

A Petition to List Three Freshwater Crustaceans:
(Two Amphipods — Genus *Stygobromus*: Crangonyctidae;
and one Copepod — Genus *Acanthocyclops*; Cylopidae)
Found in Seeps and Springs Along the Upper Potomac River
(Northern Virginia, Prince George's County Maryland and the District of Columbia)
as Endangered.

The vast majority of amphipods are *stygobionts* (they are associated with caves per se). They are generally restricted to subterranean groundwater habitats and are characterized morphologically by loss or severe reduction of eyes or pigment and attenuation of the body appendages (especially the antennae). However some *Stygobromus* species live in surface water and do not exhibit the advanced level of morphological modification. The majority of subterranean amphipods live in fresh water but some are found in brackish and even fully marine water. Subterranean amphipods are interesting biogeographically because of their taxonomic diversity, limited dispersal ability, and significant geographic isolation and restriction to groundwater aquifers, which is reflected by the large number of local endemics.

Crangonyctidae is the largest family of freshwater amphipods in North America and the genus *Stygobromus* contains over 100 described species. Approximately 80% of the crangonyctid species inhabit subterranean waters, and most of the remaining species live in small, surface streams, ponds, bogs, seeps and wetlands that may have underlying connections to groundwater aquifers.

During reproduction, the male carries the smaller female grasped between its legs. The sperm are transferred from the male to the female's genital duct. The female releases the eggs into a ventral brood chamber where they are incubated during development.

In the Eastern United States species of *Stygobromus* have been collected from caves, wells, surface seeps, bogs, small springs and their associated runoff and surface stream. (Holsinger 1978). Aquatic cave habitat usually consist of streams, drip/seep pools and phreatic pools. On the coastal plain and along the eastern margin of the Piedmont, wells are often quite shallow and some reach groundwater at a depth of a few meters. Seeps or bogs where groundwater oozes to the surfaces frequently form tiny streams which flow through leaf litter and vegetation. *Stygobromus* appears to be much more common in Coastal Plain and Piedmont where groundwater table are close to the surface, than in the Karst areas of the Appalachians (Holsinger 1978). On the Coastal Plain and in the Eastern Piedmont in the Washington D.C. area, most habitats are situated in small wooded areas. Amphipods are found in leaf litter or fine sediments submerged in the seeps, bogs and springs. Many of these habitats are temporary and dry up during the summer.

The District of Columbia is rich biologically and includes both Piedmont and Coastal Plain elements. Its biota include two rare invertebrates. One is the endemic Hay's Spring

Amphipod, (*Stygobromus hayi*), which is federally listed as endangered. *S. hayi* is known from several locations in Rock Creek park. The other species is Kenk's amphipod, (*Stygobromus kenki*) first described by Holsinger in 1978. *S. kenki* once also known from a site in Northern Virginia is presently only known from three spring sites in Rock Creek Park (pers. com, Holsinger).

The type locality for *S. kenki* is a spring southeast of North National Capitol Parks headquarters in Rock Creek Park, and the type series was collected from wet leaf litter at the spring exit (Holsinger, 1978). It was previously recovered from a well in nearby Fairfax County, Virginia. The spring and the well are approximately 21 km apart and are further separated by the Potomac River.

Another extremely rare amphipod is the Virginia well amphipod (*S. phreaticus*) which has no federal protection, was originally collected from a well at Vienna in Fairfax County, Virginia in 1921. Until recently this species was known from two collections made 27 years apart from single wells in Vienna and Alexandria. Vienna and Alexandria are situated approximately 16 km apart and both are drained by tributaries of the nearby Potomac River. In an interview with Dorothy Keough, Environment and Natural Resources Division, Fort Belvoir (pers com, Dec 2000), she reported that *S. phreaticus* had recently been collect by Chris Hobson of the Commonwealth of Virginia on Fort Belvoir property in a seep. The rediscovery of the species at Fort Belvoir is the first new record since 1948.

In 1988, collections from acidic freshwater wetlands in parks in the Southeastern District of Columbia yielded a new species of copepod (Copepoda; Crustacea) *Acanthocyclops columbiensis* from a seep in Fort Stanton Park . According to a review of "Rare, Threatened and Endangered Plants and Animals of National Capitol Parks East" supplied by Mr, Brent Steury (NPS, 2000), *A. columbiensis* is also known from Oxon Cove Park (Oxon Hill Farm) in Prince George's County, Maryland.

Based on the above information, the emergency listing of these three extremely rare invertebrates (*Stygobromus kenki*, *Stygobromus phreaticus* and *Acanthocyclops columbiensis*) is warranted.

In accordance with Section 4(a) of the Endangered Species Act of 1973 as amended the five criteria used to determine if a species is endangered are addressed:

A. Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range.

Rapid commercial and residential development over the last 20 years in the Washington Metropolitan Area have destroyed numerous seeps, springs and bogs associated with the Coastal Plain and Piedmont elements of the Upper Potomac River and its tributaries. Associated with this development is runoff and pollution that further degrades the habitat of these unique endemic invertebrates. Over the last 100 years the groundwater table has

been drastically lowered, drying up wells, springs and seeps. Today, very little habitat remains except in heavily used parks and on military reservations.

Unusually high flood levels from Rock Creek reach the level of the spring habitat of Kenk's amphipod. This level has been flooded with increasing frequency in recent years. Flood waters may adversely affect spring habitat by washing away leaf litter and fine sediments which form the microhabitat utilized by *S. kenki*.

Given the limited distribution and the highly restricted habitats, these invertebrates could be driven to extinction by relatively small human disturbances such as a single construction project.

B. Overutilization for Commercial, Scientific or Recreational Purposes.

Collecting for scientific or educational purposes, even in a moderate sense, would pose a real danger to these extremely rare invertebrate since they are endemic to small locales.

C. Disease of Predation.

Since so little is known about the life histories of these extremely rare invertebrates and they are minute (*Acanthocyclops* 0.46 – 0.48 mm in length) it would seem logical that they could possibly be prey for large aquatic insects and their predacious larvae.

D. Inadequacy of Existing Regulatory Mechanisms.

The Hay's Spring Amphipod (*Stygobromus hayi*) found in Rock Creek Park is currently federally protected as an endangered species (FWS 1982). This may afford some protection to Kenk's amphipod which is also found within Rock Creek Park. It also has some protection accorded by virtue of the fact that it occurs on NPS lands. This was, however, not considered sufficient for the protection of Hay's Spring amphipod.

S. phreaticus is presently known only from Fort Belvoir, Virginia. While residential development is not a threat to the known population, base operations or construction or single relatively small natural events could destroy the only known habitat.

The Fort Stanton and Oxon Hill Farm habitat for *Acanthocyclops coulmbiensis*, could be destroyed by manmade or natural events.

E. Other Natural or Manmade Factors Affecting Its Continued Existence.

Any activities affecting the Upper Potomac and its tributaries, especially the ground water level and its characteristics could be detrimental to the survival of these three unique invertebrates. According to Holsinger, a leading authority on *Stygobromids*, *S. kenki* and *S. phreaticus* are extremely rare species.

Summary

The protection of streams, seeps, bogs and small surface streams along the Upper Potomac River and its tributaries is essential to the survival of these unique invertebrates. Runoff and pollution must be controlled and the existing springs that are inhabited by these invertebrates must be fenced. An inventory or survey needs to be conducted to identify existing seeps or springs that are or could be habitat for the little-known and extremely limited in distribution species. Presently, the only mechanism that could afford these species the adequate protection to ensure their continued existence is listing them as endangered under the ESA.

References:

Holsinger, J.r. 1978. Systematics of the Subterranean Amphipod Genus *Stygobromous*(*Crangonytidae*), Part II: Species of the Eastern United States. Smithsonian Contributions to Zoology, 266: 1-144.

Reid, J. W. 1990. Copepoda (Crustacea) from Acid Wetlands in the District of Columbia and Maryland including a description of *Acanthocyclops columbiensis* n. sp. Trans. Am. Microsc. Soc., 109 (2): 174 – 180.

National Park Service, 2000. Rare, Threatened and Endangered Plants and Animals of National Capitol Parks East. 8 pages.

U.S. Fish and Wildlife Service. 1982. Listing Hay's Spring Amphipod as an Endangered Species. 47 FR 2: 5425-5427.

NATIONAL WILDERNESS INSTITUTE

P.O. Box 25766
Washington, D.C. 20007
ph: (703) 836-7404
fax: (703) 836-7405
e-mail: nwi@nwi.org
http://www.nwi.org



NWI

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Celebrating Ten Years as the Voice of Reason on the Environment

June 26, 2001

Mamie Parker, Ph.D.
US Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9589

Dear Dr. Parker:

I am writing to provide you with additional and new information on imminent threats faced by three invertebrates, *Stygobromus kenki*, *Stygobromus phreaticus* and *Acanthocyclops columbiensis* that were recently petitioned for listing by Dr. Richard Mitchell.

Stygobromus phreaticus is known from only one current location. Until its re-discovery at Fort Belvoir there was concern that it was extinct. At Virginia's Endangered Species Symposium in 1991 it was noted that, "The very distinctive structure of this species (Holsinger, 1978) makes it highly unlikely that the species would have been overlooked in other collections. Status undetermined rank may be assigned pending a possible future change to endangered or extinct." At Fort Belvoir there is an increasing number of activities that could affect *S. phreaticus*. Fort Belvoir is an actively used military base located adjacent to major transportation corridors (Route 1 goes through the Fort and Interstate 95, a railroad and the Potomac River border it.) In the Fort, in addition to constant activity such as military exercises and training, there is the prospect of greatly increased building activities including the creation of the Army Museum with its attendant construction activities and increased visitation. Legislation designating Belvoir as the site has been introduced in the House and Senate. 48 acres in the Fort have been offered as a site for the museum and the National Capital Planning Commission has already approved the project. The Fairfax County supervisor said he expects about one million visitors a year to visit the site. Planning is underway for additional Potomac River crossings with sites above and below Washington being considered. All of these ongoing and increasing activities are being done without any requirement that the effect of these actions on *S. phreaticus* be considered. In the absence of ESA protection, *S. phreaticus* faces imminent extinction.

Acanthocyclops columbiensis, unless protected, could likewise be extirpated at any moment. It is known from only two locations, Fort Stanton and Oxon Hill parks. The fact that it occurs in a National Park affords it little specific protection. I have not seen its site in Fort Stanton but can report that at Oxon Hill where it is found in a small, brick-lined spring, it is vulnerable to extirpation. The park is managed primarily as a working display of a 19th century farm where urban school children can view livestock and

unmechanized farm equipment. Indeed, during a recent visit I made to Oxon Hill Farm, neither of the two National Park Rangers I spoke to knew where the spring was nor had they even heard of the spring. Nevertheless, it was not hard to find being located at a trailhead a few feet from the main parking lot and next to a mowed field. The spring flows into a small stream a few yards away into which the waste from the barn and barnyard flows. The spring is completely unprotected, accessible and exposed to whatever thoughtless or mischievous act one of the many visitors might do. There were soda cans and other litter nearby and it is not hard to imagine bug spray or other harmful substance being tossed into the spring. A major federal construction project, a 12-lane, two span drawbridge and its expansive network of approaches, is underway immediately adjacent to and within the park near the spring site and no consideration has been given to the project's effects on this species. (see attached map and description). This project could massively alter the hydrologic regime altering ground water recharge and introducing pollution from the project area. Presently, prior to its expansion, in the neighborhood of 190,000 vehicles a day use the bridge. As NPS has noted as regards another spring dependent crustacean in the Washington DC area, "...road surface drainage may present short-term threats from winter road salting and urban runoff." Only by listing this species will the federal agencies involved be required to consider the potentially devastating effects of the project's construction activities and resultant permanent alteration of the local landscape, hydrology, air and water quality and other components of species' unique habitat.

Stygobromus kenki currently known from only two sites in Rock Creek Park, East Spring and Sherrill Drive Spring. The fact that a species is in a park is not, of itself, adequate protection. A macroinvertebrate survey of Rock Creek described both sites as "highly threatened," and said, "The existence of *S. kenki* is nearly as tenuous as that of *S. hayi*" which, despite being in the same national park as *S. kenki*, was found to merit listing. According to the NPS, "long-term threats exist within and outside the borders of Rock Creek Park. The East springs site could be threatened by additional development of the recreation area located up slope. The Sherrill Drive Spring site could be threatened by any changes in open space at Walter Reed Hospital or surrounding homes. An example is the plan Walter Reed Hospital has for building an additional research facility on its grounds." On June 25 the Washington Post ran a feature article on Washington DC's plans for a major construction activity that includes rebuilding the stormwater infrastructure of the city. An undescribed species of *Stygobromus* was discovered in the vicinity 1978. A subsequent attempt to collect and describe the species in 1995 was unsuccessful because fill from an excavation at the National Zoo had been dumped on the spring burying it. When asked to excavate the spring, the zoo claimed it had no funds available but it would cease adding additional fill.

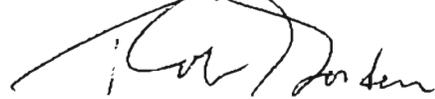
A key reason for the ESA was to make consideration of the effects of an action mandatory. Without that protection, even institutions presumably highly motivated to preserve species such as the NPS and the National Zoo inadvertently undertake activities that harm species.

M. Parker
Page 3
June 26, 2001

In your reply to a recent request for information on the listing petition by Dr. Richard Mitchell you said that its rediscovery "indicates that the species, though it may be rare, has persisted and is not in imminent danger of extinction." If present existence were all it took to keep a species off the list, it is hard to imagine any species meriting protection.

These species are in harms way. They are in the midst of a torrent of activity potentially adversely affecting their extremely limited and vulnerable habitats. Therefore, I ask that Dr. Mitchell's petition be reconsidered in light of new and significant information on the immediate and serious threats to these species provided herein.

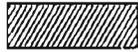
Sincerely,

A handwritten signature in black ink, appearing to read "Rob Gordon". The signature is fluid and cursive, with a large initial "R" and "G".

Rob Gordon

a. columbiana
spring site

	Hectares (Acres)
Total Property	196 (485)
Right-of-Way Required	0.02 (0.16)



Impact Area



Oxon Hill Farm

Bald Eagle Rpt.

Oxon Hill Farm
Access Road

Beltway



WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

Impacts to Oxon Hill Farm

Date
December, 1999

0 100 200
Scale in Feet

Figure
4-12

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