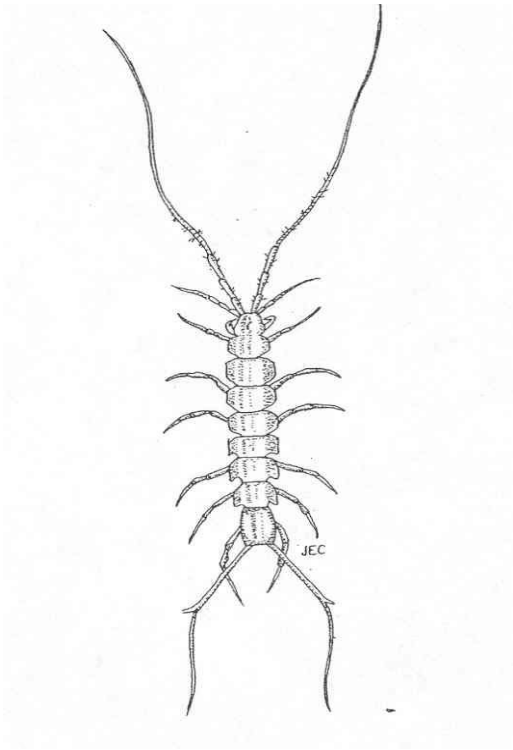
Conservation Assessment for Pendleton Cave Isopod (Caecidotea Sinunca)



(From Franz and Slifer, 1971)

USDA Forest Service, Eastern Region

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MONONGAHELA NATIONAL FOREST

This Conservation Assessment was prepared to compile the published and unpublished information on Caecidotea sinunca. 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 Pendleton cave isopod is designated as a Regional Forester Sensitive Species on the Monongahela 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.

The Pendleton cave isopod is a very rare cavernicolous crustacean that is known to occur in only three caves in Pendleton County, West Virginia.

NOMENCLATURE AND TAXONOMY

Classification:	Class Crustacea
	Order Isopoda
	Family Asellidae
Scientific name:	Caecidotea sinunca (Steeves)
Common name:	Pendleton cave isopod
Synonyms:	Asellus sinuncus
	Conasellus sinuncus

This species was described by Steeves (1965) as Asellus sinuncus. The description was short and superficial by present standards, but allows identification of the species. Steeves (1965) created the Cannulus species group and placed Asellus sinuncus in it. Henry and Magniez (1970) moved most of the North American asellids from the genus Asellus to Conasellus. Bowman (1975) followed this move, but pointed out the priority of the name Caecidotea.

DESCRIPTION OF SPECIES

Caecidotea sinunca is an eyeless, unpigmented subterranean isopod crustacean that was reported by Steeves (1965) to reach a length of 3mm. The male second pleopod endopodite tip is characterized by a single subtriangular process. Identification of this species requires laboratory dissection and examination of slide-mounted appendages under a compound microscope by a specialist in isopod taxonomy.

LIFE HISTORY

Nothing is known of the life history of this species.

HABITAT

Holsinger, et. al. (1976) reported that the isopods were found under flat rocks in cave streams.

DISTRIBUTION AND ABUNDANCE

Holsinger, et. al. (1976) reported this species from 3 caves in Pendleton County, West Virginia: Mystic Cave (type-locality), Blowhole Cave and Keel Spring Cave.

RANGEWIDE STATUS

Global Rank: G1 critically imperiled; The global rank of G1 typically includes species that are known globally from five or fewer localities. Caecidotea sinunca is known from three caves.

West Virginia State Rank: S1 critically imperiled; The state rank of S1 typically includes species that are known globally from five or fewer localities. The three localities from which Caecidotea sinunca are known all occur in West Virginia.

POPULATION BIOLOGY AND VIABILITY

Nothing is known of the population biology of Caecidotea sinunca. It was reported as being uncommon in the caves where it is known by Holsinger, et. al. (1976).

POTENTIAL THREATS

Due to the presence of Caecidotea sinunca in the restricted cave environment, it is susceptible to a wide variety of disturbances (Elliott, 1998). Caves are underground drainage conduits for surface runoff, bringing in significant quantities of nutrients for cave communities. Unfortunately, contaminants may be introduced with equal ease, with devastating effects on cave animals. 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; 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.

Impoundments may detrimentally affect cave species. Flooding makes terrestrial habitats unusable and creates changes in stream flow that in turn causes siltation and drastic modification of gravel riffle and pool habitats. Stream back-flooding is also another

potential source of introduction of contaminants to cave ecosystems (Duchon and Lisowski, 1980; Keith, 1988).

Smoke is another potential source of airborne particulate contamination and hazardous material introduction to the cave environment. Many caves have active air currents that serve to inhale surface air from one entrance and exhale it from another. Potential smoke sources include campfires built in cave entrances, prescribed burns or trash disposal. Concerning the latter, not only may hazardous chemicals be carried into the cave environment, but the residue serves as another source of groundwater contamination.

Numerous caves have been affected by quarry activities prior to acquisition. Roadcut construction for highways passing through national forest land is a similar blasting activity and has the potential to destroy or seriously modify cave ecosystems. Indirect effects of blasting include potential destabilization of passages, collapse and destruction of stream passages, changes in water table levels and sediment transport (Keith, 1988).

Oil, gas or water exploration and development may encounter cave passages and introduce drilling mud and fluids into cave passages and streams. Brine produced by wells is extremely toxic, containing high concentrations of dissolved heavy metals, halides or hydrogen sulfide. These substances can enter cave ecosystems through breach of drilling pits, corrosion of inactive well casings, or during injection to increase production of adjacent wells (Quinlan and Rowe, 1978).

Cave ecosystems are unfortunately not immune to the introduction of exotic species. Out-competition of native cavernicoles by exotic facultative cavernicoles is becoming more common, with species such as the exotic milliped Oxidus gracilis affecting both terrestrial and aquatic habitats.

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). The construction of roads or trails near cave entrances encourages entry.

SUMMARY OF LAND OWNERSHIP AND EXISTING HABITAT PROTECTION

Caecidotea sinunca occurs in the area of the Monongahela National Forest.

SUMMARY OF MANAGEMENT AND CONSERVATION ACTIVITIES

No species specific management activities are being conducted concerning Caecidotea sinunca.

The existing (1985) Monongahela Land and Resource Management Plan does not provide management direction for caves although they are being considered in the Forest

Plan revision currently underway. A Forest Plan Amendment in progress for Threatened and Endangered Species will include management for the caves on the forest.

RESEARCH AND MONITORING

No species specific research or monitoring activities are being conducted concerning Caecidotea sinunca.

RECOMMENDATIONS

Retain on list of Regional Forester Sensitive Species.

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