



Natural Heritage & Endangered Species Program

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Massachusetts Division of Fisheries & Wildlife

Umbur Shadowdragon *Neurocordulia obsoleta*

State Status: **Special Concern**

Federal Status: **None**

SPECIES DESCRIPTION: The Umbur Shadowdragon (*Neurocordulia obsoleta*) is a large insect of the order Odonata and suborder Anisoptera (the dragonflies). The shadowdragons (genus *Neurocordulia*) belong to a family of dragonflies known as the emeralds (Corduliidae). Most emeralds are characterized by moderate pubescence (hairiness) on the thorax, brilliant green eyes in mature individuals, and metallic green highlights on the face, thorax and abdomen.

Shadowdragons are one of the exceptions, being somber in coloration, with browns and dull yellows, and without metallic highlights or green eyes. The Umbur Shadowdragon is a typical member of the genus with an overall chocolate brown coloration. The face is largely olive/brown with the lower section (labrum) dull yellow. The large eyes, which meet at the top of the head, are brown to chestnut. The brown of this insect's hairy thorax is broken only by a pair of small, yet distinct, yellow markings located on the lower middle part of each side of the thorax. The tube-shaped abdomen is brown with yellow spots on each side of segments 4 through 8 (dragonflies and damselflies have 10 segments on their abdomen). There are no lateral spots on segment 9, though segment 10 is mostly yellow in color. The hind wings have a brown, triangular spot at their bases, while the forewings have a small rectangular shaped brown marking at the base of their wings. Also, there is a row of small brown spots that extend halfway out the leading edge of each wing, ending with a larger brown spot located at the nodus (the forward midpoint of each wing). Otherwise, the wings can be mostly clear to smoky brown (especially in older individuals). The Umbur Shadowdragon is a strong flier. When at rest, it hangs vertically from the branch of a tree or bush, with wings held horizontally out from the body.

Adult Umbur Shadowdragons range from about 1.7 to 1.9 inches (43 to 48 mm) in length. Although male and female Umbur Shadowdragons appear similar in their

coloration, the female is more heavily built with a thicker abdomen, especially at the base.

Neurocordulia is one of the few genera of emeralds where all of the species lack metallic green coloration and never have green eyes. The baskettails (genus *Epitheca*) completely lack these metallic highlights as well, and are similar in size and shape. However, these dragonflies generally have green eyes in mature adults and lack the rectangular spot in the forewing and the spotting in the leading edge of the wings of the Umbur Shadowdragon.

The nymphs can be distinguished by characteristics of the lateral spines on segment 9 of the abdomen, as reported in keys by Soltesz (1996) and Needham *et al.* (1999).



A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

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SIMILAR SPECIES: The Umber Shadowdragon’s sister species, the Stygian Shadowdragon (*Neurocordulia yamaskanensis*) (the only other member of this genus to occur in Massachusetts), differs in several ways from the Umber Shadowdragon. The Stygian Shadowdragon is larger than its cousin (1.8 to 2.2 inches (45 to 55 mm)), lacks the spotting found in the leading edges of the wings of the Umber Shadowdragon, and is lighter overall in coloration. The Stygian Shadowdragon is also protected in Massachusetts and is considered a species of Special Concern.

HISTORY/BEHAVIOR: Shadowdragons are crepuscular, a behavioral clue that can help to identify these species. Umber Shadowdragons are on the wing from late May through early August. Shadowdragons, formerly referred to as “twilight skimmers”, are unique among dragonflies for their strictly crepuscular habits. They are seen for only a short period just after sunset until dark, a window of no more than an hour. During this short time, there is a frenzy of feeding and mating as the shadowdragons try to complete the necessary life functions in an extremely abbreviated activity period. Presumably, these insects spend the rest of their time roosting in trees near their breeding habitat. Due to its unusual and elusive lifestyle, there has been little published on the life cycle of the Umber Shadowdragon. However, the life cycles of better-known species are probably similar and can help supplement our knowledge of the Umber Shadowdragon.

Dragonflies, like their cousins the damselflies (suborder Zygoptera), have two distinct life stages: an aquatic larval stage (nymph) and a flying adult stage. The nymphs of the Umber Shadowdragon spend much of their time clinging to the undersides of rocks, sticks and other debris in the water waiting for an unfortunate animal to wander within reach. Dragonfly nymphs are obligate carnivores, feeding on almost any animal of appropriate size. Prey includes a variety of aquatic insects, small fish, and tadpoles. The time it takes for full development of the nymph of the Umber Shadowdragon is not known, though for similarly sized dragonflies it usually takes about a year. The final stage of development is emergence from the aquatic larval stage to the flying adult. The nymph of the Umber Shadowdragon crawls up onto a solid structure such as a tree, rock, bridge abutment, or bank to emerge. Soon after the adult has fully emerged from its nymphal

exoskeleton (the exuviae), the insect takes its first flight. At this time, the adults are very soft and vulnerable to predators and other threats. For this reason, the dragonfly’s maiden flight will take it away from the breeding habitat and into the woods where it can harden and mature in relative safety. This time of wandering is also spent feeding. Adult dragonflies may be found in fields and forest clearings where they prey upon small, aerial insects such as flies and mosquitoes. Although they disperse following emergence, adult shadowdragons are rarely seen away from the breeding site and it is unclear exactly where they spend this maturation period. It is presumed that much of this time is spent in the treetops. When the dragonfly is ready to breed, usually within a week or so, they return to the lake or river.

Breeding in Massachusetts probably occurs from mid-June through mid-July. At the breeding habitat, male Umber Shadowdragons spend much of their time swiftly patrolling the edges of the lake or river searching for females with which to mate. The patrolling flight is often very near the surface of the water and can be erratic with quick changes in direction. Following mating, oviposition occurs. Females of the genus *Neurocordulia* oviposit alone and deposit their eggs directly into the water by tapping the tip of their abdomen on its surface every few feet. While ovipositing, they fly back and forth at a very rapid rate only inches above the surface of the water.

UMBER SHADOWDRAGON FLIGHT PERIOD

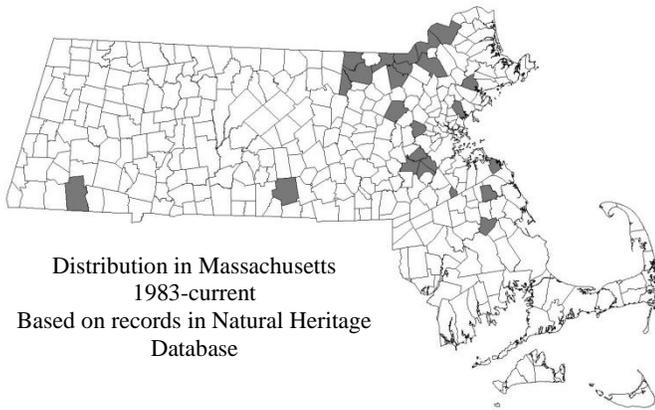
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

HABITAT: The Umber Shadowdragon is found on lakes of various sizes, and on medium to large rivers that are relatively unvegetated. They seem to do well in artificially created habitats, such as reservoirs and dammed sections of rivers, where they have been found in Massachusetts.

RANGE: The Umber Shadowdragon is found throughout much of the eastern United States. It is recorded from as far north as Maine, New York, and Michigan, south to Oklahoma, Louisiana and northern Florida.

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POPULATION STATUS IN MASSACHUSETTS:

The Umber Shadowdragon is listed as a Species of Special Concern in Massachusetts. As with all species listed in Massachusetts, individuals of the species are protected from take (picking, collecting, killing...) and sale under the Massachusetts Endangered Species Act. The species is known from a few sites in the state; however, due to its elusive nature and crepuscular habits, it is possible that populations of this dragonfly have been overlooked.

MANAGEMENT RECOMMENDATIONS: As for many rare species, exact needs for management of the Umber Shadowdragon are not known. As an inhabitant of lakes, ponds, and rivers which are popular recreation spots for large numbers of people, the Umber Shadowdragon may be vulnerable to overuse of these habitats. Power boats creating increased wave action could affect these dragonflies as they emerge near the surface of the water and are very vulnerable. Also, as shorelines are converted to lawns and public beaches, Umber Shadowdragons and other dragonflies have fewer places they can safely emerge. Eutrophication and aquatic plant overgrowth in lentic habitats may also be a threat to this species. Umber Shadowdragons also may be vulnerable to chemical pollution and runoff from roadways. The upland borders of their aquatic habitats are also crucial to the well-being of odonate populations as they are critical for feeding, resting, and maturation. Development of these areas should be discouraged and preservation of the remaining undeveloped upland bordering the river should be a top priority.

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