

*** ADOPTED ***

BOROUGH OF AVALON
BEACH MANAGEMENT PLAN
FOR the PROTECTION OF
FEDERALLY and
STATE-LISTED SPECIES

April 2009

Prepared by

Borough of Avalon Department of Public Works

and

The Avalon Environmental Commission

in cooperation with

New Jersey Department of Environmental Protection
Division of Fish and Wildlife
Endangered and Nongame Species Program

and

United States Department of the Interior
Fish and Wildlife Service
New Jersey Field Office



TABLE OF CONTENTS

LIST OF FIGURES	ii
LIST OF TABLES	ii
APPENDICES	ii
I. INTRODUCTION.....	1
A. PURPOSE	1
B. APPLICABLE LAWS AND REGULATIONS.....	2
1. Federal	2
2. State	2
C. LISTED SPECIES	3
1. Species Known to Occur on Avalon Beaches	3
(a) <u>Piping Plover</u> (<i>Charadrius melanotos</i>)	3
(b) <u>Least Tern</u> (<i>Sterna antillarum</i>)	3
(c) <u>Red Knot</u> (<i>Calidris canutus rufa</i>)	3
(d) <u>American Oystercatcher</u> (<i>Haematopus palliatus</i>)	3
(e) <u>Seabeach Amaranth</u> (<i>Amaranthus pumilus</i>).....	4
(f) <u>Seabeach Knotweed</u> (<i>Polygonum glaucum</i>)	4
(g) <u>Seabeach Evening Primrose</u> (<i>Oenothera humifusa</i>)	4
2. Species That May Potentially Occur on Avalon Beaches.....	4
(a) <u>Black skimmer</u> (<i>Rynchops niger</i>).....	4
(b) <u>Sea-milkwort</u> (<i>Glaux maritima</i>)	4
(c) <u>Seabeach purslane</u> (<i>Sesuvium maritimum</i>)	4
(d) <u>Seabeach Sandwort</u> (<i>Honckenya peploides</i>)	4
D. GOVERNMENT ENTITIES	4
E. ACRONYMS AND DEFINITIONS.....	6
II. MANAGEMENT ZONES.....	10
III. RECOVERY GOALS.....	13
IV. MANAGEMENT ISSUES.....	13
A. BIOLOGICAL MONITORING.....	13
B. PREDATOR MANAGEMENT.....	14

C. HUMAN DISTURBANCE.....	17
D. FIREWORKS.....	20
E. BEACH MANAGEMENT AND MAINTENANCE.....	23
1. Beach Raking.....	23
2. Large Debris Removal.....	26
3. Refuse Containers	27
4. Dune Management/Invasive Plant Species Control.....	27
5. Beach Nourishment.....	29
6. Sand Scraping	32
7. Beach Access Structures.....	33
F. EDUCATION AND OUTREACH	33
G. OTHER PROVISIONS	34

LIST OF FIGURES

1a. Borough of Avalon Beach Management Zones – Bird Nesting Areas.....	11
1b. Borough of Avalon Beach Management Zones – Endangered Plant Areas	12

LIST OF TABLES

1. Seasonal Protections for Listed Species When Motorized Vehicles or Equipment are Required to Respond to a State of Emergency	25
--	----

APPENDICES

APPENDIX A	U.S. Fish and Wildlife Service Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act
APPENDIX B	U.S. Fish and Wildlife Service Guidelines for Managing Fireworks in the Vicinity of Piping Plovers and Seabeach Amaranth on the U.S. Atlantic Coast
APPENDIX C	Applicable NJDEP Coastal Zone Management Rules
APPENDIX D	Summary of the Binding Provisions of the December 2005 Programmatic Biological Opinion Between the U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers, Philadelphia District, on the effects of Federal Beach Nourishment Activities along the Atlantic Coasts of New Jersey on the Piping Plover (<i>Charadrius melanotos</i>) and Seabeach Amaranth (<i>Amaranthus pumilus</i>)

I. INTRODUCTION

A. PURPOSE

The purpose of this management plan is to provide a framework for cooperation between the Borough of Avalon (hereinafter also "Avalon" or "the Borough"), the New Jersey Division of Fish and Wildlife (hereinafter also "NJDFW") Endangered and Nongame Species Program, (ENSP), and the United States Fish and Wildlife Service's (hereinafter also "USFWS") New Jersey Field Office (NJFO) in the stewardship of Federal and State-listed endangered and threatened beach nesting birds and flora (listed species) occurring on Avalon's beaches.

Through this plan, the parties seek to provide for the long-term conservation and restoration of species populations in Avalon and the State, while balancing potentially conflicting missions. The plan defines and describes the roles and responsibilities of the Borough, the NJDFW, and the USFWS in the protection and management of listed species within the Borough. Protective statutes and regulations are summarized in Section B of this Introduction.

Specifically, this plan endeavors to increase the nesting success of listed bird species and to foster the continued recovery of listed plant species in Avalon by reducing detrimental human activities and decreasing predation. Through this plan, the parties hope to continue the shared beach nesting bird management responsibilities with the Borough and citizens of Avalon, particularly for those aspects of management that protect listed species from activities permitted, encouraged, sponsored, or performed by the Borough. This plan is the result of several meetings and discussions between the staff of the Avalon Department of Public Works, members of the Avalon Environmental Commission, the NJDFW, and the USFWS.

This management plan is consistent with the USFWS Recreational Guidelines (Appendix A) and Fireworks Guidelines (Appendix B), and with the State Coastal Zone Management Rules (Appendix C). The plan also satisfies the Conservation Measures and Terms and Conditions of the December 2005 Programmatic Biological Opinion between the USFWS and the U.S. Corps of Engineers (Philadelphia District) with respect to municipal management planning for Avalon (Appendix D), and is intended to meet the conditions of permits issued by the New Jersey Department of Environmental Protection's (NJDEP) Land Use Regulation Program (DLUR) requiring management planning in municipalities receiving beach nourishment. Development and implementation of Service and NJDFW approved Plans is also directed by the Final Natural Resources Restoration Plan (2004) that resulted from the *Anitra* Oil Spill that occurred in the Delaware Bay in May 1996 and moved north along New Jersey's Atlantic Coast.

The parties to this plan acknowledge that the aforementioned guidelines, rules, terms and conditions may be periodically revised, and agree to adjust the management of listed species as appropriate to ensure continued compliance, including revision of this plan if necessary.

B. APPLICABLE LAWS AND REGULATIONS

1. Federal

Clean Water Act (CWA) (33 U.S.C. 1344 *et seq.*): Regulates discharges into waters of the United States. The CWA is administered by the U.S. Environmental Protection Agency and the Corps.

Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*): establishes that endangered and threatened animals and plants are of aesthetic, ecological, educational, historical, recreational, and scientific value to the nation and the people. Section 4 provides for wildlife and plants as threatened or endangered, including criteria for listing and delisting species. Section 6 authorizes cooperative agreements and funding for States to establish programs for conservation of threatened and endangered species. Section 7 directs all federal agencies to consult with the USFWS regarding any proposed federal action that may affect a federally listed species. Section 9 prohibits take of federally listed wildlife and restricts collection, destruction, and transport of endangered plants. Section 10 establishes permits for scientific collection, and permits for take of listed wildlife that is incidental to an otherwise lawful non-federal action contingent upon preparation of a Habitat Conservation Plan. Implementing federal regulations are found at 50 CFR 17 and 50 CFR 402. The federal list of threatened and endangered species is found at 50 CFR 17.11 and 17.12. The ESA is administered jointly by the USFWS and the National Marine Fisheries Service.

Migratory Bird Treaty Act (MBTA) (40 Stat. 755; 16 U.S.C. 703-712): Prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests except where specifically authorized by the U.S. Department of the Interior. The MBTA is administered by the USFWS.

2. State

New Jersey Endangered and Nongame Species Conservation Act of 1973, as amended (N.J.S.A. 23:2A *et seq.*): Establishes a list of wildlife species designated by the State of New Jersey as threatened and endangered, and prohibits taking, possessing, transporting, exporting, processing, selling, or shipping listed species. Implementing State regulations are found at N.J.A.C.7:25-4. The State list of threatened and endangered wildlife is found at N.J.A.C.7:25-4.13 and 4.17. The Act is administered by the ENSP.

New Jersey Endangered Species Plant List Act (N.J.S.A. 13:1B *et seq.*): Finds that plant species have medicinal, genetic, ecological, educational and aesthetic value to the citizens of New Jersey and that the perpetuation of many native plant species is in jeopardy. The Act establishes an official State list of endangered plants found at N.J.A.C.7:5C 1-1 *et seq.* The Act is administered by the Office of Natural Lands Management (ONLM).

New Jersey Coastal Zone Management Rules (N.J.A.C. 7:7E): Constitute the substantive rules of the NJDEP regarding the use and development of coastal resources, to be used primarily by the DLUR in reviewing permit applications under the New Jersey Coastal Area Facility Review Act (N.J.S.A. 13:19A-1 *et seq.* as amended) (CAFRA), the New Jersey Wetlands Act of

1970 (N.J.S.A. 13:9A-1 *et seq.*), the New Jersey Waterfront Development Law (N.J.S.A. 12:5-3), Water Quality Certification (Section 401 of the CWA), and federal Consistency Determinations (Section 307 of the federal Coastal Zone Management Act (104 Stat.4779; 16 U.S.C. 3951 *et seq.*)). The rules are administered by the DLUR.

C. LISTED SPECIES

1. Species Known to Occur on Avalon Beaches

The following species have been documented on Avalon beaches. The parties to this plan anticipate the continuing presence of these species in Avalon and the continued suitability of Borough beaches as habitat for these species.

(a) Piping Plover (*Charadrius melanotos*)

Piping Plovers are small, territorial shorebirds present on the New Jersey shore between March and August. Nests consist of a shallow scrape in the sand located above the high tide line. Flightless chicks are led by their parents to feeding areas, including the intertidal zone. The plover diet consists of invertebrates. Three to eight pairs of plovers (average of five pairs) have nested in Avalon in the past 10 years. Piping Plovers are federally listed as threatened, State-listed as endangered, and protected by the MBTA.

(b) Least Tern (*Sterna antillarum*)

Least Terns are small, colonial-nesting sea birds, present on the New Jersey shore between April and September. Nests consist of a shallow scrape in the sand located above the high tide line. Flightless chicks remain in the colony, where they are fed by their parents. The Least Tern diet consists of fish. Tern colonies in Avalon have ranged from between 20 to 213 individual birds (average of 102 birds) in the past 10 years. Least terns have been present in Avalon in all but 2 years since 1990. Least terns are State-listed as endangered and protected by the MBTA.

(c) Red Knots (*Calidris canutus rufa*)

Red Knots are migratory shorebirds that travel from South America to the Arctic to breed and use the Delaware Bay as a critical stopover site for feeding and nesting. Red Knots are a federal candidate species under consideration for inclusion on the list of endangered and threatened wildlife under the ESA and are State-listed as threatened. Red Knots use the Borough's beaches during migration as a stopover site for feeding or roosting activities. No specific management components are included in the Plan at this time.

(d) American Oystercatcher (*Haematopus palliatus*)

American Oystercatchers are territorial nesters, nesting on New Jersey beaches between April and August. They make their nests on beaches by scraping a shallow depression in the sand just above the high tide line and also nest on back-bay islands. One or two pairs have nested on Avalon's beaches over the past 5 years. Oystercatchers are a State species of concern (currently proposed). If birds nest outside the symbolically fenced area, the Borough will fence the area concerned on the advice of the appropriate authority.

(e) Seabeach Amaranth (*Amaranthus pumilus*)

Seabeach amaranth is an annual plant, visible on New Jersey's Atlantic coastal beaches between May and November. Seabeach amaranth is usually found growing in nearly pure sand. The species requires sparsely vegetated upper beach habitat that is not flooded during the growing season. Seeds are dispersed by wind and water, and are present on the beach year-round. The seabeach amaranth population in Avalon is small, about 200 plants, when first observed in the Borough in 2003. Seabeach amaranth is federally listed as threatened and State-listed as endangered.

(f) Seabeach Knotweed (*Polygonum glaucum*)

Seabeach knotweed is an annual plant visible on the New Jersey shore between May and November. Most seabeach knotweed occurrences in New Jersey are on sandy beaches where the plants generally occur above the limit of the tide. The species is State-listed as endangered. Seabeach knotweed was last documented in Avalon in 2003.

(g) Seabeach Evening Primrose (*Oenothera humifusa*)

Seabeach evening primrose is an annual plant found on beach and dune habitats in New Jersey. The species is State-listed as endangered. Seabeach evening primrose was last documented in Avalon in 2004.

2. Species That May Potentially Occur on Avalon Beaches

The following species have not been documented in Avalon, but could become established in the future. The parties to this plan will work cooperatively to manage these species if they colonize Avalon beaches. The habitat management and species protections laid out in this plan are expected to be sufficient to protect the following species if they become established; therefore, plan revision would likely not be necessary.

- (a) Black Skimmer (*Rynchops niger*): colonial beach-nesting sea bird, State-listed as endangered and protected by the MBTA.
- (b) Sea-milkwort (*Glaux maritima*): beach and salt marsh habitats plant, State-listed as endangered.
- (c) Seabeach Purslane (*Sesuvium maritimum*): beach habitats, State species of concern.
- (d) Seabeach Sandwort (*Honckenya peploides*): beach and salt marsh habitats plant, State species of concern.

D. GOVERNMENT ENTITIES

Borough: Borough of Avalon, Cape May County, New Jersey

Corps: U.S. Army Corps of Engineers, Philadelphia District. The Corps Regulatory Program issues permits for placement of fill material in waters of the United States and for construction activities in navigable waters, pursuant to Section 404 of the federal CWA and Section 10 of the Rivers and Harbors Act of 1899 (30 Stat. 1151, as amended; 33 U.S.C. 403 *et seq.*), respectively.

Corps permits are required for activities such as wetland fill, beach nourishment, and construction or maintenance of ocean groins and jetties. The Corps Civil Works Program carries out shore protection, flood control, navigation, and ecosystem restoration projects as directed by Congress, including the Atlantic Coast of New Jersey Beach Erosion Control Project that includes beach nourishment in the Borough of Avalon.

DLUR: New Jersey Department of Environmental Protection, Division of Land Use Regulation. The DLUR administers the State permitting program for activities in wetlands and within New Jersey's Coastal Zone. Permits from the DLUR are required for activities such as disturbance of wetlands, beach and dune maintenance, construction or maintenance of structures on the beach, beach nourishment, and construction or maintenance of groins, jetties, seawalls, and bulkheads.

ENSP: New Jersey Department of Environmental Protection, Division of Fish and Wildlife, Endangered and Nongame Species Program. The ENSP is responsible for listing, monitoring, and managing State-listed wildlife species, and administration of the New Jersey Endangered and Nongame Species Conservation Act.

NJDEP: New Jersey Department of Environmental Protection. The NJDEP is the State Department that oversees environmental laws and policies, and includes the DLUR, the NJDFW, and the ONLM.

NJDFW: New Jersey Department of Environmental Protection, Division of Fish and Wildlife. The NJDFW is charged with protecting and managing the State's fish and wildlife to maximize their long-term biological, recreational, and economic values. In addition to the ENSP, the NJDFW includes the Bureaus of Wildlife Management, Freshwater Fisheries, Marine Fisheries, Shellfisheries, and Information and Education, and the Office of Environmental Review.

NJFO: New Jersey Field Office, Ecological Services, U.S. Fish and Wildlife Service. Within New Jersey, the NJFO's responsibilities include review of federal water-resources projects, monitoring and management of federally listed species (both wildlife and plants), and administration of the ESA.

OEM: Avalon Office of Emergency Management. The OEM is the Borough office responsible for managing States of Emergency.

ONLM: New Jersey Department of Environmental Protection, Division of Parks and Forestry, Office of Natural Lands Management. The ONLM is responsible for administration of the New Jersey Natural Heritage Database on biodiversity resources, promulgation and amendment of New Jersey's Endangered Plant Species List, and administration and management of State-owned lands designated to the Natural Areas System.

USFWS: U.S. Fish and Wildlife Service. The USFWS is the principal agency through which the federal government carries out its responsibilities to conserve, protect, and enhance the nation's fish and wildlife and their habitats for the continuing benefit of the people. The primary responsibilities of the USFWS are migratory birds, endangered species, certain marine mammals, anadromous fish, and wildlife resources on federal land.

E. ACRONYMS AND DEFINITIONS

Beach Nourishment: Addition of sand in designed contours to extend a beach and the near shore shallows seaward.

Biological Opinion: A document that includes: (1) the opinion of the USFWS as to whether or not a proposed federal action is likely to jeopardize the continued existence of federally listed species; (2) a summary of the information on which the opinion is based; and (3) a detailed discussion of the effects of the action on federally listed species. Issuance of a Biological Opinion concludes formal consultation between the USFWS and a federal action agency pursuant to Section 7 of the ESA, and an accompanying Incidental Take Statement authorizes, if appropriate, limited incidental take of federally listed wildlife in the course of implementing the federal action.

Brood: A group of young birds hatched at one time and cared for by the same parents.

Conservation Measures: Actions to benefit or promote the recovery of listed species that are included by a federal agency as an integral part of a proposed action. These actions will be taken by the federal agency and serve to minimize or compensate for project effects on the federally listed species impacted by the proposed action. Conservation Measures are usually included in a Biological Opinion.

Consultation: The process required by Section 7 of the ESA through which the USFWS works with a federal action agency to determine if a proposed federal action is likely to adversely affect a listed species under USFWS jurisdiction, or jeopardizes the continued existence of such a species. Federal actions include actions that are carried out, funded, or authorized by a federal agency.

Declared Emergency: A state declared by Borough, County, State, and/or Federal governments in anticipation of, during, or following an event that threatens human health, safety, or property.

Throughout this plan, “State of Emergency” (SOE) signifies a state of Declared Emergency. The term “emergency” is defined below.

Within the Borough, the Mayor or Office of Emergency Management (OEM) declares all Emergencies, and the OEM manages the Emergency. A copy of the Emergency Declaration Document is on file at the Avalon Police Department, 3100 Dune Drive. Once the Emergency has been declared, the OEM, Mayor, or Chief of Police confirm and notify the Borough Clerk. Activities responding to a State of Emergency (SOE) may include the following:

SOE Beach Nourishment: Placement of clean sand on the beach to protect human life or health or public or private structures, signified by a Declared Emergency and eligibility for DLUR permits under N.J.A.C. Section 7:7E-3A.3 of the New Jersey Coastal Zone Management Rules. Emergency Beach Nourishment is included in the definition of “SOE Post-storm Beach or Dune Restoration.”

SOE Clean-up: Removal from the beach of large debris that poses a threat to human health or safety using vehicles and equipment, signified by a Declared Emergency.

SOE Raking: Mechanical beach raking necessary to remove from the beach debris that poses a threat to human health or safety (e.g., medical waste, hazardous materials), signified by a Declared Emergency.

SOE Post-storm Beach or Dune Restoration: Activities listed at Section 7:7E-3A.3(b) of the New Jersey Coastal Zone Management Rules to restore beaches or dunes impacted by coastal storms with a recurrence interval equal to or exceeding a 5-year storm event, signified by a Declared Emergency and eligibility for DLUR permits under Section 7:7E-3A.3. Placement of sand and other materials (beach nourishment) and sand scraping (defined below) are among the activities listed at 7:7E-3A.3(b).

Emergency: A situation presenting imminent risk to human life, health or safety.

Emergency Vehicle: A vehicle responding to an emergency.

Essential Vehicle: A vehicle required to provide for safety, law enforcement, maintenance of public property, or access to private dwellings not otherwise accessible.

Feral: Wild, untamed or un-owned animals that are normally pets, such as cats or dogs.

Fireworks Guidelines: The USFWS document entitled *Guidelines for Managing Fireworks in the Vicinity of Piping Plovers and Seabeach Amaranth on the U.S. Atlantic Coast* (Appendix B).

Fledged: Able to fly. Piping Plover and Least Tern chicks are presumed to have survived the nesting season once fledged; monitoring and management restrictions are usually relaxed once all chicks are fledged. For management purposes, Piping Plover chicks are considered fledged at 35 days of age or when observed in sustained flight for at least 15 meters, whichever occurs first.

Growing Season: The time of year when Seabeach Amaranth is present on the beach; usually May 15 through November 30.

Harass: An act which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering.

Harm: An act which actually kills or injures wildlife. Such acts may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

Incidental Take: Take of listed fish or wildlife species that results from, but is not the purpose of, carrying out an otherwise lawful activity.

Listed Species: For the purposes of this plan, a species that is: (1) listed or proposed for listing as endangered or threatened, or designated as a candidate for listing, by the USFWS pursuant to the ESA and its implementing federal regulations; (2) listed as endangered or threatened by the State pursuant to the New Jersey Endangered and Nongame Species Conservation Act and its implementing State regulations; (3) listed by the State as endangered pursuant to the New Jersey Endangered Plant Species List Act; and/or (4) listed as a State species of concern by the NJDFW or the ONLM.

Nesting Area: An area occupied by nesting Piping Plovers, Least Terns and/or Oystercatchers in the current or recent nesting seasons, including areas used for courtship, territorial displays, egg-laying and incubation, and chick brooding and foraging.

Nesting Season: The time of year when nesting Piping Plovers, Least Terns and/or Oystercatchers are present on the beach; usually March 15 through August 31 if both plovers and colonial nesters are present.

Predator Exclosure: Staked wire fencing that encircles a Piping Plover nest as a barrier to predators while permitting passage of plover adults and chicks; netting is normally installed on the top of the structure to prevent entry by avian predators.

Predator Management: Activities to reduce the adverse effects of predators on listed bird species, including but not limited to monitoring the effects of predators, minimizing food sources, use of predator exclosures, and predator population control through trapping or other means of removal.

Productivity: A measure of Piping Plover, Least Tern, and American Oystercatcher nesting success measured as chicks fledged per pair of nesting birds.

Programmatic Biological Opinion: A Biological Opinion that addresses a federal program rather than a single federal action; such programs typically guide implementation of future agency actions by establishing standards, guidelines, or governing criteria to which future actions must adhere (Appendix D).

Recreational Guidelines: The USFWS document entitled *Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act* (Appendix A).

Routine: Not associated with a State of Emergency (SOE).

Sand Scraping: Mechanical redistribution of sand from the lower beach profile to the upper beach profile, or alongshore; also known as sand mining or sand transfer.

Service Animal: Any guide dog, signal dog, or other animal individually trained to provide assistance to a person with a disability (e.g., seeing-eye dogs).

SOE: State of Emergency; see Declared Emergency.

Supervised Beach: A life-guarded bathing beach.

Symbolic Fencing: String-and-post fencing marked with flagging and signs, intended to protect listed species by restricting human entry into an area.

Take: To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect a listed species, or attempt to engage in any such conduct.

Terms and Conditions: Specific methods by which a federal action agency must implement actions necessary or appropriate to minimize the extent of incidental take of federally listed wildlife in the course of carrying out an otherwise lawful federal action. Terms and Conditions are usually included in an Incidental Take Statement that accompanies a Biological Opinion.

Wrack: Organic material including seaweed, seashells, driftwood and other materials deposited on beaches by tidal action. Often forms a “wrack line” along the high water mark.

II. MANAGEMENT ZONES

Five separate management zones are identified on the Borough beaches consisting of two Protected, one Balanced, and two Recreational Zones (see Figure 1), that are based on their current and historical use by beach-nesting birds and recent and potential re-establishment of Seabeach Amaranth and other listed plants. The relative importance of protective practices in each management zone considers existing human uses, habitat conditions, and past distribution and occurrence of listed species.

Protected Zones:

Avalon North: *Protected Zone*

8th Street to 9th Street.

This zone will be managed to promote the protection and recovery of listed species and enhancement of their habitat. Recreational uses will be accommodated consistent with species protections. Piping Plovers and Least Terns have historically nested in this area, however, none have been present since 2001.

Avalon Dunes: *Protected Zone*

40th Street to 58th Street

This zone is managed to promote the protection and recovery of listed species and the enhancement of their habitat. Recreational uses will be accommodated consistent with species protections. This is the most important nesting zone, based on current and historical use by nesting birds and more suitable and stable habitat conditions. This beach harbors most of Avalon's Piping Plovers, Least Terns and American Oystercatchers in most years and shall receive the highest level of protection. A portion of this area also harbors Seabeach Amaranth and the last documented occurrence of Seabeach Knotweed.

Balanced Zone:

9th Street to 12th Street

Recreational uses will be accommodated consistent with species protections. Limited uses include emergency access, cleaning of debris, outfall pipe and beach/dune maintenance and inspections when necessary.

Beach raking as approved by NJDFW & USFWS.

Recreational Zones:

12th Street to 40th Street: *North Recreational Zone*

58th Street to 80th Street: *South Recreational Zone*

These are the Borough's developed recreational zones, and will be managed primarily for that purpose. Any listed species documented in these zones will receive protection as required by applicable State and Federal laws and regulations.



Figure 1a. Borough of Avalon Beach Management Zones – Bird Nesting Areas - 2009



Figure 1b. Borough of Avalon Beach Management Zones – Endangered Plant Areas - 2009

III. RECOVERY GOALS

The parties to this plan consider the following to be realistic, sustainable targets for listed species on Avalon's beaches. Populations of listed species above these goals will continue to be protected in accordance with applicable State and Federal laws and regulations.

Piping Plovers: The goal of this plan is to maintain a five-year average of 8-12 pairs nesting on Avalon's beaches, fledging 1.50 chicks or greater per nesting pair (USFWS recovery goal) (includes both Avalon Dunes and Avalon North Protected Zones). At Avalon North, at least one pair of nesting Piping Plovers is the goal.

Least Terns: One nesting colony of Least Terns with at least moderate productivity (≥ 0.5 to ≤ 1.0 chicks fledged per pair) in either the Avalon Dunes or Avalon North Protected Zone.

Seabeach Amaranth: To promote the re-colonization of plants and to effectively protect any plants that occur.

Red Knots: Red Knots do not nest on Avalon's beaches (or any beaches in New Jersey), though they rely on areas along the Atlantic Coast and the Delaware Bay during migration as a stopover for feeding and resting. The goal is to allow for minimal disturbance during feeding and roosting.

American Oystercatchers: Two to four nesting pairs (includes both Avalon Dunes and Avalon North Protection Zone).

Seabeach Knotweed and Seabeach Evening primrose: The re-colonization of plants and to effectively protect any plants that occur.

IV. MANAGEMENT ISSUES

Management issues form the basis or framework of this plan. That is, we attempt to define the major issues and possible solutions on an issue-by-issue basis and describe how they apply to each management zone. The roles and responsibilities of each party to the plan are set forth to address each issue.

A. BIOLOGICAL MONITORING

Background

Basic biological information is routinely collected about listed species on Avalon beaches. The NJDFW monitors beach-nesting birds to determine habitat use, numbers of nesting pairs, nest locations, and reproductive success. When funding is available the USFWS will survey and monitor Seabeach Amaranth to determine plant numbers, size, reproductive status, location, and condition. Plants that are State-listed or are species of concern are recorded incidentally during

the USFWS surveys. This information is essential in evaluating species trends and progress towards recovery, and assessing the effectiveness of beach management practices.

Note: ONLM has conducted annual state-wide surveys documenting any Federal or State-listed threatened or endangered plants occurring on New Jersey's coastline and provided that information to the USFWS.

NJDFW/USFWS Actions

- The NJDFW will continue intensive surveys, monitoring, and management of nesting birds throughout the Borough beaches, as per agreement with the USFWS pursuant to Section 6 of the ESA. The NJDFW currently staffs Borough's nesting areas at least 3-5 days per week during the nesting season, including weekends and holidays.
- Subject to available funding, the USFWS will conduct annual Seabeach Amaranth surveys that include Avalon Borough to monitor population trends and distribution, and plans to initiate limited early-season survey work to identify Seabeach Amaranth plants at risk of damage or destruction.
- The NJDFW and the USFWS will promptly report any new or expanded occurrence of a listed species to the Borough, particularly within the Balanced or Recreational Zones.
- The NJDFW and the USFWS will regularly report relevant biological information to the Borough (See Section G).

B. PREDATOR MANAGEMENT

Predation is a major factor impairing Piping Plover and Least Tern productivity. Predation problems in Avalon are from feral cats (*Felis catus*), gulls (*Larus* spp.), crows (*Corvus* spp.), raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*), and red foxes (*Vulpes vulpes*). Reducing predation will involve reducing or eliminating provision of food from refuse and hand feeding, using predator exclosures, educational outreach, and, if necessary, predator removal.

Predators (herbivores) of Seabeach Amaranth include moth caterpillars belonging to the Lepidopteran families Noctuidae (cutworms) and Pyralidae (webworms), and aphids. Other potential herbivores include grasshoppers and mammals. Seabeach Amaranth may also be affected by fungal diseases.

Borough Actions

- The Borough will review current contracts with Middle Township and other contractors regarding animal control and explore changes in the contract to provide for humane live-trapping of cats in problem areas. The areas currently identified as feral cat concentration areas include 21st, 27th and 30th Streets at the boardwalk. These feral cat areas are approximately $\frac{3}{4}$ mile from the closest nesting area. The Borough will also determine the extent to which the current agreement could be used to include trapping of wild mammalian predators. If necessary the Borough will seek modifications to the

agreement/contract to accommodate increased trapping of wild mammalian predators. Trap-Neuter-Release (TNR) cats are not licensed, but records of the animals are maintained.

- The Borough has a TNR policy (Ordinance # 604-2008, adopted 11/25/08).
- The Borough will continue to enforce its cat licensing requirement ordinance (Chapter 12:18).
- The Borough will promote a “cats indoors” policy among residents and seasonal visitors.
- Through the Middle Township Animal Control officer or other qualified contractor, the Borough will conduct removal of cats in problem areas when necessary, preferably through humane live trapping. If the Middle Township Animal Control Officer or other qualified contractor is unable to effectively manage cats in problem areas, the Borough will explore other alternatives with the NJDFW assistance. Primary responsibility for control of feral cat populations lies with the Borough.

Since the threats posed by both feral cats and the Borough’s intentional establishment and maintenance of TNR colonies at least $\frac{1}{4}$ mile from of protected species are not completely avoided, and no incidental take authorization is sought for Borough -sponsored or –approved acts, liability remains a concern. Although the above Borough Actions regarding cats contain laudable components, the Borough would not be authorized or covered by the USFWS should take of species listed under the ESA occur in the future.

- The Borough will emphasize the importance of its ordinance prohibiting pets on the beach.
 - By ordinance, the Borough prohibits dogs on all beaches (Avalon Borough Code of Revised Ordinances, Chapter 12:13-5) from March 1 through September 30. All dogs are required to be leashed and are prohibited from entering fenced areas.
 - Avalon has posted “No Dogs” signs at each street end entrance to the beach.
 - The Borough will emphasize the importance of the “no dogs on beach” statute with aggressive enforcement by the police department and take all reasonable steps to provide adequate enforcement of this ordinance.
- Consistent with current State and local regulations, the Borough will not actively block predator control measures recommended and/or undertaken by NJDFW or USFWS. The Borough will not enact any new ordinances to prohibit predator management activities. See below for NJDFW responsibilities.
- By way of this signature to this plan, the Borough of Avalon gives the NJDFW and the USFWS permission to engage in predator control activities on Borough land, including trapping and removal of feral cats, foxes, and other predators including herbivores of Seabeach Amaranth.
- See also section on Education and Outreach (Section F).

NJDFW Actions

- NJDFW will continue to monitor the extent of predation on nesting birds in the Borough (Section A), and will include this in the information reported to the Borough (Section G).
- NJDFW will construct and erect predator exclosures on Piping Plover nests where and when appropriate. Use of predator exclosures will generally be tried prior to undertaking predator removal, unless the NJDFW has cause to believe that exclosures could worsen predation pressures (certain predators are known to target exclosures). In addition, control of predator populations may be necessary to reduce predation on Piping Plover chicks, or on Least Tern, Black Skimmer or Oystercatcher eggs and chicks, none of which are protected by exclosures.
- Any active predator control (other than for feral cats) will be the responsibility of NJDFW. The NJDFW will pursue control when necessary and appropriate.
- NJDFW will notify the Borough prior to engaging in any predator control activities. By way of this plan, the Borough grants the NJDFW permission for these activities, as indicated above. The NJDFW will adopt the Borough's recommendations for timing, methods, or other aspects of control operations to the extent possible.
- If the Borough is unable to obtain assistance from Middle Township Animal Control Officer or other qualified contractor with feral cat trapping and removal, NJDFW will assist the Borough in exploring other alternatives, including trapping and removal with NJDFW or contract staff.

USFWS Actions

- Upon request and within the limits of available staff time and funding, the USFWS will assist the Borough and/or the NJDFW in control of predator populations, such as arranging for removal through the U.S. Department of Agriculture's Animal and Plant Health Inspection Service or other qualified vendors.
- In the course of annual Seabeach Amaranth surveys, the USFWS will monitor the extent of Seabeach Amaranth herbivory and disease within Avalon (Section A), and will include this in the information reported to the Borough (Section G).
- In the course of annual Seabeach Amaranth surveys, the USFWS will note any observations of herbivory and disease of other listed plant species (Section A), and report this information to the Borough (Section G) and the ONLM.
- If herbivory and/or disease threaten the Seabeach Amaranth recovery goals specified in this plan, the USFWS will recommend and/or implement necessary actions, potentially including application of appropriate pesticides. By way of this plan, the Borough grants the USFWS permission for these activities, as indicated above. The USFWS will initiate early coordination with the Borough upon detection of an herbivory/disease problem, and will include the Borough in the planning of any proposed control measures. The USFWS

will notify the Borough Clerk in writing at least ten days before implementing any herbivore/disease control activities, and will adopt the Borough's recommendations for timing, methods, or other aspects of control operations to the extent possible. The USFWS will post signs in any treated areas as necessary and appropriate. Any USFWS actions are subject to the Intra-Service consultation requirements of Section 7 of the ESA, as well as all applicable regulations regarding pesticide handling and use.

C. HUMAN DISTURBANCE

Human disturbance includes any human activities that directly or indirectly harm or harass listed plants or birds, including interference with incubation and care of chicks. Recreational beach users and municipal employees may directly harm listed species by crushing plants or beach-nesting bird eggs. In addition, unfledged plover and tern chicks are highly sensitive to disturbance. Nesting birds may experience low success if exposed to frequent harassment by vehicles, pedestrians, sunbathers, pets or kites.

Borough Actions

- All areas of suitable nesting habitat on the beaches of the Protected Zones shall be pre-season fenced (fenced prior to the nesting season, or by April 1) with symbolic (string and post) fencing. The exact locations of the fence will be determined through consultation between the Avalon Department of Public Works, the Avalon Environmental Commission, and the NJDFW. Pre-season fencing will be installed by Avalon (with adjustments made as directed by NJDFW) after these discussions. NJDFW will provide signs for posting all nesting areas.
- The Borough will be responsible for removal of any beach-nesting bird fencing at the end of the nesting season as directed by NJDFW.
- In the event that unfenced Seabeach Amaranth plants remaining on the beach after August 31 are threatened by human activities (e.g., a large population of plants near a beach access structure, a Borough-sponsored clean-up or event in an area of species occurrence), the Borough will erect and maintain symbolic fencing posted with appropriate signs, as recommended by the USFWS. The Borough will remove all fencing once all plants are gone or the threat is abated, as recommended by the USFWS.
- Permanent structures, nor storage of private property are permitted on the beach, with the exception of a volleyball net at 30th Street. The Borough no longer permits catamarans to be stored or launched on Avalon's beaches and will continue to restrict this in the Protected Zones. This will remain in effect until such times as environmental conditions change and may permit catamaran activity in the Recreational Zones only under such conditions where there would be no impact to beach-nesting birds (e.g., catamarans would not be permitted adjacent to nesting zones).
- Avalon will only conduct, permit or sponsor any organized recreational activities or events (e.g., tournaments, races, games, pageants, etc.) on any of the designated Protected Zones from September 1 through March 14 (non-nesting season). In the Balanced Zone, the

Borough will consult with NJDFW or the USFWS in the beginning of the nesting season to determine if significant suitable habitat exists before any organized recreational activities or events may be conducted. In the Recreational Zones the Borough may conduct, permit, or sponsor any organized recreational activities or events (e.g., tournaments, races, games, musical events) at any time with no restrictions, unless the Borough has been notified that listed species are present. If listed species are present the Borough will adopt restrictions such as timing, fencing, or alternate locations as recommended by the NJDFW or the USFWS.

- Avalon will not create additional guarded beaches in any of the Protected Zones or take any actions to promote increased recreational use without written concurrence from the NJDFW and the USFWS that such designation or action would not adversely affect listed species or their habitats.
- The Borough will work with the NJDFW and the USFWS to regulate existing and new recreational activities as needed to protect listed species.
- The Borough will prohibit, by ordinance, kite flying within 200 meters of posted nesting areas between March 15 and August 31. The Borough will install signs and use other methods to inform the public of these instructions.
- To the maximum extent possible, the Borough will adjust the location of lifeguard stands when necessary to reduce disturbance to nests and broods.

Vehicle Use

- Avalon restricts municipal (e.g., Police, Lifeguards, Public Works) vehicle use (emergency use only allowed) from March 15 through August 31. Should nesting birds occur in the Balanced Zone the same restrictions will apply provided that suitable nesting habitat is pre-fenced.
- The Borough only permits the use of recreational vehicles on the beach between September 15 and March 15. Vehicles will remain at the high tide line between September 15 and November 30 when transiting the area to protect Seabeach Amaranth that may be present in the Protected Zones.
- Avalon informs all appropriate Borough departments (e.g., Police, Lifeguards, Public Works) and any contractors in writing of the need to avoid vehicle travel in the Protected Zones from March 15 through August 31 except in bona fide emergency or SOE situations. Before the nesting season begins, the Borough Mayor sends a letter to all affected municipal departments alerting them that the nesting season has begun. A second reminder is sent in the beginning of April reinforcing the importance of obeying the vehicle restrictions during the nesting season.
- In the Balanced Zone, the Borough will consult with NJDFW in the beginning of the nesting season to determine if significant suitable habitat exists. If suitable habitat exists, the Borough will coordinate with NJDFW and the USFWS to develop a Recreational

Vehicle Use Policy. The policy will be consistent with the Recreational Guidelines if plovers establish nesting in the Balanced Zone.

- No restrictions apply when Police are responding to an emergency as defined in this plan.
- No driving restrictions will apply in the Recreational Zones unless the Borough has been notified that listed species are present. If listed species colonize the Recreational Zones, the Borough will coordinate with NJDFW and the USFWS to develop a Recreational Vehicle Use Policy. The policy will be consistent with the Recreational Guidelines if plovers establish nesting in the Recreational Zones.

NJDFW Actions

- The NJDFW will coordinate annually with the Borough regarding the extent of areas that will be pre-season fenced. The Borough will erect symbolic fencing as necessary and appropriate in any beach zone in late March and no later than April 1st.
- The NJDFW will post all active nesting areas (in any Beach Zones) with the appropriate signs and symbolic fencing, including enlarging or adjusting pre-season fencing based on observed nesting activity. Since Seabeach Amaranth has only been reported in an area where listed birds are nesting; no additional fencing will be necessary unless plants are found outside of fenced areas, as identified by the USFWS.
- The NJDFW will advise the Borough that it may remove fencing within 10 days of the end of any nesting activity, unless fencing is needed longer to protect Seabeach Amaranth. The NJDFW and the USFWS will cooperate to remove Seabeach Amaranth fencing in a timely manner (see USFWS Actions below). All fencing will be removed promptly when it no longer provides protection to listed species.
- The NJDFW will inform the Avalon Dept. of Public Works within two working days of any new areas that have been fenced by NJDFW.
- The NJDFW will provide a timely response to Borough notification of planned events and will provide recommendations to protect listed species.

USFWS Actions

- Subject to available funding the USFWS will conduct limited early-season surveys to identify areas where Seabeach Amaranth or other listed plants are at risk of being damaged or destroyed, in order to make fencing recommendations.
- The USFWS will make recommendations after August 31, to the Borough, regarding the extent and duration of symbolic fencing needed to protect Seabeach Amaranth. Recommended fencing will be limited to areas where plants are at clear risk of being damaged or destroyed by human activity.
- The USFWS will generally recommend that the NJDFW and/or the Borough agents remove amaranth fencing once all plants are gone, or by November 30, whichever comes

first. In the unlikely event that unfenced plants remaining on the beach past August 31 are at continued risk of being damaged or destroyed by human activities, the USFWS will recommend that the Borough erect and maintain symbolic fence in limited areas as needed to protect these plants (e.g., a large population of plants near a beach access structure, a Borough-sponsored clean-up or event in an area of species occurrence). The USFWS will recommend that the Borough remove the fencing material promptly once all plants are gone for the season.

- Subject to available funding the USFWS will assist the Borough with any fencing needed after August 31 to protect Seabeach Amaranth.
- The USFWS will provide Seabeach Amaranth signs to post on symbolic fencing.
- The USFWS will continue work on Seabeach Amaranth Fencing Guidelines, and will provide these to the Borough and the NJDFW if and when approved.
- If justified by the State-wide species distribution, the USFWS will investigate creating a Seabeach Amaranth Steward position with seasonal field duties. The Steward would oversee the fencing and protection of seabeach amaranth during the growing season, and the implementation of beach management plans with regard to listed plants. At this time, it is unclear if the Steward would be employed by a federal or State agency or a private organization, and potential funding sources have not been secured. The USFWS will ensure coordination with the Borough if and when a Steward position is created.
- The USFWS will provide a timely response to Borough notification of planned events, and will provide recommendations to protect listed species.

D. FIREWORKS

Listed species in the vicinity of a fireworks launch site can be directly harmed (eggs or chicks injured or destroyed, plants crushed) by explosions, debris, equipment, or launch personnel. Listed species within a fireworks viewing area, which may be distant from the launch site, may be directly harmed by spectators, illegal pyrotechnics, and off-road vehicle patrols by public safety personnel. In addition, listed birds are indirectly affected by fireworks. Normal breeding, feeding, and sheltering activities can be disrupted by noise and activity at both launch and viewing areas, and increased trash in viewing areas attracts predators. Many of these impacts are worsened because fireworks events are conducted at night, limiting visibility of plants, eggs, chicks, and symbolic fencing.

In recent years, the primary fireworks viewing area in Avalon has been on the beach at 30th Street (over a mile from the Protected Zones) with off-shore launching. This location avoids most adverse impacts to listed species. No Seabeach Amaranth has been identified at this location to date. Moderate numbers of spectators have viewed these fireworks events from secondary viewing areas in the other Zones; the NJDFW and the Borough have provided law enforcement or other personnel at the Avalon Dunes Protected Zone (unless nesting also occurs in the North Protected Zone) to manage these crowds, as needed. Fireworks will continue to be managed consistent with the Fireworks Guidelines.

Borough Actions

- The Borough will continue to inform the NJDFW and the USFWS, in writing, of any planned fireworks events and the location proposed at least 30 days in advance.
- The Borough will continue to coordinate with the NJDFW and the USFWS to arrange for a Seabeach Amaranth survey and fencing within the fireworks primary area and secondary viewing areas in the Protected Zones (if not already fenced for the protection of beach-nesting birds) in the week preceding the event (if plants should occur).
- To protect listed species in the Protected Zones, the Borough will take the following protective measures:
 - Keep the launch and primary viewing area at or near 30th Street, as long as nesting areas remain limited to the Protected Zones.
 - Provide adequate law enforcement and other personnel to the Protected Zones during events to enforce listed species protections, including prohibiting entry into fenced areas and the use of illegal personal fireworks. The Borough will coordinate with the NJDFW to determine whether enforcement personnel are needed.
 - Prohibit driving of any vehicles in the vicinity of nesting areas during these nighttime events, unless responding to an emergency.
 - Ensure that monitors and enforcement personnel receive accurate, current information about the locations of listed species so they can minimize any disruptions from their own activities.
 - Prohibit all pets from the beach (especially near nesting areas) during fireworks events, and take reasonable steps to ensure compliance with this prohibition.
 - Remove any trash or litter from the vicinity of nesting areas immediately following the event, except any trash located within fenced areas, which will be left until daylight and then removed by or under the supervision of the NJDFW monitor, and consistent with the Recreational Guidelines.
- If nesting becomes established within the Recreational Zone, the Borough will continue the above protective measures in the Protected Zones and will take the following additional actions:
 - Relocate the primary viewing area and/or the launch site to minimize disturbance to nesting birds to the extent possible. In no case will a launch area be closer than 0.75 mile to a nesting area unless the NJDFW and the USFWS concur in writing that the proposed launch site is not likely to adversely affect listed birds.

- Extend to nesting areas in the Recreational Zone all the protective measures listed above for the Protected Zones, and work with the NJDFW to implement all relevant additional protective measures listed in the Fireworks Guidelines, including enhanced survey efforts, expanded fencing (100 foot instead of 50 foot buffers), and control of beach access and parking lots.

NJDFW Actions

- The NJDFW will provide a timely response to any request from the Borough to review specific fireworks plans and will provide recommendations to protect listed species.
- To protect listed species in the Protected Zones, the NJDFW will take the following protective measures:
 - Provide personnel to monitor the Protected Zones during fireworks events to assist the Borough in enforcement of listed species protection, as needed.
 - Provide a monitor to the Protected Zones the following day as needed to oversee trash removal from fenced areas and any trash removal requiring a vehicle.
- If nesting becomes established within the Recreational Zone, the NJDFW will continue the above protective measures in the Protected Zones and will take the following additional actions:
 - Review proposed relocated primary viewing areas and/or launch sites to determine if fireworks events are likely to adversely affect listed birds.
 - Extend to nesting areas in the Recreational Zone all the protective measures listed above for the Protected Zones, and will also work with the Borough to implement all relevant additional protective measures listed in the Fireworks Guidelines, including enhanced survey efforts, expanded fencing, and control of beach access and parking lots.

USFWS Actions

- The USFWS will provide a timely response to any request from the Borough to review specific fireworks plans and will provide recommendations to avoid impacts to listed species.
- The USFWS will continue to conduct in a timely manner consultation with the U.S. Coast Guard regarding authorization of Borough fireworks events pursuant to Section 7 of the ESA.
- Subject to available funding the USFWS will survey the primary viewing area within the week preceding the event and will erect symbolic fencing around Seabeach Amaranth or other listed plants to provide a minimum 3-meter buffer zone around plants.

E. BEACH MANAGEMENT AND MAINTENANCE

Beach maintenance includes the activities that Avalon undertakes to physically maintain the beaches and dunes including mechanical beach raking, refuse and large debris removal, dune maintenance, sand scraping, beach nourishment and oversight of beach access structures. These activities impact habitat quality, disturb nesting birds, destroy nests, chicks and plants.

1. Beach Raking

Beach raking can inadvertently destroy unprotected nests, kill chicks and remove plants. Beach raking can also diminish nesting habitat suitability by removing shell fragments and sparse vegetation. Habitat quality is also diminished by removal of natural wrack, an important foraging area for Piping Plovers and a key growing zone for Seabeach Amaranth. Beach raking is regulated by the New Jersey Coastal Zone Management Rules. The Borough will prohibit raking in the Protected Zones from March 15 to November 30. In the primary nesting areas, reducing or eliminating beach raking is desirable to ensure adequate feeding substrate to support adults and their broods.

Borough Actions

- Protected Zones**

The Borough will not rake the Protected Zones (8th – 9th and 40th – 58th Streets) between March 15 and November 30, except during a SOE (i.e., potentially harmful debris must be removed from the beach to protect public health and safety).

- Balanced Zone**

There is currently little habitat in the Balanced Zone (9th – 12th Streets) due to erosion. When habitat becomes available (as determined by NJDFW and/or USFWS) the Borough will not rake the Balanced Zone between March 15 and November 30 except during a SOE (i.e., potentially harmful debris that must be removed from the beach to protect public health and safety). If no listed species are present (as determined by NJDFW and/or USFWS) by July 15, the raking restriction may be lifted.

Should the Borough rake portions of the Balance Zone at the present time, the Borough will delineate a 2-3 meter corridor (approximately one beach-rake width) as a “no rake” zone at the toe of the dune or landward limit of the berm for Seabeach Amaranth connectivity habitat. This will allow for the potential transport of Seabeach Amaranth seeds. If this is a difficult concept to communicate for the Borough beach-rakers, the USFWS recommends the area be posted with signs to delineate a “no rake” zone. If any plants occur, they will be fenced with a 3-meter buffer for protection.

- Recreational Zones**

No raking restrictions will apply in the Recreational Zones (12th - 40th, and 58th - 80th Streets) unless the Borough has been notified that listed species are present, except as otherwise regulated or prohibited by the New Jersey Coastal Zone Management Rules. If

listed species colonize the Recreational Zones the Borough will include raking in the Recreational Zone Vehicle Use Policy to be developed with the NJDFW and the USFWS. The policy will be consistent with the Recreational Guidelines if plovers establish nesting in the Recreational Zone and will include protective measures for Seabeach Amaranth.

- The Borough will notify the NJDFW Tuckahoe Field Office and the USFWS Pleasantville Office promptly upon Declaration of an Emergency (notice by fax with confirmation of receipt is acceptable). In any Beach Zone the Borough will implement the protective measures listed in Table 1 when conducting SOE raking within 300 ft. of an active nesting area or Seabeach Amaranth occurrence. When implemented with these protective measures, the NJDFW and the USFWS will not object to SOE Raking of the Protected Zones or Balanced Zone during the restricted season (March 15 to November 30) to remove medical waste, hazardous trash, or other unusual debris; SOE raking may proceed once any required authorizations are obtained from the DLUR.

NJDFW and USFWS Actions

- The NJDFW will monitor nesting activity and regularly inform the borough (through the Business Administrator's office, Dept. of Public Works, Avalon Beach Patrol and other Borough departments as requested in writing by the Borough) of nest and brood locations so that changes in raking procedures affected by nesting status can be implemented on a timely basis.
- The NJDFW and the USFWS will promptly review requests from the Borough for SOE raking in the Protected and Balanced Zones and will make recommendations to protect listed species.
- The NJDFW and/or the USFWS will provide an on-site monitor during SOE raking, if determined that it is needed.
- The NJDFW and the USFWS will recommend to DLUR that normal raking prohibitions in the Protected or Balanced Zones be waived to permit SOE Raking that will be carried out with the protective measures listed in Table 1.
- See also Education and Outreach regarding presentations to Borough employees.

Table 1. Seasonal Protections for Listed Species When Motorized Vehicles or Equipment are Required to Respond to a State of Emergency (e.g., Life Threatening Emergency)

	Protections for Listed Birds	Protections for Listed Plants	Protections for All Listed Species
January			
February			
March 1 st – March 14th			
March 15 - May	<ul style="list-style-type: none"> ▪ SOE response will be supervised by the NJDFW monitors; ▪ vehicle use will take place during daylight hours; ▪ vehicles will not exceed 5 miles per hour when and where unfledged plover chicks are present; ▪ vehicles will not enter fenced areas; and ▪ vehicles will temporarily halt or change route as requested by the NJDFW monitors to avoid harassment of listed birds. 	<ul style="list-style-type: none"> ▪ vehicles will avoid crushing or removing seabeach amaranth and State-listed plants. 	<ul style="list-style-type: none"> ▪ vehicles will minimize removal of wrack material; and ▪ SOE response will proceed in accordance with any other recommendation of the NJDFW or the USFWS to protect listed species.
June			
July			
August			
September			
October			
November			
December			

2. Large Debris Removal

Large debris washes up on Borough beaches and must be removed periodically. If the large debris is in the Protected Zones and is not life-threatening nor a public safety hazard it can remain until the end of the nesting season (August 31) to be removed. If it definitely qualifies as a SOE then Table 1 would be used as a reference for the appropriate steps. An annual clean-up is conducted through the NJDEP Clean Shores Program. Additional clean-ups are sometimes carried out by the Borough. Removal of large debris requires motorized vehicles and equipment that can impact listed species.

Borough Actions

- No restrictions on clean-ups will apply in the Recreational Beach Zones unless the Borough has been notified that listed species are present. If listed species colonize the Recreational Zones, the Borough will include clean-ups in the Recreational Zone Vehicle Use Policy to be developed with the NJDFW and the USFWS. The policy will be consistent with the Recreational Guidelines if plovers establish nesting in the Recreational Zone and include protective measures for Seabeach Amaranth.
- The Borough will ensure that the Clean Shores Program schedules the annual NJDEP-sponsored clean-up in the Protected Zones and Balanced Zone between September 1 and March 14.
- The Borough will not conduct, sponsor, or authorize non-emergency clean-ups of the Protected Zones using motor vehicles between March 15 and August 31.
- Vehicles engaged in Borough-sponsored clean-ups of the Protected Zones and Balanced Zone between September 1 and November 30 will remain at or below the high water line to protect listed plants (if any); the Borough will notify the NJDFW and the USFWS at least 10 days prior to each scheduled clean-up.
- The Borough will notify the NJDFW and the USFWS promptly upon the Declaration of an Emergency (notice by fax with confirmation of receipt is acceptable). In any Beach Zone, the Borough will implement the measures listed in Table 1 when conducting SOE clean-ups in the vicinity of an active nesting area or Seabeach Amaranth occurrence. When implemented with these protective measures, the NJDFW and the USFWS will not object to SOE clean-ups to remove hazardous trash or other unusual debris to protect public health and safety. SOE clean-ups may proceed after any required authorizations are obtained from the DLUR.

NJDFW and USFWS Actions

- The NJDFW will assist the Borough in coordinating with the Clean Shores Program to schedule the annual NJDEP-sponsored clean-up in the Protected Zones and the Balanced Zone between September 1 and March 14.
- The NJDFW and the USFWS will provide timely review of notifications of Borough-sponsored clean-ups (both routine and SOE), and will provide recommendations to protect listed species.

- The NJDFW and/or the USFWS will provide a monitor to oversee SOE clean-ups in the Protected Zones between March 15 and August 31.

3. Refuse Containers

Regular servicing of trashcans and recycling containers located on the beach increases vehicle traffic on the beach with the inherent risks to listed species. However, minimizing trash on the beach benefits listed birds by limiting food scraps that attract predators.

Borough Actions

- The Borough will continue existing trash collection practices within the Recreational Zones unless notified that listed species are present. If listed species colonize the Recreational Zones the Borough will include refuse removal in the Recreational Zones Vehicle Regulations to be developed with the NJDFW and the USFWS. The policy will be consistent with the Recreational Guidelines if plovers establish nesting in the Recreational Zones and include protective measures for Seabeach Amaranth.
- Containers are placed along the length of the Avalon beaches. Trash containers in the Protected Zones are accessed only from the street ends and not from the beach. Therefore, no vehicular traffic interferes with listed species.
- The Borough uses “animal proof” trash can lids in all zones.

4. Dune Management and Invasive Plant Control

Steep, stabilized dunes do not provide suitable habitat for the beach-dependent listed species included in this Plan. In general dune management in the Protected and Balanced Zones should be aimed at developing a “natural” dune system -- one with irregular face, occasional breaches, and a low-lying sparsely vegetated fore dune. Limiting the width of the dune is also important to ensure sufficient low, unstabilized, sparsely vegetated back beach habitat, which is essential to listed species. A more natural dune system can also provide habitat for diverse native vegetation and wildlife. Dune creation and maintenance is regulated by the New Jersey Coastal Zone Management Rules (Section 7:7E-3A.4). Invasive plant species (e.g., Asiatic sand sedge [*Carex kobomugi*]), either exotic or native, can degrade or eliminate native habitat for listed species.

Borough Actions

- The Borough will consult with NJDFW and USFWS prior to undertaking any dune management and invasive plant species control measures (including, but not limited to, snow fencing, planting, fertilizing) and adopt recommendations in the Protected Zones. Dune management plans will be developed that provide necessary beach and property protection while minimizing or eliminating adverse impacts to listed species and their habitats.
- The Borough will provide plans for review by the NJDFW and the USFWS at least 30 days before carrying out routine dune management or invasive plant species control activities at any time of year in the Protected Zones or in the vicinity of any nesting area

or Seabeach Amaranth occurrence that may be documented in the Recreational Zone. The Borough will incorporate any recommendations of the NJDFW or the USFWS to protect listed species and their habitats.

- To avoid nest destruction or disturbance, any routine dune management work or any invasive plant species control will be carried out in the nesting zones only during the period September 1 through March 14. Work in the vicinity of a Seabeach Amaranth occurrence will be carried out between December 1 and May 14. Both seasonal restrictions will apply where Seabeach Amaranth coincides with listed birds.
- The Borough will coordinate any SOE Post-storm Beach or Dune Restoration with the NJDFW and the USFWS. The need for such activities will be signaled by a Declared Emergency, and eligibility for DLUR permits under Section 7:7E-3A.3 of the New Jersey Coastal Zone Management Rules. The Borough will notify the NJDFW and the USFWS promptly upon Declaration of an Emergency (notice by fax with confirmation of receipt is acceptable).
- In any beach Zone, the Borough will implement the protective measures listed in Table 1 when conducting SOE Restoration activities in the vicinity of an active nesting area or Seabeach Amaranth occurrence. When implemented with these protective measures, the NJDFW and the USFWS will not object to SOE Restoration activities. SOE Restoration may proceed once any required authorizations are obtained from the DLUR. The parties anticipate that SOE Restoration activities will have low potential to impact listed species as suitable nesting/growing habitat is likely to be damaged or destroyed by the erosional or storm event(s) that caused the SOE.
- Aerial fertilization of the dunes is conducted only during the period from September 1 through March 14. This fertilization is concentrated in the upper dune areas.

NJDFW and USFWS Actions

- The NJDFW and the USFWS will provide technical assistance to the Borough to develop dune management strategies that enhance nesting habitat suitability for listed species while meeting storm protection needs. The NJDFW and the USFWS will provide technical assistance to the Borough for controlling invasive plant species to enhance the suitability of habitat for listed species. The NJDFW and the USFWS recommendations will promote a diverse assemblage of native dune vegetation, and will be consistent with N.J.A.C. 7:7E-3A.4.
- The NJDFW and the USFWS will provide timely response to any request from the borough to review specific dune management plans, and will provide recommendations to protect listed species and their habitats.
- The NJDFW and the USFWS will provide timely recommendations upon Borough notification of SOE Post-storm Beach or Dune Restoration activities.
- The NJDFW and the USFWS will provide timely recommendations upon Borough notification of invasive plant species control activities.

- The NJDFW and/or the USFWS will provide a monitor to oversee SOE Beach or Dune Restoration activities, as necessary.

5. Beach Nourishment

The Corps is currently six years into the construction phase of a 50-year beach nourishment program that includes all of Seven Mile Beach Island. Initial nourishment of the beaches under the Corps program occurred in 2003. Routine nourishments are scheduled approximately every 4 years. No renourishment has been scheduled.

Prior to beach nourishment, many sites within the U.S. Army Corps of Engineers, Philadelphia District (Corps) Program Area (Program Area) for beach nourishment activities now occupied by Piping Plovers and Seabeach Amaranth had become unsuitable due to previous shoreline stabilization efforts. Sandy beach habitats had eroded and new habitats were precluded from forming by the extensive system of hard stabilization structures and upland development found along the New Jersey coast. Nourishment of oceanfront beaches can create nesting habitat for Piping Plovers and suitable for Seabeach Amaranth.

It can be anticipated that, following initial construction of the federal nourishment projects within the Program Area, similar creation of potentially suitable habitat for Piping Plovers and Seabeach Amaranth will occur in areas where these species are currently absent or, in the case of Seabeach Amaranth, are present in only very low numbers. It should also be noted that although the Corps nourishment projects will create sandy beach habitat that may attract Piping Plovers, the habitat created can be expected to be of lesser quality than habitat that is formed through natural coastal processes such as overwash. Habitat creation alone will not create a beneficial effect for either species if the habitat is suboptimal and does not provide foraging habitat for plover chicks or if disturbance from municipal and recreational users cannot be managed to avoid loss of nests of chicks or loss of plants.

Pursuant to Section 7 of the ESA, the Corps completed formal consultation with the USFWS for beach nourishment activities under the USFWS December 2005 Programmatic Biological Opinion (PBO) (Appendix D) on the effects of federal beach nourishment, renourishment, stabilization and restoration activities along the Atlantic Coast of New Jersey within the Corps, Philadelphia District on the federally listed (threatened) Piping Plover and Seabeach Amaranth.

Relevant conservation measures proposed by the Corps for protection of federally listed species and reasonable and prudent measures imposed by the USFWS to minimize take of federally listed species are specified within the USFWS's PBO and are applicable to all projects carried out under the Corps program. To be exempt from the take prohibitions of Section 9 of the ESA, the Corps must implement all pertinent reasonable and prudent measures and terms and conditions, as stipulated in the USFWS's PBO, to minimize the impact of anticipated incidental take of Piping Plovers.

Nourishment or operation and maintenance activities will be scheduled and sequenced to avoid or minimize construction activities during Piping Plover nesting season within known Piping Plover nesting areas. For areas where habitat conditions have changed substantially, such that a suitable habitat is no longer present, a case-by-case evaluation of the site will be conducted by

the USFWS in coordination with the Corps and the NJDEP. All construction activities will avoid any delineated locations of Seabeach Amaranth to the greatest practicable extent.

In the future, the Borough and/or the NJDEP may decide to sponsor beach nourishment in the Borough to supplement the Corps program. In addition, the Borough and/or the NJDEP may conduct beach nourishment as part of a SOE Post-Storm Beach or Dune Restoration. Whether routine or SOE, any beach nourishment outside of the Corps program would require federal and State permits from the Corps and the DLUR, respectively.

Borough Actions

- The Borough will work with the USFWS, NJDEP and the Corps to implement the provisions of the 2005 Programmatic Biological Opinion, and of each streamlined consultation, during each renourishment of the Borough's beaches under the Corps' nourishment program. Key provisions of the Programmatic Biological Opinion include fencing, avoidance, and possibly salvage and replacement of Seabeach Amaranth plants; and a seasonal restriction (March 15 to the fledging of the last chick) on construction within 1,000 meters of Piping Plover nesting areas, as defined in this plan.
- The Borough will work with the USFWS and the Corps to ensure that any routine nourishment activities sponsored by the NJDEP and/or the Borough (requiring federal permits) include Conservation Measures at least as protective as the provisions of the Programmatic Biological Opinion that governs implementation of the Corps' beach nourishment program. Protection would be achieved mainly through seasonal restrictions on beach construction within 1,000 meters of plover nesting areas, and fencing, avoidance, and possibly salvage and replacement of Seabeach Amaranth plants.
- SOE beach nourishment may be necessary when conditions pose a clear danger to human life or health (e.g. ocean front beach erosion has occurred that makes public access points onto the beach dangerous or impossible to use) or pose a clear danger of damage to public or private structures lying landward of the ocean-front seawall or primary dune line, such as private homes, public buildings, streets, water lines and sewer lines. Placement of clean fill material is among the activities listed at N.J.A.C. 7:7E-3A.3(b); therefore, SOE beach nourishment qualifies as "SOE Post-storm Beach or Dune Restoration" as defined in this plan.
- The Borough will coordinate any SOE Post-storm Beach or Dune Restoration (including SOE beach nourishment) with the NJDFW and the USFWS. The need for such activities will be signaled by a Declared Emergency, and eligibility for DLUR permits under Section 7:7E-3A.3 of the New Jersey Coastal Zone Management Rules. The Borough will notify the NJDFW and the USFWS promptly upon Declaration of an Emergency (notice by fax with confirmation of receipt is acceptable).
- In any Beach Zone, the Borough will implement the protective measures listed in Table 1 when conducting SOE restoration activities in the vicinity of an active nesting area or Seabeach Amaranth occurrence. When implemented with these protective measures, the NJDFW and the USFWS will not object to SOE restoration activities. SOE restoration

may proceed once any required authorizations are obtained from the DLUR and the Corps. The parties anticipate that SOE restoration activities (including SOE beach nourishment) will have low potential to impact listed species, as suitable nesting/growing habitat is likely to be damaged or destroyed by the erosional or storm event(s) that caused the SOE.

NJDFW Actions

- The NJDFW will provide current information on the status and locations of listed birds before and during any renourishment (whether sponsored by the Corps, the NJDEP, or the Borough) to aid in the implementation of relevant Conservation Measures and Terms and Conditions.
- In the course of planning for beach nourishment projects, the NJDFW will provide: (1) current and historical nesting data and locations, and (2) recommendations for habitat enhancements that could be incorporated into the project.
- The NJDFW will provide a timely response to any request from the Borough to review specific beach nourishment plans.
- The NJDFW will provide timely recommendations upon notification of SOE Post-storm Beach or Dune Restoration activities that include SOE beach nourishment.

USFWS Actions

- The USFWS will provide updated information of the locations of Seabeach Amaranth before and during any renourishment (whether sponsored by the Corps, the NJDEP, or the Borough) to aid in the implementation of relevant Conservation Measures and Terms and Conditions.
- In the course of planning for beach nourishment projects, the USFWS will provide: (1) current and historical locations of Seabeach Amaranth, and (2) recommendations for habitat enhancements that could be incorporated into the project.
- The USFWS will work with the Corps to promptly complete streamlined consultation for each renourishment of Avalon beaches under the Corps' program.
- The USFWS will work with the Corps, the applicant, and the Borough to promptly complete consultations regarding Corps permits to authorize routine or SOE beach nourishment sponsored by the NJDEP and/or the Borough.
- Regardless of the project sponsor, the USFWS will provide the Borough with copies of relevant documents resulting from the consultation process regarding beach nourishment, including key sections of Biological Opinions.
- The USFWS will provide timely recommendations upon notification of SOE Post-storm Beach or Dune Restoration activities that include SOE beach nourishment.

6. Sand Scraping

Use of motorized equipment to conduct sand scraping (mechanical distribution of sand, also called sand transfers or sand mining) can directly harm listed species by crushing eggs, chicks, plants or seeds; can harass nesting birds through disturbance; and can adversely impact habitats for listed species by creating ruts and removing shells, wrack and natural debris. Sand scraping is regulated by the New Jersey Coastal Zone Management rules and the U.S. Army Corps of Engineers. The Borough will prohibit sand scraping in the Protected Zones or Balanced Zone year round.

Borough Actions

- No restrictions on sand scraping will apply in the Recreational Zones unless the Borough has been notified that listed species are present, except as otherwise regulated or prohibited by the New Jersey Coastal Zone Management Rules. If listed species colonize the Recreational Zones, the Borough will develop appropriate policies for sand scraping with the NJDFW and the USFWS. The policy will be consistent with the Recreational Guidelines if plovers establish nesting in the Recreational Zones.
- The Borough will not conduct sand scraping in the Protected Zones or Balance Zone at any time of the year except as a necessary part of SOE Post-storm Beach or Dune Restoration.
- The Borough will prohibit vehicle use through the Protected Zones to transport sand to other portions of the beach from March 15 to August 31 except as a necessary part of SOE Post-storm Beach or Dune Restoration. Vehicles should remain at the high tide line between September 1 and November 30 to protect Seabeach Amaranth that may be present in the Protected Zones.
- Mechanical distribution of sand is among the activities listed at N.J.A.C. 7:7E3A.3(b), therefore, sand scraping under SOE conditions qualifies as “SOE Post-storm Beach or Dune Restoration” as defined in this plan.
- The Borough will coordinate any SOE Post-storm Beach or Dune Restoration with the NJDFW and the USFWS. The need for such activities will be signaled by a Declared Emergency, and eligibility for DLUR permits under Section 7:7E3A.3 of the New Jersey Coastal Zone Management Rules. The Borough will notify the NJDFW and the USFWS promptly upon Declaration of an Emergency (notice by fax with confirmation of receipt is acceptable).
- In any Beach Zone, the Borough will implement the protective measures listed in Table 1 when conducting SOE Restoration activities in the vicinity of an active nesting area or Seabeach Amaranth occurrence. When implemented with these protective measures, the NJDFW and the USFWS will not object to SOE Restoration activities. SOE Restoration may proceed once any required authorizations are obtained from the DLUR and the Corps. The parties anticipate that SOE Restoration activities will have low potential to impact listed species, as suitable nesting/growing habitat is likely to be damaged or destroyed by the erosion or storm event(s) that caused the SOE.

7. Beach Access Issues

Background

An excessive number of beach accesses and/or beach access structures can bring more recreational users into potential conflict with listed species. Such accesses and structures can also lead to unauthorized impacts to dunes, as recreational beach users create new, unauthorized walkways through the dunes; these gaps in the dune line fragment nesting and growing areas.

Borough Actions

- The Borough will not propose any new beach access points/structures within the Protected Zones. If the Borough determines additional beach access (or a change in location of current access points) is necessary or is required to provide additional access, the Borough will work with the NJDFW and the USFWS to locate (or relocate), design and construct any proposed new public access structures to minimize adverse impacts to listed species.
- Private access paths are not permitted through the dunes. There are public access paths at 40th, 42nd, 48th, 50th and 57th Streets.
- The Borough will work with the NJDFW and the USFWS to place appropriate signs regarding protections for listed species and dunes at or near public access points.

NJDFW and USFWS Actions

- The NJDFW and the USFWS will provide appropriate signs to post at or near public beach access points.

F. EDUCATION AND OUTREACH

This component of the Management Plan encompasses all of the management issues discussed above for the purposes of reducing human disturbance, predation, and the detrimental impacts of beach maintenance. Education and outreach includes on-site and off-site distribution of educational materials, educational displays, lectures, beach walks, interpretive signs, and other elements that provide information on the basic biology of listed species, the impact of various human activities and predators and recommended actions to help protect and restore populations of listed species.

Borough Actions

- The Borough has purchased several interpretive signs. These are placed on the boardwalk, at 80th St. and at several other locations. Avalon continues to locate these signs in appropriate locations and replace them as needed.
- The Borough (e.g., Avalon Environmental Commission) will develop an educational pamphlet about cats directed at residents, vacation homeowners, and renters. The pamphlet will discourage cat owners from allowing their pets to roam freely outdoors,

and from “disposing” of cats in wild areas when they leave Avalon. The pamphlet will also discourage feeding of feral (“wild” or non-owned) cats.

- The Borough will develop outreach materials to discourage feeding of gulls (signs, posters, brochures, etc) to be posted or distributed by the Borough, realtors, businesses, etc. The NJDFW and the USFWS will assist as specified below.
- Avalon Environmental Commission will develop a public education display regarding beach nesting birds for use at festivals and other events. The NJDFW will assist as needed.

NJDFW and USFWS Actions

- The NJDFW and the USFWS will assist the Borough in developing educational outreach materials by supplying existing materials and necessary information and by providing technical review.
- The NJDFW and the USFWS will provide information for the Avalon Newsletter and other publications. Upon request of the Borough, the agencies will author articles within the limits of available staff time.
- The NJDFW will provide copies of "CATS Indoors" to the Avalon Environmental Commission for general distribution.
- The USFWS will provide copies of the Seabeach Amaranth fact sheet developed by the ONLM, and the USFWS's Beach Management Planning and Piping Plover Factsheets upon request and as available. NJDFW will provide brochures on beach-nesting birds upon request and as available.
- The USFWS will provide interpretive signs on the beach annually regarding listed species, as available. The USFWS will consult the Borough in locating interpretive signs.
- The NJDFW will conduct beach walks to show beach nesting bird areas and nesting activity to Borough officials (including Environmental Commission) as requested by the Borough and scheduled at least once per season.
- Upon Request of the Borough, the NJDFW and/or the USFWS will conduct periodic educational talks and/or beach walks for Borough employees, contractors, residents, or visitors within limits of available staff time.

G. OTHER PROVISIONS

- The NJDFW and the USFWS will regularly inform the borough regarding changes in listed species locations, distribution, population, habitat and/or nesting activity that may affect any of the provisions of this plan or that it believes would be of general interest to the Borough.
- The NJDFW will provide regular notification regarding nesting activity including, but not limited to biweekly faxes or e-mails during the nesting season sent to the Borough

Administrator's office, the Dept. of Public Works and other Borough Departments as reasonably requested in writing by the Borough. The faxes or e-mails will provide the current location of nests and chicks, the NJDFW management activities, and other important information.

- The NJDFW and the USFWS will provide the Borough with a brief summary of endangered species recovery status and management, with recommendations, by the end of each calendar year.
- The NJDFW and the USFWS will provide maps of species locations within the Borough upon request.
- The NJDFW will work with the Borough of Avalon to support implementation of this plan.

**Appendix A: USFWS Guidelines for Managing Recreational Activities in Piping Plover
Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the
Endangered Species Act**

GUIDELINES FOR MANAGING RECREATIONAL ACTIVITIES
IN PIPING PLOVER BREEDING
HABITAT ON THE U.S. ATLANTIC COAST TO AVOID TAKE UNDER SECTION 9 OF
THE ENDANGERED SPECIES ACT

Northeast Region, U.S. Fish and Wildlife Service
April 15, 1994

The following information is provided as guidance to beach managers and property owners seeking to avoid potential violations of Section 9 of the Endangered Species Act (16 U.S.C. 1538) and its implementing regulations (50 CFR Part 17) that could occur as the result of recreational activities on beaches used by breeding piping plovers along the Atlantic Coast. These guidelines were developed by the Northeast Region, U.S. Fish and Wildlife Service (Service), with assistance from the U.S. Atlantic Coast Piping Plover Recovery Team. The guidelines are advisory, and failure to implement them does not, of itself, constitute a violation of the law. Rather, they represent the Service's best professional advice to beach managers and landowners regarding the management options that will prevent direct mortality, harm, or harassment of piping plovers and their eggs due to recreational activities.

Some land managers have endangered species protection obligations under Section 7 of the Endangered Species Act (see section I below) or under Executive Orders 11644 and 11989¹ that go beyond adherence to these guidelines. Nothing in this document should be construed as lack of endorsement of additional piping plover protection measures implemented by these land managers or those who are voluntarily undertaking stronger plover protection measures.

This document contains four sections: (I) a brief synopsis of the legal requirements that afford protection to nesting piping plovers; (II) a brief summary of the life history of piping plovers and potential threats due to recreational activities during the breeding cycle; (III) guidelines for protecting piping plovers from recreational activities on Atlantic Coast beaches; and (IV) literature cited.

¹ Executive Order 11644, Use of Off-Road Vehicles on the Public Lands and Executive Order 11989, Off-Road Vehicles on Public Lands pertain to lands under custody of the Secretaries of Agriculture, Defense, and Interior (except for Indian lands) and certain lands under the custody of the Tennessee Valley Authority.

I. LEGAL CONSIDERATIONS

Section 9 of the Endangered Species Act (ESA) prohibits any person subject to the jurisdiction of the United States from harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting listed wildlife species. It is also unlawful to attempt such acts, solicit another to commit such acts, or cause such acts to be committed. A "person" is defined in Section 3 to mean "an individual, corporation, partnership, trust, association, or any other private entity; or any officer, employee, agent, department, or instrumentality of the Federal Government, of any State, municipality, or political subdivision of a State, or of any foreign government; any State, municipality, or political subdivision of a State; or any other entity subject to the jurisdiction of the United States." Regulations implementing the ESA (50 CFR 17.3) further define "harm" to include significant habitat modification or degradation that results in the killing or injury of wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. "Harass" means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Penalties for violations of Section 9 are provided in Section 11 of the ESA; for threatened species, these penalties include fines of up to \$25,000, imprisonment for not more than six months, or both.

Section 10 of the ESA and related regulations provide for permits that may be granted to authorize acts prohibited under Section 9, for scientific purposes or to enhance the propagation or survival of a listed species. States that have Cooperative Agreements under Section 6 of the ESA, may provide written authorization for take that occurs in the course of implementing conservation programs. For example, State agencies have authorized certain biologists to construct predator exclosures for piping plovers. It is also legal for employees or designated agents of certain Federal or State agencies to take listed species without a permit, if the action is necessary to aid sick, injured, or orphaned animals or to salvage or dispose of a dead specimen.

Section 10 also allows permits to be issued for take that is "incidental to, and not the purpose of, carrying out an otherwise lawful activity" if the Service determines that certain conditions have been met. An applicant for an incidental take permit must prepare a conservation plan that specifies the impacts of the take, steps the applicant will take to minimize and mitigate the impacts, funding that will be available to implement these steps, alternative actions to the take that the applicant considered, and the reasons why such alternatives are not being utilized.

Section 7 of the ESA may be pertinent to beach managers and landowners in situations that have a Federal nexus. Section 7 requires Federal agencies to consult with the Service (or National Marine Fisheries Service for marine species) prior to authorizing, funding, or carrying out activities that may affect listed species. Section 7 also requires that these agencies use their authorities to further the conservation of listed species. Section 7 obligations have caused Federal land management agencies to implement piping plover protection measures that go beyond those required to avoid take, for example by conducting research on threats to piping plovers. Other examples of Federal activities that may affect piping plovers along the Atlantic Coast, thereby triggering Section 7 consultation, include permits for beach nourishment or disposal of dredged material (U.S. Army Corps of Engineers) and funding of beach restoration projects (Federal Emergency Management Authority).

Piping plovers, as well as other migratory birds such as least terns, common terns, American oystercatchers, laughing gulls, herring gulls, and great black-backed gulls, their nests, and eggs are also protected under the Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712). Prohibited acts include pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting such conduct. Violators may be fined up to \$5000 and/or imprisoned for up to six months.

Almost all States within the breeding range of the Atlantic Coast piping plover population list the species as State threatened or endangered (Northeast Nongame Technical Committee 1993). Various laws and regulations may protect State-listed species from take, but the Service has not ascertained the adequacy of the guidelines presented in this document to meet the requirements of any State law.

II. LIFE HISTORY AND THREATS FROM HUMAN DISTURBANCE

Piping plovers are small, sand-colored shorebirds that nest on sandy, coastal beaches from South Carolina to Newfoundland. Since 1986, the Atlantic Coast population has been protected as a threatened species under provisions of the U.S. Endangered Species Act of 1973 (U.S. Fish and Wildlife Service 1985). The U.S. portion of the population was estimated at 875 pairs in 1993 (U.S. Fish and Wildlife Service 1993). Many characteristics of piping plovers contribute to their susceptibility to take due to human beach activities.

LIFE HISTORY

Piping plovers begin returning to their Atlantic Coast nesting beaches in mid-March (Couto et al. 1990, Cross 1990, Goldin 1990, MacIvor 1990, Hake 1993). Males establish and defend territories and court females (Cairns 1982). Eggs may be present on the beach from mid-April through late July. Clutch size is generally four eggs, and the incubation period² usually lasts for 27-28 days. Piping plovers fledge only a single brood per season, but may renest several times if previous nests are lost. Chicks are precocial³ (Wilcox 1959, Cairns 1982). They may move hundreds of yards from the nest site during their first week of life (see Table 1, Summary of Chick Mobility Data). Chicks remain together with one or both parents until they fledge (are able to fly) at 25 to 35 days of age. Depending on date of hatching, flightless chicks may be present from mid-May until late August, although most fledge by the end of July (Patterson 1988, Goldin 1990, MacIvor 1990, Howard et al. 1993).

Piping plover nests are situated above the high tide line on coastal beaches, sand flats at the ends of sandspits and barrier islands, gently sloping foredunes, blowout areas behind primary dunes, and washover areas cut into or between dunes. They may also nest on areas where suitable dredge material has been deposited. Nest sites are shallow scraped depressions in substrates ranging from fine grained sand to mixtures of sand and pebbles, shells or cobble (Bent 1929, Burger 1987a, Cairns 1982, Patterson 1988, Flemming et al. 1990, MacIvor 1990,

²"Incubation" refers to adult birds sitting on eggs, to maintain them at a favorable temperature for embryo development.

³precocial" birds are mobile and capable of foraging for themselves within several hours of hatching.

Strauss 1990). Nests are usually found in areas with little or no vegetation although, on occasion, piping plovers will nest under stands of American beachgrass (Ammophila breviligulata) or other vegetation (Patterson 1988, Flemming et al. 1990, MacIvor 1990). Plover nests may be very difficult to detect, especially during the 6-7 day egg-laying phase when the birds generally do not incubate (Goldin 1994).

Plover foods consist of invertebrates such as marine worms, fly larvae, beetles, crustaceans or mollusks (Bent 1929, Cairns 1977, Nicholls 1989). Feeding areas include intertidal portions of ocean beaches, washover areas, mudflats, sandflats, wrack lines⁴, and shorelines of coastal ponds, lagoons or salt marshes (Gibbs 1986, Coutu et al. 1990, Hoopes et al. 1992, Loegering 1992, Goldin 1993). Studies have shown that the relative importance of various feeding habitat types may vary by site (Gibbs 1986, Coutu et al. 1990, McConnaughey et al. 1990, Loegering 1992, Goldin 1993, Hoopes 1993) and by stage in the breeding cycle (Cross 1990). Adults and chicks on a given site may use different feeding habitats in varying proportion (Goldin et al. 1990). Feeding activities of chicks may be particularly important to their survival. Cairns (1977) found that piping plover chicks typically tripled their weight during the first two weeks post-hatching; chicks that failed to achieve at least 60% of this weight gain by day 12 were unlikely to survive. During courtship, nesting, and brood rearing, feeding territories are generally contiguous to nesting territories (Cairns 1977), although instances where brood-rearing areas are widely separated from nesting territories are not uncommon (see Table 1). Feeding activities of both adults and chicks may occur during all hours of the day and night (Burger 1993) and at all stages in the tidal cycle (Goldin 1993, Hoopes 1993).

THREATS FROM NONMOTORIZED BEACH ACTIVITIES

Sandy beaches that provide nesting habitat for piping plovers are also attractive recreational habitats for people and their pets. Nonmotorized recreational activities can be a source of both direct mortality and harassment of piping plovers. Pedestrians on beaches may crush

Wrack is organic material including seaweed, seashells, driftwood and other materials deposited on beaches by tidal action.

eggs (Burger 1987b, Hill 1988, Shaffer and Laporte 1992, Cape Cod National Seashore 1993, Collazo et al. 1994). Unleashed dogs may chase plovers (McConaughey et al. 1990), destroy nests (Hoopes et al. 1992), and kill chicks (Cairns and McLaren 1980).

Pedestrians may flush incubating plovers from nests (see Table 2, Summary of Data on Distances at Which Plovers React to Disturbance), exposing eggs to avian predators or causing excessive cooling or heating of eggs. Repeated exposure of shorebird eggs on hot days may cause overheating, killing the embryos (Bergstrom 1991). Excessive cooling may kill embryos or retard their development, delaying hatching dates (Welty 1982). Pedestrians can also displace unfledged chicks (Strauss 1990, Burger 1991, Hoopes et al. 1992, Loegering 1992, Goldin 1993). Fireworks are highly disturbing to piping plovers (Howard et al. 1993). Plovers are particularly intolerant of kites, compared with pedestrians, dogs, and vehicles; biologists believe this may be because plovers perceive kites as potential avian predators (Hoopes et al. 1992).

THREATS FROM MOTOR VEHICLES

Unrestricted use of motorized vehicles on beaches is a serious threat to piping plovers and their habitats. Vehicles can crush eggs (Wilcox 1959; Tull 1984; Burger 1987b; Patterson et al. 1991; United States of America v. Breezy Point Cooperative, Inc., U.S. District Court, Eastern District of New York, Civil Action No. CV-90-2542, 1991; Shaffer and Laporte 1992), adults, and chicks. In Massachusetts and New York, biologists documented 14 incidents in which 18 chicks and 2 adults were killed by vehicles between 1989 and 1993 (Melvin et al. 1994). Goldin (1993) compiled records of 34 chick mortalities (30 on the Atlantic Coast and 4 on the Northern Great Plains) due to vehicles. Many biologists that monitor and manage piping plovers believe that many more chicks are killed by vehicles than are found and reported (Melvin et al. 1994). Beaches used by vehicles during nesting and brood-rearing periods generally have fewer breeding plovers than available nesting and feeding habitat can support. In contrast, plover abundance and productivity has increased on beaches where vehicle restrictions during chick-rearing periods have been combined with protection of nests from predators (Goldin 1993; S. Melvin, pers. comm., 1993).

Typical behaviors of piping plover chicks increase their vulnerability to vehicles. Chicks frequently move between the upper berm or foredune and feeding habitats in the wrack line

and intertidal zone. These movements place chicks in the paths of vehicles driving along the berm or through the intertidal zone. Chicks stand in, walk, and run along tire ruts, and sometimes have difficulty crossing deep ruts or climbing out of them (Eddings et al. 1990, Strauss 1990; Howard et al. 1993). Chicks sometimes stand motionless or crouch as vehicles pass by, or do not move quickly enough to get out of the way (Tull 1984, Hoopes et al. 1992, Goldin 1993). Wire fencing placed around nests to deter predators (Rimmer and Deblinger 1990, Melvin et al. 1992) is ineffective in protecting chicks from vehicles because chicks typically leave the nest within a day after hatching and move extensively along the beach to feed (see Table 1).

Vehicles may also significantly degrade piping plover habitat or disrupt normal behavior patterns. They may harm or harass plovers by crushing wrack into the sand and making it unavailable as cover or a foraging substrate, by creating ruts that may trap or impede movements of chicks, and by preventing plovers from using habitat that is otherwise suitable (MacIvor 1990, Strauss 1990, Hoopes et al. 1992, Goldin 1993).

III. GUIDELINES FOR PROTECTING PIPING PLOVERS FROM RECREATIONAL DISTURBANCE

The Service recommends the following protection measures to prevent direct mortality or harassment of piping plovers, their eggs, and chicks.

MANAGEMENT OF NONMOTORIZED RECREATIONAL USES

On beaches where pedestrians, joggers, sun-bathers, picnickers, fishermen, boaters, horseback riders, or other recreational users are present in numbers that could harm or disturb incubating plovers, their eggs, or chicks, areas of at least 50 meter-radius around nests above the high tide line should be delineated with warning signs and symbolic fencing⁵. Only persons engaged in rare species monitoring, management, or research activities should enter posted areas. These areas should remain fenced as long as viable eggs or unfledged chicks are present. Fencing is intended to prevent accidental crushing of nests and repeated flushing of

⁵ "Symbolic fencing" refers to one or two strands of light-weight string, tied between posts to delineate areas where pedestrians and vehicles should not enter.

incubating adults, and to provide an area where chicks can rest and seek shelter when large numbers of people are on the beach.

Available data indicate that a 50 meter buffer distance around nests will be adequate to prevent harassment of the majority of incubating piping plovers. However, fencing around nests should be expanded in cases where the standard 50 meter-radius is inadequate to protect incubating adults or unfledged chicks from harm or disturbance. Data from various sites distributed across the plover's Atlantic Coast range indicates that larger buffers may be needed in some locations (see Table 2). This may include situations where plovers are especially intolerant of human presence, or where a 50 meter-radius area provides insufficient escape cover or alternative foraging opportunities for plover chicks.⁶

In cases where the nest is located less than 50 meters above the high tide line, fencing should be situated at the high tide line, and a qualified biologist should monitor responses of the birds to passersby, documenting his/her observations in clearly recorded field notes. Providing that birds are not exhibiting signs of disturbance, this smaller buffer may be maintained in such cases.

On portions of beaches that receive heavy human use, areas where territorial plovers are observed should be symbolically fenced to prevent disruption of territorial displays and courtship. Since nests can be difficult to locate, especially during egg-laying, this will also prevent accidental crushing of undetected nests. If nests are discovered outside fenced areas, fencing should be extended to create a sufficient buffer to prevent disturbance to incubating adults, eggs, or unfledged chicks.

⁶ For example, on the basis of data from an intensive three year study that showed that plovers on Assateague Island in Maryland flush from nests at greater distances than those elsewhere (Loegering 1992), the Assateague Island National Seashore established 200 meter buffers zones around most nest sites and primary foraging areas (Assateague Island National Seashore 1993). Following a precipitous drop in numbers of nesting plover pairs in Delaware in the late 1980's, that State adopted a Piping Plover Management Plan that provided 100 meter buffers around nests on State park lands and included intertidal areas (Delaware Department of Natural Resources and Environmental Control 1990).

Pets should be leashed and under control of their owners at all times from April 1 to August 31 on beaches where piping plovers are present or have traditionally nested. Pets should be prohibited on these beaches from April 1 through August 31 if, based on observations and experience, pet owners fail to keep pets leashed and under control.

Kite flying should be prohibited within 200 meters of nesting or territorial adult or unfledged juvenile piping plovers between April 1 and August 31.

Fireworks should be prohibited on beaches where plovers nest from April 1 until all chicks are fledged.

MOTOR VEHICLE MANAGEMENT

The Service recommends the following minimum protection measures to prevent direct mortality or harassment of piping plovers, their eggs, and chicks on beaches where vehicles are permitted. Since restrictions to protect unfledged chicks often impede vehicle access along a barrier spit, a number of management options affecting the timing and size of vehicle closures are presented here. Some of these options are contingent on implementation of intensive plover monitoring and management plans by qualified biologists. It is recommended that landowners seek concurrence with such monitoring plans from either the Service or the State wildlife agency.

Protection of Nests

All suitable piping plover nesting habitat should be identified by a qualified biologist and delineated with posts and warning signs or symbolic fencing on or before April 1 each year. All vehicular access into or through posted nesting habitat should be prohibited. However, prior to hatching, vehicles may pass by such areas along designated vehicle corridors established along the outside edge of plover nesting habitat. Vehicles may also park outside delineated nesting habitat, if beach width and configuration and tidal conditions allow. Vehicle corridors or parking areas should be moved, constricted, or temporarily closed if territorial, courting, or nesting plovers are disturbed by passing or parked vehicles, or if disturbance is anticipated because of unusual tides or expected increases in vehicle use during weekends, holidays, or special events.

If data from several years of plover monitoring suggests that significantly more habitat is available than the local plover population can occupy, some suitable habitat may be left unposted if the following conditions are met:

1. The Service OR a State wildlife agency that is party to an agreement under Section 6 of the ESA provides written concurrence with a plan that:

- A. Estimates the number of pairs likely to nest on the site based on the past monitoring and regional population trends.

AND

- B. Delineates the habitat that will be posted or fenced prior to April 1 to assure a high probability that territorial plovers will select protected areas in which to court and nest. Sites where nesting or courting plovers were observed during the last three seasons as well as other habitat deemed most likely to be pioneered by plovers should be included in the posted and/or fenced area.

AND

- C. Provides for monitoring of piping plovers on the beach by a qualified biologist(s). Generally, the frequency of monitoring should be not less than twice per week prior to May 1 and not less than three times per week thereafter. Monitoring should occur daily whenever moderate to large numbers of vehicles are on the beach. Monitors should document locations of territorial or courting plovers, nest locations, and observations of any reactions of incubating birds to pedestrian or vehicular disturbance.

AND

2. All unposted sites are posted immediately upon detection of territorial plovers.

Protection of Chicks

Sections of beaches where unfledged piping plover chicks are present should be temporarily closed to all vehicles not deemed essential. (See the provisions for essential vehicles below.) Areas where vehicles are prohibited should include all dune, beach, and intertidal habitat within the chicks' foraging range, to be determined by either of the following methods:

1. The vehicle free area should extend 1000 meters on each side of a line drawn through the nest site and perpendicular to the long axis of the beach. The resulting 2000 meter-wide area of protected habitat for plover chicks should extend from the ocean-side low water line to the bay-side low water line or to the farthest extent of dune habitat if no bay-side intertidal habitat exists. However, vehicles may be allowed to pass through portions of the protected area that are considered inaccessible to plover chicks because of steep topography, dense vegetation, or other naturally-occurring obstacles.

OR

2. The Service OR a State wildlife agency that is party to an agreement under Section 6 of the ESA provides written concurrence with a plan that:

- A. Provides for monitoring of all broods during the chick-rearing phase of the breeding season and specifies the frequency of monitoring.

AND

- B. Specifies the minimum size of vehicle-free areas to be established in the vicinity of unfledged broods based on the mobility of broods observed on the site in past years and on the frequency of monitoring. Unless substantial data from past years show that broods on a site stay very close to their nest locations, vehicle-free areas should extend at least 200 meters on each side of the nest site during the first week following hatching. The size and location of the protected area should be adjusted in response to the observed mobility of the brood, but in no case should it be reduced to less than 100 meters on each

side of the brood. In some cases, highly mobile broods may require protected areas up to 1000 meters, even where they are intensively monitored. Protected areas should extend from the ocean-side low water line to the bay-side low water line or to the farthest extent of dune habitat if no bay-side intertidal habitat exists. However, vehicles may be allowed to pass through portions of the protected area that are considered inaccessible to plover chicks because of steep topography, dense vegetation, or other naturally-occurring obstacles. In a few cases, where several years of data documents that piping plovers on a particular site feed in only certain habitat types, the Service or the State wildlife management agency may provide written concurrence that vehicles pose no danger to plovers in other specified habitats on that site.

Timing of Vehicle Restrictions in Chick Habitat

Restrictions on use of vehicles in areas where unfledged plover chicks are present should begin on or before the date that hatching begins and continue until chicks have fledged. For purposes of vehicle management, plover chicks are considered fledged at 35 days of age or when observed in sustained flight for at least 15 meters, whichever occurs first.

When piping plover nests are found before the last egg is laid, restrictions on vehicles should begin on the 26th day after the last egg is laid. This assumes an average incubation period of 27 days, and provides a 1 day margin of error.

When plover nests are found after the last egg has been laid, making it impossible to predict hatch date, restrictions on vehicles should begin on a date determined by one of the following scenarios:

- 1) With intensive monitoring: If the nest is monitored at least twice per day, at dawn and dusk (before 0600 hrs and after 1900 hrs) by a qualified biologist, vehicle use may continue until hatching begins. Nests should be monitored at dawn and dusk to minimize the time that hatching may go undetected if it occurs after dark. Whenever possible, nests should be monitored from a distance with spotting scope or binoculars to minimize disturbance to incubating plovers.

OR

2) Without intensive monitoring: Restrictions should begin on May 15 (the earliest probable hatch date). If the nest is discovered after May 15, then restrictions should start immediately.

If hatching occurs earlier than expected, or chicks are discovered from an unreported nest, restrictions on vehicles should begin immediately.

If ruts are present that are deep enough to restrict movements of plover chicks, then restrictions on vehicles should begin at least 5 days prior to the anticipated hatching date of plover nests. If a plover nest is found with a complete clutch, precluding estimation of hatching date, and deep ruts have been created that could reasonably be expected to impede chick movements, then restrictions on vehicles should begin immediately.

Essential Vehicles

Because it is impossible to completely eliminate the possibility that a vehicle will accidentally crush an unfledged plover chicks, use of vehicles in the vicinity of broods should be avoided whenever possible. However, the Service recognizes that life-threatening situations on the beach may require emergency vehicle response. Furthermore, some "essential vehicles" may be required to provide for safety of pedestrian recreationists, law enforcement, maintenance of public property, or access to private dwellings not otherwise accessible. On large beaches, maintaining the frequency of plover monitoring required to minimize the size and duration of vehicle closures may necessitate the use of vehicles by plover monitors.

Essential vehicles should only travel on sections of beaches where unfledged plover chicks are present if such travel is absolutely necessary and no other reasonable travel routes are available. All steps should be taken to minimize number of trips by essential vehicles through chick habitat areas. Homeowners should consider other means of access, eg, by foot, water, or shuttle services, during periods when chicks are present.

The following procedures should be followed to minimize the probability that chicks will be flushed by essential (non-emergency) vehicles:

1. Essential vehicles should travel through chick habitat areas only during daylight hours, and should be guided by a qualified monitor who has first determined the location of all unfledged plover chicks.
2. Speed of vehicles should not exceed five miles per hour.
3. Use of open 4-wheel motorized all-terrain vehicles (ATVs) or non-motorized all-terrain bicycles is recommended whenever possible for monitoring and law enforcement because of the improved visibility afforded operators.
4. A log should be maintained by the beach manager of the date, time, vehicle number and operator, and purpose of each trip through areas where unfledged chicks are present. Personnel monitoring plovers should maintain and regularly update a log of the numbers and locations of unfledged plover chicks on each beach. Drivers of essential vehicles should review the log each day to determine the most recent number and location of unfledged chicks.

Essential vehicles should avoid driving on the wrack line, and travel should be infrequent enough to avoid creating deep ruts that could impede chick movements. If essential vehicles are creating ruts that could impede chick movements, use of essential vehicles should be further reduced and, if necessary, restricted to emergency vehicles only.

SITE-SPECIFIC MANAGEMENT GUIDANCE

The guidelines provided in this document are based on an extensive review of the scientific literature and are intended to cover the vast majority of situations likely to be encountered on piping plover nesting sites along the U.S. Atlantic Coast. However, the Service recognizes that site-specific conditions may lead to anomalous situations in which departures from this guidance may be safely implemented. The Service recommends that landowners who believe such situations exist on their lands contact either the Service or the State wildlife agency and, if appropriate, arrange for an on-site review. Written documentation of agreements regarding departures from this guidance is recommended.

In some unusual circumstances, Service or State biologists may recognize situations where this guidance provides insufficient protection for piping plovers or their nests. In such a case, the Service or the State wildlife agency may provide written notice to the landowner describing additional measures recommended to prevent take of piping plovers on that site.

IV. LITERATURE CITED

Assateague Island National Seashore. 1993. Piping Plover Management Plan. Assateague Island National Seashore, Berlin, Maryland. 24 pp.

Bent, A.C. 1929. Life histories of North American shorebirds. Part 2. U.S. National Museum Bulletin No. 146. 412 pp.

Bergstrom, P.W. 1991. Incubation temperatures of Wilson's plovers and killdeers. Condor. 91: 634-641.

Burger, J. 1987a. Physical and social determinants of nest site selection in piping plover in New Jersey. Condor. 98: 811-818.

Burger, J. 1987b. New Jersey Endangered Beach-Nesting Bird Project: 1986 Research. Unpublished report. New Jersey Department of Environmental Protection, New Jersey. 37 pp.

Burger, J. 1991. Foraging behavior and the effect of human disturbance on the piping plover (*Charadrius melanotos*). Journal of Coastal Research, 7(1), 39-52.

Burger, J. 1993. Shorebird squeeze. Natural History. May 1993: 8-14.

Cairns, W.E. 1977. Breeding biology of Piping Plovers in southern Nova Scotia. M.S. Thesis. Dalhousie University, Halifax, Nova Scotia. 115 pp.

Cairns, W.E. and I.A. McLaren. 1980. Status of the piping plover on the east coast of North America. American Birds. 34: 206-208.

Cairns, W.E. 1982. Biology and behavior of breeding Piping Plovers. Wilson Bulletin. 94: 531-545.

Cape Cod National Seashore. 1993. Piping plover nest found trampled by pedestrian. News Release. Cape Cod National Seashore, South Wellfleet, Massachusetts. 2 pp.

Collazo, J.A., J.R. Walters, and J.F. Parnell. 1994. Factors Affecting Reproduction and Migration of Waterbirds on North Carolina Barrier Islands. 1993 Annual Progress Report. North Carolina State University, Raleigh, North Carolina. 57 pp.

Coutu, S., J. Fraser, J. McConaughey and J. Loegering. 1990. Piping Plover distribution and reproductive success on Cape Hatteras National Seashore. Unpublished report. Cape Hatteras National Seashore, Manteo, North Carolina. 67 pp.

Cross, R.R. 1989. Monitoring, management and research of the piping plover at Chincoteague National Wildlife Refuge. Unpublished report. Virginia Department of Game and Inland Fisheries. 80 pp.

Cross, R.R. 1990. Monitoring, management and research of the piping plover at Chincoteague National Wildlife Refuge. Unpublished report. Virginia Department of Game and Inland Fisheries. 68 pp.

Cross, R.R. and K. Terwilliger. 1993. Piping plover flushing distances recorded in annual surveys in Virginia 1986-1991. Virginia Department of Game and Inland Fisheries. 5 pp.

Delaware Department of Natural Resources and Environmental Control. 1990. Delaware Piping Plover Management Plan. Delaware Department of Natural Resources and Environmental Control. 5 pp.

Eddings, K.S., C.R. Griffin, and S.M. Melvin. 1990. Productivity, activity patterns, limiting factors, and management of piping plovers at Sandy Hook, Gateway National Recreation Area, New Jersey. Unpublished report. Department of Forestry and Wildlife Management, University of Massachusetts, Amherst. 79 pp.

Flemming, S.P., R. D. Chiasson, and P.J. Austin-Smith. 1990. Piping Plover nest-site selection in New Brunswick and Nova Scotia. Unpublished document. Dept. of Biology, Queen's University, Kingston, Canada. 31 pp.

Gibbs, J.P. 1986. Feeding ecology of nesting piping plovers in Maine. Unpublished report to Maine Chapter, The Nature Conservancy. Topsham, Maine. 21 pp.

Goldin M, C. Griffin and S. Melvin. 1990. Reproductive and foraging ecology, human disturbance, and management of Piping Plovers at Breezy Point, Gateway National Recreation Area, New York, 1989. Progress report. 58 pp.

Goldin, M.R. 1990. Reproductive ecology and management of piping plovers (Charadrius melanotos) at Breezy Point, Gateway National Recreation Area, New York -- 1990. Unpublished report. Gateway National Recreation Area, Long Island, New York. 16 pp.

Goldin, M.R. 1993. Effects of human disturbance and off-road vehicles on piping plover reproductive success and behavior at Breezy Point, Gateway National Recreation Area, New York. M.S. Thesis. University of Massachusetts, Amherst, Massachusetts. 128 pp.

Goldin, M.R. 1994. Breeding history of, and recommended monitoring & management practices for piping plovers (*Charadrius melanotos*) at Goosewing Beach, Little Compton, Rhode Island (with discussion of Briggs Beach). Report to U.S. Fish and Wildlife Service, Hadley, Massachusetts. 36 pp.

Hake, M. 1993. 1993 summary of piping plover management program at Gateway NWRA Breezy Point district. Unpublished report. Gateway National Recreation Area, Long Island, New York. 29 pp.

Hill, J.O. 1988. Aspects of breeding biology of Piping Plovers *Charadrius melanotos* in Bristol County, Massachusetts, in 1988. Unpublished report. University of Massachusetts, Amherst, Massachusetts. 44 pp.

Hoopes, E.M., C.R. Griffin, and S.M. Melvin. 1992. Relationships between human recreation and Piping Plover foraging ecology and chick survival. Unpublished report. University of Massachusetts, Amherst, Massachusetts. 77 pp.

Hoopes, E.M. 1993. Relationships between human recreation and piping plover foraging ecology and chick survival. M.S. Thesis. University of Massachusetts, Amherst, Massachusetts. 106 pp.

Howard, J.M., R.J. Safran, and S.M. Melvin. 1993. Biology and conservation of piping plovers at Breezy Point, New York. Unpublished report. Department of Forestry and Wildlife Management, University of Massachusetts, Amherst. 34 pp.

Loegering, J.P. 1992. Piping Plover breeding biology, foraging ecology and behavior on Assateague Island National Seashore, Maryland. M.S. Thesis. Virginia Polytechnic Institute and State University, Blacksburg, Virginia. 247 pp.

MacIvor, L.H. 1990. Population dynamics, breeding ecology, and management of Piping Plovers on Outer Cape Cod, Massachusetts. M.S. Thesis. University of Massachusetts, Amherst, Massachusetts. 100 pp.

McConaughay, J.L., J.D. Fraser, S.D. Couto, and J.P. Loegering. 1990. Piping plover distribution and reproductive success on Cape Lookout National Seashore. Unpublished report. Cape Lookout National Seashore, Morehead City, North Carolina. 83 pp.

Melvin, S.M., L.H. MacIvor, and C.R. Griffin. 1992. Predator exclosures: a technique to reduce predation of piping plover nests. *Wildlife Society Bulletin*. 20: 143-148.

Melvin, S.M., C.R. Griffin and A. Hecht. 1994. Mortality of piping plover chicks caused by off-road vehicles on Atlantic coast beaches. *Wildlife Society Bulletin*, in press.

Nicholls, J.L. 1989. Distribution and other ecological aspects of Piping Plovers (*Charadrius melanotos*) wintering along the Atlantic and Gulf Coasts. M.S. Thesis. Auburn University, Auburn, Alabama. 150 pp.

Northeast Nongame Technical Committee. 1993. Legal categories of rare species in the northeastern states. Northeast Nongame Technical Committee, Northeast Association of Fish and Wildlife Agencies. 22 pp.

Patterson, M.E. 1988. Piping plover breeding biology and reproductive success on Assateague Island. M.S. Thesis. Virginia Polytechnic Institute and State University, Blacksburg, Virginia. 131 pp.

Patterson, M.E., J.D. Fraser, and J.W. Roggenbuck. 1991. Factors affecting piping plover productivity on Assateague Island. *Journal of Wildlife Management*. 55(3): 525-531.

Rimmer, D.W., and R.D. Deblinger. 1990. Use of predator exclosures to protect piping plover nests. *Journal of Field Ornithology*. 61: 217-223.

Shaffer, F. and P. Laporte. 1992. Rapport synthèse des recherches relatives au pluvier siffleur (*Charadrius melanotos*) effectuées aux Iles-de-la-Madeleine de 1987 à 1991. Association québécoise des groupes d'ornithologues et Service canadien de la faune. 78 pp.

Strauss, E. 1990. Reproductive success, life history patterns, and behavioral variation in a population of Piping Plovers subjected to human disturbance (1982-1989). Ph.D. dissertation. Tufts University, Medford, Massachusetts.

Tull, C.E. 1984. A study of nesting piping plovers of Kouchibouguac National Park 1983. Unpublished report. Parks Canada, Kouchibouguac National Park, Kouchibouguac, New Brunswick. 85 pp.

U.S. Fish and Wildlife Service. 1985. Endangered and Threatened Wildlife and Plants; Determination of Endangered and Threatened Status for the Piping Plover; Final Rule. *Federal Register* 50 (238): 50726-50734.

U.S. Fish and Wildlife Service. 1993. 1993 Status Update; U.S. Atlantic Coast Piping Plover. Unpublished report. U.S. Fish and Wildlife Service, Sudbury, Massachusetts. 7 pp.

Welty, J.C. 1982. *The life of birds*. Saunders College Publishing, Philadelphia, Pennsylvania. 754 pp.

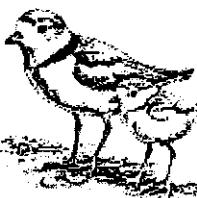
Wilcox, L. 1959. A twenty year banding study of the piping plover. *Auk*. 76:129-152.

Appendix B: Guidelines for Managing Fireworks in the Vicinity of Piping Plovers and Seabeach Amaranth on the U.S. Atlantic Coast



U.S. Fish & Wildlife Service

Piping Plover Atlantic Coast Population



 [Return to the
HOME PAGE](#)

Guidelines for Managing Fireworks in the Vicinity of Piping Plovers and Seabeach Amaranth on the U.S. Atlantic Coast

February 4, 1997

The following is provided as guidance to Federal agencies, landowners, commercial fireworks companies, and fireworks event sponsors seeking to avoid adverse effects on piping plovers and seabeach amaranth. They are intended to advise Federal agencies that conduct, fund, or authorize fireworks activities regarding the measures needed to avoid adverse effects on listed species, thereby averting the need for formal consultation under Section 7 of the Endangered Species Act (ESA). These practices also constitute the U.S. Fish and Wildlife Service's (Service's) best professional advice to non-Federal entities on avoiding take of piping plovers under Section 9 of the ESA.

These guidelines supplement information about protection of piping plovers from a variety of recreational activities, provided in the Service's April 15, 1994 *Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act* (1).

Seabeach amaranth, a threatened plant species protected under the Endangered Species Act (ESA), occurred historically along coastal beaches from southern Massachusetts to South Carolina. At the present time it is found only on Long Island, New York; North Carolina; and South Carolina. Section 7 of the ESA requires Federal agencies to consult with the Service prior to authorizing, funding, or carrying out activities that directly or indirectly affect listed plants; this requirement is applicable to permits related to fireworks events that are issued by the U.S. Coast Guard.

Potential Impacts Related to Fireworks Displays

Direct Impacts

Fireworks are highly disturbing to piping plovers. Fireworks early in the breeding season may cause plovers conducting courtship activities to abandon their territories. Direct injury can be caused by the explosions or debris, and piping plovers and terns (which often nest adjacent to or near plovers) will often abandon their nests and broods during fireworks displays, exposing eggs and chicks to weather and predators. If a flightless chick were to become permanently separated from its parents during the confusion, mortality would be almost certain.

Several situations where fireworks caused severe adverse effects on least terns, colonial nesting birds often found in the vicinity of piping plovers, serve as indicators of the effects that pyrotechnics can exert on beach-nesting birds. An August 1993 fireworks display in New Jersey caused permanent abandonment of a least tern colony located more than 250 m away, and a 1994 New Jersey fireworks display caused temporary abandonment and displays of distress by terns within a colony located more than 3/4 mile away. Incidents in New York where piping plovers were disturbed by fireworks also caused prolonged disturbance to least terns and black skimmers nesting nearby.

Seabeach amaranth can be directly affected by launch activities if they occur in areas where the plants may be crushed or damaged by launch personnel or equipment.

Indirect Impacts

In addition to adverse effects from the noise and lights of the pyrotechnics, commercial fireworks displays often draw large crowds that may pose threats to nearby plovers. These crowds may be situated at some distance from the actual launch site, for example, across an inlet. Potential indirect impacts that may adversely affect piping plovers include: spectators walking through and/or throwing objects (including illegal pyrotechnics) into plover nesting and brood-rearing areas; additional off-road vehicle patrols by public safety personnel; increased boat landings by spectators on relatively remote stretches of beach; low-flying aircraft, including helicopter patrols and personal spectator aircraft; additional trash (which attracts predators). Signs and symbolic fences that are adequate for the purpose of alerting daytime beach users to locations of plover breeding areas are often insufficient to prevent accidental entry by fireworks spectators wandering in the dark.

Potential indirect adverse effects on seabeach amaranth include trampling or crushing of unprotected plants by pedestrian or vehicular traffic on the beach.

Measures for Avoiding and Monitoring Direct and Indirect Impacts of Fireworks Events

Direct Impacts

Fireworks displays including launch areas and debris fallout areas should be located to avoid disturbance of breeding piping plovers. In general, the Service recommends that the launch site be located a minimum of 3/4 mile from the nearest plover nesting and/or foraging area. Access routes for personnel deploying the fireworks and other public safety personnel (including fire prevention/suppression and law enforcement officers) should conform with the vehicle management recommendations contained in the *Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act*. Launch sites should also be located to prevent trampling any seabeach amaranth plants.

Indirect Impacts

Event sponsors should plan and implement measures to assure that spectators will not walk through and/or throw objects into plover nesting and brood-rearing areas. Sufficient law enforcement and other personnel must also be on-site during these events to enforce plover protection measures and prevent use of illegal fireworks in the vicinity of the birds.

1. Plover habitats in the vicinity of where spectators may congregate should be intensively surveyed by qualified biologists⁽²⁾ for at least four days prior to the event to locate nests, adult plovers, chicks, and/or post-fledged juveniles. For events prior to July 1, surveyors should also search for territorial and/or courting adults that have not yet established nests or may be preparing to re-nest. In New York, potential habitat for seabeach amaranth should be surveyed to locate any seabeach amaranth plants.
2. Plover habitats should be symbolically fenced in accordance with the Service's *Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act* (see discussion of Management of Nonmotorized Recreational Uses). Seabeach amaranth plants should be symbolically fenced to provide a minimum 3 meter buffer zone around individual plants or groups of plants.
3. Additional protection measures recommended to avoid impacts that may occur when the large crowds are drawn to the beach at night include⁽³⁾:
 - a. Close parking lots and beach access points in the vicinity of breeding plovers.
 - b. Increase the size of symbolically fenced areas around plover nesting areas to provide extra buffers

between birds and pedestrians that may be on the beach. The size of buffers should be appropriate for the size of the anticipated crowd; for large crowds, buffers should be expanded from the standard 50 meters to a total of 100 meters from established nests.

- c. Increase the visibility of fencing using reflectorized tape or by substituting snowfences, plastic orange highway construction fences, or wire mesh fences for string fencing, as string fences are very difficult to see at night. Snowfences and highway construction fences should be removed the next day if there is any chance that they will impede chick movements.
- d. Fence and post foraging territories of unfledged chicks, as delineated by a qualified biologist, especially in areas where large crowds are anticipated and/or if the day of the event is especially hot (since heat often deters chick foraging during the daytime, increasing the birds' reliance on evening feeding).
- e. Provide adequate numbers (consistent with anticipated numbers of spectators) of monitors and law enforcement personnel in the vicinity of plover breeding areas or seabeach amaranth locations to patrol fenced areas from the time when spectators begin congregating on the beach until the crowd disperses after the event. Assure that monitors and enforcement personnel receive accurate current information about the locations of threatened birds and plants so that they can minimize any disruptions from their own activities.
- f. Prohibit all pets on the beach during the event and ensure compliance with this prohibition.

4. Remove any trash or litter from the beach immediately following the event. However, any trash located within fenced areas should be left until daylight and then removed by or under the supervision of plover monitors. Further, vehicles should not be used at night to remove trash within 100 meters of unfledged plover chicks.

5. In order to gauge the effectiveness of the measures 3 and 4, the following data should be collected:

- a. Locations and status of all adult plovers, nests, and chicks within 1/4 mile of spectator viewing areas should be determined by a qualified biologist on the day of the event and again on the following day.
- b. Counts of human and dog tracks that intersect the perimeter of symbolically fenced areas before and after the event.
- c. Counts of any persons actually observed inside symbolically fenced areas during the event.
- d. Counts of any instances of illegal pyrotechnics used on the beach during the event.
- e. Counts of trash/litter items inside symbolically fenced areas before and after the event. For very large areas or areas that have substantial amounts of trash before the event, trash counts may be conducted in sample plots.
- f. Count of breaks in symbolic fences.

6. Except when responding to an actual emergency situation, all law enforcement, fire department, public works, fireworks deployment, and other vehicles in the vicinity of breeding plovers should only be operated in conformance with the Service's *Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act* (see discussion of Essential Vehicles).

1. Copies of the 1994 Guidelines for general recreational activities are also available, on request, from the U.S. Fish and Wildlife Service, Wier Hill Road, Sudbury, MA 01776, Attn: Anne Hecht; telephone 508-443-4325; fax 508-443-2898.

2. State wildlife agencies and private environmental groups often conduct plover monitoring activities and can be consulted for available

information about plover breeding locations. However, intensity of surveys needed to avoid adverse effects from fireworks events will often exceed those routinely conducted by these wildlife agencies/organizations. Arrangements and commitments for added surveys for these events are the responsibility of the permitting agencies and/or event sponsors. It is recommended that these arrangements be made well in advance of the potential event, due to limited availability of qualified personnel.

3. For extremely large fireworks events, additional protection measures may be needed, including: issuing air traffic advisory for all aircraft to remain >1000' above sensitive areas; issuing mariners advisory telling boaters not to land in sensitive areas; boat patrols; extensive advanced publicity advising spectators where they *should* go to watch the fireworks and about closed areas; training about protection needs of rare plants and/or animals for law enforcement personnel.



[Department of the Interior | U.S. Fish and Wildlife Service](#)
[Privacy, Disclaimer, and Copyright Information](#)
[Photo and Drawing Credits](#)
[e-mail us at pipingplover@fws.gov](mailto:pipingplover@fws.gov)

URL address <http://pipingplover.fws.gov/>
Last updated May 26, 2000

Appendix C: Applicable NJ DEP Coastal Zone Management Rules

We have been advised to reference the applicable sections of the CMZ Rules rather than spell them out in full. That way this document will not have to go through the Borough Council approval process again should the regulations change during the life of the document.

The following sections of these rules apply (as amended):

7:7E-1.2	Jurisdiction
7:7E-3.16	Dunes
7:7E-3.17	Overwash areas
7:7E-3.22	Beaches
7:7E-3.23	Filled waters edge
7:7E-3.38	Endangered or threatened wildlife or plant species habitats
7:7E-3.39	Critical wildlife habitats
7:7E-3.40	Public open space

Subchapter 3A. Standards for Beach and Dune Activities

7:7E-3A.1	Purpose and scope
7:7E-3A.2	Standards applicable to routine beach maintenance
7:7E-3A.3	Standards applicable to emergency post-storm beach restoration
7:7E-3A.4	Standards applicable to dune creation and maintenance
7:7E-3A.5	Standards applicable to the construction of boardwalks

Subchapter 3B. Information Required in Tidal Wetland and Intertidal and Subtidal Shallows

7:7E-3B.1	Purpose and scope
-----------	-------------------

Subchapter 3C. Standards for Conducting and Reporting the Results of an Endangered or Threatened Wildlife or Plant Species Habitat Impact Assessment and/or Endangered or Threatened Wildlife Species Habitat Evaluation

7:7E-3C.1	Purpose and scope
7:7E-3C.2	Standards for conducting endangered or threatened wildlife or plant species habitat impact statements
7:7E-3C.3	Standards for conducting endangered or threatened wildlife species habitat evaluation
7:7E-3C.4	Standards for reporting results of impact assessments and habitat evaluations

Appendix D: Summary of the Binding Provisions of the December 2005 Programmatic Biological Opinion Between the U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers, Philadelphia District, on the effects of Federal Beach Nourishment Activities along the Atlantic Coast of New Jersey on the Piping Plover (*Charadrius melanotos*) and Seabeach Amaranth (*Amaranthus pumilus*)

This document provides a summary of the binding provisions of the Programmatic Biological Opinion (PBO) issued by the U.S. Fish and Wildlife Service (Service) for the U.S. Army Corps of Engineers, Philadelphia District's (Corps) ongoing program of beach nourishment of Ocean, Atlantic, and Cape May counties in New Jersey pursuant to Section 7 of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA). Additional binding provisions may be developed during streamlined consultation that is required before each scheduled renourishment. The PBO addressed the federally listed (threatened) piping plover (*Charadrius melanotos*) and seabeach amaranth (*Amaranthus pumilus*).

Definitions

Sections 4(d) and 9 of ESA, as amended, prohibit *taking* (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. *Harm* is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. *Harass* is defined as actions that create the likelihood of injury to listed species by annoying it 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 any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the federal agency or the applicant.

Incidental Take

The PBO issued by the Service includes an Incidental Take Statement. 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 a prohibited taking provided that such taking is in compliance with the provisions of the PBO. All the binding provisions of the PBO, as described below, are non-discretionary and must be undertaken by the Corps for the exemption in Section 7(o)(2) to apply. The Corps has a continuing duty to implement the activity covered by the PBO. If the Corps: (1) fails to implement the provisions or (2) fails to require all contractors to adhere to the provisions, the protective coverage provided by Section 7(o)(2) to the Corps and its contractors may lapse. In order to monitor the impact of incidental take, the Corps must report the progress of the action and its impact on the species to the Service as specified in the Incidental Take Statement.

Binding Provisions

The binding provisions of this PBO include: (1) the Conservation Measures incorporated by the Corps into their project description for the protection of listed species; and (2) the Terms and Conditions of the Incidental Take Statement issued by the Service to reduce the level of anticipated incidental take of Piping Plovers.

CONSERVATION MEASURES PROPOSED TO MINIMIZE IMPACTS TO FEDERALLY LISTED SPECIES

1. Materials and Materials Placement

All nourishment material used in Corps sponsored or permitted projects will consist of clean sand fill material (*i.e.*, 90 percent or greater sand) obtained from approved off-shore borrow areas. Grain size of fill material will be suitable for beach nourishment and will be similar in composition to the existing beach substrate on the targeted deposition site.

2. Materials Stockpiling and Equipment Storage

No materials or equipment associated with beach nourishment or hard structure repair or replacement will be stockpiled or stored within 100 meters of known piping plover nesting areas or sites colonized by seabeach amaranth. Any materials or equipment stored adjacent to known plover nesting areas will be removed prior to the nesting season (March 15th).

3. Dune Stabilization and Vegetation Planting

The Corps will work with the Service, the NJDEP, and the USDA to develop guidelines for planting and maintaining dune and beach vegetation and erecting sand fence on Corps nourished beaches that are protective of federally listed species while not diminishing the overall required beach protection function and/or dune stability. Vegetation and sand fencing should be maintained at densities that will not displace federally listed species from occupied sites, deter future colonization of unoccupied sites, or impede chick movements.

4. Extension of Outfall Structures

Following placement of sand, extension of some existing outfall structures may be required. Work associated with outfall structure extension is an integral part of a beach fill project and will be conducted in accordance with all proposed conservation measures to protect federally listed species.

5. Access Into Construction Areas

The Service and the ENSP, or their designated representatives, will be given access to Program construction areas, subject to site safety plans, for the purpose of surveying; monitoring; posting; symbolically fencing of piping plover courtship, nesting, and brood rearing areas; and erecting predator enclosures around nests. In addition, the Service and the NJDEP, Natural Heritage

Program (NHP), Office of Natural Lands Management (ONLM), or their designated representatives, will be given access to Program construction areas, subject to site safety plans, to survey potentially suitable areas for seabeach amaranth.

6. Contractor Notification

The Corps will ensure that all contractors and employees will be adequately informed of ESA concerns, and contract specifications will be written accordingly.

7. Legal Easements

The local project sponsor will obtain legal easements allowing Service, State, and Corps representatives access to all portions of the project area over the life of each individual project for the purposes of carrying out endangered species management activities, including, but not limited to, installation of protective fencing, observation, and data collection.

8. Conservation Measures to Protect Piping Plovers

a. Pipeline Placement

On newly nourished beaches outside of current nesting areas and established buffer areas, pipelines may be placed and remain on the beach during construction activities. Pipelines can be placed within nesting areas during the non-nesting season provided they are removed prior to March 15.

b. Project Scheduling, Timing Restrictions, and Buffers

(1) Beach Nourishment

No construction will take place during the nesting season (March 15th to August 15th) within a protective buffer area extending from each nesting area. Within nesting and buffer areas, work will be completed by March 15th or will proceed following conclusion of the nesting season. In general, known piping plover nesting areas will be afforded a 1,000-meter buffer so as not to interfere with courtship activities, nest site selection, and brood rearing. However, if due to eroded beach conditions or other beach features, no potentially suitable piping plover habitat is likely to be present within the buffer area during the affected nesting season, the buffer area may be reduced on a case-by-case basis by the Service.

(2) Repair and Maintenance of Hard Structures

Repair and maintenance of hard structures and associated operations and maintenance activities will be scheduled and sequenced to avoid or minimize construction activities during the nesting season (March 15th to August 15th) within known piping plover nesting areas or areas likely to be occupied during the affected nesting season.

c. Beach Profile Surveys

Yearly beach profile surveys will be conducted outside of the nesting season to the greatest extent possible. If work must be done during the nesting season, the Corps will prioritize historical nesting areas vs. non-nesting areas to schedule surveys of sensitive areas outside of the nesting season.

d. Contractor Access Into Nesting and Buffer Areas

No contractor shall be allowed into designated nesting areas without being accompanied by a qualified biologist. If it is necessary to enter a nesting area after nesting has begun, the Corps or its designated representative will coordinate with the ENSP and / or the Service to ensure that plover monitors are on site to escort workers through the nesting area. No motorized vehicles will be operated within the unfledged chick and nesting buffer areas unless authorized by the Service on a case-by-case basis and intensive monitoring is in place. Motorized vehicles will not be authorized access within 100 meters of unfledged chicks or nests under any circumstances except in the case of a *bona fide* emergency.

e. Monitoring and Management During Construction Events

The Corps will implement a monitoring program to ensure that construction activities occurring during the piping plover nesting season (March 15th to August 15th) minimize or avoid adverse impacts to the species.

f. Monitoring and Management Following Construction of Civil Works Projects

The Corps will fund a comprehensive program to monitor piping plovers on a yearly basis within each project area, beginning with the first nesting season after initial project construction and continuing for the life of the project or until assumed by the State or local project sponsor. Monitoring and management efforts will be consistent with the Service's (1994) *Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitats on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act* (Guidelines). Following construction or re-nourishment, beach management activities will be the responsibility of the local municipality or other appropriate landowner. To ensure the protection of federally listed species following project construction, the Corps will require the non-federal sponsor (NJDEP) to work with each municipality or other appropriate landowner to prepare site-specific endangered species management plans. Plans will be implemented under the guidance of the Service, the ENSP, and the Corps. The management plans will describe site-specific protective measures for piping plover, including: establishment of protective zones; restrictions on beach raking, beach maintenance, and other municipal activities; actions to reduce impacts to the local plover population from predators and humans; and other management as appropriate for individual site conditions.

g. Habitat Enhancement

h. Measures Specific to Townsends Seawall Project

9. Conservation Measures to Protect Seabeach Amaranth

a. Surveys

Prior to project construction, a Corps biologist, contracted biologist/botanist or designated representative will survey the project area within the seabeach amaranth growing season (May 1 – November 1) to document the presence or absence of seabeach amaranth.

b. Monitoring and Protection of Seabeach Amaranth Plants

In the event that seabeach amaranth is found within a project area, information including plant locations, numbers of plants and size of plants will be recorded and provided to the Service and NHP.

If construction personnel or vehicles are active in proximity to the site or might transit the site, symbolic fencing will be erected, encompassing a 3-meter protective buffer around the plant(s). The buffers will be adjusted as necessary to protect the plants and, where appropriate, will be combined into a single larger buffer area to better accommodate larger numbers of seabeach amaranth plants.

All construction activities will avoid any delineated locations of seabeach amaranth to the greatest practicable extent. Construction activities include, but are not limited to, staging, surveying, operation, and sand transport activities. The Corps will undertake all practicable measures to avoid damaging or destroying seabeach amaranth by avoiding areas where the species is present.

c. Restoration of Seabeach Amaranth Areas Likely to be Destroyed

(1) Transplantation of Plants

Individual plants that would be covered with sand, or that occur where impacts from construction equipment cannot be avoided, will be transplanted to a similar habitat near or within the project area.

(2) Seed Collection

When possible, seeds from plants to be translocated will be harvested prior to plants being moved.

(3) Stockpiling Sand Substrate

If translocation or seed collection is not a viable alternative, or has been proven ineffective, construction will be avoided around the plant and buffer area until individual plants die back. The top layer of sand substrate, including the plant site and the surrounding 3-meter buffer area, will be “scraped” and stockpiled. After the area has been graded to the design profile, the stockpiled “scraped sand” will then be re-spread within the project area in an area with suitable

habitat conditions for seabeach amaranth.

d. Long-term Management

If seabeach amaranth is found within the project area, the appropriate municipal endangered species management plan(s) will be amended to include site-specific protective measures for this species. Such measures will include establishment of protective zones, restrictions on beach raking, fencing to prevent damage from vehicle and pedestrian use, monitoring, and other management as appropriate for individual site conditions.

REASONABLE AND PRUDENT MEASURES (with implementing TERMS AND CONDITIONS, refer to USFWS's 2005 PBO)

RPM 1: Ensure that all Corps project engineers, staff, contractors, cooperators, and / or permittees are fully informed and compliant with all conservation measures contained within the Program description, RPMs, and terms and conditions of this Biological Opinion.

RPM 2: Ensure that the piping plover construction monitor is qualified to identify piping plovers and their habitats.

RPM 3: Ensure that efficient and effective communication and coordination occurs among Corps project engineers, staff, contractors, cooperators, piping plover construction monitor and / or permittees and the Service, NJDEP, municipal, and any other construction and monitoring staff.

RPM 4: Practice adaptive management of projects within the Program Area and adjust protective measures as needed or as new information becomes available.

RPM 5: Ensure that the Corps piping plover monitoring and management program is sufficient to monitor and minimize disturbance to nesting piping plovers from recreational users on Corps Program Area beaches.

RPM 6: Seek ways to preserve or enhance piping plover habitat within the Program Area while meeting shore protection goals.

RPM 7: Ensure that dune and beach management actions carried out by the State and local project sponsors and / or permittees over the life of the Program are compatible with piping plover habitat requirements.

RPM 8: Secure increased cooperation and participation of local beach managers in endangered species protection to augment conservation measure commitments summarized in the Program description.

RPM 9: Report on the progress of the action and its impact on the species, as required pursuant to 50 CFR 402.14(i)(3).

