Species: An isopod (*Caecidotea kenki*)
Global Rank: G3
State Rank: S1
State Wildlife Action Plan: Immediate Concern Species - Responsibility Species
Climate Change Vulnerability: Not Vulnerable/Presumed Stable
Confidence: Very High

Habitat:

Caecidotea kenki is apparently intermediate between an epigean (surface dwelling) and troglobotic (cave dwelling) species. Current limited survey information indicates that it inhabits four aquifers in Pennsylvania with one collection point for three watersheds and three points for the fourth. Across its entire known range, it has been documented from 17 sites historically (1933-1966). It has also been documented in Maryland, Virginia, and the District of Columbia. It is probably more widespread than records show and the number of sites could reasonably double with more survey effort (NatureServe 2008).

Caecidotea kenki possess tiny eyes and have pigmentation. While found in caves, they are primarily found in springs and spring-fed streams. Hutchins and Culver (2007) call this species a specialist of superficial groundwater sites, namely springs and seeps. They note that virtually nothing is known about the biology of the species. Crustaceans of cool-water habitats tend to have tight temperature requirements. Water temperature affects growth and metabolism rates, and temperature changes can impact species behaviors including competition and breeding (Thorp and Covich, 1991).

Isopods in general are detritivores and scavengers as adults and immatures. Juveniles feed largely upon microbial foods such as algae and bacteria. They also feed upon dead organic matter. Adults will include live prey items in their diet (Thorp and Covich 1991).

Current Threats (adapted from Hutchins and Culver 2007 and NatureServe 2008):

This species is highly adapted to seeps and springs. Protecting the groundwater is the key ingredient to long term viability of these populations. Potential threats to groundwater quality and quantity include pollution by agricultural fertilizers and pesticides, industrial chemical and wastewater spills, storm water run-off containing contaminants such as oils, heavy-metals and salts, soil compaction, siltation, pumping of water from the aquifer for domestic and industrial uses, and reduction of groundwater recharge due to increases in impervious surface area within a watershed. Upslope of the aquifers some potential exists for pollution from forestry practices and capture of surface run-off which might limit water reaching subterranean habitats.

Main factors Contributing to Vulnerability:

The key factors found to increase the vulnerability of *Caecidotea kenki* to climate change are minimal ability to disperse outside of occupied cave systems, highly restricted range, specialized groundwater habitats, increased groundwater demand and surface water capture expected due to increased frequency and duration of summer droughts. Natural

gas extraction has the potential to negatively impact watersheds, including small springs and seeps within the range of this species in Pennsylvania. This cold-water isopod is likely sensitive to changes in the seasonal hydrology and temperatures of the aquifer. However, a groundwater system should be able to moderate climatic changes to some degree.

In the CCVI version 2.0, obligate cave species were automatically given a higher resistance rating to climate change impacts. According to the CCVI guidelines (NatureServe 2010) and the West Virginia Climate Change Vulnerability Assessment Report (Byers and Norris 2011), cave species are expected to better survive climate changes in their buffered underground habitats.

Protecting water quality and quantity in occupied watersheds by increasing forest cover, prohibiting mining activities, implementing best management practices for agriculture, and limiting the addition of impervious surfaces and further water withdrawal or storage can provide important protection against current and future threats.

References:

Byers, E. and S. Norris. 2011. Climate Change Vulnerability Assessment of Species of Concern in West Virginia. West Virginia Division of Natural Resources, Elkins, WV.

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