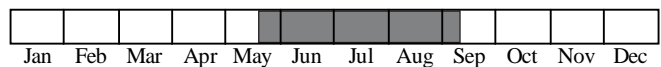


Best Survey Period



Status: State special concern

Global and state rank: G4/S1S2

Family: Gomphidae (clubtails)

Range: Found locally in much of the eastern United States from Iowa and Minnesota east to Maine and Virginia; south to Kentucky and northern South Carolina; north to Michigan and Maine. Species also present in central Mississippi, central Alabama, and central Georgia (Dunkle 2000).

State distribution: Has only been detected in Delta, Jackson, and Midland counties. However, may be present but undetected in other areas due to lack of surveying (Michigan Natural Features Inventory 2007).

Recognition: Approximately **2.1 inches (5.4 cm) long**, the riverine snaketail is smaller than other *Stylurus* species but possesses the largest club. **Abdominal segments 8 and 9 have large yellow lateral spots**, with females appearing more yellow than males and with black lateral edges. **Thorax is marked with a yellow triangle on top between two yellow stripes**. Toward the rear the thorax stripes decrease to become more narrow and are only on the sides. The **legs are black with hind thighs yellow**.

The head of the riverine snaketail is mottled black with **dark green eyes** (Dunkle 2000, Mead 2003). The triangle on the thorax and small size provide obvious means to distinguish this species from other similar species.

Best survey time: Adults can be surveyed from the third week in May through the second week in September using aerial net/visual surveys. Dragonflies can be observed foraging from perches in grass, shrubs, and undergrowth. Males tend to patrol in the middle of the day demonstrating fast flight over midstream. Exuviae (cast skin of final instar larvae) surveys can be used to survey for both adults and larva from the fourth week in May until the second week in September. During these surveys observers should search banks and rocks in appropriate habitat for the cast skin of larvae (O'Brien 1999, Foster and Soluk 2004). A D-frame net can be used to survey for larvae nearly year-round (Michigan Natural Features Inventory 2007).

Habitat: The riverine snaketail can be found in riparian corridors. Typically associated with clear, medium to large, rivers of swift-running current with sand, gravel, or mud benthos. This species tend to forage from perches in the undergrowth and males can be observed patrolling over the middle of the river.



Biology: Dragonflies of the genus *Stylurus* are commonly called “hanging clubtails”, as the males patrol for extended periods of time and then perch on the top of leaves bending them down until the dragonfly is hanging almost vertically. The male riverine snaketail specifically patrols with fast flight over the middle of the stream during the middle of the day. This species can be found foraging in both the shady and sunny underbrush and grassy areas near rivers. This taxonomic family mates on perches for approximately 10 minutes at a time. It is considered one of the more approachable dragonflies of this genus, allowing observers within close range for investigation.

Conservation/management: Because the life cycle of dragonflies is closely intertwined with aquatic systems they are particularly sensitive to water pollution and degradation of these systems (Merritt and Cummins 1996). This is especially true for clubtails, such as the riverine snaketail, as it lives in an aquatic state for two years. When the fast moving rivers on which this species depends on are dammed, or the banks are flattened and river widened due to grazing, the water flow slows, water temperature increases, and dissolved oxygen decreases. Increases in water temperature and related decreases in dissolved oxygen can also occur when riverine buffers are not left intact during forestry or agricultural practices, or urbanization. Lack of or improper protection of streams from soil erosion and runoff can change the stream bed characteristics and shade out important plants. Stream buffer zones of at least 100 feet of natural vegetation are recommended (Dunkle 2000). Water pollution such as herbicides, pesticides, sewage, and other chemicals from urban, municipal, agricultural, and industrial sources can directly kill dragonfly larvae or increase bacterial and algae growth in their habitat. Large fluctuations in water levels, due to man-made dam management or wake-creation by boat traffic, can negatively affect dragonflies in several ways. When water levels are dramatically reduced there is little vegetation remaining on the stream edge, thereby eliminating foraging habitat and overall changing the habitat. Wave action from boat traffic can increase the turbidity of rivers and directly kill emerging dragonflies if flooded at particular stages of development. This species is also directly impacted by dredging, channelization, invasive plants, and invasive animals (Moore 1997, Dunkle 2000).

Research needs: We need additional research on the distribution and population status within Michigan for better protection of this rare species. We have little information on this species life history within the state. Specifically, additional research is needed on the habitat use as well as the threats to and limitations on populations of this rare species (Michigan Natural Features Inventory 2007).

Related abstracts: Hine’s emerald (dragonfly), incurvate emerald (dragonfly), rapids clubtail (dragonfly)

Selected references:

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