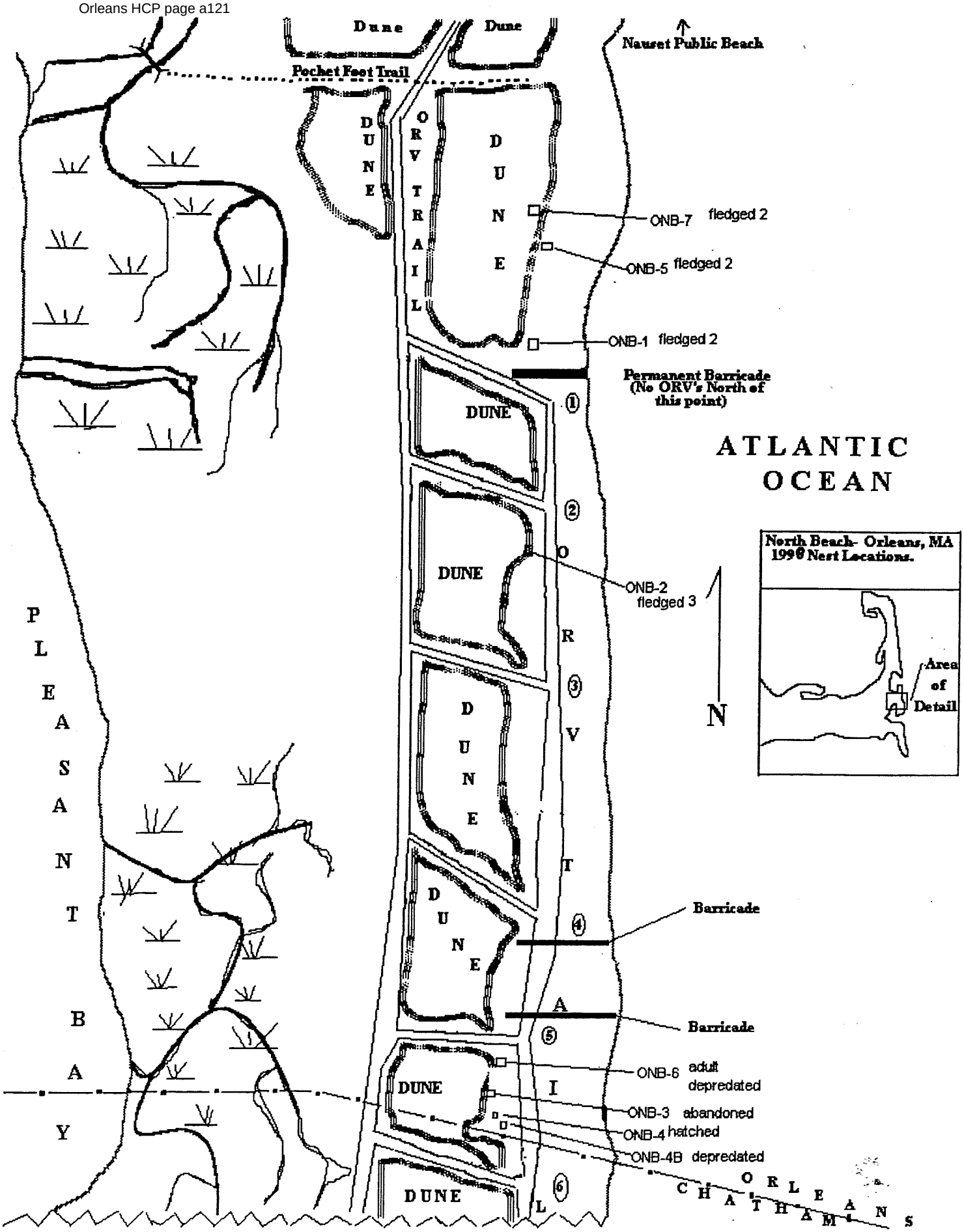
Page 1 of 8

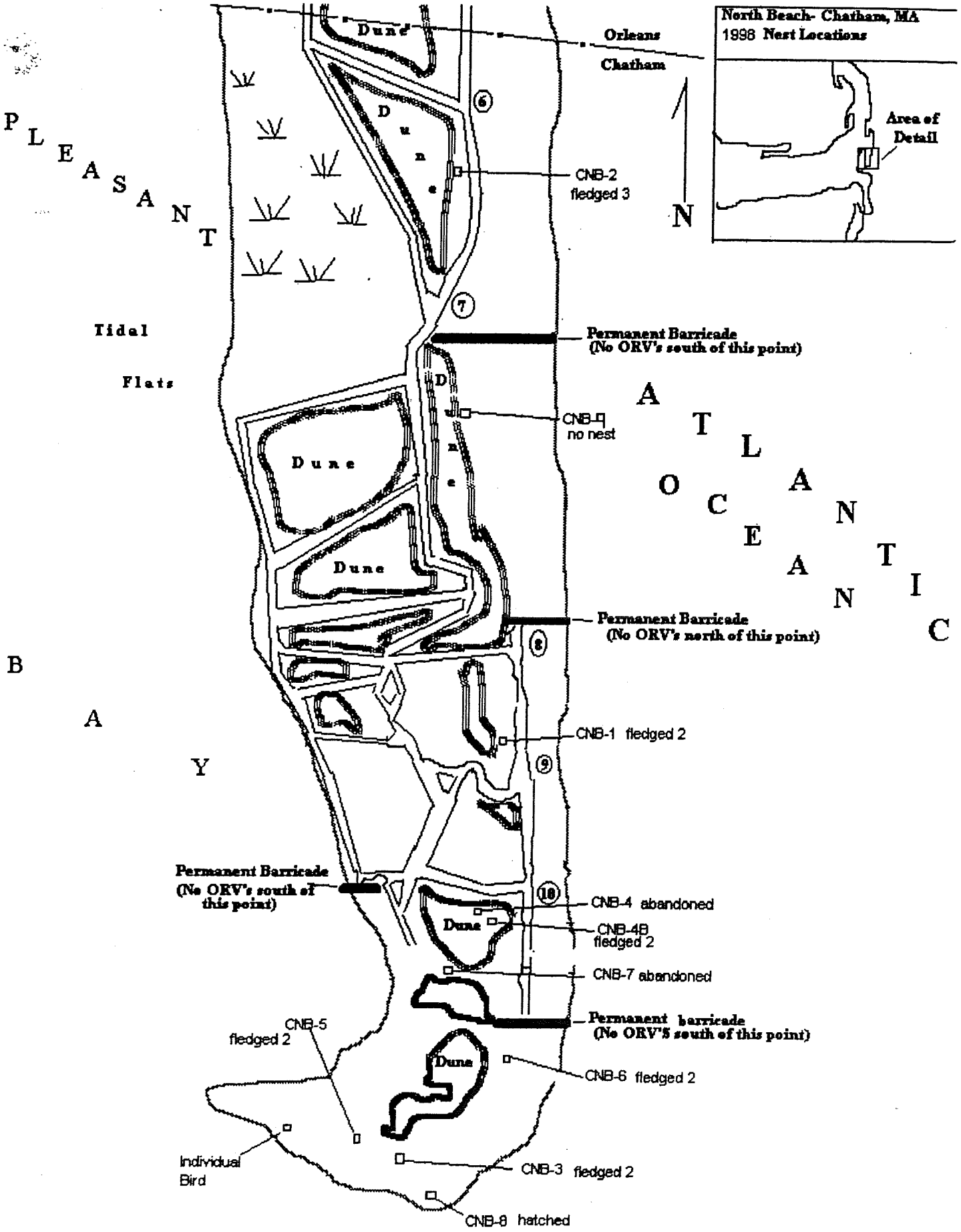
Pair No.	Nest No.	Number of Eggs/Chicks: Laid	Hatched	Fledged	Date clutch was: Found (#eggs?)	Completed	Hatched or Failed	Exclosure: Y/N	Design(A,B,...)	Date Installed
CNB-1	1	4	4	2	5/2 (3)	5/5	H 5/31	Y	B	5/8
CNB-2	1	4	4	3	5/2 (4)	≤ 5/2	H 6/9	Y	A	5/17
CNB-3	1	3	3	2	5/19 (3)	≤ 5/19	H 6/7	N	—	—
CNB-4	1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

Nest No.	Cause of Egg Mortality/Evidence	Cause of Chick Mortality/Evidence
CNB-4	1 egg was abandoned before 5/25.	
CNB-7	eggs abandoned 6/14.	

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

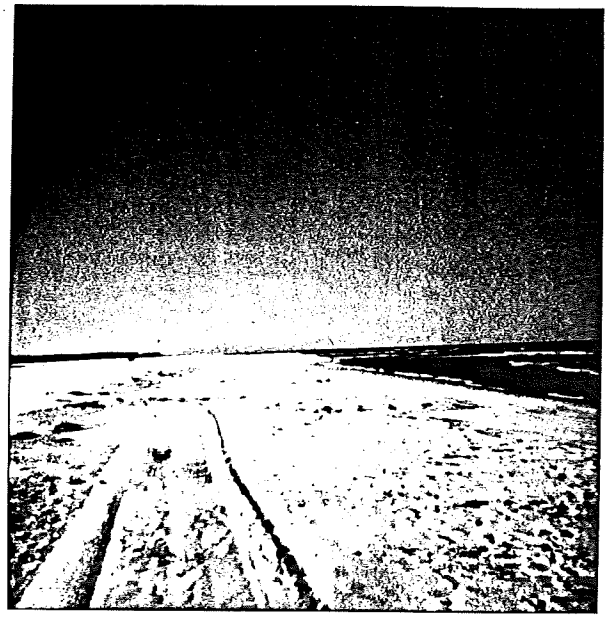

Nauset Marsh
Nauset Spit, Orleans, MA
Nest Locations
1998
Area of Detail
N
New Island
hatched NS-17
NS-16 depredated
NS-9 hatched
NS-15 hatched
NS-18 no nest
NS-10 abandoned
NS-10B hatched
NS-19 no nest
NS-7 fledged 1
NS-6 hatched
NS-11 hatched
NS-4 washed out
NS-5 washed out
NS-8 abandoned
NS-5B fledged 3
TOWN COVE
NS-3 hatched
NS-2B hatched
NS-2 washed out
"Moving" Barricade
(Location depends on status of plover chicks and/or erosion conditions)
NS-1 abandoned
NS-1B hatched
NS-13 hatched
ORV Trail
Dune
Trail
Callanan's Pass
Dune
Permanent Barricade
(Closed to ORV's South of this point)
NS-14 fledged 3
Dune
ATLANTIC OCEAN
Nauset Public Beach


Dune
Dune
Nauset Public Beach
Pochet Foot Trail
DUNE
ORV TRAIL
DUNE
ONB-7 fledged 2
ONB-5 fledged 2
ONB-1 fledged 2
Permanent Barricade (No ORV's North of this point)
DUNE
ATLANTIC OCEAN
DUNE
ONB-2 fledged 3
ORV TRAIL
North Beach- Orleans, MA 1998 Nest Locations.
Area of Detail
N
PLEASANT BAY
DUNE
DUNE
Barricade
Barricade
DUNE
ONB-6 adult depredated
ONB-3 abandoned
ONB-4 hatched
ONB-4B depredated
DUNE
CHATHAM
ORLEANS


North Beach- Chatham, MA
1998 Nest Locations
Area of Detail
Orleans
Chatham
N
PLEASANT
BAY
Tidal
Flats
ATLANTIC OCEAN
Dune
Dune
Dune
Dune
Dune
Dune
Dune
Dune
6
7
8
9
10
CNB-2
fledged 3
Permanent Barricade
(No ORV's south of this point)
CNB-
no nest
Permanent Barricade
(No ORV's north of this point)
CNB-1 fledged 2
Permanent Barricade
(No ORV's south of this point)
CNB-4 abandoned
CNB-4B
fledged 2
CNB-7 abandoned
Permanent barricade
(No ORV'S south of this point)
CNB-5
fledged 2
CNB-6 fledged 2
Individual
Bird
CNB-3 fledged 2
CNB-8 hatched

July, 1998

Wrack line on the Atlantic Ocean side of Nauset Spit



Wrack line on the Town Cove side of Nauset Spit

PAIR SUMMARIES

1998

NS-1
5/1 found nest with 4 eggs
5/11 exclosed nest was abandoned after a few days of strong winds
5/18 and 6/13 crow tracks observed circling abandoned exclosure

NS-1b
5/24 nest found with three eggs
6/20 4 eggs hatched; chicks fed on the cove near a large patch of grass
7/5 last sighting of three chicks
7/10 saw 1 chick, alone, 20 days old. Chicks were not seen again, none are believed to have fledged

NS-2
4/26 pair scraping
5/2 nest found with 3 eggs
5/14 nest was washed out by high tide

NS-2b
5/24 nest found with 2 eggs
6/21 4 eggs hatched, chicks fed on the cove in a large patch of grass
6/25 last sighting of 3 chicks
6/27 saw 2 birds, but no chicks. Coyote tracks observed going through the area

NS-3
5/9 nest found with 2 eggs
5/14 lost 1 egg to high tide
5/25-6/6 gull seen roosting next to the exclosure
6/8 3 eggs hatched
6/23 saw 3 chicks
6/24 could not find chicks
6/27 pair scraping

NS-4
4/25 pair scraping
5/9 found nest with 2 eggs
5/14 nest washed out by high tide

NS-5
5/2 pair scraping
5/8 nest found with 3 eggs
5/14 nest washed out by high tides

NS-5b
5/28 nest found with 4 eggs
6/20 4 eggs hatched, chicks fed near a seal carcass on the ocean side, near a patch of grass
6/21 saw 4 chicks
7/15 3 chicks fledged

NS-6
5/2 nest found with 2 eggs
5/14 lost 1 egg to high tide
6/6 3 eggs hatched, chicks fed on the cove in a sandy area without grass
6/10 chicks could not be found

NS-7
5/2 nest found with 2 eggs
5/29 3 eggs hatched, 1 failed; chicks fed near a seal carcass on the ocean side, near a large patch of grass
6/6 saw 3 chicks
6/12 saw 2 chicks
6/23 1 chick fledged

NS-8
5/14 found nest with 1 egg
5/16 1 egg abandoned
6/3 pair scraping

NS-9
5/18 nest found with 4 eggs
6/12 2 eggs hatched, 2 eggs failed; chicks fed on the cove near a sandy area without grass
6/14 saw 2 chicks
6/16 saw 1 chick
6/18 could not find chicks

NS-10
5/4 pair scraping
5/24 nest found with 4 eggs
6/12 exclosed nest was abandoned

NS-10b
6/21 pair scraping
6/24 nest found with 2 eggs
7/22 3 eggs hatched, 1 egg failed, chicks fed on the cove near the same patch of grass as NS-7, but did not utilize the seal carcass
7/23 saw 3 chicks
7/26 saw 2 chicks; decapitated Common Tern found in the area
8/1 could not find chicks

NS-11
5/24 nest found with 3 eggs
6/21 4 eggs hatched; chicks fed in the same grass as NS-5b
6/22 saw 3 chicks
6/24 could not find chicks
6/27 and 7/7 pair scraping

NS-12
see NS-2b

NS-13
5/24 nest found with 1 egg
6/25 4 eggs hatched; severe thunderstorm in the evening
6/27 could not find chicks

NS-14
4/25 pair in area
5/25 nest found with 3 eggs
6/21 4 eggs hatched; chicks fed on the ocean in the a.m. and on a brackish pond during the day
7/16 3 chicks fledged

NS-15
6/3 nest found with 4 eggs
6/27 4 eggs hatched; chicks fed on the cove near a sandy area with no grass
6/29 could not find chicks

NS-16
6/6 nest found with 1 egg
6/7 1 egg lost to unknown predator

NS-17
6/9 nest found with 1 egg
6/18 would not accept exclosure
7/10 3 eggs hatched; chicks fed near a large patch of grass until NS10b hatched, then on the cove near a sandy area where the nest was located
7/15 saw 3 chicks
7/23 saw 2 chicks; decapitated Common Tern found in the area
7/25 saw 1 chick. 15 days old; chicks were not seen again

NS-18
5/24 saw territorial bird
5/30 bird was seen again
6/3 bird was seen again

NS-19
6/3 saw territorial pair at barricade

ONB-1
5/7 nest found with 1 egg
6/6 3 eggs hatched
6/20 saw 3 chicks
6/24 saw 2 chicks
7/2 2 chicks fledged

ONB-2
5/15 nest found with 1 egg
6/18 4 eggs hatched
6/24 and 6/25 chicks were seen outside of closed area, barricade was moved farther north
7/13 3 chicks fledged

ONB-3
5/15 nest found with 1 egg
5/17 nest abandoned, skunk tracks seen throughout the area, coming was close as one foot to the nest
6/6 birds scraping

ONB-4
5/19 nest found with 1 egg
6/16 4 eggs hatched
6/17 saw bird fly over to bay side, two birds seen on bay, no chicks

ONB-4b
6/25 nest found with 1 egg
6/24 lost 3 eggs to an unknown predator

ONB-5
5/23 nest found with 3 eggs
6/20 3 eggs hatched; chicks fed south of the grass in a rocky area
7/15 2 chicks fledged

ONB-6
5/25 nest found with 4 eggs
6/9 found adult plover wing 5 feet from nest, eggs were abandoned

ONB-7
nest was not found
6/15 3 chicks were found; fed north of the grass in rocky area
7/2 2 chicks fledged

CNB-1
5/2 nest found with 3 eggs
5/15 hawk was seen circling the exclosure
5/31 4 eggs hatched
6/5 hawk was seen circling the area
6/18 saw 3 chicks
7/25 2 chicks fledged

CNB-2
5/15 nest found with 4 eggs
6/9 4 eggs hatched; chicks stayed in thick grass
7/4 3 chicks fledged

CNB-3
5/19 nest was found with 3 eggs
6/7 3 eggs hatched; chicks fed on bay
7/2 2 chicks fledged

CNB-4
5/26 found 1 abandoned egg

CNB-4b
5/26 nest found with 4 eggs
6/17 3 eggs hatched, 1 egg failed
6/20 birds were heard in grass on the bay
7/6 saw 1 chick on the ocean near south barricade
7/11 saw 2 chicks
7/12 2 chicks fledged

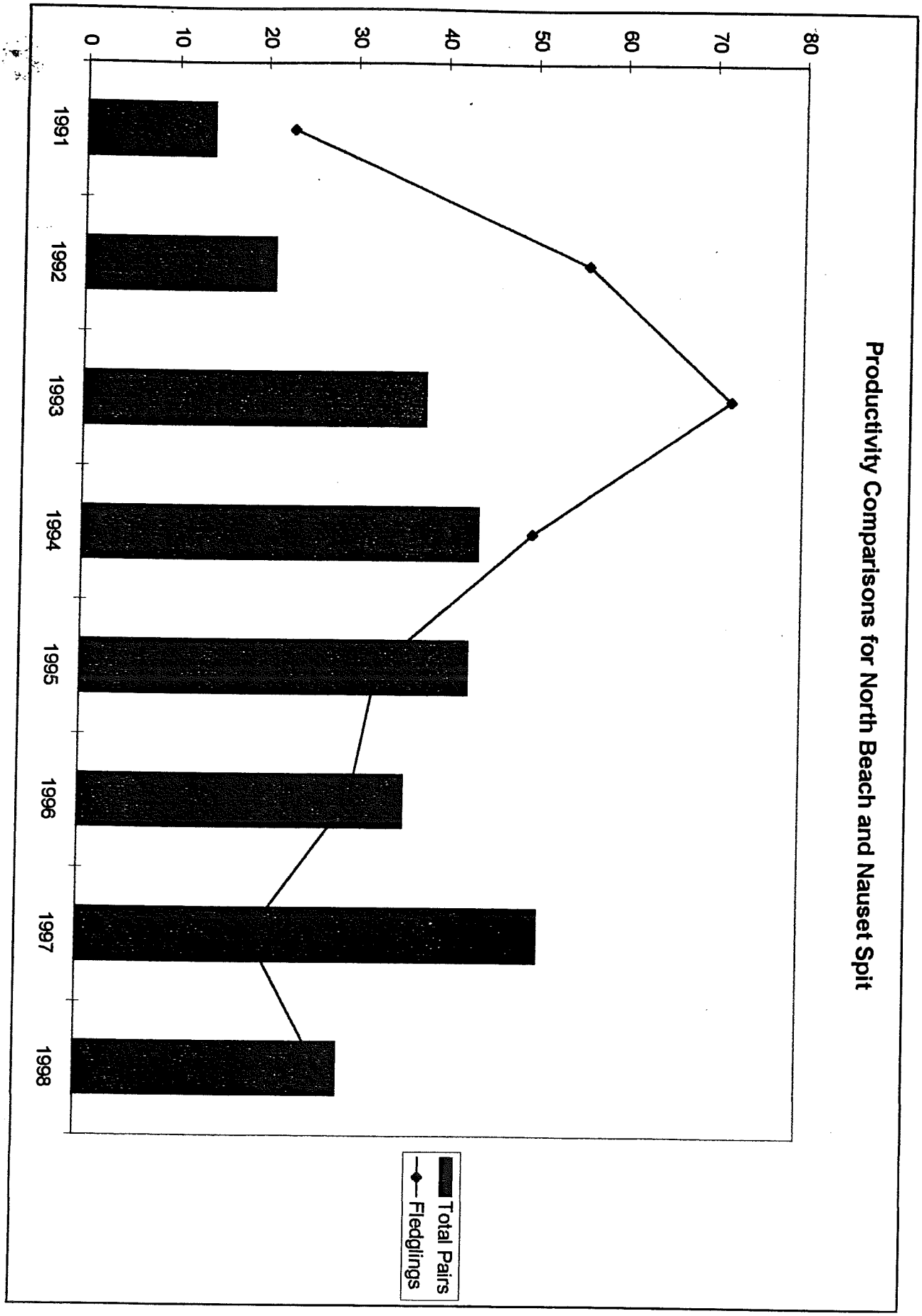
CNB-5
5/29 nest found with 4 eggs
6/15 4 eggs hatched
6/17 saw 2 chicks on the cove in the grass
7/6 saw 2 chicks, 21 days old. Chicks were not seen again, but assumed to have fledged 2 on 7/10

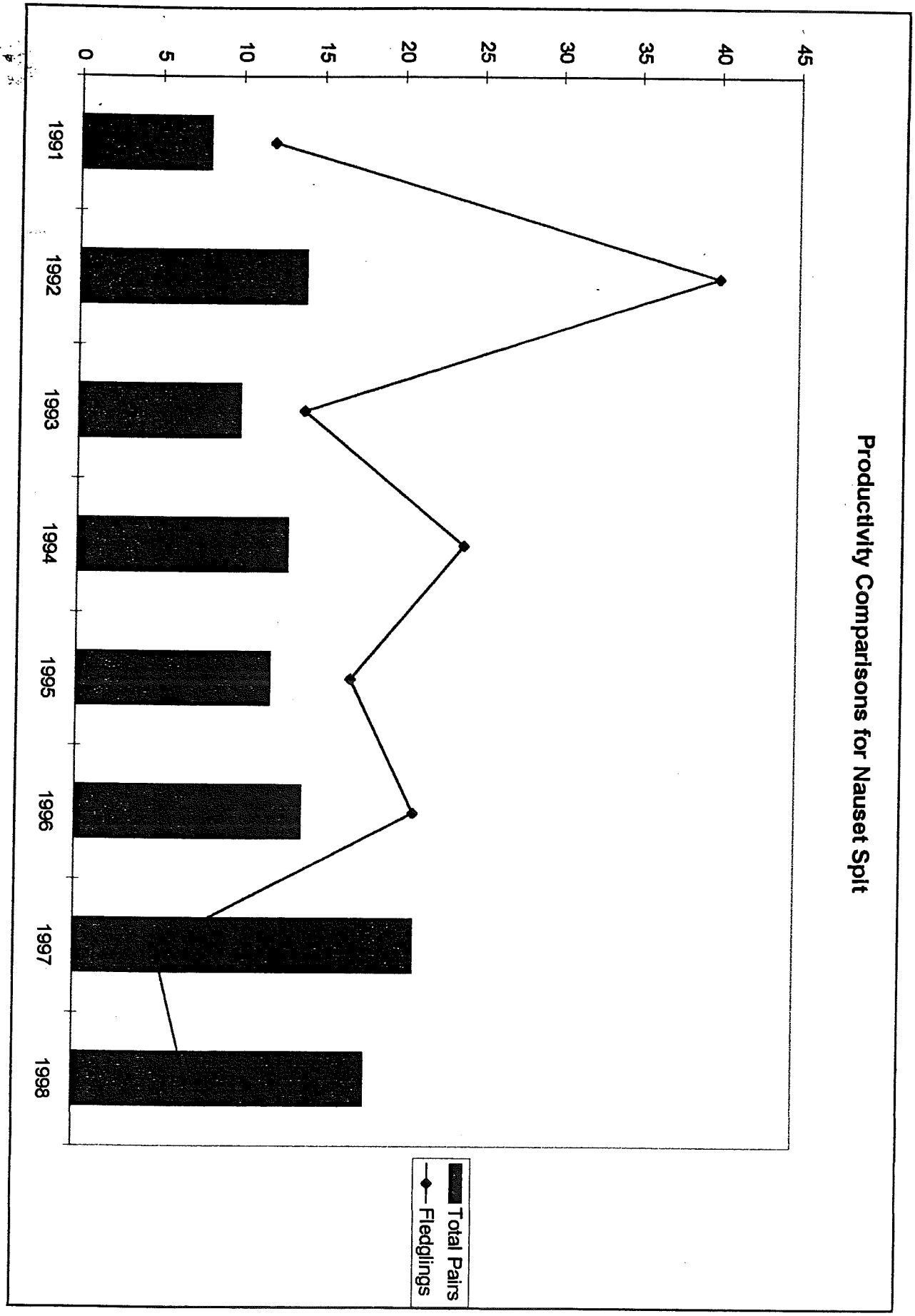
CNB-6
6/3 nest found with 1 egg
7/5 3 eggs hatched; chicks fed on ocean
7/30 2 chicks fledged

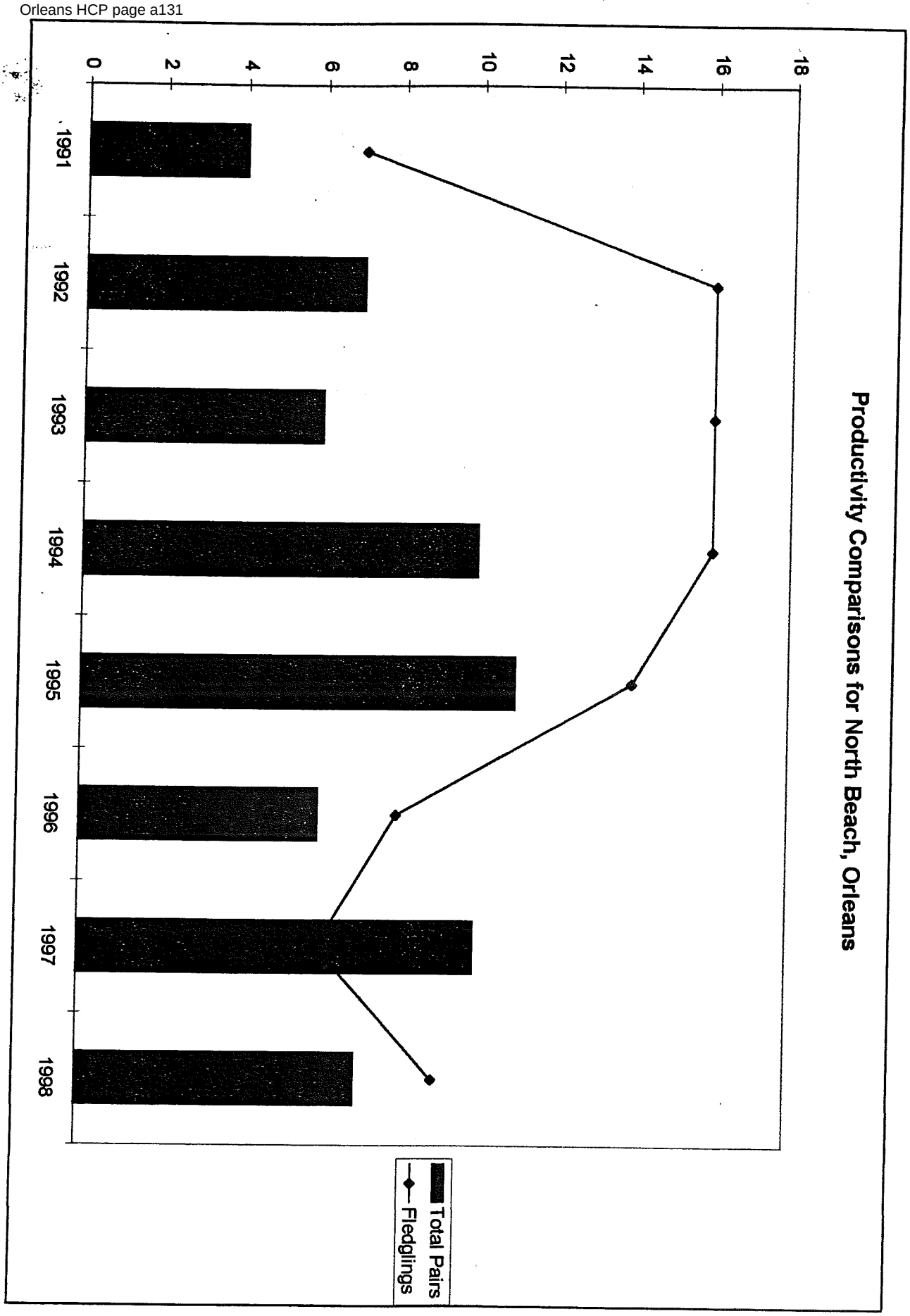
CNB-7
6/7 nest found with 4 eggs
6/15 exclosed nest abandoned

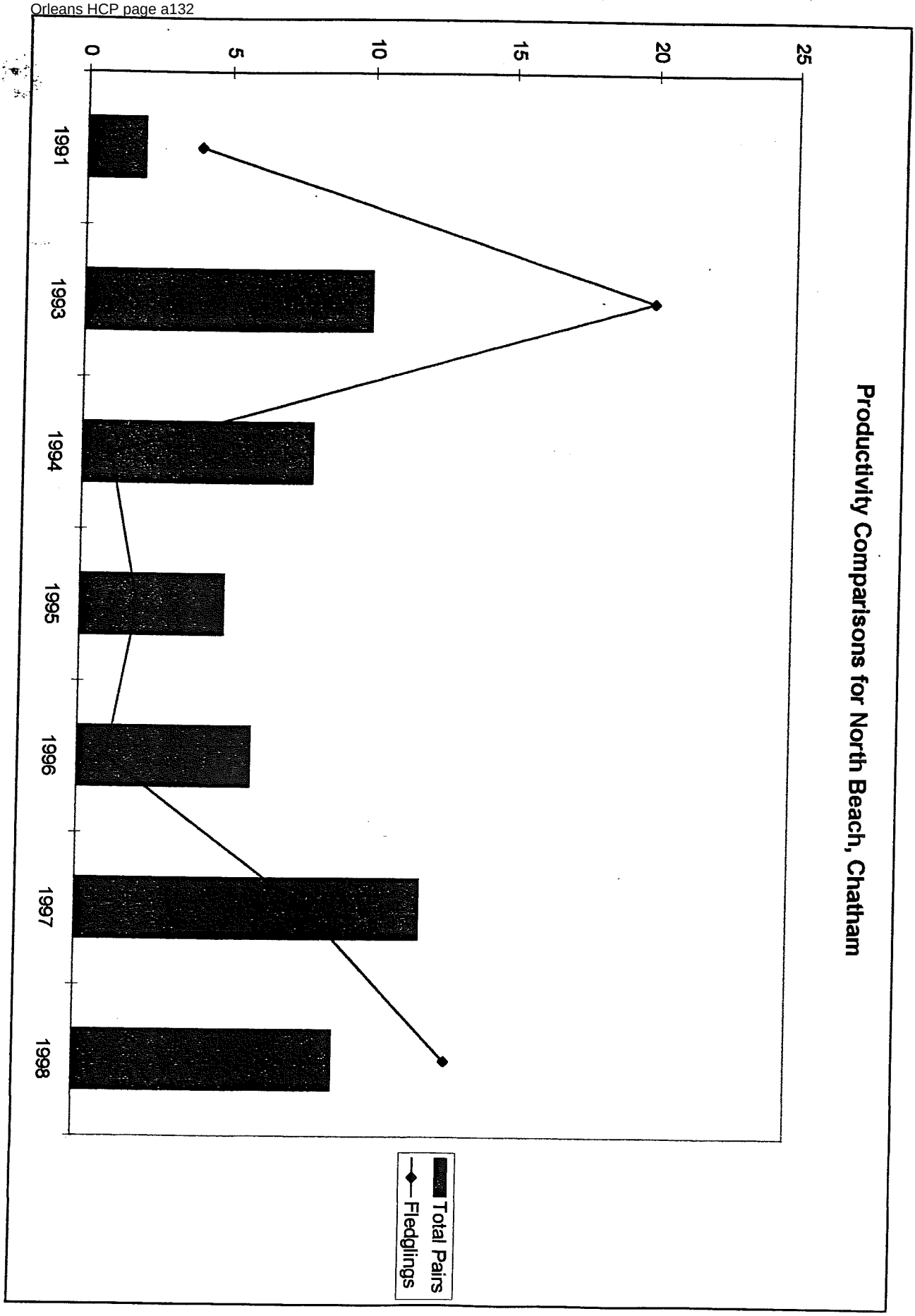
CNB-8
6/9 nest found with 4 eggs, 30-50 gulls were regularly seen roosting in the area throughout the summer
7/3 3 eggs hatched, 1 egg failed. Chicks were not seen after 7/3

CNB-9
5/30 1 bird was seen
7/3 pair found scraping


Productivity Comparisons for North Beach and Nauset Spit
80
70
60
50
40
30
20
10
0
1991
1992
1993
1994
1995
1996
1997
1998
Total Pairs
Fledglings


Productivity Comparisons for Nauset Spit
45
40
35
30
25
20
15
10
5
0
1991
1992
1993
1994
1995
1996
1997
1998
Total Pairs
Fledglings


Productivity Comparisons for North Beach, Orleans
18
16
14
12
10
8
6
4
2
0
1991
1992
1993
1994
1995
1996
1997
1998
Total Pairs
Fledglings


Productivity Comparisons for North Beach, Chatham
25
20
15
10
5
0
1991
1993
1994
1995
1996
1997
1998
Total Pairs
Fledglings

Summary of Piping Plover (Charadrius melodus) Breeding Success on Nauset Spit and North Beach, Orleans Massachusetts 1999

MAR 10 2000

Submitted to:

Paul Fulcher
Park Superintendent
Orleans Park Department
Orleans, MA 02653

And

Orleans Conservation Commission
Town Hall
Orleans, MA 02653

And

Dr. Scott Melvin
Natural Heritage and Endangered Species Program
Mass. Dept. of Fisheries and Wildlife
Westboro, MA 01581

Submitted by:

Anna Resnick and Kerry Collier
Orleans Park Department
Orleans, MA 02653

Introduction

The following is a summary of the 1999 breeding success of the Piping Plover (*Charadrius melodus*) on Nauset Spit and North Beach in the town of Orleans, Massachusetts. This report contains maps showing the locations of the nests, summaries of plover activity and tables illustrating the productivity of the birds. Plovers nesting on Nauset Spit beach were much more successful this season than in 1998.

Tern Nesting

Least Terns (*Sterna antillarum)* and Common Terns (*Sterna hirundo*) returned to Nauset Spit beach in large numbers in the 1999 nesting season. Four hundred and ninety-five Common Tern pairs were counted on Nauset Spit in early June. Also, at least 62 Least Tern pairs nested on the rocky berm at the north end of Nauset Spit. These numbers were recorded from the official A count conducted on June 15th. The Least Tern colony did not change significantly in size during the course of the nesting season, for this reason, a B count was not performed.

Abundance and Productivity of Piping Plovers on Nauset Spit, Orleans, MA, and North Beach, Orleans MA, 1999.

	Nauset Spit	North Beach Orleans	TOTAL
Nests			
Pairs	13	7	20
Total	15	7	20
Total Successful (%)*	15 (100)	5 (71)	20 (90)
Eggs			
Laid	56	27	83
Hatched (%)	56 (100)	17 (62)	73 (88)
Chicks			
Fledged (%)	27 (48)	10 (58)	37
Mean Fledge/Pair**	2.07	1.42	1.74

* A successful nest is one that hatched 1 or more eggs.
** Total no. of chicks fledged divided by the total no. of territorial pairs that were monitored closely enough to get fledging data for, even if fledging or breeding success for those pairs was zero.

1999 NEST LIST

m

Nest	Location	Found (#)	Complete	Exclosed	Exp. Hatch	Hatch Date	Fledge (#)	Notes	
NS-1	1 N of 5	4/25 (1)	2-May	4-May	30-May	30-May	6/24 (2)		
NS-2	S of 1	4/28 (1)	5-May	4-May	2-Jun	31-May	6/25 (3)		
NS-3	post 5	4/30 (3)	2-May	4-May	30-May	28-May	—	predated May 29	
NS-4	post 4	5/2 (4)	<= 4/30	4-May	<=5/28	30-May	—	predated May 30	
NS-5	1 N of 3	5/2 (1)	5/8 (3)	11-May	<= 6/5	30-May	6/25 (3)		
NS-6	1 N of 4	5/6 (1)	9-May	10-May	6-Jun	6-Jun	7/1 (2)		
NS-7	1 N of 2	5/8 (3)	7-May	10-May	4-Jun	5-Jun	6/30 (2)		
NS-8	1st washover	5/17 (4)	<=5/17	18-May	<=6/14	12-Jun	7/6 (3)		
NS-9	2 posts N of 6	5/24 (1)	30-May	28-May	27-Jun	23-Jun	7/24 (2)		
NS-10	2 posts N of 7	5/24 (3)	25-May	25-May	22-Jun	20-Jun	7/16 (2)		
NS-11	1 post N of 6	5/26 (1)	31-May	1-Jun	28-Jun	26-Jun	7/26 (2)		
NS-12	2 posts N of 3	6/8 (3)	<=6/8 (3)	15-Jun	<=7/5	17-Jun	7/14 (2)		
NS-3B	1 1/2 posts N of 5	6/23 (4)	<=6/23	27-Jun	<=7/21	16-Jul	—		
NS-4B	1/2 post N of 4	6/30 (3)	<=6/30	4-Jul	<=7/26	16-Jul	8/15 (2)		
NS-13	1/2 post S of 4	7/3 (3)	<=7/3	4-Jul	<=7/29	27-Jul	8/22 (2)		
ONB-1	S of Pochet (south)	5/10 (3)	11-May	11-May	<=6/5	6-Jun	7/1 (2)		
ONB-2	S of Pochet (north)	5/11 (1)	5/ 18 (3)	18-May	15-Jun	--	—	washed over 5/18	
ONB-3	N of 1	5/11 (2)	15-May	17-May	12-Jun	6/10 (3)	7/12 (3)		
ONB-4	10 posts S of 2	5/11 (1)	16-May	17-May	13-Jun	6/12 (3)	7/10 (3)		
ONB-5	S of Pochet (mid)	5/20 (4)	<= 5/20	20-May	<= 6/17	6/13 (3)	7/11 (2)		
ONB-6	S of Pochet (+north)	5/26 (1)	31-May	1-Jun	28-Jun	--	—		
ONB-7	S of 4	6/7 (1)	15-Jun	15-Jun	13-Jul	10-Jul	—	chicks not seen after 2 days	

Pair Summaries for 1999

ONB-1
Found 5/10
Hatched 6/6
4 chicks 6/10
3 chicks 6/12
3 chicks 6/23
2 chicks 6/29
2 fledglings 7/2
1 fledgling 7/3
2 fledglings 7/11

ONB-2
Found 5/11
Washed over 5/18- abandoned

ONB-3
Found 5/11
Hatched 6/10- 1 egg failed
3 chicks 6/10
3 chicks 6/11
3 chicks 6/12
3 chicks 6/13
3 chicks 6/19
3 chicks 6/24
3 chicks 7/3
2 chicks 7/9
3 chicks 7/11
3 fledglings 7/12

ONB-4
Found 5/11
Hatched 6/12- 1 egg failed
3 chicks 6/13
2 chicks 6/19
2 chicks 6/24
3 chicks 6/25
3 chicks 6/27
3 fledged 7/10
3 fledged 7/11

ONB-5
Found 5/20
Hatched 6/13- 1 egg failed
2 chicks, 2 eggs 6/13
2 chicks 6/16
2 chicks 6/20
3 chicks 6/23
2 chicks 6/25
2 chicks 7/1
2 chicks 7/3
2 chicks 7/9
2 chicks 7/10
2 fledged 7/11
2 fledged 7/29

ONB-6
Found 5/26
Washed over 6/9- abandoned

ONB-7
Found 6/7
Hatched 7/10
4 chicks 7/10
3 chicks 7/11
Disappeared

NS-1
Found 4/25
Hatched 5/30
3 chicks 5/31
4 chicks 6/1
1 chick 6/4
2 chicks 6/15
2 chicks 6/20
1 fledged 6/24
2 fledged 6/26

NS-2
Found 4/28
Hatched 5/31
3 chicks 6/1
2 chicks 6/2
3 chicks 6/3
3 chicks 6/8
2 chicks 6/16
2 chicks 6/17
3 chicks 6/23
3 chicks 6/24
3 fledged 7/8

NS-3
Found 4/30
Hatched 5/28
3 chicks 6/1- 4 days old

NS-4
Found 5/2
Hatched 5/31
4 chicks 5/31
1 chick 6/1
1 chick 6/4- 5 days old

NS-5
Found 5/2
Hatched 5/30
3 chicks 5/31
1 chick 6/1
3 chicks 6/2
2 chicks 6/11
4 chicks 6/13
3 chicks 6/16
2 chicks 6/20
3 chicks 6/23
3 fledged 6/25
3 fledged 7/29

NS-6
Found 5/6
Hatched 6/6
2 chicks 6/8
2 chicks 6/11
3 chicks 6/20
2 chicks 6/29
2 fledged 7/11
2 fledged 7/29

NS-7
Found 5/8
Hatched 6/5
3 chicks 6/8
2 chicks 6/13
2 chicks 6/18
2 chicks 6/20
2 chicks 6/27
2 fledged 7/2
2 fledged 7/29

NS-8
Found 5/17
Hatched 6/12
4 chicks 6/12 (on pond side until 6/24)
4 chicks 6/13
4 chicks 6/14
4 chicks 6/20
4 chicks 6/23
3 chicks 6/24 (on ocean side)
3 chicks 7/1
3 fledged 7/7
3 fledged 7/11
1 fledged 7/31

NS-9
Found 5/24
Hatched 6/23
4 chicks 6/23
4 chicks 6/26
4 chicks 6/27
2 chicks 7/6
2 chicks 7/8
2 chicks 7/16
2 fledged 7/24

NS-10
Found 5/24
Hatched 6/20
4 chicks 6/20
4 chicks 6/23
2 chicks 6/26
2 chicks 7/2
2 chicks 7/16
1 fledged 7/31

NS-11
Found 5/26
Hatched 6/26
4 chicks 6/26
3 chicks 7/2
3 chicks 7/6

(NS-11 cont'd)
2 chicks 7/10
2 chicks 7/16
2 chicks 7/23
2 chicks 7/25
2 fledged 7/30

NS-12
Found 6/8
Hatched 6/17 –(3 eggs only)
3 chicks 6/19
3 chicks 6/20
3 chicks 6/25
3 chicks 6/28
2 chicks 7/3
2 chicks 7/12
2 fledged 7/15
2 fledged 7/29
2 fledged 7/31

NS-3B
Found 6/23
Hatched 7/16
4 chicks 7/17
3 chicks 7/18
2 chicks 7/23
1 chicks 7/25—9 days old

NS-4B
Found 6/30
Hatched 7/16 (3 eggs only)
3 chicks 7/16
3 chicks 7/17
3 chicks 7/23
3 chicks 7/24
3 chicks 7/30
2 chicks 8/1
2 chicks 8/12
2 fledged 8/15

NS-13
Found 7/3
Hatched 7/27 (3 eggs only)
3 chicks 7/28
3 chicks 7/30
3 chicks 7/31
2 chicks 8/1
3 chicks 8/12
2 fledged 8/22

Year: 1999

Site Name: Nauset Spit

Town: Orleans

Ownership: Town

Observer/Agency: Kerry Collier and Anne Resnick

Address: Orleans Park Dept.
Bay Ridge lane
Orleans

Telephone: (508) 240-3775

Census Results:	Index Count	Total Count
No. of Pairs	12	13
Unpaired Adults	–	–

Census Remarks:

Month	Average # of visits to site per week
April	5
May	6
June	7
July	5

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

Exclosure Design	A	B	C
Shape	Circular w/wings	Circular w/no wings	
Diameter/Length of Side	10'	same	
Size of Wire Mesh	2" x 4"	same	
Height Above Ground	3'	same	
Depth Buried	4"	same	
Cover Material	netting	same	
Cover Spacing/Mesh Size	½" x ½"	same	

Other Management Undertaken or Needed/Remarks: No dogs allowed on beach. No pedestrians or vehicles within 50 feet of nest or 15 Feet of toe of dune. Area closed to ORV's 2 days before expected hatch date. Symbolic Fencing around entire nesting area.

OrleansCCP page a140

Site Name: Nauset Spit Year: 1999 Observer: Anna Resnick & Kerry Collier

Page 1 of 2

Pair No.	Nest No.	Number of Eggs/Chicks: Laid	Hatched	Fledged	Date clutch was: Found (#eggs?)	Completed	Hatched or Failed	Exclosure: Y/N	Design(A,B,...)	Date Installed
NS-1	1	4	4	2	4/25 (1)	5/2	H 5/30	Y	A	5/4
NS-2	1	4	4	3	4/28 (1)	5/5	H 5/31	Y	A	5/4
NS-3	1	4	4	Ø	4/30 (3)	5/2	H 5/28	Y	A	5/4
NS-4	1	4	4	Ø	5/2 (4)	≤4/30	H 5/30	Y	A	5/4
NS-5	1	3	3	3	5/2 (1)	5/30	H 5/30	Y	A	5/11
NS-6	1	4	4	2	5/6 (1)	5/9	H 6/6	Y	A	5/10
NS-7	1	4	4	2	5/8 (3)	5/7	H 6/5	Y	A	5/10
NS-8	1	4	4	3	5/17 (4)	≤5/17	H 6/12	Y	B	5/18
NS-9	1	4	4	2	5/24 (1)	5/30	H 6/23	Y	A	5/28
NS-10	1	4	4	2	5/21 (3)	5/25	H 6/20	Y	B	5/25

Nest No.	Cause of Egg Mortality/Evidence	Cause of Chick Mortality/Evidence
		NS.3 - unknown predation 5/29 NS.4. unknown predation 5/30

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

Year: 1999

Site Name: Nauset Spit

Town: Orleans

Ownership:

Observer/Agency:

Address:

Telephone:

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

Census Remarks:

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

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

Exclosure Design	A	B	C
Shape			
Diameter/Length of Side			
Size of Wire Mesh			
Height Above Ground			
Depth Buried			
Cover Material			
Cover Spacing/Mesh Size			

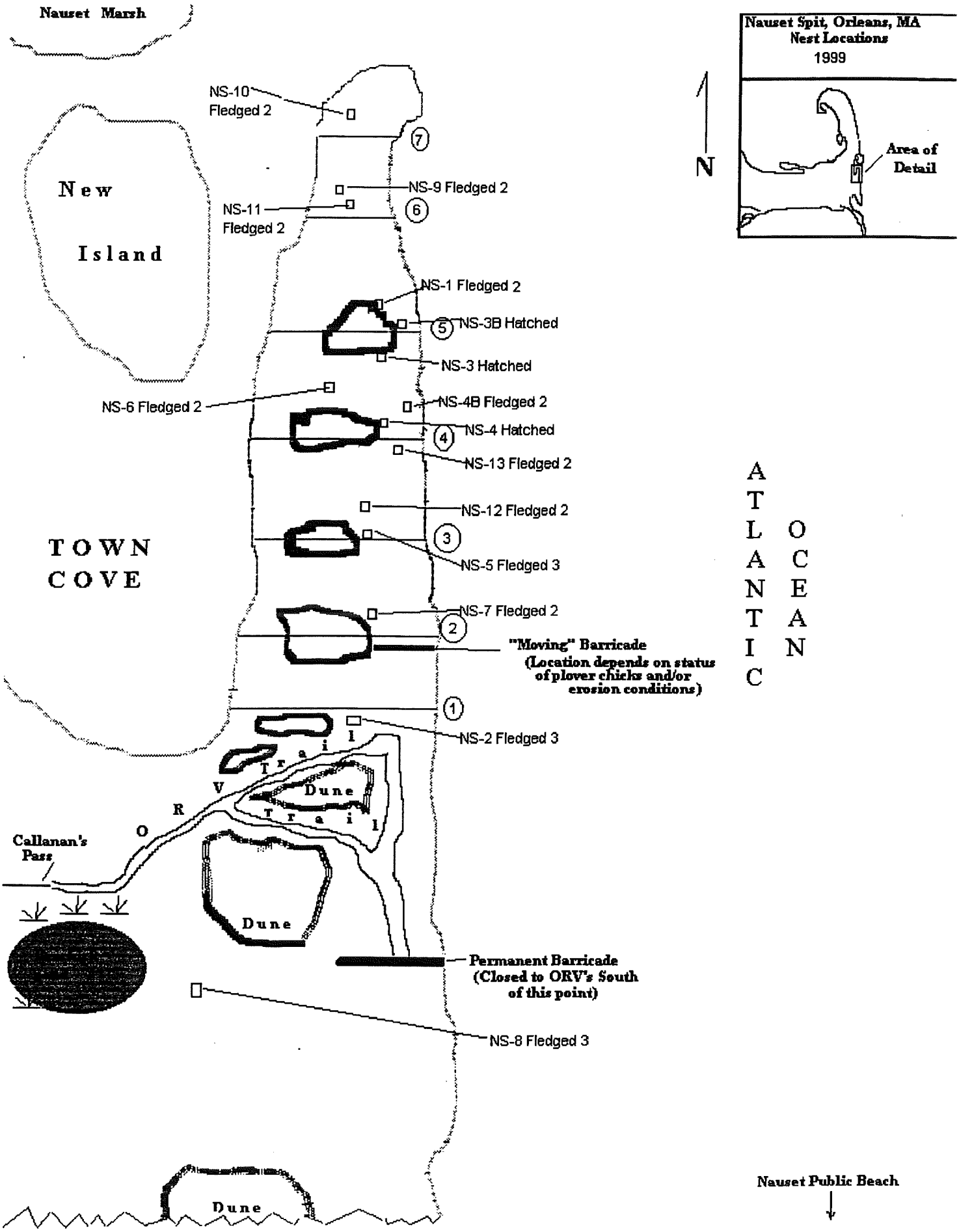
Other Management Undertaken or Needed/Remarks:

Year: [illegible] Observer: [illegible] / Terry Collier

Pair No.	Nest No.	Number of Eggs/Chicks: Laid	Hatched	Fledged	Date clutch was: Found (#eggs?)	Completed	Hatched or Failed	Exclosure: Y/N	Design(A,B,...)	Date Installed
NS-11	1	4	4	2	5/26 (1)	5/31	H 6/26	Y	B	6/1
NS-12	1	3	3	2	6/8 (3)	≤ 6/8	H 7/17	Y	B	6/15
NS.3B	2	4	4	0	6/23 (4)	≤ 6/23	H 7/16	Y	B	6/27
NS.4B	2	3	3	2	6/30 (3)	≤ 6/30	H 7/16	Y	B	7/4
NS.13	1	3	3	2	7/3 (3)	≤ 7/3	H 7/27	Y	B	7/4

Nest No.	Cause of Egg Mortality/Evidence	Cause of Chick Mortality/Evidence
		NS.3B. 3 chicks predated 7/16, 1 chick predated 7/19. Cause unknown

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


Nauset Marsh
Nauset Spit, Orleans, MA
Nest Locations
1999
Area of Detail
N
New Island
TOWN COVE
NS-10 Fledged 2
NS-9 Fledged 2
NS-11 Fledged 2
NS-1 Fledged 2
NS-3B Hatched
NS-3 Hatched
NS-6 Fledged 2
NS-4B Fledged 2
NS-4 Hatched
NS-13 Fledged 2
NS-12 Fledged 2
NS-5 Fledged 3
NS-7 Fledged 2
"Moving" Barricade
(Location depends on status of plover chicks and/or erosion conditions)
NS-2 Fledged 3
ATLANTIC OCEAN
Trail
Dune
Trail
VROO
Callanan's Pass
Dune
Permanent Barricade
(Closed to ORV's South of this point)
NS-8 Fledged 3
Dune
Nauset Public Beach

12

Year: 1999

Site Name: Orleans North Beach

Town: Orleans

Ownership: Town

Observer/Agency: Anna Resnick + Kerry Collier

Address: Orleans Park Dept.
Bay Ridge Lane

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	5
May	6
June	7
July	5

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

Exclosure Design	A	B	C
Shape	circular w/ wings	circular w/o wings	
Diameter/Length of Side	10'	10'	
Size of Wire Mesh	2" x 4"	2" x 4"	
Height Above Ground	3'	3'	
Depth Buried	4"	4"	
Cover Material	netting	netting	
Cover Spacing/Mesh Size	½" x ½"	½" x ½"	

Other Management Undertaken or Needed/Remarks: Dogs allowed on leashes. Symbolic Fencing around each nest. No pedestrians or vehicles within 50 feet of nest or 15 feet from toe of dune.

Orleans HCP Page 146

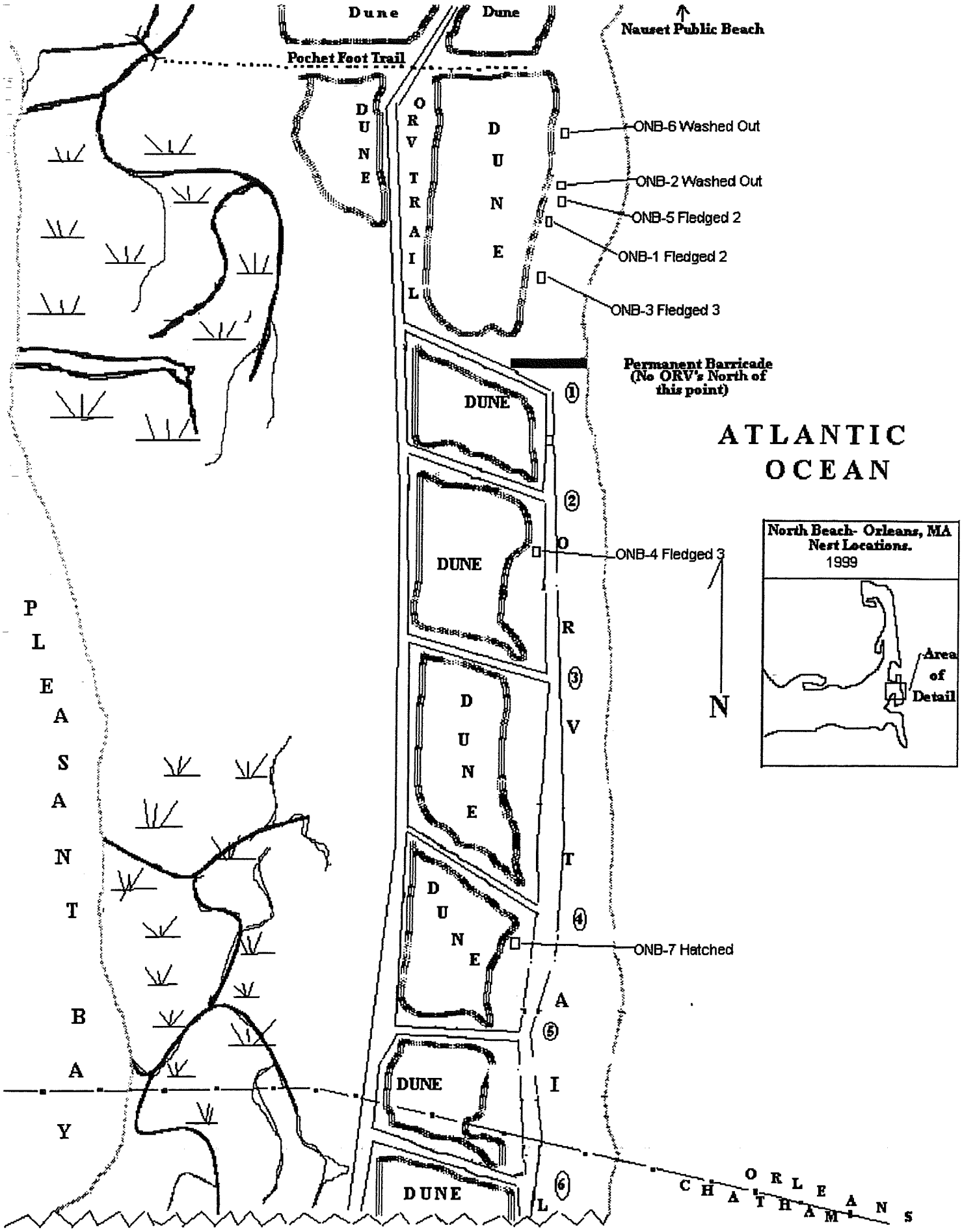
[illegible] Year: [illegible] Observer: [illegible]

Page____of_____

Pair No.	Nest No.	Number of Eggs/Chicks: Laid	Hatched	Fledged	Date clutch was: Found (#eggs?)	Completed	Hatched or Failed	Exclosure: Y/N	Design(A,B,...)	Date Installed
ONB-1	1	4	4	2	5/10(3)	5/11	H 6/6	Y	A	5/11
ONB-2	1	3	Ø	Ø	5/11 (1)	5/18	F 5/18	Y	B	5/18
ONB-3	1	4	3	3	5/11 (2)	5/15	H 6/10	Y	A	5/17
ONB-4	1	4	3	3	5/11 (1)	5/16	H 6/12	Y	B	5/17
ONB-5	1	4	3	2	5/20 (4)	≤5/20	H 6/13	Y	B	5/20
ONB-6	1	4	Ø	Ø	5/26 (1)	5/31	F 6/9	Y	B	6/1
ONB-7	1	4	4	Ø	6/7 (1)	6/14(3)	H 7/10	Y	B	6/15

Nest No.	Cause of Egg Mortality/Evidence	Cause of Chick Mortality/Evidence
ONB-2	washed over 5/18/high tide line 2" above nest	ONB-7 - chicks not seen after 7/11.
ONB-6	washed over 6/9/high tide line 2' above nest	

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


Dune
Dune
Nauset Public Beach
Pochet Foot Trail
DUNE
ORV TRAIL
DUNE
ONB-6 Washed Out
ONB-2 Washed Out
ONB-5 Fledged 2
ONB-1 Fledged 2
ONB-3 Fledged 3
Permanent Barricade (No ORV's North of this point)
DUNE
ATLANTIC OCEAN
DUNE
ONB-4 Fledged 3
North Beach- Orleans, MA Nest Locations. 1999
Area of Detail
N
PLEASANT BAY
DUNE
DUNE
ONB-7 Hatched
DUNE
DUNE
ORV TRAIL
ORLEANS
CHATHAM

HUK · MELVIN YOUNG

Massachusetts Tern Census Form

1999

15

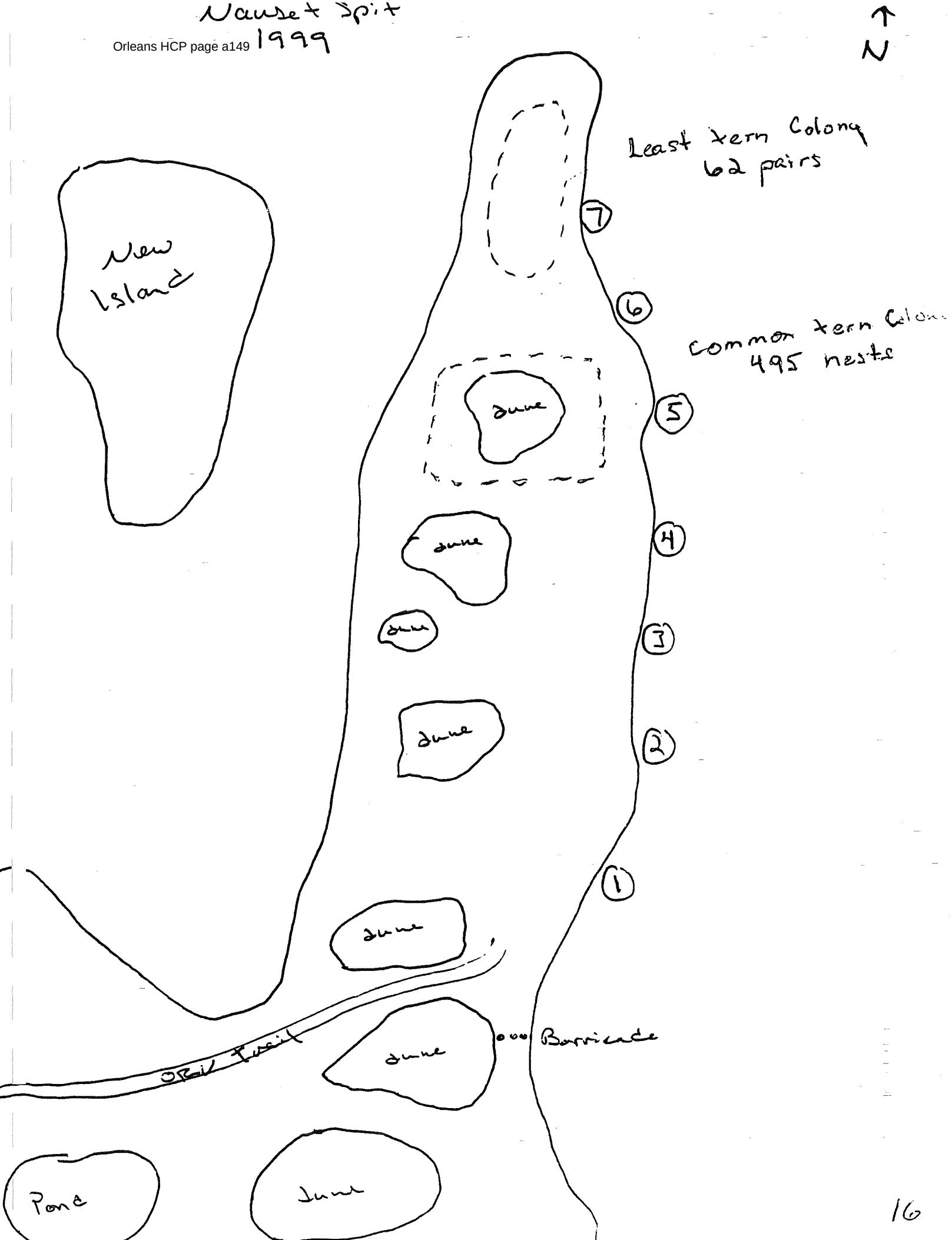
Colony Name: Nauset Spit	**Observer/Agency:** Anna Resnick / Kerry Collier, Park Dept.
Colony Number: 352009	**Street:**
Town: Orleans	**Town:**
Ownership: Town	**Zip:** **Telephone:** (508) 240-3775

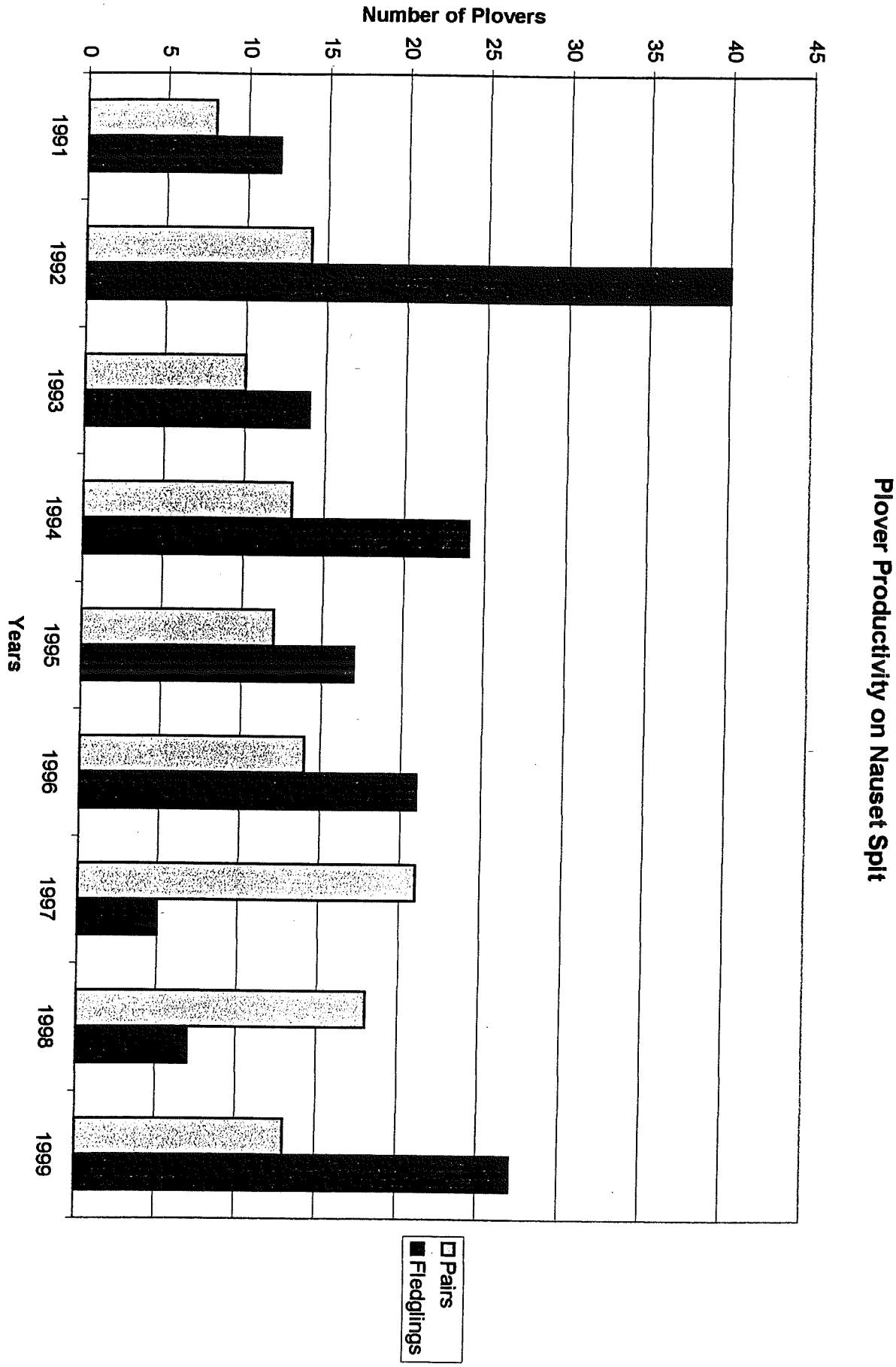
***PLEASE read the instructions on the reverse of this form before filling out.

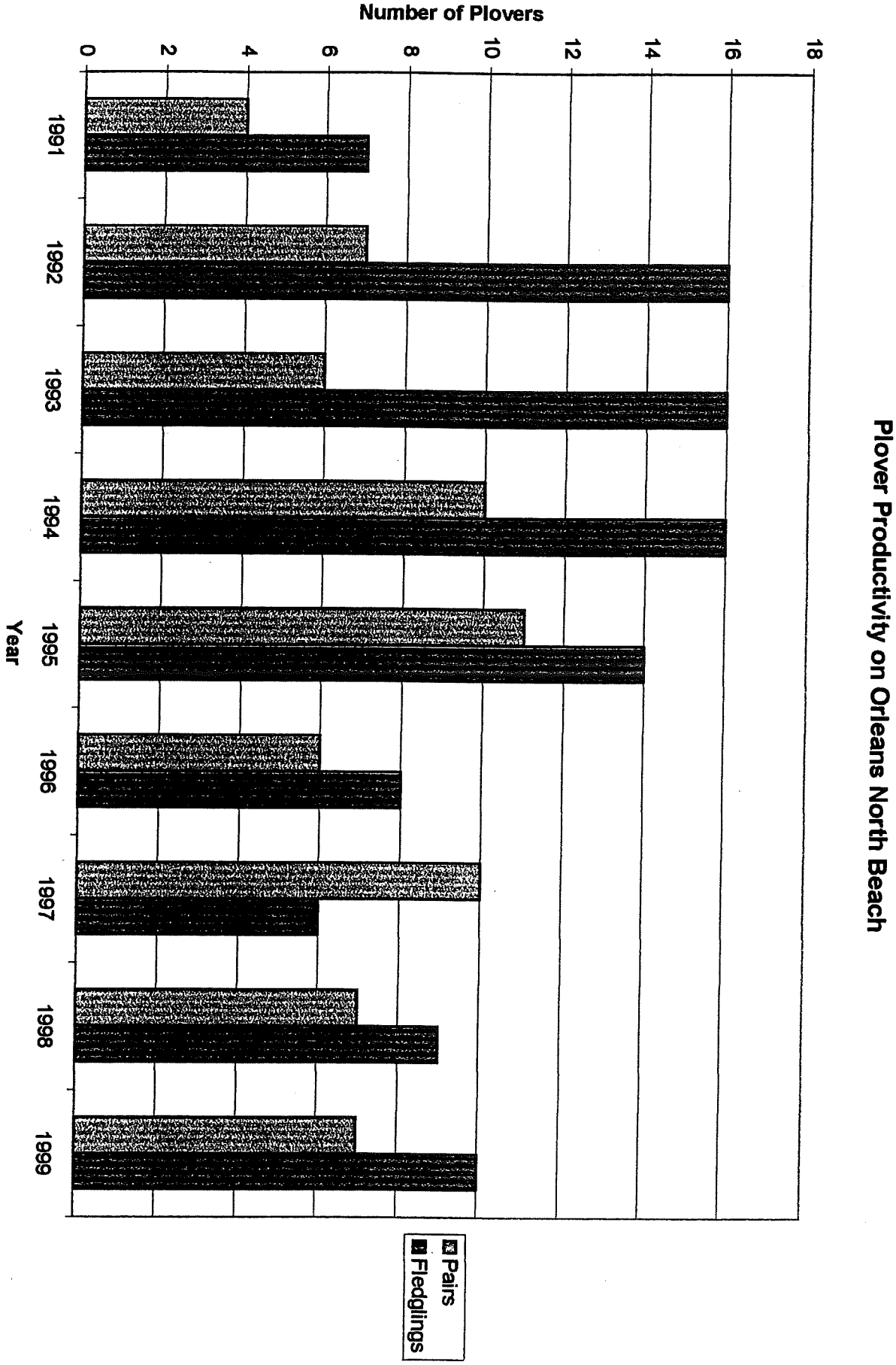
Species Code	A-Count				B-Count				P	Remarks: (e.g., evidence of predation, tide or storm washout, human disturbance, etc.) *INDICATE (if known) DATE OF FIRST EGGS LAID AND FIRST EGGS HATCHED.
	Date	No. Pairs	M	Q	Date	No. Pairs	M	Q		
ROST										
COTE	6/15	495	NC	HC						
ARTE										
LETE	6/15	62	AC	HC						
LAGU										
BLSK										
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 Rt. 135, Westborough, MA 01581-3337. Telephone: (508)792-7270 x152 / Fax: (508)792-7275 / Internet address for electronic filing: bblodget@state.ma.us

Nauset Spit 1999




Plover Productivity on Nauset Spit
Number of Plovers
0
5
10
15
20
25
30
35
40
45
1991
1992
1993
1994
1995
1996
1997
1998
1999
Years
Pairs
Fledglings


Plover Productivity on Orleans North Beach
Number of Plovers
0
2
4
6
8
10
12
14
16
18
1991
1992
1993
1994
1995
1996
1997
1998
1999
Year
Pairs
Fledglings