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Chilostigma itascae Wiggins, 1975

Headwaters Chilostigman Caddisfly

MN Status:

endangered

Federal Status:

none

CITES:

none

USFS:

none

Group:

insect

Class:

Insecta

Order:

Trichoptera

Family:

Limnephilidae

Habitats:

**Wet Meadow/Carr,
Small Rivers and
Streams**



Basis for Listing

The headwaters chilostigman caddisfly appears to be endemic to Minnesota and is known worldwide from less than 20 specimens collected in 1974, 1995, 2001, and 2005 from Itasca State Park in north central Minnesota and from Lake County in northeastern Minnesota. Given its extremely restricted distribution, the headwaters chilostigman caddisfly was listed as an endangered species in Minnesota in 1996 to insure that extant populations are protected from extinction.

Description

Only two species of *Chilostigma* are known worldwide: *C. itascae* and the Scandinavian *C. sieboldi*. Caddisfly species can only be identified by examining their abdominal processes under a microscope. No identification keys are currently available to separate the two *Chilostigma* species. Macroscopically, adult headwaters chilostigman caddisfly are 8-10 mm (0.31-0.39 in.) in length with brown wings bearing black hairs. Larvae of the genus *Chilostigma* are unknown, although two unusual limnephilid larvae were collected in August 1974 from Itasca State Park and subsequently described as "likely candidates" for headwaters chilostigman caddisfly larvae (Wiggins 1996). An intense effort to find and positively correlate headwaters chilostigman caddisfly larvae through rearing to adult was unsuccessful (**Holzenthal et al. 1997**).

Habitat



Map Interpretation



Map Interpretation

The location where the headwaters chilostigman caddisfly was first discovered is a small, meandering, silt-bottomed stream that flows through a wet meadow with several spring seeps. It was from these spring seepage areas that possible larvae were found and described (Wiggins 1996). The more recent observations were in rich swamp to poor fen habitats within a large, acid to minerotrophic peatland complex. These have a loose to moderately dense canopy of black spruce and tamarack, with some white cedar, and a shrub layer of alder and bog birch. Sphagnum mosses, sedges, and several heaths dominate the ground layer. Shallow pools among the hummocks and narrow streamlets are a characteristic feature where adults were observed crawling around on the snow. Adults were also observed in an aspen-mixed conifer forest on a ridge adjacent to this peatland complex. Presumably these wandered from the peatland where larval development took place.

Biology / Life History

Adult headwaters chilostigman caddisfly have been collected from January through March. Emergence and activity are likely strongly dependent on local weather conditions. Adults are active on the surface of the snow on sunny days. Interestingly, *C. sieboldi* adults are also found on snow during late fall and early spring (Schmid 1952). Definitively identified larvae of the headwaters chilostigman caddisfly have not been collected so it unknown when mature larvae are present. The species' unusual winter emergence could be the result of larvae maturing and pupating in late summer or fall and delaying emergence until late winter, or it could be that the larvae do not mature and pupate until sometime in winter.

The species may take several years to develop from egg to adult as evidenced by the failure to detect any adults prior to the 1995 observations despite a rigorous collecting effort by Monson (1994) between 1988 and 1993, including year round adult emergence trapping from January 1988 to June 1990. Another possible explanation is that the precise conditions for adult emergence are infrequent and the species remains in the pupal stage until such an event comes along.

The species' dietary needs are unknown but species of related genera generally consume woody debris and microorganisms (Wiggins 1996).

Conservation / Management

No specific conservation measures or management strategies can be developed for this species until the larval habitat is better known. No data are available on general *Chilostigma* tolerance to anthropogenic disturbances. Larvae of related genera tend to be intolerant of organic pollution, modification of riparian habitat, and warming water temperature (Harris and Lawrence 1978; Hilsenhoff 1987; Wiggins 1996; Barbour et al. 1999). The originally discovered population of the headwaters chilostigman caddisfly appears to be very small and on that basis alone vulnerable to extirpation. The recently discovered population is clearly substantial and dispersed over a large area,

making it much more secure. Even so, until it is determined that there are other populations, the risks to the survival of the species are sufficient to warrant strong conservation concern.

Conservation Efforts in Minnesota

The two known localities of the headwaters chilostigman caddisfly are within publicly owned lands managed for natural resource values. The **Itasca State Park** locality is safe from intentional acute habitat destruction, although Monson (1994) recommended that the site and its surrounding wetland meadow be monitored for signs of watershed-level habitat degradation. The other site is within the **Finland State Forest**, and here potential timber harvest activities could threaten the species. Careful review of all such activities should be conducted to minimize impacts. The U.S. Fish and Wildlife Service considers the headwaters chilostigman as possibly appropriate for federal threatened or endangered status, but additional data on biological vulnerability and threats is needed (U.S. Fish and Wildlife Service 1991). Field surveys, in conjunction with a University of Minnesota study on the caddisflies of Minnesota (Houghton et al. 2001), are being conducted to search for additional populations of this species.

References

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