

Getting Started with Dunes

Sand dunes are important coastal features that provide a variety of ecosystem services, such as habitat for coastal species and protection for infrastructure and communities landward of them. Dunes can be found along beaches all over the world and range in size from small piles of sand to dunes in excess of 900 feet tall, such as those found on Moreton Island in Australia. In New Jersey, recent storms such as Sandy (2012), Joaquin (2015), and Jonas (2016), have helped to highlight the importance of a healthy beach and dune system to coastal resilience. The official dune definition adopted by the State of New Jersey in Title 7 of the New Jersey Administrative Code is as follows:

“. . . 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.”
(N.J.A.C.7:7E Coastal Zone Management Rules)

Dune modification in New Jersey is regulated by the New Jersey Department of Environmental Protection (NJDEP). Individuals and communities are encouraged to contact the NJDEP prior to commencing projects intended to create or modify an existing dune. Care must also be exercised (in coordination with the Endangered and Non-Game Species Program (ENSP) and Fish and Wildlife Service representatives) to ensure that proposed activities do not degrade habitats for rare, threatened, or endangered species.

Natural coastal dunes are dynamic geologic features that are created as wind-blown sand is deposited primarily along the back beach (Figure 1). As the sand deposits grow, it is typical for vegetation to colonize the dune. Vegetation helps stabilize the dune and promotes dune growth by trapping additional windblown sand. Naturally established dunes are irregular and often contain multiple layers of ridges and valleys with a variety of sediment, vegetation, and wildlife. In contrast, man-made dunes are typically linear and often lack the complexity found in natural dune systems, which limits their habitat value. In some cases, poorly designed dunes can even degrade habitats for certain rare, threatened, and endangered species. Fortunately, it is possible with careful design, to engineer artificial dunes that can be compatible with the habitat needs of native species.



Figure 1. Coastal sand dunes with established vegetation (landward of the fence) and newly accumulated areas of windblown sand (along the fence).