SPECIES FACT SHEET

**Common Name:** Oregon Cave Amphipod  
**Scientific Name:** *Stygobromus oregonensis* (Holsinger 1974)

*Phylum: Crustacea*  
*Class: Malacostraca*  
*Order: Amphipoda*  
*Family: Crangonyctidae*

**Conservation Status:**
- **Global Status (2004):** G1G2  
- **Rounded Global Status:** G1 - Critically Imperiled  
- **Nation: United States**  
- **National Status (United States):** N1N2  
- **State Status: Oregon:** S1S2  
  (The Oregon ranking indicates that the species is imperiled to critically imperiled because of extreme rarity or some other factor(s) making it especially vulnerable to extirpation or extinction).  
  (NatureServe 2008).

**Technical Description:**
Amphipods are shrimp-like crustaceans with elongate, laterally compressed bodies and seven (rarely six) pairs of leg-like appendages (Triplehorn and Johnson 2005, Voshell 2002). The anterior pairs of legs are directed downward and forward, while the posterior legs are usually turned upward and backward. The abdominal segments are more or less fused with the thoracic segments, and the carapace (hard covering of the thorax common in other crustaceans) is lacking. Each of the six abdominal segments has one pair of short appendages on the underside. The cephalothorax (a fusion of the head and first thoracic segment) has two pairs of antennae. The eyes are generally well-developed but are sometimes reduced or lacking, particularly in subterranean species.

The type-series of *Stygobromus oregonensis* consists of two fully mature females measuring 9.5 mm (0.37 in.) and 11.0 mm (0.43 in.) in body length, excluding appendages. This relatively large species (most *Stygobromus* are under 10 mm (0.39 in.) in length) can be easily distinguished from other species of the *hubbsi* group by the following traits: numerous long, stiff setae and slender spines on peduncular segments IV and V of the second antennae; proportionately large propod of gnathopod I with very long, heavily spined palm; convex palm of gnathopodal propod II with a double row of 16 spine teeth; gnathopodal propods with doubly and triply inserted superior medial setae; posterior margins of the bases of pereopods V-VII convex; posterior marginal setae of pleonal plates II and III positioned midlaterally; pleonal plates with small, subacute posterior corners; and the comparatively large ramus of uropod III with 5 rather long spines (Holsinger 1974).
The holotype of this species is deposited in the Smithsonian’s United States National Museum of Natural History in Washington, D.C. and the paratype is in the research collection of Dr. John Holsinger at Old Dominion University, Norfolk, Virginia (Holsinger 2008, pers. comm.).

**Life History:**
Little is known about the life cycle, development, ecological interactions, or population biology of this species. Sexually mature females have been collected in April and January, although this may be more reflective of sampling period than the phenology of the animal.

In general, amphipod eggs are deposited in a brood pouch on the underside of the adult female. The eggs hatch in one to three weeks, and the young amphipods remain in the pouch for about one to eight days. They are released the first time their mother sheds her skin after her next mating (Voshell 2002). The immature stages resemble the adults, and undergo successive molts (usually between 8 and 9) until maturity. It is unclear whether sexual maturity is reached after a fixed number of molts or the completion of gonad development, both of which have temperature dependent rates (Highsmith & Coyle 1991). Most species complete their life cycle (egg to adult) in one year or less (reviewed in Fasulo 2005). Subterranean species appear to have an exceptionally long lifespan and may live for four to six years (Voshell 2002).

**Range, Distribution, and Abundance:**
*Stygobromus* is a relatively large genus, consisting of approximately 135 described species, most of which are from the United States (ZipcodeZoo 2008, Holsinger 1974). This species is known from a single small cave on private land near Roseburg, Douglas Co., Oregon (Holsinger 1974), where it was collected by Jim Riggs on two occasions: in April, 1967 and in January, 1983 (Holsinger 2008, pers. comm.).

Forest Service/BLM lands: There are no records of this species on federal lands.

Abundance: Two individuals of this species were collected on both sample occasions, but no abundance estimates of this species have been made.

**Habitat Associations:**
Although a few species of *Stygobromus* are found in seeps, springs, wells, and rarely, deep lakes, the genus is primarily cavernicoulous (Holsinger 1974). The small cave where this species was found is a crevice in Lower Eocene basalt with water sometimes occurring about 9.1m (30 feet) below the entrance (Holsinger 1974). The collected specimens on the 1983 sample occasion were from a small pool at the bottom of the cave where the water temperature was around 50 degrees Fahrenheit (Holsinger 2008, pers. comm.). The presence of
subterranean groundwater, such as in small pools at the bottom of caves and crevices, is probably the limiting factor in the distribution of this freshwater species (Holsinger 2008, *pers. comm*.).

**Threats:**
The restricted, subterranean habitat of this species subjects it to a wide variety of freshwater disturbances. Since caves are underground drainage conduits for surface runoff, their biological communities are often subjected to significant quantities of nutrients and contaminants (Lewis 2001). Potential groundwater contaminants include:

- Herbicides and insecticides applied to crops, lawns, and roadsides
- Fertilizers applied to crops and lawns
- Human and livestock fecal waste, including sewage plant effluent, septic field waste, campground outhouses, feedlots, and grazing pastures

Changes in water-table hydrology due to human development (withdrawal of excessive amounts of water from wells) and global climate change (particularly climatic variations in the amount of precipitation and rate of uptake by plants) may also impact this species.

**Conservation Considerations:**
The distribution of this species is expected to be much larger than is documented, including much of southern Oregon and possibly ranging as far south as California (Holsinger 2008, *pers. comm*.). Searching potential habitats (e.g. caves, seeps, wells, spring flows) is the only way to find out if this species occurs beyond its type-locality (Holsinger 2008, *pers. comm*.). Considering the potentially numerous interconnecting cracks and crevices in many cave systems (particularly in karst areas with lava flow or fractured bedrock), it is very unlikely that this species is restricted to a single cave (Holsinger 2008, *pers. comm*.). With diligent search effort, a number of other karst species have been found well beyond their original type-localities (Holsinger 2008, *pers. comm*.).

Inventory: Survey subterranean groundwater habitat in southern Oregon for new population sites of this species. Address habitat in both unsurveyed and well-studied cave systems. Oregon Caves National Monument (OCNM), for example, has a record of amphipods from ~15 years ago but the specimens (probably *Stygobromus*) were not well preserved and are too damaged to be positively identified to species (Roth 2008, *pers. comm*.). Although recent (~2006 to 2007) surveys for this taxon at OCNM have been unproductive,
additional survey work may reveal this (or other) *Stygobromus* species (Roth 2008, *pers. comm.*).

Management: Protect known sites and their watersheds from activities that would damage or alter groundwater quality or hydrology.

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Date: December 2008

Edited by: Sarina Jepsen  
Xerces Society for Invertebrate Conservation  
Date: January 2009

**ATTACHMENTS:**

1. **References**
2. **List of pertinent or knowledgeable contacts**
3. **Survey Protocol for this species**

**ATTACHMENT 1: References:**

<http://creatures.ifas.ufl.edu/misc/amphipods.htm>


Lewis, J. 2001. USDA Forest Service Conservation Assessment Assessment for Pocahontas Cave Amphipod (*Stygobromus nanus*). Available at:  


Roth, John. 2008. Personal communication with Sarah Foltz.


ATTACHMENT 2: List of pertinent, knowledgeable contacts:

John R. Holsinger, Professor of Biological Sciences, Department of Biological Sciences, Old Dominion University, Norfolk, Virginia 23529-0266, USA

ATTACHMENT 3: Survey Protocol
Species: Stygobromus oregonensis

Stygobromus is a large genus (~135 species) including mainly cave obligate species. This species is known from a single cave on private property in Douglas Co., Oregon. The cave is described as a crevice in Lower Eocene basalt with water sometimes found 30 feet (9.1 m) below the cave entrance. The specimens were collected in April, 1967 and January, 1983. The January record specifies collection from a small pool at the bottom of the cave with water temperature around 50° F (10° C).

The species author, John Holsinger, seriously doubts if the species is restricted to a single cave, and suspects that, with diligent search effort, it may be found in similar groundwater habitat in Southern Oregon and even into California (Holsinger 2008, pers. comm.). When searching for new sites, efforts should be made to cover a range of cave sizes, elevations and geographic locales. Within cave systems, survey at regular intervals in areas where water or mud occurs.
Typically, *Stygobromus* specimens are collected by sucking them up into a syringe or capturing them in a fine-mesh dip-net (mesh size <2mm). A small jar, baited with fresh shrimp and left in the water for 1 to 2 hours, can also be used to collect specimens (Holsinger 2008, *pers. comm.*). Freshwater amphipods should be preserved in 70-75% ethanol (Holsinger 1976), and handled and packaged carefully to prevent damage to individuals. Since the species description is based on fully mature female specimens, collection of this sex and life-stage would ease the identification process (Holsinger 2008, *pers. comm.*). Collection labels should include the following information: date, time of day, collector, detailed locality (including cave name, geographical coordinates, mileage from named location, elevation, etc.), and detailed cave/waterbody habitat information (including size, substrate characteristics, and water quality, temperature and depth). Complete determination labels include the species name, sex and maturity (if known), determiner name, and date determined.

Accurate yet environmentally sensitive methods to estimate amphipod population sizes in subterranean groundwater systems are not well-developed. Careful visual searching is the only known method of estimating abundance of this species (Holsinger 2008, *pers. comm.*).

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**References (Survey Protocol only):**
