

## **VI. Landscape Assessments and Conservation Strategies**

### **Atlantic Coastal Landscape**

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The Atlantic Coastal landscape consists of barrier islands and beaches, tidal salt marshes, rivers, shallow bays and lagoons along New Jersey's coastline. The landscape includes the eastern edge of Monmouth, Ocean, Atlantic, and Cape May counties, and the Atlantic Ocean. Excluding the ocean, the landscape covers 40,366 hectares (155.8 sq. miles).

#### **A. Ecological Units in the Atlantic Coastal Landscape**

The Atlantic Coastal Landscape is within the New Jersey Outer Coastal Plain (232Ab) in the Middle Atlantic Coastal Plain Section.

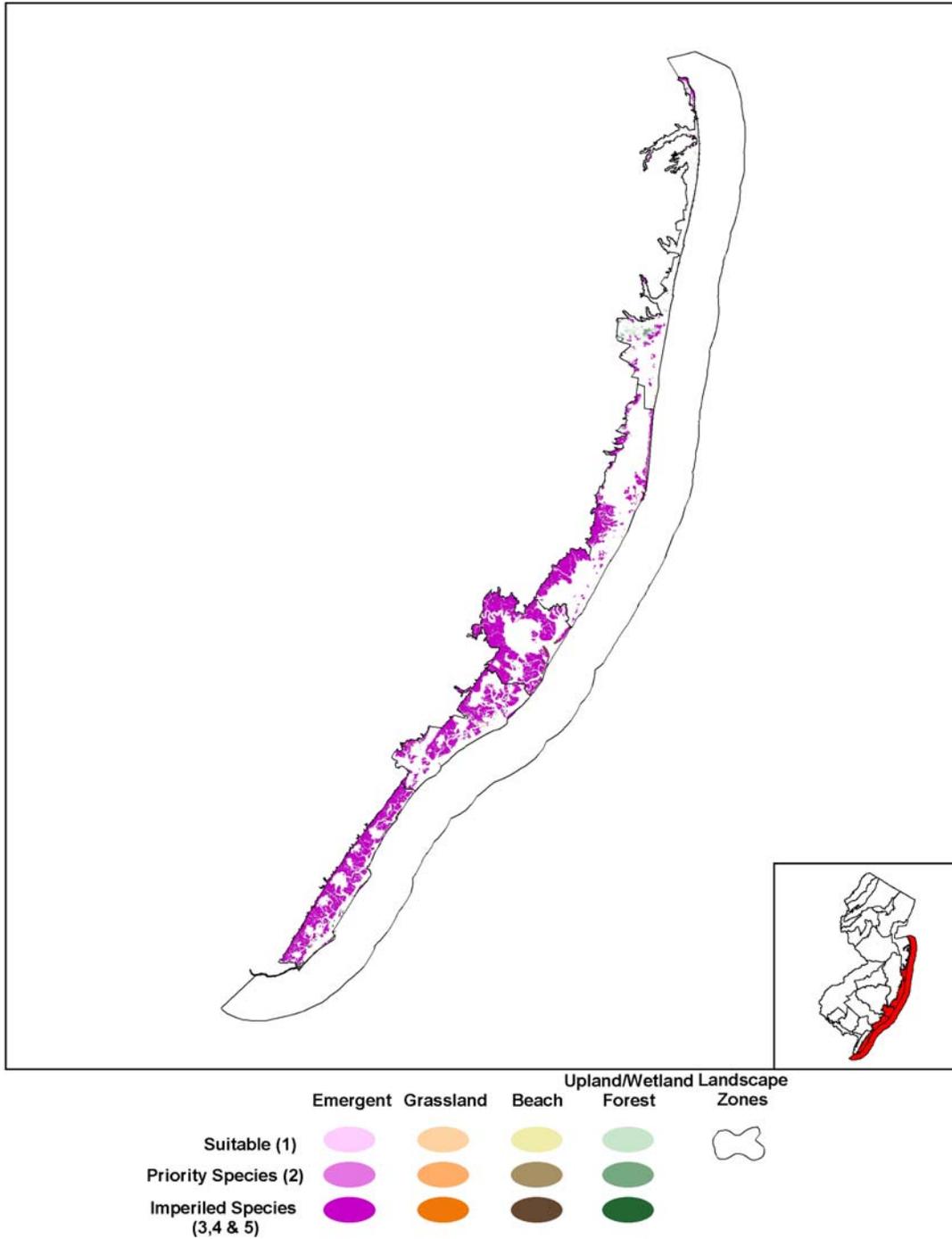
#### **B. Geology and Climate**

The Atlantic Coastal Landscape is within the Coastal Plain physiographic province. The landscape's dynamic barrier islands are reformed by erosion and deposition of beach sand by waves and currents, while rivers deposit mud and sand in the bays and estuaries that support the extensive tidal salt marshes. The Atlantic Coastal landscape spans the entire eastern edge of the New Jersey Outer Coastal Plain, where the average temperature varies from 10.5 to 12.2°C (51 to 54°F) with a growing season of 180 to 225 days, and the average annual precipitation is between 101-117 centimeters (39.6 to 46 inches).

#### **C. Habitats of the Atlantic Coastal Landscape**

Beaches, dunes, tidal salt marshes, brackish bays, river estuaries, barrier islands, and the ocean characterize the Atlantic Coastal landscape (Figure 4). The heavily developed barrier islands have vast beaches and dunes (1,346 hectares, 5.1 sq. mi.), fragmented upland forest, including scrub-shrub (2,515 hectares, 9.7 sq. mi.), and grasslands (121 hectares, 0.4 sq. mi.). The salt

**Figure 4.** Critical landscape habitats within the Coastal Landscape and associated conservation zones as identified through the Landscape Map (v2).



marshes (36,384 hectares, 140 sq. mi.) and back-bays persist in the shadow of beachfront resorts. The Holgate and Little Beach units of Forsythe National Wildlife Refuge, as well as portions of Island Beach State Park and the Sandy Hook Unit of Gateway National Recreation Area, provide examples of how the barrier islands looked before development, with an extensive primary and secondary dune system and maritime scrub-shrub and forest communities. It is important to note that habitats identified as “forest” and “forested wetlands” habitats on the Landscape Maps include scrub/shrub habitat. The landscape is the eastern edge of the Atlantic Flyway and provides important habitat for migrating and breeding birds, as well as for wintering waterfowl and seabirds. The Atlantic Ocean supports New Jersey’s marine wildlife, including fish, turtles, whales, seals, dolphins, and pelagic bird species.

The Priority Conservation Zones in the Atlantic Coastal Landscape are:

- (1) *Atlantic Coastal Cape May*
- (2) *Atlantic City Area*
- (3) *Brigantine - Great Bay*
- (4) *Barnegat Bay - Little Egg Harbor*
- (5) *Northern Atlantic Coastal*
- (6) *The Atlantic Ocean*

Priority conservation zones were delineated based loosely on watershed management area boundaries and sub-watershed area boundaries, grouped or adjusted to incorporate geographic and geological features and to accommodate significant conserved land boundaries. Similarities in the degree of development and the aerial extent of inland watershed drainage also influenced the grouping of the watershed areas.

The Atlantic Coastal Cape May conservation zone includes the entire Atlantic coastal portion of the Cape May watershed management area, except that only the barrier beach and dune areas are included south of the Cape May Canal. The Atlantic City Area conservation zone includes nearly the entire Atlantic coastal portion of the Great Egg Harbor River watershed management area adjusted to exclude lands administered as part of the Forsythe National Wildlife Refuge. The Brigantine - Great Bay conservation zone includes the entire Atlantic Coastal portion of the Mullica watershed management area. In addition, the southernmost sub-watershed area of the Barnegat Bay watershed management area was included to capture all of the lands administered as part of the Forsythe National Wildlife Refuge and all of the lands included in the Great Bay Wildlife Management Area. The Barnegat Bay – Little Egg Harbor conservation zone is comprised of all of the Barnegat Bay watershed management area except the portion included in the Brigantine – Great Bay zone as noted above and excluding the northernmost sub-watershed area (Barnegat Bay – north). The Northern Atlantic Coastal conservation zone includes the entire Atlantic coastal portion of the Monmouth watershed management area plus the Barnegat Bay – north sub-watershed as noted above. Finally, the Atlantic Ocean conservation zone includes all of the open ocean areas bordering the Atlantic Coastal Landscape extending out to the 3-mile limit under state jurisdiction.

#### **D. Wildlife of Greatest Conservation Need of the Atlantic Coastal Landscape**

Successful management of the Atlantic Coastal Landscape species and habitats is essential to the conservation in New Jersey of beach nesting birds, colonial waterbirds (except great blue herons), ospreys, marine mammals, pelagic birds, and Atlantic sturgeon. It also provides critical wintering and migratory habitat for a variety of waterfowl including the world's largest concentration of wintering Atlantic brant and American black ducks. The Atlantic Coastal Landscape also plays a crucial role in the conservation of Northern diamondback terrapin, peregrine falcons, northern harriers, black rails, Northeastern beach tiger beetles, migratory shorebirds, migratory songbirds, and coastal marsh birds. In addition, this landscape plays an accessory role in the conservation of Cope's gray treefrogs, Fowler's toads, eastern box turtles, forest-dwelling bats, pied-billed grebes, and bald eagles.

The Atlantic Coastal Landscape of New Jersey supports 16 federal endangered or threatened species including piping plover, northeastern beach tiger beetle, and whales and sea turtles associated with New Jersey's coast. This landscape also supports ten state endangered species, five state threatened species, and 52 species of special concern or regional priority. Several game species, most notably selected waterfowl species, have been assigned priority status. The state endangered species are the bald eagle, American bittern, black skimmer, least tern, northern harrier, peregrine falcon, pied-billed grebe, sedge wren, short-eared owl, and Cope's gray treefrog. Black rail, black- and yellow-crowned night herons, red knot and osprey are the state threatened species. The American oystercatcher, common tern, little blue heron, red-throated loon, ruddy turnstone, eastern box turtle, and northern diamondback terrapin are among the state species of special concern and regional priority. The beaches and dunes are nesting habitat for black skimmers, least terns, piping plovers, and other beach nesting birds. The beach is also habitat for the proposed reintroduction of the northeastern beach tiger beetle. Red knot and other migratory shorebirds, as well as songbirds, raptors, and butterflies, stop in the Atlantic Coast Landscape during migration. Bald eagles, ospreys, and peregrine falcons, coastal marsh birds, waterfowl, and colonial waterbirds nest and forage in the salt marshes and meadows. Northern diamondback terrapins can be found in the tidal marshes, while raptors and Cope's gray treefrogs inhabit upland forested wetlands. The region's forests and riparian areas also host summer and migratory populations of forest-dwelling bats and may contain habitat suitable for summer colonies of Indiana bats. Harbor seals, harbor porpoises, whales, sea turtles, pelagic birds and waterfowl, and anadromous fish species inhabit the Atlantic Ocean and coastal bays.

The following tables list the wildlife of greatest conservation need, the suites of wildlife, and the conservation opportunity areas to conserve them in the Atlantic Coastal Landscape. The wildlife are prioritized by federal endangered and threatened, state endangered, state threatened, and special concern and regional priority status.

Prioritized List of the Wildlife of Greatest Conservation Need and their Location in the Atlantic Coastal Landscape

Table C1. Federal Endangered and Threatened Species\*

Common Name	Federal Status & Regional Priority	Atlantic Coastal Cape May	Atlantic City Area	Brigantine - Great Bay	Barnegat Bay - Little Egg Harbor	Northern Atlantic Coastal	Atlantic Ocean
<b>Mammals</b>							
Blue whale	E						I
Fin whale	E						I
Humpback whale	E						I
Indiana bat	R	R**	R**	R**	R**	R**	
Right whale	E						I
Sei whale	E						I
Sperm whale	E						I
<b>Birds</b>							
Piping plover	T & RP	I	I	I	I	I	
Roseate tern	E/T & RP				R		
<b>Reptiles</b>							
Bog turtle	T				R		
Green sea turtle	E/T	I	I	I	I	I	I
Hawksbill sea turtle	E	I	I	I	I	I	I
Kemp's ridley sea turtle	E	I	I	I	I	I	I
Leatherback sea turtle	E	I	I	I	I	I	I
Loggerhead sea turtle	T	I	I	I	I	I	I
<b>Insects</b>							
Northeastern beach tiger beetle	T			I	R	I	

\*All Federal Endangered and Threatened species have an Endangered status on the NJ List of Endangered Wildlife.

\*\*Potential presence.

T: Federally threatened species.

E: Federally endangered species.

RP: Species is of regional priority; currently only mammals, reptiles, and insects are not identified due to information gaps.

M: Maintain population, species occurs within specific habitat(s) of landscape region.

I: Increase and stabilize population, species occurs within specific habitat(s) of landscape region.

R: Research and restore population, suitable habitat, species presence unknown.

Table C2. State Endangered Species

Common Name	Regional Priority	Atlantic Coastal Cape May	Atlantic City Area	Brigantine - Great Bay	Barnegat Bay - Little Egg Harbor	Northern Atlantic Coastal	Atlantic Ocean
<b>Birds</b>							
American bittern	RP	R	R	R	R	R	
Bald eagle	T	I	I	I	I	I	
Black skimmer	RP	I	I	I	I	M	
Least tern	RP	I	M	I	I	I	
Northern harrier		I	I	I	I	M	
Peregrine falcon		M	M	M	M	I	
Pied-billed grebe	RP			I	I		
Sedge wren	RP	M	M	M	M		
Short-eared owl	RP	I	I	I	I		
<b>Amphibians</b>							
Cope's gray treefrog		M		M	M		

RP: Species is of regional priority; currently only mammals, reptiles, and insects are not identified due to information gaps.

M: Maintain population, species occurs within specific habitat(s) of landscape region.

I: Increase and stabilize population, species occurs within specific habitat(s) of landscape region.

R: Research and restore population, suitable habitat, species presence unknown.

Table C3. State Threatened Species

Common Name	Regional Priority	Atlantic Coastal Cape May	Atlantic City Area	Brigantine - Great Bay	Barnegat Bay - Little Egg Harbor	Northern Atlantic Coastal	Atlantic Ocean
<b>Birds</b>							
Black rail	RP	I	I	I	I		
Black-crowned night-heron	RP	I	I	I	I	I	
Osprey		M	M	M	M	M	
Red knot	RP	I	I	I	I	I	
Yellow-crowned night-heron	RP	I	I	I	I	I	

RP: Species is of regional priority; currently only mammals, reptiles, and insects are not identified due to information gaps.

M: Maintain population, species occurs within specific habitat(s) of landscape region.

I: Increase and stabilize population, species occurs within specific habitat(s) of landscape region.

R: Research and restore population, suitable habitat, species presence unknown.

Table C4. Nongame Species of Conservation Concern

Common Name	Conservation Status	Atlantic Coastal Cape May	Atlantic City Area	Brigantine - Great Bay	Barnegat Bay - Little Egg Harbor	Northern Atlantic Coastal	Atlantic Ocean
<b>Mammals</b>							
Harbor porpoise	RP	M	M	M	M	M	M
Harbor seal	RP	M	M	M	M	M	M
Marsh rice rat	RP	R	R	R	R	R	
Southern bog lemming	RP	R	R	R	R	R	
<b>Birds</b>							
American golden-plover	RP	M	M	M	M	M	
American oystercatcher	RP	I	I	I	I	I	
Audubon's shearwater	RP						M
Black tern	SC/RP	M	M	M	M	M	
Bridled tern	RP						M
Caspian tern	SC	M	M	M	M	M	
Cattle egret	RP	I	I	I	I	I	
Chimney swift	RP	I	I	I	I	I	
Common barn owl	SC	M	M	M	M	M	
Common tern	SC/RP	I	I	I	I	I	
Forster's tern	RP	M	M	M	M		
Glossy ibis	RP	I	I	I	I	I	
Great blue heron	SC/RP	M	M	M	M	M	
Great crested flycatcher	RP	M	M	M	M	M	
Great egret	RP	M	M	M	M	M	
Greater shearwater	RP						M
Greater yellowlegs	RP	M	M	M	M	M	
Green heron	RP	M	M	M	M	M	
Gull-billed tern	RP	I	I	I	I	I	
Horned grebe	RP						M
Horned lark	SC	M	M	M	M	M	
Hudsonian godwit	RP	M	M	M	M	M	
King rail	SC/RP	M	M	M	M		
Least bittern	SC/RP	R	R	R	R	R	
Little blue heron	SC/RP	I	I	I	I	I	
Manx shearwater	RP						M
Marbled godwit	RP	M	M	M	M	M	
Marsh wren	RP	M	M	M	M	M	
Nelson's sharp-tailed sparrow	RP	M	M	M	M	M	

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Nongame Species of Conservation Concern (continued)

Common Name	Conservation Status	Atlantic Coastal Cape May	Atlantic City Area	Brigantine - Great Bay	Barnegat Bay - Little Egg Harbor	Northern Atlantic Coastal	Atlantic Ocean
<b>Birds (continued)</b>							
Northern gannet	RP						M
Purple sandpiper	RP	M	M	M	M	M	
Razorbill	RP						M
Red-throated loon	RP						M
Royal tern	RP	M	M	M	M	M	
Ruddy turnstone	RP	I	I	I	I	I	
Saltmarsh sharp-tailed sparrow	RP	I	I	I	I	I	
Sanderling	SC/RP	M	M	M	M	M	
Seaside sparrow	RP	M	M	M	M	M	
Semipalmated sandpiper	RP	I	I	I	I	I	
Snowy egret	SC/RP	I	I	I	I	I	
Tricolored heron	SC/RP	I	I	I	I	I	
Whimbrel	SC/RP	M	M	M	M	M	
Willet	RP	M	M	M	M	M	
Wilson's phalarope	RP	M	M	M	M	M	
<b>Reptiles</b>							
Eastern box turtle	SC	M	M	M	M		
Northern diamondback terrapin	SC	I	I	I	I	I	
<b>Amphibians</b>							
Fowler's toad	SC	M	M	M	M	M	
<b>Fish</b>							
Atlantic sturgeon	SC*/RP	R	R	R	R	R	R

\* Federal species of special concern

SC: Species of special concern as identified within the state.

RP: Species is of regional priority; currently only mammals, reptiles, and insects are not identified due to information gaps.

M: Maintain population, species occurs within specific habitat(s) of landscape region.

I: Increase and stabilize population, species occurs within specific habitat(s) of landscape region.

R: Research and restore population, suitable habitat, species presence unknown.

Table C5. Game Species of Regional Priority

Note: Species identified within the table have seasonal harvests within New Jersey.

Common Name	Regional Priority	Atlantic Coastal Cape May	Atlantic City Area	Brigantine - Great Bay	Barnegat Bay - Little Egg Harbor	Northern Atlantic Coastal	Atlantic Ocean
<b>Birds</b>							
American black duck	RP	M	M	M	M	M	
Atlantic brant	RP	M	M	M	M	M	
Black scoter	RP	R	R	R	R	R	R
Bufflehead	RP	M	M	M	M	M	
Canada goose (Atlantic population)	RP	M	M	M	M	M	
Canvasback	RP	I	I	I	I	I	
Clapper rail	RP	M	M	M	M	M	
Common eider *	RP	R	R	R	R	R	R
Greater scaup	RP	I	I	I	I	I	
Harlequin duck*	RP	R	R	R	R	R	R
Lesser scaup	RP	I	I	I	I	I	
Long-tailed duck	RP	R	R	R	R	R	R
Northern pintail	RP	I	I	I	I	I	
Surf scoter	RP	R	R	R	R	R	R
Virginia rail	RP	R	R	R	R	R	
White-winged scoter	RP	R	R	R	R	R	R

\*Species considered regional priority, however, NJ is south of the species' normal winter range and there is no natural habitat. A few occur along man-made rock jettys each winter, but this is insignificant to the overall population status.

RP: Species of regional priority; currently mammals, reptiles, and insects are not identified due to information gaps.

M: Maintain population, species occurs within specific habitat(s) of landscape region.

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I: Increase and stabilize population, species occurs within specific habitat(s) of landscape region.  
 R: Research and restore population, suitable habitat, species presence unknown.

Table C6. Fish Species

Note: Species identified within the table are nongame species within New Jersey, currently without state or regional status.

Common Name	Regional Priority	Atlantic Coastal Cape May	Atlantic City Area	Brigantine - Great Bay	Barnegat Bay - Little Egg Harbor	Northern Atlantic Coastal	Atlantic Ocean
<b>Fish</b>							
Hickory shad		X	X	X	X	X	X

X: Species present. Management strategy not yet determined.

Table C7. Game Species

Note: Species identified within the table have seasonal harvests within New Jersey and currently are not identified as regional priority species, but they are considered by NJDFW to be species of concern.

Common Name	Regional Priority	Atlantic Coastal Cape May	Atlantic City Area	Brigantine - Great Bay	Barnegat Bay - Little Egg Harbor	Northern Atlantic Coastal	Atlantic Ocean
<b>Mammals</b>							
River otter		M	M	M	M	M	
<b>Birds</b>							
Sora rail		R	R	R	R	R	

M: Maintain population, species occurs within specific habitat(s) of landscape region.  
 I: Increase and stabilize population, species occurs within specific habitat(s) of landscape region.  
 R: Research and restore population, suitable habitat, species presence unknown.

Table C8. Suites of Wildlife and their Location in the Atlantic Coastal Landscape

Common Name	Atlantic Coastal Cape May	Atlantic City Area	Brigantine - Great Bay	Barnegat Bay - Little Egg Harbor	Northern Atlantic Coastal	Atlantic Ocean
<b>Mammals</b>						
Forest-Dwelling Bats	X	X*	X*	X*	X*	
Mammal inhabitants of Wetland, Marsh and Bog	X	X	X	X	X	
Pinnipeds	X	X	X	X	X	X
Whales						X
<b>Birds</b>						
Beach Nesting Birds	X	X	X	X	X	
Coastal High marsh Birds	X	X	X	X	X	
Coastal Low-Marsh Birds	X	X	X	X	X	
Colonial Waterbirds	X	X	X	X	X	
Migratory Shorebirds	X	X	X	X	X	
Migratory Songbirds & Raptors	X	X	X	X	X	
Pelagic and Seasonally Pelagic Birds	X	X	X	X	X	X
Waterfowl	X	X	X	X	X	X
<b>Reptiles</b>						
Reptiles of Special Concern	X	X	X	X	X	
Sea Turtles	X	X	X	X	X	X
<b>Amphibians</b>						
Amphibians of Special Concern	X		X	X		
<b>Fish</b>						
Anadromous	X	X	X	X	X	X
<b>Insects</b>						
Northeastern beach tiger beetle**			X	X	X	

\*Potential presence  
 \*\* Federally listed, proposed reintroduction

X: Species suite occurs within identified landscape region.

## **E. Threats to Wildlife and Habitats of the Atlantic Coastal Landscape**

The barrier islands of New Jersey's coastal landscape are heavily influenced by human alteration. Efforts to stabilize barrier islands, including jetties, groins, bulkheads, beach replenishment projects, and intense dune management (including excessive dune fencing and unnecessary beach grass planting where adequate storm protection already exists), interfere with the natural geological processes needed to create and maintain habitat for beach strand species. While most developable land in the coastal landscape has been built, continued in-fill development threatens the remaining scrub-shrub and forested habitats important to migratory songbirds, raptors, and butterflies. This development also creates barriers for movement for amphibians and reptiles such as the northern diamondback terrapin and increases disturbance to important foraging and nesting habitats for beach nesting birds and colonial waterbirds. Salt marshes and other coastal wetland habitat has been destroyed or severely altered as a result of coastal development and management to control mosquitoes and/or tidal flow, resulting in negative or unknown effects on native species. Mechanical beach raking reduces foraging habitat for beach nesting birds and migratory shorebirds and destroys breeding habitat for northeastern beach tiger beetles.

Barrier beaches and back-bay waters are meccas for human recreational activity. The resulting disturbance to nesting and foraging birds leads to diminished nesting success and brood survival for beach nesting birds, colonial waterbirds, osprey, and others. Vehicle use on beaches, including permitted private and "official" vehicles, creates disturbance, harms foraging habitats, can destroy habitats for northeastern beach tiger beetles, and can cause direct mortality for beach nesting birds. Boating and personal watercraft activity inflicts disturbance on nesting and foraging colonial waterbirds, osprey and others.

Many commercial shipping and fishing enterprises cause direct mortality to whales, sea turtles, and other marine species. Low to mid-frequency active sonar, along with other anthropogenic (human generated) sound sources, threatens marine mammals by disrupting navigation, foraging and communication abilities. Overexploitation of riparian, estuarine, and marine fisheries are not only a threat to specific fish species, but may also have ecosystem impacts that are inimical to species such as colonial waterbirds, the bald eagle, osprey, and others. Environmental impacts of aquaculture and back-bay hydraulic crab dredging are largely unmeasured and poorly understood. The effects of offshore and inshore wind energy projects (towers) on avian species, especially songbirds and seabirds, and possibly bats, are unknown but may be a cause of mortality due to collision. Depending on where they are sited, offshore structures associated with wind energy projects may also have impacts on marine mammals and sea turtles.

Human enterprise in the watersheds that feed estuaries has increased pollution from point-sources and run-off into estuarine areas. Contaminants such as PCBs, pesticides and heavy metals pose threats to aquatic species and ecosystems, and impact reproductive success of bald eagles, ospreys, peregrine falcons, waterfowl and water birds. Large oil spills, although only periodic events, are likely to continue to occur because of the state's proximity to major shipping lanes up the Delaware River and into the New York City Harbor. Spills loom as a possible threat to a wide range of coastal species, with potentially catastrophic results.

Human activities also negatively affect ecosystems by introducing invasive or exotic plants and animals and sustaining native species whose populations have expanded beyond that which would occur naturally. Invasive and/or exotic plants or wildlife (e.g., phragmites, Japanese sedge, mute swan) diminish habitat suitability of coastal marsh and dune habitats for wildlife, and reduce the ecological integrity of natural communities. Over-abundant native wildlife species (e.g., resident Canada goose, greater snow goose, gull species), if left uncontrolled, also have potentially negative impacts on habitat quality and populations of other critical wildlife. Burgeoning subsidized predator populations, (e.g., red fox, crow species, gull species, raccoon, striped skunk, free roaming “owned” or feral cats), severely impair nesting success and productivity of beach nesting birds, colonial waterbirds and northern diamondback terrapins.

Although it is difficult to measure, assess, and address the impacts of sea-level rise, this issue presents perhaps the greatest long-term threat to the coastal habitat and its species as it may completely alter the coastal landscape.