BOROUGH OF SEASIDE PARK
BEACH MANAGEMENT PLAN

For the Protection of
Federally & State-Listed Species

April 2023

IN COOPERATION WITH:

New Jersey Department of Environmental Protection
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

LIST OF TABLES

APPENDICES

I. INTRODUCTION

A. PURPOSE

The purpose of this beach management plan (BMP) is to provide a framework for cooperation among the Borough of Seaside Park (Borough), the New Jersey Department of Environmental Protection's (NJDEP) New Jersey Fish and Wildlife's (NJFW) Endangered and Nongame Species Program (ENSP), and the U.S. Fish and Wildlife Service's (USFWS) New Jersey Field Office (NJFO) in the stewardship of birds and plants listed as endangered, threatened, or of special concern under Federal and/or State law (listed species) occurring on the Borough's beaches. Through this BMP, the parties seek to provide for the long-term protection and recovery of species populations in the Borough and the State, while balancing potentially conflicting missions. In the BMP, the parties define and describe the roles and responsibilities of the Borough, the NJFW, 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.

Through this BMP, the parties endeavor to increase the nesting success of listed bird species, to provide habitat for migratory shorebirds, and to foster the continued recovery of listed plant species in the Borough by reducing detrimental human activities and decreasing predation. Through this BMP, the parties hope to effect a progressive shift of specific beach management responsibilities to the Borough and citizens of Seaside Park, particularly for those aspects of management that protect listed species from activities permitted, encouraged, sponsored, or performed by the Borough. This BMP is the result of meetings and discussions among the Borough Engineer, Chief of Police, Public Works Manager, Beach Committee; Conserve Wildlife Foundation of New Jersey (which assists the USFWS and ENSP in beach management planning; the NJFW; and the USFWS.

This BMP is consistent with the USFWS's Recreational Activities (Appendix A) and Fireworks (Appendix B) Guidelines, and with the State Coastal Zone Management Rules (Appendix C). This BMP also satisfies the Terms and Conditions of the December 2005 Programmatic Biological Opinion on the Effects of Federal Beach Nourishment Activities along the Atlantic Coast of New Jersey within the U.S. Army Corps of Engineers (Corps), Philadelphia District on the Piping Plover (*Charadrius melodus*) and Seabeach Amaranth (*Amaranthus pumilus*) (2005 PBO) (Appendix D) with respect to municipal management planning for the Borough. The plan meets the conditions of permits issued by the NJDEP's Division of Land Resource Protection (DLRP) requiring management planning in municipalities receiving beach nourishment.

The parties to this BMP 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 BMP if necessary.

B. APPLICABLE LAWS AND REGULATIONS

1. Federal

Clean Water Act (86 Stat. 816; 33 U.S.C. 1344 *et seq.*) (CWA): Regulates discharges into waters of the United States. The CWA is administered by the U.S. Environmental Protection Agency (EPA) and the Corps.

Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA): Establishes that endangered and threatened animals and plants are of aesthetic, ecological, educational, historical, recreational, and scientific value to the nation and its people. Section 4 provides for listing wildlife and plants as threatened or endangered, including criteria for listing and de-listing 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 (40 Stat. 755; 16 U.S.C. 703-712) (MBTA): prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests except when 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.*) (ENSCA): 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 ENSCA is administered by the ENSP.

New Jersey Endangered Plant Species List Act (N.J.S.A. 13:1B *et seq.*) (EPSLA): 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 EPSLA establishes an official State list of endangered plants found at N.J.A.C. 7:5C1-1 *et seq.* The EPSLA is administered by the Office of Natural Lands Management (ONLM).

New Jersey Coastal Zone Management Rules (N.J.A.C. 7:7): Constitute the substantive rules of the NJDEP regarding the use and development of coastal resources, to be used primarily by the DLRP in reviewing permit applications under the New Jersey Coastal Area Facility Review

Act (N.J.S.A. 13:19-1 *et seq.* as amended to July 19, 1993) (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 DLRP.

C. LISTED SPECIES

1. Species Known to Occur on Seaside Park Beaches

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

(a) Piping Plover (*Charadrius melodus*)

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 plucked from wet sand or from wrack material. Two pairs nested on the Borough's beaches in 2021, but exact nest locations were not identified due to discovering the broods after hatching. Both pairs fledged 2 chicks from the Borough's beaches which exceeded the USFWS recovery goal of 1.5 chicks fledged per pair. In 2022, one pair nested and fledged 4 chicks. Piping plovers are federally listed as threatened under the ESA, State-listed as endangered under the ENSCA, and protected by the MBTA.

(c) 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. Seabeach amaranth was absent in New Jersey for nearly 100 years before it reappeared in 2000. Five plants were found on the Borough's beaches for the first time in 2021 and four plants in 2022. Seabeach amaranth is federally listed as threatened under the ESA and State-listed as endangered under the EPSLA.

2. Species That May Potentially Occur on Seaside Park Beaches

The following species have not been documented on the Borough's beaches, but could become established in the future. The parties to this BMP will work cooperatively to manage these species if they colonize Borough 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*)

Black skimmers are colonial beach-nesting seabirds 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 of beaches; smaller nesting colonies may also occur in back-bay marsh islands. Flightless chicks remain in the colony, where they are fed by their parents. The black skimmer diet consists of fish and crustaceans that the birds hunt from the air by skimming the water with the elongated lower part of their bill. Black skimmers are State-listed as endangered under the ENSCA, and protected by the MBTA.

(b) Least Tern (*Sternula antillarum*)

Least terns are small, colonial-nesting seabirds, 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 or near the colony, where they are fed by their parents. The least tern diet consists of fish. Least terns are State-listed as endangered under the ENSCA and protected by the MBTA.

(c) American Oystercatcher (*Haematopus palliatus*)

American oystercatchers are territorial shorebirds present on New Jersey beaches from April to 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. Flightless chicks are led by their parents to feeding areas, including the intertidal zone. Their diet consists of bivalves such as mussels, clams and oysters. Oystercatchers are designated a State species of special concern and are protected by the MBTA.

(d) Red Knot (*Calidris canutus rufa*)

Red knots are long distance migrants that breed in the Arctic and winter as far south as Tierro del Fuego, Chile. While small numbers of red knots are present in New Jersey year round, most are seasonal visitors to New Jersey beaches, stopping during spring (mid-May through early June) and fall (late July through November) migration periods to rest and refuel. The spring migration is timed to coincide with the spawning season for the horseshoe crab (*Limulus polyphemus*). Horseshoe crab eggs on the shore of the Delaware Bay provide a rich, easily digestible food source for migrating birds. Mussel beds on New Jersey's southern Atlantic cost are also an important food source during the fall migration. Red knots have not been documented using the Borough's beaches for foraging or roosting. Red knots are federally listed as threatened under the ESA, State-listed as endangered under the ENSCA, and protected by the MBTA.

(e) Seabeach Knotweed (*Polygonum glaucum*)

Seabeach knotweed is an annual plant visible on New Jersey beaches between May and November. Most occurrences are on sandy beaches above the high tide line. Seabeach knotweed is State-listed as endangered under the EPSLA.

(f) Seabeach Purslane (*Sesuvium maritimum*)

Seabeach purslane is an annual plant occurring in beach habitats. It is designated a State species of concern by the ONLM.

(d) Seabeach Sandwort (*Honckenya peploides*)

Seabeach sandwort is a perennial plant occurring in beach and salt marsh habitats. Seabeach sandwort is State-listed as endangered under the EPSLA.

D. GOVERNMENT ENTITIES

APHIS-WS: U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services. The Wildlife Services program carries out the Federal responsibility for helping to solve problems that occur when human activity and wildlife are in conflict with one another, including the management of wildlife causing damage to other natural resources. The program strives to develop and use wildlife damage management strategies that are biologically sound, environmentally safe, and socially acceptable.

Borough: Borough of Seaside Park, Ocean 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 Planning Program carries out shore protection, flood control, navigation, and ecosystem restoration projects as directed by Congress, including the New Jersey Shore Protection Study that includes beach nourishment in the Borough.

DLRP: New Jersey Department of Environmental Protection, Division of Land Resource Protection. The DLRP administers the State permitting program for activities in wetlands and within New Jersey's Coastal Zone. Permits from the DLRP 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 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 ENSCA.

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

NJFW: New Jersey Department of Environmental Protection, Fish and Wildlife. The NJFW 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 NJFW includes the Bureaus of Freshwater Fisheries, Land Management, Law Enforcement, Marine Fisheries, Shellfisheries, Wildlife Management, and Information and Education; and the Offices of Administration, Environmental Review, and Fish and Wildlife Health and Forensics.

NJFO: New Jersey Field Office, Ecological Services, U.S. Fish and Wildlife Service. Within New Jersey, the NJFO's responsibilities include review of Federal projects, monitoring and management of federally listed species (both wildlife and plants), partnering with local landowners on habitat restoration, and administration of the ESA.

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

ONLM: New Jersey Department of Environmental Protection, State Park Service, 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.

USCG: U.S. Coast Guard. The USCG is a branch of the U.S. Armed Forces operating under the Department of Homeland Security. The USCG is unique among the U.S. military branches for having a maritime law enforcement mission and a Federal regulatory agency mission as part of its mission set. The USCG has roles in maritime homeland security, maritime law enforcement, maritime patrol, search and rescue, marine environmental protection, and the maintenance of river, intracoastal and offshore aids to navigation.

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

ATV: All-Terrain Vehicle

Beach nourishment: addition of sand in designed contours to extend a beach and the nearshore 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 Municipal, 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.

The New Jersey Coastal Zone Program Permit Rules (N.J.A.C. 7:7-1.1 *et seq.*) require prior authorization to conduct any action under a declared SOE in the event of an emergency or to avert a threat to property. The ESA's exception is limited to "bodily harm". Therefore, actions taken to avert a threat to property can only be conducted after: (1) a formal declaration of an SOE; (2) with prior authorization from the NJDEP under N.J.A.C. 7:7-21; and **(3) with the prior advice from the USFWS that the action is not likely to result in a "take" of a federally protected species.** Communication with the NJFW would apply in items (1) through (3) above, should actions be requested to avert a threat to property.

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 Borough Hall Building at 1701 North Ocean Avenue. Once the Emergency has been declared, the OEM or Mayor, confirm and notify the Borough Administrator. 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 DLRP permits under N.J.A.C. Section 7:7-10.3 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 7:7-10.3(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 DLRP permits under Section 7:7-10.3. Placement of sand and other materials (beach nourishment) and sand scraping (defined below) are among the activities listed at 7:7-10.3(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, referring to animals that are normally pets such as cats (*Felis catus*) or dogs (*Canis lupus*).

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, least tern, and black skimmer 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 when observed in sustained flight for at least 15 meters, irrespective of age. In most cases, piping plovers attain flight capability by 35 days of age, but longer pre-fledge periods may occur. (Appendix F)

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 act 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 ENSCA and its implementing State regulations; (3) listed by the State as endangered pursuant to the New Jersey EPSLA; and/or (4) listed as a State species of concern by the NJFW or the ONLM.

Nesting area: an area occupied by nesting piping plovers, least terns, black skimmers and/or American 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, black skimmers and/or American oystercatchers are present on the beach; usually March 15 through August 31 if both plovers and colonial nesters are present.

Plant Protection Strip: an area located immediately adjacent to the landward limit of the beach (*e.g.*, primary dune, boardwalk, bulkhead, etc.) that incorporates special conditions related to raking, scraping, and driving, which are intended to promote establishment of listed beach plants by limiting activities that disturb seed banks, seedlings and mature plants.

Plant Protection Strip fencing: PVC posts, erected with signs when available (but not necessarily flagging, string, or tape) to identify the locations of Plant Protection Strips.

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.

Predation management: activities to reduce the adverse effects of predators on listed bird species, including but not limited to monitoring, 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, black skimmer 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.

Recreational Activities 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 SOE or emergency.

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). Comfort or emotional support animals are not considered service animals.

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

Pursuant to the binding provisions of the PBO, beach management plans establish zones for the protection and management of listed species. Up to three types of management zones may be identified in a municipality: Protected, Precautionary, and Recreational. The relative importance of protective management practices in each management zone considers existing human uses, habitat conditions, and past distribution and occurrence of listed species.

Two separate management zones are identified for the Borough's beaches consisting of one Protected Zone and one Recreational Zone (Figure 1).

RECREATIONAL ZONE:

*From Stockton Avenue south to L street **and** from F street south to the southern municipal boundary with South Seaside Park Borough at 14th Avenue (approximately 1.75 miles)*

This zone is comprised of the developed recreational beaches. It includes heavily utilized public supervised recreational beaches. A privately owned beach is located from Stockton Avenue north to Porter Avenue at the Borough's municipal border. Any listed species documented in these zones will receive protection as required by applicable State and Federal laws and regulations. Within the Recreational Zone, a "Plant Protection Strip" will be designated, from Decatur Avenue to the southern border of the borough, comprising approximately 10 percent of the beach width as measured between the mean high-water line and the easterly toe of the dune to encourage colonization by listed beach plants. Beach access paths and a 10ft area north and south of the foot of each access path are excluded from the Plant Protection Strips, as well as the lifeguard headquarters shed at O Street is excluded from the PPS.

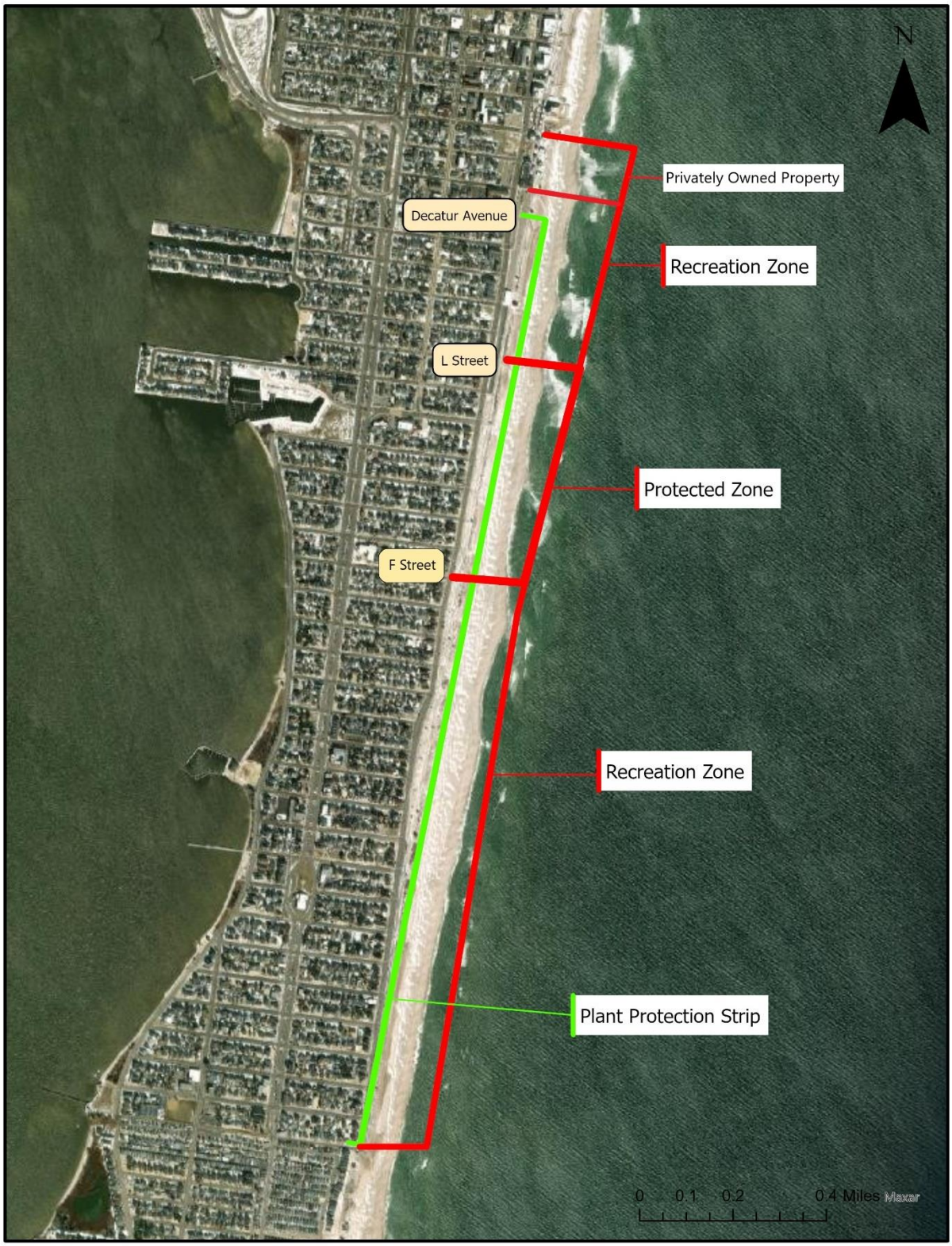
PROTECTED ZONE:

From the south side of the public beach access point at L Street to the north side of the public beach access point at F Street (approximately 0.5 mile)

This zone will be 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. Limited uses include emergency vehicular access, hand cleaning of debris, and beach/dune maintenance and inspections when necessary. Recreation is permitted, except in any symbolically fenced areas. Within the Protected Zone, a "Plant Protection Strip" will be designated, comprising approximately 10 percent of the beach width as measured between the mean high-water line and the easterly toe of the dune to encourage colonization by listed beach plants.

The location of the Protected Zone is subject to change in the future if a consistent history of bird nesting is established in another location on the Borough's beach.

Figure 1. Borough of Seaside Park Beach Management Zones



III. RECOVERY GOALS

The parties to this BMP consider the following to be realistic, sustainable targets for listed species on Borough beaches based on current and historical uses of listed species and creating a balance with the Borough's recreational and beach maintenance needs. Populations of listed species above these goals will continue to be protected in accordance with applicable State and Federal laws and regulations. The goals may be revised and/or amended when this BMP is periodically updated.

Piping plover:
- 2-3 pairs.
- Productivity greater than or equal to the USFWS recovery goal of 1.5 chicks fledged per pair.

American oystercatcher:
- 1 to 2 pairs.

Red knot:
- To effectively protect by allowing for undisturbed foraging and roosting activities during migration.

Seabeach amaranth:
- Long-term average population size of 25 plants.
- Minimum one-year population size of 10 plants.

IV. MANAGEMENT ISSUES

Management issues form the basis or framework for this BMP. The major issues are defined, and 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 Borough beaches. The NJFW monitors beach-nesting birds to determine habitat use, numbers of nesting pairs, nest locations, and reproductive success. The USFWS or ONLM surveys and monitors (when funding is available) seabeach amaranth to determine plant numbers, size, reproductive status, location, and condition. Additional plants of concern that may occur are recorded incidentally during the seabeach amaranth surveys. This information is essential in evaluating species trends and progress towards recovery, and assessing the effectiveness of beach management practices.

➢ NJFW/USFWS Actions

- The NJFW will conduct surveys, monitoring, and management of nesting birds throughout the Borough's beaches, as per agreement with the USFWS pursuant to Section 6 of the ESA. The NJFW will survey the Borough's beaches 1-3 times per week during the nesting season. The survey intensity will increase to 3-5 days per week, including weekends and holidays, when nesting birds are present. Survey intensity will be scaled back (or discontinued) after mid-July in those years when no breeding birds are present.

- The USFWS (or its designee) will conduct seabeach amaranth surveys throughout the growing season, when funding is available, to symbolically fence plants for protection and monitor population trends and distribution.

- The NJFW and the USFWS will promptly report any new or expanded occurrence of a listed species to the Borough, particularly within the Recreational Zone.

- The NJFW and the USFWS will regularly report relevant biological information to the Borough (see Section G).

B. PREDATION MANAGEMENT

➢ Background

Predation is a major factor impairing beach-nesting bird productivity. Potential predators in the Borough include gulls (*Larus* spp.), crows (*Corvus* spp.), red foxes (*Vulpes vulpes*), raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*), and feral cats. Reducing predation will involve reducing or eliminating provisions of food from refuse and hand feeding, using predator exclosures, educational outreach, and if necessary, predator removal.

➢ Borough Actions

- The Borough will enforce its ordinance prohibiting the feeding of wildlife on Borough property (Borough Code 9-28-2005, Ord. No 1373 § 127-24) since this activity attracts predators.

- Through the Animal Control Officer, the Borough will conduct removal of cats in problem areas when necessary, preferably through humane live trapping. If the Animal Control Officer is unable to assist, the Borough will explore other alternatives with the NJFW assistance. Primary responsibility for control of feral cat populations lies with the Borough.

- Should feral cats become a factor impairing beach-nesting bird productivity, the Borough will take the following steps in addition to the removal of cats:

    - Promote and phase in the American Bird Conservancy's "Cats Indoors" program for its residents and seasonal visitors.

- Information regarding the "Cats Indoors" program is available at: https://abcbirds.org/program/cats-indoors/

- Free downloadable brochures for the "Cats Indoors" program are available at: https://abcbirds.org/program/cats-indoors/take-action/

- Promote New Jersey's "No Animal Abandonment" statute (N.J.S.A. 4:22-20(a) (b)).

- The Borough will emphasize the importance of its ordinance prohibiting dogs on the beach (Borough Code 3-24-1976, Ord. No. 731 § 127-15)

    - By ordinance, the Borough prohibits dogs (except service dogs) upon beaches under Borough jurisdiction year-round.

- Consistent with current State and local regulations, the Borough will not actively block measures to control predator populations recommended and/or undertaken by the NJFW or the USFWS. The Borough will not enact any new ordinances to prohibit predation management activities.

- By way of signature to this BMP, the Borough gives the NJFW and the USFWS written permission to engage in predator control activities on Borough beaches, including removal of feral cats, and foxes.

- See also Education and Outreach (Section F).

➢ **NJFW Actions**

- The NJFW will continue to monitor the extent of predation on nesting birds within the Borough (Section A), and will include this in the information reported to the Borough (Section G).

- The NJFW will erect predator exclosures on piping plover nests where and when appropriate. Use of predator exclosures to reduce plover nest predation will generally be tried prior to undertaking predator removal, unless the NJFW 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 plover chicks, or on least tern, American oystercatcher and black skimmer eggs and chicks, none of which are protected by exclosures.

- Any predator population control (other than for feral cats) will be the responsibility of the NJFW. The NJFW will pursue control when necessary and appropriate.

- The NJFW will notify the Administrator, Public Works Supervisor, Borough Clerk and the Borough Police at least two days before engaging in any predator control activities; by way of this BMP the Borough grants the NJFW permission for these activities, as

indicated above. The NJFW will consider 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 the Borough's Animal Control Officer with cat removal, the NJFW will assist the Borough in exploring other alternatives, including carrying out removal with a contract vendor.

➢ **USFWS Actions**

- Upon request and within the limits of available staff time and funding, the USFWS will assist the Borough and/or the NJFW in control of predator populations using USFWS staff or by arranging for removal through the U.S. Department of Agriculture's Animal and Plant Health Inspection Service-Wildlife Services (APHIS-WS) or other qualified vendors.

C. HUMAN DISTURBANCE

➢ **Background**

The broad area of 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 beach-nesting bird eggs or plants. In addition, unfledged plover, tern, oystercatcher and skimmer chicks are highly sensitive to disturbance. Nesting birds may experience low success if exposed to frequent harassment by vehicles, pedestrians, sunbathers, pets, kites or drones.

➢ **Borough Actions**

- The Borough will allow the NJFW to erect symbolic fencing around active nesting areas for the protection of listed species. If a history of nesting becomes established in a specific area, the Borough will allow the NJFW to erect pre-season fencing around suitable habitat in anticipation of nesting. (See NJFW Actions, below.)

- The Borough will allow the USFWS (or its designee) to erect symbolic fencing around seabeach amaranth plants that are threatened by human activities, maintaining a 3-meter buffer around each plant and posted with appropriate signs.

- The Borough will regulate permanent and temporary private structures and storage of private property on the beach (*e.g.*, catamarans, volleyball nets, shelters) as needed to protect listed species or their habitat.

- The Borough will place lifeguard equipment boxes at the eastern edge outside of Plant Protection Strips.

- The Borough will work with the NJFW and the USFWS to regulate existing and new recreational activities as needed to protect listed species.

- The Borough will prohibit and discourage kite flying and drone flying within 200 meters of posted nesting areas between March 15 and August 31 (if no listed shorebird species are present, then July 15) through signs and education. The Borough will coordinate with NJFW and USFWS when planning Kite Night to ensure activities do not affect active nesting birds or chicks.

- In the Recreational Zone, 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 NJFW and/or the USFWS. Activities will be minimized in or avoid the Plant Protection Strip to the extent possible.

- In the Protected Zone, the Borough will schedule organized events only between September 1 and March 14, unless the NJFW and the USFWS have indicated in writing that the event will not affect listed species (*e.g.*, nesting activity or the growing season has concluded for the year, or listed species are absent from the event area). For events scheduled in the Protected Zone between September 1 and November 30, the Borough will implement the USFWS fencing recommendations to protect seabeach amaranth, if present.

- The Borough will allow for the use of recreational vehicles on Borough beaches from the Brighton Avenue vehicle access point to the southern border of the Borough on a seasonal basis from October 1 – May 15 (Code Section 135-13D, Ord. No. 720). Driving within the Protected Zone is not permitted from March 15 through September 30. Driving in the Plant Protection Strips is not permitted from March 15 through November 30. The Borough will install signage to demarcate the Protected Zone and the Plant Protection Strips.

- The Borough municipal vehicles driven on the beach include the Beach Patrol (lifeguards) to patrol the beach for safety, and Public Works vehicles for maintaining the beach, Borough Police Department, TriBoro First Aid, and Seaside Park Fire Department. All Borough vehicles access the beach at Brighton Avenue and Stockton Avenue. The Borough will implement driving restrictions in the Protected Zone consistent with the USFWS's Recreational Activities Guidelines (Appendix A). Specifically:

    - Routine driving will be prohibited within the Protection Zone during the nesting season from March 15 through August 31. Essential vehicles responding to critical needs for human safety or maintenance will be the only exception. If no listed shorebird species are present by July 15 or once nesting activities are completed for the season, this restriction may be lifted in consultation with NJFW and USFWS.

Vehicle restrictions will remain in effect within the Plant Protection Strip through November 30.

- With the exception of the Plant Protection Strip, there will be no driving restrictions in the Recreational Zone unless the Borough has been notified that listed species are present. If listed species colonize the Recreational Zone, the Borough will coordinate with the NJFW and the USFWS to develop a Recreational Zone Vehicle Use Policy consistent with the USFWS's Recreational Activities Guidelines (Appendix A).

- Outside of the Plant Protection Strips, no driving restrictions will apply in the Recreational Beach Zone unless the Borough has been notified that piping plover chicks are present in the Protected Zone (see bullet below) or other listed species are present in the Recreational Zone. If listed species colonize the Recreational Zone, the Borough will coordinate with the NJDFW and the USFWS to develop a Recreational Zone Vehicle Use Policy. The policy will be consistent with the Recreational Activities Guidelines if plovers establish nesting in the Recreational Zone.

- In the event that the plover chicks move further north or south on the beach outside the protection zone (i.e. highly mobile chicks), the Borough will need to further adjust driving after consultation with the NJFW and USFWS. If piping plover chicks are present in the Recreation Zone, driving will automatically be temporarily ceased within a 100-meter buffer, the minimum distance outlined under the Recreational Activities Guidelines and for chicks less than a week old, a 200-meter buffer will be established. The driving restriction will be in effect until the chicks are able to fly, either 35 days after hatching or when sustained flight (15 meters) is observed by NJFW staff, whichever is sooner. If all the chicks die prior to fledgling, the vehicle restriction will be lifted as soon as that mortality is confirmed by NJFW staff.

- Police and other municipal vehicles will be prohibited within the Plant Protection Strip from May 15 to November 30, except in emergencies.

- Police will only drive in the Protected Zone in response to an emergency

- No restrictions apply when emergency vehicles are responding to an emergency as defined in this BMP.

- The Borough will coordinate with NJFW to request a monitor for one-time activities within the protected zone that may include the placement of lifeguard stands and boxes at the start of the season, and clearing/grading of sand from beach access points onto the beach berm. Every effort should be made by the Borough to prepare access points prior to March 15.

- The Borough will inform, in writing, all appropriate Borough Departments (*e.g.*, Police, Public Works, Beach Patrol) and any contractors or vendors of the need to avoid vehicle travel in the Protected Zone from March 15 through August 31 (if no listed shorebird species are present, then July 15), except in bona fide emergency or SOE situations.

- Between September 1 and November 30, vehicles will slow to 5 mph and maintain a distance of 400 feet from red knots or any flocks of migrating shorebirds to avoid disturbance.

- No restrictions apply when Police or other Emergency Response Vehicles are responding to an emergency as defined in this BMP.

➢ **NJFW Actions**

- The NJFW will be responsible for any pre-season fencing in areas of suitable nesting habitat as necessary and appropriate (based on nesting history) in late March or early April. The NJFW will coordinate annually with the Borough regarding the extent of areas that will be pre-season fenced.

- The NJFW will post all active nesting areas (in any beach Zone) with appropriate signs and symbolic fencing, including enlarging or adjusting pre-season fencing based on observed nesting activity.

- The NJFW will remove fencing within 10 days of the end of any nesting activity, unless fencing is needed longer to protect seabeach amaranth. The NJFW, the USFWS, and the Borough 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 NJFW will inform the Borough Police Chief, Public Works Manager, and administrator within two working days of any areas that have been fenced.

- The NJFW will provide a timely response to Borough notification of planned events, and will provide recommendations to protect listed species.

- The NJFW will notify the Borough promptly when chicks are hatched, and will keep the Borough updated regarding the location of the chicks.

➢ **USFWS Actions**

- Subject to Corps or other funding, the USFWS (or its designee) will conduct early-season surveys to identify areas where seabeach amaranth or other listed plants are at risk of being damaged or destroyed by human activity, vehicle use or beach management practices.

- Subject to Corps or other funding, the USFWS (or its designee) will erect any symbolic fencing needed to protect seabeach amaranth. Fencing will provide at least a 3-meter buffer surrounding each plant, and will be removed by December 1 or sooner if no longer needed.

- The USFWS will provide appropriate seabeach amaranth signs to post on symbolic fencing.

- The USFWS will provide a timely response to Borough notification of planned events, and will provide recommendations to protect listed species.

D. FIREWORKS

➢ Background

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, 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.

Currently, the Borough does not hold any annual Borough-sponsored fireworks events. If in the future the Borough wishes to plan a fireworks display during the nesting/growing season, the Borough will coordinate the approval with the NJFW and USWFS. Fireworks event(s) will be managed consistent with the Fireworks Guidelines and include the following Borough Actions described below.

➢ Borough Actions

- The Borough will inform the NJFW and the USWFS, in writing, of any planned fireworks events and the location proposed at least 30 days in advance.

- The Borough will coordinate with the USFWS to arrange for a seabeach amaranth survey and fencing within the primary and any secondary viewing areas in the week preceding a fireworks event.

- In the event that nesting occurs on the beach, the Borough will take the following protective measures:

- Keep the launch area at least 0.75 mile from any nesting site.

- Provide adequate law enforcement and other personnel during the event to enforce listed species protections, including prohibiting entry in fenced areas and use of personal fireworks. The Borough will coordinate with the NJFW to determine the number of required enforcement personnel.

- Prohibit driving of municipal, contractor, and vendor vehicles in the vicinity of nesting areas during nighttime events, unless responding to an emergency. Law enforcement patrol vehicles and any other essential municipal vehicles will remain on the street behind the dunes, from which personnel can access the beach front on foot.

- 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 except service animals on the beach (especially near nesting areas) during fireworks events, and ensure compliance with this prohibition. Service animals near active nesting areas will be required to stay on a leash and will not be permitted in fenced areas.

- 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 NJFW monitors. Further, any vehicles needed to remove trash will be operated during daylight hours, under supervision of a NJFW monitor, and consistent with the Recreational Guidelines.

➢ **NJFW Actions**

- The NJFW will provide a timely response to any request from the Borough to review specific fireworks plans and will provide recommendations to protect listed species.

- In the event that nesting occurs on the beach, the NJFW will take the following protective measures:

  - Provide a monitor as needed to the nesting site during fireworks events to assist the Borough in enforcement of listed species protections.

  - Provide a monitor the following day as needed to oversee trash removal from fenced areas, and any trash removal requiring a vehicle.

➢ **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 USCG regarding authorization of Borough fireworks events pursuant to Section 7 of the ESA.

- Subject to the availability of Corps or other funding, the USFWS will survey the primary viewing area and any secondary viewing areas 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 activities that the Borough undertakes to physically maintain its beaches and dunes, including refuse and large debris removal, dune maintenance, beach nourishment, sand scraping, and oversight of beach access structures. These activities can impact habitat quality, disturb nesting birds, and destroy nests, chicks, and plants.

1. Beach Raking

➢ Background

Beach rakes can inadvertently destroy unprotected nests, kill chicks, and remove plants. Beach raking can also diminish the suitability of nesting habitat 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.

➢ Borough Actions

- The Borough will prohibit raking in the Protected Zone between March 15 and August 31 except during an SOE (*i.e.*, potentially harmful debris must be removed from the beach to protect public health and safety). If no listed shorebird species are present (as determined by NJFW and/or USFWS) by July 15 or once nesting activities are completed for the season, the raking restriction may be lifted. However, raking restrictions will remain in effect within the Plant Protection Strip through November 30 to provide opportunities for colonization by listed beach plants.

- Outside of the Plant Protection Strip and except as otherwise regulated or prohibited by the New Jersey Coastal Zone Management Rules, no raking restrictions will apply in the Recreational Zone unless the Borough has been notified that listed species are present. Within the Plant Protection Strip, raking will be prohibited from May 15 to November 30. If listed species colonize the Recreational Zone, the Borough will include raking in the Recreational Zone Vehicle Use Policy to be developed with the NJFW and the USFWS. The policy will be consistent with the Recreational Activities Guidelines if plovers establish nesting in the Recreational Zone and will include protective measures for seabeach amaranth.

- The Borough will notify the NJFW and the USFWS promptly upon Declaration of an Emergency (notice by email 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 in the vicinity of an active nesting area, foraging red knots, or seabeach amaranth occurrence. When implemented with these protective measures, the NJFW and the USFWS will not object to SOE Raking of the Protected Zone to remove medical waste, hazardous trash, or other unusual debris; SOE Raking may proceed once any required authorizations are obtained from the DLRP.

➢ **NJFW and USFWS Actions**

- The NJFW will monitor nesting activity and regularly inform the Borough through the Police Chief and Public Works Manager of nest and brood locations so that emergency raking procedures effected by nesting status can be implemented on a timely basis.

- The NJFW and the USFWS will promptly review requests from the Borough for SOE Raking in the Protected Zone, and will make recommendations to protect listed species.

- The NJFW and/or the USFWS will provide an on-site monitor during SOE Raking, if determined that it is needed.

- The NJFW and the USFWS will recommend to the DLRP that normal raking prohibitions in the Protected Zone be waived to permit SOE Raking and other provisions in the BMP that will be carried out with the protective measures listed in Table 1.

2. Large Debris Removal

➢ **Background**

Large debris that washes up on Borough beaches must be removed periodically by the Department of Public Works. Removal of large debris requires motorized vehicles and equipment that can impact listed species.

➢ **Borough Actions**

- Outside of the Plant Protection Strip, no restrictions on clean-ups will apply in the Recreational Zone unless the Borough has been notified that listed species are present. If listed species colonize the Recreational Zone, the Borough will include clean-ups in the Recreational Zone Vehicle Use Regulations to be developed with the NJFW and the USFWS. The Regulations will be consistent with the Recreational Guidelines if plovers establish nesting in the Recreational Zone and include protective measures for seabeach amaranth. Vehicles involved in large debris clean-ups will be prohibited from the Plant Protection Strip between May 15 and November 30.

- The Borough will not conduct, sponsor, or authorize routine clean-ups in the Protected Zone using motor vehicles between March 15 and August 31 (or until the breeding season is complete) with the following exception.

    - After July 15, in the event that no listed shorebird species are present, vehicle restrictions for clean-ups may be lifted in the Protected Zone in consultation with NJFW and USFWS. Any seabeach amaranth plants will be fenced with a minimum 3-meter buffer before clean-ups occur that use motor vehicles. Vehicles will be prohibited in the Plant Protection Strip through November 30.
    - On occurrences deemed necessary by NJFW, the Borough will coordinate with NJFW to provide a monitor to carry out large debris removal with vehicles.

- The Borough will notify the NJFW and the USFWS promptly upon Declaration of an Emergency (notice by email 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, foraging red knots, or seabeach amaranth occurrence. When implemented with these protective measures, the NJFW 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 once any required authorizations are obtained from the DLRP.

➢ **NJFW and USFWS Actions**

- The NJFW 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 NJFW and/or the USFWS will provide a monitor to oversee SOE Clean-ups in the Protected Zone between March 15 and August 31.

3. Refuse Containers

➢ **Background**

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

Refuse containers are located on the beach at the end of public beach access paths. These containers are emptied by the Public Works Department with the use of vehicles.

➢ **Borough Actions**

- The Borough will continue existing trash collection practices within the Recreational Zone, unless the Borough is notified that listed species are present. If listed species colonize the Recreational Zone, the Borough will include refuse removal in the Recreational Zone Vehicle Regulations to be developed with the NJFW and the USFWS. The policy will be consistent with the Recreational Activities Guidelines if plovers establish nesting in the Recreational Zone and include protective measures for seabeach amaranth.

- When using vehicles for trash collection in the Recreational Zone, no vehicles shall enter the Plant Protection Strip from May 15 through November 30.

- The Borough will not place any refuse containers on the beach within the Protected Zone, on top of the following beach access paths (F, H, and J), nor in the Plant Protection Strips.

- Litter can be removed from PPS manually if area is absent of plants or symbolic fencing.

Table 1. Seasonal Protections for Listed Species When Motorized Vehicles or Equipment are required to respond to a State of Emergency (SOE)

<table>
<tr><th></th><th>Protections for Listed Birds</th><th>Protections for Listed Plants</th><th>Protections for All Listed Species</th></tr>
<tr><td>December 1 - March 14</td><td></td><td rowspan="2">▪ Vehicles will avoid driving in the Plant Protection Strip if possible.</td><td></td></tr>
<tr><td>March 15 –May 14</td><td rowspan="4">▪ SOE response will be supervised by the NJFW 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 NJFW monitors to</td><td rowspan="3">▪ Vehicles will avoid crushing or removing seabeach amaranth and State-listed plants.
▪ Vehicles will avoid driving in the Plant Protection Strip.</td><td rowspan="3">▪ Vehicles will minimize removal of wrack material; and
▪ SOE response will proceed in accordance with any other recommendations of the NJFW or the USFWS to protect listed species.</td></tr>
<tr><td>May 15 –May 31</td></tr>
<tr><td>June</td></tr>
<tr><td>July</td></tr>
</table>

August	avoid harassment of listed birds.		
September	▪ Vehicles will slow to 5 mph and keep a distance of 400 feet from red knots and flocks of migratory shorebirds.		
October			
November			

EMERGENCY CONTACTS:

New Jersey DEP Fish and Wildlife – Endangered and Nongame Species Program
Christina Davis 609-628-1919 (office) or 609-960-6614 (cell) or christina.davis@dep.nj.gov
Emily Heiser 609-628-0401 (office) or 609-775-5579 (cell) or Emily.Heiser@dep.nj.gov

U.S. Fish and Wildlife Service – New Jersey Field Office 609-646-9310

4. Dune Management and Invasive Plant Species Control

➢ Background

Steep, stabilized dunes do not provide suitable habitat for the beach-dependent listed species included in this plan. The dune management goal in the Protected Zone is the development of a more natural dune system, featuring an irregular face, occasional breaches, and a low-lying sparsely vegetated fore-dune. Limiting the width of the dune zone 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 are regulated by the New Jersey Coastal Zone Management Rules (Section 7:7-10.4). Invasive plant species (*e.g.*, Asiatic sand sedge [*Carex kobomugi*]), either exotic or native, can degrade or eliminate native habitat for listed species.

Specific dune guidelines to minimize adverse effects to piping plovers and other beach-dependent species in New Jersey are in the process of being developed and will be added to this plan when they are available. In the meantime, general recommendations regarding sand fencing and vegetation planting practices can be found in Appendix G. These general recommendations, in conjunction with coordination with USFWS and NJFW, should be followed until more detailed and site-specific guidance is available.

➢ Borough Actions

- The Borough will adopt recommendations of the NJFW and the USFWS, within reason, to manage dunes and control invasive plant species in the Protected Zone in ways that enhance suitability of habitat for listed species, and dunes that provide for adequate storm

protection. Dunes will be managed to promote a diverse assemblage of native vegetation and in accordance with N.J.A.C. 7:7-10.4.

- The Borough will provide plans for review by the NJFW and the USFWS at least 30 days before carrying out routine dune management (including placement of dune fencing, vegetation planting and fertilization) or invasive plant species control activities at any time of year in the Protected Zone, or in the vicinity of any nesting area or seabeach amaranth occurrence that may be documented in the Recreational Zone. The Borough will incorporate recommendations of the NJFW or the USFWS to protect listed species and their habitats.

- For routine dune management or invasive plant species control in the vicinity of a nesting area in any beach Zone, the Borough will schedule work between September 1 and 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. Work will not be performed in the vicinity of red knots, when present.

- The Borough will coordinate any SOE Post-storm Beach or Dune Restoration with the NJFW and the USFWS. The need for such activities will be signaled by a Declared Emergency, and eligibility for DLRP permits under Section 7:7-10.3 of the New Jersey Coastal Zone Management Rules. The Borough will notify the NJFW and the USFWS promptly upon Declaration of an Emergency (notice by email 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, foraging red knots, or seabeach amaranth occurrence. When implemented with these protective measures, the NJFW and the USFWS will not object to SOE Restoration activities; SOE Restoration may proceed once any required authorizations are obtained from the DLRP. 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.

➢ **NJFW and USFWS Actions**

- The NJFW and the USFWS will provide technical assistance to the Borough to develop dune management strategies that enhance suitability of habitat for listed species while meeting storm protection needs.

- The NJFW and USFWS will provide technical assistance to the Borough for controlling invasive plant species to enhance suitability of habitat for listed species. The NJFW and the USFWS recommendations will promote a diverse assemblage of native dune vegetation, and will be consistent with N.J.A.C. 7:7-10.4.

- The NJFW and the USFWS will provide a timely response to any request from the Borough to review specific routine dune management activities (including placement of dune fencing, vegetation planting and fertilization) and will provide recommendations to protect listed species and their habitats.

- The NJFW and the USFWS will provide timely recommendations upon Borough notification of SOE Post-storm Beach or Dune Restoration activities.

- The NJFW and the USFWS will provide timely recommendations upon Borough notification of invasive plant species control activities.

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

5. Beach Nourishment

➢ Background

The Borough participated in the Corps' Manasquan Inlet to Barnegat Inlet, New Jersey Hurricane and Storm Reduction Project for construction of a new beach and dune that was completed in 2019.

Prior to beach nourishment, many sites within the 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 have 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 sites 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 chick 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's December 2005 PBO. 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 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 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 the piping plover nesting season within known piping plover nesting areas, or if migrating red knots are present. For areas where habitat conditions have changed substantially, such that a suitable habitat is no longer present, a case-by-base 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 an 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 DLRP, respectively.

- **Borough Actions**

  - The Borough will work with the USFWS, NJDEP, and the Corps to implement the provisions of the PBO, and of each streamlined consultation, during each renourishment of Borough beaches under the Corps' nourishment program. Key provisions of the PBO include fencing, avoidance, and possibly salvage and replacement of seabeach amaranth plants; and a seasonal restriction (March 15 to fledging of the last chick) on construction within 1,000 meters of piping plover nesting areas, as defined in this BMP.

  - 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 PBO that governs implementation of the Corps' beach nourishment program. Protection would be achieved mainly through seasonal restrictions on 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. 7.7-10.3(b); therefore, SOE Beach Nourishment qualifies as "SOE Post-storm Beach or Dune Restoration" as defined in this BMP.

  - The Borough will coordinate any SOE Post-storm Beach or Dune Restoration (including SOE Beach Nourishment) with the NJFW and the USFWS. The need for such activities

will be signaled by a Declared Emergency, and eligibility for DLRP permits under Section 7:7-10.3 of the New Jersey Coastal Zone Management Rules. The Borough will notify the NJFW and the USFWS promptly upon Declaration of an Emergency (notice by email 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, foraging red knots, or seabeach amaranth occurrence. When implemented with these protective measures, the NJFW and the USFWS will not object to SOE Restoration activities; SOE Restoration may proceed once any required authorizations are obtained from the DLRP 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.

- **NJFW Actions**

  - The NJFW 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 NJFW will provide: (1) current and historical nesting data and locations, and (2) recommendations for habitat enhancements that could be incorporated into the project.

  - The NJFW will provide a timely response to any request from the Borough to review specific beach nourishment plans.

  - The NJFW 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 complete promptly streamlined consultation for each renourishment of the Borough's beaches under the Corps' program.

- The USFWS will work with the Corps, the applicant, and the Borough to promptly complete consultation 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 the PBO.

- 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

➢ Background

Use of motorized equipment to conduct sand scraping (mechanical redistribution 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.

➢ Borough Actions

- Outside of the Plant Protection Strip and except as otherwise regulated or prohibited by the New Jersey Coastal Zone Management Rules, no restrictions on sand scraping will apply in the Recreational Zone unless the Borough has been notified that listed species are present. If listed species colonize the Recreational Zone, the Borough will develop appropriate policies for sand scraping with NJFW and the USFWS. The policy will be consistent with the Recreational Guidelines if plovers establish nesting in the Recreational Zone.

- The Borough will not conduct sand scraping in the Protected Zone at any time of the year except as a necessary part of SOE Post-storm Beach or Dune Restoration (consistent with the Borough's Coastal Zone Management Permit, restrictions do not apply in beach access paths).

- The Borough will not conduct sand scraping in the Plant Protection Strip at any time of the year except as a necessary part of SOE Post-storm Beach or Dune Restoration (consistent with the Borough's Coastal Zone Management Permit, restrictions do not apply in beach access paths and a 10-foot area at the base of the access path).

- Mechanical redistribution of sand is among the activities listed at N.J.A.C. 7.7-10.3(b); therefore, sand scraping under SOE conditions qualifies as "SOE Post-storm Beach or Dune Restoration" as defined in this BMP.

- The Borough will coordinate any SOE Post-storm Beach or Dune Restoration with the NJFW and the USFWS. The need for such activities will be signaled by a Declared Emergency, and eligibility for DLRP permits under Section 7:7-10.3 of the New Jersey Coastal Zone Management Rules. The Borough will notify the NJFW and the USFWS promptly upon Declaration of an Emergency (notice by email 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, foraging red knots, or seabeach amaranth occurrence. When implemented with these protective measures, the NJFW and the USFWS will not object to SOE Restoration activities; SOE Restoration may proceed once any required authorizations are obtained from the DLRP 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 erosional or storm event(s) that caused the SOE.

7. Beach Access Structures

➢ Background

Public access to New Jersey's beaches is a central goal of the NJDEP's Coastal Management Program, as reflected in the State Coastal Zone Management Rules. Public access is also a key requirement of Federal and State rules governing beach nourishment carried out with public funds. However, an excessive number of beach access structures brings more recreational users into potential conflict with listed species. Such 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.

The Borough maintains twenty (20) beach access points/structures, this includes including four (4) ADA (Americans with Disabilities Act) access ramps at Decatur Avenue, F Street, 7th Avenue and 13th Ave, down to the high-water line; two vehicular access ramps at Brighton Avenue and Stockton Avenue, and two for lifeguard use only.

The Borough may install temporary sand fencing at the three ADA beach access ramps located at F Street, 7th Avenue, and Decatur Avenue. In early May, this sand fencing is placed perpendicular to the dune to slow sand accumulation in front of the ADA access points during common south blowing winds. When sand builds up along these fences it is redistributed onto the beach.

Generally sand fencing is incompatible with PPS as it tends to accumulate sand and burry seeds. Conversely, it could also accumulate seeds and create a localized population boom that could make it difficult to do maintenance in that area. Additionally, if the area is accumulating seeds and then that sand/seeds is distributed onto the beach, this practice risks shifting seedbank from the back beach to more seaward areas, where any seedlings are probably at greater risk of getting

raked/run over/trampled and where additional restrictions on beach use may be incurred in areas fenced for any surviving plants that germinate in this area. This Beach Management Plan will allow the temporary sand fencing as long as no adverse effects to listed species are observed.

- **Borough Actions**

  - The Borough will not propose any new public beach access points/structures within the Protected Zone as the current number and locations of access points is sufficient and meets current State requirements. 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 NJFW and the USFWS to locate (or relocate), design, and construct any proposed new public access structures to minimize adverse impacts to listed species.

  - The Borough will work with the NJFW and the USFWS to place appropriate signs regarding protections for listed species and dunes at or near public access points.

  - When sand builds up along ADA access point sand fences, the Borough will:

    - Notify and coordinate with the USFWS and the seabeach amaranth monitor to determine if there are plants present and where sand should be redistributed. Disturbance to the PPS and surrounding sand shall be kept to a minimum, utilizing the smallest possible machinery, as to not negatively impact the seed bank.

    - If plovers or other beach nesting birds are present, the Borough will coordinate with the ENSP.

    - The Borough will be responsible for State land use permitting and any other necessary authorizations and approvals.

- **NJFW and USFWS Actions**

  - The NJFW and the USFWS will provide recommendations regarding any proposed new (or relocated) public beach access structures, if it is determined such changes are necessary.

  - Whenever possible, the NJFW and the USFWS will make an effort to avoid blocking off any public or private access paths with symbolic fencing.

  - The NJFW and the USFWS will provide appropriate signs to post at or near public beach access points (See Section F, Education and Outreach).

F. EDUCATION AND OUTREACH

- **Background**

This component of the BMP encompasses all of the management issues discussed above for the purposes of reducing predation, human disturbance, and the detrimental impacts of beach maintenance. Education and outreach include on-site and off-site distribution of educational materials, educational displays, lectures, beach walks, interpretive signs, and other elements that provide information on the 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 will work with the NJFW and the USFWS to post appropriate signs at beach entry points and on the beach regarding protections for listed species and dunes, refuse policies, the Borough's pet ordinance, and activities prohibited or discouraged on the beach.

  - Through the Borough newsletter, website, and/or other publications or social media, the Borough will inform residents, vacation homeowners, and renter about recreational driving policies on Borough beaches.

  - Through the Borough newsletter, website, and/or other publications or social media, the Borough will inform residents, vacation homeowners, and renters about protections for listed species and dunes, refuse policies, the Borough's pet ordinance, and activities prohibited or discouraged on the beach. The Borough will also post periodic updates on the nesting success, population status, species biology, and management activities for listed species (information provided by the agencies).

  - Through the Borough newsletter, website, and/or other publications or social media, the Borough will inform residents, vacation homeowners, and renters about the importance of keeping cats indoors. The information will discourage cat owners from allowing their pets to roam freely outdoors, and from abandoning pet cats. The articles will also discourage the feeding of feral cats.

  - The Borough will post signs within the Borough to discourage feeding of wildlife, with the exception of backyard bird feeders.

  - To promote compliance with the aforementioned prohibition, the Borough will discourage kite-flying and drone-flying near nesting areas through signs and educational materials.

- **NJFW and USFWS Actions**

  - The NJFW and the USFWS will assist the Borough in developing educational outreach materials by supplying existing materials and necessary information, and providing technical review as requested.

- The NJFW and the USFWS will provide information for the Borough newsletter articles and/or other publications. Upon request of the Borough, the agencies will author articles within limits of available staff time.

- The USFWS will provide copies of the seabeach amaranth fact sheet developed by the ONLM (as needed), and the USFWS's Beach Management Planning and Piping Plover Factsheets upon request and as available. The NJFW will provide brochures on beach-nesting birds upon request and as available.

- The NJFW will conduct beach walks to show beach nesting bird areas and nesting activity to Borough officials as requested by the Borough and scheduled at least once per season.

- Upon request of the Borough, the NJFW and/or the USFWS will conduct periodic educational talks and/or beach walks for the Borough employees, contractors, residents, or visitors within limits of available staff time.

G. OTHER PROVISIONS

- The NJFW and the USFWS will regularly inform the Borough regarding changes in listed species locations, distribution, populations, habitat, and/or nesting activity that may affect any of the provisions of this BMP or that would be of general interest to the Borough.

- The NJFW will provide regular notification regarding nesting activity, including but not limited to, weekly emails during the nesting season sent to the Police Chief and Public Works Manager. The emails will provide the current location of nests and chicks, the NJFW management activities, and other important information.

- The NJFW 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 NJFW and the USFWS will provide maps of species locations within the Borough, upon request.

- The NJFW and the USFWS will work with the Borough to support implementation of this BMP.

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

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 11989[1] 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.

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[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-blacked 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 (Coutu 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 period[2] 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 precocial[3] (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, 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).

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

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

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 lines[4], 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 eggs (Burger 1987b, Hill 1988, Shaffer and Laporte 1992, Cape Cod National Seashore 1993, Collazo et al. 1994). Unleashed dogs may chase plovers (McConnaughey et al. 1990), destroy nests (Hoopes et al. 1992), and kill chicks (Cairns and McLaren 1980).

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

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 fencing[5]. 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 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

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[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.

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.

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. (See the Service's February 4, 1997 Guidelines for Managing Fireworks in the Vicinity of Piping Plovers and Seabeach Amaranth on the U.S. Atlantic Coast.)

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[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 yard buffers around nests on State park lands and included intertidal areas (Delaware Department of Natural Resources and Environmental Control 1990).

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 accidently 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 crushed 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.

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Table 1. Summary of Chick Mobility Data

Source	Location	Data
Patterson 1988 (p.40)	Maryland and Virginia	18 of 38 broods moved to feeding areas more than 100 meters from their nests; 5 broods moved more than 600 meters (distance measured parallel to wrackline).
Cross 1989 (p.23)	Virginia	At three sites, observers relocated broods at mean distances from their nests of 153 m +/- 97m (44 observations, 14 broods), 32 m +/-7 m (8 observations, 3 broods), and 492 m +/-281 m (12 observations, 4 broods).
Coutu et al. 1990 (p.12)	North Carolina	Observations of 11 broods averaged 212 m from their nests; 3 broods moved 400-725 m from nest sites.
Strauss 1990 (p.33)	Massachusetts	10 chicks moved more than 200 m during first 5 days post-hatch while 19 chicks moved less than 200 meters during same interval.
Loegering 1992 (p.72)	Maryland	Distances broods moved from nests during first 5 days post-hatch averaged 195 m in Bay (n=10), 141 m in Interior habitat (n=36), and 131 m in Ocean habitat (n=41). By 21 days, movement in each habitat had, respectively, increased to 850 m (n=1), 464 m (n=10), (n=69). One brood moved more than 1000 m from its nest.
Melvin et al. 1994	Massachusetts and New York	In 14 incidents in which 18 chicks were killed by vehicles, chicks were run over $\leq$ 10 m to $\leq$ 900 m from their nests. In 7 of these instances, mortality occurred $\geq$ 200 m from the nest.

Table 2. Summary of Data on Distances at which Piping Plovers React to Disturbance

Source	Location	Data
<u>Flushing of Incubating Birds by Pedestrians</u>		
Flemming et al. 1988 (p.326) however, great variation existed and	Nova Scotia	Adults usually flushed from the nests at distances <40 m; reaction distances as great as 210 m were observed.
Cross 1990 (p.47) (n=181, range = 5 m to 300 m) and 25 m	Virginia	Mean flushing distances in each of two years were 47 m (n=214, range = 2 m to100 m).
Loegering 1992 (p.61) 174 m. Recommended use of 225 m	Maryland	Flushing distances averaged 78 m (n=43); range was 20 m to disturbance buffers on his site.
Cross and Terwilliger 1993 plover sites, 1986-91) was 63 m years were not significant, but	Virginia	Mean flushing distance for all years on all sites (Virginia (n=201, SD=31, range = 7 m to 200 m). Differences among differences among sites were.
Hoopes 1993 (p.72) (n=31).	Massachusetts	Mean flushing distance for incubating plovers was 24 m
<u>Disturbance to Non-incubating Birds</u>		
Hoopes 1993 (p.89) pedestrian disturbances (range = m for dogs/pets (range = 20 m to	Massachusetts	Mean response distance (all ages, all behaviors) was 23 m for 10 m to 60 m), 40 m for vehicles (range = 30 m to 70 m), 46 100 m), and 85 m for kites (range = 60 m to 120 m).
Goldin 1993b (p.74) 18.7 m for pedestrian disturbances (n=111). Pedestrians caused joggers at 32.3 m (n=37), and vehicles chick moved 260 m in direct	New York	Average flushing distance for adult and juvenile plovers was (n=585), 19.5 m for joggers (n=183), and 20.4 m for vehicles chicks to flush at an average distance of 20.7 m (n=175), at 19.3 m (n=7). Tolerance of individual birds varied; one response to 20 disturbances in 1 hour.

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

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 (Services'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*.

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 broodrearing 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[1] 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 Section on 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[2]:

   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.

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[1] 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.

[2] 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.

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).

APPENDIX C

Excerpts from the New Jersey Coastal Zone Management Rules

N.J.A.C. 7:7

COASTAL ZONE MANAGEMENT RULES
Statutory authority:
N.J.S.A. 13:19-1 et seq.; 12:3-1 et seq., 12:5-3; 13:9A-1 et seq.
Date last amended:
October 5, 2021

Referenced Sections:

7:7 Subchapter 1. GENERAL PROVISIONS

7:7-1.1 Purpose
7:7-1.2 Scope

7:7 Subchapter 9. SPECIAL AREAS

7:7-9.16 Dunes
7:7-9.17 Overwash areas
7:7-9.22 Beaches
7:7-9.36 Endangered or threatened wildlife or plant species habitats
7:7-9.37 Critical wildlife habitats
7:7-9.38 Public open space

7:7 Subchapter 10. STANDARDS FOR BEACH AND DUNE ACTIVITIES

7:7-10.1 Purpose and scope
7:7-10.2 Standards applicable to routine beach maintenance
7:7-10.3 Standards applicable to emergency post-storm beach restoration
7:7-10.4 Standards applicable to dune creation and maintenance
7:7-10.5 Standards applicable to the construction of boardwalks

7:7 Subchapter 11. 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

7:7-11.1 Purpose and scope
7:7-11.2 Standards for conducting endangered or threatened wildlife or plant species habitat impact assessments
7:7-11.3 Standards for conducting endangered or threatened wildlife species habitat evaluation
7:7-11.4 Standards for reporting the results of impact assessments and habitat evaluations

SUBCHAPTER 1. GENERAL PROVISIONS
7:7-1.1 Purpose

(a) This chapter establishes the rules of the Department regarding the use and development of coastal resources. The rules are used in reviewing applications for coastal permits under the Coastal Area Facility Review Act, N.J.S.A. 13:19-1 et seq. (CAFRA permits), the Wetlands Act of 1970, N.J.S.A 13:9A-1 et seq. (coastal wetlands permits), and the Waterfront Development Law, N.J.S.A 12:5-3 (waterfront development permits). The rules are also used in the review of water quality certificates subject to Section 401 of the Federal Clean Water Act, 33 U.S.C § 1341, and Federal consistency determinations under Section 307 of the Federal Coastal Zone Management Act, 16 U.S.C. § 1456. The rules also provide a basis for recommendations by the Program to the Tidelands Resource Council on applications for riparian grants, leases, and licenses.

(b) The Department interprets the "public health, safety, and welfare" clause in CAFRA (N.J.S.A. 13: 19-10.f) and the Wetlands Act of 1970 (N.J.S.A 13:9A-4.d) as providing for full consideration of the national interest in the wise use of coastal resources as required under the Federal Coastal Zone Management Act (16 U.S.C. §§ 1451 et seq.).

(c) Both the New Jersey Coastal Management Program and the Coastal Zone Management Rules are founded on the eight broad coastal goals described at (c) 1 through 8 below. The coastal goals express results that the New Jersey Coastal Management Program strives to attain. Each goal is supplemented by related policies that set forth the means to realize that goal. The Coastal Zone Management Rules, including the coastal goals and policies set forth below, are enforceable policies of the New Jersey Coastal Management Program as approved under the Federal Coastal Zone Management Act (16 U.S.C. §§ 1451 et seq.). The New Jersey Coastal Management Program goals and supplemental policies are:

1. Healthy coastal ecosystems.
   i. Protect, enhance and restore coastal habitats and their living resources to promote biodiversity, water quality, aesthetics, recreation and healthy coastal ecosystems; and
   ii. Manage coastal activities to protect natural resources and the environment;
2. Effective management of ocean and estuarine resources.
   i. Develop and implement management measures to attain sustainable recreational and commercial fisheries;
   ii. Manage commercial uses to reduce conflict between users and encourage water-dependent uses; and
   iii. Administer the safe and environmentally sound use of coastal waters and beaches to protect natural, cultural and aesthetic resources, promote safe navigation, and provide recreational opportunities;
3. Meaningful public access to and use of tidal waterways and their shores.
   i. Preserve public trust rights to tidal waterways and their shores;
   ii. Preserve and enhance views of the coastal landscape to enrich aesthetic and cultural values and vital communities;
   iii. Conserve and increase safe, environmentally sound, and meaningful public access from both the land and water to the tidal waterways and their shores for recreation and aesthetic experiences;

iv. Enhance public access by promoting adequate affordable public facilities and services;
v. Balance diverse uses of tidal waterways and their shores; and
vi. Protect, enhance and promote waterfront parks;

4. Sustained and revitalized water-dependent uses.
   i. Encourage, sustain and enhance active port and other water-dependent facilities, and maritime uses;
   ii. Encourage the redevelopment of inactive and under-utilized waterfront facilities for port, water-dependent and maritime uses;
   iii. Conserve waterfront sites for water-dependent activities; and
   iv. Manage dredging in an environmentally sound manner, promote environmentally sound and economically feasible dredged material management practices and preserve historic dredged material placement sites;
5. Coastal open space.
   i. Preserve, enhance and restore open space including natural, scenic, historic and ecologically important landscapes that:
      (1) Provide opportunities for passive and active recreation;
      (2) Protect valuable wildlife and plant habitats and ecosystem health, foster aesthetic and cultural values;
      (3) Minimize natural hazards; and
      (4) Abate impacts from nonpoint sources of pollution;
   ii. Promote and enhance public access to and use of open space where appropriate; and
   iii. Promote strategies for the creation of open space;
6. Safe, healthy and well-planned coastal communities and regions.
   i. Manage coastal activities and foster well-planned communities and regions that:
      (1) Encourage mixed-use redevelopment of distressed waterfront communities including underutilized, abandoned and contaminated sites;
      (2) Promote concentrated patterns of development;
      (3) Ensure the availability of suitable waterfront areas for water dependent activities;
      (4) Sustain coastal economies;
      (5) Create vibrant coastal communities and waterfronts;
      (6) Conserve water supply;
      (7) Protect the natural environment;
      (8) Minimize the threat of natural hazards to life and property;
      (9) Provide meaningful public access to tidal waterways and their shores; and
      (10) Preserve and restore significant historic and cultural resources and aesthetic coastal features;
   ii. Maintain, enhance and encourage maritime uses;
   iii. Preserve and enhance beach and dune systems and wetlands, and manage natural features to protect the public from natural hazards;
   iv. Promote public health, safety and welfare;
   v. Promote and implement strategies for the development of hazard mitigation plans; and
   vi. Promote and implement strategies that eliminate or reduce risks to human health and the ecosystem from coastal activities;
7. Coordinated coastal decision-making, comprehensive planning and research.
   i. Promote the attainment of the New Jersey Coastal Management Program goals by

encouraging other government agencies to employ the policies which supplement the goals;
ii. Encourage incorporation of the coastal goals and supplemental policies into State, regional and municipal land use management, funding and acquisition programs within the coastal zone;
iii. Coordinate cooperative government sponsored and academic coastal research and information dissemination to foster informed decision-making;
iv. Ensure opportunities for public participation in coastal decision-making;
v. Encourage the preparation of comprehensive plans, including:
(1) Land acquisition plans that further the goals and supplemental policies of New Jersey's Coastal Management Program; and
(2) Special area management plans that protect significant natural resources and provide the opportunity for sound coastal dependent economic development; and
8. Coordinated public education and outreach.
i. Coordinate education and outreach activities on coastal issues; and
ii. Encourage coastal related education and participation opportunities for the public.

(d) The coastal land and water areas of New Jersey are diverse. The Coastal Zone Management rules address a wide range of land and water types (locations), current and potential land and water uses, and natural, cultural, social and economic resources in the coastal zone. In developing these rules, balances were struck among various conflicting, competing, and contradictory local, State, and national interests in coastal resources and in uses of coastal locations. This balancing and conflict-reducing approach reflects that coastal management involves consideration of a broad range of concerns in contrast to other resource management programs which are more limited in scope.

(e) The location rules (N.J.A.C 7:7-9 through 14), use rules (N.J.A.C 7:7-15), and resource rules (N.J.A.C 7:7-16) stem from the coastal goals at (c) above. The Department does not expect each proposed use of coastal resources to involve all location rules, use rules, and resource rules. Decision-making on proposed actions involves examining, weighing, and evaluating complex interests using the framework provided by this chapter. The Coastal Zone Management Rules provide a mechanism for integrating professional judgment by Department officials, as well as recommendations and comments by applicants, public agencies, specific interest groups, corporations, and citizens into the coastal decision-making process. In this process, interpretations of terms, such as "prudent," "feasible," "minimal," "practicable," and "maximum extent," as used in a rule or a combination of rules, may vary depending upon the context of the proposed use, location, and design.

7:7-1.2 Scope

(a) This chapter shall apply to actions and decisions by the Department, as described at (d) through (h) below, on uses and development of coastal resources within or affecting the coastal zone, which is described at (b) below.

(b) This chapter shall apply geographically to the New Jersey coastal zone, which comprises:
1. The CAFRA area;

2. Coastal waters, which are any tidal waters of the State and all lands lying thereunder. Coastal waters of the State of New Jersey extend from the mean high water line out to the three-geographical-mile limit of the New Jersey territorial sea, and elsewhere to the interstate boundaries of the States of New York, and Delaware and the Commonwealth of Pennsylvania, except as provided at (c) below;
3. All lands outside of the CAFRA area extending from the mean high water line of a tidal water body to the first paved public road, railroad, or surveyable property line existing on September 26, 1980, generally parallel to the waterway, provided that the landward boundary of the upland area shall be no less than 100 feet and no more than 500 feet from the mean high water line;
4. All areas containing tidal wetlands; and
5. The Hackensack Meadowlands District as defined by N.J.S.A. 13:17-4.

(c) In accordance with the decree of the United States Supreme Court in *State of New Jersey v. State of Delaware*, 552 *U.S.* 597, 623-24 (2008), the State of New Jersey may, under its laws, grant and thereafter exercise governing authority over ordinary and usual riparian rights for the construction, maintenance, and use of wharves and other riparian improvements appurtenant to the eastern shore of the Delaware River within the 12-mile circle and extending outshore of the mean low water mark. The 12-mile circle is the circle the radius of which is 12 miles, and the center of which is the building used prior to 1881 as the courthouse at New Castle, Delaware, the arcs of which are as set forth in the decree of the United States Supreme Court in *New Jersey v. Delaware,* 295 *U.S.* 694 (1935).

1. The State of Delaware may, under its laws and subject to New Jersey's authority over riparian rights as stated at (c) above, exercise governing authority over the construction, maintenance, and use of those same wharves and other improvements appurtenant to the eastern shore of the Delaware River within the 12-mile circle and extending outshore of the low-water mark, to the extent that they exceed ordinary and usual riparian uses.

(d) This chapter shall apply to all coastal permits.

(e) This chapter shall apply to decisions on the consistency or compatibility of proposed actions by Federal, State, and local agencies within or affecting the coastal zone, including, but not limited to Federal consistency determinations, determinations of consistency or compatibility under the Federal Coastal Zone Management Act, comments on Draft and Final Environmental Impact Statements prepared under the National Environmental Policy Act, 42 U.S.C. §§ 4321 et seq., and comments on other public and private plans, programs, projects, and policies. This chapter shall also apply to decisions on proposed activities that require a water quality certificate. Requests for water quality certificates shall also be reviewed in accordance with all applicable statutes and regulations administered by the Department including the Surface Water Quality Standards, N.J.A.C. 7:9B.

1. An activity requiring a Federal consistency determination may also require a coastal permit. In this instance, the coastal permit is the Federal consistency determination.
2. An activity requiring a water quality certificate may also require a coastal permit. In this instance, the coastal permit will include the water quality certificate.
3. A water quality certificate not issued in conjunction with a coastal permit shall be valid for

five years from the date of issuance or for the duration of the underlying Federal permit (without renewals), whichever period is shorter.

4. A Federal consistency determination or a water quality certificate issued in conjunction with an authorization under a coastal general permit-by-certification or a general permit shall be valid for the duration of that authorization.

5. A Federal consistency determination issued in conjunction with an individual coastal permit shall be valid for the duration of that individual permit.

(f) This chapter shall apply to State aid financial assistance decisions by the Department under the Shore Protection Program and Green Acres Program within the coastal zone, to the extent permissible under existing statutes and regulations.

(g) This chapter shall apply, to the extent statutorily permissible, to Department management actions, including permit decisions, approvals, certifications, conveyances, and compliance activities, in or affecting the coastal zone.

(h) This chapter shall provide the basic policy direction for planning actions undertaken by the Department in the coastal zone as the lead state agency for Coastal Management under Section 306 of the Federal Coastal Zone Management Act.

SUBCHAPTER 9. SPECIAL AREAS

7:7-9.1 Purpose and scope

(a) Special areas are areas that are so naturally valuable, important for human use, hazardous, sensitive to impact, or particular in their planning requirements, as to merit focused attention and special management rules. This subchapter divides special areas into four categories:

1. Special water areas, N.J.A.C. 7:7-9.2 through 9.15, extend landward to the spring high water line or the level of normal flow in non-tidal waters;

2. Special water's edge areas, N.J.A.C.:7-9.16 through 9.30, are divided into three subcategories depending on their location. Special water's edge areas in (a)2i and ii below are found only next to tidal waters, while coastwide special water's edge areas are found adjacent to tidal as well as non-tidal waters;

   i. Oceanfront, and Raritan and Delaware Bayfronts, N.J.A.C. 7:7-9.16 through 9.19;

   ii. Barrier and bay islands, N.J.A.C. 7:7-9.20 and 9.21; and

   iii. Coastwide special water's edge areas, N.J.A.C. 7:7-9.22 through 9.30;

3. Special land areas, N.J.A.C. 7:7-9.31 through 9.33, generally are landward of the special water's edge areas; and

4. Coastwide special areas, N.J.A.C. 7:7-9.34 through 9.47, may include special water areas, special water's edge areas, or special land areas.

(b) All land or water areas, except certain special water's edge areas, are subject to either the general land area rules at N.J.A.C. 7:7-13 or the general water area rules at N.J.A.C. 7:7-12. In addition, certain land or water areas are subject to one or more special area rules. All special water's edge areas are subject to one or more special area rules. In some cases, a portion of a site is subject to both general area rules and special area rules. Where the applicable general area rules and special area rules conflict, the special area rules shall govern.

7:7-9.16 Dunes

(a) A dune is a wind or wave deposited or man-made formation of sand (mound or ridge), that lies generally parallel to, and landward of, the beach and the foot of the most inland dune slope. “Dune” includes the foredune, secondary or tertiary dune ridges and mounds, and all landward dune ridges and mounds, as well as man-made dunes, where they exist

1. Formation of sand immediately adjacent to beaches that are stabilized by retaining structures, and/or snow fences, planted vegetation, and other measures are considered to be dunes regardless of the degree of modification of the dune by wind or wave action or disturbance by development.
2. A small mound of loose, windblown sand found in a street or on a part of a structure as a result of storm activity is not considered to be a "dune."

(b) Development is prohibited on dunes, except for development that has no practicable or feasible alternative in an area other than a dune, and that will not cause significant adverse long-term impacts on the natural functioning of the beach and dune system, either individually or in combination with other existing or proposed structures, land disturbances, or activities. In addition, the removal of vegetation from any dune, and the excavation, bulldozing, or alteration of dunes is prohibited, unless these activities are a component of a Department-approved beach and dune management plan. Examples of acceptable activities are:

1. Demolition and removal of paving and structures;
2. Limited, designated access ways for pedestrian and authorized motor vehicles between public streets and the beach that provide for minimum feasible interference with the beach and dune system and are oriented so as to provide the minimum feasible threat of breaching or overtopping as a result of a storm surge or wave runup (see N.J.A.C. 7:7-10);
3. Limited stairs, walkways, pathways, and boardwalks to permit access across dunes to beaches, in accordance with N.J.A.C. 7:7-10, provided they cause minimum feasible interference with the beach and dune system;
4. The planting of native vegetation to stabilize dunes in accordance with N.J.A.C. 7:7-10;
5. Sand fencing, either a brush type barricade or picket type, to accumulate sand and aid in dune formation in accordance with N.J.A.C. 7:7-10;
6. Shore protection structures which meet the coastal engineering rule at N.J.A.C. 7:7-15.11; and
7. Linear development which meets the rule on location of linear development (N.J.A.C. 7:7-14.1).

(c) The creation of dunes for the purpose of shore protection is strongly encouraged. According to the National Flood Insurance Program (NFIP) Regulations established by the Federal Emergency Management Agency (FEMA), primary frontal dunes will not be considered as effective barriers to base flood storm surges and associated wave action where the cross-sectional area of the primary frontal dune, as measured perpendicular to the shoreline and above the 100-year stillwater flood elevation and seaward of the dune crest, is equal to or less than 1,100 square feet. This standard represents the minimal dune volume to be considered effective in providing protection from the 100-year storm surge and associated wave action, and should represent a "design dune" goal.

(d) The maintenance of an engineered dune to the dune design template through alteration of the dune is conditionally acceptable provided:

1. It is demonstrated through pre- and post- construction surveys overlaid on the dune design template, that:
    i. The existing dune is not consistent with the design template; and
    ii. The proposed alteration of the dune will not result in the reduction of any portion of the dune below the design template;
2. A New Jersey licensed professional engineer certifies that alteration of the dune will not compromise the beach and dune system;
3. The activity:
    i. Is conducted in accordance with the State Aid Agreement between the Department and municipality or county; and
    ii. Complies with the management plan for the protection of State and Federally listed threatened and endangered species, as approved by the Department's Division of Fish and Wildlife and the USFWS;
4. All existing public accessways are maintained;
5. Any existing vegetation disturbed during the maintenance activities shall, at a minimum, be restored in accordance with the dune construction planting specifications in the Federal consistency determination or Department permit for the engineered dune, as applicable; and
6. Any sand transferred as part of the maintenance of the dune design template shall be moved only within the shore protection project and shall be placed within the existing dune system, or within the engineered beach berm in accordance with the beach rule, N.J.A.C. 7:7-9.22(b).

(e) Rationale: Ocean and bayfront dunes are an irreplaceable physical feature of the natural environment possessing outstanding geological, recreational, scenic and protective value. Protection and preservation in a natural state is vital to this and succeeding generations of citizens of the State and the Nation. The dunes are a dynamic migrating natural phenomenon that helps protect lives and property in adjacent landward areas, and buffers barrier islands and barrier beach spits from the effects of major natural coastal hazards such as hurricanes, storms, flooding and erosion. Natural dune systems also help promote wide sandy beaches and provide important habitats for wildlife species.

Extensive destruction of dunes has taken place in this century along much of the coast. This disruption of the natural processes of the beach and dune system has led to severe erosion of some beach areas; jeopardized the safety of existing structures on and behind the remaining dunes and upland of the beaches; increased the need to manage development in shorefront areas no longer protected by dunes; interfered with the sand balance that is so essential for recreational beaches and the coastal resort economy; necessitated increased public expenditures by citizens of the entire State for shore protection structures and programs; and increased the likelihood of major losses of life and property from flooding and storm surges.

The rule encourages the natural functioning of the dune system and encourages restoration of destroyed dunes, to protect and enhance the coastal beach dune areas, and to devote these precious areas to only those limited land uses which preserve, protect and enhance the natural environment of the dynamic dune system.

The Department strongly supports the creation, enhancement and maintenance of coastal sand dunes as cost-effective shore protection. The value of dunes in protecting the densely

developed oceanfront from coastal storm hazards has been well documented by the Department, the Federal Emergency Management Agency, the Army Corps of Engineers, and others. In fact, the New Jersey Hazard Mitigation Plan (Section 406) specifically identifies dune creation and enhancement as a primary storm hazard mitigation strategy.

In addition to the benefits that dunes provide as a natural form of shore protection, dunes often provide important habitat for numerous species of plants and wildlife. Moreover, dunes are important aesthetic resources that complement and promote tourism along the New Jersey shore. With large quantities of sand being placed on New Jersey beaches as part of the State-Federal shore protection program, opportunities to restore beach and dune habitats and associated biodiversity have increased tremendously. Beach nourishment provides the basis for restoration of coastal landforms (beaches and dunes) and biota, and rediscovery of lost environmental heritage. A large variety of species inhabit coastal dune environments, including plants (beachgrass, beach plum, beach pea, goldenrod, bayberry, juniper, cedar, Virginia creeper) and animals (sparrows, warblers, waxwings, kinglets, tanagers, tiger beetles, burrowing spiders, grasshoppers, butterflies).

The natural and aesthetic values of habitat restoration are an important byproduct of the State's beach and dune restoration efforts. Dunes can evolve as natural dynamic landforms that restore an important component of New Jersey's coastal heritage, while providing significant areas of vegetated habitat for coastal biota. The restoration of the natural and beneficial functions of beaches and dunes has become the cornerstone of New Jersey's shore protection program. These benefits are described in Nordstrom and Mauriello (2001), Restoring and Maintaining Naturally Functioning Landforms and Biota on Intensively Developed Barrier Islands under a No-Retreat Scenario. In addition, dune restoration for the purpose of providing wildlife habitat and scenic amenities is consistent with the goals of CAFRA to preserve and enhance the unique environmental and aesthetic resources of the coastal area.

Typically, beach nourishment projects include the construction of dunes for shore protection and/or storm damage reduction purposes. These engineered dunes are designed to a specific height, width, slope, and length, in accordance with a dune design template. In some instances, the engineered dunes may capture sand and grow beyond their design template. In these cases, maintenance of the dune to its design template may be necessary to minimize the effects that an influx of sand can have on infrastructure, access, and public safety. This excess sand can then be utilized along sections of dune or upper beach berm that are below the design template. Engineered dunes are designed to provide storm damage reduction in addition to the beach berm, and are subject to the influx of wind-blown sand from the beach berm as well as erosion from wave and tidal current activity. Engineered dunes may be supplemented during periodic renourishment cycles to replenish lost material to maintain the overall design template. Maintenance activities between renourishment cycles can potentially reduce the volume of material needed when accreted sand is transferred from areas that have expanded above the design template to areas that have experienced increased erosion. However, maintenance of the engineered dune must not reduce any part of the dune to less than the dune design template.

7:7-9.17 Overwash areas

(a) An overwash area is an area subject to accumulation of sediment, usually sand, that is deposited landward of the beach or dune by the rush of water over the crest of the beach berm, a dune, or a structure. An overwash area may, through stabilization and vegetation, become a

dune.

1. The seaward limit of the overwash area is the seaward toe of the former dune, or the landward limit of the beach, in the absence of a dune.
2. The landward limit of the overwash area is the inland limit of sediment transport.
3. Verifiable aerial photography and other appropriate sources may be used to identify the extent of overwash.

(b) Development is prohibited on overwash areas, except for development that has no prudent or feasible alternative in an area other than an overwash area, and that will not cause significant adverse long-term impacts on the natural functioning of the beach and dune system, either individually or in combination with other existing or proposed structures, land disturbances or activities. Examples of acceptable activities are:

1. Creation of dunes or expansion of existing dunes in accordance with N.J.A.C. 7:7-10;
2. Demolition and removal of paving and structures;
3. Limited, designated access ways for pedestrians and authorized motor vehicles between public streets and the beach that provide for the minimum feasible interference with the beach and dune system and are so oriented as to provide the minimum feasible threat of breaching or overtopping as a result of storm surge or wave runup;
4. Shore protection structures which meet the coastal engineering rule at N.J.A.C. 7:7-15.11(g);
5. Linear development which meets the rule on location of linear development (N.J.A.C. 7:7-14.1);
6. Removal of newly deposited overwash fans from public roads and or developed lots; and
7. Construction of street-end beach accessways along the oceanfront, provided they are oriented at an angle against the predominant northeast storm approach, are limited in width to no more than ten feet, and are defined/stabilized with sand fencing. These standards should be included in all beach and dune management plans for oceanfront locations.

(c) A development may be permitted if, by creating a dune with buffer zone or expanding an existing dune landward, the classification of the site is changed so as to significantly diminish the possibility of future overwash. In determining overwash potential, the protective capacity of newly created dunes will be evaluated in terms of the “design dune” goal discussed in N.J.A.C. 7:7-9.16(c).

(d) A single story, beach/tourism oriented commercial development located within a commercial boardwalk area existing on July 19, 1993, is conditionally acceptable provided that it meets the following conditions:

1. The site is located within an area currently used and zoned for beach related commercial use, and is landward of the boardwalk;
2. The height of the building does not exceed 15 feet measured from either the elevation of the existing ground or the boardwalk (depending on the specific site conditions) to the top of a flat roof or the mid-point of a sloped roof;
3. The facility is open to the general public and supports beach/tourism related activities, that is, retail, amusement and food services. Lodging facilities are excluded; and
4. The facility meets all the requirements of the flood hazard area rule, N.J.A.C. 7:7-9.25.

(e) Any development determined to be acceptable at (b) through (d) above shall comply with the requirements for impervious cover and vegetative cover that apply to the site under N.J.A.C. 7:7-13.

(f) Rationale: Overwash areas indicate weakness in natural and man-made shore protection. Hazard has been demonstrated, often with extensive property damage. Overwash areas are, therefore, unsuitable locations for further development, and public funds should not be used to rebuild damaged shore protection structures. However, in certain oceanfront communities where an existing municipal boardwalk (including all adjacent resort-oriented commercial establishments) is already densely developed and is the dominant tourism attraction of the community, low intensity, infill development may be permitted. At these specific locations, the gain in public use and enjoyment of the beach, ocean and boardwalk facilities outweighs the limited additional and loss in property damages. Elsewhere the return of these areas to a natural state and the formation of dunes is desirable.

Overwash is a natural shoreline movement process associated with storm and rising sea level and is one of the processes by which barrier islands migrate inland under natural conditions. In New Jersey, migration caused by overwash is usually prevented due to shore protection structures, the highly developed nature of barrier islands and post-storm clean-up practices.

A development proposed in an overwash area may, by incorporating a "design dune" and buffer area, whose dimensions of which would be determined on a case-by-case basis, migrate the hazard and change the classification of the site so that it is no longer an overwash area.

7:7-9.22 Beaches

(a) Beaches are gently sloping areas of sand or other unconsolidated material, found on all tidal shorelines, including ocean, bay, and river shorelines that extend landward from the mean high water line to either:

1. A man-made feature generally parallel to the ocean, inlet, or bay waters such as a retaining structure, seawall, bulkhead, road or boardwalk, except the sandy areas that extend fully under and landward of an elevated boardwalk are considered beach areas; or
2. The seaward or bayward foot of dunes, whichever is closest to the bay, inlet or ocean waters.

(b) Development is prohibited on beaches, except for development that has no prudent or feasible alternative in an area other than a beach, and that will not cause significant adverse long-term impacts to the natural functioning of the beach and dune system, either individually or in combination with other existing or proposed structures, land disturbances, or activities. Examples of acceptable activities are:

1. Demolition and removal of paving and structures
2. Dune creation and related sand fencing and planting of vegetation for dune stabilization, in accordance with N.J.A.C. 7:7-10;
3. The reconstruction of existing amusement and fishing piers and boardwalks;
4. Temporary recreation structures for public safety such as first aid and lifeguard stations;
5. Shore protection structures which meet the use conditions of N.J.A.C. 7:7-15.11(g);
6. Linear development which meets the rule on location of linear development, N.J.A.C. 7:7-14.1;

7. Beach maintenance activities which do not adversely affect the natural functioning of the beach and dune system, and which do not preclude the development of a stable dune along the back beach area. These activities, which include routine cleaning, debris removal, mechanical sifting, maintenance of access ways, and Department approved dune creation and maintenance activities, must be carried out in accordance with the standards found at N.J.A.C. 7:7-10;
8. Post-storm beach restoration activities involving the placement of clean fill material on beaches, and the mechanical redistribution of sand along the beach profile from the lower to the upper beach. These post-storm activities, which are different than routine beach maintenance activities, must be carried out in accordance with the standards found at N.J.A.C. 7:7-10;
9. The following development in Atlantic City provided it meets the standards of N.J.A.C. 7:7-9.47:
i. Development on or over existing ocean piers;
ii. Pilings necessary to support development proposed on or over existing ocean piers; and
iii. Development on or over the Boardwalk; and
10. The maintenance of an engineered beach to the beach berm design template through the transfer of sand from the upper beach berm to the lower beach berm, from the lower beach berm to the upper beach berm, and/or alongshore provided:
i. It is demonstrated through pre- and post- construction surveys overlaid on the beach berm design template, that:
(1) The existing beach berm is not consistent with the beach berm design template; and
(2) The proposed transfer of sand will not result in the grading any portion of the beach below the beach berm design template;
ii. A New Jersey licensed professional engineer certifies that sand transfer will not compromise the beach system;
iii. The sand transfer:
(1) Is conducted in accordance with the State Aid Agreement between the Department and a municipality or county; and
(2) Complies with the management plan for the protection of State and Federally listed threatened and endangered species, as approved by the Department's Division of Fish and Wildlife and the USFWS;
iv. The sand transfer does not impact any existing dunes, unless the transfer complies with the dune rule, N.J.A.C. 7:7-9.16; and
v. Any sand transferred as part of the maintenance of the beach berm design template shall be moved only within the shore protection project and shall be placed within the existing engineered dune in accordance with N.J.A.C. 7:7-9.16(d).

(c) Public access shall be provided in accordance with the lands and waters subject to public trust rule, N.J.A.C. 7:7-9.48, and the public access rule, N.J.A.C. 7:7-16.9.

(d) Rationale: Undeveloped beaches are vital to the New Jersey resort economy. Unrestricted access for recreational purposes is desirable so that the beaches can be enjoyed by all residents and visitors of the State. Public access will be required for any beaches obtaining

State funds for shore protection purposes. Beaches are subject to coastal storms and erosion from wave action and offshore currents. Public health and safety considerations require that structures be excluded from beaches to prevent or minimize loss of life or property from storms and floods, except for some shore protection structures and linear facilities, such as pipelines, when non-beach locations are not prudent or feasible.

Many of New Jersey's beaches, especially those along the Atlantic Ocean, have been nourished through the State's Shore Protection Program. These engineered beaches are designed to a specific height, width, slope, and length, in accordance with a beach berm design template. Engineered beaches are subject to erosive forces of waves, winds, and tidal currents; in many instances, eroded material is moved and deposited in areas within the project area in such a way that the beach grows beyond the design template and thus the beach no longer conforms to the shore protection project design. For engineered beaches to provide the storm damage reduction and shore protection for which they were designed, the beach berm design template must be maintained throughout the entire project area. Municipalities are encouraged to maintain the project design to the maximum extent feasible between project renourishment cycles. However, maintenance of the engineered beach must not reduce any portion of the beach to less than the beach berm design template.

7:7-9.36 Endangered or threatened wildlife or plant species habitats

(a) Endangered or threatened wildlife or plant species habitats are terrestrial and aquatic (marine, estuarine, or freshwater) areas known to be inhabited on a seasonal or permanent basis by or to be critical at any stage in the life cycle of any wildlife or plant identified as "endangered" or "threatened" species on official Federal or State lists of endangered or threatened species, or under active consideration for State or Federal listing. The definition of endangered or threatened wildlife or plant species habitats includes a sufficient buffer area to ensure continued survival of the population of the species as well as areas that serve an essential role as corridors for movement of endangered or threatened wildlife. Absence of such a buffer area does not preclude an area from being endangered or threatened wildlife or plant species habitat.

1. Areas mapped as endangered or threatened wildlife species habitat on the Department's Landscape Maps of Habitat for Endangered, Threatened and Other Priority Wildlife (known hereafter as Landscape Maps) are subject to the requirements of this section unless excluded in accordance with (c)2 below. Buffer areas, which are part of the endangered or threatened wildlife species habitat, may extend beyond the mapped areas. The Department's Landscape Maps, with a listing of the endangered and threatened species within a specific area, are available from the Department's Division of Fish and Wildlife, Endangered and Nongame Species Program at the Division's web address, https://www.nj.gov/dep/fgw/ensp/landscape/index.htm.
2. Information on the areas mapped as endangered or threatened plant species habitat on the Department's Landscape Maps and the occurrence of endangered or threatened plant species habitat is available from the Department's New Jersey Natural Heritage Program, Office of Natural Lands Management, Natural Heritage Data Request Form at Mail Code 501-04, PO Box 420, Trenton, New Jersey 08625-0420.
3. The required endangered or threatened wildlife or plant species habitat buffer area shall be based upon the home range and habitat requirements of the species and the development's anticipated impacts on the species habitat.

(b) Development of endangered or threatened wildlife or plant species habitat is prohibited unless it can be demonstrated, through an endangered or threatened wildlife or plant species impact assessment as described at N.J.A.C. 7:7-11, that endangered or threatened wildlife or plant species habitat would not directly or through secondary impacts on the relevant site or in the surrounding area be adversely affected.

(c) Applicants for development of sites that contain or abut areas mapped as endangered or threatened wildlife species habitat on the Landscape Maps shall either:

1. Demonstrate compliance with this rule by conducting an endangered or threatened wildlife species impact assessment in accordance with N.J.A.C. 7:7-11.2; or
2. Demonstrate that the proposed site is not endangered or threatened wildlife species habitat and this rule does not apply by conducting an endangered or threatened wildlife species habitat evaluation in accordance with N.J.A.C. 7:7-11.3.

(d) If the Department becomes aware of an occurrence of an endangered or threatened wildlife species on a site that is not mapped as endangered or threatened wildlife species habitat on the Department's Landscape Maps, and the Department determines that the habitat may be suitable for that species, the Department shall notify the applicant and the applicant shall demonstrate compliance with or inapplicability of this rule in accordance with (c) above.

(e) If the Department becomes aware of an occurrence of an endangered or threatened plant species on a site that is not in the Natural Heritage Database, the Department will notify the applicant and the applicant shall demonstrate compliance with this rule in accordance with (b) above.

(f) The Department is responsible for the promulgation of the official Endangered and Threatened Wildlife lists pursuant to the Endangered and Nongame Species Conservation Act, N.J.S.A. 23:2A-1 et seq. These lists include wildlife species that are endangered and threatened in New Jersey as well as wildlife species officially listed as endangered or threatened pursuant to the Endangered Species Act of 1973, 16 U.S.C. §§ 1531 et seq. Because the lists are periodically revised by the Department in accordance with N.J.S.A. 23:2A-1 et seq., the lists are not published as part of this rule. The lists are found at N.J.A.C. 7:25-4.13 and 4.17, the rules adopted pursuant to the Endangered and Nongame Species Conservation Act. To obtain a copy of the most current Endangered and Threatened Wildlife lists, please contact the Department, Division of Fish and Wildlife, Endangered and Nongame Species Program at the Division's web address, https://www.nj.gov/dep/fgw/ensp/landscape/index.htm, or by writing to the Division at Mail Code 501-03, PO Box 420, Trenton, New Jersey 08625-0420.

(g) The Department is responsible for promulgation of the official Endangered Plant Species List pursuant to N.J.S.A. 13:1B-154. The Endangered Plant Species List, N.J.A.C. 7:5C-5.1, includes plant species determined by the Department to be endangered in the State as well as plant species officially listed as endangered or threatened or under active consideration for Federal listing as endangered or threatened. Because the Endangered Plant Species List is periodically revised based on new information documented by the Department, it is not published as part of this rule. To obtain the most current Endangered Plant Species List, please contact the Department,

Division of Parks and Forestry, Office of Natural Land Management, Mail Code 501-04, PO Box 420, Trenton, NJ 08625-0420.

(h) For sites located within the Pinelands National Reserve and the Pinelands Protection Area, the plant species listed in the Pinelands Comprehensive Management Plan (N.J.A.C. 7:50-6.24) are also considered endangered or threatened plant species.

(i) Rationale: Endangered and threatened species are organisms which are facing possible extinction in the State in the immediate future due to loss of suitable habitat, and past overexploitation through human activities or natural causes. Extinction represents a loss of biodiversity, which would adversely affect education, research and the interrelationship of all living creatures within the coastal ecosystem.

7:7-9.37 Critical wildlife habitat

(a) Critical wildlife habitats are specific areas known to serve an essential role in maintaining wildlife, particularly in wintering, breeding, and migrating.

1. Rookeries for colonial nesting birds, such as herons, egrets, ibis, terns, gulls, and skimmers; stopovers for migratory birds, such as the Cape May Point region; and natural corridors for wildlife movement merit a special management approach through designation as a Special Area.
2. Ecotones, or edges between two types of habitats, are a particularly valuable critical wildlife habitat. Many critical wildlife habitats, such as salt marsh water fowl wintering areas, and muskrat habitats, are singled out as water or water's edge areas.
3. Definitions and maps of critical wildlife habitats are currently available only for colonial waterbird habitat in the 1979 Aerial Colony Nesting Waterbird Survey for New Jersey (NJDEP, Division of Fish and Wildlife). Until additional maps are available, sites will be considered on a case-by-case basis by the Division of Fish and Wildlife.

(b) Development that would directly or through secondary impacts on the relevant site or in the surrounding region adversely affect critical wildlife habitats is discouraged, unless:

1. Minimal feasible interference with the habitat can be demonstrated;
2. There is no prudent or feasible alternative location for the development; and
3. The proposal includes appropriate mitigation measures.

(c) The Department will review proposals on a case-by-case basis.

(d) Rationale: The State of New Jersey, as custodian of a particular portion of the national wildlife heritage, has the obligation of stewardship on behalf of the people of the state and nation to perpetuate wildlife species within its borders for the use, education, research, and enjoyment by future generations.

7:7-9.38 Public open space

(a) Public open space constitutes land areas owned or maintained by State, Federal, county and municipal agencies or private groups (such as conservation organizations and homeowner's

associations) and used for or dedicated to conservation of natural resources, public recreation, visual or physical public access or, wildlife protection or management. Public open space also includes, but is not limited to, State Forests, State Parks, and State Fish and Wildlife Management Areas, lands held by the New Jersey Natural Lands Trust (N.J.S.A. 13:1B-15.119 et seq.), lands held by the New Jersey Water Supply Authority (N.J.S.A. 58:1B-1 et seq.) and designated Natural Areas (N.J.S.A. 13:1B-15.12a et seq.) within DEP-owned and managed lands.

(b) New or expanded public or private open space development is encouraged at locations compatible or supportive of adjacent and surrounding land uses.

(c) Development that adversely affects existing public open space is discouraged.

(d) Development within existing public open space is conditionally acceptable, provided that the development is consistent with the character and purpose of public open space, as described by the park master plan when such a plan exists.

(e) Development in Atlantic City is acceptable within existing public open space provided the public open space is a street right-of-way or the Boardwalk and the development meets the standards of N.J.A.C. 7:7-9.47(e) through (j).

(f) Provision of barrier free access to public open space is encouraged.

(g) All new development adjacent to public open space will be required to provide an adequate buffer area and to comply with the buffers and compatibility of uses rule, N.J.A.C. 7:7-16.11. The buffer required will be dependent upon adjacent land uses and potential conflicts between users of public open space and the proposed adjacent land use.

(h) Rationale: As the urbanization of New Jersey continues and leisure time increases, open space will play an increasingly important role in maintaining a desirable living environment for the residents of New Jersey. While the supply of open space has decreased under the growing pressure for development, the State's expanding population will require more public open space to satisfy its needs.

Not only is open space the basic resource for recreation facility development, it also performs other worthwhile functions. Open space can create public spaces in densely settled areas, shape urban growth, provide buffers between incompatible uses, retain contiguous farmland, insure the preservation of wildlife corridors, increase the economic value of adjacent land, and preserve distinct architectural, historic, and geologic sites. In addition, undeveloped and minimally developed open space can positively affect water quality by, for example, absorbing stormwater runoff.

SUBCHAPTER 10. STANDARDS FOR BEACH AND DUNE ACTIVITIES

7:7-10.1 Purpose and scope

(a) This subchapter sets forth the standards applicable to routine beach maintenance, emergency post-storm restoration, dune creation and maintenance, and construction of

boardwalks. These standards are referenced at N.J.A.C. 7:7-9.16, Dunes; N.J.A.C. 7:7-9.17, Overwash areas; N.J.A.C. 7:7-9.19, Erosion hazard areas; N.J.A.C. 7:7-9.22, Beaches; and standards for the general permit for beach and dune maintenance activities, N.J.A.C. 7:7-6.2. The standards in this subchapter are organized as follows:

1. The standards applicable to routine beach maintenance, including debris removal and clean-up; mechanical sifting and raking; maintenance of access ways; removal of sand from street ends, boardwalk promenades and residential properties; repairs or reconstruction of existing gazebos and dune walkover structures; and limited sand transfers from the lower beach to the upper beach or alongshore, are found at N.J.A.C. 7:7-10.2;
2. The standards that apply to the restoration of all beaches that are impacted by coastal storms with a recurrence interval to or exceeding a five-year storm event are found at N.J.A.C. 7:7-10.3;
3. The standards for dune creation and maintenance, including the placement and/or repair of sand fencing, the planting and fertilization of appropriate dune vegetation, the maintenance and clearing of beach access pathways less than eight feet in width, and the construction or repair of approved dune walkover structures are found at N.J.A.C. 7:7-10.4; and
4. The standards for construction of boardwalks along tidal shorelines are found at N.J.A.C. 7:7-10.5.

(b) Beach and dune maintenance activities subject to this subchapter shall comply with any applicable management plan for protection of State and Federally listed threatened and endangered species, as approved by the Department and the USFW

7:7-10.2 Standards applicable to routine beach maintenance

(a) Routine beach maintenance includes debris removal and clean-up; mechanical sifting and raking; maintenance of accessways; removal of sand accumulated beneath a boardwalk; removal of sand from street ends, boardwalks/promenades, and residential properties; the repair or reconstruction of existing boardwalks, gazebos, and dune walkover structures; and limited sand transfers from the lower beach to the upper beach or alongshore (shore parallel). Sand transfers from the lower beach profile to the upper beach profile are specifically designed to restore berm width and elevation, to establish/enhance dunes, and to repair dune scarps. Activities which preclude the development of a stable dune along the back beach are not considered to be routine beach maintenance activities, pursuant to this section. Specifically, the bulldozing of sand from the upper beach (berm) to the lower beach (beach face), for the purpose of increasing the berm width or flattening the beach profile, is not considered to be routine maintenance, except as provided at (a)9 below.

1. All routine beach maintenance activities shall be conducted in a manner that does not destroy, jeopardize, or adversely modify endangered or threatened wildlife or plant species habitat; and shall not jeopardize the continued existence of any local population of an endangered or threatened wildlife or plant species.
2. If the activities in (a) above are proposed to be conducted by a municipal or county agency on property owned by that governing body, then the municipal or county engineer must certify that the activities will be conducted in accordance with these standards. The appropriate municipal or county engineer is responsible for ensuring compliance with these requirements. If these activities are proposed to be conducted on privately owned property,

then the property owner is responsible for ensuring that the activities will be conducted in accordance with these standards. If these activities are proposed to be conducted on State owned properties, then the DEP, Bureau of Construction and Engineering must certify that the activities will be conducted in accordance with these standards.

3. All guidelines and specifications of this section must be incorporated into any contract documents or work orders related to proposed beach and dune activities, as described in this section. The Division of Land Use Regulation is available to assist in the development of specific maintenance plans for oceanfront locations, upon request.

4. In areas documented by the Department as habitat for threatened or endangered beach nesting shorebirds such as Piping Plovers (*Charadrius melodus*), Least Terns (*Sternula antillarum*), and Black Skimmers (*Rynchops niger*), no beach raking, other mechanical manipulation of the beach, or use of non-emergency vehicles, shall take place between March 15 and August 31.

i. The Department's Division of Fish and Wildlife shall develop a list of specific areas where this restriction shall apply, based on documented habitat during the most recent nesting seasons. The list of restricted areas shall be updated annually by the Division of Fish and Wildlife, at the end of each nesting season and will be available from the Division of Land Use Regulation at the address set forth at N.J.A.C. 7:7-1.6. The updated list shall be provided by the Department to each permittee prior to March 1 of each year.

ii. If a particular beach area is identified on the updated list as described in (a)4i above as habitat for threatened or endangered beach nesting shorebirds, regardless of the habitat classification of the previous nesting season, no beach raking, other mechanical manipulation of the beach, or the use of non-emergency vehicles shall take place between March 15 and August 31 in those areas.

iii. If a particular beach area is not identified on the updated list as described in (a)4i above, but is subsequently found to contain a nest or unflighted chick of a threatened or endangered beach nesting shorebird, the Department shall notify the permittee and no beach raking other mechanical manipulation of the beach, or use of non-emergency vehicles shall take place between March 15 and August 31 in those areas.

iv. The restrictions contained in (a)4 above may be waived if the Department's Division of Fish and Wildlife determines that the identified areas do not represent suitable threatened or endangered beach nesting shorebird habitat, due to beach erosion or other causes. Requests for such a waiver shall be made in writing to the Division of Land Use Regulation at the address set forth at N.J.A.C. 7:7-1.6.

5. In areas documented by the Department as supporting known occurrences of Federally listed endangered or threatened plant species such as seabeach amaranth (*Amaranthus pumilus*), or known occurrences of State listed endangered plant species, such as sea-beach knotweed (*Polygonum glaucum*), no beach raking, other mechanical manipulation of the beach, or use of non-emergency vehicles, shall take place between May 15 and November 30.

i. The Department, in cooperation with the USFWS, shall develop a list of present and documented habitat areas where this restriction shall apply based on occurrence locations during the previous seasons. The list of restricted areas shall be updated annually and will be available from the Division of Land Use Regulation at the address set forth at N.J.A.C. 7:7-1.6. The updated list shall be provided by the Department to each permittee prior to May 1 of each year.

ii. If a particular beach area is not identified on the updated list as described (a)5 above, but is subsequently found to contain an occurrence of a Federally listed endangered or threatened plant species, or a State listed endangered plant species, the Department shall notify the permittee and no beach raking, other mechanical manipulation of the beach, or use of non-emergency vehicles, shall take place between May 15 and November 30 in those areas.

iii. The restrictions contained in (a)5 above may be waived if the Department determines that the identified areas do not support occurrences of Federally listed endangered or threatened plant species, or occurrences of State listed endangered plant species. Requests for such a waiver shall be made in writing to the Division of Land Use Regulation at the address set forth at N.J.A.C. 7:7-1.6.

6. Mechanical sifting and beach raking shall be limited to recreational beach areas only. For the purposes of this subsection, "recreational beach area" means all areas within 100 yards of a staffed lifeguard stand.

7. The excavation of sand accumulated beneath a boardwalk is conditionally acceptable provided:

i. The elevation of the area after the excavation is completed is not lower than either the upper beach berm design template for an engineered beach, or, for a non-engineered beach, the elevation of the existing beach berm;

ii. The excavated sand is relocated to the seaward toe of the existing dune, if present, or on the upper beach berm;

iii. Where breaching of an existing dune is necessary to allow for sand excavation, the following apply:

(1) The area of the dune breached shall be minimized; and

(2) The dune shall be restored to pre-existing conditions immediately upon excavation of the sand;

iv. Where sand is removed from the landward dune slope, the slope must be:

(1) Restored to the preexisting conditions and in no case be steeper than three horizontal to one vertical; and

(2) Revegetated in accordance with N.J.A.C. 7:7-10.4(b) and (c).

8. Any sand excavated from boardwalks, street ends, and single family lots shall be placed on the seaward toe of the existing dune, if present, or on the upper beach berm.

9. Placement of temporary sand fencing during the winter months, which results in the accumulation of sand that is later redistributed on the beach berm, is conditionally acceptable, provided:

i. The sand fencing is:

(1) Placed a minimum of 15 feet waterward of the seaward toe of any existing dune or, if no dune is present, from the waterward side of any structure;

(2) Installed no earlier than October 15 and removed prior to the Memorial Day weekend, unless threatened and endangered species timing restrictions apply;

(3) Installed in a manner that does not prevent public access along the tidal water and does not restrict public access to the beach from existing public access points; and

ii. The accumulated sand that is redistributed:

(1) Is placed on the beach;

(2) Does not result in the grading of the beach below the beach berm design template for an engineered beach or, for a non-engineered beach, below the elevation of the beach berm elevation existing prior to the redistribution; and
(3) Where feasible, does not result in the grading of the beach face to a slope steeper than 10 horizontal to one vertical.

(b) Projects involving the transfer of sand from the lower beach profile to the upper beach profile, or alongshore, are acceptable, in accordance with the following standards:

1. All sand transfer activities shall be conducted in a manner that does not destroy, jeopardize, or adversely modify endangered or threatened wildlife or plant species habitat; and shall not jeopardize the continued existence of any local population of an endangered or threatened wildlife or plant species.
2. The amount of sand transferred at any one time shall be limited to one foot scraping depth at the borrow zone. This borrow zone may not be rescraped until the sand volume from the previous scraping activities has been fully restored.
3. The borrow zone shall be limited to the area between the low water line and the inland limit of the berm. It is strongly recommended that a program of beach profiling be utilized to monitor the condition of the beaches and to ensure compliance with the standards of this section.
4. If the purpose of the sand transfers is to repair eroded dunes (dune scarps), all filled areas shall be stabilized with sand fencing and planted with beach grass in accordance with Department or Soil Conservation Service standards. Fencing shall be in place within 30 calendar days of the transfer operation, while the vegetative plantings may be installed during the appropriate seasonal planting period (October 15 through March 31, anytime the sand is not frozen).
5. There shall be no disturbance to existing dune areas.
6. In areas of documented habitat for threatened or endangered beach nesting shorebirds such as Piping Plovers (*Charadrius melodus*), Least Terns (Sternula antillarum), and Black Skimmers (*Rynchops niger*), no sand transfers shall take place between March 15 and August 31.
    i. The Department's Division of Fish and Wildlife shall develop a list of specific areas where this restriction shall apply, based on documented habitat during the most recent nesting seasons. The list of restricted areas shall be updated annually by the Division of Fish and Wildlife, at the end of each nesting season and will be available from the Division of Land Use Regulation at the address set forth at N.J.A.C. 7:7-1.6. The updated list shall be provided by the Department to each permittee prior to March 1 of each year.
    ii. If a particular beach area is identified on the updated list as described in (b)6i above as habitat for threatened or endangered beach nesting shorebirds, regardless of the habitat classification of the previous nesting season, no sand transfers shall take place between March 15 and August 31 in those areas.
    iii. If a particular beach area is not identified on the updated list as described in (b)6i above, but is subsequently found to contain a nest or unflighted chick of a threatened or endangered beach nesting shorebird, the Department shall notify the permittee and no sand transfers shall take place between March 15 and August 31 in those areas.
    iv. The restrictions contained in (b)6 above may be waived if the Department's Division of Fish and Wildlife determines that the identified areas do not represent suitable

threatened or endangered beach nesting shorebird habitat due to beach erosion or other causes. Requests for such a waiver shall be made in writing to the Division of Land Use Regulation at the address set forth at N.J.A.C. 7:7-1.6.

7. In areas documented by the Department as supporting known occurrences of Federally-listed endangered or threatened plant species, or known occurrences of State-listed endangered
plant species, no sand transfers shall take place between May 15 and November 30.

i. The Department, in cooperation with the USFWS, shall develop a list of present and documented habitat areas where this restriction shall apply, based on occurrence locations during the previous seasons. The list of restricted areas shall be updated annually and will be available from the Department's Division of Land Use Regulation at the address set forth at N.J.A.C. 7:7-1.6. The updated list shall be provided by the Department to each permittee prior to May 1 of each year.

ii. If a particular beach area is not identified on the updated list as described at (b)7i above but is subsequently found to contain an occurrence of a Federally listed endangered or threatened plant species, or an occurrence of a State listed endangered plant species, the Department shall notify the permittee and no sand transfer on the beach shall take place between May 15 and November 30 in those areas.

iii. The restrictions contained in (b)7 above may be waived if the Department determines that the identified areas do not support occurrences of a Federally listed endangered or threatened plant species, or occurrences of State listed endangered plant species. Requests for such a waiver shall be made in writing to the Division of Land Use Regulation at the address set forth at N.J.A.C. 7:7-1.6.

8. Sand transfers to or from wetland areas that may exist on a beach are not authorized by this permit.

9. Records of all sand transfer activities shall be maintained by the property owner, beach association, governmental agency or other authority conducting the activities, and shall be available for inspection by the Department, upon request. These records shall include, but not be limited to, dates of transfer, borrow area limits, fill area limits, estimates of the amount of sand transferred, the name of the person(s) supervising the transfer activities, and the engineering certification required (if appropriate) for all sand transfer activities.

7:7-10.3 Standards applicable to emergency post-storm beach restoration

(a) This section on emergency post-storm beach restoration will apply to all beaches which are impacted by coastal storms with a recurrence interval equal to or exceeding a five-year storm event. Emergency post-storm beach restoration projects not specifically identified in this section may be authorized by the Department through an emergency authorization pursuant to N.J.A.C. 7:7-21 if the Department determines that there is an imminent threat to lives or property.

(b) Beach restoration activities, as part of an emergency post-storm recovery, include: the placement of clean fill material with grain size compatible with (or larger than) the existing beach material; the bulldozing of sand from the lower beach profile to the upper beach profile; the alongshore transfer of sand on a beach; the placement of concrete, rubble or rock; and the placement of sand filled geotextile bags or tubes.

(c) The emergency post-storm beach restoration activities in (b) above should be designed and implemented as a means to restore the beaches to the pre-storm condition, or to restore the beaches to a level sufficient to provide protection from a storm event with a minimum recurrence interval of five years (five-year storm protection). For the purpose of this section, five-year storm protection equates to a minimum 30-foot wide berm at elevation +8 Mean Sea Level (NAD, 1983). Restoration beyond the pre-storm beach condition is encouraged by the Department, but will not be considered "emergency post-storm beach restoration," pursuant to this section.

(d) The bulldozing of sand from the lower beach profile to the upper beach profile, as part of an emergency post-storm beach restoration plan, is acceptable, in accordance with the following standards:

1. Bulldozing is limited to the beach area landward of the low water line. Removal of material from below the low water line is considered dredging, and is not authorized pursuant to this section; and
2. The beach face cannot be graded to a slope steeper than one vertical to three horizontal.

(e) The alongshore transfer of sand from one beach area to another, as part of an emergency post-storm beach restoration plan, is acceptable, in accordance with the following standards:

1. No disturbance to existing dune areas is permitted;
2. Sand borrow areas shall not be bulldozed to a depth which exceeds one foot;
3. The borrow areas may not be rescraped until full sand volume recovery has occurred; and
4. An adequate supply of sand is available at the borrow area site, so that the relocation of this material will not decrease the level of protection adjacent to the borrow area.

(f) The placement of sand filled geotextile bags or geotubes, as part of an emergency post-storm beach restoration plan, is acceptable, in accordance with the following standards:

1. In areas where dunes are present, the geotextile bags or geotubes shall be placed along the toe of any scarped dune, or seaward of the dune toe, and not on the dune itself;
2. In areas where dunes are not present, the geotextile bags or geotubes shall be placed at the landward limit of the beach and in no case be placed below the mean high water line;
3. The geotextile bags or geotubes shall be tapered at the end of the project area, to minimize the impact to adjacent areas which are not protected by the geotextile bags or geotubes;
4. The crest and seaward side of the geotubes shall be buried to achieve a gradual, uniform slope from the upper beach to the crest of the geotextile bag or geotube;
5. The length of shoreline along which the geotextile bags or geotubes are installed shall not exceed a cumulative length of 500 feet;
6. Fill material for the geotextile bags or geotubes shall be from an upland source excluding the beach and dune or from suitable dredged material;
7. The geotextile bag or geotube shall be installed parallel to the shoreline; and
8. The geotextile bag or geotube shall be installed with the manufacturer's recommended scour apron.

(g) The placement of sand, gravel, rubble, concrete, rock or other inert material, as part of an emergency post-storm beach restoration plan, is acceptable, in accordance with the following standards:

1. All material shall be non-toxic sand, gravel, concrete, rubble, rock, or other inert material;

2. The placement of concrete, rubble, or rock shall be temporary in nature, and is not to be used as permanent protection, unless it is part of a Department-approved, engineered design for permanent shore protection;
3. All concrete, rubble, or rock placed on the beach shall be removed within 90 calendar days, unless an application is filed within 90 calendar days of the placement of the material for Department approval of an engineered design for permanent shore protection. If a permit application is filed within this period, the material may remain on the beach until a determination is made on the application; and
4. The use of automobiles, tires, wood debris, asphalt, appliances or other solid waste is prohibited.

7:7-10.4 Standards applicable to dune creation and maintenance

(a) Dune creation and maintenance includes the placement and/or repair of sand fencing (including wooden support posts), the planting and fertilization of appropriate dune vegetation, the maintenance and clearing of beach access pathways less than eight feet in width, and the construction or repair of approved dune walkover structures. Bulldozing, excavation, grading, vegetation removal or clearing, and relocation of existing dunes are not authorized pursuant to this section.

(b) All dune creation and maintenance activities should be conducted in accordance with the specifications found in Guidelines and Recommendations for Coastal Dune Restoration and Creation Projects (DEP, 1985), and/or Restoration of Sand Dunes Along the Mid-Atlantic Coast (Soil Conservation Service, 1992). The Department will provide site specific technical assistance for dune creation and maintenance projects, upon request.

(c) All proposed dune vegetation shall be native to New Jersey and should be limited to the following coastal species, to the maximum extent practicable: American Beachgrass (*Ammophila breviligulata*), Coastal Panicgrass (*Panicum amarulum*), Bayberry (*Myrica pensylvanica*), Beach Plum (*Prunus maritima*), Seaside Goldenrod (*Solidago sempervirens*), Beach Pea (*Lathyrus japonicus*), Bitter Panicgrass (*Panicum amarum*), Switchgrass (*Panicum virgatum*), Partridge Pea (*Chamaecrista fasiculata*), Eastern red cedar (*Juniperus virginiana*), Groundsel tree (*Baccharis halimifolia*), and Saltmeadow cordgrass (*Spartina patens*).

1. American beachgrass is the preferred species for the stabilization of newly established dunes, and for stabilization of the primary frontal dune. Woody plant species are suitable for back dune and secondary dune environments. Herbaceous plant species are preferred as supplemental plantings for all dune areas.
2. Dune vegetation should be diversified to the maximum extent practicable, in an effort to provide continuous stabilization in the event that pathogens reduce or eliminate the effectiveness of one species. A complex of associated grasses, herbaceous species and woody species is preferred to the planting of one species.
3. A landscape plan is required as part of any dune creation activity. The landscape plan shall depict the proposed vegetative community on the dune and include:
    i. Species and quantity to be planted;
    ii. Spacing of all plantings;
    iii. Stock type (plugs, potted, seed); and

iv. Source of the plant material.

(d) The construction of elevated timber dune walkover structures shall be in accordance with the standards and specifications (or similar specifications) described in Beach Dune Walkover Structures (Florida Sea Grant, 1981). The construction of elevated dune walkover structures, particularly at municipal street-ends and other heavily used beach access points is preferred to the construction of pathways or walkways through the dunes.

1. Copies of the DEP and Florida Sea Grant reports are available from the Department at the address set forth at N.J.A.C. 7:7-1.6.

(e) The construction of at-grade dune walkovers is acceptable only at single family and duplex residential dwellings, subject to the following conditions:

1. Only one walkover per residential building is allowed;
2. The width of the walkover must not exceed four feet;
3. The walkover shall be fenced on both sides through the use of sand fencing;
4. The use of unrolled sand fencing as a base for the walkover is preferred to the use of planks and boards. Sand fence based walkovers allow for easier seasonal removal and placement, and allow for greater growth of beachgrass, while still providing an adequate base for pedestrian traffic; and
5. Solid boardwalk type walkovers shall be elevated at least one foot above the dune, to allow for movement of sand and vegetative growth under the boardwalk structure.

(f) The controlled use of discarded natural Christmas trees for the purpose of dune stabilization is generally discouraged, but may be acceptable, in accordance with the standards set forth below. Discarded Christmas trees serve the same function as sand fencing, by trapping wind-blown sand and facilitating sand deposition and dune formation. However, uncontrolled or inappropriate placement of trees will hinder the development of dunes and may present a fire hazard.

1. Only natural, coniferous trees are suitable for use in dune stabilization. The use of tree limbs, clippings, artificial trees, and other dead vegetation is prohibited;
2. Trees should be placed at least 100 feet landward of the high water line, in areas which are generally not subject to spring tidal inundation and wave swash action;
3. The placement of trees should be oriented against the prevailing winds, in either a straight line or zig-zag formation;
4. The trees should be installed by overlapping the stump end of one tree with the pointed end of another, and then anchoring the connection point with a sufficient amount of sand to hold the trees in place;
5. Newly placed trees should be monitored to ensure that the trees remain anchored and do not become dislodged. Additional quantities of sand or wooden anchor stakes may be used to hold the trees in place until they become stabilized; and
6. All newly deposited sand should be stabilized through the planting of beachgrass, during the appropriate planting season.

7:7-10.5 Standards applicable to the construction of boardwalks

(a) The construction of oceanfront or bayfront boardwalks should address a number of

engineering concerns related to structural support, resistance to vertical and horizontal water and wind loads, and scouring. The construction of boardwalks along tidal shoreline is acceptable, in accordance with the following standards:

1. All timber support piles shall be a minimum of eight inches in diameter;
2. Support piles should be driven to a depth of at least 10 feet (mean sea level), for all V zone locations. In A zones, the depth of penetration should be at least five feet (mean sea level);
3. The method for insertion of piles should be a pile driver or drop hammer;
4. All support joists and timber connections should be anchored through the use of hurricane clips or metal plates; and
5. All metal fasteners, including but not limited to bolts, screws, plates, clips, anchors and connectors, shall be hot dipped galvanized.

SUBCHAPTER 11. 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

7:7-11.1 Purpose and scope

(a) This subchapter sets forth the standards for conducting an endangered or threatened wildlife or plant species habitat impact assessment and for conducting an endangered or threatened wildlife species habitat evaluation. One or both must be employed by an applicant seeking to demonstrate compliance with or inapplicability of N.J.A.C. 7:7-9.36 when the site contains or abuts areas mapped as endangered or threatened wildlife species habitat on the Landscape Maps. This subchapter also sets forth the standards for reporting the results of an endangered or threatened wildlife or plant species habitat impact assessment and an endangered or threatened wildlife species habitat evaluation.

(b) An endangered or threatened wildlife or plant species habitat impact assessment is required to demonstrate that endangered or threatened wildlife or plant species habitat as defined at N.J.A.C. 7:7-9.36(a) would not, directly or through secondary impacts on the relevant site or in the surrounding area, be adversely affected by the proposed development. The standards for conducting an impact assessment pursuant to N.J.A.C. 7:7-9.36(b), (d), and (e) are found at N.J.A.C. 7:7-11.2.

(c) Pursuant to N.J.A.C. 7:7-9.36(c), an endangered or threatened wildlife species habitat evaluation is required to demonstrate that a site does not contain suitable endangered or threatened wildlife or plant species habitat, as defined at N.J.A.C. 7:7-9.36(a). The standards for conducting an evaluation are found at N.J.A.C. 7:7-11.3.

(d) The reporting requirements for habitat evaluations and impact assessments are found at N.J.A.C.7:7-11.4.

7:7-11.2 Standards for conducting endangered or threatened wildlife or plant species habitat impact assessment

(a) Applicants who choose not to dispute the Department designation of the site as endangered or threatened wildlife species habitat shall demonstrate compliance with N.J.A.C. 7:7-9.36(b) by providing information required at this section and N.J.A.C. 7:7-11.4. The required information shall demonstrate that the proposed development will not negatively affect the population(s) or habitat of endangered or threatened wildlife species that resulted in identification of the site, or an area abutting the site, as endangered or threatened wildlife species habitat in accordance with N.J.A.C. 7:7-9.36(a) and/or (d).

(b) If an endangered or threatened plant species has been documented to be on the site or a portion of the site or an area abutting the site, applicants shall demonstrate compliance with N.J.A.C. 7:7-9.36(b) by providing information required at this section and N.J.A.C. 7:7-11.4. The required information shall demonstrate that the proposed development will not negatively affect the population(s) or habitat of endangered or threatened plant species documented to be on the site or a portion of the site or on an area abutting the site.

(c) Impact assessments shall be conducted for each endangered or threatened wildlife or plant species described in (a) and/or (b) above. The impact assessment shall consider the likely affects of the proposed development on the local populations of the particular species on or abutting the site. The impacts shall be assessed using accepted ecological principles and scientific literature on each species and both direct and indirect impacts of the proposed development shall be considered. This assessment shall be based on habitat requirements and life history of each species, and the manner in which the proposed development may alter habitat, including, but not limited to, vegetation, soils, substrate, bathymetry, salinity, hydrology, wildlife movement corridors, human disturbance, and effects on competitor, parasite, or predator species.

7:7-11.3 Standards for conducting endangered or threatened wildlife species habitat evaluation

(a) Applicants who dispute the Department designation of the site as endangered or threatened wildlife species habitat, or dispute the boundary of that habitat shall provide information that demonstrates that the habitat is not suitable for each of the endangered or threatened wildlife species that resulted in identification of the site, a portion of the site, or an area abutting the site, as endangered or threatened wildlife species habitat in accordance with N.J.A.C. 7:7-9.36(a) and/or (d).

(b) Habitat evaluations for endangered or threatened wildlife species pursuant to N.J.A.C. 7:7-9.36(c) shall be conducted for each wildlife species described in (a) above. This habitat evaluation shall:

1. Use scientific methodology appropriate for each species or species group;

2. Examine specific attributes and characteristics of the site that limit or eliminate its suitability as habitat, including, but not limited to, an examination of vegetative cover, soils, hydrology, existing land use and any other factors that are used to determine suitability of a site for the species. The site's vegetative analysis shall include an on-site investigation and evaluation; and
3. Include an examination of the area surrounding the site using aerial photographs and/or appropriate cover maps.

(c) A survey for the endangered or threatened wildlife species that resulted in identification of the site, a portion of the site, or an area abutting the site, as endangered or threatened wildlife species habitat in accordance with N.J.A.C. 7:7-9.36(a) and/or (d), will only be considered in the context of supplementing information on habitat suitability. If such a survey is conducted, it shall be conducted consistent with techniques established in the scientific literature.

7:7-11.4 Standards for reporting the results of impact assessments and habitat evaluations

(a) All habitat evaluations and impact assessments submitted to the Department shall include:
1. An introduction describing the goals of the habitat evaluation and/or impact assessment;
2. A copy of the USGS quad map(s) showing the location of the site, with the State plane coordinates of the site. The accuracy of these coordinates shall be within 50 feet of the actual center point of the site. For linear sites, 2,000 feet in length and longer, additional coordinates shall be provided at each 1,000 foot interval;
3. The lot, block, municipality and county in which the site is located;
4. For wildlife habitat evaluations and impacts assessments only, a map identifying the site, and the areas mapped as endangered or threatened wildlife species habitat on the Landscape Maps onsite and abutting the site, along with a list of the endangered or threatened species that resulted in the mapping of endangered or threatened species habitat;
5. For impact assessments for plant species only, a map identifying the location of the species habitat on the site or abutting the site along with a list of the potential plant species from the Department's Natural Heritage Database;
6. A description of the habitat requirements for each of these species identified at (a)4 and/or 5 above, including appropriate literature citations; and
7. The names and qualifications of all investigators who performed habitat evaluations, species surveys, and/or impact assessments.

(b) Wildlife habitat evaluations shall include a narrative with supporting documentation, including maps, photographs, and field logs, which contains the following:
1. A description, for each species, of the findings of the habitat evaluation performed in accordance with N.J.A.C. 7:7-11.3;
2. If a survey was conducted in accordance with N.J.A.C. 7:7-11.3(c), literature citations for the methodology used and a description of how the methodology was applied to the survey, giving the following information: surveyor’s name(s), dates and times surveys were

performed, number of samples, and number of replications. This information shall be provided for each species surveyed; and

3. A comparison of the findings of the habitat evaluation with the known habitat requirements for each species, as provided at (a)6 above, and a description of the specific attributes and characteristics of the site that limit or eliminate the site's suitability as habitat.

(c) Impact assessments shall include a narrative with supporting documentation, such as maps and photographs, which contains the following:

1. A description for each species, of how the proposed development will alter habitat, including vegetation, soils, hydrology, human disturbance, and effects on competitor, parasite, or predator species. The impact assessment shall describe the likely affects of the proposed development on the local populations of the particular species on or abutting the site and why the development would not directly or through secondary impacts adversely affect each endangered or threatened species habitat; and

2. Literature citations used to reach the conclusions in (c)1 above.

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 melodus*) 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 melodus*) 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 exclosures 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 15t) 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 permitees 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).*

APPENDIX E

Addendum Regarding Timing of Management to Protect Unfledged Chicks

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: ADDENDUM REGARDING TIMING OF MANAGEMENT TO PROTECT UNFLEDGED CHICKS

Northeast Region, U.S. Fish and Wildlife Service

March 9, 2015

The purpose of this addendum is to provide recent information regarding the phenology of Atlantic Coast piping plovers that may have management implications for 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). The guidelines are advisory, and failure to implement them does not, of itself, constitute a violation of the law. Rather, they represent the U.S. Fish and Wildlife 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.

Addendum

1. The 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 (Guidelines) state that "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." This language is now amended as follows:

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 management, plover chicks are considered fledged when observed in sustained flight for at least 15 meters, irrespective of age. In most cases, piping plovers attain flight capability by 35 days of age, but longer pre-fledge periods may occur* (italics denotes new wording).

We note that it is unnecessary and potentially counter-productive to repeatedly attempt to "flight test" piping plover chicks by trying to flush them. Fledglings will readily demonstrate flight capability as soon as their primary feathers become sufficiently developed.

2. The Guidelines also state that, when plover nests are found after the last egg has been laid (making it impossible to predict hatch date), sites without intensive monitoring should begin restrictions on nonessential vehicles on May 15. This language is now amended as follows:

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 10* (the earliest probable hatch date). If the nest is discovered after *May 10*, then restrictions should start immediately (italics denotes new wording).

Discussion

The dates and intervals associated with piping plover breeding cycle stages in the 1994 Guidelines were formulated following an extensive review of the large volume of available breeding records. They were intended to furnish reliable advice to land managers seeking to avoid violations of the Endangered Species Act without causing unnecessary restrictions on beach recreation. Review of monitoring reports routinely includes dates of piping plover arrival, nest initiation, hatching, and fledging. As of 2010, the U.S. Fish and Wildlife Service (Service) was unaware of deviations in breeding phenology with implications for management.

Since 2011, however, the Service has received occasional reports of unusually delayed fledging periods, early hatch dates, and other phenological "anomalies." Piping plovers older than 35 days that are incapable of flight have now been reported from several widely distributed sites in Massachusetts, New York, and Maryland. A few hatch dates prior to May 15 have been reported from New Jersey, Virginia, and North Carolina; given the overall synchrony of piping plover chronology across the U.S. Atlantic breeding range, we cannot rule out the potential for early hatching anywhere from Maine to North Carolina. The Service has solicited information about potential contributing factors (e.g., evidence that prey is limited, harsh weather, unusual disturbance), but rare events are inherently difficult to interpret. To the best of our knowledge, these situations remain rare, but we continue to request reports of such instances and any potential causal factors. At this time, the Service is furnishing this information to help managers provide reliable expectations to the beach-going public.

APPENDIX F

Effects of Sand Fences and Planting of Vegetation on Piping Plover Breeding Habitat and Recommendations to Avoid or Minimize Habitat Degradation

Effects of Sand Fences and Planting of Vegetation on Piping Plover Breeding Habitat and Recommendations to Avoid or Minimize Habitat Degradation

The Atlantic Coast Piping Plover Recovery Plan (USFWS 1996) includes Task 1.23:

> **Discourage beach stabilization projects including snowfencing and planting of vegetation at current or potential plover breeding sites.** Snowfencing and plantings of American beach grass (*Ammophila breviligulata*), sea oats (*Uniola paniculata*), and other vegetation accelerate the processes that degrade habitat and should be avoided. Installation of snowfences and "planting" of discarded Christmas trees in blowouts, overwashes, or elsewhere on the beach should also be avoided. To the extent possible, the natural processes of overwash and blowouts that perpetuate characteristics of preferred habitat should be allowed to continue unimpeded.

Various consultations (e.g., USFWS 1995, 1997) for piping plovers have incorporated explicit conservation measures to avoid adverse effects by proscribing use of snowfences (referred to as "sand fences" in many documents and hereafter in this document) and planting of vegetation in current and potential piping plover habitat. Here, we (1) update and summarize literature on relevant aspects of piping plover habitat requirements, (2) summarize literature on the effects of sand fences and vegetation planting on barrier beach topography and vegetative cover, (3) discuss effects of sand fencing and vegetation plantings on piping plover habitat, (4) provide recommendations to avoid adverse effects of sand fencing and vegetation planting on piping plover habitat, and (5) provide recommendations to reduce and mitigate those effects where they cannot be avoided.

1. Piping Plover Habitat Requirements

Piping plover nests are situated above the high tide line on coastal beaches, sandflats at the ends of sandspits and barrier islands, gently sloping foredunes, blowout[1] areas behind primary dunes, and washover[2] areas cut into or between dunes. They may also nest on areas where suitable dredge material has been deposited at a low slope and elevation. Nests are usually found in areas with little or no vegetation although, on occasion, piping plovers will nest under stands of

[1] Blowouts are distinctive "bowl-like" areas within the interdune area caused by wind erosion behind the primary dune ridge; the ocean view is often obstructed.

[2] Washover areas are created by the flow of water through the primary dune line with deposition of sand on the barrier flats, marsh, or into the lagoon, depending on the storm magnitude and the width of the beach (Leatherman 1979). Nests may be situated on portions of these storm-created areas that are relatively dry during the nesting season, while plovers may feed on any portions that stay moist.

American beachgrass (*Ammophila breviligulata*) or other vegetation (Patterson 1988, Flemming et al. 1992, MacIvor 1990). Feeding areas include intertidal portions of ocean beaches, washover areas, mudflats, sandflats, wrack lines[3], and shorelines of coastal ponds, lagoons, or salt marshes (USFWS 1996). A large body of evidence reinforces the importance of wide, flat, sparsely-vegetated barrier beach habitats for recovery of Atlantic Coast piping plovers.

At Cape Cod National Seashore in Massachusetts, Jones (1997) found that significantly more nests were on beaches with access to bayside feeding habitats compared with random points. However, almost two-thirds of Jones's nests occurred on beaches without chick access to bayside foraging; nest success was significantly greater on beaches without bayside access, while fledging success did not differ significantly. Two logistic regression models indicated that sparse vegetation and distance from pedestrian access points were important indicators of beach suitability, while one of the models also identified bay access as characteristic of nest habitat selection. Beach slope at nests averaged 5.6%, less than the mean slope at random points (8.3%; Jones 1997).

Out of 80 piping plover nests observed by Strauss (1990) at Sandy Neck in Barnstable, Massachusetts, no nests were located seaward of "steep foredunes," where this habitat constituted 83% of the beach front. Much of the beach in Strauss's study site that was not used by piping plovers had been artificially plugged with discarded Christmas trees and/or sand fences. Piping plover distribution and foraging rates during the pre-nesting period (during establishment of territories and courtship) on South Monomoy Island, Massachusetts, indicated that sound and tidal-pond intertidal zones were the most important feeding areas in the period before egg-laying (Fraser et al. 2005).

Goldin and Regosin (1998) found significantly higher chick survival and overall productivity among chicks with access to salt pond "mudflats" than those limited to oceanside beaches at Goosewing Beach, Rhode Island. Goldin and Regosin (1998) also reported that broods on the pond shore spent significantly less time reacting to human disturbance (1.6%) than those limited to the ocean beach (17%). Since ocean beaches are highly attractive to recreational beachgoers, limiting plovers to these habitats may also increase the potential for disturbance from people and pets.

A 1992-1993 study of nest site selection on 90 km (55.8 miles) of beach on Jones Beach Island, Fire Island, and Westhampton Island, New York (Elias et al. 2000) found that all 1-km beach segments with ephemeral pools or bay tidal flats were used for nesting and brood rearing, whereas less than 50% of beach segments without these habitats were used. When the amount of time that plover broods used each habitat was compared with its availability, broods preferred ephemeral pools on segments where pools were present. On beach segments with bay tidal flats,

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

broods preferred bay tidal flats and wrack to other habitats. On segments with neither ephemeral pools nor bay tidal flats, wrack was the most preferred habitat, and open vegetation was the second most preferred. Indices of arthropod abundance were highest on ephemeral pools and bay tidal flats. Chick peck rates were highest on ephemeral pools, bay tidal flats, and the ocean intertidal zone.

Cohen et al. (2008) reported that mean vegetative cover around piping plover nests on a recently re-nourished Long Island beach was 7.5%, and all plovers nested in <47% cover. Although almost 60% of nests were on bare ground, nests occurred in sparse vegetation more often than expected based on availability of this habitat type. Plovers also exhibited some preference for nest sites with coarse substrate compared to pure sand. At the same study area, piping plover chicks foraged more than expected and exhibited high peck rates in wrack, where arthropod abundance indices were also high (Cohen et al. 2009).

Following storm-and human-related increases in nesting and foraging habitat, the population at West Hampton Dunes, New York, grew from five pairs in 1993 to 39 pairs in 2000, and then declined to 18 pairs by 2004 concurrent with habitat losses to human development and vegetation growth (Cohen et al. 2009). Distribution of nests was heavily concentrated on the bayside of the barrier island in the early years following inlet formation and closure, but bayside nests decreased precipitously starting in 2001 and disappeared by 2004 as the study area was redeveloped and the bayside revegetated. The chick foraging rate was highest in bayside intertidal flats and in ocean and bayside fresh wrack. Chicks used the bayside more than expected based on percentage of available habitat, and survived better on the bayside before village construction and the initiation of predator trapping, but not after. In most years, density of nesting pairs adjacent to bayside overwash was 1.5 to two times that at an adjacent reference site, where beach nourishment increased nesting habitat but not foraging habitat. Cohen et al. (2009) concluded that local population growth can be very rapid where storms create both nesting and foraging habitat in close juxtaposition. An increase in local nesting habitat via artificial beach nourishment, however, is not necessarily followed by an increase in the local population if nearby intertidal flats are absent. Cohen et al. (2009) also note similarity between their results and observations by Wilcox (1959) of rapid colonization of habitats created on Westhampton barrier beaches by storms in the 1930s and their subsequent decline following revegetation and redevelopment.

Classification and regression tree analysis of piping plover nest-site selection at 19 New Jersey beaches was used to develop target values for habitat (i.e., goals for restoration projects): vegetative cover <10% on the backshore and 13% on the primary dune, 17-18% shell cover, dune height $\leq$1.1 meter, and dune slope $\leq$13% (Maslo et al. 2011). "Triggers" (when action is required to maintain suitable conditions) included vegetation density of 17% on the backshore and 22% on the primary dune, dune height 1.6 meter, and dune slope 17%. Habitat became unsuitable when vegetative cover exceeded 33.5%, distance from the high tide line to toe of the dune was less than 9.5 meters, dune height exceeded 2.0 meters, and dune slope exceeded 20%.

Dramatic increases in plover productivity and breeding population on Assateague Island in Maryland following the 1991-1992 advent of large overwash events corroborated earlier findings of significantly higher survival rates of piping plover chicks using sparsely vegetated access routes to reach foraging habitats on the island interior and bay beaches compared with those which foraged solely on the ocean beach (Loegering and Fraser 1995). Piping plover productivity, which had averaged 0.77 chicks per pair in a five-year period before the overwash, averaged 1.67 chicks per pair from 1992 to 1996 following the overwash events. The nesting population also grew rapidly, doubling by 1995 and tripling by 1996, when 61 pairs nested there. Over the 12 years from 1996-2007, the breeding population held steady at approximately 60 pairs (range = 56-66), but increasing vegetation caused, in part, by construction of a foredune that impeded overwash, forced nesting locations further seaward or into atypical vegetated habitats and blocked chick access to bayside foraging habitats (NPS 2012, Schupp et al. 2013). The breeding population declined to 49 pairs in 2008, and productivity matched the previous recorded low of 0.41 chicks per pair. Overwash restoration efforts have included the cutting of 14 notches (i.e., cross-shore depressions with a peak elevation of 2.16 meters) in the constructed foredune in 2008 and 2009 (Schupp et al. 2013).

In Virginia, Boettcher et al. (2007) reported that the five islands where piping plover breeding was observed every year from 1986-2005, "… encompass large segments of broad beaches with low discontinuous dunes and expansive sand-shell flats … providing unimpeded access from beach nest sites to the moist-soil ecotones of backside marshes." Cross and Terwilliger (2000) found that chick habitat use, foraging rates, and invertebrate prey abundance on four Virginia barrier islands was highest at moist inner-beach marsh edge and barrier flat habitats.

At Cape Lookout National Seashore, North Carolina, 13-46 pairs of plovers have nested on North and South Core Banks each year since 1992. While these unstabilized barrier islands total 70.4 km (44 miles) in length, nesting distribution is extremely patchy, with all nests clustered on the highly dynamic ends of the barrier islands, recently closed and sparsely vegetated "old inlets," expansive barrier mudflats, or new ocean-to-bay overwashes (NPS 2008). During a 1990 study, 96% of brood observations at Cape Lookout Seashore were on bay tidal flats, even though broods had access to both bay and ocean beach habitats (McConnaughey et al. 1990).

2. Effects of sand fences and vegetation planting on barrier beach topography and vegetative cover

Sand fences accelerate sand accumulation, affecting both topography and density of vegetative cover. Replicate treatments using sand fences oriented parallel to the shore, parallel with perpendicular additions, and zigzag (also termed oblique or diagonal) and vegetation plantings at Timbalier Island, Louisiana and Santa Rosa Island, Florida demonstrated appreciable vertical height and volume accumulation over controls (Mendelssohn et al. 1991, Miller et al. 2001). Fences filled rapidly, with half the accumulation over three years occurring in the first six months in Florida, 64% in the first 14 months in Louisiana. In sand deficient systems, however,

the shoreline will continue to erode back toward the dune unless the beach also is nourished (Mendelssohn et al. 1991, Freestone and Nordstrom 2001).

Vegetation also traps sand (USACE 1967), but it plays a smaller role than fences in sand accumulation during the first few years after planting (Mendelssohn et al. 1991, Miller et al. 2001). Over time, however, vegetation will continue to accumulate sand through upward and lateral growth without additional inputs (Miller et al. 2001). Lower density plantings resulted in formation of a low gradient sand ramp whereas higher density plots resulted in formation of a steep dune (Jackson and Nordstrom 2011). Thinning can be used to temporarily reduce cover, but hand-pulling did not prevent rapid regrowth in vigorous stands of American beach grass (USACE 1967).

Nordstrom et al. (2000) state that the frequent use of fences or earth-moving equipment to rebuild the foredune after scarping or breaching by floods leads to a linear, uniform dune ridge. Their recommendations for enhancing more naturally functioning dunes on developed coasts include restricting use of sand-trapping fences after burial of the initial fence that is used to create the initial dune ridge that provides interim protection to human structures. Symbolic (string) fences allow for aeolian (wind) transport while preventing trampling of dunes (Nordstrom et al. 2000, Grafals-Soto and Nordstrom 2009). Protecting the backbeach using signs or non-sand-trapping fences allows dunes to form at the uppermost wrack lines and define the seaward location of the foredune on natural criteria (Nordstrom et al. 2000).

Cessation of sand fence installation and beach-raking in Avalon, New Jersey resulted in greater dune volume and beach volume, but lower dune crests compared with "managed" sites with sand fences and beach-raking (Nordstrom et al. 2012). Suspension of raking and sand fence installation allowed the dunes to build seaward creating greater and more natural topographic variability as well as diversity of plant species. Furthermore, the new fences at "managed" sites had to be placed close to the dune to retain space for beach recreation (Nordstrom et al. 2012).

3. Effects of sand fences and vegetation plantings on piping plover habitat

The wide, flat, sparsely vegetated barrier beaches preferred by the piping plover are an unstable habitat, dependent on natural forces for renewal and susceptible to degradation by development and shoreline stabilization efforts (USFWS 1996). Study-specific management recommendations to conserve ephemeral pools, bay tidal flats, sparse vegetation, gently-sloping foredunes, and overwashes are contained in Loegering and Fraser (1995), Elias et al. (2000), Fraser et al. (2005), and Cohen et al. (2009). Conversely, activities that accelerate the formation of heavily vegetated berms and dunes that block overwash and replace gently sloping and sparsely vegetated foredunes adversely affect piping plovers and their habitats. Jones (1997) stated that the use of sand fencing or discarded Christmas trees will degrade piping plover nesting habitat if these installations create dune slopes >10%. Cohen et al. (2008) noted that once beach grass becomes dense, it may have to be thinned each growing season to retain

characteristics of suitable piping plover nesting habitat. Maslo et al. (2011) conclude that recovery and persistence of piping plovers will depend on conservation and restoration of breeding habitats with very low slopes, dune heights, and vegetative cover.

Other consequences of artificial beach stabilization include exacerbating conflicts with beach recreation as sand fences and vegetation plantings narrow the remaining seaward beach at the same time that they impede landward or cross-island movement of sand. Piping plovers at Westhampton Dunes placed most of their nests on the bay side of the beach in the first years following the breach and its closing, but redevelopment and revegetation of the bayside shifted nesting to the ocean beach (Cohen et al 2009). Sand fences and vegetation plantings similarly accelerate loss of sparsely vegetated foredune habitats, forcing piping plovers and human beach-goers to compete for the same narrowing swath of seaward beach.

Piping plover nests on narrow linear beaches backed by sand fences and vegetation may also be more susceptible to predation. Modeling by Seymour et al. (2004) using red fox movement data from northern England indicated that risk of fox predation on ground-nesting bird species in long, linear habitats increased with narrowing habitat width, and was sensitive to changes in habitat width of even a few meters. Furthermore, artificially-enhanced dunes and vegetation may augment denning habitat for mammalian predators.

4. Avoiding Adverse Effects From Sand Fences And Vegetation Planting

Not installing sand fences or planting vegetation is the practice most compatible with conserving piping plover habitat. However, one-time installation of a single strand of sand fence not more than three meters seaward of dense vegetation or developments that are currently unsuitable habitat for piping plovers may constitute a *de minimus* impact. If zigzag configurations or perpendicular spurs are included in the sand fence design, the seaward limit of the fence should not extend beyond the three meter limit. Likewise, planting native herbaceous vegetation within three meters of existing dense vegetation or developments is likely to cause *de minimus* effects. This should not be interpreted, however, to mean that successive additions of sand fencing or vegetation will not rise to the level of significant adverse effects (i.e., if more fence rows are added as the initial installations engender dense vegetation, then the width and area of available piping plover habitat is likely to be substantially compromised). Furthermore, sand fence installation and vegetation planting should be conducted before March 15 or after September 1 in order to avoid direct disturbance to piping plovers in their breeding range.

Whenever possible, symbolic fences should be used instead of sand fences to channel public use away from sensitive vegetation or wildlife habitat. Where temporary use of sand fences is deemed necessary for public use management, adverse effects can be avoided via prompt removal. Sand fences placed for public use management in suitable piping plover habitat should not be allowed to become buried. They should always be removed before September 1; if natural processes do not restore beach topography to pre-installation elevation and profile,

remedial mechanical re-grading to restore the pre-fencing topography should be conducted before March 15.

5. Reducing and Mitigating Adverse Effects from Sand Fences and Vegetation Planting Where Their Use Is Deemed Essential to Protection of Infrastructure

The most deleterious effects from sand fences and vegetation occur when they are situated on habitat at unstabilized inlets, on spits, or on other shoreline with overwashes or blowouts, which constitute the most valuable plover habitat. The highest priority should be accorded to avoiding use of sand fences and vegetation planting in these highly suitable habitats, which support the highest densities of breeding piping plovers (Cohen et al. 2009).

Where they are deemed essential to protection of beachfront developments or other infrastructure (and where overwashes or blowouts have not formed), sand fences should be placed as far landward as possible in order to minimize the amount of sparsely vegetated and gently sloping beach that will be replaced with steep dunes and dense vegetation. The number of rows of sand fence should be minimized to decrease the extent of habitat loss.

Only native herbaceous vegetation should be planted and the areal extent and density of plantings should be minimized. Adverse effects can be further reduced if conservation commitments include periodic thinning of planted beach grass, with a goal of maintain vegetation density of around 10% on the backshore and 13% on the primary dune (Maslo et al. 2011). Both mechanical and chemical (herbicide) thinning treatments can be considered. Project sponsors or landowners are strongly encouraged to include provisions for monitoring and evaluating effects of thinning on both the vegetation and on piping plover habitat use. Removal of dead vegetation may be needed to restore habitat suitability.

On beaches where dune erosion is a concern, managers should consider suspending any ongoing mechanical beach cleaning activities. Hand-picking anthropogenic trash and leaving the wrack will foster the natural dune development process (Nordstrom et al. 2000, Nordstrom et al. 2012, Cathcart and Melby 2009). It will also conserve important wrack foraging habitat for piping plovers and other shorebirds (Gibbs 1986, Hoopes 1993, Elias et al. 2000, Cohen et al. 2009, Defeo et al. 2009).

Beach managers should anticipate increased conflicts between piping plovers and human recreation seaward of dunes on beaches narrowed through the use of sand fences and vegetation planting. Additional piping plover monitoring, wardening, public outreach, and enforcement of symbolic fences should be provided to manage and reduce human disturbance of piping plovers.

Predator removal should be provided to mitigate the increased efficiency of predators hunting on beaches that made narrower and more linear by sand fences or vegetation planting.

Effects of sand fences and planted vegetation on habitat characteristics and essential piping plover behaviors should be monitored[4] and compared with nearby untreated control areas. Data collection should be conducted pre-project (to document baseline conditions) and annually for five years following project implementation. Important parameters may include (but are not limited to) dune height, dune slope, width and density of vegetation, width and slope of the beach seaward of the dune and of vegetation, abundance and distribution of piping plover breeding territories, piping plover chick habitat use, and predator track patterns.

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[4] This monitoring should be considered during formulation of requirements under 50 CFR 402.14(i)(1)(iii) and 50 CFR 402.12(i)(3).

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APPENDIX G

The Borough of Seaside Park Beach Actions Table

Action	Zone	Prohibited Start Date	Prohibited End Date	Comment
Routine Driving on the Beach (non-emergency)	Protected	March 15	August 31* November 30**	*If no listed species are present by July 15 or once nesting activities are completed for the season, this restriction may be lifted in consultation with NJFW and USFWS. ** In the plant protection strip
	Recreational	No Restrictions*	No Restrictions*	*When no listed species are present.
Large Debris Removal with vehicles) (except SOE)	Protected	March 15	August 31	
	Recreational	No Restrictions*	No Restrictions*	*When no listed species are present.
Sand Scraping (except SOE)	Protection	Year-round	Year-round	
	Recreational	No Restrictions*	No Restrictions*	Refer to DLRP permit. *When no listed species are present.
Beach Raking (except SOE)	Protection	March 15	August 31* November 30**	*If no listed species are present by July 15 or once nesting activities are completed for the season, this restriction may be lifted in consultation with NJFW and USFWS. * In the plant protection strip
	Recreational	No Restrictions*	No Restrictions*	Refer to DLRP permit. *When no listed species are present.
Beach Nourishment	Protection	March 15	Fledging of the last chick	Refer to USFWS's 2005 Programmatic Biological Opinion.
	Recreational	March 15	Fledging of the last chick	Refer to USFWS's 2005 Programmatic Biological Opinion.

Action	Zone	Prohibited Start Date	Prohibited End Date	Comment
Dune Management (except SOE)	Protection	March 15	August 31*	*When no listed species present
	Recreational	No Restrictions*	No Restrictions*	Refer to DLRP permit. *When no listed species are present.
Organized Events	Protection	March 15	August 31 November 30*	*Between September 1 and November 30 only when the area has been surveyed for seabeach amaranth and any plants are fenced with a minimum 3-meter buffer.
	Recreational	No Restrictions*	No Restrictions*	*When no listed species are present.
Kite and Drone Flying on the Beach	Protection	March 15	August 31	Prohibited within 200 meters of posted nesting areas.
	Recreational	No Restrictions*	No Restrictions*	*When no listed species are present. *Prohibited within 200 meters of posted nesting areas.
Dogs on the Beach	Protection	Year-round	Year-round	Refer to Borough Ordinance Borough Code 3-24-1976, Ord. No. 731 § 127-15)
	Recreational	Year-round	Year-round	Refer to Borough Ordinance Borough Code 3-24-1976, Ord. No. 731 § 127-15)