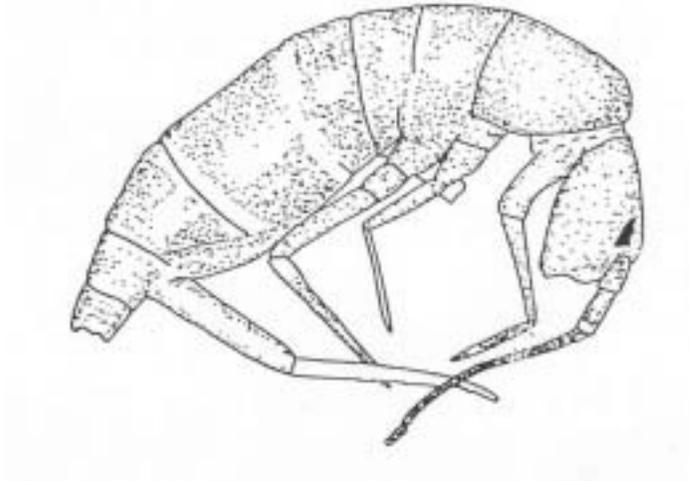


***Conservation Assessment
for
Two-Toothed Springtail (Tomocerus Bidentatus)***



(Christiansen & Bellinger, 1998)

USDA Forest Service, Eastern Region

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This Conservation Assessment was prepared to compile the published and unpublished information on Tomocerus bidentatus. It does not represent a management decision by the U.S. Forest Service. Though the best scientific information available was used and subject experts were consulted in preparation of this document, it is expected that new information will arise. In the spirit of continuous learning and adaptive management, if you have information that will assist in conserving the subject community and associated taxa, please contact the Eastern Region of the Forest Service Threatened and Endangered Species Program at 310 Wisconsin Avenue, Milwaukee, Wisconsin 53203.

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EXECUTIVE SUMMARY

The Two-toothed springtail is designated as a Regional Forester Sensitive Species on the Hoosier National Forest in the Eastern Region of the Forest Service. The purpose of this document is to provide the background information necessary to prepare a Conservation Strategy, which will include management actions to conserve the species.

Tomocerus bidentatus is a troglomorphic springtail insect that is known mostly from caves. This species occurs in the eastern U.S. from Illinois to Pennsylvania.

NOMENCLATURE AND TAXONOMY

Classification:	Class Insecta Order Collembola Family Tomoceridae
Scientific name:	<u>Tomocerus bidentatus</u>
Common name:	Two-toothed springtail
Synonyms:	<u>Tomocerus jeanneli</u> <u>Tomocerus henroti</u>

The species was redescribed and synonyms are listed by Christiansen and Bellinger (1998).

DESCRIPTION OF SPECIES

Tomocerus bidentatus, typical of other springtails, is a tiny insect, reaching a length of about 5 millimeters. The species has trapezoidal eyespots and is typically pale yellowish white to speckled gray in appearance. Identification of this species requires a specialist knowledgeable in the taxonomy of springtails.

LIFE HISTORY

Nothing is known specifically about the life history of Tomocerus bidentatus. In general springtails lay their eggs on the substrate in a concealed location. Several molts occur prior to the insect reaching its adult size, but in springtails no metamorphosis occurs and the juveniles and adults are similar except in size (Borror and DeLong, 1971).

HABITAT

This species is a troglomorphic troglophile, thus occurs mostly in caves, but is also known from surface localities. It is usually found in moist organic litter, stream detritus stranded on mudbanks, on racoon or woodrat droppings, or similar nutrient rich microhabitats.



○ *Tomocerus bidentatus*.

DISTRIBUTION AND ABUNDANCE

Tomocerus bidentatus was reported by Christiansen (1982) from caves from Illinois to Pennsylvania, south to Alabama (Figure 1). Lewis (1998) reported Tomocerus bidentatus from more than 25 caves in southern Indiana.

Figure 1. Distribution of caves in which has been collected Tomocerus bidentatus (from Christiansen, 1982). Each dot may represent multiple caves.

RANGEWIDE STATUS

Global Rank: G3 vulnerable; The global rank of G3 is assigned to species that are known from between 21-100 localities. Tomocerus bidentatus was reported from caves in 46 counties by Christiansen (1982), with multiple occurrences in some counties.

Indiana State Rank: S3 vulnerable; The state rank of S3 is similarly assigned to species that are known from between 21-100 localities.

POPULATION BIOLOGY AND VIABILITY

Nothing is known specifically about Tomocerus bidentatus. In general springtails feed on decaying plant material, fungi, bacteria or arthropod feces (Borror and DeLong, 1971).

POTENTIAL THREATS

Tomocerus bidentatus is a tiny litter dwelling insect that is widespread in caves of the Hoosier National Forest (and elsewhere) and appears to be little threatened by human visitation to caves. Most of the caves from which it is known are rarely visited nor or they particularly threatened at present.

SUMMARY OF LAND OWNERSHIP AND EXISTING HABITAT PROTECTION

On the Hoosier National Forest Tomocerus bidentatus is known from caves in several areas: (1) Little Blue River area in Salt Shake Cave, Enlow's Back Door Cave and Mesmore Spring Cave (Hemlock Cliffs Special Area); (2) Megenity Peccary Cave; (3) Little Africa in Dillon Cave and Concord Spring Cave; (4) Tincher Special Karst Area from Williams Cave; (5) Springs Valley area from Not Our Area Cave and Chris Continuous Crevice Cave; (6) and Deam Wilderness at Dead Possum Pit. Several of these caves receive the restrictive management accorded forest service special areas or wilderness areas (USDA Forest Service, 1991; 2000).

SUMMARY OF MANAGEMENT AND CONSERVATION ACTIVITIES

No species specific management or conservation activities are being conducted concerning Tomocerus bidentatus, however cave and karst habitat located on the Hoosier National Forest are subject to standards and guidelines for caves and karst protection and management as outlined in the Hoosier National Forest Land and Resource Management Plan (Forest Plan) (USDA Forest Service, 1991). These standards and guidelines include the following:

- *Caves are protected and managed in accordance with the Federal Cave and Karst Resources Protection Act of 1988, Forest Service Manual 2353, Memorandums of Understanding between the forest service and the National Speleological Society, the Indiana Karst Conservancy, Inc., the Forest Cave Management Implementation Plan, and individual specific cave management plans.

- *Except where modified by an existing cave management prescription, vegetation within a 150-200 foot radius of cave entrances and infeeder drainages with slopes greater than 30 percent will generally not be cut. No surface disturbing activities will be conducted on any slopes steeper than 30 percent adjacent to cave entrances. Similar protection areas will be maintained around direct drainage inputs such as sinkholes and swallow holes known to open into a cave's drainage system of any streams flowing into a known cave.

- *Allow no sediment from erosion of access roads and drilling sites to wash into caves or karst features.

- *Seismic surveys requiring explosives shall not be conducted directly over known cave passages or conduits.

- *All caves will be managed as significant.

(USDA Forest Service, 1991)

The forest plan includes a cave and karst management implementation plan. This management plan places an emphasis on cave resource protection and mitigation. Understanding of the caves is established through mapping, bioinventory, cataloging of resources (e.g., archaeological, paleontological, speleothems, etc.), and estimating use levels and trends. Protection zones or other mitigation measures recommended by a management prescription will be established around caves entrances, sinkholes and swallowholes. Specific criteria will include consideration for protection of entrance and cave passage microclimate, animals inhabiting the cave, physical and chemical parameters and aesthetic values associated with the cave.

RESEARCH AND MONITORING

A cave bioinventory of the Hoosier National Forest resulted in the discovery of several additional populations of Tomocerus bidentatus (Lewis, et al., 2002; and in progress).

RECOMMENDATIONS

This is a widespread, troglophilic species that might be considered for removal from the list of Regional Forester Sensitive Species if bioinventory of caves of the Hoosier National Forest indicates it is more common than previously believed.

REFERENCES

- Borror, Donald J. and Dwight M. DeLong. 1971. An Introduction to the study of insects. Holt, Rinehart and Winston, New York, 812 pages.
- Christiansen, Kenneth. 1982. Zoogeography of cave collembola of the great plains. N.S.S. Bulletin, 44 (2): 32-41.
- Christiansen, Kenneth and Peter Bellinger. 1998. The Collembola of North America. Part 3. Families Entomobryidae, Cyphoderidae, Paronellidae, Oncopoduridae, Tomoceridae. Grinnell College Press, 877-1174.
- Lewis, Julian J. 1998. The subterranean fauna of the Blue River area. Final Report, The Nature Conservancy, 266 pages.
- Lewis, Julian J., Ronnie Burns and Salisa Rafail. 2002. The subterranean fauna of the Hoosier National Forest. Unpublished report, Hoosier National Forest, 115 pages.
- USDA Forest Service. 1991. Land and Resource Management Plan Amendment for the Hoosier National Forest.
- USDA Forest Service. 2000. Land and Resource Management Plan, Amendment No. 5, for the Hoosier National Forest.