

**Hay's Spring amphipod  
(*Stygobromus hayi*)**

**5-Year Review:  
Summary and Evaluation**

**U.S. Fish and Wildlife Service  
Chesapeake Bay Field Office  
Annapolis, Maryland**

**Fall 2007**

**5-YEAR REVIEW**  
**Hay's Spring amphipod (*Stygobromus hayi*)**

**1.0 GENERAL INFORMATION**

**1.1 Reviewers**

U.S. Fish and Wildlife Service: Mary Parkin  
Others: Dan Feller, Maryland Department of Natural Resources  
Chris Hobson, Virginia Division of Natural Heritage  
Dr. John R. Holsinger, Old Dominion University  
Bill Yeaman, National Park Service

Lead Field Office: Chesapeake Bay Field Office, Andy Moser, 410-573-4537

Lead Regional Office: Northeast Regional Office, Mary Parkin, 413-253-8617

**1.2 Methodology Used to Complete the Review**

This 5-year review was developed by Chesapeake Bay Field Office staff, with Andy Moser serving as the lead biologist and primary author. Data for this review were solicited from interested parties through a January 29, 2007, Federal Register notice and through a January 31, 2007, electronic mail soliciting information from interested parties.

**1.3 Background**

**1.3.1 Federal Register Notice citation announcing initiation of this review:**

Endangered and Threatened Wildlife and Plants; Initiation of a 5-Year Review of Ten Listed Northeastern Species (72 FR 4018-4019, January 29, 2007)

**1.3.2 Listing history:**

Federal Register (FR) notice:	47 FR 5425
Date listed:	February 5, 1982
Entity listed:	Species
Classification:	Endangered

**1.3.3 Associated rulemakings: None**

**1.3.4 Review history:**

November 6, 1991, (56 FR 56882) – The Hay's Spring amphipod was included in a cursory 5-year review conducted for all species listed prior to 1991. Otherwise, no status review focused specifically on this species has been conducted since its listing in 1982.

**1.3.5 Species' Recovery Priority Number at start of 5-year review: 5**

This recovery Priority number is indicative of a species facing a high degree of threat and with a low recovery potential.

**1.3.6 Recovery plan:**

The Hay's Spring amphipod has been exempted from recovery planning because the U.S. Fish and Wildlife Service determined that management options were so limited that no conservation benefits would ensue from a recovery plan. This exemption is subject to being withdrawn if new information or analysis indicates that the species would benefit from recovery planning.

**2.0 REVIEW ANALYSIS**

**2.1 Application of the 1996 Distinct Population Segment (DPS) policy**

**2.1.1 Is the species under review a vertebrate?** No. The DPS policy is not, therefore, applicable.

**2.2 Recovery Criteria**

**2.2.1 Does the species have a final, approved recovery plan containing objective, measurable criteria?** No (see Section 1.3.6 above).

**2.2.2 Adequacy of recovery criteria:** Not applicable.

**2.3 Updated Information and Current Species Status**

**2.3.1 Biology and habitat:**

**2.3.1.1 New information on the species' biology and life history:** No new information on biology has become available since the species' listing. Changes in known distribution are discussed in 2.3.1.5 below.

**2.3.1.2 Abundance, population trends, demographic features, or demographic trends:** Due to the difficulty in sampling/collecting large numbers of this species, very little population or demographic information exists.

**2.3.1.3 Genetics, genetic variation, or trends in genetic variation:** No new information

**2.3.1.4 Taxonomic classification or changes in nomenclature:** No new information

**2.3.1.5 Spatial distribution, trends in spatial distribution, or historic range:** The known distribution of the species has increased from a single site at the time of listing to four confirmed sites (Culver and Sereg 2004; J. Holsinger, pers. comm. 2007; B.

Yeaman, in litt. 2003). Amphipods found at three additional sites in Rock Creek Park are considered probable to be Hay's Spring amphipods but have not been confirmed by species expert Dr. John Holsinger (Culver and Sereg 2004; J. Holsinger, in litt. 2007). The original site was a spring on National Zoo property adjacent to Rock Creek in the District of Columbia. The other six sites (confirmed and probable) consist of five springs and one interstitial sample from the sediments of Rock Creek, all within Rock Creek Park in the District of Columbia. Although the amphipod is now known from four different springs/seeps and may occur at three additional sites, the range of the species remains quite small. Collectively, all seven known and probable sites are within a 3-mile reach of the Rock Creek floodplain and all are subject to similar environmental conditions.

**2.3.1.6 Habitat or ecosystem conditions:** Because Rock Creek Park is a heavily used recreation area and because its watershed outside the park is highly urbanized, there are many activities that may be degrading the species' habitat, including intensive recreational use adjacent to the springs in Rock Creek Park, which increases the potential for pollution of the springs, and intensive development and associated increases in impermeable surfaces, which may decrease water quality and quantity in the springs. Past and ongoing changes in the hydrology of the watershed are associated with intensive urban development (Feller 1997). These activities were identified as threats were at the time of the species' listing but have likely increased in intensity since 1982. Because this species inhabits seeps or springs, the quality and quantity of the groundwater supply feeding these habitats is of particular concern. Culver and Sereg (2004) provide information indicating that water quality is degraded at several of the springs along Rock Creek within the range of Hay's Spring amphipod.

## **2.3.2 Five-factor analysis:**

**2.3.2.1 Present or threatened destruction, modification or curtailment of its habitat or range:** The 1982 listing rule cites two main threats to the Hay's Spring amphipod under this factor: (1) The increasing frequency of flooding of Rock Creek, which may remove individual amphipods and adversely affect habitat by removing leaves and sediment that form the species' spring habitat; and (2) construction activities affecting spring habitats. These threats remain. In addition, increased recreational use of Rock Creek Park and changes in hydrology and water quality in the spring recharge areas are threats to the species' habitat (Feller 1997, Culver and Sereg 2004).

**2.3.2.2 Overutilization for commercial, recreational, scientific, or educational purposes:** The original listing rule indicated that future collecting presented a danger to this species; however, there is no evidence that the small number of Hay's Spring amphipods collected since its listing represents a threat to the species. In fact, the majority of collections of *S. hayi* since 1982 have occurred at sites not known at the time of listing. These collections have extended the known range of the species.

**2.3.2.3 Disease or predation:** Considered not applicable in original listing rule; no new information



**2.3.2.4 Inadequacy of existing regulatory mechanisms:** Within Rock Creek Park (managed by the National Park Service) and the National Zoological Park (managed by the Smithsonian Institution), the Endangered Species Act, together with the policies of the managing agencies, provides adequate authority to protect the species from any threats originating within the boundaries of these parks. However, non-point source pollution and changes in hydrology originating outside these boundaries are likely to adversely affect this species (Feller 1997) and are extremely difficult to regulate in the urban landscape surrounding these parks.

**2.3.2.5 Other natural or manmade factors affecting its continued existence:** Considered not applicable in original listing rule; no new information

## **2.4 Synthesis**

Information that has become available within the past 10 years indicates that the known distribution of the Hay's Spring amphipod has increased from a single spring to four springs (with three additional probable sites), all occurring within a short stretch of the Rock Creek floodplain in the District of Columbia.

The information also indicates that the types of threats faced by the Hay's Spring amphipod have not changed since the species' listing, but that their intensity probably has intensified due to increased development in the Rock Creek watershed. Because the landscape surrounding the parklands of Rock Creek Park and the National Zoological Park is likely to become increasing urbanized, threats to the hydrology and water quality of the springs supporting this species will continue. Additional work to delineate the recharge areas of these springs may allow further protection of at least some of the recharge areas occurring within park boundaries but will not ameliorate or eliminate all threats.

Although expansion of the known distribution of the Hay's Spring amphipod is a positive development, it does not significantly change the status of the species, because all occurrences are subject to threats which are similar throughout this reach. Consequently, we have concluded that the Hay's Spring amphipod continues to meet the definition of an endangered species.

## **3.0 RESULTS**

**3.1 Recommended Classification:** Retain as endangered. No change needed.

**3.2 Recommended Recovery Priority Number:** 5 (no change)

Brief Rationale: The recovery priority number is unchanged because this species continues to be subject to a high degree of threat with low recovery potential.

#### 4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

- Take additional amphipod samples at the three sites where probable Hay's Spring amphipods have been found in order to allow confirmation of the species' occurrence.
- Carry out a study to precisely delineate recharge areas for the springs supporting Hay's Spring amphipod. Once this delineation is complete, designate areas within the parks to protect these recharge zones.
- Redirect existing artificial surface flows away from springs and spring runs supporting this species.
- To the extent possible, prevent any increase in impervious surfaces or clearing of forest lands within the drainages and recharge areas supporting this species.
- Develop a recovery outline and (if deemed appropriate as a consequence of the analysis in the recovery outline) a recovery plan for the amphipod.

#### 5.0 REFERENCES

- Culver, D.C. and Sereg, I. 2004. Kenk's amphipod (*Stygobromus kenki* Holsinger) and other amphipods in Rock Creek Park, Washington, D.C. Environmental Studies Program, American University. Unpublished report to the National Park Service. 147pp.
- Feller, D. 1997. Aquatic subterranean macroinvertebrate survey of Rock Creek and associated National Parks, Washington, D.C. Heritage and Biodiversity Conservation Programs Technical Report. Maryland DNR, Annapolis, Maryland. 38pp.
- Holsinger, J. Electronic mail of 8/3/2007 indicating that only three of the sites considered by Yeaman to support *S. hayi* had adequate samples to confirm the identification.
- Holsinger, J. Phone conversation of 8/21/2007 indicating that specimens from a fourth site (Kennedy Street Spring) had been confirmed to be *S. hayi* (as noted in Culver and Sereg 2004).
- United States Fish and Wildlife Service. 1982. Endangered and Threatened Wildlife and Plants; Listing of Hay's Spring amphipod as an endangered species. Federal Register, Vol. 47, No. 25, February 5, 1982.
- Yeaman, B. Electronic mail of 7/31/2003 confirming that Dr. Culver's recent surveys of Rock Creek Park bring the total number of sites supporting Hay's Spring Amphipod to six springs.

**U.S. FISH AND WILDLIFE SERVICE  
5-YEAR REVIEW OF HAY'S SPRING AMPHIPOD**

**Current Classification:** Endangered

**Recommendation resulting from the 5-Year Review:** No change needed.

**Review Conducted By:** Andy Moser, Chesapeake Bay Field Office

**FIELD OFFICE APPROVAL:**

**Lead Field Supervisor, Fish and Wildlife Service**

Approve Mary J. Rathaswamy Date 12/18/2007  
*Acting Deputy Field Supervisor*

**REGIONAL OFFICE APPROVAL:**

**Lead Regional Director, Fish and Wildlife Service**

Approve  Date 12/12/07  
*Acting*  
**/s/Wendi Weber**