—Use lists and table wherever possible.

List of Subjects in 43 CFR Part 2

Administrative practice and procedure, Confidential information, Courts, Freedom of Information Act, Privacy Act.

Dated: September 7, 2016.

Kristen J. Sarri,

Principal Deputy Assistant Secretary for Policy, Management and Budget.

For the reasons stated in the preamble, the Department of the Interior proposes to amend 43 CFR part 2 as follows:

PART 2—FREEDOM OF INFORMATION ACT; RECORDS AND TESTIMONY

■ 1. The authority citation for part 2 continues to read as follows:

Authority: 5 U.S.C. 301, 552, 552a, 553; 31 U.S.C. 3717; 43 U.S.C. 1460, 1461.

■ 2. Amend § 2.254 to add paragraph (b)(18) to read as follows:

§ 2.254 Exemptions.

* * * * *

(b) * * *

(18) Investigations Case Management System (CMS), BSEE–01.

[FR Doc. 2016–23707 Filed 9–29–16; 8:45 am]

BILLING CODE 4310–VH–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R5–ES–2016–0030; 4500030113]

RIN 1018–BB50

Endangered and Threatened Wildlife and Plants; Endangered Species Status for the Kenk's Amphipod

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to list the Kenk's amphipod (*Stygobromus kenki*), a ground water species from the District of Columbia, Maryland, and Virginia, as an endangered species under the Endangered Species Act (Act). If we finalize this rule as proposed, it would extend the Act's protections to this species. The effect of this regulation will be to add the species to the List of Endangered and Threatened Wildlife.

DATES: We will accept comments received or postmarked on or before November 29, 2016. Comments submitted electronically using the Federal eRulemaking Portal (see **ADDRESSES** below) must be received by 11:59 p.m. Eastern Time on the closing date. We must receive requests for public hearings, in writing, at the address shown in **FOR FURTHER INFORMATION CONTACT** by November 14, 2016.

ADDRESSES: You may submit comments by one of the following methods:

(1) *Electronically:* Go to the Federal eRulemaking Portal: *http://www.regulations.gov.* In the Search box, enter FWS–R5–ES–2016–0030, which is the docket number for this rulemaking. Then, in the Search panel on the left side of the screen, under the Document Type heading, click on the Proposed Rules link to locate this document. You may submit a comment by clicking on ''Comment Now!''

(2) *By hard copy:* Submit by U.S. mail or hand-delivery to: Public Comments Processing, Attn: FWS–R5–ES–2016–0030; U.S. Fish and Wildlife Service Headquarters, MS: BPHC, 5275 Leesburg Pike, Falls Church, VA 22041–3803.

We request that you send comments only by the methods described above. We will post all comments on *http://www.regulations.gov.* This generally means that we will post any personal information you provide us (see *Public Comments* below for more information).

FOR FURTHER INFORMATION CONTACT: Genevieve LaRouche, Field Supervisor, U.S. Fish and Wildlife Service, Chesapeake Bay Field Office, 177 Admiral Cochrane Drive, Annapolis, MD 21401, by telephone 410–573–4577 or by facsimile 410–269–0832. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Act, if a species is determined to be an endangered or threatened species throughout all or a significant portion of its range, we are required to promptly publish a proposal in the **Federal Register** and make a determination on our proposal within 1 year. Critical habitat shall be designated, to the maximum extent prudent and determinable, for any species determined to be an endangered or threatened species under the Act. Listing a species as an endangered or threatened species and designating and revising critical habitat can be completed only by issuing a rule.

What this document does. This document proposes the listing of the Kenk's amphipod (*Stygobromus kenki*) as an endangered species. The Kenk's amphipod is a candidate species for which we have on file sufficient information on its biological vulnerability and threats to support preparation of a listing proposal, but for which development of a listing regulation has been precluded by other higher priority listing activities. This proposed rule assesses the best available information and data regarding the status of and threats to the Kenk's amphipod.

The basis for our action. Under the Act, we can determine that a species is an endangered or threatened species based on any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) Overutilization for commercial, recreational, scientific, or educational purposes; (C) Disease or predation; (D) The inadequacy of existing regulatory mechanisms; or (E) Other natural or manmade factors affecting its continued existence. We have determined that the Kenk's amphipod is in danger of extinction primarily due to poor water quality, erosion, and sedimentation resulting from urban runoff in Maryland and the District of Columbia (Factor A) and the effects of small population dynamics (Factor E) at all known locations.

We will seek peer review. We will seek comments from independent specialists to ensure that our determination is based on scientifically sound data, assumptions, and analyses. We will invite these peer reviewers to comment on our listing proposal. Because we will consider all comments and information received during the comment period, our final determination may differ from this proposal.

Information Requested

Public Comments

We intend that any final action resulting from this proposed rule will be based on the best scientific and commercial data available and be as accurate and as effective as possible. Therefore, we request comments or information from the public, other concerned governmental agencies, Native American Tribes, the scientific community, industry, or any other interested parties concerning this proposed rule. We particularly seek comments concerning:

(1) The Kenk's amphipod's biology, range, and population trends, including:

(a) Biological or ecological requirements of the species, including habitat requirements for feeding, breeding, and sheltering;

(b) Genetics and taxonomy;

(c) Historical and current range including distribution patterns;

(d) Historical and current population levels, and current and projected trends; and

(e) Past and ongoing conservation measures for the species, its habitat, or both.

(2) Factors that may affect the continued existence of the species, which may include habitat modification or destruction, overutilization, disease, predation, the inadequacy of existing regulatory mechanisms, or other natural or manmade factors.

(3) Biological, commercial trade, or other relevant data concerning any threats (or lack thereof) to the species and existing regulations that may be addressing those threats.

(4) Additional information concerning the historical and current status, range, distribution, and population size of this species, including the locations of any additional populations of the species.

(5) Additional information on the hydrology (*e.g.*, connectedness, size of recharge areas) of the known Kenk's amphipod sites.

(6) Reliable methodology for estimating the total population size at an individual seep site (*e.g.*, calculating the number of animals in the subsurface from the number of animals at the surface).

(7) Additional information on the interspecific interactions of amphipods at the known Kenk's amphipod sites (*e.g.*, predator/prey dynamics or competition for food or space resources).

(8) The specific tolerance of the Kenk's amphipod or the Potomac groundwater amphipod (*Stygobromus tenuis potomacus*) to temperature, sewage effluent, chlorinated water, or other contaminants.

Please include supporting documentation with your submission (such as scientific journal articles or other publications) to allow us to verify any scientific or commercial information you include.

Please note that submissions merely stating support for or opposition to the action under consideration without providing supporting information, although noted, will not be considered in making a determination, as section 4(b)(1)(A) of the Act directs that determinations as to whether any species is a threatened or endangered species must be made ''solely on the basis of the best scientific and commercial data available.''

You may submit your comments and materials concerning this proposed rule by one of the methods listed in **ADDRESSES**. We request that you send comments only by the methods described in **ADDRESSES**.

If you submit information via *http://www.regulations.gov*, your entire submission—including any personal identifying information—will be posted on the Web site. If your submission is made via a hardcopy that includes personal identifying information, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so. We will post all hardcopy submissions on *http://www.regulations.gov.*

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on *http://www.regulations.gov*, or by appointment, during normal business hours, at the U.S. Fish and Wildlife Service, Chesapeake Bay Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Public Hearing

Section 4(b)(5) of the Act provides for one or more public hearings on this proposal, if requested. Requests must be received within 45 days after the date of publication of this proposed rule in the **Federal Register**. Such requests must be sent to the address shown in **FOR FURTHER INFORMATION CONTACT**. We will schedule public hearings on this proposal, if any are requested, and announce the dates, times, and places of those hearings, as well as how to obtain reasonable accommodations, in the **Federal Register** and local newspapers at least 15 days before the hearing.

Peer Review

In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (59 FR 34270), we will seek the expert opinions of at least three appropriate and independent specialists regarding this proposed rule. The purpose of peer review is to ensure that our listing determination is based on scientifically sound data, assumptions, and analyses. The peer reviewers have expertise in Kenk's/*Stygobromus* amphipod biology, habitat, or stressors (factors negatively affecting the species) to the Kenk's amphipod species or its habitat. We invite comment from the peer reviewers during this public comment period.

Previous Federal Action

In 2001, the Service received a petition to list the Kenk's amphipod and two other invertebrates. Higher priority workload that consumed the listing budget prevented the Service from making a 90-day finding until fiscal year (FY) 2006 when we found that the petition did not present substantial information (72 FR 51766, September 11, 2007) indicating that listing may be warranted. In 2010, the Service, under its own candidate assessment process, initiated a status review for the Kenk's amphipod, completed an analysis on the best available data, and determined that listing the species was warranted. However, we were precluded from moving forward with rulemaking for the species due to other higher priority listing actions. The Kenk's amphipod was added to the FY 2010 candidate list (75 FR 69222, November 10, 2010). The species' status was reviewed at least annually and continued to be found warranted but precluded for listing in all subsequent annual Candidate Notices of Review (76 FR 66370, October 26, 2011; 77 FR 69994, November 21, 2012; 78 FR 70104, November 22, 2013; 79 FR72450, December 5, 2014; 80 FR 80584, December 24, 2015). For additional information see: *http://ecos.fws.gov/tess_public/profile/speciesProfile?spcode=K04P* (last accessed June 22, 2016). In 2011, the Service entered into a settlement agreement with the Center for Biological Diversity and WildEarth Guardians that specified a listing determination must be made for all species from the FY 2010 candidate list (*Center for Biological Diversity* v. *Salazar* 10–cv–0230 (D.D.C.); *WildEarth Guardians* v. *Salazar* Nos. 10–cv–0048; 10–cv–0421; 10–cv–1043; 10–cv–1045; 10–cv–1048; 10–cv–1049; 10–cv–50; 10–cv–51; 10–cv–1068; 10–cv–2299; 10–cv–2595; 10–cv–3366 (D.D.C.)). Per the settlement agreement, a not warranted finding or proposed listing rule for the Kenk's amphipod must be delivered to the **Federal Register** no later than September 30, 2016.

Background

Taxonomy and Species Description

The Kenk's amphipod (*Stygobromus kenki*) was first collected in 1967 by Roman Kenk from a spring in Rock Creek Park (Park), southeast of North National Capitol Parks' headquarters in the District of Columbia, and it was formally described by J.R. Holsinger (1978, pp. 39–42). We have carefully reviewed the best available taxonomic data and conclude that the Kenk's amphipod is a valid species.

The Kenk's amphipod is a moderately small ground water crustacean, with the largest male and female specimens growing to 0.15 inch (in) (3.7 millimeters (mm)) and 0.22 in (5.5 mm) in length, respectively. The Kenk's amphipod is a member of the Spinosus Group of *Stygobromus*, which includes two other closely related but separate species, Blue Ridge stygobromid (*S. spinosus*) and Luray Caverns amphipod (*S. pseudospinosus*), that are found only in Virginia, primarily in Shenandoah National Park. The Kenk's amphipod is distinguished from those two species, as well as other co-occurring amphipods, such as the Potomac groundwater amphipod and Hay's spring amphipod (*S. hayi*), on the basis of various morphological features (Holsinger 1978, p. 39). For additional morphological description details, please see the Kenk's amphipod's FY 2015 candidate assessment form here: *http://ecos.fws.gov/docs/candidate/assessments/2015/r5/K04P_I01.pdf* (last accessed on June 22, 2016).

Accurate identification of the Kenk's amphipod can occur only when a specimen is removed from the seepage spring site (hereafter referred interchangeably as seepage spring, seep, spring, or site depending upon the reference), and preserved in alcohol or other fixing agent for identification by a species expert who removes legs and other appendages from the specimen for microscopic examination. This identification method is the best scientific method available. Because the laboratory identification results in mortality, the Service has been judicious in limiting the frequency and number of specimens removed from known sites.

Reproduction and Longevity

We have no reproductive or longevity information specific to the Kenk's amphipod, but assume those attributes are similar to other *Stygobromus* species. Like other amphipods, females of the genus *Stygobromus* deposit their eggs in a brood pouch on their underside (Foltz and Jepson 2009, p. 2). Young of the Potomac groundwater amphipod hatch from the egg and actively swim from the brood pouch, with days or even weeks passing between the hatching of the first and last young of a brood (Williams 2013, p. 10). The immature stages resemble the adults, and individuals undergo successive molts (usually between eight and nine) until maturity. Most surface amphipod species from the family Talitridae complete their life cycle (egg to adult) in 1 year or less, but subterranean species like the Kenk's amphipod have a longer life span and may live for 4 to 6 years (Foltz and Jepson 2009, p. 2).

Habitat

Amphipods of the genus *Stygobromus* occur in ground water and ground water-related habitats (*e.g.*, caves, seeps, small springs, wells, interstices, and rarely deep ground water lakes). Members of this genus occur only in freshwater and belong to the family Crangonyctidae, the largest family of freshwater amphipods in North America, and have modified morphology for survival in the subterranean ground water that is their primary habitat. These species are generally eyeless and unpigmented (without color), and frequently have attenuated (reduced in length and width) bodies (Holsinger 1978, pp. 1–2).

The Kenk's amphipod is found in wooded areas where ground water emerges to form seepage springs (Holsinger 1978, p. 39). More specifically, this habitat is called the hypotelminorheic. Hypotelminorheic is described as habitats: (1) With a perched aquifer fed by subsurface water that creates a persistent wet spot; (2) underlain by a clay or other impermeable layer typically 5 to 50 centimeters (cm) (2 to 20 in) below the surface; and (3) rich in organic matter compared with other aquatic subterranean habitats. The water supplying the springs infiltrates to the ground water from precipitation and runoff into the catchment (*e.g.*, recharge or drainage) areas (see Factor A—Water Quality/Quantity Degradation Due to Chronic Pollution of Urban/Suburban Runoff section below for more details). The water exits these habitats at seepage springs. Seepage springs typically have a diffuse discharge of water where the flow cannot be immediately observed but the land surface is wet compared to the surrounding area (Culver *et al.* 2012, p. 2). The shading, hydrologic conditions, and organic matter found in these woodlands are considered important factors in maintaining suitable habitat for the species.

The Kenk's amphipod has been found in the dead leaves or fine sediment submerged in the waters of its seepage spring outflows (Holsinger 1978, p. 130). The best available data indicate that the species will move between the surface and subterranean portions of the spring habitat, but it is unknown when or how often that movement occurs (Kavanaugh 2009, p. 3). Seepage springs typically have a drainage area of less than 10,000 square meters (2.5 acres (ac); 1 hectare (ha)) and their water quality parameters differ from those parameters of small surface waters by having higher conductivity and dissolved oxygen, and lower pH and temperature (Culver *et al.* 2012, pp. 5–6). For example, an unpublished study (Culver and Chestnut 2006, pp. 1–3) found that sites supporting the genus *Stygobromus* had lower temperatures during spring and summer, higher dissolved oxygen, lower pH, and lower nitrate levels than other seepage springs (70 putative seepage springs) along the George Washington Memorial Parkway in Virginia. The Service has contracted with the Maryland Geological Survey to delineate the recharge areas and conduct electrical resistivity surveying to determine elevations of bedrock or clay that may be perching the water table, and to detect elevation of the water table of several seepage springs supporting the Kenk's amphipod; however, the results of this study will not be available until 2017.

All *Stygobromus* species found in the hypotelminorheic habitats appear to have similar requirements—shallow ground water and springs with good water quality and persistent flow for most of the year in wooded habitats. Forest canopy cover appears to be necessary both for the shading and the food source its leaf litter provides. This food source consists of organic detritus and the microorganisms using the leaf litter as substrate.

Springs currently known to support the Kenk's amphipod are found in forested areas with steep slopes, adjacent to streams, and overlying the Wissahickon geologic formation in the Piedmont of Maryland and the District of Columbia and in the Calvert formation just above the Nanjemoy formation in the upper Coastal Plain of Virginia. While the applicable areas containing the known appropriate geology in the Piedmont of Maryland and the District of Columbia have been extensively surveyed for Kenk's amphipod, the same is not true for areas in the Coastal Plain of Maryland and Virginia because information that these geological formations support occupied Kenk's amphipod habitat is new to the Service and species experts (see the *Distribution and Relative Abundance*—Current Range and Distribution Since 2016 section below for more information). The Service conducted a preliminary geographic information system (GIS) analysis to determine that the total amount of forested areas containing the appropriate geology in the Coastal Plain areas of Maryland and Virginia is approximately 20,500 ac (8,296 ha), with approximately 3,063 ac (1,240 ha) on public lands. However, the potential amount of suitable habitat for the Kenk's amphipod is less than 20,500 ac (8,296 ha). The Service will narrow the scope of potential habitat areas to survey by evaluating slope, adjacent waterways, and other habitat quality parameters.

Distribution and Relative Abundance

Known Range and Distribution Prior to 2016

Prior to 2016, all known occurrences of the Kenk's amphipod were from the Potomac River watershed in or near the District of Columbia. At the time of its description, this amphipod was known from two seepage springs (East Spring and Holsinger Spring) in Rock Creek Park in the District of Columbia and was initially thought to be identified from one shallow well in Fairfax County in northern Virginia (Holsinger 1978, p. 39; Terwilliger 1991, p. 184). However, the single immature male specimen from this well was later reexamined by a taxonomic expert and determined not to be a Kenk's amphipod (Holsinger 2009, p. 266). Because of the difficulty in finding the small seepage area of Holsinger Spring, the location was surveyed only once (in 2003) between the Kenk's amphipod's original discovery at the site in 1967 and surveys conducted in 2015.

The Kenk's amphipod was discovered in two additional springs (Sherrill Drive Spring and Kennedy Street Spring (this spring also supports the federally endangered Hay's Spring amphipod) in Rock Creek Park in 1995 and 2001 and in two springs (Coquelin Run Spring and Burnt Mill Spring #6) in Montgomery County, Maryland, in 2003 to 2004, bringing the total number of springs known to support the Kenk's amphipod to six. All of these sites are considered to be in the Washington metropolitan area because they are all within the Washington Beltway (*i.e.,* the I–495 highway).

Until 2016, the species was known only from six seepage spring sites in the District of Columbia and Montgomery County, MD (Culver and Sereg 2004, pp. 35–36; Feller 2005, p. 5) (see figure 1 below), despite extensive surveys for the species in the same area (Feller 1997, entire; Culver and Sereg 2004, entire; Feller 2005, entire). Ground water amphipod surveys on National Park Service (NPS) properties in Arlington and Fairfax Counties, VA, failed to detect the Kenk's amphipod (Hutchins and Culver 2008, entire). In addition, surveys in 2014 in the vicinity of the proposed Purple Line light rail project in Montgomery County, MD, also failed to detect the species (Culver 2015, entire).

Within the species' historical range, the District of Columbia and Maryland, it is plausible that urbanization of the Rock Creek and Northwest Branch watersheds (outside of the protected parklands) has reduced the range and distribution of the Kenk's amphipod because many large and small springs throughout these drainages have been lost as a result of urbanization (Williams 1977, entire; Feller 2005, p. 11). In particular, the southern Rock Creek watershed is where most of the natural tributaries and springs in the District of Columbia south of the National Zoo have been lost due to leveling and filling of the stream valleys, or conversion to covered sewers (Williams 1977, pp. 6, 11). However, there is no available method to estimate to what extent the Kenk's amphipod may have been present in these areas. The best available data indicate that there were no ground water amphipod surveys at any of the springs prior to those habitat areas being filled or otherwise converted to unsuitable habitat.

Current Range and Distribution Since 2016

Within the Washington metropolitan area, five of the known sites are within the Rock Creek drainage: Four are within Rock Creek Park in the District of Columbia (Holsinger Spring, Kennedy Street Spring, East Spring, and Sherrill Drive Spring), and the fifth (Coquelin Run Spring) is in Montgomery County, MD, not far from the District of Columbia border. A sixth known site (Burnt Mill Spring #6) is within the Northwest Branch Park in the Northwest Branch drainage in Montgomery County, MD, approximately 3 miles (mi) (4.8 kilometers (km)) from the District of Columbia border. Thus, the current range of this species in the Washington metropolitan area is limited to Federal land (four sites) and private property (one site) adjacent to approximately 4 linear mi (6.4 km) of Rock Creek, and a single site to the east, on county parkland adjacent to the Northwest Branch. Both Rock Creek Park and the Northwest Branch Park are long, linear parks within heavily urbanized areas.

In addition to the distribution described above for the Washington metropolitan area, a new area occupied by the Kenk's amphipod was identified in 2016—the U.S. Army's Fort A.P. Hill installation in Caroline County, VA, approximately 60 mi (97 km) south of all previously known sites (see figure 1 below). The species was collected during surveys conducted for another amphipod species in 2014, but not identified as the Kenk's amphipod until May 2016, when the Service was notified of the information. Out of a total of 21 surveyed sites on the installation, 4 were found to contain the Kenk's amphipod. Seven Kenk's amphipod individuals were identified from these four springs, which are along Mount and Mill Creeks, both tributaries of the Rappahannock River (J. Applegate, pers. comm., 05/02/2016; C. Hobson, pers. comm., 05/12/2016) (see figure 1). The spring sites in the two creek systems are approximately 7.5 mi (12 km) apart. The area immediately surrounding Fort A.P. Hill is less developed than the Washington metropolitan area.

BILLING CODE 4333–15–P

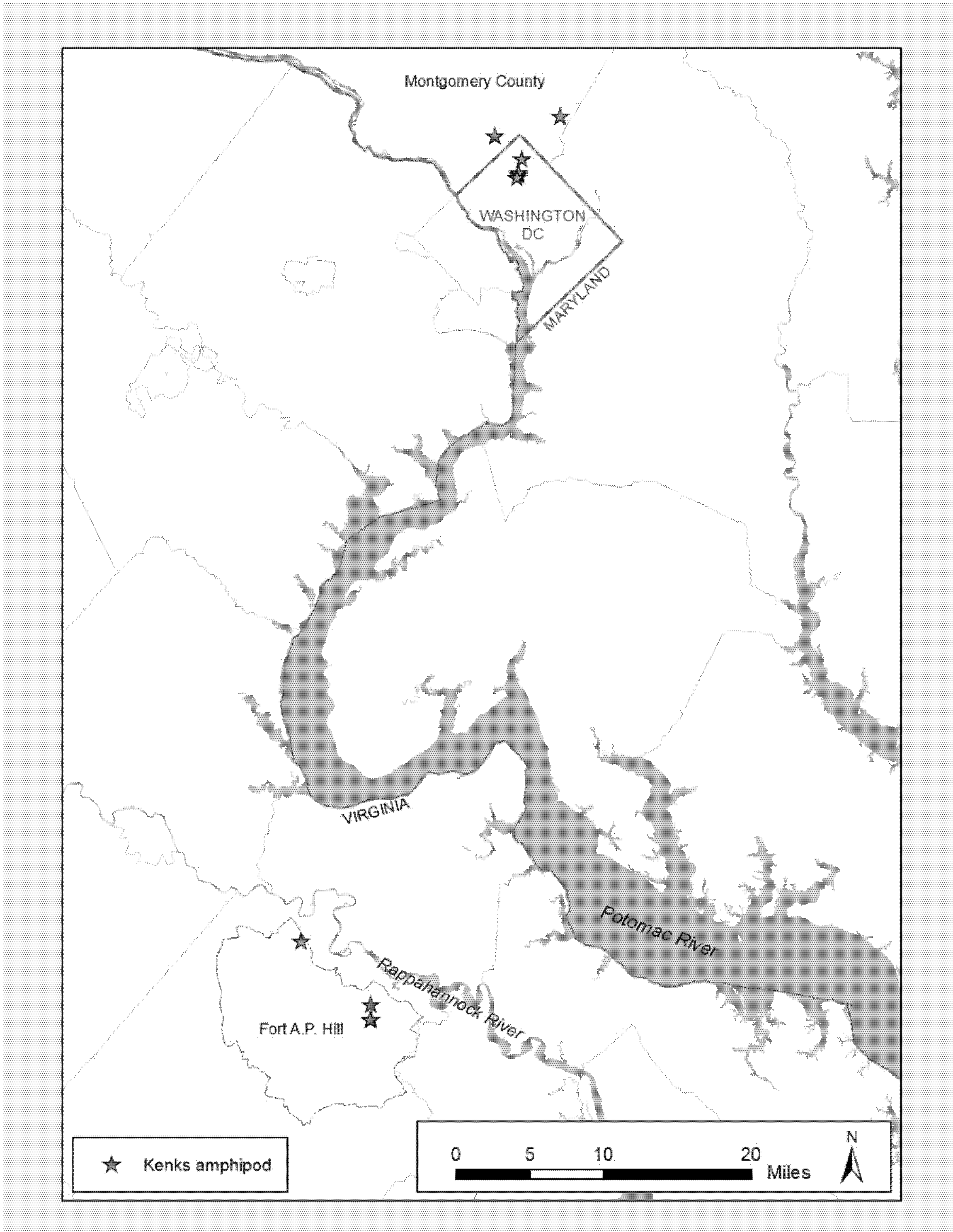

Figure 1. Current distribution of the 10 known Kenk's amphipod seep sites. Due to scale, some sites are obscured by the symbols of others.

BILLING CODE 4333–15–C

Relative Abundance

There are no reliable total population numbers for Kenk's amphipod sites due to sampling difficulties (*e.g.,* flow conditions) and the lack of information on the portion of the population that may remain in the springs' ground water supply (Feller 2005, p. 10). However, because surveying in the Washington metropolitan area has been conducted using systematic and consistent methodology over many years, often by the same individuals, the numbers of Kenk's amphipod individuals observed and the number of conducted surveys required to find the species are considered to be the best available data and do provide a reliable indication of the species' relative abundance.

The species is typically found in small numbers and then only when ground water levels are high and springs are flowing freely, conditions that cause the Kenk's amphipod to be transported to the surface. These conditions typically occur during the spring season, except during especially dry years. Given the small size of the shallow ground water aquifers supporting the sites occupied by this species, and the known characteristics of subterranean invertebrates, it is probable that each of the Kenk's amphipod populations has always been small (Hutchins and Culver 2008, pp. 3–6).

Although specimens were not collected and identified to the species level, *Stygobromus sp.,* including some in the right size range for Kenk's amphipod, were observed during site reconnaissance visits between 2004 and 2015 in several of the known Kenk's amphipod Washington metropolitan area spring habitats (B. Yeaman, pers. comm., 05/04/2012). In addition, visual inspections during this same time period indicated that most of the sites continued to appear to be suitable habitat, leading us to conclude that the Kenk's amphipod was extant at least at Burnt Mill Spring #6, Kennedy Street Spring, and East Spring (D. Feller, pers. comm., 04/01/2015). However, actual identifications of specimens collected during surveys conducted in 2015 and 2016 (D. Feller, pers. comm., 03/16/2016) suggest that the species may not be extant at those sites (see below).

Prior to 2015, all Kenk's amphipod specimens were discovered on the first or second survey conducted at all known sites. In 2015 and 2016, Kenk's amphipod was confirmed at only one of the Washington metropolitan area spring sites, Coquelin Run Spring, despite all of the sites being sampled multiple times during these 2 years (see table 1 below) (D. Feller, pers. comm., 03/16/2016; D. Feller, pers. comm., 04/22/2016). It is unclear whether the species may be extirpated at Burnt Mill Spring #6, Kennedy Street Spring, and East Spring, but the best available data show a decrease in observed individuals at these sites.

Although there have been no Kenk's amphipods (*Stygobromus kenki*) observed at five of the six District of Columbia/Maryland sites during the 2015–2016 survey efforts, increasing numbers of Potomac groundwater amphipod have been observed at several of the sites (Burnt Mill Spring #6, East Spring, Kennedy Street Spring, and Holsinger Spring) (D. Feller, pers. comm., 04/22/2016). At Sherrill Drive Spring, no *Stygobromus* species have been detected for 12 years, and the water quality at this site has been documented to be poor (see Factor A—*Water Quality/Quantity Degradation Due to Chronic Pollution of Urban/Suburban Runoff* section below for more details), leading us to conclude that the species is likely extirpated at this site. This conclusion is consistent with the earlier characterization of the population at this site by Culver and Sereg (2004, p. 73) over a decade ago as ''barely hanging on.''

Table 1. Survey results for Kenk's amphipod—The first pair of numbers (e.g., "1 of 2") indicates the number of site visits where the species was detected compared to the total number of site visits that year. The numbers in parenthesis "()" are the total number of Kenk's amphipod collected. The N/A indicates no surveys were conducted at the site in that year.

Site Name (owner)	1960s			1990s		2000 to 2006						Current	
	1966	1967	1968	1994	1995	2000	2001	2003	2004	2005	2006	2015	2016
East Spring	1 of 1 (3)	5 of 5 (3 to 21)	1 of 1 (1)	0 of 2	0 of 1	0 of 1	2 of 3 (1 and 2)	N/A	N/A	N/A	N/A	0 of 3	0 of 4
Holsinger Spring	N/A	1 of 1 (24)	N/A	N/A	N/A	N/A	N/A	0 of 1	N/A	N/A	N/A	0 of 3	N/A
Sherrill Drive Spring	N/A	N/A	N/A	0 of 1	1 of 2 (3)	0 of 1	1 of 2 (1)	0 of 1	N/A	N/A	N/A	0 of 3	0 of 4
Kennedy Street Spring	N/A	N/A	N/A	N/A	N/A	N/A	1 of 2 (1)	0 of 1	N/A	N/A	N/A	N/A	0 of 4
Coquelin Run	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1 of 1 (2)	1 of 1 (2)	N/A	N/A	1 of 4 (1)
Burnt Mill Spring #6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1 of 1 (5)	0 of 1	0 of 3	0 of 6
Upper Mill #2 (DoD)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1 of 4 (1)
Mill #4 (DoD)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1 of 6 (1)
Mill #5 (DoD)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2 of 7 (4)
Mount #2 (DoD)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2 of 6 (1)

At Fort A.P. Hill, all collections of the Kenk's amphipod were taken during surveys conducted in the spring of 2014; therefore, no trend data exist for the four occupied spring sites. Twenty-one sites were surveyed with 5 to 7 visits per site. The numbers of the Kenk's amphipod collected that year were low at all sites, ranging from 1 to 4 individuals (see table 1 above). Other species of *Stygobromus,* including *S. tenuis* (no common name), Tidewater stygonectid amphipod (*S. indentatus*), and Rappahannock Spring amphipod (*S. foliatus),* were also found at several of these Virginia sites.

Summary of Distribution and Relative Abundance: The above information represents the best available data on the Kenk's amphipod's known distribution and relative abundance. However, the habitat areas at Fort A.P. Hill occur in different river drainages and geological formations from those in the Washington metropolitan area, which suggests that additional surveys may identify additional locations and further expand the species' current known range. The Service plans to fund additional amphipod surveys to be conducted during suitable sampling conditions in late 2016 and early 2017 in accessible areas of Maryland and northeastern Virginia that have geology similar to that of the Fort A.P. Hill sites and other suitable habitat characteristics (*e.g.,* forested slopes dissected by streams). The U.S. Army also plans to conduct additional amphipod surveys at Fort A.P. Hill in spring 2017. Additional surveys for the known Maryland and the District of Columbia sites are also planned.

Summary of Biological Status and Threats

The Act directs us to determine whether any species is an endangered species or a threatened species because of any factors affecting its continued existence. In this section, we review the biological condition of the species and its resources, and the influences on such to assess the species' overall viability and the risks to that viability.

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

Water Quality/Quantity Degradation Due to Chronic Pollution of Urban/ Suburban Runoff

Habitat modification, in the form of degraded water quality and quantity, is one of the primary drivers of Kenk's amphipod viability. While the species' specific tolerances to parameters affecting water quality and quantity is not yet known, we do know that the Kenk's amphipod is at increased risk to parameters that negatively affect water quality and quantity because these freshwater amphipods spend their entire life cycle in water and are, therefore, continually exposed to changes in the aquatic habitat. Water quality degradation of ground water at spring sites located in the Washington metropolitan area has been previously cited as a top concern in several studies and reports (Feller 1997, pp. 12–13; Culver and Sereg 2004, p. 13; Feller 2005, p. 9; Hutchins and Culver 2008, p. 6; Kavanaugh 2009, p. 60; Culver *et al.* 2012, p. 37; Culver and Pipan 2014, p. 219).

The amount of forested buffer surrounding the seep influences the species' vulnerability and exposure to negative effects, and the smaller the buffer, the greater the risk of exposure. Buffer distance is important because the buffer helps filter sediment and other contaminants from the surface water entering the catchment areas and, therefore, the ground water that supports the Kenk's amphipod. The Washington metropolitan area amphipod sites have narrow riparian buffers (94 feet (ft) to 1,000 ft) (29 m to 305 m) separating them from the surrounding urban landscape. This urban land is characterized by impervious surface cover, which includes paved roads, sidewalks, parking lots, and buildings (Sexton *et al.* 2013, p. 42). The general percentage of impervious surface inside the Capitol Beltway (I–495) (*i.e.*, where all the District of Columbia and Maryland Kenk's amphipod sites are located) increased from 22 percent in 1984 to 26 percent in 2010. The annual rate of increase in impervious cover within the Washington Beltway has also doubled since the 1980s, from 2 to 4 square (sq.) miles (6 to 12 sq. km) (Sexton *et al.* 2013, pp. 42–53; Song *et al.* 2016, pp. 1–13; *http://www.earthobservatory.nasa.gov/IOTD/view.php?id=87731*, last accessed 07/07/2016).

Urban impervious surfaces can result in increased surface water flow after storm events due to decreased opportunity for immediate or proximal infiltration. The surface flow waters have higher temperatures, higher sediment loads, and higher levels of heavy metals (zinc, cadmium), nitrogen, phosphorus, and fecal coliform bacteria (Walsh *et al.* 2005, pp. 706–723). In addition to affecting water quality, urban impervious surfaces can affect water quantity; decreased infiltration can result in depletion of ground water reserves and ultimately cause springs to dry up over time (Frazer 2005, p. 3).

It is well documented that impervious cover from urbanization affects biological communities in streams. For example, a review of more than 30 studies by the Center for Watershed Protection (2003, pp. 101–102) found that sensitive aquatic insect species were absent or less abundant in streams that drain from urban areas, and aquatic insect diversity decreased when imperviousness reached 10 to 15 percent. The Maryland Department of Natural Resources (MDDNR) found that, in Maryland when the general percentage of watershed imperviousness exceeds 15 percent, stream health is never rated as ''good,'' based on a combined fish and benthic macroinvertebrate Index of Biotic Integrity. The Potomac Washington metropolitan basin, which incorporates the area surrounding Kenk's amphipod sites, has the smallest percentage of stream miles rated as ''good'' (less than 1 percent) (Boward *et al.* 1999, p. 45).

Hyporheic habitat, which is a transition area between surface and shallow ground water, is found within the interstitial spaces within the sediments of a stream bed but also can be found in spring runs (Culver and Sereg 2004, pp. 70–71) that support the Kenk's amphipod. Hancock (2002, pp. 766–775) evaluated human activities that affect the hyporheic zone. Pesticide pollution, heavy metal and chemical pollution from industrial and urban sources, increased salinity, and acidity were all cited as stressors that may make this habitat unsuitable for invertebrates. In addition to documenting lethal effects on individuals from these stressors, researchers have documented changes in macroinvertebrate diversity and abundance that include an increase in species that are tolerant to elevated levels of the stressors and a decrease in species sensitive to elevated levels of those stressors (Hancock 2002, pp. 768–770).

The hypotelminorheic zone, which is described as the main habitat required by the Kenk's amphipod, may be more vulnerable to the effects of urban runoff than streams or the hyporheic zone with respect to pollutants, erosion, and sedimentation because of the small size and shallow nature of the habitat. In addition, the aforementioned narrow buffer zones around the hypotelminorheic sites increase the habitat's and species' exposure to urban runoff.

Storm water runoff in urban areas is commonly transported through Municipal Separate Storm Sewer Systems (MS4s), from which it is often discharged untreated into local waterbodies. Storm water is regulated to prevent harmful discharges of pollutants into MS4s. The Clean Water Act's (CWA's) National Pollutant Discharge Elimination System program requires permits for discharges into MS4s and development of storm water management programs. Despite these regulatory requirements, poor water quality has been documented in the past at several springs in Rock Creek Park (Culver and Sereg 2004, p. 69).

In the Washington metropolitan area, water quality degradation from urban runoff is believed to have affected the Kenk's amphipod's Sherrill Drive Spring population (Culver and Sereg 2004, p. 69). Sherrill Drive Spring is close (approximately 115 ft (35 m)) to the edge of Rock Creek Park where there is an abrupt change from forested habitat to an urban landscape along 16th Street Northwest, which parallels the park boundary. There is a significant amount of impervious cover that routes runoff into the catchment area surrounding the Sherrill Drive Spring.

While there have been no laboratory studies conducted to evaluate the effects and tolerance of the Kenk's amphipod or the more common Potomac groundwater amphipod to chemical, nutrient, pesticide, or heavy metal pollution, we do know from published studies that amphipods may be one of the most vulnerable groups of organisms to chemical pollution due to their high sensitivity to toxicants and contaminant accumulation (Borgmann *et al.* 1989, p. 756; Brumec-Turc 1989, p. 40). Culver and Sereg (2004, pp. 30–31) collected water samples from the East Spring, Kennedy Spring, and Sherrill Drive Spring sites on four occasions (October 2000, April 2001, July 2001, and March 2003) to measure temperature, pH, conductivity, dissolved oxygen, and nitrates. Sediment samples surrounding the springs were also collected in September 2001 at East Spring and Sherrill Drive Spring to analyze metal and organic contaminants. From these samples, Sherrill Drive Spring showed evidence of water quality degradation via the presence of heavy metals and higher nitrate and conductivity levels as compared to the other sampled spring sites; East Spring also had evidence of heavy metals (see below) (Culver and Sereg 2004, pp. 30–31).

Heavy metals were found in sediment samples taken from Sherrill Drive Spring and East Spring in Rock Creek Park. Values were similar for the two sites, although East Spring had the highest values for all heavy metals, with the exception of zinc (Culver and Sereg 2004, p. 65). Because the spring sediments instead of water samples were collected for heavy metal analysis, it is difficult to know whether the value of the heavy metals measured in the sediments exceed aquatic life standards in water or any published values for freshwater amphipod species. Sources of trace metals in an urban environment may include vehicles, streets, parking lots, snowpacks, and rooftops (Center for Watershed Protection 2003, p. 73).

Nitrate levels as high as 30.8 milligrams per liter (mg/L) were also found at Sherrill Drive Spring. There are no aquatic life standards for nitrates issued by the Maryland Department of the Environment, the District of Columbia Department of the Environment, or the U.S. Environmental Protection Agency (EPA). Therefore, we reviewed the best available and relevant guidance values from Minnesota, Canada, and New Zealand (Minnesota Pollution Control Agency 2010, p. 9; Canadian Council of Ministers of the Environment 2012, p. 1; Hickey and Martin 2009, p. 20). Based on the comparison with available guidance, the nitrate concentrations collected at Sherrill Drive Spring (up to 30.8 mg/L) exceeded the chronic aquatic life exposure criterion for nitrate (*e.g.*, 2.4 mg/L to 4.9 mg/L) based on Minnesota, New Zealand, and Canada guidance values on three of the four sampling events. It is not known how typical these concentrations are and if chronic exposure is occurring. The source of the nitrate is unknown; nitrate could come from runoff containing fertilizers or animal waste or from sanitary sewer leaks. There is a sanitary sewer line that runs adjacent to the spring, and this sewer line has leaked in the past (Feller 1997, p. 37; B. Yeaman, pers. comm., 06/02/2014).

Chloride levels as high as 207 mg/L were detected at Sherrill Drive Spring. Chronic concentrations of chloride as low as 250 mg/L have been recognized as harmful to freshwater life (Canadian Council of Ministers of the Environment 2011, p. 1; *https://www.epa.gov/wqc/national-recommended-water-quality-criteria-aquatic-life-criteria-table*, last accessed 07/19/2016). Although we do not know the exact source of the elevated chloride levels at Sherrill Drive Spring, one potential source could be road salt. The Washington metropolitan area receives, on average depending on where it was measured and the time series, approximately 15 inches of snow annually *(https://www.sercc.com/climateinfo/historical/avgsnowfall.html*, last accessed August 10, 2016; *https://www.currentresults.com/Weather/US/washington-dc-snowfall-totals-snow-accumulation-averages.php*, last accessed 8/10/2106). The District of Columbia Department of Public Works uses road salt and other salt products to pre- and post-treat road surfaces before and after ice and snowfall events *(http://dpw.dc.gov/service/dc-snow-removal*, last accessed 8/10/2016). Studies have shown that the widespread use of salt to deice roadways has led to regionally elevated chloride levels equivalent to 25 percent of the chloride concentration in seawater during winter. The chloride levels can remain high throughout the summer even in less urbanized watersheds due to long-term (*e.g.*, decades) accumulation of chloride in ground water (Kaushal *et al.* 2005, pp. 13518–13519).

At Coquelin Run Spring, ground water pollution from yard chemicals and road runoff (*e.g.*, road salts, oil) could be a concern for the species' long-term viability. U.S. Geological Survey (USGS) research on water quality degradation in other urban areas indicates that chemicals enter waterways and ground water primarily through runoff from rain events and these chemicals have commonly been detected in streams and shallow ground water (USGS 1999a, pp. 1–3; USGS 1999b, p. 1; USGS 2001, p. 2; *http://pubs.usgs.gov/fs/1998/fs007-98/index.html*, last accessed 07/19/2016). Although no water samples have been taken at the Coquelin Run Spring site, it is separated from backyards in this neighborhood by a narrow, wooded riparian strip (less than 100 ft) (30 m) that slopes steeply down to the site. Therefore, the Coquelin Run Spring may be at increased risk of exposure to chemical pollutants from the surrounding urban development.

The other four Washington metropolitan area sites (Burnt Mill Spring #6, Holsinger Spring, East Spring, and Kennedy Spring) have wider buffers than Sherrill Drive Spring and Coquelin Run Spring, with buffer distances ranging from approximately 272 ft (83 m) to 1,000 ft (305 m). East Spring and Kennedy Spring had much lower conductivity and nitrate levels than Sherrill Drive Spring (Culver and Sereg 2004, pp. 55–58). Surveys conducted in 2015 and 2016 did not re-confirm the Kenk's amphipod at any of these sites but consistently found the more common Potomac groundwater amphipod at all the sites in higher numbers (*e.g.*, greater than 40 observed at Burnt Mill Spring #6 during 1 sampling event). As discussed previously, urban runoff can decrease biotic richness and favor more pollution-tolerant species in urban streams (Center for Watershed Protection 2003, pp. 101–102). If the Potomac groundwater amphipod has a higher tolerance than Kenk's amphipod to poor water quality parameters, the change in species' composition discussed above in the Relative Abundance section and below in Factor E—*Changes in Species Composition* could indicate that urban runoff is negatively affecting the Kenk's populations at these spring sites. Water quality samples will be collected at these sites in 2016 and 2017 to better assess whether water quality parameters exceed general EPA guidance values for aquatic life.

The NPS manages the surrounding habitat at the four seepage spring sites supporting the Kenk's amphipod in Rock Creek Park. Conservation of park resources is mandated by the National Park Service Organic Act of 1916, which requires the NPS ''to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.'' It is also mandated by section 7 of the Rock Creek Park enabling legislation of 1890, which states that ''such regulations shall provide for the preservation from injury and spoilation of all timber, animals, or curiosities within said park, and their retention in their natural condition, as nearly as possible.'' These laws are implemented through the NPS's formal management policy that requires that management of candidate species should, to the greatest extent possible, parallel the management of federally listed species (D. Pavek, pers. comm., 05/12/2011). While the NPS is utilizing its regulatory authority to manage water quality concerns for the species within Rock Creek Park, the agency has little influence over the protection of or effects to any seep recharge areas occurring outside park boundaries, and over maintenance or repair of city-owned infrastructure such as storm water and sewer systems located near the spring sites.

The NPS worked with the District of Columbia Department of Transportation (DCDOT) to incorporate the construction of a storm sewer under

Sherrill Drive into the design of the 16th Street road reconstruction and storm drainage project (B. Yeaman, pers. comm., 05/19/2015), resulting in the elimination of a major outfall at the Sherrill Drive Spring site. However, as discussed above, this effort has not completely eliminated the documented erosion and poor water quality concerns at the site.

The NPS is communicating with DCDOT on the need to move the sanitary sewer line adjacent to the Sherrill Drive Spring out of Rock Creek Park and into the neighborhood on the other side of 16th Street. If the line cannot be moved, the alternative is to reline the existing pipe to prevent further leakage (B. Yeaman, pers. comm., 07/11/2016). In addition, the Service, NPS, and the District of Columbia Department of the Environment have worked cooperatively to obtain funding for best management practices (reducing erosion and increasing infiltration) on two tributaries flowing into the drainage of Kennedy Street Spring, which supports both the Kenk's amphipod and the federally endangered Hay's Spring amphipod. Project funding was approved in January of 2015, and implementation, which includes construction of bioretention basins and infiltration berms, is to be completed by November 2017.

In Virginia, poor water quality may not be affecting the species at the Fort A.P. Hill because the sites are substantially buffered by currently undeveloped property.

Summary of Water Quality—In total, poor water quality is believed to be a significant or contributing stressor at all six of the Washington metropolitan area sites (*i.e.*, 60 percent of the total known sites). Water quality in this area is expected to worsen due to significant runoff events from anticipated increases in both winter and spring precipitation and the frequency of high intensity storms. See Factor A—*Excessive Storm Water Flows* and Factor E—*Effects of Climate Change* sections below for more details.

Excessive Storm Water Flows

Runoff from impervious surfaces after heavy rain events can result in flooding (Frazer 2005, p. 4; *http://www.nbcwashington.com/traffic/transit/Metro-Station-Flooding-Nearby-Parking-Lot-Expansion-Could-Be-Part-of-Cause-384015451.html*; last accessed 06/24/16). Flash flooding can also result in erosion and sedimentation (Center for Center for Watershed Protection 2003, pp. 30–33), which, if it occurs in the catchment area, can subsequently degrade a spring site's value as habitat for the Kenk's amphipod.

In the Washington metropolitan area, excessive storm water flows are causing significant habitat degradation at two sites—Sherrill Drive Spring and Coquelin Run Spring. A washout at Sherrill Drive Spring from 16th Street was observed in 2016 making it difficult to find a seep to survey (D. Feller, pers. comm., 06/15/2016). Coquelin Run Spring is severely degraded by runoff from the surrounding Chevy Chase Lake Subdivision, where severe erosion was first observed at this site in 2006 (D. Feller, pers. comm., 07/01/2016). When the site was first re-surveyed in 2016, a plastic underground pipe several inches in diameter was observed less than 1 ft (0.3 m) from the original seep (D. Feller, pers. comm., 02/27/2016; D. Feller, pers. comm., 05/27/2016), which may have been an attempt to address water flow and erosion at the site. Erosion was still evident during the 2016 surveys and it was difficult for MDDNR to find a flowing seep (D. Feller, pers. comm., 02/27/2016). A small flow was observed in May 2016, but was located several feet above the original seep documented in 2006. Plastic sheet material was also observed under this uphill seep (D. Feller, pers. comm., 05/25/2016), which may have been an attempt to address water flow and erosion at the site. It is unknown what affect the pipe or plastic may have on the long-term hydrology of the site.

Erosion from storm water flows has also been observed at the other four springs in Rock Creek Park, but not to the extent that it has been observed at Sherrill Drive and Coquelin Run springs. It is unknown how much chronic or acute erosion and sedimentation causes a site to become unsuitable for the Kenk's amphipod; however, Culver and Sereg (2004, p. 69) found that sediment transported by storm runoff results in the degradation of ground water animals' habitat by clogging the interstices of gravels in the spring seep, thereby preventing the species from using those interstitial spaces for shelter. It is uncertain to what extent Kenk's amphipod uses those interstitial spaces, but if they do, then it is plausible that this type of sedimentation would cause the habitat to become unsuitable for the species.

At the Virginia sites, we have no information indicating excessive storm water flows may affect the species.

Summary of Excessive Storm Water Flows—Excessive storm water flows are a concern at 60 percent (6 of 10) of the species' sites.

Sewer Line Breaks and Spills

The same riparian areas that contain the habitats of the Kenk's amphipod are among the principal areas where sewer lines are located in the Washington metropolitan area (Feller 2005, p. 2). Most of these sewer lines are old (most installed between 1900 and 1930 in the District of Columbia, and between 1941 and 1971 in Montgomery County, MD) and subject to periodic breakage and leakage (Shaver 2011, entire; Kiely 2013, entire). While there have been no laboratory or field studies evaluating the effect of sewage leaks or spills on the Kenk's amphipod or the Potomac groundwater amphipod, adverse effects of sewage contamination on amphipods and other invertebrates have been documented by several researchers. For instance, Simon and Buikema (1977, entire) studied a karst ground water system and found that amphipods were absent from ground water pools polluted by septic system effluent. The authors reported that the highest densities of Virginia cave isopods were found in pools that were slightly and moderately polluted from septic systems, whereas an amphipod, *Stygobromus makini* (southwestern Virginia cave amphipod), was absent from all polluted pools. de-la-Ossa-Carretero *et al.* (2012, p. 137) stated that, as an Order, amphipods were generally sensitive to sewage pollution, but that there are substantial differences in sensitivity between amphipod species (de-La-Ossa-Carretero *et al.* 2012, p. 129).

Releases of large volumes of sewage (up to 2 million gallons (gal)) from sanitary sewer leaks have occurred in the District of Columbia and Montgomery County, MD. Distances of seep sites to nearby upslope sewer lines are shown in table 2 below. Based on these distances, Coquelin Run Spring, Burnt Mill Spring #6, and Sherrill Drive Spring are most vulnerable to sewage spills (see table 2 below). As mentioned above, a sanitary sewer line located nearby Sherrill Drive Spring has been described as structurally unsound and is subject to leakage (Feller 1997, p. 37; B. Yeaman, pers. comm., 06/02/2014; B. Yeaman, pers. comm., 02/24/15).

Over the 10-year period from 2005 through 2015, the Washington Suburban Sanitary Commission (WSSC) has documented approximately 38 leaks of more than 1,000 gal in the Rock Creek drainage and 15 leaks of more than 1,000 gal in the Northwest Branch in Montgomery County. During the same period there were 136 leaks of more than 100 gal in the Rock Creek drainage and 51 leaks of more than 100 gal in the

Northwest Branch in Montgomery County (WSSC 2015). The District of Columbia does not have such detailed records, but the District of Columbia Water Chief Executive Officer has stated that half the District's 1,800 mi (2,896 km) of sewer lines are at least 84 years old and has estimated that faulty pipes result in two dozen sewer spills every year (Olivio 2015). The frequency of spills is likely to increase in the future as the sewer lines continue to age.

TABLE 2—SEWER AND WATER LINES NEAR KENK'S AMPHIPOD SPRINGS

Site name	Location	Pipe type	Diameter in inches (″)	Year installed	Pipe material	Distance from spring in feet (′)
Sherrill Drive Spring	Rock Creek Park	Sanitary Sewer	12	1924	unknown	10
Sherrill Drive Spring	Rock Creek Park	Sanitary Sewer	12	1926	unknown	200
Sherrill Drive Spring	Rock Creek Park	Storm Sewer	30	1958	unknown	30
Sherrill Drive Spring	Rock Creek Park	Storm Sewer	24	1933	unknown	60
Sherrill Drive Spring	Rock Creek Park	Storm Sewer	15	1949	unknown	120
Sherrill Drive Spring	Rock Creek Park	Water Transmission Main.	30	1955	PCCP Lined Cylinder.	130
Sherrill Drive Spring	Rock Creek Park	Water Distribution Main.	12	1919	cast iron	155
East Spring	Rock Creek Park	Storm Sewer	18	unknown	unknown	475
East Spring	Rock Creek Park	Sanitary Sewer	10	1925	unknown	658
East Spring	Rock Creek Park	Sanitary Sewer	10	1911	unknown	750
East Spring	Rock Creek Park	Water Distribution Main.	6	1921	cast iron	560
East Spring	Rock Creek Park	Water Distribution Main.	8	1911	cast iron	740
Kennedy Street Spring.	Rock Creek Park	Sanitary Sewer	10	1911	unknown	900
Kennedy Street Spring.	Rock Creek Park	Storm Sewer	21	1931	unknown	1300
Kennedy Street Spring.	Rock Creek Park	Sanitary Sewer	10	1911	unknown	1350
Kennedy Street Spring.	Rock Creek Park	Water Distribution Main.	8	1911	cast iron	860
Kennedy Street Spring.	Rock Creek Park	Water Distribution Main.	8	1912	cast iron	1357
Coquelin Run Spring.	Montgomery County, MD.	Gravity sewer pipe	8	1954	unknown	220
Coquelin Run Spring.	Montgomery County, MD.	Water pipe	8	1954 (lined 1995)	cast iron or sand spun.	205
Coquelin Run Spring.	Montgomery County, MD.	Water pipe	4	unknown	ductile iron	213
Coquelin Run Spring.	Montgomery County, MD.	Water pipe	8	1954 (lined 1995)	cast iron or sand spun.	232
Burnt Mill Spring #6	Montgomery County, MD.	Gravity sewer pipe	6	unknown	cast iron	186
Burnt Mill Spring #6	Montgomery County, MD.	Gravity sewer pipe	8	unknown	unknown	383
Burnt Mill Spring #6	Montgomery County, MD.	Water pipe	6	1959	cast iron or sand spun.	394
Holsinger Spring	Rock Creek Park	Storm Sewer	36	1931	unknown	1875
Holsinger Spring	Rock Creek Park	Sanitary Sewer	18	1908	unknown	1925
Holsinger Spring	Rock Creek Park	Water Distribution Main.	6	1898	cast iron	1885

At the Virginia sites, we have no information indicating sewer pipelines may affect the species.

Summary of Sewer Line Spills—In total, sewer line breaks and spills are a concern at 30 percent (3 of 10) of the species' sites.

Water Pipe Breaks

Bursting of large-diameter water pipes can cause significant erosion of surrounding areas as a result of the large volume of fast-moving water that exits the pipe at the break point. Bursting water pipes and the resulting erosion has been documented within the Washington metropolitan area, including at areas near but not directly at a specific Kenk's amphipod seep site. For example, a 60-in (152.4-cm) water main broke at the Connecticut Avenue crossing of Coquelin Run in 2013, releasing 60 million gal of water and scouring out a 500-ft (152.4-m) length of the creek (Dudley *et al.* 2013, entire). The Coquelin Run Spring site is on a small tributary that flows into Coquelin Run, about a quarter mile downstream of the aforementioned severely damaged section of the creek bed and, due to its elevation above Coquelin Run, was not affected by the flood and subsequent erosion caused by this burst pipe.

The exposure risk of bursting water pipes at locations that could affect Kenk's amphipod sites is increasing given the age of the water pipe infrastructure (see table 2 above). As an example, there is one very-large-diameter (30-in (76-cm)) water pipe within 130 ft (39.6 m) of Sherrill Drive Spring that was installed more than 60 years ago. The significant erosion resulting from a large break, should the break occur near Kenk's amphipod habitat, could eliminate the seep and all associated amphipods.

The best available data indicate that there are smaller pipes near three of the sites (Sherrill Drive Spring, Burnt Mill #6 Spring, Coquelin Run Spring) (WSSC GIS Web site, *http://gisweb.wsscwater.com/WERI/Account/Login?ReturnUrl=%2fweri*, last accessed 12/21/2015) (see table 2 above). Although less likely to eliminate habitat of springs, breakage of smaller pipes (less than 1 ft (0.3 m) in diameter) is even more frequent (Water Research Foundation 2016, p. 2) and still may result in erosion or sedimentation at the spring site. Coquelin Run Spring is within 250 ft of a 6- to 8-in (15- to 20-cm) water pipe installed in 1954 (WSSC GIS Web site). Given the overall age of the infrastructure and the District of Columbia and Maryland utilities' inability to keep up with the needed replacements (Shaver 2011, entire; Kiely 2013, entire), additional breaks are predicted to occur.

At the Virginia sites, we have no information indicating water pipeline breaks may affect the species.

Summary of Water Pipe Breaks—In total, large water pipeline breaks are a concern at 10 percent (1 of 10) of the species' sites, while smaller water pipeline breaks are a concern for 30 percent (3 of 10) of the sites.

Other Habitat Considerations

Compared to the stressors to the Kenk's amphipod habitat in the Washington metropolitan area, the stressors to the species' habitat at Fort A.P. Hill are likely minimal. Little or no development is expected to occur near the spring sites (J. Applegate, pers. comm., 05/5/2016). However, military training exercises may be conducted in areas surrounding the springs, which may result in disturbance of the spring recharge areas. Live-fire exercises may result in uncontrolled burns that reduce canopy cover that shades the seep sites, moderates water temperature, and provides leaf litter for food. Timber harvests and other forest management activities such as timber stand improvement, prescribed burns, and possible pesticide application for forest-destroying pests such as gypsy moths may occur in the general vicinity of the springs (Fort A.P. Hill 2016, pp. 751–754). Fort A.P. Hill has included a 100-ft (30.5-m) buffer around the springs in the installation's Integrated Natural Resources Management Plan (INRMP) (2016, pp. 9–22), but it is unknown whether this buffer distance is sufficient to protect the sites and recharge areas from all of the activities (*e.g.*, forest management, live-fire exercises) outlined in the INRMP. However, staff at Fort A.P. Hill have indicated a willingness to work with the Service to delineate recharge areas based on topography, and, if needed, institute more protective buffers (J. Applegate, pers. comm., 06/15/2016).

Summary of Factor A—Habitat modification, in the form of degraded water quality and quantity, is one of the primary drivers affecting Kenk's amphipod viability, despite the discussed ongoing conservation measures. Reductions in water quality are occurring primarily as a result of urbanization, which increases the amount of impervious cover in the watersheds surrounding Kenk's amphipod sites. Impervious cover increases storm water flow velocities and increases erosion and sedimentation. Impervious cover can also increase the transport of contaminants and nutrients common in urban environments, such as heavy metals (zinc, cadmium), nitrogen, phosphorus, and fecal coliform bacteria. The Washington metropolitan area sites have narrow riparian buffers separating them from the surrounding development, increasing the sites' exposure to poor water quality runoff. Poor water quality has been documented at Sherrill Drive Spring but is likely affecting all six sites in the Washington metropolitan area, whereas the Virginia sites are not thought to be affected by poor water quality because of the larger forested buffers on Fort A.P. Hill.

Excessive storm water runoff from heavy rain events can result in flooding, which can cause erosion and sedimentation. Habitat degradation due to excessive storm water flows is having significant effects at two sites—Sherrill Drive Spring and Coquelin Run Spring—but has also been observed at the other four springs in Rock Creek Park, and may increase in the future. At the Virginia sites, we have no information indicating excessive storm water flows may affect the species.

Sewer and water line breaks and leaks are a concern at the Washington metropolitan area sites because most of them are located in the same riparian areas that contain the habitats of the Kenk's amphipod. While leaks and breaks of these pipelines have not yet been known to directly affect the species or its habitat, the pipeline systems are subjected to chronic leaks and breaks, the frequency of which is likely to increase given the age of the infrastructure, and thus the exposure risk of the species to this stressor will continue to increase. Coquelin Run Spring, Burnt Mill Spring #6, and Sherrill Drive Spring are most vulnerable to sewage spills and water pipe breaks due to the pipe's proximity to each site and the age of the pipes. At the Virginia sites, we have no information indicating sewer or water pipeline breaks may affect the species.

Potential stressors to Kenk's amphipod habitat are lesser in scope and severity at Fort A.P. Hill, as opposed to the Washington metropolitan area habitat, and are associated with disturbance to the surface habitat.

TABLE 3—RELATIVE VULNERABILITY OF KENK'S AMPHIPOD SEEP HABITAT SITES

Site name	Location	Current seep status	Current biological status of the Kenk's amphipod
Sherrill Drive Spring	Rock Creek Park, Washington, DC.	Approximately 50′ to road, documented decrease in water quality (chemical and sedimentation), within 10′ of 1924 sewer pipe and 130′ of 1955 30″ water pipe.	Extirpated? Not found in recent surveys. No other *Stygobromus* present. Last detected 2001 (8 surveys since and none found).
East Spring	Rock Creek Park, Washington, DC.	Approximately 300–500′ buffer of protected forest, within 560′ of 6–8″ 1921 water pipe.	Unknown. Not found in recent surveys but other *Stygobromus* present. Last detected 2001 (7 surveys in 2015–2016 and none found).
Kennedy Street Spring	Rock Creek Park, Washington, DC.	Approximately 500′ buffer of protected forest, within 860′ of 6–8″ 1911 water pipe.	Unknown. Not found in recent surveys but other *Stygobromus* present. Last detected 2001 (5 surveys since and none found).
Holsinger Spring	Rock Creek Park, Washington, DC.	Approximately 700–1,000′ buffer of protected forest	Historical? Not documented since 1967. 1 survey in 2003 and 3 surveys in 2015 and none found.
Burnt Mill Spring #6	Northwest Branch Park, Montgomery County, MD.	In county park protected from further development, within 186′ of unknown age sewer pipe and 394′ of 6–8″ 1959 water pipe.	Unknown. Not found in recent surveys but other *Stygobromus* present. Last detected in 2005 (10 surveys since and none found).

TABLE 3—RELATIVE VULNERABILITY OF KENK'S AMPHIPOD SEEP HABITAT SITES—Continued

Site name	Location	Current seep status	Current biological status of the Kenk's amphipod
Coquelin Run Spring	Private land, Montgomery County, MD.	Erosion problems are already apparent, site has been modified with a plastic pipe and plastic material, and riparian forest is very narrow, within 220′ of 1952 sewer pipe and 250′ of 6–8″ 1954 water pipe.	Present in upslope portion of seep (1 individual found in last survey); lower portion has some erosion and species absent in recent surveys (3 surveys and none found).
Fort A.P. Hill (4 seeps)	Department of Defense, Caroline County, VA.	Good habitat quality, sites unaffected by urbanization. Military exercises and forest management could affect surface habitat if protective areas encompassing the recharge area are not established and implemented.	Recently discovered. 1 individual each found at Upper Mill 2, Mill 4, and Mount 2; 4 individuals found at Mill 5.

Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Overutilization is not known to be a factor affecting the Kenk's amphipod. The Kenk's amphipod is a Maryland State endangered species under its Nongame and Endangered Species Conservation Act (Section 10–2A–01–09 of the Maryland Code). This designation makes ''taking, possession, transportation, exportation, processing, sale, offer for sale, or shipment within the State'' of a State-listed species unlawful. Kenk's amphipod is considered a species of greatest conservation need in the District of Columbia's State Wildlife Action Plan (*http://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/03%202015%20WildlifeActionPlan%20%20Ch2%20SGCN.pdf*; last accessed 8/10/2016), but this status does not confer any regulatory protection; the species is not State-listed in Virginia.

Distribution surveys for the species are coordinated with the Service and, where required, collection is permitted through the Service, NPS, and the MDDNR. Whether specifically permitted or not, all amphipod surveys are conducted using consistent methodology and collection protocols. The target species of *Stygobromus* is collected based on size, and the number of individuals collected at each spring has been limited to 10 or fewer individuals in the target species' size range. However, the Service has allowed larger numbers to be collected during 2016 surveys in the Washington metropolitan area since none of the specimens of appropriate size collected in the 2015 surveys have been identified to be Kenk's amphipod. These protocols are followed to minimize effects to the species. Because the occurrence of subterranean invertebrates at spring emergence sites likely represents only a portion of the actual underground population, the Service has considered the collecting procedures (Feller 1997, p. 2) to be nondetrimental to the populations.

Factor C. Disease or Predation

We have no information that indicates that either disease or predation is affecting the Kenk's amphipod.

Factor D. The Inadequacy of Existing Regulatory Mechanisms

The following existing regulatory mechanisms were specifically considered and discussed as they relate to the stressors, under the applicable Factors, affecting the Kenk's amphipod: The CWA's National Pollutant Discharge Elimination System, Rock Creek Park enabling legislation of 1890, and National Park Service Organic Act of 1916 (Factor A) and Nongame and Endangered Species Conservation Act (Factor B). In Factor A we conclude that habitat modification, in the form of degraded water quality and quantity, is one of the primary drivers affecting Kenk's amphipod viability. In Factor B we conclude that overutilization is not known to be affecting the species. There are no existing regulatory mechanisms to address the stressors affecting the species under Factor E (see below).

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

Small Population Dynamics

The observed small size of each of the 10 Kenk's amphipod populations makes each one vulnerable to natural environmental stochasticity and human-caused habitat disturbance, including relatively minor impacts in their spring recharge areas. Each population is also vulnerable to demographic stochasticity, including loss of genetic variability and adaptive capacity. Unless the populations are larger than we know or are hydrologically connected such that individuals can move between sites, we conclude that these small populations are vulnerable to the effects of small population dynamics.

Species that are restricted in range and population size are more likely to suffer loss of genetic diversity due to genetic drift, potentially increasing their susceptibility to inbreeding depression, and reducing the fitness of individuals (Soule 1980, pp. 157–158; Hunter 2002, pp. 162–163; Allendorf and Luikart 2007, pp. 117–146). Small population sizes and inhibited gene flow between populations may increase the likelihood of local extirpation (Gilpin and Soulé 1986, pp. 32–34). With the exception for the Mount Creek #2 and Mount Creek #5 populations at Fort A.P. Hill, which are separated by only approximately 360 ft (110 m), all the other populations of the Kenk's amphipod are isolated from other existing populations and known historical habitats by long distances, inhospitable upland habitat, and terrain that creates barriers to amphipod movement. The level of isolation and the restricted range seen in this species, based on our current knowledge of known habitat, make natural repopulation of historical habitats (*e.g.*, the District of Columbia sites and Burnt Mill Spring #6 where the species' presence has not been recently confirmed) and other potentially suitable habitat virtually impossible without human intervention.

Effects of Climate Change

Climate change may result in changes in the amount and timing of precipitation, the frequency and intensity of storms, and air temperatures. All of these changes could affect the Kenk's amphipod and its habitat. The amount and timing of precipitation influence spring flow, which is an important feature of the habitat of this groundwater species. Also, the frequency and intensity of storms affects the frequency, duration, and intensity of runoff events, and runoff transport of sediment and contaminants (see Factor A above) into catchment areas of Kenk's amphipod sites, especially in the Washington metropolitan area, where there is a substantial amount of impervious cover in close proximity to the habitat. Below we discuss the best available climate predictions for the areas supporting the Kenk's amphipod.

The 2014 National Climate Assessment (Melillo *et al.* 2014, entire) predicts increasing ambient temperatures, increasing winter and spring precipitation, increasing frequency of heavy downpours, and increasing summer and fall drought risk as higher temperatures lead to greater evaporation and earlier winter and spring snowmelt (Horton *et al.* 2014, p. 374 *In* Melillo *et al.* 2014). These droughts may result in the drying up of springs and mortality of the Kenk's amphipod, while the increase in heavy downpours will likely result in increased runoff and resulting erosion of surface features at spring sites, based on previously documented events. The 2014 National Climate Assessment further indicates that overall warming in the Northeast, including Maryland and the District of Columbia, but not Virginia, will be from 3 to 10 degrees Fahrenheit (°F) (1.7 to 5.6 degrees Celsius (°C)) by the 2080s (Horton *et al.* 2014, p. 374 *In* Melillo *et al.* 2014).

Data specific to the District of Columbia from NOAA's National Climate Data Center (*http://www.ncdc.noaa.gov/cag/time-series/us/49/USW00093738/tavg/1/5/1895-2016?base_prd=true&firstbaseyear=1901&lastbaseyear=2000&trend=true&trend_base=10&firsttrendyear=1895&lasttrendyear=2016*, last accessed 07/20/2016) shows that the average annual air temperature in the District of Columbia area has already increased by approximately 3 °F (1.7 °C) from 1960, the decade corresponding to the first Kenk's amphipod surveys, to 2015. This higher rate of change in the District of Columbia area may be due to the urban heat island effect (Oke 1995, p. 187), which is an increase in ambient temperature due to heating of impervious surfaces. This activity also results in an increase in temperature of rainwater that falls on heat-absorbing roads and parking lots. A sudden thunderstorm striking a parking lot that has been sitting in hot sunshine can easily result in a 10 °F (5.6 °C) increase in the rainfall temperature. Menke *et al.* (2010, pp. 147–148) showed that these temporary increases in temperature of storm water can still result in a shift in the biotic community composition and even accelerate changes in species distributions. Based on the work of Menberg *et al.* (2014, entire), we expect these changes in air temperature to be reflected in the temperature of the shallow ground water within a few years, but at a lower magnitude. While we do not have specific temperature tolerance information for the Kenk's amphipod, there are studies of other amphipod species that indicate sensitivity to elevated temperatures, exhibited by reduced or eliminated egg survival at water temperatures above 75 °F (24 °C) to 79 °F (26 °C) (Pockl and Humpesch 1990, pp. 445–449).

In summary, it is highly probable that by the 2080s some increase in ground water temperatures will occur at sites occupied by the Kenk's amphipod, but the magnitude and significance of these changes is difficult to predict.

Change in Species Composition

At most of the Washington metropolitan area sites supporting the Kenk's amphipod, numbers of the Potomac groundwater amphipod, which is the most widely distributed and abundant *Stygobromus* species in the lower Potomac drainage (Kavanaugh 2009, p. 6), have increased as numbers of observed Kenk's amphipod have declined (D. Feller, pers. comm., 03/16/2016; D. Feller, pers. comm., 04/22/2016). The exact cause of this change is not known, but it may be an indication that some stressor has led to a competitive advantage for the Potomac groundwater amphipod (Culver et al. 2012, p. 29). Other than at Coquelin Run Spring, there are no obvious physical changes at these sites indicating a cause for the decline. However, as described above in Factor A, impaired water quality could favor a more common species over a rare species. Culver and Sereg (2004, pp. 72–73) indicated that there is a possibility that the Kenk's amphipod is a poor competitor with other *Stygobromus* species, which may be a factor promoting the Kenk's amphipod's natural rarity, and that in cave locations *Stygobromus* species strongly compete with each other. While the Kenk's amphipod may have always been naturally rare, we conclude that the species may be getting rarer due to the stressors discussed above.

Summary of Factor E—Small population size at all of the sites makes each one of them vulnerable to natural environmental stochasticity and human-caused habitat disturbance, including relatively minor impacts in their spring recharge areas. The small size and isolation of sites also make each population vulnerable to demographic stochasticity, including loss of genetic variability and adaptive capacity.

The best available climate data indicate that the areas supporting the Kenk's amphipod will see increasing ambient temperatures, increasing winter and spring precipitation, increasing frequency of heavy downpours, and increasing summer and fall drought risk as higher temperatures lead to greater evaporation and earlier winter and spring snowmelt. Droughts could result in drying up of spring sites, while the increase in heavy downpours could result in erosion and sedimentation of sites. Ambient air temperature has increased by 3 °F (1.7 °C) since 1960, and is expected to increase by 10 °F (5.6 °C) by the 2080s. It is highly probable that by the 2080s some increase in ground water temperatures will occur at sites occupied by the Kenk's amphipod, but the magnitude and significance of these changes is difficult to predict.

Cumulative Effects

Many of the factors discussed above are cumulatively and synergistically affecting the Kenk's amphipod. For example, Kenk's amphipod habitat can be degraded by storm water runoff, which is likely to increase with more frequent and intense storms and precipitation levels in the future. Species with larger populations are naturally more resilient to the stressors affecting individuals or local occurrences, while smaller populations or individuals are more susceptible to demographic or stochastic events. Below we discuss the Kenk's amphipod's viability as expressed through the conservation biology principles of representation, redundancy, and resiliency, which illustrate how the cumulative and synergistic effects are affecting the species as a whole.

Redundancy—The species has some redundancy given its known distribution is 10 sites across 3 municipal jurisdictions and multiple streams. For example, the isolation of the two Montgomery County, MD, populations from other Washington metropolitan area populations and their occurrence along different tributary streams make it unlikely that a single catastrophic adverse event (*e.g.,* a spill) will eliminate more than one occurrence at a time. In addition, the Virginia sites occur in two stream areas, Mill Creek and Mount Creek, making it unlikely that a single military training event or other catastrophic event will eliminate more than one occurrence at a time.

Representation—Based on the information about historical changes to the landscape across the Washington metropolitan area, we conclude it is likely that the species' historical distribution was larger than the current distribution; therefore, the species may have previously experienced a significant loss in representation. Also, because we do not yet have any information on the genetics of these populations, we cannot determine whether the species possesses a single genetic identity or has genetic variability across populations. Therefore, we conclude that the species' representation has likely been reduced, and may currently be limited.

Resiliency—Given the range of the species, the small number of seeps and individuals at those seeps, and each seep's vulnerability to stressors, the Kenk's amphipod's overall resiliency is low. Based on the best available data, we conclude that the stressors to the species are not decreasing and, in most cases, are expected to increase in the future. Furthermore, the small size of each of the 10 habitat areas makes each population vulnerable to natural environmental stochasticity and human-caused habitat disturbance, including relatively minor effects in the spring recharge area. As a result of habitat fragmentation/isolation there is a lack of connectivity and genetic exchange between populations and, we assume, a lack of ability to recolonize extirpated sites, leading to an overall reduced resiliency for the species.

Determination

Section 4 of the Act (16 U.S.C. 1533), and its implementing regulations in title 50 of the Code of Federal Regulations at 50 CFR part 424, set forth the procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a)(1) of the Act, we may list a species based on (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) Overutilization for commercial, recreational, scientific, or educational purposes; (C) Disease or predation; (D) The inadequacy of existing regulatory mechanisms; or (E) Other natural or manmade factors affecting its continued existence. Listing actions may be warranted based on any of the above threat factors, singly or in combination.

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future stressors to the Kenk's amphipod and find that several of those stressors rise to the level of threats to the species as a whole. Habitat loss and degradation (Factor A) from poor water quality parameters associated with urban runoff in Maryland and the District of Columbia has decreased water quality and increased erosion and sedimentation at several shallow ground water habitat sites. These parameters are likely to be exacerbated in the future by the increasing risk of exposure to breaks and leaks from the aging sewer and water pipe infrastructure (Factor A), as well as more frequent and intense rainfall events, due to the effects of climate change (Factor E). In addition, all 10 sites are characterized by small numbers of the Kenk's amphipod that appear to be declining and affected by the inherent vulnerabilities associated with small population dynamics (Factor E). Overutilization (Factor B), disease (Factor C), and predation (Factor C) are not considered threats to the Kenk's amphipod. The existing regulatory mechanisms (Factor D) for the stressors and threats affecting the species have been evaluated under Factors A, B, and E. While the Kenk's amphipod has some redundancy and representation, the resiliency of each individual site is compromised, making the species' overall resiliency low.

The Act defines an endangered species as any species that is ''in danger of extinction throughout all or a significant portion of its range'' and a threatened species as any species ''that is likely to become endangered throughout all or a significant portion of its range within the foreseeable future.'' We find that the Kenk's amphipod is presently in danger of extinction throughout its entire range based on the severity and immediacy of threats currently affecting the species. The best available data indicate that, while the species may have always been represented by small numbers of individuals found at the surface of each seep site, the species' abundance appears to be declining. In addition, each of the 10 known seep sites are vulnerable to varying levels of stressors and threats: 1 Seep (Sherrill Drive Spring), based on repeated negative survey results combined with documented poor water quality, may be extirpated, and another seep (Coquelin Run Spring) has visible erosion and sedimentation. The Kenk's amphipod has some redundancy and representation, but those two conservation parameters are compromised due to each site's low resiliency, all of which makes the species' overall resiliency low. The primary drivers affecting the species' viability (water quality and habitat degradation and small population dynamics) are difficult to manage because either they are caused by factors outside the control of the landowner's jurisdiction (*e.g.,* poor water quality or risk of sewer/water line spills at NPS-controlled sites) or there are no apparent management actions to minimize or control them (*e.g.,* small population dynamics), and some of those threats and additional stressors are likely to increase in the future.

Therefore, on the basis of the best available scientific and commercial information, we propose listing the Kenk's amphipod as endangered in accordance with sections 3(6) and 4(a)(1) of the Act. We find that a threatened species status is not appropriate for the Kenk's amphipod based on the high magnitude and imminence of the threats across the species' range. If additional Kenk's amphipod sites are found and those sites are individually resilient and add to the species' overall representation, redundancy, and resiliency, then a threatened species status may be appropriate at that time.

Under the Act and our implementing regulations, a species may warrant listing if it is endangered or threatened throughout all or a significant portion of its range. Because we have determined that the Kenk's amphipod is an endangered species throughout all of its range, no portion of its range can be ''significant'' for purposes of the definitions of ''endangered species'' and ''threatened species.'' See the Final Policy on Interpretation of the Phrase ''Significant Portion of Its Range'' in the Endangered Species Act's Definitions of ''Endangered Species'' and ''Threatened Species'' (79 FR 37578; July 1, 2014).

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened species under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition, through listing, results in public awareness and conservation by Federal, State, Tribal, and local agencies, private organizations, and individuals. The Act encourages cooperation with the States and other countries and calls for recovery actions to be carried out for listed species. The protection required by Federal agencies and the prohibitions against certain activities are discussed, in part, below.

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species, so that they no longer need the protective measures of the Act. Subsection 4(f) of the Act calls for the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The recovery planning process involves the identification of actions that are necessary to halt or reverse the species' decline by addressing the threats to its survival and recovery. The goal of this process is to restore listed species to a point where they are secure, selfsustaining, and functioning components of their ecosystems.

Recovery planning includes the development of a recovery outline shortly after a species is listed and preparation of a draft and final recovery plan. The recovery outline guides the immediate implementation of urgent recovery actions and describes the process to be used to develop a recovery plan. Revisions of the plan may be done to address continuing or new threats to the species, as new substantive information becomes available. The recovery plan also identifies recovery criteria for review of when a species may be ready for downlisting or delisting, and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. Recovery teams (composed of species experts, Federal and State agencies, nongovernmental organizations, and stakeholders) are often established to develop recovery plans. When completed, the recovery outline, draft recovery plan, and the final recovery plan will be available on our Web site (*http://www.fws.gov/endangered*), or from our Chesapeake Bay Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, Tribes, nongovernmental organizations, businesses, and private landowners. Examples of recovery actions include habitat restoration (*e.g.,* restoration of native vegetation), research, captive propagation and reintroduction, and outreach and education. The recovery of many listed species cannot be accomplished solely on Federal lands because their range may occur primarily or solely on non-Federal lands. To achieve recovery of these species requires cooperative conservation efforts on private, State, and Tribal lands. If this species is listed, funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost share grants for non-Federal landowners, the academic community, and nongovernmental organizations. In addition, pursuant to section 6 of the Act, the State of Maryland, Commonwealth of Virginia, and the District of Columbia would be eligible for Federal funds to implement management actions that promote the protection or recovery of the Kenk's amphipod. Information on our grant programs that are available to aid species recovery can be found at: *http://www.fws.gov/grants.*

Although the Kenk's amphipod is only proposed for listing under the Act at this time, please let us know if you are interested in participating in recovery efforts for this species. Additionally, we invite you to submit any new information on this species whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7(a), and in particular section 7(a)(1), of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as an endangered or threatened species and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service.

Federal agency actions within the species' habitat that may require conference or consultation or both as described in the preceding paragraph include management and any other landscape-altering activities on Federal lands administered by the National Park Service (Rock Creek Park) and U.S. Army (Fort A.P. Hill); issuance of section 404 CWA permits by the Army Corps of Engineers; and construction and maintenance of roads or highways by the Federal Highway Administration.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to endangered wildlife. The prohibitions of section 9(a)(1) of the Act, codified at 50 CFR 17.21 make it illegal for any person subject to the jurisdiction of the United States to take (which includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these) endangered wildlife within the United States or on the high seas. In addition, it is unlawful to import; export; deliver, receive, carry, transport, or ship in interstate or foreign commerce in the course of commercial activity; or sell or offer for sale in interstate or foreign commerce any listed species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to employees of the Service, the National Marine Fisheries Service, other Federal land management agencies, and State conservation agencies.

We may issue permits to carry out otherwise prohibited activities involving endangered wildlife under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22. With regard to endangered wildlife, a permit may be issued for the following purposes: For scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities. There are also certain statutory exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

It is our policy, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify to the maximum extent practicable at the time a species is listed, those activities that would or would not constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness of the effect of a proposed listing on proposed and ongoing activities within the range of the species proposed for listing. At this time, we are unable to identify specific activities that would not be considered to result in a violation of section 9 of the Act because the Kenk's amphipod occurs in seep habitats that are influenced by the surrounding environment and it is likely that site-specific conservation measures may be needed for activities that may directly or indirectly affect the species.

Based on the best available information, the following activities may potentially result in a violation of section 9 of the Act; this list is not comprehensive:

(1) Unauthorized handling or collecting of the species;

(2) Destruction/alteration of the species' habitat by discharge of fill material, use of motorized vehicles such as all-terrain vehicles or creation of trails that would increase foot traffic through the spring area, draining, or diversion or alteration of surface or ground water flow into or out of the seepage springs or catchment basins;

(3) Forest management practices that alter the seepage spring sites or remove canopy cover from above the seepage spring sites;

(4) Discharge of chemicals, storm water, or runoff into the seepage springs or catchment basins.

Questions regarding whether specific activities would constitute a violation of section 9 of the Act should be directed to the Chesapeake Bay Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Critical Habitat for the Kenk's amphipod (*Stygobromus Kenki*)

Background

Critical habitat is defined in section 3 of the Act as:

(1) The specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the Act, on which are found those physical or biological features:

(a) Essential to the conservation of the species, and

(b) Which may require special management considerations or protection; and

(2) Specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Conservation, as defined under section 3 of the Act, means to use and the use of all methods and procedures that are necessary to bring an endangered or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.

Critical habitat receives protection under section 7 of the Act through the requirement that Federal agencies ensure, in consultation with the Service, that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Such designation does not allow the government or public to access private lands. Such designation does not require implementation of restoration, recovery, or enhancement measures by non-Federal landowners. Where a landowner requests Federal agency funding or authorization for an action that may affect a listed species or critical habitat, the consultation requirements of section 7(a)(2) of the Act would apply, but even in the event of a destruction or adverse modification finding, the obligation of the Federal action agency and the landowner is not to restore or recover the species, but to implement reasonable and prudent alternatives to avoid destruction or adverse modification of critical habitat.

Section 4 of the Act requires that we designate critical habitat on the basis of the best scientific data available. Further, our Policy on Information Standards Under the Endangered Species Act (published in the **Federal Register** on July 1, 1994 (59 FR 34271)), the Information Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106–554; H.R. 5658)), and our associated Information Quality Guidelines, provide criteria, establish procedures, and provide guidance to ensure that our decisions are based on the best scientific data available. They require our biologists, to the extent consistent with the Act and with the use of the best scientific data available, to use primary and original sources of information as the basis for recommendations to designate critical habitat.

Prudency Determination

Section 4(a)(3) of the Act, as amended, and implementing regulations (50 CFR 424.12), require that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time the species is determined to be endangered or threatened. Our regulations (50 CFR 424.12(a)(1)) state that the designation of critical habitat is not prudent when one or both of the following situations exist: (1) The species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of threat to the species, or (2) such designation of critical habitat would not be beneficial to the species.

There is currently no imminent threat of take attributed to collection or vandalism under Factor B for the Kenk's amphipod. Identification and mapping of critical habitat is not likely to increase any such threat. In the absence of finding that the designation of critical habitat would increase threats to a species, if there are any benefits to a critical habitat designation, then a prudent finding is warranted. The potential benefits of designation include: (1) Triggering consultation under section 7 of the Act, in new areas for actions in which there may be a Federal nexus where it would not otherwise occur because, for example, it is or has become unoccupied or the occupancy is in question; (2) focusing conservation activities on the most essential features and areas; (3) providing educational benefits to State or county governments or private entities; and (4) preventing people from causing inadvertent harm to the species. Therefore, because we have determined that the designation of critical habitat will not likely increase the degree of threat to this species and may provide some measure of benefit, we find that designation of critical habitat is prudent for the Kenk's amphipod.

Critical Habitat Determinability

Having determined that designation is prudent, under section 4(a)(3) of the Act we must find whether critical habitat for the species is determinable. Our regulations at 50 CFR 424.12(a)(2) state that critical habitat is not determinable when one or both of the following situations exist: (i) Information sufficient to perform required analyses of the impacts of the designation is lacking, or (ii) The biological needs of the species are not sufficiently well known to permit identification of an area as critical habitat.

As discussed above, we have reviewed the available information pertaining to the biological needs of the Kenk's amphipod and habitat characteristics where the species is located. Because we are awaiting the results of hydrology studies that support the species' physical and biological features, and additional surveys in new habitat areas (*e.g.,* accessible areas within steep, sloped, forested habitat overlaying the Calvert formation in Maryland and Virginia), we conclude that the designation of critical habitat is not determinable for the Kenk's amphipod at this time. We will make a determination on critical habitat no later than 1 year following any final listing determination.

Required Determinations

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

(1) Be logically organized;

(2) Use the active voice to address readers directly;

(3) Use clear language rather than jargon;

(4) Be divided into short sections and sentences; and

(5) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in **ADDRESSES**. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

National Environmental Policy Act (42 U.S.C. 4321 et seq.)

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 *et seq.*), need not be prepared in connection with listing a species as an endangered or threatened species under the Endangered Species Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A complete list of references cited in this rulemaking is available on the Internet at *http://www.regulations.gov* and upon request from the Chesapeake Bay Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this proposed rule are the staff members of the Chesapeake Bay Field Office and the Northeast Regional Office.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

■ 1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 1531–1544; 4201–4245; unless otherwise noted.

■ 2. In § 17.11(h), add an entry for ''Amphipod, Kenk's'' to the List of Endangered and Threatened Wildlife in alphabetical order under CRUSTACEANS to read as set forth below:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
* * * * * * *				
CRUSTACEANS				
* * * * * * *				
Amphipod, Kenk's	*Stygobromus kenki*	Wherever found	E	[**Federal Register** citation when published as a final rule]
* * * * * * *				

Dated: September 7, 2016.

Stephen Guertin,

Acting Director, U.S. Fish and Wildlife Service.

[FR Doc. 2016–23103 Filed 9–29–16; 8:45 am]

BILLING CODE 4333–15–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 660

RIN 0648–BG17

Fisheries Off West Coast States; Amendment 27 to the Pacific Coast Groundfish Fishery Management Plan

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice of availability of proposed fishery management plan amendment; request for comments.

SUMMARY: NMFS announces that the Pacific Fishery Management Council (Council) has submitted Amendment 27 to the Pacific Coast Groundfish Fishery Management Plan (PCGFMP) for Secretarial review. Amendment 27 would add deacon rockfish to the FMP, reclassifies big skate as an actively managed stock, add a new inseason management process for commercial and recreational in California, and several clarifications.

DATES: Comments on Amendment 27 must be received on or before November 29, 2016.

ADDRESSES: You may submit comments on this document, identified by NOAA–NMFS–2016–0094, by any of the following methods:

• *Federal e-Rulemaking Portal:* Go to *www.regulations.gov/#!docketDetail;D=NOAA-NMFS-2016-0094,* click the ''Comment Now!'' icon, complete the required fields, and enter or attach your comments.

• *Mail:* Submit written comments to William Stelle, Regional Administrator, West Coast Region, NMFS, 7600 Sand Point Way NE., Seattle, WA 98115–0070.

Instructions: NMFS may not consider comments if they are sent by any other method, to any other address or individual, or received after the comment period ends. All comments received are a part of the public record and NMFS will post for public viewing on *www.regulations.gov* without change. All personal identifying information (*e.g.,* name, address, etc.), confidential business information, or otherwise sensitive information submitted voluntarily by the sender is publicly accessible. NMFS will accept anonymous comments (enter ''N/A'' in the required fields if you wish to remain anonymous).

Information relevant to Amendment 27, which includes a draft environmental assessment (EA), a regulatory impact review (RIR), and an initial regulatory flexibility analysis (IRFA) are available for public review during business hours at the NMFS West Coast Regional Office at 7600 Sand Point Way NE., Seattle, WA 98115.