

SPECIES FACT SHEET

Common Name: Hubbs' amphipod

Scientific Name: *Stygobromus hubbsi* Shoemaker 1942

Synonyms:

Phylum: Arthropoda

Class: Crustacea (Malacostraca)

Order: Amphipoda

Family: Crangonyctidae

Type Locality: OREGON, Harney County, Malheur Cave, C. Hubbs col. July 1928.

OR/WA BLM and FS Region 6 Units where Suspected or Documented:

BLM: Andrews Resource Area (documented).
Burns District (documented).

Description:



Stygobromus gracilipes (Holsinger) (ca. 10 mm long) from cave in Virginia, USA
(photograph by Lynda Richardson).

Stygobromus hubbsi is a medium-sized cavernicolous species bearing a close morphological affinity with cave species of east-central California, but is distinguished by having fewer plumose setae on the inner plates of maxillae 1 and 2; fewer apical spines on the inner plate of the maxilliped; only 8 or 9 apical spines on the telson.

Life History:

Stygobromus species are found in caves, wells, seeps, springs, and cavernicolous and interstitial habitats (Pennak 1989, Drost and Blinn 1997). In a cave in Arizona a new species of *Stygobromus* was discovered primarily in side channels, shallow pools, and other areas where the water was still or relatively slow-flowing and where small deposits of silty and sandy sediments occurred (Drost and Blinn 1997).

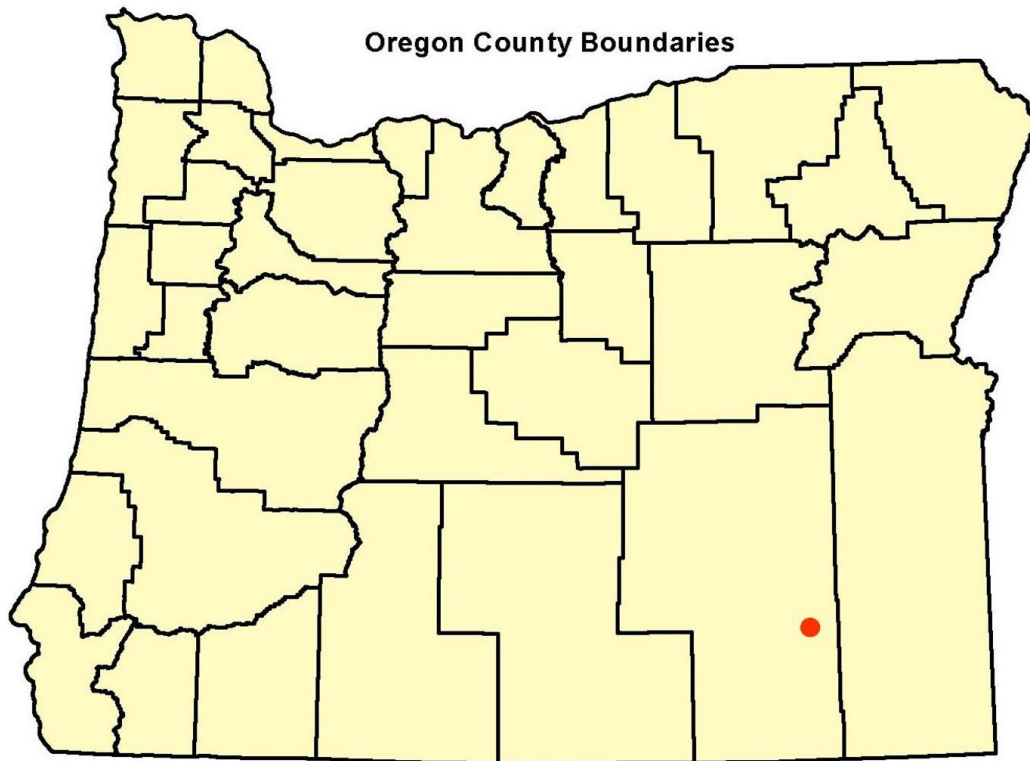
One of the foods of *Stygobromus* species is bacteria in the water (Drost and Blinn 1997).

Adults have been collected in July and August, and juveniles in August. These collections may not reflect the true phenology of the species but instead reflect the sampling occurrence (NatureServe 2005).

Range, Distribution), and Abundance:

Stygobromus species occur in low abundance wherever they are found (Drost and Blinn 1997). The *hubbsi* group of *Stygobromus* is composed of 19 closely allied species, geographically distributed from Vancouver, Canada, Washington, Oregon, and Montana southward through California and Nevada to southern Arizona.

Stygobromus hubbsi is known only from its type locality, Malheur Cave in Harney County, OR. This cave is a lava tube formed in basalt of Late Cenozoic age. The original type-series and subsequent topotypes were collected from a lake over a thousand feet within the cave



Distribution of *Stygobromus hubbsi* Shoemaker in Oregon.

Habitat Associations:

Members of the *hubbsi* group of *Stygobromus* are recorded from a variety of subterranean groundwater habitats, including limestone and lava caves, wells, springs, interstices of gravel substrates beneath surface streams (hyporheic), the outflow of seeps (hypotelminorheic), and from the depths of Lake Tahoe (Holsinger and Shaw 1987).

Threats:

The most significant threat for cavern wildlife can be disturbance and alteration of the habitat. Human visitation from tourism to spelunking can alter temperature, disturb hibernating bats, and introduce pollutants. Closure of entrances or further opening of a cave can affect wildlife use and the air circulation patterns and air temperatures. Vandalism or intentional destruction has been noted as well. Other threats include pollution of aquatic systems that maintain the humidity of the cave environment.

Loss of vegetation can lead to increased erosion and water runoff. Polluted runoff washes into waterways, which drain into underground

areas, affecting both the cave environment and the creatures that live within it.

The most inappropriate activities with the highest impact are those that destroy or alter cave resources, such as: acts of vandalism, graffiti and spray painting, dumping garbage or litter, removal or damage of cave resources, or other such destructive behaviors or activities.

Conservation Considerations:

- (1) Tread slowly and softly at all times. Take care where you place your hands and feet.
- (2) Be aware of sensitive features, including fauna and their habitats. Walk carefully around waterways, tree roots, sediment banks and organic deposits (leaf litter, wood, dead animals). Look but don't disturb spider webs and other nests.
- (3) Protect water quality in the area.
- (4) Maintaining the natural surface vegetation is vital to the survival of cave ecosystems.

Sampling Considerations:

Stygobromus hubbsi is a cave-dwelling species and therefore collecting should be limited to few specimens. Collected specimens should be preserved in vials filled with 70-80% ethyl alcohol. Identification requires a taxonomic expert.

Benedict and associates collected *Stygobromus hubbsi* by towing a plankton net behind a rubber raft, and by looking under rocks and rotted wood near the edge of the cave lake. They also collected amphipods in small traps baited with shrimp (Benedict and McEvoy 1995).

Diagnostic Characteristics: (NatureServe 2005)

Possibly confused with east central California species but distinguished by having fewer plumose setae on inner plates of maxillae one and two, fewer apical spines on inner plate of maxilliped, and only eight or nine apical spines on telson. Wang and Holsinger (2001) note it is a medium sized species closely allied morphologically with species of *Stygobromus* from east central California but distinguished by having fewer plumose setae on inner plates on maxillae 1 and 2; fewer apical spines on inner plate of maxilliped; and fewer apical spines on apical margin of telson.

ATTACHMENTS:

- (1) BLM Distribution Maps**
- (2) List of Pertinent References/Literature**
- (3) Original Published Description**

Shoemaker, C.R. 1942. A new cavernicolous amphipod from Oregon.
Occ. Pap. Mus. Zool. Univ. Mich. 466:1-6.

Preparer:

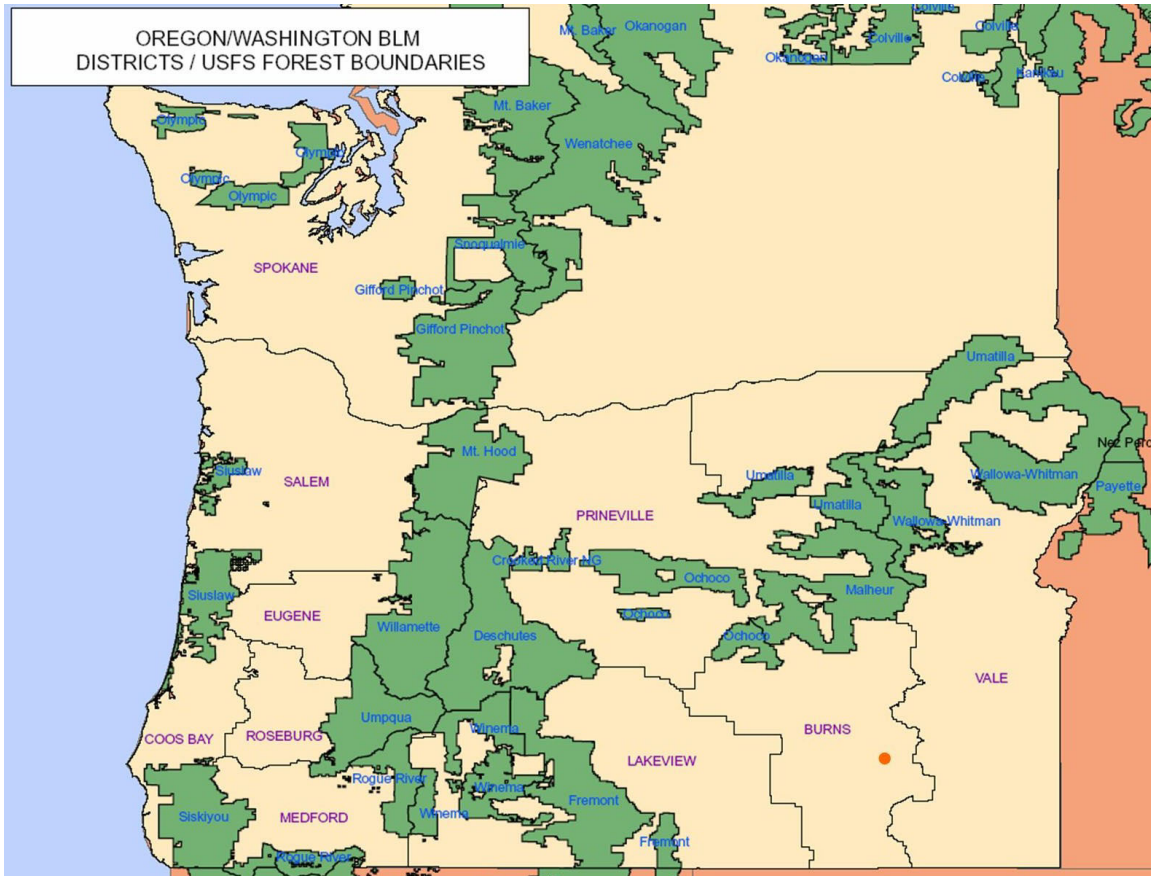
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Date Completed: August 22, 2005

BLM Distribution Maps



BLM Resource Areas where *Stygobromus hubbsi* Shoemaker has been found.



BLM Districts/USDA FS Forests and localities where *Stygobromus hubbsi* Shoemaker has been found.

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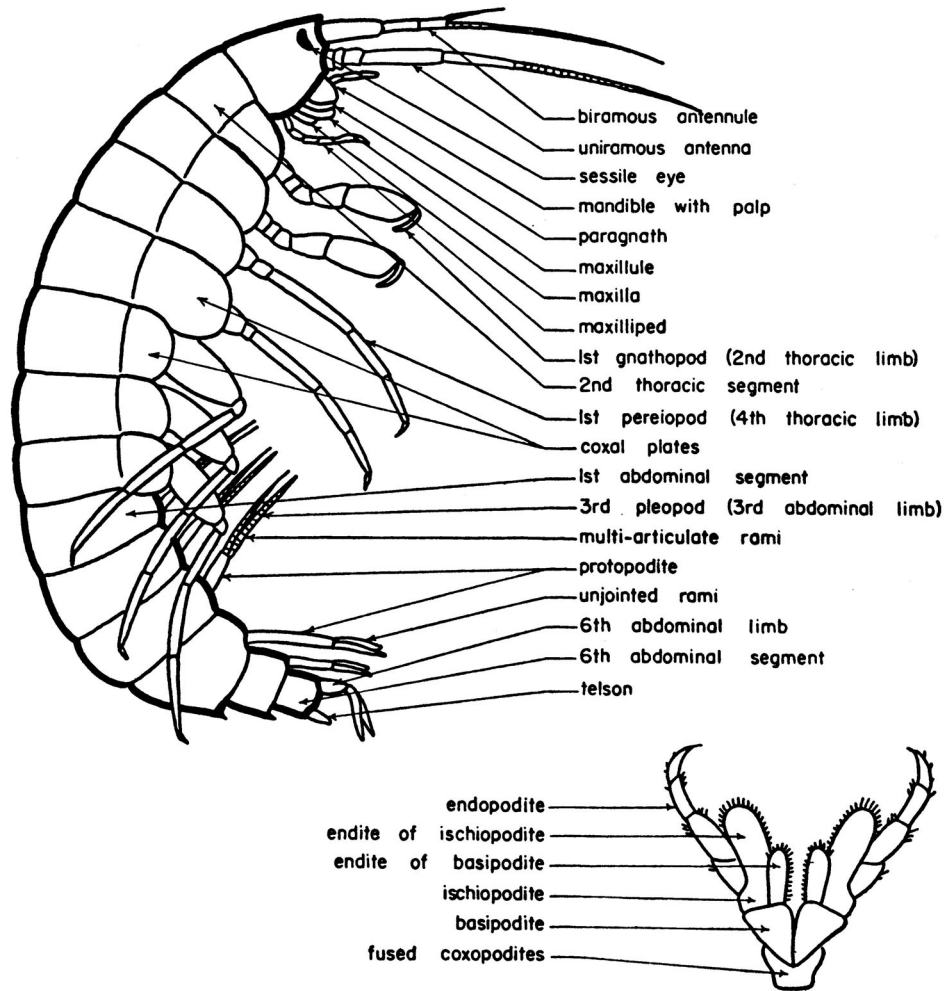
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Technical Description:



Gammarus. A specimen seen from the right side, and the 1st thoracic appendages, or maxillipeds.

Diagram of amphipod morphology (Bullough 1968).

Adult Female: Head, lateral lobes rather prominent and distally rounding; eyes absent. Antenna 1 nearly twice as long as antenna 2, first joint a little longer than second; third joint over half the length of the second; flagellum longer than peduncle and consisting of about sixteen joints, the last seven or eight of which bear slender sense organs; accessory flagellum shorter than the first joint of primary flagellum and consisting of one long and one short terminal joint. Antenna 2, fourth and fifth joints about equal in length; flagellum about equal in length to the fifth peduncular joint and consisting of six joints.

Gnathopod 1, second joint equal in length to the sixth joint; fifth joint longer than wide and armed on the upper margin with three spines in addition to terminal spines; sixth joint with palm slightly convex and very

oblique, leaving a very short hind margin which does not bear spines; palm armed on outside and inside margin with stout notched spines and defined by a long, curved, notched spine beyond which are four short spines; six slender, curved, closely set spines on inside surface of joint submarginal to the deflating angle; seventh joint curved and reaching to the long defining spine. Gnathopod 2, second joint shorter than sixth; fifth joint longer than wide and armed on upper margin with three spines in addition to the terminal spines; sixth joint over twice as long as wide with a palm very oblique leaving a very short hind margin which bears two groups of spines; palm with distal third slightly convex and proximal two-thirds straight, armed throughout on outside and inside margins with notched spines and two groups of long, slender spines where apex of seventh joint touches, and defined by a very long curved spine, below which,, on the inside surface of the joint, are three stout spines; seventh joint very long and curved, but not reaching the long defining spine.

First coxal plate longer than deep; second, third, and fourth coxal plates about as long as deep, fourth excavate behind. Paraeopods 1 and 2 much alike, but 2 the longer; seventh joint long, slender, slightly curved and bearing a long nail and a setule. Peraeopods 4 and 5 long and slender and very much alike, but 4 a little longer; second joint only moderately expanded; seventh joint about one-third the length of the sixth, nearly straight and bearing a rather long nail and a setule, coxal gills simple, borne on well defined stalks and attached to gnathopod 2 and peraeopods 1 to 4, the fifth paraeopod being without gills. Sternal gills are not present.

Metasome segments with the lower hind corner not produced, but narrowly rounding and bearing a short spinule. Urosome segments free. Uropod 1 extending farther back than 2, peduncle longer than the inner ramus, which is slightly longer than the outer; four closely set spines at inner distal corner of peduncle. Uropod 2, peduncle a little longer than inner ramus, which is longer than the outer; upper margin of peduncle bearing three spines. Uropod 3 very short, not reaching end of telson, ramus about one-third the length of the peduncle and armed apically with three spines. Telson longer than wide, distal margin with shallow median incision, each lobe armed with four spines, and the lateral margins each bearing two plumose setules. Length of female 6.5 - 7 mm.

Adult Male: The male very much like the female, but is smaller, measuring 5.5 mm. Right mandible, cutting edge rather long and slender and armed with six or seven teeth; accessory plate three-pronged; spine-row of five long and two short spines; molar well developed, with a group of short plumose setae on front margin and a long seta on inner edge; palp, second joint not much longer than third and both with very few spines. Maxilla 1, inner plate broad and bearing eight plumose setae;

outer plate armed with seven pectinate spine-teeth; palp armed distally with five slender spines and two setae. Maxilla 2, inner plate a little longer and broader than outer plate, and bearing an oblique row of ten plumose setae. Maxillipeds, inner plate reaching to about the middle of outer plate, and armed distally with three or four spine teeth and several plumose setae; outer plate reaching to about one-third the distance along the second joint of palp, armed on inner margin with one spine-tooth and a few spines and on rounding distal margin with three long spines; palp rather short and stout, fourth joint bearing a long nail and several spinules. Lower lip without inner lobes, lateral lobes very large. Gill arrangement the same as in female. The peduncle of uropod 1 bears a broad triangular extension at the lower distal end and a group of three spines at the upper inner distal corner.

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