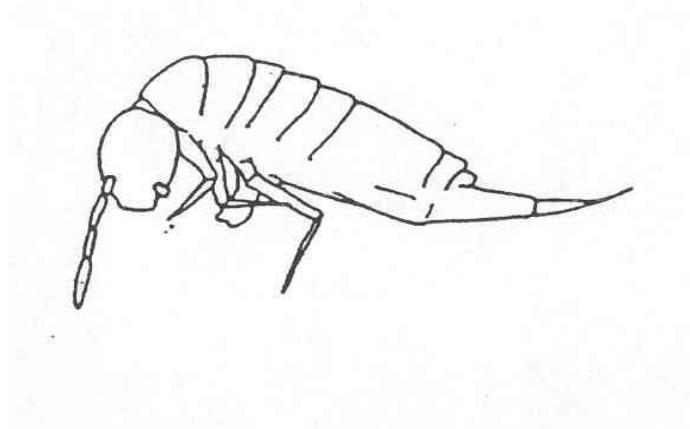


***Conservation Assessment
for
Springfield Plain Cave Springtail (*Pseudosinella Espana*)***



(From Christiansen, 1960)

USDA Forest Service, Eastern Region
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This Conservation Assessment was prepared to compile the published and unpublished information on Pseudosinella espana. 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 Springfield Plain cave springtail is designated as a Regional Forester Sensitive Species on the Mark Twain 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.

Pseudosinella espana is a rare cavernicolous springtail insect known with certainty only from caves in the Ozark Plateau in southern Missouri.

NOMENCLATURE AND TAXONOMY

Classification: Class Insecta
Order Collembola
Family Entomobryidae

Scientific name: Pseudosinella espana

Common name: Springfield Plain cave springtail

Synonyms: none

This species was described by Christiansen (1960). The nomenclature of the species has been stable since that time.

DESCRIPTION OF SPECIES

Pseudosinella espana, typical of other springtails, is a tiny insect, reaching a length of about 1.1mm. The species is eyeless and unpigmented, white 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 Pseudosinella espana. 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 troglobite known only from caves. Gardner (1986) reported it as found on rotting wood. Elsewhere it is presumably found in moist organic litter or similar nutrient rich microhabitats.

DISTRIBUTION AND ABUNDANCE

Pseudosinella espana was reported by Christiansen and Bellinger (1998) with certainty only from caves in Christian, Stone and Newton counties in southwestern Missouri. Two new localities have been found by the Cave Research Foundation in Oregon County (Sutton, 1993). These new localities extend the range of the species from the Springfield Plain well into the adjacent Salem Plateau.

Questionable localities occur in Edmonson County, Kentucky and Montgomery County, Tennessee that are almost certainly a different species (Christiansen, personal communication).

RANGEWIDE STATUS

Global Rank: G1 critically imperiled; The global rank of G1 is assigned to species that are known from between 1-5 localities. This species was previously known with certainty from three caves in southwestern Missouri. The addition of the two new Oregon County populations from the CRF cave bioinventory brings the number of localities for this species to five.

Missouri State Rank: S1 critically imperiled; The state rank of S1 is similarly assigned to species that are known from between 1-5 localities. The only known certain localities for Pseudosinella espana are in southern Missouri.

POPULATION BIOLOGY AND VIABILITY

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

POTENTIAL THREATS

No threats to any specific sites inhabited by Pseudosinella espana were reported by any reviewer of this assessment.

There are numerous potential threats that might reasonably occur on national forest land due to the presence of Pseudosinella espana in the restricted cave environment. These include problems caused by activities outside of forest owned properties that may be imported by surface runoff or groundwater flow. Potential contaminants include (1) sewage or fecal contamination, including sewage plant effluent, septic field waste, campground outhouses, feedlots, grazing pastures or any other source of human or animal waste (Harvey and Skeleton, 1968; Quinlan and Rowe, 1977, 1978; Lewis, 1993; Panno, et al 1996, 1997, 1998); (2) pesticides or herbicides used for crops, livestock, trails, roads or other applications; fertilizers used for crops or lawns (Keith and Poulson, 1981; Panno,

et al. 1998); (3) hazardous material introductions via accidental spills or deliberate dumping, including road salting (Quinlan and Rowe, 1977, 1978; Lewis, 1993, 1996).

Habitat alteration due to sedimentation is a pervasive threat potentially caused by logging, road or other construction, trail building, farming, or any other kind of development that disturbs groundcover. Sedimentation potentially changes cave habitat, blocks recharge sites, or alters flow volume and velocity. Keith (1988) reported that pesticides and other harmful compounds like PCB's can adhere to clay and silt particles and be transported via sedimentation.

There is a long history of mineral (e.g., zinc, lead) exploration and development in the southeastern and east central Ozarks and groundwater contamination is a potential threat.

With the presence of humans in caves comes an increased risk of vandalism or littering of the habitat, disruption of habitat and trampling of fauna, introduction of microbial flora non-native to the cave or introduction of hazardous materials, e.g., spent carbide, batteries (Peck, 1969; Elliott, 1998). The construction of roads or trails near cave entrances encourages entry.

SUMMARY OF LAND OWNERSHIP AND EXISTING HABITAT PROTECTION

Pseudosinella espana was reported by Gardner (1986) from Moonshine Still Cave, which is on the Mark Twain National Forest. The CRF cave bioinventory localities in Oregon County, Cropper Cave and Kelly Hollow Cave, are also on the Mark Twain National Forest.

SUMMARY OF MANAGEMENT AND CONSERVATION ACTIVITIES

No species specific management or conservation activities are being conducted Pseudosinella espana.

Caves and springs located on the Mark Twain National Forest are subject to Forest Plan standards and guidelines for cave and spring protection and management. Perennial springs and spring branches will have a minimum 100 foot buffer zone within which any treatment will be modified on a case-by-case basis to: (1) meet state water quality standards and regulations, (2) comply with the riparian zone standards and guidelines identified under forest-wide 2500 (water and soil resource management) and 2600 (wildlife habitat management), (3) protect visual aspects, and (4) protect and enhance natural plant and animal communities. Similar guidelines exist for the management of seeps and fens.

Caves in the Mark Twain National Forest are recognized as specialized habitat areas and will be managed in accordance to the recommendations established by Gardner in 1982 in "An Inventory and Evaluation of Cave Resources of the Mark Twain National Forest".

This includes the designation of an area of at least five acres centered on and completely surrounding a cave entrance for permanent old growth management. Insecticides and herbicides will not be used within the surface and known subsurface watersheds of caves utilized by the Indiana or Gray bats, Ozark cavefish, or any state endangered or rare species.

RESEARCH AND MONITORING

The Cave Research Foundation is conducting cave bioinventory on the Mark Twain National Forest and has found two new localities for Pseudosinella espana on forest property to date.

RECOMMENDATIONS

Retain on list of Regional Forester Sensitive Species.

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