

been found just upstream of the Chequessett Neck Road Dike in 1978 at densities of 4 per square foot in a narrow band on the east shore of the small tidal island in the middle of the river (Gaskell 1978). However, no softshell clams were found in Herring River upstream of the dike during the 1984 survey (Roman 1987). Softshell clams are currently harvested in Wellfleet Harbor at various locations. Other shellfish species found in the Herring River estuary include razor clams, blue mussels (*Mytilus edulis*), surf clams (*Spisula solidissima*), and bay scallops (*Argopecten irradians*) all of which are found downstream of the Chequessett Neck Road Dike (Town of Wellfleet 1995). Bay scallops are occasionally important commercially, but occur erratically in Wellfleet Harbor. According to Curley et al. (1972) their numbers are limited by the harbor's 10-foot tide range, which exposes large areas of flats in the winter, which can adversely affect survival (Curley et al. 1972).

3.7 FEDERAL AND STATE-LISTED RARE, THREATENED, AND ENDANGERED SPECIES

Federally listed Threatened and Endangered Species—The purpose of the Endangered Species Act is to protect and recover imperiled species and the ecosystems upon which they depend. Effective December 11, 2014, the rufa red knot (*Calidris canutus rufa*) was federally listed as a threatened subspecies of the red knot under the ESA (79 FR 73706). Effective May, 4, 2015, the northern long-eared bat was federally listed as a threatened species under the Endangered Species Act (80 FR 17974). The red knot has been identified as potentially utilizing Herring River tidal wetlands as foraging habitat during migration. The northern long-eared bat (*Myotis septentrionalis*) has been identified as potentially utilizing wetlands for foraging, and adjacent forested uplands as summer roosting habitat within the Herring River project area. As part of the permitting process, the project will complete Section 7 Consultations with the USFWS for both species pursuant to the Endangered Species Act of 1973, as Amended (16 USC 1531 et seq.). Informal consultation is underway.

State-listed Rare, Threatened, and Endangered Species—NPS policies (e.g., *NPS Management Policies 2006* and Director's Order 12) and the Massachusetts Endangered Species Act (MESA) (M.G.L. c.131A and regulations 321 CMR 10.00) require examination of impacts on federal and state-listed threatened and endangered species and species of special concern. Massachusetts Division of Fish and Wildlife, NHESP oversees listing of state species and administering MESA. Species listed as endangered or threatened by the state are defined in the same way as federally endangered and threatened species. Currently, six state listed wildlife species occur within the Herring River project area: three birds, American bittern (*Botaurus lentiginosus*), least bittern (*Ixobrychus exilis*), and northern harrier (*Circus cyaneus*); two reptiles, diamondback terrapin (*Malaclemys terrapin*) and eastern box turtle (*Terrapene c. carolina*); and one invertebrate, water-willow stem borer (*Papaipema sulphurata*). The following sections describe these protected species and their current status within the Herring River.

3.7.1 RUFA RED KNOT (*CALIDRIS CANUTUS RUFA*) – FEDERALLY THREATENED

The rufa red knot is a medium-sized shorebird that completes a long distance migration between its breeding grounds in the Canadian Arctic and several wintering grounds that include the Southeastern United States, Northeast Gulf of New Mexico, northern Brazil, and Tierra del Fuego at the southern tip of South America. The red knot has been recorded as a spring migrant on Cape Cod, but it is more commonly present as a mid-summer-early fall migrant (Harrington et al. 2010a; Harrington et al. 2010b). During their southward migration to wintering areas, red knots typically feed on small clams and mussels found along coastal beaches and exposed intertidal flats.

3.7.2 **NORTHERN LONG-EARED BAT (*MYOTIS SEPTENTRIONALIS*) – FEDERALLY THREATENED**

The northern long-eared bat is a widespread species found in the United States from Maine to North Carolina on the Atlantic Coast, westward to eastern Oklahoma and north through the Dakotas, even reaching into eastern Montana and Wyoming. The northern long-eared bat is one of the species of bats most impacted by the disease white-nose syndrome, and these impacts are the main impetus behind the listing of the species in 2015.

During the summer, northern long-eared bats roost singly or in colonies in forested habitat underneath bark, in cavities or in crevices of both live trees and snags (dead trees). Northern long-eared bats seem to be flexible in selecting roosts, choosing roost trees based on suitability to retain bark or provide cavities or crevices. During the evening, northern long-eared bats can be found foraging in a variety of forested and non-forested habitats, including wetlands. During winter, northern long-eared bats hibernate in caves and mines (hibernacula) with constant temperatures, high humidity, and no air currents. Factors affecting the species include modifications to bat hibernacula, disturbance of hibernating bats, and loss of forest habitat including forest fragmentation.

3.7.3 **AMERICAN BITTERN (*BOTAURUS LENTIGINOSUS*) – STATE ENDANGERED**

The American bittern is a medium-sized bird that spends the majority of its time hidden among marshland vegetation. It prefers wetlands dominated by tall, emergent vegetation such as cattails, bulrushes, sedges, and grasses, but may also occur in brackish wetlands (NHESP n.d.). Within these habitats the American bittern frequents vegetation fringes and shorelines (Gibbs et al. 2009a). The American bittern forages in marshes, meadows, and along edges of shallow ponds. Preferred foods include frogs, small snakes and eels, crayfish, fish, salamanders, and occasionally mice and grasshoppers caught in open fields (NHESP n.d.).

Bitterns typically nest in marshes, but may also nest in grassy upland fields adjacent to wetlands. Nests are about a foot (30 centimeters) in diameter, made up of dead reeds, cattails, grasses, and sedges; nests located on the ground in dense vegetation or on a platform about a foot above the water. One clutch of three to five eggs is laid per year (NHESP n.d.). The breeding range of the American bittern extends from Newfoundland west to Manitoba and British Columbia; south to Maryland; and west through Oklahoma and Kansas to southern California. American bitterns return from their wintering habitat to Massachusetts marshes in April (Gibbs et al. 2009a).

The entire life cycle of the bittern is dependent on wetlands, so availability of suitable wetland breeding habitat within its range likely determines gross abundance of this species (Gibbs et al. 2009a). Population trends in Massachusetts are not known although the global population is thought to be declining (NHESP n.d.). Loss of wetland habitat is the major cause of decline, starting as early as the 1890s in some states, including Massachusetts. Over half the original wetlands in the United States have already been destroyed; inland, freshwater wetlands, the nesting and wintering areas of American bitterns are among the most threatened habitats. Other causes of population declines are human disturbance and pesticides/contaminants (Gibbs et al. 2009a).

Although call-playback survey results indicate the presence of American bitterns (Erwin, Conway, and Hadden 2002), there is no documentation of nesting activity of this species within the Herring River project area. Surveys conducted in parts of the Herring River flood plain in 2012 and 2013 (Broker n.d.) did not result in observations of American bittern. However, based on NPS vegetation mapping for the Herring River flood plain and discussions with NHESP, it is estimated that under

existing conditions, potential nesting habitat for the American bittern is available. These habitats are primarily freshwater marsh located in the Lower Herring River, Upper Pole Dike Creek, and Bound Brook sub-basins with an additional 13 acres of salt marsh in the Lower Herring River as foraging, roosting, and migratory habitat.

3.7.4 **LEAST BITTERN (*IXOBRYCHUS EXILIS*) – STATE ENDANGERED**

The least bittern is the smallest member of the heron family, weighing on average 2.8 ounces (80 grams), and among the most inconspicuous of North American marsh birds. Suitable habitats include fresh and brackish water marshes with tall, dense emergent vegetation and clumps of woody plants over deep water (Gibbs et al. 2009b). Massachusetts NHESP occurrence records describe habitat as primarily cattails and open water (NHESP n.d.). Least bitterns forage by stalking along the openwater side of emergent vegetation, grasping clumps of plants with their long toes and curved claws. They are also known to build small foraging platforms at feeding sites, catching fast-moving prey (mainly small fish and insects) (Gibbs et al. 2009b).

The least bittern nest is an elevated platform with an overhead canopy, built of emergent aquatic vegetation and sticks. A clutch of four to five eggs is laid over a six-day period every year. A second attempt at breeding may occur if the first attempt fails. Least bitterns breed from southeastern Canada through the eastern and central United States to Mexico and Costa Rica. They typically arrive at nesting areas in Massachusetts by mid- to late-May; eggs and fledglings have been observed in the state throughout June (NHESP n.d.).

When encountered, least bitterns typically burrow through dense vegetation, fly away weakly over marsh vegetation, or stand still with their bill pointed upward, feathers compressed, and eyes directed forward (Gibbs et al. 2009b).

Although call-playback survey results indicate the presence of least bitterns (Erwin, Conway, and Hadden 2002), there is no documentation of nesting activity of this species within the Herring River project area. The least bittern was documented in parts of the Herring River flood plain during surveys conducted in 2012 and 2013 (Broker n.d.). These sightings have included spring-time observations of behaviors which suggest that least bitterns are nesting within the flood plain during some years (Broker n.d.; unpublished data). Based on the locations of these observations, NPS vegetation mapping for the Herring River flood plain, and discussions with NHESP, it is estimated that under existing conditions, potential nesting habitat for the least bittern is available. These habitats are primarily freshwater marsh located in the Lower Herring River, Upper Pole Dike Creek, and Bound Brook sub-basins with an additional 13 acres of salt marsh in the Lower Herring River as foraging, roosting, and migratory habitat.

3.7.5 **NORTHERN HARRIER (*CIRCUS CYANEUS*) – STATE THREATENED**

The northern harrier, sometimes referred to as the marsh hawk, is a slim, long-legged, long-tailed accipiter. Harriers establish nesting and feeding territories in wet meadows, grasslands, and coastal and inland marshes. Harriers construct their nests from grasses, weeds, and other emergent aquatic and upland vegetative material. Nests are typically on the ground among bushes and other low vegetation. Sometimes the nests are built over shallow water on raised mounds of sticks. Egg incubation occurs in the spring (April). Harriers prey on a variety of small animals, including rodents, rabbits, and other small mammals, small birds, insects, amphibians, reptiles, and carrion. In Massachusetts, meadow voles (*Microtus pennsylvanicus*) constitute an important component of the harrier's diet; there is a direct correlation between the breeding success of northern harriers and the number of voles found in their territory (NHESP n.d.).

Harriers are uncommon summer residents or migrants in Massachusetts, although they once were much more abundant in the state. The harrier was once a common breeder throughout Massachusetts from the mid-1800s to the early 1900s. Today, almost all of the breeding harriers in the state are confined to the offshore islands, Cape Cod, and Plum Island in the northeast corner of the state. Most harriers in the state that do not migrate south spend the winter in coastal marshes on Cape Cod and the offshore islands. Some northern harriers that breed in areas north of Massachusetts may also spend the winter on the offshore islands and along the coast (NHESP n.d.).

Results from field surveys conducted from 2004 through 2006 indicate the harrier breeding population at the Seashore in 2004 consisted of 10 nesting pairs, which was likely the largest breeding population anywhere on the Massachusetts mainland and, therefore, of statewide conservation significance. The 2005 population was smaller, comprising five nesting pairs plus four other pairs that mated and established a breeding territory early in the season but did not progress to nesting (Bowen 2006). The 2006 population was slightly larger and consisted of seven nesting pairs (Byrne 2007). Two of the seven nests were successful and produced five fledglings. Two nesting sites documented within the vicinity of the Herring River project at the Ryder Hollow and Bound Brook areas in all three survey years may be affected by the proposed project. Both sites were in freshwater marshes dominated by cattail. Although no formal, systematic nesting survey has been conducted since 2006, anecdotal observations of adult harriers have been made since then during the nesting season near documented nesting sites. Thus there is no reason to assume that northern harriers have not continued to nest in the Bound Brook sub-basin (Cook, pers. comm. 2011).

Cattail marshes are considered the single most important harrier nesting habitat at the Seashore, accounting for 50 percent of all nest sites. Other nests on Cape Cod have been found in outwash scrub oak barrens (Bowen 2006). The most substantial factor in the northern harrier decline has been destruction of suitable habitat by reforestation of agricultural land and destruction of coastal and freshwater wetlands. In coastal areas, human disturbance may cause some harriers to abandon their nests. Other factors such as prey abundance, prolonged periods of rain (which may destroy nests and eggs), and predation on eggs and nestlings can also affect their success (NHESP n.d.).

3.7.6 **DIAMONDBACK TERRAPIN (*MALACLEMYS TERRAPIN*) – STATE THREATENED**

The diamondback terrapin, a marine turtle, uses brackish marsh habitats for foraging and sandy shoreline habitats for nesting. The brackish marshes along the periphery of Wellfleet Harbor support the northernmost population on the East Coast, although individuals have been found in Provincetown.

Terrapins are strong, fast swimmers and feed primarily on snails, mussels, and crabs. They live most of their lives in the marsh and are the only emydid turtle capable of surviving in a high salinity environment without accessing a freshwater source. Terrapins hibernate in the mud of tidal creeks and mate in the calm waters of the salt marsh in mid-spring. Females nest on land, usually among the dunes and open habitats adjacent to the marsh, often within the Seashore (Cook 2008a).

Terrapin populations were decimated in the 19th century by overharvesting for food. They recovered by the mid-20th century, but now face renewed pressures from loss or degradation of nesting habitats to development, increased nest predation by raccoons and skunks, and increased adult mortality from road kills (Cook 2008b).

3.7.7 EASTERN BOX TURTLE (*TERRAPENE C. CAROLINA*) – STATE SPECIES OF SPECIAL CONCERN

Although listed as a Species of Special Concern under MESA, eastern box turtles are relatively common terrestrial reptiles on Cape Cod that use dry and moist woodland and freshwater marsh habitats (R. Cook pers. comm. 2011). The box turtle shifts habitats seasonally to avoid excessive heat or cold. They frequent the edges of wetlands, especially during dry summer periods when they move into fresh surface water for hydration.

Pine barrens and oak thickets present in areas adjacent to the Herring River estuary are optimal habitat types for this species. Upland habitats that support communities of bearberry (*Arctostaphylos uva-ursi*), lowbush blueberry (*Vaccinium angustifolium*), and bracken fern (*Pteridium aquilinum*), common upland plant species adjacent to the estuary, are also preferred habitat (Erb 2011). The turtles feed on a broad range of foods including insects, worms, slugs, fruit, mushrooms, vegetation, and carrion provided by the upland habitats.

Box turtles are in decline throughout much of their range in the eastern United States. They are extremely long lived, slow to mature, and have relatively few offspring per year. These characteristics, along with habitat degradation, road kill frequency, and pet collection, make the box turtle a species particularly susceptible to human-induced pressures. The Seashore, however, with its fairly intact, unfragmented landscape, likely provides some of the best remaining box turtle habitat in New England and they are frequently encountered in and adjacent to the Herring River project area (R. Cook pers. comm. 2011).

3.7.8 WATER-WILLOW STEM BORER (*PAPAPEMA SULPHURATA*) – STATE THREATENED

The water-willow stem borer is a globally rare, noctuid moth found only on the coastal plain of southeastern Massachusetts and Cape Cod. Water-willow stem borer larvae feed almost exclusively on water-willow (*Decodon verticillatus*), a freshwater wetland plant widely distributed throughout New England.

Typically, water-willow grows in the shallowest portions of vernal ponds, in seasonally flooded freshwater swamps, and along upland edges of streams, ponds, and other permanent bodies of water. On outer Cape Cod, water-willow has become established in formerly tidal river systems where diking has created and maintained freshwater conditions.

Numerous stands of water-willow support the stem borer along the margins of the Herring River and its tributaries. During a survey performed in 2006, 89 larval host plant patches were located within the Herring River flood plain and 80 records of stem borer use were recorded. *D. verticillatus* patches were mapped as 172 discrete stands occurring along approximately 41,000 linear feet of streambank habitat. An additional 29 stem borer records were found within 17 host plant patches at Salt Meadow within the East Harbor system in Truro (Mello 2006). Casual observations by Seashore scientists made since the 2006 survey indicate that *D. verticillatus* also occurs along the edges of a majority of vernal pools and ponds throughout the Seashore (R. Cook, unpublished NPS data, 2012).

3.8 TERRESTRIAL WILDLIFE

Over 450 species of amphibians, reptiles, fish, birds, and mammals depend on the diversity of upland, wetland, and coastal ecosystems found in the Seashore and nearby environs. Depending on the

species, the Seashore may provide habitat year round, or only during nesting season, migration, or winter. Seashore wildlife includes marine mammals and turtles; the familiar gulls, terns, and waterbirds of beaches and salt marshes; and a great variety of animals that inhabit Seashore woodlands, heathlands, grasslands, swamps, marshes, and vernal ponds (NPS 2011e).

3.8.1 BIRDS

The Seashore provides a wide diversity of freshwater, marine, and upland habitats for the roughly 370 species of birds. About 80 of these nest here during the spring and summer months, with the remainder using the Seashore for migratory stopovers or to overwinter. The Seashore contains prime habitat for a multitude of species including many that migrate along the Atlantic Flyway. A list of species observed within the project area is presented in appendix E.

Freshwater Marsh Birds and Upland Birds

The birds of the Wellfleet area were surveyed in 2000, as part of a survey of grassland birds (Kearney and Cook 2001). Species recorded at Wellfleet during the breeding season (June) and presumed to breed there or nearby and forage there include the following: northern flicker (*Colaptes auratus*), mourning dove (*Zenaidura macroura*), eastern phoebe (*Sayornis phoebe*), eastern kingbird (*Tyrannus tyrannus*), brown thrasher (*Toxostoma rufum*), northern mockingbird (*Mimus polyglottos*), black-capped chickadee (*Poecile atricapillus*), prairie warbler (*Dendroica discolor*), red-winged blackbird (*Agelaius phoeniceus*), brown-headed cowbird (*Molothrus ater*), rufous-sided towhee (*Pipilo* spp.), American goldfinch (*Carduelis tristis*), song sparrow (*Meospiza melodia*), chipping sparrow (*Spizella passerina*), field sparrow (*Spizella pusilla*), and vesper sparrow (*Pooecetes gramineus*). Many of these species are generalists and live near freshwater habitats, but may also forage and rest near brackish water.

Species common to shrub thickets and freshwater habitat likely have increased in the Herring River flood plain as conditions changed due to the tidal restriction. These include red-winged blackbirds (*Agelaius phoeniceus*), song sparrows (*Melospiza melodia*), prairie warblers (*Dendroica discolor*), common yellowthroats (*Geothlypis trichas*), eastern towhees (*Pipilo erythrophthalmus*), and grey catbirds (*Dumetella carolinensis*). Many of these species are abundant nesters elsewhere on Cape Cod and southeastern Massachusetts (Veit and Peterson 1993).

Marsh birds were inventoried at the Seashore during a 1999 and 2000 auditory and visual detection survey. Seven species were identified; sora (*Porzana carolina*), pied-billed grebe (*Podilymbus podiceps*), Virginia rail (*Rallus limicola*), American coot (*Fulica Americana*), king rail (*Rallus elegans*), American bittern, and least bittern. As described in “Section 3.7: Federal and State-listed Rare, Threatened, and Endangered Species,” the American bittern and least bittern are listed as endangered under Massachusetts Environmental Policy Act (MEPA). Within the entire survey area, the most commonly detected freshwater marsh birds were sora, pied-billed grebe, and Virginia rail. Sora and Virginia rail were the only species detected within the Herring River flood plain. Both were only detected auditorially, outside of the breeding season (Erwin, Conway, and Hadden 2002).

Salt Marsh Birds

Many birds use salt marsh habitats for breeding, foraging, and roosting, including several species of waterfowl, raptors, wading birds, shorebirds, and songbirds. Seasonal use of intertidal and salt marsh habitat also varies, with some species using the salt marsh for breeding and others during migration or the wintering period. Because freshwater habitats now dominate the once salt water marsh, many

species of birds found in the Herring River likely are different today when compared to what existed prior to the construction of the Chequessett Neck Road Dike.

Much of the change in bird occurrence and use likely has been the result in the change of a system dominated by intertidal flats and cordgrass (*Spartina* spp.) to one currently dominated by freshwater (cattail and common reed) and mixed upland vegetation. Concurrent with these changes has been the resulting poor water quality conditions in the Herring River (e.g., acidification and oxygen depletions) and the limited tidal range that has adversely affected forage fish populations important seasonal food resources for many birds (HRTC 2007).

Several high-priority tidal creek and saltmarsh-dependent species such as saltmarsh sharp-tailed sparrows (*Ammodramus caudacutus*), willets (*Catoptrophorus semipalmatus*), American black ducks (*Anas rubripes*), common and roseate terns (*Sterna hirundo* and *S. dougallii*), and several species of shorebirds and wading birds (USFWS 2006) commonly use nesting (*Spartina* dominated habitat) and/or foraging opportunities (primarily estuarine fish) in salt marshes adjacent to the Herring River. Other species, including but not limited to, osprey (*Pandion haliaetus*), and belted kingfisher (*Ceryle alcyon*) also forage in nearby salt marshes.

3.8.2 MAMMALS

Small mammals, such as mice, voles, and shrews are very abundant in marsh grasses around Herring River. Small mammals are an important component of Seashore fauna. In addition to their direct contribution to species richness, they play a major role in trophic dynamics, consuming plant material and invertebrates, and in turn serving as prey items for snakes, raptorial birds, and small to mid-sized carnivorous mammals.

The most common group of mammals found in coastal marsh habitats in the New England region are rodents, such as the meadow vole, which are an important prey species for northern harriers and other raptors (see “Section 3.7.5: Northern Harrier (*Circus cyaneus*) – Threatened”). Other common mammals of coastal marshes include red fox (*Vulpes vulpes*), opossum (*Didelphis virginiana*), chipmunk (*Tamias* spp.), and muskrat (*Ondatra zibethicus*) (Smith 1997).

In 2000 and 2001, small mammals were inventoried at the Seashore to determine their occurrence, abundance, and preferred habitats (Cook, Boland, and Dolbeare 2006). Sites in heathland, freshwater marsh, grassland, oak forest, and pine forest were sampled using live traps. A total of 1,829 individuals representing 11 species were captured. Two species of rodents, the white-footed mouse (*Peromyscus leucopus*) and the meadow vole, accounted for 59 percent of all individuals caught. Collectively, rodents made up 83.5 percent of the total. Small mammals were most abundant in woodland and wetland habitats, with decreasing numbers in grasslands, pine forests, and heathlands (Cook, Boland, and Dolbeare 2006).

The three most common species documented in sites near the Herring River were white-footed mouse, meadow vole, and the meadow jumping mouse (*Zapus hudsoniu*). Although species composition of small mammal communities at the Seashore are essentially the same as those found elsewhere on Cape Cod, relative abundance of species differs (Adler 1988). Compared to other sites studied in the Cape Cod region, masked shrew and meadow jumping mouse were more abundant, and short-tailed shrew and red-backed vole were less abundant at the Seashore. Regardless of whether they are considered a generalist or a specialist with regard to habitat structure, the occurrence and abundance of prevalent species appears related to site moisture (Smith 1997).

Larger mammals, such as coyotes (*Canis latrans*), river otters (*Lutra canadensis*), raccoons (*Procyon lotor*), and white-tailed deer (*Odocoileus virginianus borealis*) also use the freshwater habitats within Herring River flood plain. Within the Seashore, red fox and other carnivores prey upon nests of colonial waterbirds and shorebirds. Because small mammals serve as a food source for these predators, variation in their abundance may affect predation pressure on these birds (Cook, Boland, and Dolbeare 2006).

3.8.3 REPTILES AND AMPHIBIANS

The Seashore is an important area for reptiles and amphibians. In addition to its importance to the five species of migratory marine turtles foraging the offshore waters of Cape Cod, there are 23 species of reptiles and amphibians living their entire life at the Seashore within the Herring River project vicinity (table 3-16). Many of these species are important in the functioning of park ecosystems, consuming large quantities of small prey items, such as insects, and serving as prey for larger species of wildlife (Cook 2008a).

Turtles comprise a familiar group of vertebrates occupying a broad range of habitats and ecological functions. The Seashore supports populations of six species of nonmarine turtles, occupying terrestrial, freshwater, and estuarine habitats. In addition to the diamondback terrapin and eastern box turtle (discussed in “Section 3.7: Federal and State-listed Rare, Threatened, and Endangered Species”), these include presently common and/or widespread species such as the freshwater painted turtle (*Chrysemys picta*); snapping turtle (*Chelydra serpentina*); the less common musk turtle (*Sternotherus odoratus*); and spotted turtle (*Clemmys guttata*) (Cook 2008a).

Other species of reptiles and amphibians including the green frog (*Rana clamitans melanota*), Fowler’s toad (*Bufo woodhousii fowleri*), eastern spadefoot toad (*Scaphiopus holbrookii*), eastern garter snake (*Thamnophis s. sirtalis*), and northern water snake (*Nerodia s. sipedon*) use coastal marsh habitats similar to those found at the Herring River and Wellfleet Harbor estuary. The four-toed salamander (*Hemidactylium scutatum*) has also been documented in or adjacent to wetlands associated with the Herring River (Cook, Portnoy, Murphy et al. 2006).

A long-term monitoring effort of pond breeding amphibians was initiated in 2003 as a component of freshwater wetland monitoring in the Seashore (Cook, Schult, Goodstine et al. 2006). Occurrence and abundance of vernal pond breeding species spotted salamander (*Ambystoma maculatum*) and wood frog (*Rana sylvatica*) are currently monitored through egg mass counts. Occurrence and relative abundance of the breeding anuran community park wide is also monitored. Five monitoring sites are within the Herring River project area, near Bound Brook Island Road, and Pamet Point Road. Of those sites, spotted salamander egg masses were present during the 2003 to 2005 surveys, but wood frogs were not present at any site location during the surveys. Additional monitoring of these species is necessary to better characterize the important role amphibians play in wetland habitats, and how global, regional, and local factors alter the abundance, distribution, and structure of their communities.

TABLE 3-16: REPTILES AND AMPHIBIANS OF CAPE COD NATIONAL SEASHORE AND ADJACENT TOWNS, BASED ON RECENT RECORDS (1980 THROUGH SEPTEMBER 2008)

Species	Eastham	Wellfleet	Truro	Provincetown
Spotted salamander	X*	X*	X*	
Red-spotted newt	X*			
Redback salamander	X*	X*	X*	X*
Four-toed salamander	X*	X*	X*	
Eastern spadefoot toad (MA T)	X*	X*	X*	X*
Fowler's toad	X*	X*	X*	X*
Spring peeper	X*	X*	X*	X*
Grey treefrog	X*			X*
Bullfrog	X*	X*	X*	X*
Green frog	X*	X*	X*	X*
Wood frog	X*	X*		
Pickerel frog	X	X*	X*	
Leatherback turtle (marine)	X	X	X	X
Green turtle (marine)	X	X	X	X
Loggerhead (marine)	X	X	X	X
Hawksbill turtle (marine)	X	X	X	X
Kemp's ridley turtle (marine)	X	X	X	X
Snapping turtle	X*	X*	X*	X*
Musk turtle	X*	X*	X*	
Painted turtle	X*	X*	X*	X*
Spotted turtle	X*	X*	X*	X*
Diamondback terrapin (MA T)	X	X*	X	X*
Eastern box turtle (MA SC)	X*	X*	X*	X*
Eastern garter snake	X*	X*	X*	X*
Eastern ribbon snake	X*	X*	X*	X*
Northern water snake		X*	X*	
Northern ringneck snake	X*	X*	X*	X*
Black racer	X*	X*	X*	X*
Eastern hognose snake	X	X*	X*	X
Eastern milk snake		X*	X*	X*

Source: Cook 2008a.

MA SC and MA T denote Massachusetts special concern and threatened species, respectively.

*Species with documented presence inside Cape Cod National Seashore.

3.9 CULTURAL RESOURCES

The NPS has a unique stewardship role for cultural resources, reflected in regulation and policy. NPS categorizes cultural resources as archeological resources, cultural landscapes, historic districts and structures, museum objects, and ethnographic resources. For this final EIS/EIR, the categories of archeological resources and historic structures were retained for analysis.