

are immediate, homeowners may apply for emergency authorization to protect their home and/or other eligible structures. Under existing Florida statutes, county governments may assume emergency coastal armoring permitting authority. To date, Indian River County is the only Florida county to assume this responsibility and since 1996 has issued six permits for emergency armoring, covering 20 upland structures. In the late 1990s, concerns were expressed by the Florida Department of Environmental Protection (FDEP) and Caribbean Conservation Corporation (CCC), a non-profit environmental advocacy group, that Indian River County's implementation of coastal armoring permitting was resulting in the take of sea turtles that nest throughout the shoreline of Indian River County. To avoid immediate litigation, the FDEP, CCC, Applicant, and Petitioners (affected homeowners) entered into an Interim Agreement that required, in part, the Applicant to develop a HCP and apply for an ITP.

Three species of sea turtles nest on the beaches of Indian River County. On average 5,894 loggerhead, 271 green, and 7 leatherback sea turtles annually nest along Indian River County's 22.25 miles of coastline. Neither hawksbill or Kemp's ridley turtles have been documented to nest in Indian River County. Portions of northern Indian River County beaches are considered critically important for loggerhead turtles and some of the highest concentrations of green sea turtles nesting in the State occur within Archie Carr National Wildlife Refuge in southern Brevard and northern Indian River counties.

While the mechanism remains largely unknown, nesting sea turtles return to their natal beaches when they are reproductively mature. Once a gravid female reaches her selected nesting beach, she hauls herself from the sea, crawls to an area above the mean high water line (in Indian River County this is usually at the toe of the primary dune), excavates an egg chamber, deposits 80 to 135 eggs (depending on the species), covers the egg chamber, and returns to the sea. This process typically takes about one and a half hours and for most species occurs at night. Loggerhead turtles nest from late April to mid September, green turtles from late May to mid September, and leatherback turtles from late February to July. Artificial lights, obstructions (*e.g.*, groins, escarpments, beach furniture, and armoring structures), night-time human activity on nesting beaches, and predation are known or suspected to deter turtles from nesting.

Sea turtle eggs incubate within the warm, moist egg chamber for 50 to 75 days (species specific). Incubating eggs are vulnerable to predation, crushing, drowning, or washout. Along Indian River County's coastline, sea turtle nests are depredated principally by raccoons and in some locations predation rates may be as high as 30 percent. Trampling by humans and heavy construction equipment can crush sea turtle nests. Sea turtle eggs can withstand occasional inundation associated with spring tides, but repeated or long-duration inundation typically associated with storm events can drown eggs. During storm events, sea turtle nests are often washed out. Nests deposited between an armoring structure and the sea are more vulnerable to washout.

After hatching, young sea turtles dig upward to the beach surface and immediately crawl toward the sea. Hatchling emergence typically occurs at night. Factors affecting the survival of hatchling sea turtles include compaction of sand on top of the egg chamber, predation, and disorientation due to artificial lighting. Pedestrian traffic and heavy equipment use can cause compaction of sand and create an impenetrable substrate for hatchling turtles which ultimately results in their death. Following successful emergence at the beach surface, hatchlings are vulnerable to terrestrial and aerial predators. Raccoons, domestic cats, ghost crabs, and a variety of sea birds often take hatchling sea turtles. Because hatchling sea turtles orient to ambient light reflected by the sea surface, artificial light sources can interfere with the ability of hatchlings to correctly orient towards the sea. Often, disoriented hatchlings are attracted towards the source of the artificial light and away from the sea. Disoriented hatchlings typically die from dessication, predation, or exhaustion.

The Applicant proposes to authorize the construction of up to 31 emergency coastal armoring structures on beachfront property used by nesting sea turtles. The 31 armoring structures will impact about 3,196 linear feet of coastline where turtles nest. Over the 30-year period of the requested ITP, the Applicant anticipates taking 1,185 sea turtle nests. The loss of sea turtle nests is expected due to a decrease in the quality of nesting habitat seaward of armoring structures once they are built. Adult sea turtles and their eggs and hatchlings may also be taken during construction of temporary emergency shoreline armoring structures due to the destruction of eggs by equipment and construction materials, mortality of eggs due to relocation actions, mortality of

hatchlings and adults due to entanglement in construction equipment and debris or entrapment in excavated areas, and from harassment due to construction activities. Construction-related impacts to sea turtles and their nests are expected to be minor.

Most of the taking of sea turtles will occur as a result of post-construction impacts of the armoring structures. Once completed, armoring structures can prevent sea turtles from accessing suitable nesting habitat, result in modified nesting behavior, or increase the risk of wash-out of nests constructed seaward of armoring structures. Construction and post-construction impacts are described in greater detail below.

**Construction:** A variety of emergency armoring structures may be constructed under the Applicant's statutory authority. Possible armoring structures can generally be divided into two categories; soft structures and hardened structures. Soft structures typically refer to the placement of beach-compatible sand into areas that have eroded and may take the form of loose sand or sand temporarily contained by fabric or other materials. Hardened structures usually include "walls" constructed of wood, metal sheetpile, or concrete. These types of structures are sited as landward as possible but can occur within the tidal zone on severely eroded beaches.

Depending on the type of structure to be built, the construction may involve the scraping of sand from lower areas of the beach and using it to create a protective berm. Alternatively, beach-compatible fill from upland sources may also be used in some localities to create a protective berm. Temporary barriers made of sand bags or geo-textile tubes filled with sand may also be used. Existing structures may be reinforced with one or more of the methods described above. The construction of hardened emergency armoring structures requires the driving of pilings and/or sheetmetal into the soil.

During any of these construction activities, sea turtle nests may be smothered, unearthed, or crushed. Additionally, equipment and materials left on the beach overnight may effectively eliminate or prevent nesting turtles from reaching otherwise suitable nesting habitat. Those same materials, as well as holes and debris on the beach, may entrap both adult and hatchling turtles.

**Post Construction:** An armoring structure can have deleterious effects on nesting sea turtles. Although emergency armoring structures can only remain in place for a maximum of 30 days