United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Field Office
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Concord, New Hampshire 03301-5087

REF: Formal Consultating 04-001 (F) October 20, 2004

M.E. Landry
Captain, U.S. Coast Guard
Marine Safety Office
U.S. Coast Guard
20 Risho Avenue
East Providence, RI 02914

Dear Captain Landry:

This document transmits the U.S. Fish and Wildlife Service's (Service) 1) biological opinion based on our review of the actions directed by the U.S. Coast Guard (Coast Guard) in response to the April 27, 2003 Bouchard B120 spill in Buzzards Bay, Massachusetts, and 2) the emergency consultation on the effects of the response actions on the federally-listed threatened Northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*), threatened piping plover (*Charadrius melodus*), endangered American burying beetle (*Nicrophorus americanus*) and endangered roseate tern (*Sterna dougallii*). The biological opinion and emergency consultation are provided in accordance with Section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1536, *et seq*.).

Procedures for satisfying the consultation requirements of the Act during emergencies can be found at 50 CFR part 402.05. These regulations define emergencies as "situations involving acts of God, disasters, casualties, national defense or security emergencies, etc." During such incidents, consultations may proceed informally to accommodate the need for expeditious exchange of information and recommendations to minimize or avoid adverse effects on listed species. This expedited exchange between the Service and the action agency is considered the emergency consultation. As soon as practicable after the emergency is under control, the action agency is required to initiate formal consultation if listed species have been adversely affected.

During the B120 spill emergency consultation, the Service consulted with the Coast Guard to assess the likelihood of adverse effects to listed species from response activities. We concurred with the Coast Guard that response actions were not likely to adversely affect the Northeastern beach tiger beetle due to protective measures implemented shortly after the spill. However, we determined that response activities were likely to adversely affect the piping plover and roseate tern and advised the Coast Guard of the need to consult formally as required by Section 7 of the Act and the regulations guiding emergency consultation. Communications between our agencies

regarding the procedural aspects of formal consultation for the B120 oil spill are summarized below. The substance of our emergency consultation, including a brief description of the basis for the above effects determinations, is provided in the DESCRIPTION OF THE ACTION section of the biological opinion.

Your request to initiate formal consultation was received on March 28, 2004. This biological opinion is based on information from the following sources: the Biological Evaluation (BE) for the B120 oil spill (Coley and McCollough 2004), Incident Action Plans, correspondence, meetings and telephone calls between our agencies, Wildlife Unit updates, and field reports and investigations by Service staff and contracted plover and tern monitors. A complete administrative record of this consultation is on file at this office.

Consultation History

In addition to the following specific communications and meetings, information between the Service's New England Field Office (NEFO) endangered species biologists and Coast Guard staff was relayed by a combination of telephone conversations, electronic communications and indirect contact via the Federal Response Coordinator (FRC).

Telephone Communications and Meetings:

April 27, 2003 – Acting on behalf of the Federal On-Scene Coordinator, Steve Lehmann, National Oceanic and Atmospheric Administration (NOAA), notified Andrew Raddant, Department of the Interior (DOI), about the oil spill and discussed implications on listed species.

April 28, 2003 – Unified Command Post established at Coast Guard Air Station Cape Cod. Response personnel arrive; informal consultation under section 7 of the ESA begins with discussions between USCG and Service personnel.

May 5, 2003 – Scott Lundgren, Coast Guard, consulted with Paul Nickerson, Service, for authorization of cleaning procedures in the vicinity of piping plover nests.

May 6, 2003 – Telephone conversation between S. Lundgren, Coast Guard, and Susi von Oettingen, NEFO, discussing cleanup efforts on piping plover beaches. Discussion included requests for cleanup crews to avoid fenced and roped areas and for monitors to work through the wildlife coordinator and not go directly to the cleanup crew when issues arise; coordination for recommendations for cleanup activities to go through the State On-Scene Coordinator.

May 7, 2003 – S. Lundgren, Coast Guard, drafted memo outlining cleanup procedures for the oil spill based on May 6, 2003 discussions.

May 6 and 7, 2003 – Meeting at Ram Island between Michael Amaral, NEFO, ENTRIX employees, Coast Guard personnel, Randy Henry and Carolyn Mostello, Massachusetts Division of Fisheries and Wildlife (MADFW).

May 6-8, 2003 – Site visit to Ram Island by M. Amaral, NEFO, where cleanup activities were observed and hazing was performed.

May 8, 2003 – Meeting between S. Lundgren, Coast Guard, and S. von Oettingen, NEFO, to begin coordinating informal Section 7 consultation. Meeting was a follow-up to May 6, 2003 telephone conversation. Discussed logistics of developing environmental documentation in preparation for initiating formal consultation and determination of effects of response activities on piping plovers, roseate terns and Northeastern tiger beetles.

May 8, 2003 – Meeting between S. Lehman, NOAA, S. von Oettingen and M. Amaral, NEFO, and other state and Service staff to discuss draft cleanup endpoints for piping plover and roseate tern beaches developed by NOAA.

May 15, 2003 – Meeting between S. Lundgren and Travis Coley, Coast Guard, and S. von Oettingen, NEFO, to discuss consultation process, information needed for formal consultation, and review of previous coordination between agencies to minimize effects of the response on endangered species. Field trip to some plover beaches to observe response activities.

May 27, 2003 – Meeting between state and federal agencies, including Coast Guard, Service and Responsible Party (RP) representatives to discuss breaching Allens Pond and recommendations to minimize and avoid adverse effects to piping plovers from the breaching operations and other response activities, in particular, use of vehicles and heavy equipment at Little Beach/Barneys Joy when plover chicks might be present.

May 28, 2003 – NEFO provided recommendations for vehicle restrictions during response activities in a memorandum to the RP, NOAA and FRC.

June 25, 2003 – NEFO provided recommendations to the RP on final beach cleanup procedures.

July 8, 2003 – Meeting at Mattapoisett between NEFO staff M. Amaral and Vanessa Johnson, C. Mostello, MADFW, and other trustees.

July 8, 2003 – Site visit to Ram Island and Penikese Island by M. Amaral and V. Johnson, NEFO, C. Mostello, MADFW, other trustees and ENTRIX.

July 8, 2003 – NEFO reviewed the Barney's Joy road restoration plan and provided recommendations to the RP.

July 8, 2003 – NEFO forwarded electronically to the RP, Service, concurrence that realignment of symbolic fencing at Barney's Joy was not likely to adversely affect nesting piping plovers.

August 21, 2003 – Email to Paul Nickerson, Service, and NEFO staff M. Amaral, S. von Oettingen and Andrew Major, from Tim Fannin, Service, asking for input regarding the criteria used to measure a sufficient level of cleanup.

August 26, 2003 – Coast Guard and NEFO discuss preparation of, and information needs for, the Coast Guard's biological evaluation in a conference call.

September 19, 2003 – Conference call between NEFO, Coast Guard, and NOAA staff to discuss the biological assessment timeline, information needed to complete the biological assessment, and "reasonable and prudent measures" to be taken. S. Lundgren, Coast Guard, provided follow-up memo (electronically) on September 23, 2003.

November 4, 2003 – S. von Oettingen, NEFO, and Chuck Angil, Coast Guard, met to review Coast Guard files to research site-specific response activities for the B120 spill.

January 16, 2004 – Staff from the Coast Guard and Service met to discuss "lessons learned" from the B120 spill and develop recommendations to assure improved interagency coordination during oil spill response activities that may affect listed species.

February 19, 2004 – Summary of January 16, 2004 meeting and draft "lessons learned" provided by S. Lundgren, Coast Guard, in electronic memorandum.

February 25, 2004 – Email to M. Amaral, NEFO, from Ian C. T. Nisbet, Roseate Tern Recovery Team member, in response to oil spill review.

March 28, 2004 –Coast Guard requests to initiate formal Section 7 consultation.

BIOLOGICAL OPINION AND EMERGENCY CONSULTATION

The focus of this biological opinion will be limited to those sites <u>where oil spill response activities adversely affected federally-listed species</u>. The biological opinion addresses the effects of response actions only; it does not address the effects of oil on the biological resources.

DESCRIPTION OF THE ACTION

On April 27, 2003, the Bouchard No. 120 fuel barge apparently struck bottom in Buzzards Bay, Massachusetts and released approximately 55,000 gallons of no. 6 fuel oil through an 11-12" fracture in its hull. Within 24 hours, an oil slick approximately ten miles long and two miles wide was observed in the Bay (Fig. 1). Because the barge was towed for an estimated ten miles before stopping and unloading the remaining oil, wind and currents moved the released oil throughout Buzzards Bay, primarily north, northwest and northeast of the spill. Roughly 90 miles of shoreline were oiled to some degree; levels of oiling ranged from thickly-oiled areas of beach and rocky shoreline to pancake-sized oil slicks and tar balls. Additional details on the spill and how it occurred are found on pages three and four of the Biological Evaluation for the Response to Bouchard 120 Buzzards Bay Oil Spill (BE).

The response was conducted using the Incident Command System (ICS) under a Unified Command. The Unified Command consisted of the Federal On-Scene Coordinator (FOSC) from the U.S. Coast Guard Marine Safety Office Providence, a State On-Scene Coordinator (SOC) from the Massachusetts Department of Environmental Protection (MADEP), and an RP representative for Bouchard Transportation Company, owner of the fuel barge.

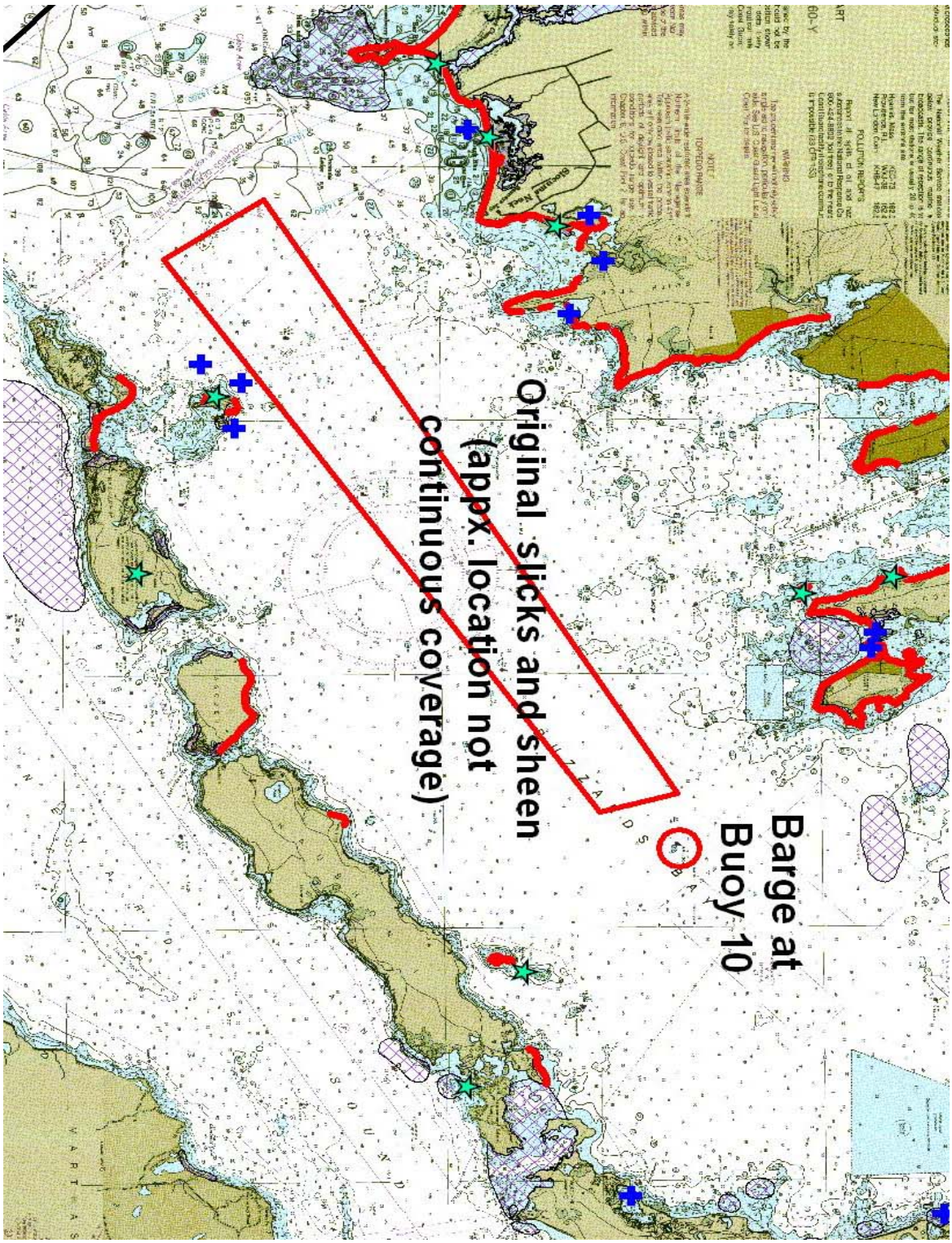

Fig. 1. Location of B120 oil spill.

Incident response was accomplished by a multi-organization team organized by the ICS and operated under the leadership and objectives set by the Unified Command. Daily Incident Action Plans (IAPs) served as the documents that guided response activities during the first two weeks of the spill, after which multiple-day IAPs guided the response activities. Response activities focused on minimizing the amount of oil released from the barge, protecting sensitive environments, cleaning up recoverable oil, and rehabilitating oiled wildlife.

In order to systematically develop appropriate response activities for the 90 miles of shoreline affected in Buzzards Bay and beyond, the shoreline was divided into 15 labeled segments. The 15 segments were further subdivided into 149 individual shoreline segments for additional detail. Shoreline Cleanup Assessment Teams (SCAT) routinely surveyed the segments, recorded the amount of oil observed and relayed the information to the Unified Command. This information was then used to direct response activities.

Under Operations, a Wildlife Unit was formed to assess impacts to wildlife resources, develop recommendations to minimize or avoid adverse effects to listed species from response operations, and coordinate the recovery and rehabilitation of oiled wildlife. The wildlife unit was comprised of the Service, the MADFW, Tri-State Bird Rescue (wildlife rehabilitator), and various non-governmental cooperators. The Wildlife Unit initially met daily and subsequently less regularly as spill response activities and spill impacts diminished. During these meetings, the Wildlife Unit was joined by the SOC, the RP and occasionally the Coast Guard, NOAA, and the Buzzards Bay Project (a technical assistance and planning unit of the Massachusetts Coastal Zone Management Program). Specific recommendations to minimize or avoid adverse effects on listed species were forwarded to the Unified Command and generally acted upon within 24 to 48 hours.

On September 1, 2003, the Unified Command Post was deactivated because the level of residual oiling requiring cleanup activities was reduced to the point that it was determined that the Incident Command Post was no longer necessary. After September 1st, under the Massachusetts Commonwealth Contingency Plan, 310 CMR 40.0000, the Commonwealth of Massachusetts took over the responsibility for identifying beaches with oil, coordinating appropriate response activities, and determining when beaches were considered clean. Therefore, the biological opinion only addresses response activities occurring between April 28 and September 1, 2003.

Emergency Consultation

Shortly after the Service was notified of the spill, its Oil Spill Coordinator notified the FOSC that three federally-listed species occurred in the spill area: the endangered roseate tern (*Sterna dougallii*), the threatened piping plover (*Charadrius melodus*), and the Northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*). Known locations for these species were mapped and response actions occurring on these beaches and islands were coordinated with the Service through the Wildlife Unit. Response actions included those intended to prevent the release of oil from the vessel, the recovery or cleanup of released oil, and the prevention of released oil from reaching specific areas or sensitive resources. A summary of the response activities occurring in endangered species habitat follows. Greater detail on the overall response activities coordinated by the FOSC is found on pages 9 and 10 and Table 1 of the BE.

- Aircraft operations: Aircraft, primarily helicopters, were used only in a very limited capacity, primarily during the early stages of the spill and response to survey the affected shoreline and conduct assessments of beach conditions and the distribution of oil.
- Water-based operations: Boats were used to transport response crews, SCAT and high-pressure hot wash systems (HotSy). One landing area on Ram Island (roseate tern nesting area) was designated by the MADFW to limit adverse impacts. Snare and boom were deployed off-shore via boat or placed along the shore to collect oil.
- Beach operations: Personnel monitored the distribution of oil and wildlife, collected oiled wildlife, assessed cleanup efforts and conducted cleanup operations. Cleanup operations included the use of all-terrain vehicles, heavy construction equipment (front end loaders, excavators), mechanical washing systems, manual removal of oil (shoveling, raking, bagging wrack and debris), placement and collection of sorbent material (snare) and at times, involved large numbers of response personnel.
- Upland operations: At least one staging and storage area was established near a known piping plover beach. Pedestrian access from the staging area led through nesting piping plover habitat. In addition, a temporary road initially constructed to allow vehicle and heavy equipment to access the beach bisected occupied piping plover habitat. The road was later moved away from nesting plovers as the season progressed.

<u>Conservation measures implemented to reduce adverse effects</u>
The Service, Coast Guard, MADFW and NOAA worked cooperatively to develop and implement measures to reduce and avoid adverse effects from the oil as well as from response activities. The following is a summary of the conservation measures.

Piping plovers and Northeastern beach tiger beetles
Traditionally, piping plovers are monitored for productivity on all Massachusetts and Rhode Island beaches. Management and monitoring of plover beaches are generally undertaken by trained biologists hired by the landowner (municipalities or state and federal agencies) or provided by non-governmental organizations. In eastern Rhode Island and the Buzzards Bay area, three groups, The Nature Conservancy of Rhode Island, the Lloyds Center for Environmental Studies, and the Massachusetts Audubon Society monitor almost all plover beaches. Biologists generally visit the sites, collect data on nesting activity and reproductive success three to four times weekly, and employ protective measures such as symbolic fencing and placement of predator exclosures around plover nests.

Within 48 hours of the spill, the Service and the MADFW, with the concurrence of the Unified Command, began to implement a number of protective measures to minimize and/or avoid take of piping plovers and Northeastern beach tiger beetles. These measures included:

- daily monitoring of piping plovers on almost all beaches and increased plover monitor presence during response activities;
- symbolic fencing of piping plover and Northeastern beach tiger beetle habitat to manage response activities within sensitive habitat areas and to prevent or minimize disruption to nesting plovers;
- prohibiting access of motorized equipment and restricted access by responders in symbolically-fenced areas;

- reducing speeds for motorized vehicles;
- facilitating direct communication between monitors and oil spill response site supervisors to avoid or correct unanticipated disturbance to plovers;
- rerouting access roads away from nesting plovers and their broods at Barneys Joy beach;
- closure of the inlet to Allens Pond to prevent oiling of nesting and feeding plover and shorebird habitat and subsequent breaching to increase salinity and avoid flooding of plover nests;
- round-the-clock monitoring of piping plover chicks at Barney's Joy to identify any observable adverse effects as soon as possible and take appropriate measures to avoid or minimize those effects; any indication of disturbance or loss of visual contact with the chicks would have required the immediate cessation of work.

Roseate terns

On July 13, 2001, the Coast Guard, NOAA, Massachusetts biologists, Service biologists, and several members of the roseate tern recovery team met in Buzzards Bay, Massachusetts. At this meeting, information was provided to NOAA and the Coast Guard regarding the areas within Buzzards Bay most in need of protection to ensure the conservation of endangered roseate terns.

As with piping plovers, all roseate tern (and common tern) nesting sites in Massachusetts are monitored. In Buzzards Bay, where there are currently two important tern colonies, Bird and Ram Islands, biologists employed by or under contract to the MADFW visit tern colonies on a daily basis or at a minimum, several times per week. A third Buzzards Bay island, Penikese Island, was historically one of the largest roseate tern nesting colonies in the North Atlantic (Table 1A, USFWS 1998). Biologists typically obtain information on numbers and distributions of nesting terns, reproductive success and productivity, band nestlings and some adults, undertake small-scale habitat enhancements, and respond to and document predation events.

Within 48 hours of the spill, in accordance with the recommendations of the Service and the MADFW, the Unified Command began to implement a number of protective measures to minimize and/or avoid take of roseate terns. These measures included:

- identification of Ram and Bird Islands as protection priorities and initial protection strategies were developed on April 28 and 29. Federal, state and private tern biologists were consulted;
- deployment of absorbent snare around Bird, Ram and a portion of Penikese Islands;
- on-site and aerial evaluation of degree of oiling of both terns and tern nesting habitat at the three island colonies;
- on-site monitoring during response activities and development of recommendations to minimize oiling of unoiled areas by the cleanup response teams and unnecessary disturbance to terns;
- installation of fencing and other means to restrict access of cleanup crews to upland, tern nesting habitat;
- initiation of hazing on Ram Island (on or about May 3) to prevent terns nesting, roosting, bathing and loafing in oiled areas;
- initiation of measures to attract nesting terns to Penikese and Bird Islands;
- daily monitoring of terns and cleanup response activities at all three colonies.

STATUS OF THE SPECIES

Piping plovers
The BE provides additional life history information on piping plovers on pages 15 through 17. The following is a summary of general life history information and distribution.

Piping plovers are small, sand-colored shorebirds approximately seven inches long with a wing span of approximately 15 inches (USFWS 1996). In 1985, the Service listed the piping plover under the Act, as amended, and recognized three distinct populations: the Atlantic Coast population listed threatened, the Great Lakes population listed endangered, and the Northern Great Plains population listed threatened (USFWS 1985). Critical habitat was designated for the wintering population of all piping plover populations in 2001 (USFWS 2001), encompassing 137 areas from North Carolina to Texas.

Atlantic Coast piping plovers breed on coastal beaches from Newfoundland to North Carolina (and occasionally in South Carolina), and winter along the Atlantic Coast from North Carolina south, along the Gulf Coast, and in the Caribbean (USFWS 1996). In general, piping plovers begin returning to their Atlantic Coast nesting beaches in mid-March (Cross 1990; Goldin *et al*. 1990; MacIvor 1990; Hake 1993; USFWS 1996). Piping plovers have been documented to return as early as March 15 in Massachusetts. By early April, males begin to establish and defend territories and court females (USFWS 1996). Piping plovers are monogamous, but usually shift mates between years (Wilcox 1959; Haig and Oring 1988; MacIvor 1990), and less frequently between nesting attempts in a given year (Haig and Oring 1988; MacIvor 1990; Strauss 1990). Plovers are known to breed at one year of age (MacIvor 1990), but the rate at which this occurs is unknown.

Clutch size is usually four eggs, and eggs are usually incubated for 27-28 days before hatching. Piping plovers generally fledge only a single brood per season, but may re-nest several times if previous nests are lost.

Upon hatching, precocial[1] piping plover chicks may move hundreds of yards from the nest site during their first week of life. Adults lead the chicks to and from feeding areas, shelter them from harsh weather and protect young from perceived predators. K. Jones (1997) studied home ranges of piping plovers at the Cape Cod National Seashore in Massachusetts and observed that most broods moved an average of 500m from their nests after hatching and before fledging. Two plover families with chicks within 16 to 21 days old were found to forage up to 1,000m from their nests. Plover broods have also been observed to move up to 1,600m from their nest and back in one day, and have moved maximum distances of more than 4,000m before fledging (Jones 1997).

Chicks remain together with one or both parents until they fledge at 25 to 35 days of age. Depending on the date of hatching, unfledged chicks may be present on beaches from late May through mid-August, although most have fledged by late July or early August.

[1] Precocial birds are mobile and capable of foraging for themselves within several hours of hatching.

Piping plovers nest above the high tide line on coastal beaches, sandflats at the ends of sandspits and barrier islands, gently sloping foredunes, blowout areas behind primary dunes, sparsely vegetated dunes, and washover areas cut into or between dunes. Feeding areas include intertidal portions of ocean beaches, washover areas, mudflats, sandflats, wrack lines, and shorelines of coastal ponds, lagoons or salt marshes (USFWS 1996).

Loss and degradation of habitat due to development and shoreline stabilization have been major contributors to the species' decline. Disturbance by humans and pets often reduces the functional suitability of habitat and causes direct and indirect mortality of eggs and chicks. Predation has also been identified as a major factor limiting piping plover reproductive success at many Atlantic Coast sites, and substantial evidence shows that human activities are affecting types, numbers, and activity patterns of predators, thereby exacerbating natural predation (USFWS 1996).

Inasmuch as pressure on Atlantic Coast beach habitat from development and human disturbance is unrelenting, the recovery of the Atlantic Coast piping plover population is occurring in the context of extremely intensive management that is annually implemented on almost all plover beaches. Since being listed, the Atlantic Coast population has doubled from approximately 800 pairs to an estimated 1625 pairs in 2003 (USFWS 2004), while the U.S. portion of the population has more than doubled from approximately 550 pairs to an estimated 1,400 pairs. The initial increase between 1986 and 1989 is attributed to increased survey efforts, especially in two states, whereas any increase after 1989 is a reflection of increased management and protection (USFWS 2003).

Status – Rangewide and Recovery Unit

To facilitate an even distribution of the Atlantic Coast piping plover population for recovery purposes, four recovery units were developed: Atlantic Canada, New England, New York-New Jersey, and Southern. Current information indicates that most Atlantic Coast piping plovers nest within their natal region, that regional population trends are related to regional productivity, and that intensive regional protection efforts contribute to increases in regional piping plover numbers (USFWS 1996). However, at least some dispersal is ongoing within the Atlantic Coast piping plover population; therefore, recovery units do not represent biologically distinct population segments under the Act (USFWS 1996).

Since 1989, the New England recovery unit increased by 480 pairs, the New York-New Jersey recovery unit gained approximately 211 pairs, the Southern (DE-MD-VA-NC) recovery unit gained on average four pairs and the Atlantic Canada recovery unit gained approximately 23 pairs.[2] In general, New England productivity is either equal to or higher than other recovery units, although estimated productivity in 2003 was the second lowest recorded for this unit (USFWS 2004). Inclement weather and increased predation on both adults and their young are primarily believed to be responsible for the decreased productivity.

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[2] The discussion on recovery unit gains for 2003 is based on preliminary data and may be subject to revision.

The Revised Recovery Plan for the Atlantic Coast piping plover (USFWS 1996) identified a recovery objective for delisting the species, as well as five criteria for meeting the recovery objective. The overall objective is to ensure the long-term viability of the Atlantic Coast plover population in the wild. Delisting of the Atlantic Coast piping plover population may be considered when the following criteria have been met:

- increase and maintain for five years a total of 2,000 breeding pairs, distributed among four recovery units;
- verify the adequacy of a 2,000-pair population of piping plovers to maintain heterozygosity and allelic diversity over the long term;
- achieve a five-year average productivity of 1.5 fledged chicks per pair in each of the recovery units;
- institute long-term agreements to assure protection and management sufficient to maintain the population targets and average productivity in each recovery unit;
- ensure long-term maintenance of wintering habitat, sufficient in quantity, quality, and distribution to maintain survival rates for a 2,000-pair population.

The New England Recovery Unit target is a minimum of 625 pairs. In 2003, there were approximately 686 pairs of piping plovers in New England with an average productivity of "1.19 chicks per pair (USFWS 2004). Although the population goal for the New England Recovery Unit has been met, the average productivity has declined in recent years and is now below the 1.5 chicks/pair threshold needed to maintain a secure population.

Five non-jeopardy formal consultations have been written for projects within the New England Recovery Unit. Most of the consultations were with the U.S. Coast Guard for marine event permits for fireworks events in coastal areas of Connecticut and Massachusetts (Table 1). One consultation was written for the U.S. Army Corps of Engineers for maintenance dredging and disposal of dredged material on plover habitat. Allowable incidental take was rarely reached and never exceeded.

Table 1. Previous biological opinions completed for piping plovers in New England

Year	Project	Incidental Take		Project Completed
		Amount/Extent of Take	Documented	
1997	Fireworks (Connecticut)	4 pairs of plovers and their broods/Harassment	No mortality or loss of productivity	Yes
1997	Fireworks (Massachusetts)	2 pairs of plovers/Harassment	No mortality or loss of productivity	Yes
1999	Beach nourishment/dredging (Maine)	2 pairs no productivity/harassment and mortality of young for the life of the project	1 pair 2002, no young, 1 pair 2003, 1 young	Yes, effects are ongoing
2000	Fireworks (Massachusetts)	1 egg /Mortality 4 broods/Harassment	No mortality or loss of productivity	Yes
2003	Fireworks (Connecticut)	2 pairs of plovers/Harassment	No plovers present during event	Yes

Roseate Terns

The BE provides life history information on roseate terns on pages 13 through 15. The following is a summary of general life history information and distribution, excerpted primarily from the Roseate Tern Recovery Plan, Northeastern Population (USFWS 1998).

The roseate tern is a medium-sized sea tern about 15 inches long (including tail streamers up to eight inches) and weighs about four ounces. Its plumage superficially resembles that of the common tern, among which it invariably nests in the Northeast. On November 2, 1987, the Service determined the population that nests in the Northeast to be endangered, and that in the Caribbean to be threatened.

The known breeding and winter distribution of roseate terns in the northeastern portion of the western hemisphere is as follows: Birds breed from Long Island, New York, east and north to Nova Scotia and Quebec (Iles Madeleines). Historically, the breeding range extended south to Virginia and North Carolina. In recent decades, the breeding range has contracted and the population has become concentrated in Massachusetts and New York, with smaller colonies in Connecticut, New Hampshire and Maine.

The basic breeding biology of the roseate tern is as follows: Adults return to nesting colony sites in April, and begin egg laying in mid-to-late May. Typically, two eggs are laid and the incubation period lasts 23 days. Young tern chicks are fed small fish by both adults and grow rapidly. Re-nesting is common if the first clutch of eggs is lost. By mid-August, most terns have completed nesting and leave colony sites for pre-migratory staging areas. About 20 post-breeding staging areas have been identified around Cape Cod, Massachusetts, and South Beach and the Monomoy Islands appear to be among the most important locations for roseates prior to fall migration (Trull *et al*. 1999).

After feeding for a matter of weeks, roseate terns migrate south through the West Indies to winter off the northern and eastern coasts of South America. The winter quarters are not fully known but recent work by Hays *et al*. (1997 and 1999) documented concentrations of wintering birds along the Brazilian coast. A roseate tern recovered at Mangue Seco, Bahia, Brazil set a longevity record for the species at 25.6 years (Hays *et al*. 1999).

The roseate tern is exclusively marine, usually breeding on small islands, but occasionally on sand dunes at the ends of barrier beaches. All recorded nestings in the Northeast have been in colonies of common terns. Within these mixed colonies, roseate terns usually select the more densely vegetated areas (Burger and Gochfeld 1988) or other areas that provide dense cover. Unlike most other temperate zone terns, roseate terns usually nest under or adjacent to objects that provide cover or shelter (Nisbet 1981). These objects include clumps of vegetation, rocks, driftwood, or other man-made objects. Plants utilized for cover include beach grass (*Ammophila breviligulata*), seaside goldenrod (*Solidago sempervirens*), lambs quarter (*Chenopodium alba*), beach pea (*Lathyrus japonica*), and mustard (*Brassica* sp.). At some colony sites, vegetation grows to a height of 1-2 meters over the nesting sites during the breeding season, providing concealment for the eggs and chicks, but sometimes impeding access by the adults. At other colony sites, roseate terns nest under rocks, sometimes deep within crevices of rock riprap placed to protect island slopes from erosion. They readily adopt artificial sites such as nest boxes or

partially-buried automobile tires (Spendelow 1982, 1994). Nests typically are 60 to 180 centimeters apart and density is sometimes as high as two or three nests per square meter within patches of suitable cover (Nisbet 1981; Burger and Gochfeld 1988).

Foraging Habitat During the Breeding Season

During the breeding season, roseate terns forage over shallow coastal waters, sometimes near the colony and at other times at distances of over 20 miles (32 km) (Heinemann 1992). Roseates tend to concentrate in places where prey fish are brought close to the surface, either by predatory fish pursuing them from below or by vertical movement of the water. Hence, they usually forage over shallow bays, tidal inlets and channels, tide-rips and sandbars over which tidal currents run rapidly (Nisbet 1981; Duffy 1986; Safina 1990; Heinemann 1992; Casey, Kilpatrick and Lima, unpubl. data, 1996 USFWS). Roseate terns usually feed in clearer and deeper water than those favored by common terns from the same colony sites, and do not typically feed close to shore.

Status and Recovery Objectives

The numbers of roseate terns nesting in the Northeast were greatly reduced in the 19th century by commercial hunting for the millinery trade. With the cessation of market hunting, the population recovered and by the 1930s, there were about 8,500 pairs. However, encroachment by gulls and habitat loss reduced numbers to a low of about 2,500 pairs in 1977. In the past 15 years, the total estimated breeding population has fluctuated in the range of about 2,750 pairs to 4,300 pairs. During this period, the breeding population has exhibited about a 20% increase in the number of nesting pairs. Roseate terns have delayed maturity but are long-lived birds (Spendelow *et al*. 2002) and appear capable of maintaining relatively stable populations from year to year. (Spendelow *et al*. 2002). The greatest annual fluctuation in roseate breeding pair numbers recorded between 1988-2003 was a 19% drop from 2000 to 2001 (Table 2).

Table 2. Estimated "total season" nesting pairs of roseate tern in the Northeastern U.S.

Year	1988	1989	1990	1991	1992	1993	1994	1995
No. pairs	3332	3164	3332	3718	3072	3400	3527	3633
Year	1996	1997	1998	1999	2000	2001	2002	2003
No. pairs	3596	3980	4271	4284	4926	4012	3781	4129

While roseates are now known to nest at about 20 different sites, they remain vulnerable because only small numbers of pairs occur at most colonies. In 2003, only six nesting colonies supported more than 100 pairs and more than 90% of the total population in the Northeast breeds on just five islands. Concentrated at so few nesting sites, the North Atlantic population of the roseate tern is susceptible to stochastic events, including erosion of nesting habitat, storms and over-washing of nests, predation, oil spills and human disturbance. In addition, the roseate tern breeding population is numerically and geographically reduced from historic levels.

USFWS (1998) indicates that reclassification of the roseate tern from endangered to threatened should be evaluated when the northeast nesting population achieves the following criteria:

- increase to 5,000 or more pairs, with high productivity (1.0 young per pair for five years)
- the pairs occur in six or more colonies of > 200 pairs
- the six colonies are distributed across the geographic range

Delisting can be considered when, in addition to the above, the number of roseate tern nesting colonies has been expanded to 30 or more sites and the breeding range has been expanded to include historically-occupied areas south of the current range (USFWS 1998).

Only one prior biological opinion has been prepared involving roseate terns in the North Atlantic. In 1998, we submitted a non-jeopardy biological opinion to the U.S. Army Corps of Engineers for a shoreline protection project at Falkner Island, Connecticut. An unspecified level of incidental take was identified[3] and phase 1 of the project was completed in 2000. Approximately nine roseate terns (one adult and eight chicks) are suspected of being "taken" (died as a result of entrapment in the revetment) (Spendelow and Kuter 2001). It appears unlikely that phase 2 of the project will be built (W. Kolodnicki, USFWS, pers. comm.).

Analysis of the species affected

During the first few weeks of the oil spill, the Service and the Unified Command worked cooperatively to modify response actions to minimize or avoid adverse effects to piping plovers, roseate terns and Northeastern beach tiger beetles without compromising the ability to clean oiled shoreline. As a result, the Service and the Coast Guard determined that some response activities *adversely affected* piping plovers and roseate terns, primarily by harm or harassment of these species. However, response activities were determined *not likely to have adversely affected* the Northeastern beach tiger beetle and the American burying beetle.

Only one oiled beach in the action area (Westport Beach) has a known Northeastern beach tiger beetle population. The response activity was primarily directed toward manual cleaning of the beach, including removal of oil, oiled sand, wrack and debris. Hand digging and mechanical removal were used to remove buried oil. ATV use was documented. No information was available on numbers of cleanup crews at this site.

The Northeastern beach tiger beetle population at Westport Beach was rediscovered in 1994 when approximately 200 beetles were documented. Since then, the population has precipitously declined; in 2002 and 2003, between zero and three adult beetles were observed during surveys in July and August. Protective measures, including symbolically-fencing tiger beetle larval habitat (see page 7) to prevent crushing larvae and destruction of winter larval habitat by motorized vehicles, were implemented before concerted cleanup activities occurred. Although a few larvae may have been present near the high tide line (moving out of winter habitat to summer habitat), adverse effects were considered to be discountable (not expected to occur). The limited ATV use (most was restricted to below the high tide line) most likely did not crush larval burrows, given the low numbers of beetles present and the extent of available larval habitat not driven on or otherwise altered during response activities. Adverse effects to adult tiger beetles were avoided since adults were not present during response activities (they are present in mid-July through mid-August).

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[3] In 1998, about 3% of the roseates in the North Atlantic breeding population nested on Falkner Island; therefore, the vast majority of roseates were unaffected by the project.

The endangered American burying beetle was reintroduced to Penikese Island during the period 1990-1993 by the Service and the State of Massachusetts (Amaral *et al.* 1997). Annual or semi-annual surveys since the reintroduction program confirm that the species persists on the island in relatively low numbers. Since the American burying beetle is a terrestrial species and is not generally associated with the shoreline or habitats below mean high water, it is unlikely that it was affected by the spill response. No critical habitat has been designated for the burying beetle, therefore none was adversely affected.

ENVIRONMENTAL BASELINE

Status of the species within the action area

As defined in 50 CFR 402.02, "action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies in the United States or upon the high seas. The "action area" is defined as all areas to be affected directly or indirectly by the federal action, and not merely the immediate area involved in the action. The direct and indirect effects of the actions and activities resulting from the federal action must be considered in conjunction with the effects of other past and present federal, state, or private activities, as well as the cumulative effects of reasonably certain future state or private activities within the action area.

The BE defined the action area as the "area affected by the oil spill and the associated federal actions in response to the oil spill". This area encompasses the shorelines of Buzzards Bay, Massachusetts and portions of shoreline in Rhode Island. The westernmost extent of the action area includes the coast of Rhode Island from Sakonnet Point in Little Compton east to Buzzards Bay. The easternmost extent of the action area is the Cape Cod Canal entrance near the Massachusetts Maritime Academy in the village of Buzzards Bay, Massachusetts. The vast majority of occupied piping plover and, to a lesser extent, roseate tern habitat within Buzzards Bay was oiled and received some level of cleanup activity. A detailed description of the general action area is found on page three of the BE.

Piping plover

Approximately 26 beaches that are either extant or historic for piping plovers are located within the action area of the B120 oil spill. Of these 26 beaches, piping plovers were documented to have nested at 13 sites in 2003 (although not all sites on the Elizabeth Islands were checked), of which 12 were oiled and subjected to cleanup activities (Table 3). Table 1 of the BE provides detailed information on the response activity and productivity for plover nesting sites within the action area. Based on information provided by the IAPs, personal observations, monitoring reports and Coast Guard notes, response activities may have adversely affected up to 55 piping plovers on 12 sites in Buzzards Bay.

Table 3. Piping plover population and productivity within the action area between 2003 and 2001 (oiled sites in bold).

Location	Number of pairs/chicks fledged[4]		
	2003[5]	2002	2001
Stony Point Dike, Wareham	5 pairs/4 chicks	4 pairs/4 chicks	2 pairs/3 chicks
Long Beach, Wareham	0 pairs/0 chicks	1 pair/0 chicks	0 pairs/0 chicks
Little Harbor Beach, Wareham	1 pair/4 chicks	1 pair/4 chicks	0 pairs/0 chicks
Strawberry Point, Mattapoisett	0 pairs/0 chicks	0 pairs/0 chicks	0 pairs/0 chicks
West Island, Fairhaven	0 pairs/0 chicks	0 pairs/0 chicks	0 pairs/0 chicks
Winsegansett Heights, Fairhaven	0 pairs/0 chicks	0 pairs/0 chicks	0 pairs/0 chicks
Round Hill Beach, Dartmouth	2 pairs/0 chicks	1 pair/1 chick	0 pairs/0 chicks
Salters Pond, Dartmouth	1 pair/0 chicks	1 pair/0 chicks	0 pairs/0 chicks
Demarest Lloyd State Park, Dartmouth	3 pairs/4 chicks	4 pairs/11 chick	2 pairs/6 chicks
Little Beach/Barney's Joy, Dartmouth	14 pairs/16 chicks	10 pairs/9 chicks	10 pairs/14 chicks
Gooseberry Neck, Westport	2 pairs/0 chicks	2 pairs/4 chicks	1 pair/2 chicks
Horseneck Beach, Westport[6]	13 pairs/7 chicks	16 pairs/11 chicks	14 pairs/29 chicks
Acoaxet, Westport	0 pairs/0 chicks	0 pairs/0 chicks	0 pairs/0 chicks
Cockeast Pond, Westport	2 pairs/6 chicks	2 pairs/4 chicks	1 pair/1 chick
Richmond Pond, Westport	0 pairs/0 chicks	1 pair/3 chicks	1 pair/1 chick
Bay Point, Swansea	0 pairs/0 chicks	0 pairs/0 chicks	0 pairs/0 chicks
Naushon Island	No data	1 pair/1 chick	1 pair/4 chicks
Pasque Island (3 sites)	4 pairs/No data	1 pair/no data	0 pair/0 chicks
Nashawena Island (2 sites)	No data	3 pairs/no data	3 pairs/0 chicks
Cuttyhunk Island	No data	1 pair/no data	1 pair/4 chick
Quicksand Pond/Goosewing, Little Compton (RI)	9 pairs/10 chicks	7 pairs/14 chicks	7 pairs/6 chicks
Briggs Beach, Little Compton (RI)	9 pairs/5 chicks	7 pairs/9 chicks	5 pairs/9 chicks
Block Island, New Shoreham (RI)	1 pair/3 chicks	1 pair/0 chicks	1 pair/0 chicks
Action area average productivity	**0.95**	**1.17**	**1.61**

Factors affecting the environment within the action area

Piping plovers nest on private- and government (municipal, state and federal)-owned beaches in Buzzards Bay. Most of these beaches are heavily used for recreation during the summer months when plovers are present and breeding. In 1994, the Service developed guidelines (USFWS 1994) for managing recreational activities on piping plover habitat in order to avoid violations of the Act. Management recommendations are focused on avoiding or minimizing take of nesting plovers from pedestrian activities and off-road vehicle use.

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[4] Number of pairs based on total counts provided by the MADFW annual summaries of piping plover census data (Mostello and Melvin 2002, Melvin and Mostello 2003).

[5] Preliminary data (S. Melvin, MADFW, pers. comm., 2004).

[6] This location comprises Horseneck Beach State Reservation, Bakers Beach, Cherry-Webb Beach and Westport Town Beach and is monitored by the Massachusetts Audubon Society and the Lloyd Center for Env. Studies.

Massachusetts state guidelines (Massachusetts Division of Fisheries and Wildlife 1993) for managing piping plovers have been in place since 1993, although intensive management of beaches was initiated prior to their publication. Management at most sites in the state now conforms to both state and federal guidelines. All current nesting beaches and most historical or potential sites are censused each year, and more than 70% of the major sites are monitored at least three times per week during periods of nesting and brood-rearing. Since 1995, estimates of productivity were obtained for more than 95% of all breeding pairs in the state.

On most Massachusetts beaches where nests are potentially threatened by pedestrian activities, nests are protected with buffers delineated by symbolic fencing and warning signs. Additionally, some nests are protected with wire predator exclosures. Within the action area, a number of nests are not exclosed at locations where predators have keyed into exclosures in the past and caused increased predation of eggs, chicks, and occasionally adults. Management of off-road vehicles at nearly all major beaches in Massachusetts conforms to most components of state and federal guidelines. Beginning in early April, and extending until the first egg hatches, off-road vehicles are restricted by the guidelines to discrete travel corridors along the outer edges of suitable plover nesting habitat. The guidelines call for sections of beach where unfledged plover chicks are present to be completely closed to recreational vehicles until chicks reach 35 days of age or are observed in flight. The Massachusetts Wetlands Protection Act is also an effective regulatory tool to protect plover habitat from degradation caused by off-road vehicles and dune building activities by requiring state-approved beach management plans.

Rhode Island beaches in the Buzzards Bay area are managed by the Service's Rhode Island National Wildlife Refuges Complex and The Nature Conservancy of Rhode Island according to the Service's guidelines. Symbolic fencing and signage is generally erected once plovers have established territories and begun scraping. Predator exclosures are used on a site-specific basis.

A primary management problem is dog control on plover beaches. Dogs disturb plovers and often prevent successful nesting by chasing adults and chicks and crushing eggs. Enforcement of town and state leash laws or dog prohibitions has been minimal at best. Westport Town Beach, Horseneck Beach State Reservation, Gooseberry Neck, Briggs Beach and Goosewing Beach are plover beaches with documented plover disturbance by dogs and blatant violation of leash laws and dog prohibitions.

Additional management challenges include illegal off-road vehicle use and increasing predation pressure. Recreational off-road vehicles are generally not allowed on beaches in Buzzards Bay; however, in 2003, one plover chick was run over by illegal ATV use in Westport (not associated with the spill). Predator control measures are rarely implemented due to restrictive state regulations, limited funding, or lack of support by the landowners.

Roseate Tern

Three important roseate tern nesting sites, Bird, Ram and Penikese Islands, and other associated tern habitats within Buzzards Bay (foraging, bathing, loafing, night roosting, etc.) were affected by the spill and consequently by the response to the spill. Roseate terns have also nested at a fourth location within the area affected by the spill response, Nashawena Island in the

Elizabethan Island chain. However, no roseates have nested at Nashawena since the late 1980s and early 1990s (USFWS 1998).

Roseates migrated north from their wintering areas and arrived in Buzzards Bay more or less concurrent with the advent of the spill on April 27. For example, on Bird Island, no terns were observed during a visit to the island on April 19 but both roseate and common terns were present on May 1 (Hatch 2003). On Ram Island, both species of terns were visiting the island by early May.

In the five-year period from 1999 to 2003, 42-49% of all roseate terns recorded at breeding colonies in the North Atlantic population nested at the three Buzzards Bay sites noted above. Accordingly, the Buzzards Bay roseate colonies play a vital role in both the survival and recovery of the species (Table 4). Critical habitat was not affected because no critical habitat has been officially designated for this species.

Table 4. Roseate tern nesting pairs and productivity (chicks fledged per pair) within the action area between 2001 and 2003.

Location	Numbers of pairs/productivity		
	2001	2002	2003
Bird Island, Marion, MA	1062/nd	505/1.02	904/1.25
Ram Island, Mattapoisett, MA	626/1.05	952/0.96	557/1.12
Penikese Island, Gosnold, MA	0/0	0/0	251/0.87
Nashawena, Island, Gosnold, MA	0/0	0/0	0/0

Survival and productivity of roseate terns in Buzzards Bay are influenced by a number of factors, including but not limited to weather (particularly storms), predation, competition for nest sites, human disturbance and food availability. The Buzzards Bay tern colonies are monitored on a nearly daily basis by tern biologists that also act as island wardens to minimize the potential for human disturbance by recreational boaters coming ashore. Tern biologists also provide structures for roseate terns to nest within or under. These structures sometimes alleviate competition for nest sites with common terns and minimize egg and chick loss to predation.

Tern researchers have long noticed a temporal variation in reproductive success. Previous studies by Nisbet (1981), Spendelow (1982) and Burger *et al.* (1996) have demonstrated that productivity of roseate terns at colony sites from Long Island Sound to Buzzards Bay, Massachusetts declines steadily with laying date during the breeding season. In addition, these studies show that the declines in productivity are reasonably consistent across different sites and years. In all studies, terns that laid eggs in mid-late May had higher productivity than those pairs that initiated egg-laying later in June.

Roseate tern nesting habitat on 1.5-acre Bird Island is deteriorating due to erosion and salt water intrusion through the 160-year-old revetment that surrounds and protects the island. The State of Massachusetts, the Town of Marion, the U.S. Army Corps of Engineers, and other interested parties are actively studying alternative ways in which the revetment and tern nesting habitat on the island can be restored.

EFFECTS OF THE ACTION

In evaluating the effects of the federal action under consideration in this consultation, 50 CFR 402.2 and 402.14(g)(3) require the Service to evaluate the direct and indirect effects of the action on the species.

A general description of response activities occurring within the action area is provided in the DESCRIPTION OF THE ACTION section (pages 4-8). Adverse effects from the response actions were site-specific, and depended on the number and distribution of piping plovers and roseate terns and the method and intensity of the response.

Piping plover
The following is a summary of each occupied piping plover site, the response activities that occurred and adverse effects that are attributed to the response. Maps of these sites are provided in Appendix A.

Stony Point Dike: Oiling and response activities were limited at Stony Point Dike and consisted primarily of manual oil removal, debris removal and the use of sorbent material. Response personnel ranged between 10 and 20 responders periodically through May and were limited to three to seven responders through June. Response activities likely **did not adversely affect** piping plovers at this site. The level of response was minimal and plover monitors did not observe disturbance to plovers from the manual removal of oil and debris.

West Island: This site did not have nesting piping plovers, however, intense response activities were initiated shortly after the spill occurred as piping plovers were returning to their summer breeding habitat. Response crews of 75 to 280 people manually removed oil and oiled debris in the first half of May; thereafter, numbers ranged from eight to 80 through June. Oiled rocks were cleaned with a hot wash system and buried oil on the beach was manually removed. ATVs were used to remove bagged debris and oil. Massachusetts Audubon Society and Lloyd Center plover monitors report that plovers may have attempted to nest at this site (at least one plover was observed), but were discouraged from nesting due to the concerted response activities (Bogart *et al*. 2003). Piping plovers may have been **adversely affected** by response personnel and equipment interrupting territory establishment and foraging, as well as repeatedly removing wrack, a valuable food source.

Round Hill Beach: This is a small site and generally only reports one to two pairs of plovers. Response activities primarily involved the manual removal of oil from the beach. Twenty to forty workers removed oil, oiled sand, wrack and debris through June 30th. Due to the limited habitat available to plovers, it is likely that the presence of cleanup crews removing oil and debris from the beach prevented the birds from foraging for some periods of time, and may have limited foraging opportunities by removing wrack, resulting in **adverse effects** to the birds (through harassment).

Salters Pond: There is limited piping plover habitat at this site; Salters Pond generally only supports one pair of plovers. Response activities focused on manual oil removal. Twenty to forty workers removed oil, oiled sand, wrack and debris through June 30th. Up to two booms were

used in the creek feeding into Salters Pond. Response activities **adversely affected** the plover pair, most likely by interrupting feeding and breeding behavior. The pair abandoned their nest and did not re-nest at the site, possibly due to disturbance from the response activities.

Demerest Lloyd State Park: Response activities were not well documented at this site. Apparently, manual removal of oil, oiled sand, wrack and debris was the primary response activity, especially in the early days of the spill. Some ATV use was observed by plover monitors and/or Service staff. Response activities most likely **adversely affected** nesting piping plovers by interrupting breeding and foraging behaviors.

Little Beach/Barney's Joy (includes Allens Pond): Response activities were more intense at this location than any other plover beach. Cleanup activities included the manual removal of oil, oiled sand, wrack and debris by 50 to 180 workers during the first month of the spill. By the end of June, response staff was reduced to two to three workers. Because of the severity of the oiling and the level of effort required to clean the beach and prevent additional oiling, a field tent and staging area were erected behind the dune line (additional information is provided on pages 16 and 17 of the BE) and an access road leading to the beach was constructed and later rerouted. Mechanical operations, including heavy equipment and ATVs, were consistently in use in occupied plover habitat through June 23rd. A hot wash system was unsuccessfully used to try to remove oil from rocks at Barneys Joy, after which mechanical washing systems were used to flush oil from sand within the rocky area. In order to prevent oiling of Allens Pond shortly after the spill occurred, the inlet to the pond was closed. One month later, the inlet was reopened due to rising water levels and falling salinity. Piping plovers were **adversely affected** by the response activities at this site. One pair was documented to have begun establishing a nesting territory prior to the spill [nest scrapes and courting behavior were observed prior to the spill (Gene Albanese, Massachusetts Audubon Society, pers. comm., 2003)], although the area had not been symbolically fenced. The pair abandoned the site shortly after cleanup crews, ATVs, and bagged oil debris were observed in the plover habitat. Some plovers apparently did not respond to cleanup activities occurring close by while other plovers were observed running away from responders, interrupting their foraging to move off to different foraging habitat and making distress calls at approaching responders. During the filling of the breach to Allens Pond shortly after the spill, observers documented a number of plovers responding to the presence of workers with alarm calls, disruption to feeding, moving off nesting territories and away from the work area. Monitors also reported cleanup crews within symbolically-fenced areas, trash bags blowing into fenced nesting habitat, bagged debris and tools placed on symbolic fencing, causing posts and twine to break, and accidental passage of an ATV within plover nesting habitat. The staging area may have become an attractant to predators due to the storage of refuse material, including food, oiled debris, and garbage associated with a large cleanup crew. Some bagged debris was left overnight on the beach, possibly attracting predators into plover habitat. Extensive and prolonged removal of wrack may also have affected foraging opportunities for plovers.

Gooseberry Neck: Response activity was primarily directed toward manual cleaning of the beach, including removal of oil, oiled sand, wrack and debris. The level of personnel varied from two to thirty people, however these numbers were determined from field observations, since there were no available records recording specific response activities for this site. Because the beach is very narrow, plovers were most likely disturbed by cleanup crews as they walked the

beach and removed oil and oiled debris. Therefore, piping plovers were **adversely affected** by the response activities, most likely as a result of interruptions to feeding and breeding behaviors, although the effects were limited in duration.

Horseneck, Bakers and Westport Beaches: Response activity was primarily directed toward manual cleaning of the beach, including removal of oil, oiled sand, wrack and debris, and lasted through mid-June. Hand digging and mechanical removal were used to remove buried oil. ATV use was documented. No information was available on numbers of cleanup crews at this site. Response activities **adversely affected** piping plovers. Monitors documented disturbance of adults by cleanup crews and at least two to three nests were abandoned with references to the potential cause being either predation and/or disturbance from response activities (Bogart *et al*. 2003; Melvin *in litt.* 2003). Although ample suitable habitat is available at this site, at least two pairs of piping plovers did not nest and moved between Horseneck and Westport Beaches, possibly due to disturbance from response activities (Sifleet 2003).

Cockeast Pond: Site-specific response activities were not documented, since the information on response activities was combined for Cockeast and Goosewing Beaches. Service and plover monitor observations documented ATV use and manual removal of oil, oiled sand, wrack and debris. At least five to 40 workers were observed during the course of the response. ATVs were driven with excessive speed and drivers were told on a few occasions to slow down by Service staff and monitors. Piping plovers were **adversely affected** by the response activities, most likely by interruption of feeding and nesting.

Goosewing Beach: Site-specific response activities were not documented, since the information on response activities was combined for Cockeast and Goosewing Beaches. Boom and snare were placed in the inlet to Quicksand and Tunipus Ponds. Service and plover monitor observations documented ATV use and manual removal of oil, oiled sand, wrack and debris. At least five to 40 workers were observed during the course of the response. Piping plovers were **adversely affected** by response activities. At least one nest may have been abandoned due to cleanup activities (Wiitala 2004); in addition, feeding and breeding behavior was most likely interrupted by cleanup crews and ATVs.

Briggs Beach: Site-specific information on response activities was unavailable. Plover monitors observed manual removal of oil, oiled sand, wrack and debris. Sorbent materials were reported to have been used. Piping plovers were **adversely affected** by the response activities, most likely by interruption of feeding and nesting. The effects were of short duration, since response crews were only present between May 7 and May 21.

Elizabeth Islands: Site-specific information on response activities was unavailable. The BE assumes that limited manual removal of oiled sand, wrack and debris occurred on oiled areas of the islands. Based on the limited response, limited shoreline oiling, and limited numbers of breeding piping plovers, we believe that the response activities were **not likely to have adversely affected** piping plovers.

In summary, response activities adversely affected piping plovers at all but two sites by interrupting or preventing foraging, breeding and roosting behavior, making potential habitat

physically or functionally unsuitable (by the presence of cleanup crews and storage of bagged debris and other materials), and removing a source of foraging habitat, the wrack line. Observations made by plover monitoring staff, state and Service biologists, and others indicate that plovers moved away from cleanup crew activities and blowing debris, often repeatedly in one day. Predator activity at these sites has been well documented in the past. However, there may have been increased predation at some sites, in particular the Allens Pond Complex and Westport Beaches, due to the amount of cleanup activity, including overnight storage of garbage on or near the beach and increased human presence during a time when recreational activity is generally low. Excluding the Rhode Island sites, 71% of all nest losses in the Buzzards Bay area were due to predation (Bogart *et al*. 2003), an increase of 45% from 2002. Dr. Scott Melvin (MADFW) observed that three of seven initial clutches at the Allens Pond Complex had only three eggs in their first clutch; normally, plovers have four-egg clutches early in the season (Melvin, pers. comm., 2003). Overall productivity of the Buzzards Bay sites was lower in 2003 than in 2001 and 2002 (Table 3). Some of the decrease in productivity is likely attributed to the effects of oiling (at one point, up to 80% of all plovers were oiled at some level), however, the effects of daily disturbance during the early initiation of territory establishment, courtship, copulation and nesting most likely decreased productivity by delaying breeding activities.

Roseate Tern

The effects of oil spill response activities on the roseate tern are summarized on pages 19 and 20 and in Table 1 of the BE. The following supplements that discussion and evaluates the effect of the response action in greater detail. Maps of the islands are provided in Appendix A.

The period of initial response to the B120 oil spill (April 28–September 1, 2003) overlapped with the spring return of roseate terns to Buzzards Bay, their courtship and nesting activities at Ram, Bird and Penikese Islands, and their post-breeding movements prior to fall migration. Thus, roseate terns were present during the spill response and in many of the locations where response activities took place.

In consultation with the Service and the MADFW, the Coast Guard identified Ram, Penikese and Bird Islands as protection priorities. Within 24 hours of the spill, reconnaissance revealed that Ram Island was heavily oiled, and shortly thereafter, Penikese Island was moderately oiled (Coley and McCollough 2004). Bird Island received very little oiling. Absorbent snare was deployed at all three islands. In general, oil spill response was commensurate with the degree of oiling at Ram and Bird Islands, but the cleanup response at Penikese Island, beyond the deployment and removal of snare, did not occur until June 2, 2003 (Coley and McCollough 2004).

The response to the Bouchard oil spill affected roseate terns in a number of ways, including inadvertent, periodic disturbance; direct purposeful hazing in order to keep terns from heavily oiled areas; forced displacement to less preferred nesting islands; delayed nesting; entanglement with response materials (snare); and physical degradation of habitat. Low flying aircraft and extensive motorboat operations resulted in short-term disturbance and displacement of roseate terns from resting, foraging and other preferred habitats. The presence of large cleanup crews and power equipment, such as pumps and hot water washers, contributed to the displacement of

roseates during the cleanup of Ram Island. From May 2 to May 30, crews ranging in size from 10 to 86 people were on Ram Island on a daily basis (Mostello *et al*. 2003).

Although Bird Island was only lightly oiled, snare deployed around the island absorbed oil and then came ashore when anchors failed and anchor lines broke (Hatch 2003).

One roseate tern became entangled in snare on Penikese Island on May 27. It was handled and released unharmed by tern biologists on the island. No effort was made to capture or pursue (oiled) roseate terns for rehabilitation purposes.

Due to the degree of oiling on Ram Island and the expectation that cleanup activities would be time-consuming, terns were hazed from settling on Ram Island. Hazing in this case was the purposeful harassment of terns attempting to return to nest at their preferred breeding site and was necessary to prevent large numbers of adult roseate and common terns from coming into contact with oil. Hazing on Ram Island occurred from May 3 to May 30, and appeared effective in keeping most terns from settling and breeding on the island until later in the hazing period, when they had likely become acclimated to the noise and light emitting devices. By then, Ram Island was substantially cleaner than when hazing began (M. Amaral, USFWS, pers. obs.).

The response action on Ram Island adversely affected nesting roseate terns in the form of disturbance and displacement, but prevented what would have been even more serious adverse effects to the terns from the oil (addressed under Beneficial Effects). The following analysis of the adverse effects of hazing at Ram Island on roseate tern nesting distribution and productivity was developed with input from the three recovery team members[7] most familiar with roseate tern nesting ecology in Buzzards Bay, Massachusetts. Additional information and assumptions upon which this effects analysis is based are found in Appendix B.

1. Displacement of Ram Island Nesting Roseate Terns

The total number of roseate terns nesting in Buzzards Bay in 2003 (1,712 pairs) increased 255 pairs, or 17.5%, from 2002 levels (1,457 pairs). We believe that hazing discouraged a substantial number of roseate terns (over 1,100 individuals) from nesting on Ram Island in 2003. Had the B120 oil spill not occurred, it is reasonable to assume that these additional 255 pairs would have been distributed on Ram and Bird Islands. Under this scenario, Ram Island would have supported 1,119 pairs in 2003, up from 952 pairs in 2002, and well above the 557 pairs (a 41% decline from 2002) that ultimately nested there in 2003. Similarly, Bird Island's roseate population, absent the spill, would have gained a modest 87 pairs in 2003 (for an estimated 593 pairs), instead of the 904 pairs that were recorded there in 2003. In addition to the decrease of nesting pairs on Ram Island and the increase of pairs on Bird Island, a substantial number of roseates nested on Penikese Island in 2003. The estimated number of roseate pairs displaced as a result of the hazing at Ram Island is 562 pairs (311 pairs to Bird and 251 pairs to Penikese).

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[7] The Service requested peer review of its preliminary draft take analysis from three members of the roseate tern recovery team, Dr. Ian Nisbet, Dr. Jeffrey Spendelow, and Carolyn Mostello, who declined comment. Doctors Nisbet and Spendelow provided substantive comments and assistance determining the estimated level of incidental take and their assistance is herein acknowledged.

Displacement of traditional Ram Island nesting roseate terns to other islands affected their productivity in 2003. This is believed to be due in part to competition with "resident" pairs for nesting space, greater predation at the "new" sites, and the lack of familiarity of displaced terns with nearby foraging sites. Available data indicates that the 251 pairs of "probable Ram Island roseates" that nested instead on Penikese Island experienced productivity in 2003 that was considerably lower (0.87 young fledged per pair) than on Ram Island (1.12 young fledged per pair). An additional 311 pairs of "probable Ram Island roseates" were displaced to Bird Island, where productivity was 1.25 young per pair in 2003, higher than at Ram Island in 2003, but likely would have been even higher but for the spill response.

2. Delayed Nesting and Effect on Productivity
Hazing at Ram Island also contributed to delayed nesting of Buzzards Bay roseate terns in 2003. Studies previously cited (Nisbet 1981, Spendelow 1982, and Burger *et al.* 1996) reported a temporal variation in breeding success, with productivity varying strongly with delayed egg laying. We estimate that the delay in nesting is likely to have reduced the productivity of the 557 pairs that ultimately nested at Ram Island, the 311 pairs that were displaced from Ram and relocated on Bird Island and the 251 pairs that moved to Penikese Island.

The combined "cost" of 1) displacement and 2) delayed nesting, in terms of fewer chicks produced in 2003, is further explained in Appendix B and enumerated in the Incidental Take section on page 27.

The oil spill response also affected roseate tern habitat. Ram Island is a small island (about 1.0 acre in size) with a very low profile to the sea. Portions of the island are subject to over-washing during storm events. The major cleanup action that occurred on the island involved removal of oil and a substantial, but unquantified amount of physical material, including wrack, dried eel grass, peat, drift debris, soil, sand and small rocks. Oiled rocks too large to remove from the island were scrubbed as best as possible and relocated (off island) from the upper beach to subtidal areas. The cleanup action physically reduced Ram Island and may have increased its vulnerability to over-wash in future storm events (M. Amaral, pers. obs., May 8, 2003).

Trampling by the large cleanup crew also impacted salt marsh vegetation (*Spartina alterniflora*) around the southern periphery of the island, further increasing the island's susceptibility to storms and erosion. Upon request by the MADFW, root plugs of salt marsh vegetation were planted as an emergency restoration action by ENTRIX on July 12-14 of 2003, however many of these plantings failed and unvegetated areas remained as of June 16, 2004 (V. Varela, USFWS, pers. comm., 2004).

Beneficial Effects
Although the response activities adversely affected piping plovers and roseate terns and resulted in some reduced productivity, the overall effect of the response action was to minimize and prevent oiling of plovers and roseate terns, their young and their habitat.

The majority of piping plovers were oiled to some extent. However, as the season progressed and the plovers preened their feathers, less oiled birds were observed. Response activities removing oil, oiled sand, and debris minimized the extent of re-oiling of plovers and reduced the likelihood

that chicks hatched later in the season would be oiled. In fact, relatively few chicks were observed to have been oiled. The removal of oiled wrack most likely eliminated important foraging habitat for piping plovers, especially if clean wrack was indiscriminately removed with contaminated wrack. However, removal of oiled wrack and debris also prevented the ingestion of oil and oiled prey items by feeding piping plovers.

The hazing of terns at Ram Island contributed to distributing the breeding population among the three islands, thereby reducing the concentration of the Buzzards Bay population on Bird and Ram Islands in 2003.[8] Hazing and other aspects of the oil spill response apparently did not affect the overall number of roseate terns nesting in Buzzards Bay, as there was an increase in total nesting pairs recorded among the islands from 2002 to 2003. Hazing also prevented a far greater harm to endangered roseate terns. Hazing almost certainly prevented many more roseate terns from becoming oiled, which could have led to their death, infirmity, or impaired reproductive performance (through transfer of oil from plumage to eggs).

Consultations initiated between the Service and the Coast Guard shortly after the spill occurred allowed the relatively swift implementation of Service recommendations to avoid or minimize impacts to plovers and terns. In particular, the ability to have information and recommendations flow directly between plover and tern monitors and cleanup crew management teams ensured that unanticipated impacts from cleanup activities were quickly addressed and remediated.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act.

Piping plover beaches in the action area are a mixture of publicly- and privately-owned land. On public beaches (Westport Town Beach, Horseneck Beach, Gooseberry Neck, Demarest Lloyd State Park), recreational activity is expected to increase annually, as residential units are expanded and tourism of the area is promoted. Furthermore, ongoing disturbance and predation (resulting from human activities attracting predators to the area) are likely to continue throughout the action area. With the escalating numbers of beachgoers and their pets, disturbance to breeding piping plovers is expected to increase. Currently, few sites have effective management plans in place, particularly on the smaller, privately-owned beaches (Salters Pond, Round Hill Pond, Cockeast Beach) and there is little-to-no enforcement of dog ordinances or leash laws. Therefore, it is expected that plover productivity will be adversely affected by the increasing recreational use of the Buzzards Bay beaches. One dredge and disposal project proposed by the

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[8] However, the improvement in the distribution from two to three islands was apparently short-lived. In the absence of hazing at Ram Island, only nine roseate pairs nested on Penikese in 2004 (J. Spendelow, BRD, pers. comm.).

U.S. Army Corps of Engineers for the Westport River and Westport Beach will be reviewed and consulted under Section 7 of the Act within the next two years. Future dredging and subsequent beach nourishment actions that may affect piping plovers will be addressed in future biological opinions.

No cumulative effects on roseate terns are anticipated.

CONCLUSION

After reviewing the current status of the piping plover and roseate tern, the environmental baseline for the action area, the effects of the action and cumulative effects, it is the Service's biological opinion that the response effort led by the Coast Guard *is not likely to have jeopardized* the continued existence of the piping plover or the roseate tern. To jeopardize the continued existence of a species is defined as an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and the recovery of a listed species in the wild by reducing reproduction, numbers, or distribution of that species (50 CFR §402.02). No critical habitat has been designated for these species in the action area, therefore none was affected.

The Service's conclusions are based on the following:

1. The Coast Guard implemented a number of protective measures to avoid or limit impacts associated with the response.
2. The overall effect of response activities on productivity is difficult to separate from the effect of the oil on piping plovers and their habitat. Although the productivity within the action area was less than the state-wide and geographical unit productivity, it is unlikely that the effect of the decline in productivity in the action area was likely to appreciably reduce the survival and recovery of the piping plover.
3. There was no observed loss of piping plover adults or chicks as a result of response activities.
4. There was no observable effect on the distribution of plovers resulting from response activities.
5. Successful hazing of roseate terns at Ram Island prevented substantial numbers of breeding age adults (the most important demographic group to roseate tern population persistence and recovery) from becoming oiled.
6. Overall numbers of roseate terns nesting in Buzzards Bay in 2003 increased from 2002, the preceding, pre-spill breeding season.
7. Overall numbers of roseate terns breeding in the North Atlantic population increased from 2002 to 2003.
8. Productivity of roseate terns at Ram Island (1.12 young per pair), the location most impacted by oil and oil spill response, was within the range reported for Ram Island during the past several nesting seasons (0.96–1.45 for the period 1998-2002).

9. The estimated reduction in the productivity of Buzzards Bay roseate terns as a result of hazing at Ram Island is not likely to have range-wide population level effects.[9]
10. The current estimated survival rate for roseate terns from fledging to recruitment into the breeding population is 35% (J. Spendelow, pers. comm.). Therefore, the estimated reduction in roseate tern productivity caused by hazing at Ram Island will reduce the future adult breeding population of roseate terns by about 122 birds (projected to be < 2% of the 2006 breeding population).

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and federal regulations pursuant to Section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. Harass is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of an Incidental Take Statement.

AMOUNT OR EXTENT OF TAKE

Piping Plover

The Service believes a currently unquantified amount of take of piping plovers occurred in the form of harassment of plovers and their broods as a result of intense or sustained disturbance and impacts to foraging habitat. Productivity was affected, however the overall extent is not known. At least four pairs of piping plovers may not have been able to establish nests during the early phases of response activities and either did not reproduce or were considerably delayed. Delayed nesting or re-nesting often results in some loss of productivity.

The Service believes that three nests totaling eight eggs were potentially abandoned as a result of disturbance from response activities. We are unable to quantify direct take or harassment-related impacts to plovers, chicks and nests at this time other than eight eggs lost to abandonment.

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[9] Even with this reduction in productivity, Buzzards Bay roseate terns had overall higher productivity than in the previous two years (Table 4).

We base this estimated amount of take on the following:

1. The Coast Guard adopted recommended protection measures designed to limit the risk of direct mortality and the extent of disturbance to plovers and their chicks, although some recommendations were not implemented as quickly as the USFWS and the MADEP requested (e.g., the use of a hotwash system at Barney's Beach). Most of the response effort was conducted in compliance with these protection measures, although several violations were observed.
2. The extreme difficulty of detecting impacts to individual plovers, chicks, and nests from response activities as opposed to the oil itself, precludes us from determining the specific quantity of any direct mortality that may have occurred, other than eight eggs lost to abandonment. Similarly, we have no data that would enable us to quantify the amount of harassment that occurred.

Roseate Tern

We preface this section with the acknowledgement that hazing at Ram Island was a necessary action that protected endangered roseate terns from a greater harm, coming into direct contact with no. 6 oil. During the very successful hazing program, Ram Island was substantially cleaned of oil while terns were discouraged from settling, and without this "extreme" response action, many more roseate terns would have been taken.

The take of roseate terns occurred during the oil spill response in the form of harm and harassment during the intentional hazing at Ram Island, May 3-May 30. During hazing, normal tern activity at Ram Island, including feeding, breeding and sheltering, was disrupted. Due to hazing, large numbers of roseate terns (about 560 pairs) were forced from their preferred breeding site, to alternate locations. Many roseate terns (approximately 500 individuals) that probably would have nested at Ram Island moved to Penikese Island, however terns nesting on Penikese exhibited lower productivity than those on Ram and Bird Islands. We also believe that hazing caused delayed nesting at all Buzzards Bay roseate colonies in 2003. As previously stated, terns that complete egg laying earlier during the nesting season are generally more productive than those that initiate egg-laying later.

We estimate that approximately 350 roseate terns were incidentally taken as a result of the oil spill response (intentional hazing) at Ram Island. This is attributable to lower productivity (fewer chicks produced) due to the combined effects of displaced nesting and delayed breeding and not to adult mortality. This level of take, while significant, is estimated to be less than 10% of the number of chicks successfully raised by roseate terns at all northeast colonies in 2003. This level of take does not include projections on the reduced number of future breeding adults resulting from the estimated reduced productivity in 2003.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of take is not likely to have jeopardized the continued existence of the piping plover and roseate tern.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

On January 16, 2004, staff from NEFO and the Coast Guard met to address shortcomings of the B120 response and coordination process in order to avoid or minimize future impacts to listed species in the event of another oil spill in New England. Recommendations were developed for pre-spill planning, including early determination of formal versus informal consultation, emergency consultation and data collection, chain of command, endangered species staff roles versus general Service staff roles, and improvements/clarifications to the Interagency Memorandum of Agreement Regarding Oil Spill Planning and Response Activities (MOA). Additional recommendations focusing on improving the MOA were provided by Andrew Raddant, DOI, Regional Environmental Officer, Office of Environmental Policy and Compliance, in a separate memorandum.

NEFO, the Coast Guard and NOAA had initiated pre-spill informal consultation as provided under the MOA prior to the B120 spill. As a result of the B120 spill and confusion regarding emergency consultation under Section 7 of the Act, as opposed to procedures outlined in the MOA, the Service and the Coast Guard developed the following recommendations to facilitate future pre-spill planning efforts:

- Organize a small group consisting of Service, Coast Guard and NOAA staff to review the B120 specifics regarding impacts to piping plovers, terns and Northeastern beach tiger beetles and develop general recommendations applicable for programmatic consultation. The planning work should emphasize the time-sensitive nature of spill response, and recognize the tradeoffs that result from any action or inaction.
- Provide guidance on early determination of informal versus formal consultation, possibly in matrix form. A matrix for each (coastal) species could provide countermeasures on one axis, and the potential effects on the other (no effect, not likely to adversely affect, may adversely affect), which could guide the amount of required consultation during a spill event.
- Develop a simple practical guide for responders that helps with the emergency/post-emergency consultation.

To improve coordination and consultation between the Coast Guard and the Service in the event of another spill, the group developed the following recommendations:

Emergency Consultation and Data Collection

- As soon as possible after the spill has occurred, determine data needs and who will be providing or collecting the data. Develop generic checklists and data collection forms to facilitate consistent and precise data compilation.

- To obtain timely information on oil spill response impacts, provide a short form for the response manager and wildlife observers to be completed daily for beaches (or site) with listed species. The site form should contain the following fields (at a minimum):
    - Staff (numbers)
    - Actions taken
    - Equipment used
    - Time working
    - Checkboxes for weather (sunny, cloudy, etc.)
    - Wrack (wet seaweed at high tide line) removed? (Y/N) [There was significant discussion on this, but it was determined that any volumetric/percent numbers would be too hard to interpret.]
- All forms should emphasize the need for more detail when there are extraordinary circumstances, such as nest abandonment, thought to be related to the response. Positive information (response activities were not disturbing) is also useful.

Chain-of-Command

- When there are significant listed species and response overlaps, such as in the B120 oil spill, an endangered species technical specialist free from other responsibilities (i.e., field coordination, Scientific Support Coordinator) should be appointed to focus solely on listed species issues. This specialist could come from the involved Service(s), or could be a Coast Guard person who normally performs such functions on a non-emergency basis, such as an Environmental Protection Specialist.
- The proposed endangered species specialist can help to ensure that the necessary information is gathered at the Incident Command Post (ICP) daily, could serve as a secondary conduit for recommendations and be a representative for this input directly to the ICP.

Clarifications to the MOA

- The definition of "emergency" in the MOA is not appropriate. The description of Emergency Consultation in the Definitions section of the MOA (p. 4) incorrectly states that the informal consultation process begins after the emergency is over. This is inconsistent with the Act regulations at 50 CFR 402.05(a), the FWS/NMFS Consultation Handbook at Section 8.2(A), and even the Act MOU, Section V.B. (p. 7, par. 1) (Raddant 2003 *in litt*.).
- Documentation. The MOA Guidebook, on page 43 (Funding), emphasizes that the documentation needed to initiate a formal consultation ("...if listed species or critical habitat are adversely affected") can/should be undertaken during the response phase, and funded through the Pollution Removal Funding Authorization (PRFA). However, Section V.B.(3) of the MOA and Appendix B take this even a step further, front-loading what is considered post-response *formal consultation* [Section 8.2(B) of the FWS/NMFS Consultation Handbook], into the *informal*/response phase/documentation package (see below for a side-by-side comparison). This will continue to result in differing expectations unless the MOA is modified so that Appendix B, in particular, is brought

into consistency with the rest of the MOA and the FWS/NMFS Consultation Handbook (Raddant 2003 *in litt*.).

- The MOA emphasizes preparation of pre-spill consultations in order to avoid adverse effects on listed species and ensure informal consultation. However, when endangered species are present during a spill, adverse effects may be unavoidable and formal consultation must be initiated. Therefore, more guidance on formal consultations should be provided in the MOA. Example data forms and types of information required to assess response impacts should be included. For this region, the focus of coastal spills should be on roseate terns, piping plovers and Northeastern beach tiger beetles.

The participants who developed the recommendations to facilitate future consultations on oil spills in New England agreed to review the MOA roles and responsibilities closely to see if there are any other recommendations that should be provided based on the B120 experience.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation regarding the Coast Guard's response to the B120 oil spill. The Command Post was disestablished on September 2, 2003. Thereafter, a Massachusetts state-approved contractor assumed responsibility for assessing the status of remaining oiled beaches and providing the response. Although the consultation period was closed, the federal project remained open until June 1, 2004, with the Coast Guard and state continuing to monitor the contractor's activities. Therefore, we do not anticipate any activities that would require reinitiating consultation as provided in 50 CFR 402.16. Should re-oiling of piping plovers, roseate terns or their habitat occur to the extent that the Coast Guard directs cleanup response activities, these activities will be addressed in a separate consultation.

If you have any questions regarding this opinion, please contact Susi von Oettingen or Michael Amaral at 603-223-2541.

Sincerely yours,

Michael J. Bartlett
Supervisor
New England Field Office

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Appendix A


Tinkhamtown
Crystal Spring
Cranberry Bogs
Water Tank
Harbor Beach
Mattapoisett
MATTAPOISETT
Holly Woods
Crescent Beach
Eel Pond
Mattapoisett Harbor
Ned Point
Pine Island Pond
Point Connett
Peases Point
Angelica Point
Strawberry Point
Shell Beach
East Fairhaven
OLD
RR
GRADE
Knollmere
Mattapoisett Neck
Antassawamock
Brant Island
Ram Island
Naskeutucket Bay
North Point
Aucoot Cove
Hiller Cove
Butler Point
MARION
Bird Island
BAY
Bird Island
Ram Island
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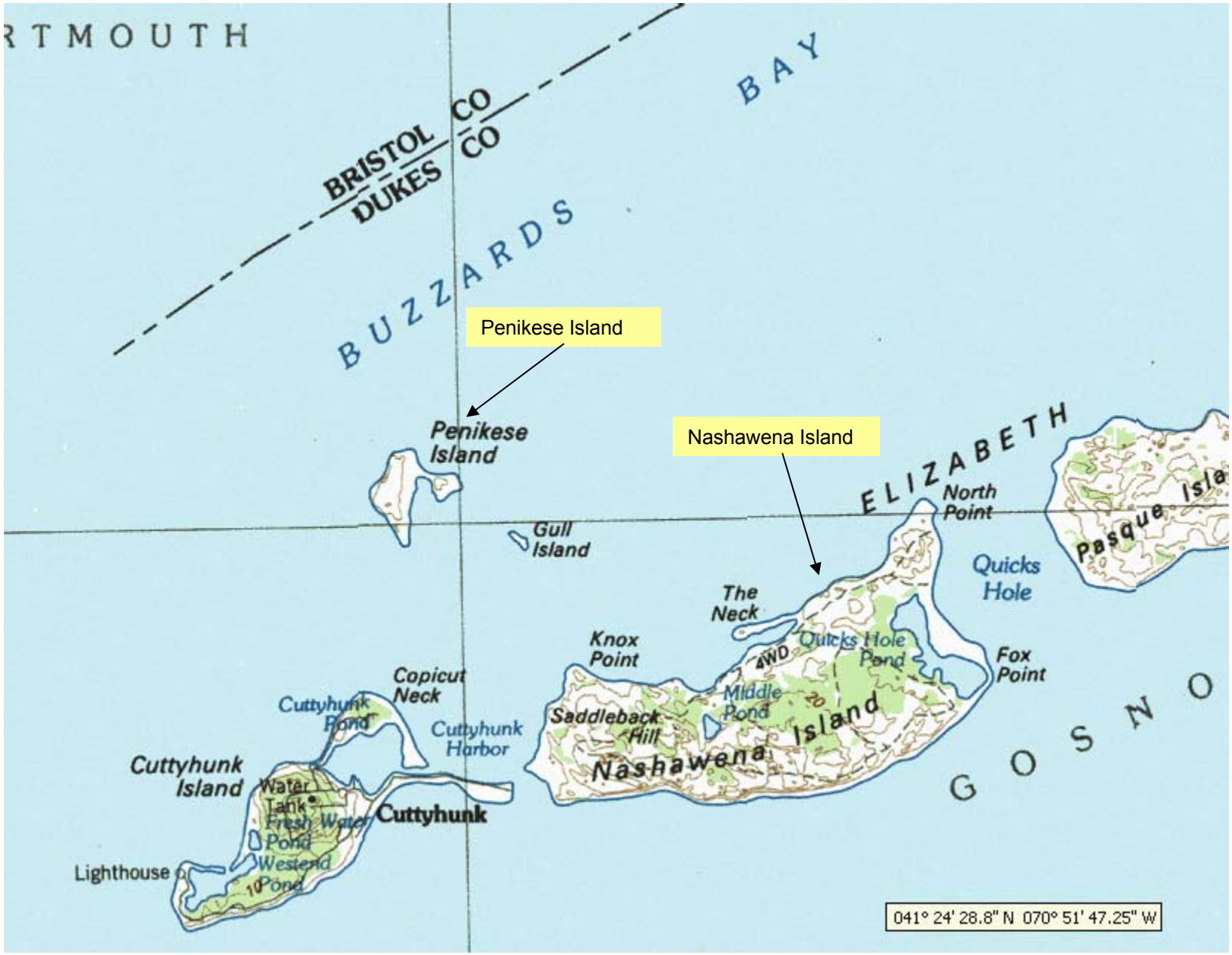
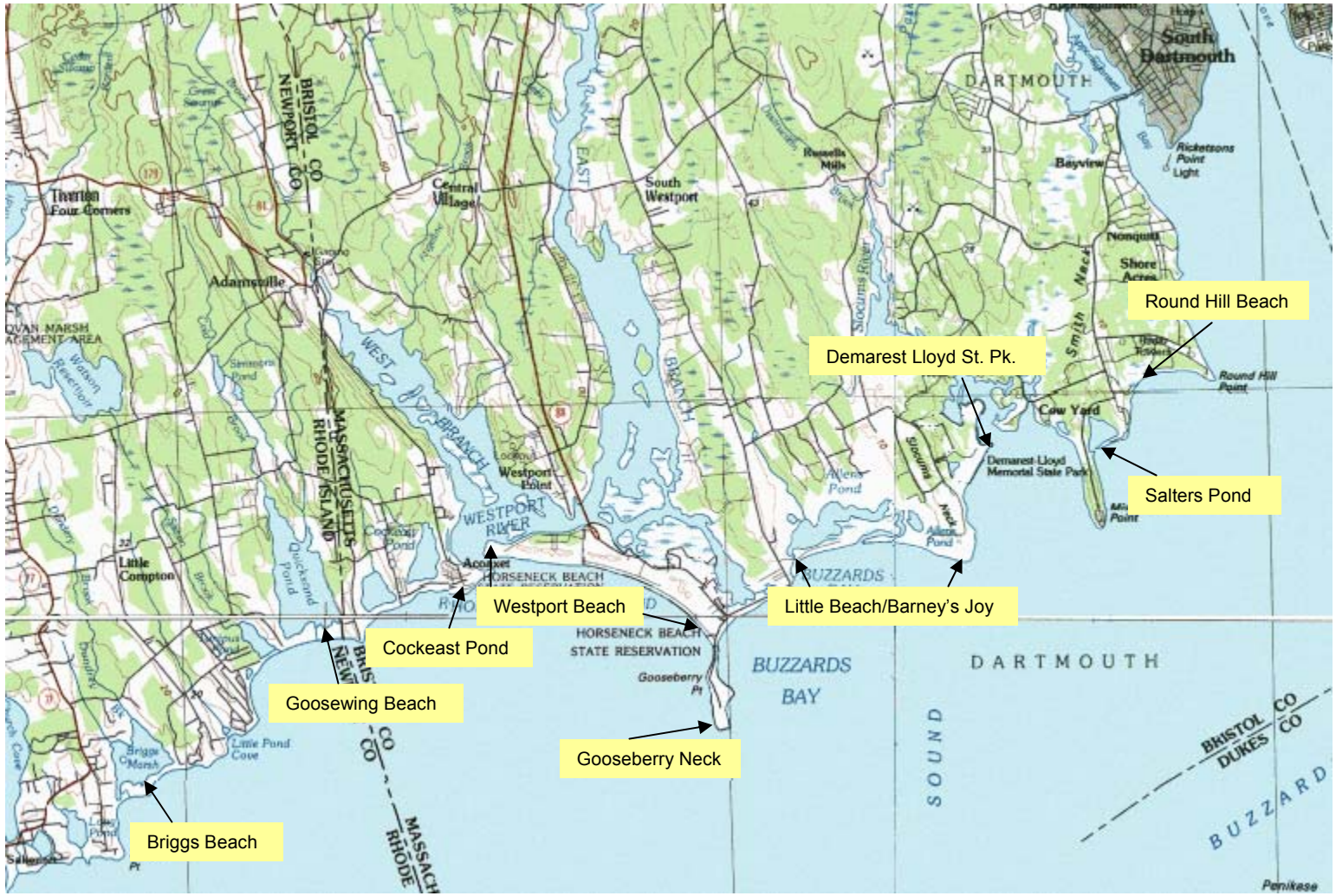

RTMOUTH
BAY
BRISTOL CO
DUKES CO
BUZZARDS
Penikese Island
Nashawena Island
Penikese Island
Gull Island
ELIZABETH
North Point
Pasque Isle
Quicks Hole
The Neck
Knox Point
Quicks Hole Pond
4WD
Fox Point
Middle Pond
20
Saddleback Hill
Nashawena Island
Copicut Neck
Cuttyhunk Pond
Cuttyhunk Harbor
Cuttyhunk Island
Water Tank
Fresh Water Pond
Cuttyhunk
Westend Pond
10
Lighthouse
GOSNO
041° 24' 28.8" N 070° 51' 47.25" W


Round Hill Beach
Demarest Lloyd St. Pk.
Salters Pond
Little Beach/Barney's Joy
Westport Beach
Cockeast Pond
Goosewing Beach
Gooseberry Neck
Briggs Beach
DARTMOUTH
South Dartmouth
BUZZARDS BAY
SOUND
HORSENECK BEACH STATE RESERVATION
WESTPORT RIVER
EAST BRANCH
WEST BRANCH
Demarest Lloyd Memorial State Park
Round Hill Point
Cow Yard
Bayview
Central Village
South Westport
Adamsville
Little Compton
Westport Point
Gooseberry Pt
Penikese


Stony Point Dike
West Island
ROCHESTER
MARION
MATTAPOISETT
FAIRHAVEN
BUZZARDS BAY
Mattapoisett
Marion
Fairhaven
Sturtevant Mill
Tinkhamtown
Crescent Beach
Holly Woods
Peases Point
Point Connett
Shell Beach
Knollmere
Antassawamock
Brant Island
Ram Island
Harbor View
FORT PHOENIX STATE PARK
Silver Shell Beach
Wilbur Point
Rocky Point
Piney Point Beach
Great Hill Point
Butler Point
Bird Island
Harbor Beach
Aucoot Cove
Hiller Cove
Ned Point
Strawberry Point
Angelica Point
Nobska Beach
Little Harbor Beach
Swifts Beach
Briarwood Beach
Hamilton Beach
Barlows Landing
Pocasset
Bassetts Island
Megansett Harbor
North Falmouth
Old Silver Beach
West Falmouth
Saconesset Hills
Chappaquoit Point
Nyes Neck
Scraggy Neck
Meshnee Island
Toby's Island
Naskatucket Bay
Sippican Harbor
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Appendix B

Appendix B. Derivation of Effects of the Action and Incidental Take of Roseate Terns from Hazing at Ram Island in 2003, by Ian Nisbet, PhD., August 4, 2004.

Step 1. How many pairs were displaced?

Peak-of-season numbers (pairs) at the three sites in 2002 and 2003 were as follows:

	2002	2003
Ram Island	952	557
Bird Island	505	904
Penikese Island	0	251
Total	1,457	1,712

I use peak-of-season numbers rather than total season numbers because (a) the latter are less accurate; (b) the late birds were not directly affected by the response action; and (c) the late birds raise few young.

Total numbers in Buzzards Bay increased by 17.5% between 2002 and 2003. Although several scenarios could be developed to predict how the additional birds would have been distributed among the three sites in the absence of hazing, the most neutral assumption is that they would have settled on Ram and Bird Islands in the same proportions as in 2002. Under this assumption, the distribution of 1,712 pairs in 2003 would have been 1,119 pairs at Ram (952 x 1.175) and 593 pairs at Bird (505 x 1.175). Hence, estimates of the numbers of pairs displaced are 311 pairs to Bird and 251 pairs to Penikese.

Step 2. By how much was laying delayed?

Median laying dates at the three sites in 2002 and 2003 were as follows:

	2002	2003
Ram Island	28 May	5 June
Bird Island	30 May	29 May
Penikese Island	-	5 June

Relative to Bird Island, laying was delayed by about nine days at Ram Island in 2003 (eight days later at Ram versus one day earlier at Bird). However, laying at Bird Island would also have been delayed because about one-third of the birds that nested there in 2003 had been displaced.

Because the median laying date of the birds that moved from Ram to Penikese Island was the same as that of the birds that stayed at Ram Island, it is reasonable to assume that the birds that moved to Bird Island would have laid at the same time, i.e., a median date of 5 June. Accordingly, the birds that nested at Bird Island would have included 311 displaced pairs with a median date of 5 June and 593 native pairs with an earlier median date. Defining the latter date as D days earlier than 29 May, the following relationship must be satisfied to yield the observed overall median date of 29 May:

$$593 \times D = 311 \times 8,$$

which yields D = 4.2. Accordingly, the best estimate of the median laying date of the "native" pairs at Bird Island in 2003 is 25 May; this is five days earlier than the median laying date in 2002. Hence, it is reasonable to assume that in the absence of hazing, laying at Ram Island in 2003 would also have been five days earlier than in 2002.

According to this reconstruction, median laying dates would have been about 23 May at Ram Island and 25 May at Bird Island, but for the hazing which delayed all birds at Ram and one-third of the birds at Bird.

Step 3. By how much did the delay reduce productivity?

Previous studies by Nisbet (1981), Spendelow (1982) and Burger *et al.* (1996) have shown that productivity of roseate terns declines steadily with laying date during the breeding season; these declines are reasonably consistent across different sites and years. The most extensive tabulation of data was by Burger *et al.* (1996), who presented data for five years at Bird Island and four years at Cedar Beach, New York. The data from Bird Island are used here, because they are more directly relevant; the data from Cedar Beach were more variable from year to year, although the overall average pattern was similar to that at Bird Island. Applying linear regression to the five sets of data from Bird Island in Table 4 of Burger *et al.* (1996), the mean rate of decline in productivity was 0.023 chicks/nest per day (range, 0.012-0.034). Applying this value to the 13-day delay in laying at Ram Island and the four-day delay in laying at Bird Island in 2003 leads to estimates of 0.30 chicks/pair for the resulting reduction in productivity at Ram Island and 0.09 chicks/pair at Bird Island.

Step 4. By how much was chick production reduced?

Based on the preceding estimates, average productivity at Ram Island in 2003 would have been about 1.12 + 0.30 = 1.42 chicks/pair. As a cross-check on this estimate, it is similar to the value (1.43) of roseate tern productivity at Bird Island in 1980 and to the values at Bird (1.49) and Ram (1.45) Islands in 1998, years when B-chick survival was similarly high. Hence, for the 251 pairs that moved to Penikese Island, productivity was reduced by an average of about 0.53 chicks/pair. For the 311 pairs that moved to Bird Island, productivity was reduced by an average of about 0.17 chicks/pair. These reductions were caused primarily by factors unrelated to the oil spill (predation at both sites, nest desertions at Penikese). According to these estimates, in the

absence of the response action, 1,119 pairs would have nested at Ram Island in 2003 and raised an average of 1.42 chicks per pair, i.e., a total of 1,589 chicks. As a result of the response action, these birds were dispersed among three sites, nested about 13 days late, and raised chicks as follows:

Ram Island	557 x 1.12	=	624
Bird Island	311 x 1.25	=	389
Penikese Island	251 x 0.87	=	218

Total:			1,231

(see Note) Accordingly, the best available estimate of the number of roseate chicks that were taken as a result of the initial response to the oil spill ("hazing" and clean-up activities at Ram Island) is 1,589 – 1,231 = 358. This estimate includes both effects resulting from delayed laying (affecting both the birds that remained at Ram Island and those that moved to the other two sites) and effects resulting from other factors (predation and desertion) acting at Bird and Penikese Islands. It does not include effects attributable to exposure to oil (e.g., reductions in clutch-size and/or hatching success) that may have reduced productivity additionally at one or all sites; these effects are still being assessed. It also does not include any possible indirect effects of the delayed laying in 2003 (e.g., reduced condition and viability of the fledglings that were produced late, delayed consequences in 2004, etc.).

Note Uncertainty arises from each step in the analysis. The following estimates of possible ranges of uncertainty are based on scientific judgment, not formal analysis.

(a) The number of pairs that moved from Ram to Bird Island is uncertain by about $\pm$ 100 (range, 211-411). This translates to an uncertainty of $\pm$ 13 in the number of birds taken.

(b) The delay at Ram Island could have been as short as 10 days or as long as 15 days. This translates to an uncertainty of – 78 to + 52 in the number of birds taken.

(c) The slope of the productivity/date relationship at Ram Island could have been as low as 0.012 or 0.034 (the observed range among years at Bird Island). This translates to an uncertainty of $\pm$ 157 in the number of birds taken.

(d) Taking the extreme values of all three of these ranges, the possible range in the number of birds taken is 32-630. The extreme values in this range are very unlikely.