

## **U.S. Fish and Wildlife Service Recommendations for Beach Management Plans: Precautionary Zones, Plant Protection Strips, and Red Knot Protections**

The U.S. Fish and Wildlife Service (Service) works in partnership with the New Jersey Division of Fish and Wildlife's Endangered Nongame Species Program (ENSP) and local beach managers to develop and implement Beach Management Plans (Plans or BMPs).<sup>1</sup> The BMPs focus on plants and animals listed as endangered, threatened, or of special concern under Federal and/or State law. The Service encourages all beach management entities in New Jersey to develop a BMP. Plans are required for those New Jersey beaches that receive publicly-funded beach nourishment projects, such as projects carried out by the U.S. Army Corps of Engineers (Corps). Federal and State laws require beach management that is compatible with the needs of listed species, particularly on beaches maintained through publicly-funded projects. The responsibility for protecting listed species is shared among the Corps, the Service, the State, and local beach managers.

The BMPs address a wide range of issues such as symbolic fencing for protection and management of listed species, trash collection, beach raking, dune management, vehicles, and law enforcement. The issues addressed by Plans are generally consistent across the coast, but the specific provisions of each Plan are site-specific and developed cooperatively by local beach managers, the ENSP, and the Service. This document does not address all the issues that are covered by the BMPs. Instead, this document provides justifications and recommendations for three particular kinds of conservation practices that should be included in BMPs—Precautionary Zones, Plant Protection Strips, and Red Knot (*Calidris canutus rufa*) Protections. These recommendations supplement guidelines issued previously for listed beach species (U.S. Fish and Wildlife Service 1994, 1997, 2002, 2005) and are now being incorporated into BMPs with the goal of enhancing recovery.

### **Precautionary Zones**

Precautionary Zones are areas that are not known to currently support federally or State-listed beach species, including piping plover (*Charadrius melodus*), but that are believed to be of sufficient quality habitat to support those species. The designation of a Precautionary Zone within a municipality will be made on a case-by-case basis using best professional judgment, but will be incorporated in most BMPs. Decisions regarding whether and where to establish precautionary zones within a municipality will be based on opportunities to maintain or promote suitable habitat, using the following criteria.

1. The presence of habitat features that promote use by listed species, such as the following:
  - areas with overwash, open connections to bayside foraging habitats, or at accreting ends of barrier islands;
  - gently sloped beaches (*i.e.*, lower foredunes and upper strands of non-eroding beaches);
  - the presence of salt pond intertidal “flats”;

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<sup>1</sup> [http://www.fws.gov/northeast/njfieldoffice/pdf/Beach\\_Manage\\_.pdf](http://www.fws.gov/northeast/njfieldoffice/pdf/Beach_Manage_.pdf)

- the presence of ephemeral pools;
  - a well-developed wrack line;
  - sparse vegetation; and
  - a more natural, less stabilized dune line.
2. Proximity to inlets: Proximity to inlets is of sufficient importance to federally and State-listed species that it is considered a criterion on its own. Inlet beaches often contain high-quality habitat for piping plovers and other beach-nesting birds because they typically have low wave energy, accreting sandflats, and a rich infaunal community providing good foraging opportunities. Research has shown that the majority of piping plover nests in New Jersey occur on inlet beaches, which are commonly greater than 150 meters wide and undeveloped (Maslo *et al.* 2011). Likewise, seabeach amaranth (*Amaranthus pumilis*) is primarily found near inlets (U.S. Fish and Wildlife Service 1996), and unimproved inlets are a preferred habitat for red knots (Harrington 2008; U.S. Fish and Wildlife Service 2014).
  3. Relatively low levels of potential disturbance from factors including, but not limited to, the following:
    - dogs;
    - recreational beachgoers;
    - kite flying;
    - driving on the beach;
    - fireworks;
    - predators; and
    - lifeguards, public works personnel, etc.
  4. The extent of available habitat (length and width of beach).
  5. The proximity to other areas with known use by federally and State-listed species (provides better opportunities for colonization to occur).
  6. Historical occurrence of federally and State-listed species (indicates that habitat was of sufficient quality and quantity to have been used in the past).

### **Plant Protection Strips**

New Jersey's upper beaches (from the wrack line or high water mark to the dune or other landward limit, such as a boardwalk or bulkhead) support a number of listed beach plants including seabeach amaranth. Seabeach amaranth was extirpated from New Jersey in 1913 and remained absent from the State until its rediscovery in 2000 (U.S. Fish and Wildlife Service 2007). Following a period of geographic re-expansion in the 2000s, seabeach amaranth populations recently declined sharply. Range-wide, plant numbers declined more than 99% between 2002 and 2013. In New Jersey, seabeach amaranth counts from 2007 to 2014 were down more than 75% compared to the period from 2001 to 2006. Moreover, New Jersey's remaining plants are very concentrated, with more than 95% located in Sandy Hook. Thus, populations outside of Sandy Hook are at high risk of extirpation. In 2014, outside of Sandy

Hook, only 11 plants were observed in Monmouth County, 7 were observed in Ocean County, and none were found in Atlantic or Cape May Counties.

However, seabeach amaranth does have potential to recover in New Jersey. This species has a long-lived seedbank, with fresh seeds dispersed by wind and water (U.S. Fish and Wildlife Service 1996). These traits make seabeach amaranth an effective colonizer of suitable habitats when germination and plant development are not precluded by human activities. The primary human activities limiting the distribution of beach plants like seabeach amaranth are mechanical beach raking and off-road vehicle use (Kelly 2014). Thus, recovery of seabeach amaranth and other listed beach plants will likely be enhanced by limiting these activities in the upper beach areas where the plants occur.

The first generation of BMPs, which were approved from 2006 to 2011, generally provided plant protections incidental to those for beach-nesting birds. Indeed, areas set aside for beach-nesting birds do generally support rare beach plants as well, largely due to the exclusion of beach rakes and other vehicles. However, population declines in seabeach amaranth and other beach plants show that additional measures are necessary to conserve and restore these species. In particular, beach plants would likely benefit from “corridors” that can support seed exchange between protected areas. These corridors can also allow for recolonization of a protected area following storms or other events that result in a localized decline or extirpation.

Kelly (2015) found that recreational beach users (*e.g.*, swimmers, walkers, sunbathers, off-road vehicles) are concentrated lower on the beach profile (nearer the ocean), but are relatively sparse on the more landward portions of the upper beach. In fact, even during periods of peak beach use (*e.g.*, summer holidays), only 1% of beachgoers used the upper (landward) 20% of the beach, and 90% were present within the lower 60% of the beach. Thus, curtailment of raking and driving on the most landward portion of the upper beach will have minimal effect on the majority of beach users. Curtailment of beach raking in this area can also foster development of natural dune systems (Nordstrom *et al.* 2000, Cathcart and Melby 2009, Nordstrom *et al.* 2012), provide habitat to native pollinators like butterflies, result in cost-savings to beach managers, and diversify the range of recreational amenities available to beach-users (*i.e.*, some visitors enjoy experiencing a natural section of dry beach featuring native plants, shells, etc.). Based on the high value of the landward portion of upper beaches as dispersal corridors for rare plants and the low conflict with beach users in this zone, the Service recommends the following provisions be incorporated in all new and revised BMPs.

#### Within Protected Zones:

- Prohibit mechanical raking and scraping year-round, except as needed during a State of Emergency (SOE).
- Designate a “Plant Protection Strip,” consisting of approximately 25% of the total beach width, located immediately adjacent to the landward limit of the beach (*e.g.*, primary dune, boardwalk, bulkhead, etc.). Prohibit driving within the Plant Protection Strip year-round.
- Outside of the Plant Protection Strip, follow site-specific driving restrictions as specified in the BMP.

#### Within Precautionary Zones:

- Prohibit mechanical raking and scraping between March 15 and August 31, except as needed during an SOE. If no listed species are present by July 15, raking and scraping restrictions may be lifted, except within the Plant Protection Strip, as discussed below.
- Designate a Plant Protection Strip, consisting of approximately 25% of the total beach width, located immediately adjacent to the landward limit of the beach (*e.g.*, primary dune, boardwalk, bulkhead, etc.). Eliminate driving and mechanical raking and scraping within the strip, preferably year round, but minimally from March 15 to November 30, except during an SOE.
- Outside of the Plant Protection Strip, follow site-specific driving restrictions as specified in the BMP.

#### Within Recreational Zones:

- Within each Recreational Zone, designate a “Plant Protection Strip,” consisting of approximately 10% of the total beach width, located immediately adjacent to the landward limit of the beach (*e.g.*, primary dune, boardwalk, bulkhead, etc.). Eliminate driving and mechanical raking and scraping within the strip, preferentially year-round, but minimally from May 15 to November 30, except during an SOE.

#### For All Plant Protection Strips:

- Seasonally mark Plant Protection Strips with PVC posts and signs (but not rope or string). The Service can provide a limited number of signs.
- Conduct an annual meeting or training to educate beach rake and off-road vehicle operators about the need to stay out of the Plant Protection Strips.

### **Red Knot Protections**

The rufa red knot breeds in the tundra of the central Canadian Arctic and winters primarily in the southern tip of South America, northern Brazil, the Caribbean, and the southeastern and Gulf coasts of the U.S. Some of these robin-sized shorebirds fly more than 9,300 miles from south to north every spring and reverse the trip every autumn. Migrating red knots can complete non-stop flights of 1,500 miles or more, converging on vital stopover areas to rest and refuel along the way. Large flocks arrive along the Delaware Bay and New Jersey’s Atlantic coast each spring (May through June), in time to coincide with the spawning season for the horseshoe crab (*Limulus polyphemus*). Horseshoe crab eggs provide a rich, easily digestible food source for migrating birds. Mussel beds on New Jersey’s southern Atlantic coast are also an important food source for migrating red knots.

Red knots show moderate fidelity to stopover locations during fall migration (mid-July through November). Key foraging and roosting areas along New Jersey’s Atlantic coast are located primarily at unstabilized inlets (*e.g.*, Stone Harbor Point, North Brigantine Natural Area), but also include several continuous beaches (*e.g.*, Avalon, North Wildwood, Stone Harbor north of the Point). Consistently used stopovers typically feature intertidal sand flats that become exposed on a falling tide; however, red knots may also use other New Jersey beaches on a less consistent basis. In addition, small numbers of red knots may spend all or part of the winter in New Jersey.

The rufa red knot was federally listed as threatened on January 12, 2105. Threats to the red knot include sea level rise; coastal development; shoreline stabilization; dredging; reduced food availability at stopover areas; disturbance by vehicles, people, dogs, aircraft, and boats; and climate change (U.S. Fish and Wildlife Service 2014). For more information, visit <http://www.fws.gov/northeast/redknot/>.

In developing each new or revised BMP, the Service will use the best available data regarding red knot use in that municipality or jurisdiction and make conservation recommendations accordingly. In areas where documented red knot use is minimal (*e.g.*, only a few birds over the past 10 years), the Service will recommend only minimal conservation measures, such as educating beach management staff to avoid direct lines of travel through shorebird flocks. In areas of moderate or high red knot use, the Service may recommend additional conservation measures to manage habitat, predation and/or disturbance. Where red knot use areas overlap with habitat used by beach-nesting birds, few additional protections are likely to be necessary during the nesting season, but some measures may need to be extended through part or all of the fall months. All red knot conservation measures included in a final BMP will be developed cooperatively between the Service, ENSP, and the local beach managers, and will be tailored to site-specific conditions.

## **Conclusion**

Along with previously issued guidelines for managing fireworks and other recreational activities (U.S. Fish and Wildlife Service 1994, 1997), the Service expects the measures outlined above will provide necessary protections to aid recovery of listed beach species. The Service looks forward to continued coordination with local beach managers to accommodate recreational beach uses while also promoting stewardship of federally and State-listed endangered and threatened beach-dependent birds and plants.

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