The Northern Parula (*Parula americana*) is listed as a threatened species by the state. It is one of the smallest of North American wood warblers at 4¼ to 4¾ inches in length. It is usually found in red maple or white cedar swamps, river margins or pond shores and usually nests in association with the moss-like lichen Old-Mans Beard (*Usnea spp*.). In Mashpee it has been found nesting along the Mashpee River.

The Grasshopper Sparrow (*Ammodramus savannarum*) is a 4.5 to 5.5 inch sparrow that favors open fields, a vanishing habitat in Mashpee. It is listed as a threatened species by the state, with a most recent observation listed for Mashpee in 2004 and most likely to be found at Otis ANGB.

The Cooper's hawk (*Accipiter cooperii*) was formerly listed as a species of special concern but has now been removed from the state's list. It is a small bluish or brownish hawk with white breast and sides marked with brown. It has a rounded tail, long body and fairly straight-edged wings so that, in flight, it resembles a flying cross. It feeds almost entirely on songbirds and poultry and was present year-round at the time of Sargent's survey, with a summer group of birds moving south in the fall to be replaced by birds which have moved down from the north. He reported a likely nest site in the Noisy Hole area northeast of the Indian Meeting House.

When Sargent did his survey, the Bald Eagle (*Haliaeetus leucocephalus*) nested along the Mashpee River. Listed by the state as an endangered species, it still pays occasional visits to the river.

One additional species has become more and more familiar to Mashpee residents as it stages a spectacular recovery from near-extermination in the 1960s due to the widespread use of organochlorine pesticides such as DDT. The Osprey (*Pandion haliaetus carolinensis*) or "fish hawk" was downlisted in 1990 from a species of special concern to a "watch list" species after its statewide numbers increased from 45 nesting pairs in 1981 to over 200 and climbing in 1990. Its recovery was due to the banning of organochlorine pesticides and a cooperative effort with utility companies to erect artificial nesting poles near suitable water bodies. In Mashpee, such poles exist at New Seabury, South Cape Beach State Park and on Monomoscoy and Seconsett Islands. Additional opportunities for both artificial nesting poles and use of natural nesting trees exist both on the Mashpee River and Popponesset Bay and in the Jehu Pond area.

## 6. Insects and Other Invertebrates

No attempt will be made here to inventory all of the insects and other small creatures which occupy their niche in Mashpee's environment. Suffice it to say that we have a wide variety of mayflies, damselflies, dragonflies, neuroptera, caddisflies, bugs, beetles, flies, gnats, wasps, mosquitoes etc. We also have our share of sponges, planarians, leeches, crustacea, arachnids and other invertebrates.

Six of these are worth specific mention, however, as they have been listed by the state as threatened or of special concern. The Water-willow Stem Borer (*Papaipema sulphurata*), Pine Barrens Bluet (*Enallagma recurvatum*) and Scarlet Bluet (*Enallagma pictum*) are all listed as threatened. The coastal Barrens Buckmoth (*Hemileuca maia*), the Comet Darner (*Anax longipes*) and the New England Bluet (*Enallagma laterale*) are listed as species of special concern.

Gerhard's Underwing Moth (*Catocala herodias gerhardi*) and the Spiny Oakworm (*Anisota stigma*), which had previously been listed in Mashpee as threatened and as of special concern respectively, are no longer listed.

Both the Barrens Buckmoth and Gerhard's Underwing Moth inhabit extensive areas of pitch pine barrens in sandy soil that support an abundance of their two main larval foodplants: scrub oak (*Quercus ilicifolia*) or dwarf chestnut oak (*Quercus prinoides*). As their larvae hatch (Gerhard's in mid-May, Buckmoth in late May or early June), they immediately begin to feed on their host plant. Because they depend totally on these specific plants at this critical stage in their life-cycle, preservation of this specific habitat is therefore critical to their survival. Aside from avoiding land development and fragmentation, periodic fires are critical to prevent invasion by vegetation which could shade the sun-loving oaks.

Because of current fire suppression policies, the only way that appropriate habitat can be maintained is through controlled burning on large acreages. In order to accomplish that in Mashpee's pine barrens, located between Great Neck Road South, Route 28 and Red Brook Road, and in a smaller area west of the Quashnet River, the Town and the Mass. Division of Fisheries and Wildlife have acquired several hundred acres with the potential for controlled burns.

The Water-willow Stem Borer and the Comet Darner rely on a much wetter and equally limited habitat for their survival. The Borer's larvae feed exclusively on Water-willow (*Decodon verticillatus*) located in the shallowest edges of vernal pools and seasonally-flooded swamps and along the upland edges of streams, ponds and other permanent water bodies. The nymph of the Comet Darner feeds on aquatic vegetation in the shallow edge of coastal plain ponds. Both habitats are very sensitive to water level fluctuations, so protection of the species will require both preservation of land near the critical water bodies and careful management of nearby groundwater withdrawals and other activities which could affect water levels.

The threatened Pine Barrens Bluet and the New England Bluet, a species of special concern, are closely related blue and black colored damselflies often found together along sandy shallow shores of our coastal plain ponds, particularly where there are large amounts of vegetation close to shore, especially Military Rush (*Juncus militarus*), and yearly natural fluctuations in water levels. The nymphs are aquatic and live among aquatic vegetation and debris. The adults inhabit emergent vegetation along the shore and in wetlands, as well as nearby uplands.

Another Damselfly, the threatened Scarlet Bluet, is the only red Bluet in the Northeast. It is found in acidic, sandy ponds like our coastal plain ponds with floating vegetation such as water lilies. Nymphs are aquatic and live among the aquatic vegetation, while adults spend much of their time flying out over the water, alighting on lily pads. When the nymphs emerge into adults, the fly off to nearby uplands for a few weeks to feed and mature before they return to the wetlands.

All three Damselflies are threatened by degaration and destruction of the wetlands which are their breeding and nymphal habitat. Threats include construction and development, artificial drawdown of pond water level by groundwater pumping, and runoff from roadways and septic

systems. In addition, high-impact recreational uses such as ORVs driving through pond shores, which may destroy breeding or nymphal habitat, and motor boats, whose wakes swamp delicate emerging adults, are threats. Since they spend time away from their ponds maturing, it is important to maintain natural upland habitat adjoining their breeding sites for roosting and hunting. Without protected uplands the delicate newly emerged adults are more susceptible to predation and mortality from inclement weather.

## 7. Wildlife Migration Corridors

Review of road kill records kept by the Mashpee Animal Control Officer as well as discussions with the staff of the Buzzards Bay office of the Division of Fisheries and wildlife indicate that there are very few clear wildlife corridors, other than small scale animal trails, evident in Mashpee. The only significant wildlife movement corridors appear to follow the courses of the Mashpee and Quashnet Rivers in a general north to south direction from northern Mashpee and the Massachusetts Military Reservation to the South Mashpee Pine Barrens, "Bufflehead Bay" and South Cape Beach areas.

## 8. Rare, Threatened and Endangered Species

Mashpee species listed as endangered, threatened, of special concern or watch list have been described in the previous sections along with discussion of some of the steps necessary to protect them. Additional reference material provided by the state's Natural Heritage and Endangered Species Program is included in the appendix.

## MASHPEE SPECIES - ENDANGERED, THREATENED OR SPECIAL CONCERN

Massachusetts Natural Heritage & Endangered Species Program, August, 2007

| Taxonomic Group | Scientific Name | Common Name | MESA Status | Federal Status | Most Recent Observation |
|---|---|---|---|---|---|
| Amphibian | Hemidactylium scutatum | Four-toed Salamander | SC | | 2006 |
| Bird | Botaurus lentiginosus | American Bittern | E | | 1965 |
| Bird | Circus cyaneus | Northern Harrier | T | | 2004 |
| Bird | Charadrius melodus | Piping Plover | T | T | 2002 |
| Bird | Bartramia longicauda | Upland Sandpiper | E | | 2004 |
| Bird | Sterna dougallii | Roseate Tern | E | E | 2002 |
| Bird | Sterna hirundo | Common Tern | SC | | 2002 |
| Bird | Sterna antillarum | Least Tern | SC | | 2004 |
| Bird | Tyto alba | Barn Owl | SC | | 1991 |
| Bird | Parula americana | Northern Parula | T | | 1984 |
| Bird | Ammodramus savannarum | Grasshopper Sparrow | T | | 2004 |
| Butterfly / Moth | Hemileuca maia | Barrens Buckmoth | SC | | 2003 |
| Butterfly / Moth | Papaipema sulphurata | Water-willow Stem Borer | T | | 1994 |
| Dragonfly / Damselfly | Anax longipes | Comet Darner | SC | | 1996 |
| Dragonfly / Damselfly | Enallagma laterale | New England Bluet | SC | | 2000 |
| Dragonfly / Damselfly | Enallagma recurvatum | Pine Barrens Bluet | T | | 1996 |
| Dragonfly / Damselfly | Enallagma pictum | Scarlet Bluet | T | | 1999 |
| Fish | Lampetra appendix | American Brook Lamprey | T | | 1989 |
| Mussel | Alasmidonta undulata | Triangle Floater | SC | | 1997 |
| Mussel | Leptodea ochracea | Tidewater Mucket | SC | | 1999 |
| Mussel | Ligumia nasuta | Eastern Pondmussel | SC | | 1997 |
| Reptile | Malaclemys terrapin | Diamondback Terrapin | T | | 1971 |
| Reptile | Terrapene carolina | Eastern Box Turtle | SC | | 2004 |
| Vascular Plant | Ophioglossum pusillum | Adder's-tongue Fern | T | | 1960's |
| Vascular Plant | Sphenopholis pensylvanica | Swamp Oats | T | | 1967 |
| Vascular Plant | Dichanthelium wrightianum | Wright's Panic-grass | SC | | 1926 |
| Vascular Plant | Dichanthelium ovale ssp. pseudopubescens | Commons's Panic-grass | SC | | 1968 |
| Vascular Plant | Dichanthelium dichotomum ssp. mattamuskeetense | Mattamuskeet Panic-grass | E | | 1989 |
| Vascular Plant | Lachnanthes caroliana | Redroot | SC | | 1988 |
| Vascular Plant | Rhynchospora inundata | Inundated Horned-sedge | T | | 1926 |
| Vascular Plant | Lipocarpha micrantha | Dwarf Bulrush | T | | 1999 |
| Vascular Plant | Sagittaria teres | Terete Arrowhead | SC | | 1997 |
| Vascular Plant | Polygonum puritanorum | Pondshore Knotweed | SC | | 2003 |
| Vascular Plant | Utricularia subulata | Subulate Bladderwort | SC | | 1931 |
| Vascular Plant | Corema conradii | Broom Crowberry | SC | | 1985 |
| Vascular Plant | Helianthemum dumosum | Bushy Rockrose | SC | | 1935 |