Common Name: SAY'S SPIKETAIL

Scientific Name: *Cordulegaster sayi* Selys

Other Commonly Used Names: none

Previously Used Scientific Names: Generic names *Zoraena* and *Archegaster* have been proposed but not accepted.

Family: Cordulegastridae

Rarity Ranks: G2/S1S2

State Legal Status: Threatened

Federal Legal Status: none

Description: Adults are typically 60 - 69 mm (2⅜ - 2¾ inches) in total length, making this the smallest spiketail in its range. Both sexes have similar coloration patterns. The thorax is dark brown, with one shoulder and two pale-colored, lateral stripes. Pale colors are white in younger individuals and become yellow in older adults of both sexes. The thorax has magenta dorsal coloring around the two shoulder stripes, and a magenta stripe between the two pale lateral stripes. Eyes are gray to pale green. The base color of the abdomen is mostly dark brown. Segments 3 - 8 each have two pale markings: a very thin dorsal line at the posterior edge (looks like a ring from overhead) and a thicker complete ring near the anterior end. When viewed laterally, the thicker ring is angled to the rear dorsally. More pictures are available at Giff Beaton's website.

Similar Species: The only other ringed spiketail in the south is the much larger tiger spiketail, but this species does not occur within the range of Say's spiketail. All other spiketails in its range have spots or other abdominal markings but not rings, and no other spiketail in the east has magenta coloring. Resembles some *Macromia* cruisers and the stream cruiser (*Didymops transversa*), but these species have only one lateral thoracic stripe and very different behavior.

Habitat: Adults feed in scrub oak sandhills and breed in mucky seeps adjacent to hardwood forests. This habitat is very localized and patchily distributed within the species' range. A recent study noted their co-occurrence with salamander larvae in the genus *Pseudotriton*.

Diet: Adults eat almost any flying insect prey they can catch, especially wasps and bees. Larvae eat a variety of aquatic invertebrates.

Life History: Adults are typically on the wing from the middle of March to late April. Known flight dates in Georgia are 8 March to 23 April. Known flight dates for the species across its entire range are 27 February to 23 April. Adults emerge by crawling out of the seep and then move away from the larval habitat into nearby fields and other areas of open habitat. After maturing for a week or two, they return to the breeding habitat and set up territories. Say's spiketail can be difficult to find in breeding habitat and is most often encountered while feeding in nearby scrub oak sandhills, brushy fields, or grasslands. It frequently perches low to the ground in these feeding habitats. Bees and wasps are favored food items, and this species has been observed patrolling slowly around the crowns of trees in flower waiting to capture pollinating bees or wasps. Before females approach the breeding habitat, males slowly patrol up and down the seep and frequently perch within or adjacent to the breeding habitat. Mating takes place while perched, and females oviposit by hovering and thrusting the tip of the abdomen vertically into the substrate. Long thought to have a two-year cycle, recent studies of larval populations suggest a three-year larval period.

Survey Recommendations: Say's spiketail may be surveyed for as adults or as larvae, but are more easily surveyed for as larvae. Adult surveys should focus on the correct habitat during late March or April, on sunny or partly cloudy days with the temperature above 24°C (75°F). Immature adults are more difficult to find as they are spread out away from the seep in open habitat. Larvae are difficult to find within the mucky seeps in which this species is found, but careful sifting through muck in deeper sections of the seep will eventually produce larvae of the different age classes. Final instar larvae are very difficult to find.

Range: Say's spiketail is considered a longleaf-pine ecosystem endemic and is restricted to the eastern Coastal Plain sandhills of Georgia and Florida. However, one specimen from extreme southeast Alabama has been reported to be this species. It is currently known from about 25 sites rangewide, with most of these sites (17) occurring in Georgia. Recent surveys suggest that extirpations have occurred at some of these sites where habitats have been altered or impacted by recent drought. This applies at least to the Coffee County site and one each of the Emanuel and Tattnall County sites. Also, many of these sites are very small in size and support only a very small number of adults (<30).

Threats: The largest manageable threat to this species is probably commercial or residential development of habitat, including development of the open foraging habitat required for maturation of adults. Drought-related loss of habitat is also a significant threat.

Georgia Conservation Status: About half of the sites for this species in Georgia are on public land, including two protected populations at Fort Stewart in Evans County, and one small population each at Gordonia-Altamaha State Park in Tattnall County and Penholoway Swamp Wildlife Management Area in Wayne County. Other protected populations are on lands managed by The Nature Conservancy. Feeding and maturing areas near the Tattnall population have been seriously degraded by the development of the park's golf course and lake. This occurred before this species was state listed, which should improve coordination of efforts to protect this species on state-owned lands in the future. No other populations in Georgia are protected, although at least two populations are on private land owned by conservation-minded property owners.

Conservation and Management Recommendations: Conservation groups should work cooperatively with developers and local governments to minimize the impacts from new home construction and commercial development. The Nongame Conservation Section can be contacted for site-specific location information, which may help avoid impacts to known populations. Surveys carried out during 2006-2008 documented 9 currently occupied sites, but there is a need for additional surveys to document new populations and for periodic monitoring of known populations.

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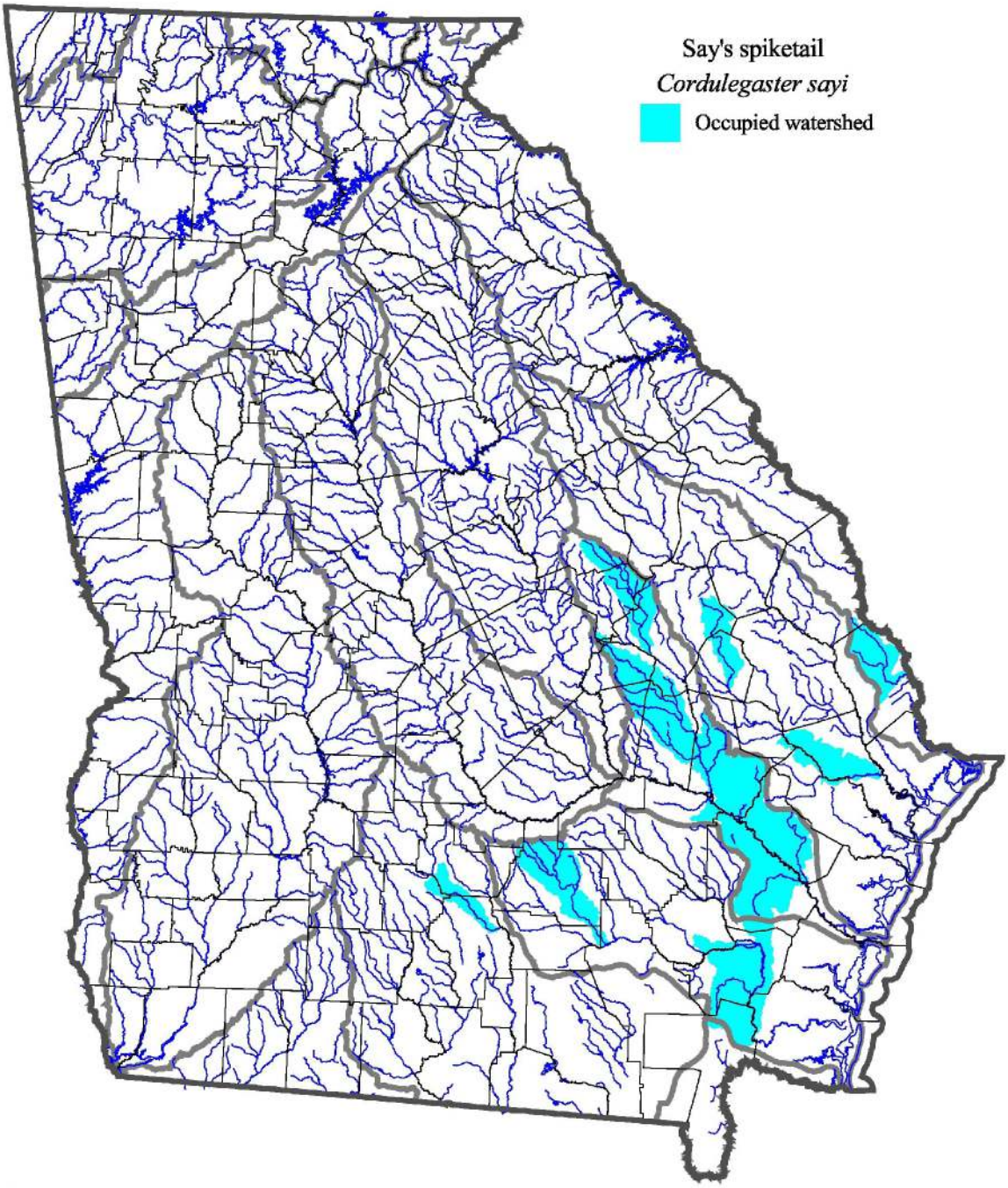
Giff Beaton, June 2008: original account



Watersheds (Huc 10) with known occurrences. Streams, county lines, and major river basin boundaries are also shown. Map generated from GADNR (Nongame Conservation Section) data March 2009.