



Natural Heritage & Endangered Species Program

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Massachusetts Division of Fisheries & Wildlife

Skillet Clubtail *Gomphus ventricosus*

State Status: **Threatened**
Federal Status: **None**

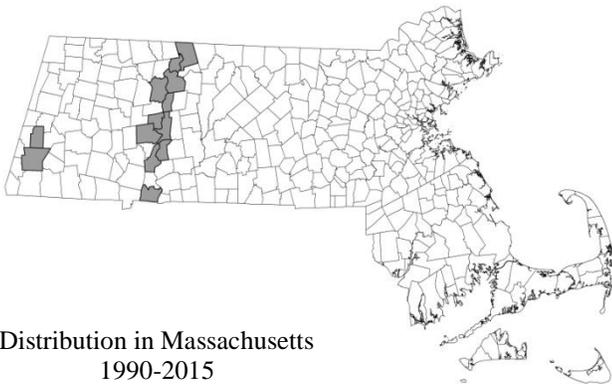
DESCRIPTION: The Skillet Clubtail is a large, semi-aquatic insect in the order Odonata, suborder Anisoptera (the dragonflies). Like all dragonflies, Skillet Clubtails have long, slender abdomens, four wings (two forewings and two hind wings) with dense venation, and large heads with huge eyes and powerful, chewing mouthparts. They are members of the family Gomphidae, or clubtails, a large, diverse group comprising about 100 species in North America. Clubtails are named for the lateral swelling at the tip of the abdomen (the seventh through ninth segments) that produces a club-like appearance. The extent of this swelling varies greatly, from non-existent to extreme, depending upon the species. The club is generally more pronounced in males than females. The purpose of the club is uncertain, but it may be used for displays, or it may serve an aerodynamic function. Clubtails are further distinguished from other dragonflies by their widely separated eyes, wing venation characteristics, and behavior. Many species are very elusive and thus poorly known.



Photo © Blair Nikula

The Skillet Clubtail is in the subgenus *Gomphurus*, a group characterized by having the broadest clubs of any of the Gomphidae. Skillet Clubtails are dark brown dragonflies with pale yellow to greenish markings on the body and bright green eyes. The top of the thorax is marked with thick, pale stripes that form a rearward-facing U pattern. There are broad, pale, lateral stripes on the sides of the thorax. The pale thoracic markings are bright yellow in immatures, but become a dull grayish-green in mature individuals. The dark abdomen has thin, yellow markings on the tops of segments one through seven, and on the sides of the club. The face is plain, dull yellow and the legs are blackish. The sexes are similar in appearance, though the females have thicker abdomens and a less developed, though still prominent, club.

Adult Skillet Clubtails range in length from 1.8 to 2.1 inches (45 mm - 53 mm), with a wingspan averaging 2.5 inches (63 mm).



Distribution in Massachusetts
1990-2015
Based on records in
Natural Heritage Database

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1 Rabbit Hill Rd., Westborough, MA; tel: 508-389-6300; fax: 508-389-7890; www.mass.gov/dfw

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SIMILAR SPECIES: The Skillet Clubtail is one of three species in the subgenus *Gomphurus* in Massachusetts. The other two, the Cobra Clubtail (*Gomphus vastus*) and Midland Clubtail (*G. fraternus*), are very similar in appearance. As in most clubtails, the shape of the male hamules (located on the underside of the second abdominal segment) and terminal appendages, and the female vulvar laminae (located on the underside of the eighth and ninth abdominal segments) provide the most reliable means for identification. Skillet Clubtails are the smallest and most slender of the three *Gomphurus* species in the state, but have the widest club, giving them a distinctive shape. The Skillet Clubtail has a plain yellow face, without the black cross-striping present on the Cobra Clubtail, and lacks the yellow spot on the top of abdominal segment eight that characterizes the Midland Clubtail. The pale stripes on the top of the thorax are thicker than on the other two species. The nymphs can be distinguished by characteristics of the palpal lobes on the labium, as per the keys in Soltesz (1996) and Needham et al. (1999).

HABITAT: Skillet Clubtails inhabit rivers of various sizes, but apparently have never been recorded in numbers anywhere. There are recent records from the Connecticut River, from Mt. Holyoke in Hadley, from the Mill River in Deerfield, adjacent to the Housatonic River in Sheffield, and from a stream feeding into the Merrimack River in Haverhill.

LIFE-HISTORY/BEHAVIOR: Skillet Clubtails are among the most poorly known odonates in North America. Adults have been recorded from late May into mid-July.

Although little is known about the life history of Skillet Clubtails, it is likely similar to other *Gomphurus* species. The nymphs are aquatic and spend at least a year, probably more, maturing, undergoing several molts during this period. They burrow into the sandy bottom of rivers and feed upon a variety of aquatic life; they are voracious predators. When ready to emerge, the nymphs crawl out onto exposed rocks, emergent vegetation, partially submerged logs, or the steeper sections of river banks, where they undergo transformation to adults, a process known as “eclosion.” Eclosion generally takes place very early in the morning, presumably to reduce exposure to predation. The cast exoskeletons, known as exuviae, can be identified to species and provide a

reliable, useful means to determine the presence of a species.

As soon as the freshly emerged (teneral) adults are dry and the wings have hardened sufficiently, they fly off to seek refuge in the vegetation of adjacent uplands. Here they spend several days or more feeding and maturing, before returning to their breeding habitats. Clubtails feed on aerial insects which they capture in short sallies from their perches.

When mature, the males return to the water where they are most often found perched in a more or less horizontal position on the broad leaves of overhanging vegetation. They have also been reported to perch on exposed rocks and to hover briefly over rapids, presumably in search of females. Females generally appear at water only for a brief period when they are ready to mate and lay eggs. When a male encounters a female, he attempts to grasp the back of her head with claspers located on the end of his abdomen. If the female is receptive, she allows the male to grasp her, then curls the tip of her abdomen upward to connect with the male’s sexual organs located on the underside of his second abdominal segment, thus forming the familiar heart-shaped “wheel” typical of all Odonata, with the male above, the female upside down underneath. In this position, the pair flies off to mate, generally hidden high in nearby trees where they are less vulnerable to predators. The duration of mating in Skillet Clubtails has not been recorded, but in similar-sized odonates typically lasts from several minutes to an hour or more.

Oviposition by female Skillet Clubtails has not been reported, but in similar species involves flying low over the water, periodically striking the surface with the tips of the abdomen to wash off the eggs. It is not known how long the eggs take to develop.

RANGE: Skillet Clubtails range throughout northeastern North America from Nova Scotia, New Brunswick, Quebec, and Ontario, south to North Carolina, Mississippi, and Iowa. They appear to be scarce throughout their range. In New England, the species has been recorded in Vermont, New Hampshire, Massachusetts, and Connecticut.

POPULATION STATUS IN MASSACHUSETTS: The Skillet Clubtail is not often recorded in Massachusetts, and is listed as Threatened. As with all

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SKILLET CLUBTAIL FLIGHT PERIOD

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

species listed in Massachusetts, individuals of the species are protected from take (picking, collecting, killing, etc...) and sale under the Massachusetts Endangered Species Act. Increased field work recently has resulted in several new records, but the species' status remains unclear.

MANAGEMENT RECOMMENDATIONS: As for many rare species, the exact management needs of Skillet Clubtails are not known. With most odonates water quality is critical to their well-being, and Skillet Clubtails are undoubtedly no exception. Potential threats to the water quality include industrial and agricultural pollution, sewage overflow, salt and other road contaminant run-off, and siltation from construction or erosion. The impact of the disruption of natural flooding regimes by damming and water diversion projects on Skillet Clubtails and other riverine species is unknown but may be considerable. Extensive use of the river by power boats and jet skis is a serious concern, particularly during the early summer emergence period of Skillet Clubtails (as well as several other clubtail species). Many species of clubtails, as well as other riverine odonates, eclose low over the water surface on exposed rocks, emergent or floating vegetation, or steep sections of the river bank where they are imperiled by the wakes of high speed watercraft. Low-level recreational use from fishermen and canoeists probably has little impact on odonate populations, but should be monitored. The upland borders of these river systems are also crucial to the well-being of odonate populations as they are critical for feeding, resting, and maturation, particularly for the teneral adults. Development of these areas should be discouraged, and the preservation of remaining undeveloped upland should be a top priority.

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