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# Part II

# Department of the Interior

## Fish and Wildlife Service

## 50 CFR Part 17

## Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for the Georgia Pigtoe Mussel, Interrupted Rocksnail, and Rough Hornsnail with Critical Habitat; Proposed Rule

**DEPARTMENT OF THE INTERIOR**

**Fish and Wildlife Service**

**50 CFR Part 17**

**[FWS–R4–ES–2008–0104; MO 9221050083]**

**RIN 1018–AU88**

# Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for the Georgia Pigtoe Mussel, Interrupted Rocksnail, and Rough Hornsnail with Critical Habitat

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Proposed rule.

**SUMMARY:** We, the U.S. Fish and Wildlife Service (Service), propose to list the Georgia pigtoe mussel (*Pleurobema hanleyianum*), interrupted rocksnail (*Leptoxis foremani*), and rough hornsnail (*Pleurocera foremani*), as endangered species under the Endangered Species Act of 1973, as amended (Act). The Georgia pigtoe, interrupted rocksnail, and rough hornsnail are endemic to the Coosa River drainage within the Mobile River Basin of Alabama, Tennessee, and Georgia. These three species have disappeared from large portions of their natural ranges due to extensive construction of dams that eliminated or reduced water currents and caused changes in habitat and water quality. The surviving populations are small, localized, and highly vulnerable to water quality and habitat deterioration.

We are also proposing to designate critical habitat concurrently for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail under the Act. In total, approximately 258 kilometers (km) (160 miles (mi)) of stream and river channels fall within the boundaries of the proposed critical habitat designation for the three species: 153 km (95 mi) for the Georgia pigtoe, 101 km (63 mi) for the interrupted rocksnail, and 27.4 km (17 mi) for the rough hornsnail. The proposed critical habitat is located in Cherokee, Clay, Coosa, Elmore, and Shelby Counties, Alabama; Gordon, Floyd, Murray, and Whitfield Counties, Georgia; and Bradley and Polk Counties, Tennessee.

These proposals, if made final, would implement Federal protection provided by the Act.

**DATES:** We will accept comments received on or before August 28, 2009. We must receive requests for public hearings, in writing, at the address shown in the **FOR FURTHER INFORMATION CONTACT** section by August 13, 2009.

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

- Federal eRulemaking Portal: *http://www.regulations.gov*. Follow the instructions for submitting comments.
- U.S. mail or hand-delivery: Public Comments Processing, Attn: RIN 1018–AU88; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, Suite 222; Arlington, VA 22203.

We will not accept e-mail or faxes. We will post all comments on *http://www.regulations.gov*. This generally means that we will post any personal information you provide us (see the Public Comments section below for more information).

**FOR FURTHER INFORMATION CONTACT:** Cary Norquist, Acting Field Supervisor, Mississippi Fish and Wildlife Office at 6578 Dogwood View Parkway, Suite A, Jackson, MS 39213 (telephone 601–321–1122; facsimile 601–965–4340). If you use a telecommunications device for the deaf (TDD), you may call the Federal Information Relay Service (FIRS) at 800–877–8339.

**SUPPLEMENTARY INFORMATION:**

## Public Comments

We intend that any final action resulting from this proposal will be as accurate and as effective as possible. Therefore, we are seeking comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning this proposed rule. We particularly seek comments concerning:

(1) Any biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to the Georgia pigtoe mussel, interrupted rocksnail, and rough hornsnail;

(2) Any additional information concerning the ranges, distributions, and population sizes of the species;

(3) Land use designations and current or planned activities in the subject area and their possible impacts on these species or proposed critical habitats;

(4) The reasons why any area should or should not be designated as critical habitat as provided by section 4 of the Act (16 U.S.C. 1531 *et seq.*), including whether the benefit of designation would outweigh threats to the species caused by designation such that the designation of critical habitat is prudent;

(5) Specific information on the amount and distribution of habitat for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail, including areas occupied at the time of listing and containing the features essential to the conservation of the species, and areas not occupied at the time of listing that are essential to the conservation of the species and why;

(6) Any foreseeable economic, national security, or other potential impacts resulting from the proposed designation and, in particular, any impacts on small entities, and information about the benefits of including or excluding any areas that exhibit those impacts; and

(7) Whether our approach to designating critical habitat could be improved or modified in any way to provide for greater public participation and understanding, or to assist us in accommodating public concerns and comments.

You may submit your comments and materials concerning this proposed rule by one of the methods listed in the **ADDRESSES** section. We will not accept comments you send by e-mail or fax or to an address not listed in the **ADDRESSES** section.

We will post your entire comment—including your personal identifying information—on *http://www.regulations.gov*. If you provide personal identifying information in addition to the required items specified in the previous paragraph, such as your street address, phone number, or e-mail address, 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.

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, Mississippi Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

## Background

### Georgia Pigtoe Mussel

The Georgia pigtoe (*Pleurobema hanleyianum*) is a freshwater mussel in the family Unionidae. It was described in 1852 by I. Lea as *Unio hanleyianum* from the Coosawattee River in Georgia. It was placed in the genus *Pleurobema* by Simpson in 1900. The uniqueness of the Georgia pigtoe has been verified both morphologically (Williams *et al.* 2008, p. 533) and genetically (Campbell *et al.* 2008, pp. 719–721).

The shell of the Georgia pigtoe reaches about 50 to 65 millimeters (mm) (2 to 2.5 inches (in)) in length. It is oval to elliptical and somewhat inflated. The posterior ridge is low and evenly

rounded when evident. The anterior end is rounded, while the posterior margin is bluntly pointed below. Dorsal and ventral margins are curved, and the beaks rise slightly above the hinge line. The periostracum (membrane on the surface of the shell) is yellowish-tan to reddish-brown and may have concentric green rings. The beak cavity is shallow, and the shell interior is white to dull bluish-white (Parmalee and Bogan 1998, p. 185; Williams *et al.* 2008, p. 533).

Little is known about the habitat requirements or life history of the Georgia pigtoe; however, it is found in shallow runs and riffles with strong to moderate current and coarse sand–gravel–cobble bottoms. Unionid mussels, such as the Georgia pigtoe, filter-feed on algae, detritus, and bacteria from the water column. The larvae of most unionid mussels are parasitic, requiring a period of encystment on a fish host before they can develop into juvenile mussels. The fish host and glochidia (parasitic larvae) of Georgia pigtoe are currently unknown.

The Georgia pigtoe was historically found in large creeks and rivers of the Coosa River drainage of Alabama, Georgia, and Tennessee (Johnson and Evans 2000, p. 106; Williams *et al.*, 2008, p. 534). There are historical reports or museum records of the Georgia pigtoe from Tennessee (Conasauga River in Polk and Bradley Counties), Georgia (Conasauga River in Murray and Whitfield Counties, Chatooga River in Chatooga County; Coosa River in Floyd County, Etowah River in Floyd County), and Alabama (Coosa River in Cherokee County, Terrapin Creek in Cherokee County, Little Canoe and Shoal Creeks in St. Clair County, Morgan Creek in Shelby County, and Hatchet Creek in Coosa County) (Florida Museum of Natural History Malacology Database (FLMNH) 2006; Gangloff 2003, p. 45). Based on these historical records, the range of the Georgia pigtoe included more than 480 km (300 mi) of river and stream channels. Additional historical Coosa River tributary records credited to Hurd (1974, p. 64) (for example, Big Wills, Little Wills, Big Canoe, Oothcalooga, Holly Creeks) have been found to be misidentifications of other species (M. Gangloff in litt. 2006).

In 1990, the Service initiated a status survey and review of the molluscan fauna of the Mobile River Basin (Hartfield 1991, p. 1). This led to extensive mollusk surveys and collections throughout the Coosa River drainage (Bogan and Pierson 1993a, pp. 1–27; P. Hartfield in litt. 1990–2001). At all localities surveyed in the Coosa River drainage, the freshwater mussel fauna had declined from historical levels, and at all but a few localized areas, the fauna proved to be completely eliminated or severely reduced due to a variety of impacts, including point and non-point source pollution, and channel modifications such as impoundment. Following a review of these efforts and observations, the Service reported 14 species of mussels in the genus *Pleurobema*, including the Georgia pigtoe, as presumed extinct, based on their absence from collection records, technical reports, or museum collections for a period of 20 years or more (Hartfield 1994, p. 1).

The Service and others continued to conduct surveys in the Coosa River drainage for mollusks (P. Hartfield in litt. 1990–2001; Williams and Hughes 1998, pp. 2–6; Johnson and Evans 2000, p. 106; Herod *et al.* 2001, pp i–ii; Gangloff 2003, pp. 11–12; McGregor and Garner 2004, pp. 1–18; Johnson *et al.* 2005, p. 1). Several freshly dead and live individuals of the Georgia pigtoe were collected during these mussel surveys in the Upper Conasauga River, Murray and Whitfield Counties, Georgia (Williams and Hughes 1998, p. 10; Johnson and Evans 2000, p. 106). Gangloff (2003, pp. 11–12, 45) conducted mussel surveys of Coosa River tributaries in Alabama, including all known historical collection sites for the Georgia pigtoe, without relocating the species. McGregor and Garner (2004, p. 8) surveyed the Coosa River dam tailraces for mollusks without encountering the Georgia pigtoe.

The Georgia pigtoe is currently known from a few isolated shoals in the Upper Conasauga River in Murray and Whitfield Counties, Georgia, and in Polk County, Tennessee (Johnson and Evans 2000, p. 106; Evans 2001, pp. 33–34). All recent collection sites occur within a 43-km (27-mi) reach of the river. Within this reach, the Georgia pigtoe is very rare (Johnson and Evans 2000, p. 106), and no population estimates are available.

Interrupted Rocksnail

The interrupted rocksnail (*Leptoxis foremani*) is a small-to-medium-sized freshwater snail that historically occurred in the Coosa River drainage of Alabama and Georgia. The shell grows to approximately 22 mm (1 in) in length and may be plicate (folds in the surface) with obscure striations (fine longitudinal ridges), subglobose (not quite spherical), thick, dark, brown to olive in color, and occasionally spotted. The spire (apex) of the shell is very low, and the aperture (opening) is large and subrotund (not quite round).

The interrupted rocksnail, a member of the aquatic snail family Pleuroceridae, was described from the Coosa River, Alabama, by Lea in 1843. Goodrich (1922, p. 13) placed the species in the ''*Anculosa* (=*Leptoxis) picta* (Conrad 1834) group,'' which also included the Georgia rocksnail (*Leptoxis downei* (Lea 1868)). *L. foremani* was considered to inhabit the Lower Coosa River, with *L. downei* inhabiting the Upper Coosa drainage (Goodrich 1922, pp. 18–19, 21–23). When a rocksnail population was rediscovered surviving in the Oostanaula River, Georgia, in 1997, it was initially identified as *L. downei* (Williams and Hughes 1998, p. 9; Johnson and Evans 2000, pp. 45–46); however, Burch (1989, p. 155) had previously placed *L. downei* within *L. foremani* as an ecological variation. Therefore, *L. downei* is currently considered an upstream phenotype of the interrupted rocksnail, and *L. foremani* is recognized as the valid name for the interrupted rocksnail (Turgeon *et al.* 1998, p. 67; Johnson 2004, p. 116).

Rocksnails live in shoals, riffles, and reefs (bedrock outcrops) of small to large rivers. Their habitats are generally subject to moderate currents during low flows and strong currents during high flows. These snails live attached to bedrocks, boulders, cobbles, and gravel and tend to move little, except in response to changes in water level. They lay their adhesive eggs within the same habitat (Johnson 2004, p. 116). Interrupted rocksnails are currently found in shoal habitats with sand-boulder substrate, at water depths less than 50 centimeters (cm) (20 in), and in water currents less than 40 cm/second (sec) (16 in/sec) (Johnson 2004, p. 116). We know little of the life history of pleurocerid snails; however, they generally feed by ingesting periphyton (algae attached to hard surfaces) and biofilm detritus scraped off of the substrate by the snail's radula (a horny band with minute teeth used to pull food into the mouth) (Morales and Ward 2000, p. 1). Interrupted rocksnails have been observed grazing on silt-free gravel, cobble, and boulders (Johnson 2004, p. 116). They have survived as long as 5 years in captivity (Johnson in litt. 2006b).

The interrupted rocksnail was historically found in colonies on reefs and shoals of the Coosa River and several of its tributaries in Alabama and Georgia. The range of the rocksnail formerly encompassed more than 800 km (500 mi) of river and stream channels, including the Coosa River (Coosa, Calhoun, Cherokee, Elmore, Etowah, Shelby, St. Clair, and Talladega

Counties), Lower Big Canoe Creek (St. Clair County), and Terrapin Creek (Cherokee County) in Alabama; and the Coosa and Lower Etowah Rivers (Floyd County), the Oostanaula River (Floyd and Gordon Counties), the Coosawattee River (Gordon County), and the Conasauga River (Gordon, Whitfield, and Murray Counties) in Georgia (Goodrich 1922, pp. 19, 21; Johnson 2004, p. 116; FLMNH 2006).

Snail surveys conducted within the historical range of the interrupted rocksnail (Bogan and Pierson 1993a, pp. 1–27; Williams and Hughes 1998, pp. 1–21) resulted in the collection of only a single live specimen from the Oostanaula River, Floyd County, Georgia, during 1997 (Williams and Hughes 1998, p. 9). Intensive surveys of the Oostanaula, Coosa, Coosawattee, Etowah, and Conasauga Rivers since 1999 have located the species in about 12 km (7.5 mi) of the Oostanaula River upstream of the Gordon–Floyd County line (Johnson and Evans 2000, pp. 45–46; Johnson and Evans 2001, pp. 2, 25). A captive colony was maintained at the Tennessee Aquarium Research Institute (TNARI) from 2000 through 2005 for study and propagation. In coordination with TNARI and the Service, the Alabama Department of Conservation and Natural Resources (ADCNR) developed a plan and strategy to reintroduce interrupted rocksnails from the TNARI colony into the Coosa River above Wetumpka, Elmore County, Alabama (ADCNR 2003, pp. 1–4). In 2003, 2004, and 2005, approximately 3,200, 1,200, and 3,000 juvenile snails, respectively, from the TNARI culture were released into the Lower Coosa River (ADCNR 2004, p. 33; P. Johnson in litt. 2005a). In 2005, ADCNR established the Alabama Aquatic Biodiversity Center (AABC) at the Marion State Fish Hatchery for the culture of imperiled mollusk species, and the interrupted rocksnail TNARI colony was transferred to that facility.

Following its rediscovery, the interrupted rocksnail population size on shoals in the Oostanaula River declined from a high of 10 to 45 snails per square meter ($m^2$) (1.2 square yards ($yd^2$) in 1999 (Johnson and Evans 2001, p. 22) to only 20 snails found during 6 search-hours in 2004 (P. Johnson in litt. 2003, 2004). The cause of decline was suspected to be some form of water contamination (P. Johnson in litt. 2003, 2004; P. Hartfield in litt. 2006). A July 2006 search for adults to use as hatchery stock failed to locate any rocksnails in more than 2 search-hours (P. Hartfield in litt. 2006). However, a subsequent search in August 2006 under lower flow conditions resulted in the location of 89 snails in 4 search-hours at one shoal, and 2 rocksnails in 4 search-hours at another shoal (P. Johnson in litt. 2007a).

Since their reintroduction into the Lower Coosa River of Alabama, a few of the 2003 hatchery-cultured interrupted rocksnails were observed in the vicinity of the release site in 2004 (Johnson in litt. 2005c). An alternative site was selected for release in August 2005, and 18 snails were located 3 months following release (M. Pierson in litt. 2005). During a 40–minute search of this release area in 2006, two interrupted rocksnails were found (P. Johnson in litt. 2007b). Observations of only small numbers of reintroduced snails may be due to habitat size and dispersal, low fecundity of the species, predation, reproductive failure due to dispersal, or habitat disturbance (Johnson in litt. 2005b).

Rough Hornsnail

The rough hornsnail's (*Pleurocera foremani*) shell is elongated, pyramidal, and thick. Growing to about 33 mm (1.3 in) in length, the shell has as many as nine yellowish-brown whorls. The aperture is elongated, angular, channeled at the base, and usually white inside. The presence of prominent nodules or tubercles on the lower whorls above the aperture is the most distinctive feature that separates it from other hornsnails (Tryon 1873, p. 53). These tubercles, along with the size and shape of the shell, distinguish the species from all other pleurocerid snails (*Elimia* spp., *Leptoxis* spp., *Pleurocera* spp.) in the Mobile River Basin.

The rough hornsnail is a member of the aquatic snail family of Pleuroceridae. The species was described in 1843 by Lea as *Melania foremanii* (=*foremani*) (Tryon 1873, p. 52). It was later placed in the genus *Pleurocera* by Tryon (1873, p. 52), who noted that *P. foremani* closely resembled species of that genus. Goodrich (1935, p. 3) reported a variation of a species of *Pleurocera* in the Cahaba River that resembled *foremani*, but later identified that variant as a ''mutation'' or form of brook hornsnail (*P. vestitum*) (Goodrich 1941, p. 12). This variant, however, is no longer extant in the Cahaba River (Bogan and Pierson 1993b, p. 12; Sides 2005, pp. 21–22, 28). Goodrich (1944, p. 43) considered that the Coosa River *P. foremani* might also be eventually found to be simply a variant of smooth hornsnail (*P. prasinatum*), another more widely distributed species in the Coosa River.

In a recent dissertation on the systematics of the Mobile River Basin *Pleurocera*, the rough hornsnail was found to be both morphologically and genetically distinct from other species in the genus (Sides 2005, pp. 26, 127). This analysis also found that the rough hornsnail was genetically more closely allied to a co-occurring species in the genus *Elimia*, and concluded that it should be recognized as *Elimia foremani* (Sides 2005, pp. 26–27). Although the Sides (2005, pp. 26–27) study provides some evidence that this species should be placed in the genus *Elimia*, this taxonomic change has not been formally peer-reviewed and published. Therefore, for the purposes of this action, we will continue to use currently recognized nomenclature for the rough hornsnail (*Pleurocera foremani*).

Rough hornsnails are primarily found on gravel, cobble, and bedrock in moderate currents. They have been collected at depths of 1 m (3.3 ft) to 3 m (9.8 ft) (Hartfield 2004, p. 132). The species appears to tolerate low-to-moderate levels of silt deposition (Sides 2005, p. 127). Little is known regarding the life history characteristics of this species. Snails in the genus *Pleurocera* generally lay their eggs in a spiral arrangement on smooth surfaces (Sides 2005, pp. 26–27), whereas *Elimia* snails generally lay eggs in short strings (P. Johnson 2006). Attempts to induce rough hornsnails to lay eggs in captivity have been unsuccessful (Sides 2005, p. 27).

The rough hornsnail is endemic to the Coosa River system in Alabama. Goodrich (1944, p. 43) described the historical range as the Coosa River downstream of the Etowah River and at the mouths of a few tributaries. The Etowah River enters the Coosa River in Floyd County, Georgia; however, there are no known museum or site-specific records of the rough hornsnail that validate its range into the State of Georgia (P. Johnson in litt. 2006a). Historical museum records of the rough hornsnail in the Coosa River (FLMNH 2006, and elsewhere) indicate that they occurred from Etowah, St. Clair, Shelby, Talladega, and Elmore Counties, Alabama, a historical range of approximately 322 river km (200 river mi). There are also historical museum records of this species from nine Coosa River tributaries in Alabama, including Big Wills Creek in Etowah County; Kelly, Big Canoe, and Beaver Creeks in St. Clair County; Ohatchee Creek, Calhoun County; Choccolocco and Peckerwood Creeks in Talladega County; Yellowleaf Creek, Shelby County; and Yellow Leaf Creek in Chilton County (FLMNH 2006).

The rough hornsnail is currently known to occur at two locations: Lower

Yellowleaf Creek in Shelby County, Alabama; and the Lower Coosa River below Wetumpka Shoals in Elmore County, Alabama (Sides 2005, p. 40). There are also museum records of the species from Wetumka Shoals in the early 1990s (FLMNH 2006); however, the species has not been collected from the shoal reach in recent surveys (Johnson 2002, pp. 5–9). Yellowleaf Creek is a moderately sized stream where rough hornsnails have been collected from about a 50-m (55-yd) length of the stream. At this location, rough hornsnails occur at densities of 8 to 32 $m^2$ (1.2 $yd^2$) (Pierson in litt. 2006). The Lower Coosa River is a large river channel where rough hornsnails have been found in an area of about 100 $m^2$ (120 $yd^2$) (P. Hartfield 2001). No quantitative estimates have been made at this site. Searches of unimpounded reaches of the Coosa River and the lower portions of tributaries to the Coosa have failed to locate the species elsewhere (Bogan and Pierson 1993a, pp. 1–27; Garner, pers. com. 2005; Hartfield in litt. 2006). The two known surviving populations are separated by three impoundments and about 113 km (70 mi) of impounded channel habitat.

**Previous Federal Action**

The interrupted rocksnail and rough hornsnail were first identified as candidates for protection under the Act in the November 21, 1991, **Federal Register** (56 FR 58804). They were assigned a category 2 status designation, which was given to those species for which there was some evidence of vulnerability, but for which additional biological information was needed to support a proposed rule to list as endangered or threatened. In the November 15, 1994, notice of candidate review (59 FR 58982), the rough hornsnail was again assigned a category 2 status, while the status category for the interrupted rocksnail (*Leptoxis foremani*) was changed to 3A (taxa for which the Service has persuasive evidence of extinction).

Assigning categories to candidate species was discontinued in 1996 (Notice of Candidate Review; February 28, 1996; 61 FR 7596), and only species for which the Service has sufficient information on biological vulnerability and threats to support issuance of a proposed rule are now regarded as candidate species. Candidate species were also assigned listing priority numbers based on immediacy and the magnitude of threat, as well as their taxonomic status (48 FR 43098; Sept. 21, 1983). Due to a need for taxonomic clarification, the rough hornsnail was dropped as a candidate species in 1996.

In 1997, we received reports of a small population of the interrupted rocksnail surviving in the Ostanaula River, Georgia, along with reports of Georgia pigtoe collections in the Conasauga River of Georgia and Tennessee, and their status as candidates was reevaluated. In the 1999 (64 FR 57533), 2001 (66 FR 54808), 2002 (67 FR 40657), and 2004 (69 FR 24876) **Federal Register** notices of candidate review, both the Georgia pigtoe and interrupted rocksnail (as Georgia rocksnail, *Leptoxis downei*) were identified as listing priority 5 candidate species. In the May 11, 2005, **Federal Register** notice of candidate review (70 FR 24870) the nomenclature was corrected for the interrupted rocksnail, and the listing priority for both species was changed from 5 to 2, based on the continued rarity of the Georgia pigtoe and a decline in abundance of the interrupted rocksnail. The rough hornsnail was recognized as a listing priority 2 candidate in the September 12, 2006, **Federal Register** notice of candidate review (71 FR 53756), following clarification of its taxonomy, along with the interrupted rocksnail and Georgia pigtoe.

**Summary of Factors Affecting the Species**

Section 4 of the Act (16 U.S.C. 1533), and implementing regulations at 50 CFR part 424, set forth procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a) of the Act, we may list a species on the basis of any of five factors, as follows: (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. In making this finding, information regarding the status and trends of the Georgia pigtoe, interrupted rocksnail, and rough hornsnail are considered in relation to the five factors provided in section 4(a)(1) of the Act.

Under section 3 of the Act, a species is ''endangered'' if it is in danger of extinction throughout all or a significant portion of its range and is ''threatened'' if it is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. The word ''range'' refers to the range in which the species currently exists. Range is discussed further below in the Conclusion section of this proposed rule.

Foreseeable future is determined by the Service on a case-by-case basis, taking into consideration a variety of species-specific factors such as lifespan, genetics, breeding behavior, demography, threat projection timeframes, and environmental variability.

The average lifespan of the interrupted rocksnail in the wild is unknown; however, interrupted rocksnails have survived in captivity for as long as 5 years (Johnson in litt. 2006b). Heavy-shelled mussels are known to have long life spans, with many species living from 30 to 70 years (Williams *et al.* 2008, p. 68). For the purposes of this analysis, we estimate a life span of 30 years for the Georgia pigtoe.

Some percentage of rocksnails cultured in captivity have been observed ovipositing in their first year, but all are believed to become sexually mature in their second year. Less is known about the rough hornsnail; however, some pleurocerid snails in the genus *Elimia* may live up to 5 years (Dillon 1988, p. 113). It is also believed that most pleurocerid snails may begin reproducing within 1 year post-hatch, depending upon habitat and productivity (Johnson 2008).

The age of sexual maturity for the Georgia pigtoe is unknown and varies widely among the genera of freshwater mussels. In general, thin-shelled species reach sexual maturity earlier and have shorter lifespans than heavier-shelled species. In the Mobile River Basin, age at sexual maturity for mussels has been shown to vary from 1 to 2 years for the thin-shelled southern pocketbook (*Lampsilis ornata*), and 3 to 9 years for the heavy-shelled Alabama orb (*Quadrula asperata)* (Haag and Staton 2003, pp. 2122–2123). The Georgia pigtoe is similar in shell size and thickness to the Alabama orb, so we are estimating sexual maturity for the Georgia pigtoe at age 5 years, and a generational time span of 5 years. Heavy-shelled mussels are also known to have long life spans, with many species living from 30 to 70 years (Williams *et al.* 2008, p. 68).

Threat projection timeframes for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail include specific activities that can arise at any time (such as permitted discharges, construction activities, channel modifications, or random accidents and spills of toxic substances) and periodic weather events (such as droughts and floods).

The following analysis examines all five factors currently affecting or that are likely to affect Georgia pigtoe,

interrupted rocksnail, and rough hornsnail snail. The five factors listed under section 4(a)(1) of the Act and their application to the Georgia pigtoe mussel (*Pleurobema hanleyianum* (Lea 1852)), interrupted rocksnail (*Leptoxis foremani* (Lea 1843)), and rough hornsnail (*Pleurocera foremani* (Lea 1843)) are as follows:

*A. The present or threatened destruction, modification, or curtailment of its habitat or range.*

All three species have experienced significant curtailment of their occupied habitats (see ''Background'' above). The Georgia pigtoe has been eliminated from about 90 percent of its historical range of 480 river km (298 river mi). It now inhabits only 43 river km (27 river mi). Interrupted rocksnail has been eliminated from 99 percent of a historical range of 800 river km (497 river mi), and is now known from 12 river km (7 river mi). The rough hornsnail has disappeared from more than 99 percent of a historical range of 321 river km (199 river mi) and now occurs in less than 1 river km (0.6 river mi). The primary cause of range curtailment for all three species has been modification and destruction of river and stream habitats, primarily by the construction of large hydropower dams on the Coosa River. This was compounded by fragmentation and isolation of the remaining free-flowing portions of the Coosa River and its tributaries, as well as their increased vulnerability to local historical events of water quality and habitat degradation.

Dams and Impoundments

Dams eliminate or reduce river flow within impounded areas, trap silts and cause sediment deposition, alter water temperature and dissolved oxygen levels, change downstream water flow and quality, affect normal flood patterns, and block upstream and downstream movement of species (Watters 1999, pp. 261–264; McAllister *et al.* 2000, p. iii; Marcinek *et al.* 2005, pp. 20–21). Within impounded waters, decline of freshwater mollusks has been attributed to sedimentation, decreased dissolved oxygen, and alteration in resident fish populations (Neves *et al.* 1997, pp. 63–64; Watters 1999, pp. 261–264; Marcinek *et al.* 2005, pp. 9–10). Below dams, mollusk declines are associated with changes and fluctuation in flow regime, scouring and erosion, reduced dissolved oxygen levels and water temperatures, and changes in resident fish assemblages (Williams *et al.* 1992b, p. 7; Neves *et al.* 1997, pp. 63–64; Watters 1999, pp. 261–264; Marcinek *et al.* 2005, pp. 20–21). The decline and extinction of freshwater snails and mussels in the Mobile River Basin has been directly attributed to construction of numerous large impoundments in the major river systems (Williams *et al.* 1992b, pp. 1–8; Bogan *et al.* 1995, pp. 250–251; Lydeard and Mayden 1995, pp. 803–804; Neves *et al.* 1997, pp. 62, 64; Marcinek *et al.* 2005, p. 9).

The Georgia pigtoe, interrupted rocksnail, and rough hornsnail are all endemic to the Coosa River system. The Coosa River was impounded by six major dams constructed between 1928 and 1966. Today, more than 60 percent of the Coosa River and its 19 largest tributaries are inundated or affected by flow regulation (Marcinek *et al.* 2005, pp. 12–16).

Dam construction on the Coosa River had a secondary effect of fragmenting the ranges of aquatic mollusk species, leaving relict habitats and populations isolated by the structures as well as by extensive areas of uninhabitable, impounded waters. These isolated populations were left more vulnerable to, and affected by, natural events (such as droughts), runoff from common land-use practices (such as agriculture, mining, urbanization), discharges (such as municipal and industrial wastes), and accidents (such as chemical spills) that reduced population levels or eliminated habitat (Neves *et al.* 1997, pp. 64–71; U.S. Fish and Wildlife Service 2000, pp. 14–15). As a result, many relict populations became locally extirpated, and many mollusk species were driven to extinction (Bogan *et al.* 1995, pp. 250–251; Lydeard and Mayden 1995, pp. 803–804; Neves *et al.* 1997, pp. 54, 62; U.S. Fish and Wildlife Service 2000, pp. 6–9). If conditions subsequently improved, the surviving mollusk species were unable to naturally recolonize suitable areas, due to impediments created by the dams and impounded waters.

The only known natural population of the interrupted rocksnail occurs in the free-flowing Oostanaula River (Williams and Hughes 1998, p. 9; Johnson and Evans 2001, p. 25). The Oostanaula River is formed by the confluence of the Conasauga and Coosawatee Rivers. The Upper Coosawatee is impounded by Carters Dam, a hydropower dam which discharges into Carters Re-regulation Dam and from there into the Coosawatee River. Hydropower discharges from Carters Dam are believed to be implicated in the disappearance of the interrupted rocksnail from the Coosawattee River (Johnson and Evans 2001, p. 26). The effects of power generation discharges from Carters Dam, along with cold water temperatures are evident downstream (Williams and Hughes 1998, p. 11), even to the shoals on the Oostanaula River where the interrupted rocksnail is found (Johnson and Evans 2001, p. 26; Marcinek *et al.* 2005, p. 15). A Federal Energy Regulatory Commission (FERC) license was issued to construct a hydroelectric facility on the Carters Re-regulation Dam (FERC 2001, pp. 1–2). A notice of probable termination of license has been issued due to failure to commence construction in a timely manner (FERC 2005a, pp. 1–2). An appeal to the termination order was made (FERC 2005b, p. 1) but denied (FERC 2006a, pp. 1–3). However, the applicant has since applied for a preliminary permit to proceed with the hydroelectric facility (FERC 2006b, pp. 1–3).

Rough hornsnails currently survive in Lower Yellowleaf Creek, at the transitional area between the flowing stream and the embayment created by Lay Dam, and in a small area of the Coosa River below the shoals along the Fall Line near Wetumpka, Alabama. Known from the main channel of the Coosa River and the mouths of some of the larger tributaries, all historical habitats, including those two where the rough hornsnail currently survives, are affected to some degree by impounded waters and hydropower releases.

The Georgia pigtoe historically occurred in the Coosa River and many of its major tributaries. As noted above, the Coosa is impounded throughout most of its length by major hydropower dams. In addition, all historically occupied tributaries are isolated from each other by one or more of these dams and extensive reaches of impounded waters. The species is currently known to survive only in the Upper Conasauga River, far above the influence of the Coosa River impoundments.

Water and Habitat Quality

The disappearance of shoal populations of rough hornsnail, interrupted rocksnail, and Georgia pigtoe from unimpounded relict habitats in the Coosa River drainage is likely due to historical pollution problems. Pleurocerid snails and freshwater mussels are highly sensitive to water and habitat quality (Havlik and Marking 1987, pp 1–15; Neves *et al.* 1997, pp. 64–69). Historical causes of water and habitat degradation in the Coosa River and its tributaries included drainage from gold mining activities, industrial and municipal pollution events, and construction and agricultural runoff (for example, Hurd 1974, pp. 38–40; Lydeard and Mayden 1995, pp. 803–804; Freeman *et al.* 2005, pp. 560–562).

Prior to the passage of the Federal Clean Water Act (33 U.S.C. 1251 *et seq.*, 1972) and the adoption of State water quality regulations and criteria, water pollution was a significant factor in the disappearance of mollusks from unimpounded river and stream channels in the Mobile River Basin (Baldwin 1973, p. 23; Hurd 1974, pp. 38–40, 144–151). Hurd (1974, pp. 147–149), for example, noted the extirpation of freshwater mussel communities from the Conasauga River below Dalton, Georgia, apparently as a result of textile and carpet mill waste discharges. He also attributed the disappearance of the mussel fauna from the Etowah River and other tributaries of the Coosa River to organic pollution and siltation. Baldwin (1973, p. 23) documented the loss of mussel diversity in the Cahaba River and identified the primary causes as pollution from coalfields and industrial and urban wastes.

Although Federal and State water quality laws and regulations have generally reduced the impacts of point source discharges, nonpoint source pollution continues to affect and possibly threaten the remaining populations of each of these mollusk species. Nonpoint source pollution has been identified as a concern in the Yellowleaf Creek and Lower Coosa River watersheds (Alabama Clean Water Partnership (ACWP) 2005 Chapter 12). These drainages encompass historical habitat for the interrupted rocksnail and Georgia pigtoe, currently occupied habitat for the rough hornsnail, and a recent reintroduction of the interrupted rocksnail. Both Yellowleaf Creek and the eastern watershed of the Lower Coosa River have been designated as High Priority Watersheds by the ACWP (2005 Chap. 12), due to the high potential of nonpoint source pollution associated with expanding human population growth rates and urbanization. The headwaters of Yellowleaf Creek are about 5 km (3 mi) southeast of the greater metropolitan area surrounding Birmingham, and the watershed is highly dissected by county roads. The Lower Coosa River is about 16 km (10 mi) north of the Montgomery greater metropolitan area and is accessible by a four-lane highway. Both general areas are experiencing growth due to their proximity to major metropolitan areas.

Nonpoint source pollution and habitat deterioration are also problems in the Upper Coosa River Basin, including the Conasauga and Oostanaula rivers (Georgia Department of Natural Resources (GDNR) 1998, pp. 4.27–4.42). In the reaches of the Conasauga River where the Georgia pigtoe continues to survive, overall molluscan abundance and diversity have experienced a general decline over the past two decades that has been primarily attributed to water or sediment toxicity and channel instability (Johnson and Evans 2000, pp. 171–173; Sharpe and Nichols 2005, pp. 81–88). Sedimentation has been identified as a potential limiting factor for the interrupted rocksnails in the Oostanaula River (Johnson and Evans 2001, p. 26). Following its rediscovery, the interrupted rocksnail population size in the Oostanaula River has declined from a high of 10 to 45 snails per square meter (10.7 sq ft) in 1999 (Johnson and Evans 2001, p. 22) to only 20 snails found during 6 search-hours in 2004 (P. Johnson in litt. 2003, 2004). The cause of decline is suspected to be some form of water contamination (P. Johnson in litt. 2003, 2004; P. Hartfield in litt. 2006).

Nonpoint source pollution from land surface runoff originates from virtually all land use activities and includes sediments; fertilizer, herbicide, and pesticide residues; animal or human wastes; septic tank leakage and gray water discharge; and oils and greases (GDNR 1998, pp. 4.27–4.42; ACWP 2005, Chap. 9). Nonpoint source pollution can cause excess sedimentation, nutrification, decreased dissolved oxygen concentration, increased acidity and conductivity, and other changes in water chemistry that can seriously impact aquatic mollusks. Land use types around the Georgia pigtoe, interrupted rocksnail, and rough hornsnail populations include pastures, row crops, timber, and urban and rural communities.

Excessive sediments are believed to impact riverine mollusks requiring clean, stable streams (Ellis 1936, pp. 39–40; Brim Box and Mossa 1999, p. 99). Impacts resulting from sediments have been noted for many components of aquatic communities. For example, sediments have been shown to abrade or suffocate periphyton (organisms attached to underwater surfaces, upon which snails may feed); affect respiration, growth, reproductive success, and behavior of aquatic insects and mussels; and affect fish growth, survival, and reproduction (Waters 1995, pp. 173–175). Potential sediment sources within a watershed include virtually all activities that disturb the land surface, and all localities currently occupied by these mollusks are affected to varying degrees by sedimentation.

Land surface runoff also contributes nutrients to rivers and streams. Excessive nutrient input (for example, nitrogen and phosphorus from fertilizers, sewage, and animal manure) can result in effects that are detrimental to aquatic species. High levels of nutrients in surface runoff can promote excessive filamentous algal growth. Dense algal growth covers gravel, cobble, or bedrock substrates and interstices (spaces between bottom particles), and can seriously reduce dissolved oxygen in waters during dark hours due to algal respiration (Shepard *et al.* 1994, pp. 61–64), which affects feeding, reproduction, and respiration in adult and juvenile mussels and snails, and limits access to substrate interstices important to juvenile and adult mussels. Algal mats also provide cover for invertebrate predators of juvenile mollusks (such as flatworms, hydra, and chironomids) and increase their vulnerability to such predators. Filamentous algae may also displace certain species of fish, or otherwise affect fish–mussel interactions essential to recruitment (for example, Hartfield and Hartfield 1996, p. 373). In hatcheries, filamentous algal growth reduces juvenile mussel survival by reducing flow, increasing sedimentation, and causing competition with and reduction of the unicellular algal community on which the mussels feed (R. Neves 2002). Nutrient and sediment pollution may have synergistic effects (when the toxic effect of two or more pollutants operating together is greater than the sum of the effects of the pollutants operating individually) on freshwater mollusks, as has been suggested for aquatic insects (Waters 1995, p. 67).

Land surface runoff contributes the majority of human-induced sediments and nutrients to water bodies throughout the United States. The human population is expanding within the areas currently occupied by the Georgia pigtoe, interrupted rocksnail, and rough hornsnail, increasing the sediment and nutrient input to their riverine habitats, and leaving these mollusks vulnerable to progressive water and habitat degradation from land surface runoff.

Accidental spills that may affect water or habitat quality also threaten surviving populations of each species. For example, on September 12, 2006, a train derailment spilled four tank cars of soybeans into a tributary of Yellowleaf Creek (Birmingham News in litt. 2006). A large rain event flushed the decomposing soybeans into Yellowleaf Creek, resulting in a serious decline in dissolved oxygen in the stream, killing fishes, mussels (including two endangered species, southern pigtoe and triangular kidneyshell), and snails (including the endangered cylindrical

lioplax) (Johnson 2006). Fortunately, the location of the largest surviving population of rough hornsnail is in the lowest reaches of Yellowleaf Creek, remote from the spill, and no mortality was observed in this population as a result of the spill (Johnson 2006).

In summary, the historical loss of habitat and range is currently, and projected to continue to be, a significant threat to the rough hornsnail, interrupted rocksnail, and Georgia pigtoe. Curtailment of habitat and range also amplifies threats from nonpoint source water and habitat quality degradation, accidental spills, or violation of permitted discharges. Due to the extremely limited extent of habitat currently occupied by each species, and the severity and magnitude of this threat, we have determined that the present or threatened destruction, modification, or curtailment of habitat and range represents an ongoing and significant threat to the rough hornsnail, interrupted rocksnail, and Georgia pigtoe.

*B. Overutilization for commercial, recreational, scientific, or educational purposes.*

The Georgia pigtoe, interrupted rocksnail, and rough hornsnail are not commercially utilized. Each species has been taken for scientific and private collections in the past, yet collecting is not considered a factor in the decline of these species. While collection is not considered a current threat, the desirability of these species in scientific and commercial collections may increase as their existence and rarity becomes known, and their localized distributions and small population sizes leaves them vulnerable to overzealous recreational or scientific collecting.

*C. Disease or predation.*

Diseases of freshwater mollusks are poorly known and are not currently considered to be a threat to the Georgia pigtoe, interrupted rocksnail, and rough hornsnail, or a factor in their decline. Aquatic snails and mussels are consumed by various vertebrate predators, including fishes, mammals, and possibly birds. Although predation by naturally occurring predators is a normal aspect of the population dynamics of a species and is not known to be a threat to any of these species, changes in water flows, depths, temperatures, and other environmental factors within some portions of their ranges may have led to increased numbers of native mollusk-eating fish, such as freshwater drum (Johnson in litt. 2005b). In addition, the potential now exists for the black carp (*Mylopharyngodon piceus*), a mollusk-eating Asian fish recently introduced into the waters of the United States (U.S. Fish and Wildlife Service 2002), to eventually enter and disperse through the Mobile River Basin via the Tennessee–Tombigbee Waterway, or by their accidental release from catfish farms or other aquaculture facilities.

In summary, disease in freshwater mollusks is poorly known and not currently considered a threat. Although there is no direct evidence at this time that predation is detrimentally affecting the Georgia pigtoe, interrupted rocksnail, or rough hornsnail, their small populations and limited ranges leaves them vulnerable to threats of predation from natural or introduced predators. Therefore, we have concluded that predation currently represents a threat of low magnitude, but it could potentially become a significant future threat to the Georgia pigtoe, interrupted rocksnail, or rough hornsnail due to their small population sizes.

*D. The inadequacy of existing regulatory mechanisms.*

The Alabama Department of Conservation and Natural Resources currently recognizes the rough hornsnail as a ''Priority 1'' species (Highest Conservation Concern) (Mirarchi *et al.* 2004, p. 117; ADCNR 2005, p. 302). The interrupted rocksnail is considered ''Extirpated (in Alabama) – Conservation Action Underway'' (Mirarchi *et al.* 2004, p. 114), and the Georgia pigtoe is listed as ''extinct'' (Mirarchi *et al.* 2004, p. 13). While these classifications identify the status of imperiled species in the State of Alabama, they convey no legal protection. Interrupted rocksnail and Georgia pigtoe currently lack any official status recognition by the State of Georgia, but they have been nominated for inclusion on the State Protected Species List. The Georgia pigtoe is identified as a species of the Greatest Conservation Need by the State of Tennessee. NatureServe (2006) identifies the Georgia pigtoe, interrupted rocksnail, and rough hornsnail as G1 critically imperiled species; however, no State or Federal protection is conveyed by these classifications. Without State or Federal protection, these three species are not currently given any specific special consideration under environmental laws when project impacts are reviewed, other than those provided for water quality.

The mollusk fauna (including the Georgia pigtoe) of the Conasauga River and the interrupted rocksnail in the Oostanaula River have experienced significant declines in recent years, apparently due to water quality or sediment toxicity (Evans 2001, p. 3; Johnson in litt. 2004; Sharpe and Nichols 2005, pp. 1–4; Konwick *et al.* 2008, pp. 2016–2017). There is no specific scientific information on the sensitivity of the Georgia pigtoe, interrupted rocksnail, and rough hornsnail or their host fish species to common industrial and municipal pollutants, and little information on other freshwater mollusks. Current State and Federal regulations regarding pollutants are assumed to be protective of freshwater mollusks; however, these species may be more susceptible to some pollutants than test organisms commonly used in bioassays. For example, several recent studies have suggested that U.S. Environmental Protection Agency's (EPA) criteria for ammonia may not be protective of freshwater mussels (Augspurger *et al.* 2003, p. 2571; Augspurger *et al.* 2007, p. 2026; Newton *et al.* 2003, pp. 2559–2560; Newton and Bartsch 2007, p 2057; Ward *et al.* 2007, p. 2075).

In a review of the effects of eutrophication on mussels, Patzner and Muller (2001, p. 329) noted that stenoecious (narrowly tolerant) species disappear as waters become more eutrophic. They also refer to studies that associate increased levels of nitrate with the decline and absence of juvenile mussels (Patzner and Muller 2001, pp. 330–333). Other studies have also suggested that early life stages of mussels are more sensitive to metals and such inorganic chemicals as chlorine and ammonia than are common bioassay test organisms (Keller and Zam 1991, pp. 543–545; Goudreau *et al.* 1993, p. 221; Naimo 1995, pp. 354–355). Therefore, it appears that inadequate research and data prevent existing regulations, such as the Clean Water Act (administered by the EPA and the U.S. Army Corps of Engineers), from being fully utilized or effective in the management and protection of these species.

Rough hornsnails currently survive at localized sites in Yellowleaf Creek and in the Lower Coosa River below Wetumpka Shoals in Alabama. In addition, the interrupted rocksnail was recently reintroduced into Wetumpka Shoals. The Alabama Department of Environmental Management (ADEM) has designated the water use classification for some portions of Yellowleaf Creek as ''Swimming'' (S) and others as ''Fish and Wildlife'' (F&W). The F&W designation establishes minimum water quality standards that are believed to protect

existing species and water uses (for example, fishing, recreation, irrigation) within the designated area, while the S classification establishes higher water quality standards that are protective of human contact with the water. The Lower Coosa River below Wetumpka is currently designated as F&W by ADEM, and adjacent tributaries are classified as S. Both water bodies are currently believed to support their designated uses. However, Yellowleaf Creek and the eastern watershed of the Lower Coosa have been designated as High Priority Watersheds by the ACWP (2005, Chap. 12) due to a lack of monitoring data and the high potential of nonpoint source pollution in these drainages associated with expanding human population growth rates and urbanization.

The reach of the Conasauga River at and below the Tennessee–Georgia State Line supports the only known surviving population of the Georgia pigtoe. This river reach is identified on Georgia's 303(d) list as partially supporting its designated use of Fishing–Drinking Water (GDNR 2006, p. 35). The Georgia 303(d) list identifies high levels of fecal coliform bacteria and Fish Consumption Guidance (FCG) due to polychlorinated biphenyls (PCBs) as the reasons for this river reach's inclusion on the list, and nonpoint pollution is identified as the source of pollutants (GDNR 2006, p. 35). Recent studies have also implicated sediment and water toxicity in the decline of mollusks in the Conasauga River (Sharpe and Nichols 2005, pp. 81–88; Konwick *et al.* 2008, pp. 2016–2017).

States maintain water-use classifications through issuance of National Pollutant Discharge Elimination System (NPDES) permits to industries, municipalities, and others that set maximum limits on certain pollutants or pollutant parameters. For water bodies on the 303(d) list, States are required under the Clean Water Act to establish a total maximum daily load (TMDL) for the pollutants of concern that will bring water quality into the applicable standard. The Georgia Department of Natural Resources has identified TMDLs for the Oostanaula River to address existing problems of PCBs and fecal coliform loads from nonpoint source and urban runoff sources.

In summary, recent declines in mollusk communities within the ranges of each of these species has been attributed to poor water or sediment quality. Although regulatory mechanisms are in place to protect aquatic species, a lack of specific information on the sensitivity of the Georgia pigtoe, interrupted rocksnail, and rough hornsnail and their host fish to common industrial and municipal pollutants limits their application. Water and sediment quality is believed to currently affect (and is expected to continue to affect) the Georgia pigtoe and interrupted rocksnail and has been identified as a concern for the rough hornsnail in Yellowleaf Creek. Therefore, we have determined that the threat of inadequate existing regulatory mechanisms is an imminent threat of high magnitude to the Georgia pigtoe, interrupted rocksnail, and rough hornsnail.

*E. Other natural or manmade factors affecting its continued existence.*

As noted under Factor A, above, the Georgia pigtoe, interrupted rocksnail, and rough hornsnail have been eliminated from 90 percent or more of their historical ranges. Surviving populations of each species are small, extremely localized, isolated, and vulnerable to habitat modification, toxic spills, and progressive degradation from land surface runoff (non-point source runoff) (see Factor A: Dams and Impoundments, Water and Habitat Quality; and Factor D: The inadequacy of existing regulatory mechanisms). These conditions also leave each species vulnerable to catastrophic changes to their habitats that may result from natural events such as flood scour and drought.

There is a growing concern that climate change may lead to increased frequency of severe storms and droughts (for example, Golladay *et al.* 2004, p. 504; McLaughlin *et al.* 2002, p. 6074; Cook *et al.* 2004, p. 1015). During 2007–2008, a severe drought affected the Coosa River watershed in Alabama and Georgia. Streamflow for the Conasauga River at Tilton, Georgia, during September 2007, was the lowest recorded for any month in 69 years (U.S. Geological Survey 2007). Although the effects of the drought on the Georgia pigtoe, interrupted rocksnail, and rough hornsnail have not been quantified, mollusk declines as a direct result of drought have been documented (for example, Golladay *et al.* 2004, p. 494; Haag and Warren 2008, p. 1165). Reduction in local water supplies due to drought is also compounded by increased human demand and competition for surface and ground water resources for power production, irrigation, and consumption (Golladay *et al.* 2004, p. 504).

Freshwater mussels and snails are capable of moving only short distances. As noted previously (see discussion under Factor A: Dams and Impoundments), there are numerous obstacles in the Coosa River drainage to long distance movement of snails, mussels, or the fish hosts of mussels, between relict patches of historically occupied and potentially suitable riverine habitats. Therefore, even if habitat conditions improve for the survival of the Georgia pigtoe, interrupted rocksnail, and rough hornsnail in historically occupied stream and river habitats, they will be unable to recolonize those areas without human assistance. Low numbers of individuals within these isolated populations also increases the risks and consequences of inbreeding and reduced genetic diversity (Lynch 1996, pp. 493–494).

The Georgia pigtoe may be adversely affected by the loss or reduction in numbers of the fish host(s) essential to its parasitic glochidial stages. The specific fish host(s) for the glochidia of the Georgia pigtoe is unknown; therefore, specific impacts on this aspect of the mussels' life cycle cannot be evaluated. However, other species of mussels in the genus *Pleurobema* are known to parasitize various species of chubs, minnows, stonerollers, and other stream fish species.

In summary, a variety of natural or manmade factors, such as droughts, storms, and toxic spills, threaten surviving populations of the Georgia pigtoe, interrupted rocksnail, and rough hornsnail due to the highly restricted and fragmented nature of their habitats and their small population sizes. Other factors, such as inbreeding, reduced genetic diversity, and loss or reduction of fish hosts for the Georgia pigtoe, may threaten each of the three species; however, the severity and magnitude of these threats are not currently known. Therefore, we have determined that other natural and manmade factors, such as accidental spills, floods, and droughts, currently pose an imminent and high degree of threat to the Georgia pigtoe, interrupted rocksnail, and rough hornsnail, and the levels of these threats are projected to continue or increase in the future.

**Proposed Determination**

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the Georgia pigtoe, interrupted rocksnail, and rough hornsnail. Section 3(6) of the Act defines an endangered species as ''any species which is in danger of extinction throughout all or a significant portion of its range.'' Based on the severity and magnitude of the threats currently affecting each of these species, we

propose to list them as endangered species under the Act.

The most significant historical factor affecting the current status of the interrupted rocksnail, rough hornsnail, and Georgia pigtoe was the extreme curtailment of their habitat and range, as discussed in Factor A (above). Curtailment of habitat and range, along with small population sizes, amplifies existing or impending threats from nonpoint source water and habitat quality degradation, accidental spills, violation of permitted discharges, inadequate knowledge to implement existing regulatory measures, floods, or droughts (described under Factors A, D, and E). These threats are imminent and high in magnitude (applicable to the entire range) for each species. As described in Factor C and E above, small populations are also at increased threat due to predation from natural or introduced predators, genetic isolation, and inbreeding depression; however, these threats are not currently known to be imminent.

Only single, localized populations are known to exist of the interrupted rocksnail and Georgia pigtoe, and only two extremely localized populations of the rough hornsnail are known. Each species is faced with a tenuous future even with only the random variation of natural environmental factors. However, the additional threats of water and habitat quality degradation or destruction further threaten each species and this trend is expected to continue or increase.

We believe that, when combining the effects of historical, current, and projected habitat loss and degradation, historical and ongoing drought, and the exacerbating effects of small population sizes and isolation, the interrupted rocksnail, rough hornsnail, and Georgia pigtoe are in danger of extinction throughout all of their ranges, as defined in the ''Summary of Factors Affecting the Species'' above. We believe these threats, particularly the threats resulting from habitat loss and fragmentation, small population sizes, and random natural or human induced events, are current and are projected to continue. We have determined that these threats are operating on each species and their respective habitats with a high degree of imminence, magnitude, and severity (rangewide), as discussed above.

Based on the best available scientific and commercial information, we propose to list the Georgia pigtoe, interrupted rocksnail, and rough hornsnail as endangered species under the Act. Without the protection of the Act, these species are in danger of extinction throughout all of their ranges. This could occur within a few years, given recurring drought conditions, accidents, or other existing threats. Furthermore, because of their curtailed ranges, and immediate and ongoing significant threats to each species throughout their entire respective ranges, as described above in the five-factor analysis, we find that it is unnecessary to analyze whether there are any significant portions of ranges for each species that may warrant a different determination of status.

Critical Habitat

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

(1) The specific areas within the geographical area occupied by a 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 a 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 any endangered species or threatened species to the point at which measures provided under the Act are no longer necessary.

Critical habitat receives protection under section 7 of the Act through the prohibition against Federal agencies carrying out, funding, or authorizing the destruction or adverse modification of critical habitat. Section 7(a)(2) of the Act requires consultation on Federal actions that may affect 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 private 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) may apply. However, even in the event of a destruction or adverse modification finding, the Federal action agency's and the applicant's obligation is not to restore or recover the species, but to implement reasonable and prudent alternatives to avoid destruction or adverse modification of critical habitat.

To be included in a critical habitat designation, the habitat within the area occupied by the species must first have features that are essential to the conservation of the species. The Service must identify, to the extent known using the best scientific data available, habitat areas that provide essential life cycle needs of the species (areas on which are found the Primary Constituent Elements (PCEs), as defined at 50 CFR 424.12(b)). To be included in the designation, the features at issue must also be ones that may require special management considerations or protection.

Under the Act, we can designate unoccupied areas as critical habitat only when we determine that the best available scientific data demonstrate that the designation of that area is essential to the conservation needs of the species.

Section 4 of the Act requires that we designate critical habitat on the basis of the best scientific and commercial data available. Furthermore, 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 represent 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.

When we are determining which areas we should as critical habitat, our primary source of information is generally the information developed during the listing process for the species. Additional information sources may include the recovery plan for the species, articles in peer-reviewed journals, conservation plans developed by States and counties, scientific status surveys and studies, biological assessments, or other unpublished materials and expert opinion or personal knowledge.

Habitat is often dynamic, and species may move from one area to another over time. Furthermore, we recognize that designation of critical habitat may not include all of the habitat areas that we may eventually determine, based on scientific data not now available to the

Service, are necessary for the recovery of the species. For these reasons, a critical habitat designations does not signal that habitat outside the designated area is unimportant or may not be required for recovery of the species.

Areas that support populations, but are outside the critical habitat designation, will continue to be subject to conservation actions we implement under section 7(a)(1) of the Act. They are also subject to the regulatory protections afforded by the section 7(a)(2) jeopardy standard, as determined on the basis of the best available scientific information at the time of the agency action. Federally funded or permitted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans (HCPs), or other species conservation planning efforts if new information available to these planning efforts calls for a different outcome.

Prudency Determination

Section 4 of the Act, as amended, and implementing regulations (50 CFR 424.12) require that, to the maximum extent prudent and determinable, we designate critical habitat at the time the species is determined to be endangered or threatened. Our regulations at 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 activity and the identification of critical habitat can be expected to increase the degree of threat to the species; or (2) the 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 each of these species, and identification of critical habitat is not expected to initiate such a threat to each of the species. Critical habitat designation identifies the physical and biological features of the habitat essential to the conservation of the interrupted rocksnail, rough hornsnail, and Georgia pigtoe, which may require special management and protection. As such, these designations will provide information to individuals, local and State governments, and other entities engaged in activities or long-range planning in areas essential to the conservation of the species. Conservation of the interrupted rocksnail, rough hornsnail, and Georgia pigtoe and essential features of their habitats will require habitat management, protection and restoration, which will be facilitated by knowledge of habitat locations and the physical and biological features of those habitats. Based on this information, we believe critical habitat would be beneficial to each of the species. Therefore, we have determined that the designation of critical habitat for the interrupted rocksnail, rough hornsnail, and Georgia pigtoe is prudent.

We have reviewed the available information pertaining to historical distribution of the Georgia pigtoe, interrupted rocksnail, and rough hornsnail, and the habitat characteristics where they currently survive. This and other information represent the best scientific and commercial data available and lead us to conclude that we have sufficient information necessary to identify specific areas that meet the definition of critical habitat. Therefore, we have determined that the designation of critical habitat is both prudent and determinable for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail.

Methods

As required by section 4(b)(2) of the Act, we use the best scientific data available in determining occupied areas that contain the features that are essential to the conservation of the Georgia pigtoe, interrupted rocksnail, and rough hornsnail, and unoccupied areas that are essential to the conservation of the Georgia pigtoe, interrupted rocksnail, and rough hornsnail.

We have reviewed the available information pertaining to historical and current distributions, life histories, and habitat requirements of these species. Our sources included: peer reviewed scientific publications; unpublished survey reports; unpublished field observations by the Service, State, and other experienced biologists; and notes and communications from qualified biologists or experts.

Primary Constituent Elements (PCEs)

In accordance with sections 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12, in determining which areas within the geographical area occupied at the time of listing to propose as critical habitat, we identify the specific PCEs required for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail based on their biological needs. We consider the physical and biological features that are essential to the conservation of each species to be the PCEs laid out in the appropriate quantity and spatial arrangement for the conservation of the Georgia pigtoe, interrupted rocksnail, and rough hornsnail. These include, but are not limited to:

(1) Space for individual and population growth and for normal behavior;

(2) Food, water, air, light, minerals, or other nutritional or physiological requirements;

(3) Cover or shelter;

(4) Sites for breeding, reproduction, and rearing (or development) of offspring; and

(5) Habitats that are protected from disturbance or are representative of the historical, geographical, and ecological distribution of a species.

The PCEs required for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail are derived from biological needs of the species as described in the Background section of this proposal. Unfortunately, little is known of the specific habitat requirements of any of these mollusk species other than all three require flowing water, stable stream or river channels, and adequate water quality. Georgia pigtoe mussel larvae also require a currently unknown fish host for development to juvenile mussels. To identify the physical and biological needs of the species, we have relied on current conditions at locations where each of the species survive, the limited information available on these three species and their close relatives, and factors associated with the decline and extirpation of these and other aquatic mollusks from extensive portions of the Mobile River Basin.

Space for Individual and Population Growth and for Normal Behavior

The Georgia pigtoe, interrupted rocksnail, and rough hornsnail were all historically associated with stream and river shoals of the Coosa River drainage (Goodrich 1922, p. 5; Johnson and Evans 2001, p. 21; Williams *et al.* 2008). The decline of the aquatic mollusk fauna of the Mobile River Basin is directly associated with the loss of shoal habitats, primarily due to inundation by impounded waters (Bogan *et al.* 1995, pp. 250–251; Lydeard and Mayden 1995, pp. 803–804; Neves *et al.* 1997, pp. 63–64; Marcinek *et al.* 2005, pp. 7–10, 20–21). Shoals are defined as discrete areas that are of lower depth, greater slope, higher velocity flows, and coarser bed materials relative to other channel segments. Shoals include areas that are also referred to as riffles, gravel bars, and reefs. Shoals generally have substrates composed of bedrock, cobble, boulder, and gravel interspersed with

sands, and sufficient current velocities to remove finer sediments and maintain interstitial habitats (Marcinek *et al.* 2005, p. 4). The interrupted rocksnail and rough hornsnail are found clinging to gravel, cobble, and boulders in moderate to strong currents in shoals, while Georgia pigtoe mussels are found imbedded in sand–gravel substrates within shoals. Rough hornsnails are also found in pools below shoals. Shoals and associated pools not only provide space for these three mollusks, but also provide cover and shelter and sites for breeding, reproduction, and growth of offspring.

Shoal–pool habitats are formed and maintained by water quantity, channel slope, and sediment input to the system. Changes in one or more of these parameters can result in channel degradation or channel aggradation, with serious effects to mollusks. Therefore, we believe that stream channel stability is essential to the conservation of the Georgia pigtoe, interrupted rocksnail, and rough hornsnail.

Food

The interrupted rocksnail and rough hornsnail generally feed by ingesting periphyton and biofilm detritus scraped off the substrate by the snail's radula (Morales and Ward 2000, p. 1). Unionid mussels, such as the Georgia pigtoe, filter algae, detritus, and bacteria from the water column (Williams *et al.* 2008, p. 67). Food availability and quality for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail in shoal habitats is affected by habitat stability, flow, and water quality.

Water

The Georgia pigtoe, interrupted rocksnail, and rough hornsnail are riverine-adapted species that depend upon adequate water flow (Williams *et al.* 2008, p. 534; Goodrich 1922, p. 5) and are not found in ponds or lakes. Continuously flowing water is a habitat feature associated with all surviving populations of the three species. Flowing water maintains the stream bottom and shoal habitats where these species are found, transports food items to the sedentary juvenile and adult life stages of the Georgia pigtoe, supports the periphyton and biofilm ingested by the interrupted rocksnail and rough hornsnail, removes wastes, and provides oxygen for respiration for each of the three species.

The ranges of standard physical and chemical water quality parameters (such as temperature, dissolved oxygen, pH, conductivity) that define suitable habitat conditions for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail have not been investigated. However, as relatively sedentary animals, aquatic snails and mussels must tolerate the full range of such parameters that occur naturally within the streams where they persist. Both the amount (flow) and the physical and chemical conditions (water quality) where each of the three species currently exist vary widely according to season, precipitation events, and seasonal human activities within the watershed. Conditions across their historical ranges vary even more due to watershed size, geology, geography, and differences in human population densities and land uses. In general, each of the species survives in areas where the magnitude, frequency, duration, and seasonality of water flow are adequate to maintain stable shoal habitats (for example, sufficient flow to remove fine particles and sediments without causing degradation), and where water quality is adequate for year-round survival (for example, moderate to high levels of dissolved oxygen, low to moderate input of nutrients, and relatively unpolluted water and sediments). Therefore, adequate water flow and water quality (as defined below) are essential to the conservation of the Georgia pigtoe, interrupted rocksnail, and rough hornsnail. We currently believe that most numeric standards for pollutants and water quality parameters (for example, dissolved oxygen, pH, heavy metals) that have been adopted by the States under the Clean Water Act represent levels that are essential to the conservation of each of these three mollusks. However, some States' standards may not adequately protect mollusks, or are not being appropriately measured, monitored, or achieved in some reaches (see Factor A: The present or threatened destruction, modification, or curtailment of its habitat or range, Water and Habitat Quality; and Factor D: Inadequacy of existing regulatory mechanisms, above). The Service is currently in consultation with the EPA to evaluate the protectiveness of criteria approved in EPA's water quality standards for threatened and endangered species and their critical habitats as described in the Memorandum of Agreement that our agencies signed in 2001 (66 FR 11201). Other factors that can potentially alter water quality are droughts and periods of low flow, non-point source runoff from adjacent land surfaces (for example, excessive amounts of nutrients, pesticides, and sediment), and random spills or unregulated discharge events. This could be particularly harmful during drought conditions when flows are depressed and pollutants are more concentrated. Therefore, adequate water quality is essential for normal behavior, growth, and viability during all life stages of the Georgia pigtoe, interrupted rocksnail, and rough hornsnail.

Sites for Breeding, Reproduction, or Rearing

Pleurocerid snails require clean hard surfaces, such as gravel, cobble, boulder, or bedrock, for laying eggs and for survival of juveniles (Bogan *et al.* 1995, p. 251). Excessive fine sediments or dense growth of filamentous algae can restrict or eliminate spawning sites and expose juveniles to entrainment (being swept away) or predation. Geomorphic instability may result in entrainment and loss of eggs by scouring currents or burial of eggs by excessive deposition. Therefore, stable shoals with low amounts of filamentous algae are essential to the conservation of the interrupted rocksnail and rough hornsnail.

Freshwater mussels require a host fish for transformation of larval mussels (glochidia) to juvenile mussels (Williams *et al.* 2008, p. 68), and presence of the appropriate host fish is essential to the conservation of the Georgia pigtoe. The specific fish host(s) for the Georgia pigtoe is currently unknown, However, other species of mussels in the genus *Pleurobema* are known to parasitize various species of chubs, minnows, stonerollers, and other stream adapted fish species (Haag and Warren 2003).

Juvenile Georgia pigtoe mussels require interstitial shoal habitats for growth and survival. Excessive sediments or dense growth of filamentous algae can expose juvenile mussels to entrainment or predation and be detrimental to the survival of juvenile mussels (Hartfield and Hartfield 1996). Geomorphic instability can result in the loss of interstitial habitats and juvenile mussels due to scouring or deposition (Hartfield 1993). Therefore, stable shoals with low to moderate amounts of filamentous algae growth are essential to the conservation of the Georgia pigtoe.

PCEs for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail

Based on the above needs and our current knowledge of the life history, biology, and ecology of the species, we have determined that the Georgia pigtoe's PCEs are:

(1) Geomorphically stable stream and river channels and banks (channels that maintain lateral dimensions,

longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation).

(2) A hydrologic flow regime (the magnitude, frequency, duration, and seasonality of discharge over time) necessary to maintain benthic habitats where the species are found. Unless other information becomes available, existing conditions at locations where the species occur will be considered as minimal flow requirements for survival.

(3) Water quality (including temperature, pH, hardness, turbidity, oxygen content, and chemical constituents) that meets or exceeds the current aquatic life criteria established under the Clean Water Act (33 U.S.C. 1251–1387).

(4) Sand, gravel, cobble, boulder, or bedrock substrates with low to moderate amounts of fine sediment and attached filamentous algae.

(5) The presence of fish host(s) for the Georgia pigtoe (currently unknown). Diverse assemblages of native chubs, minnows, stonerollers, and other stream adapted fish species will serve as a potential indication of presence of host fish.

The PCEs required for the interrupted rocksnail are:

(1) Geomorphically stable stream and river channels and banks (channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation).

(2) A hydrologic flow regime (the magnitude, frequency, duration, and seasonality of discharge over time) necessary to maintain benthic habitats where the species are found. Unless other information becomes available, existing conditions at locations where the species occur will be considered as minimal flow requirements for survival.

(3)Water quality (including temperature, pH, hardness, turbidity, oxygen content, and chemical constituents) that meets or exceeds the current aquatic life criteria established under the Clean Water Act (33 U.S.C. 1251–1387).

(4) Sand, gravel, cobble, boulder, or bedrock substrates with low to moderate amounts of fine sediment and attached filamentous algae.

The PCEs required for the rough hornsnail are:

(1) Geomorphically stable stream and river channels and banks (channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation).

(2) A hydrologic flow regime (the magnitude, frequency, duration, and seasonality of discharge over time) necessary to maintain benthic habitats where the species are found. Unless other information becomes available, existing conditions at locations where the species occur will be considered as minimal flow requirements for survival.

(3) Water quality (including temperature, pH, hardness, turbidity, oxygen content, and chemical constituents) that meets or exceeds the current aquatic life criteria established under the Clean Water Act (33 U.S.C. 1251–1387).

(4) Sand, gravel, cobble, boulder, or bedrock substrates with low to moderate amounts of fine sediment and attached filamentous algae.

This proposed designation is designed for the conservation of the physical and biological features essential to the life history functions that were the basis for the proposal and the areas containing those features (that is, the PCEs in the appropriate spatial arrangement and quantity). Because not all life history functions require all the PCEs, not all PCEs may be present throughout the proposed critical habitat units.

Units are designated based on sufficient PCEs being present to support at least one of the species' life history functions. Some areas contain all PCEs and support multiple life processes, while some areas may contain only a portion of the PCEs necessary to support the species' particular use of that habitat.

Special Management Considerations or Protections

When designating critical habitat, we assess whether the areas within the geographical area occupied by the species at the time of listing contain features that are essential to the conservation of the species and whether those features may require special management considerations or protections. All of the critical habitat units proposed for these three species below, with the exception of a portion of Unit RH 1, have been designated as critical habitat for other mollusk species that are already listed under the Act. None of the areas proposed are presently under special management or protection provided by a legally operative management plan or agreement for the conservation of either the interrupted rocksnail, rough hornsnail, or Georgia pigtoe. Various activities in or adjacent to each of the critical habitat units described in this proposed rule may affect one or more of the PCEs. Some of these activities include, but are not limited to, those discussed in the ''Summary of Factors Affecting the Species,'' above. For example, three of the units described below (Units IR 1, IR 2, and RH 1 (which includes IR 3)) may require special management considerations due to detrimental effects of hydropower generation or lack of minimum flow releases from dams (see ''Factor A: Dams and Impoundments'' above). Features in all of the proposed critical habitat units may require special management due to threats posed by land-use runoff and point- and nonpoint-source water pollution (see ''Factor A: ''Water and Habitat Quality,'' and ''Factor D: Inadequacy of existing regulatory mechanisms,'' above). Other activities that may affect PCEs in the proposed critical habitat units include those listed in the ''Effects of Critical Habitat'' section as ''Federal Activities that May Affect Critical Habitat and Require Consultation,'' below.

Criteria Used to Identify Proposed Critical Habitat

We are proposing to designate as critical habitat all stream channels that are currently occupied by the species, as well as some specific areas not currently occupied but that were historically occupied, because we have determined that these additional areas are essential for the conservation of the Georgia pigtoe, interrupted rocksnail, and rough hornsnail, and that designating only occupied habitat is not sufficient to conserve each of these species.

When identifying proposed critical habitat boundaries, we make every effort to avoid including developed areas such as lands covered by buildings, pavement, and other structures because such lands usually lack PCEs for endangered or threatened species. Areas proposed for critical habitat for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail, below, include only stream channels within the ordinary high water line and do not contain any developed areas or structures.

Occupied Stream Reaches Proposed as Critical Habitat

We have defined occupied habitat as those stream reaches known to be currently occupied by the Georgia pigtoe, interrupted rocksnail, or rough hornsnail. We used information from surveys and reports prepared by the U.S. Geological Survey, the Alabama Department of Conservation and Natural Resources, the Tennessee Aquarium, Alabama Geological Survey, Auburn University, University of Alabama, and Service field records to identify the specific locations occupied by the Georgia pigtoe, interrupted rocksnail, or rough hornsnail.

Currently, occupied habitat for each of the three species is extremely limited and isolated. The Georgia pigtoe persists only in a restricted series of shoals in the Conasauga River (Johnson and Evans 2000, p. 106). The interrupted rocksnail naturally survives in a short reach of the Oostanaula River in Gordon and Floyd Counties, Georgia, and population reintroductions have been attempted into a shoal of the Lower Coosa River, Elmore County, Alabama (ADCNR 2004, p. 33). The rough hornsnail is known from two small, localized, and isolated populations: Yellowleaf Creek, Shelby County, Alabama, and a short reach of the Lower Coosa River, Elmore County, Alabama (Sides 2005, p. 40). We believe that all currently occupied areas contain features essential to the conservation of these species. With such limited distribution, each of these species are at a high risk of extinction and highly susceptible to stochastic events.

Unoccupied Stream Reaches Proposed as Critical Habitat

The streams not currently occupied that we are proposing as critical habitat were all historically occupied. We believe that the designation of additional areas not known to be currently occupied by the Georgia pigtoe, interrupted rocksnail, or rough hornsnail is essential for their conservation because:

(1) The range of each species has been severely curtailed, occupied habitats are limited and isolated, and population sizes are extremely small for each species. While occupied units provide habitat for current populations, they are at high risk of extirpation and extinction from stochastic events, whether periodic natural events or existing or potential human-induced events (see ''Summary of Factors Affecting the Species''). The inclusion of essential unoccupied areas will provide habitat for population reintroduction and will decrease the risk of extinction for each species.

(2) The essential unoccupied areas may offer habitat that is superior to that in the occupied units (the potential viability of the mollusks in unoccupied units may be higher) because the essential unoccupied areas may be faced with fewer and more easily treated threats than the occupied units (see discussion under ''Factor A: Dams and Impoundments'').

(3) The protection of PCEs in currently occupied areas is directly related to conditions in adjacent unoccupied stream reaches (such as the Oostanaula and Lower Coosa Rivers).

Based on the best scientific data available, we believe that areas that are not currently occupied by the Georgia pigtoe, interrupted rocksnail, or rough hornsnail are essential for their conservation.

*Length of Occupied Stream Reaches*

Following the identification of occupied stream reaches, the next step was to delineate the length of upstream and downstream reaches of known occupied areas to determine the length of stream reaches that are needed for the conservation of the populations for each species. All known occurrences for each species are extremely localized, and rare aquatic snails and mussels can be difficult to locate. In addition, creek and river habitats are highly dependent upon upstream and downstream channel habitat conditions for their maintenance. Therefore, where more than one occurrence record of a particular species was found within a stream reach, we considered the entire reach between the uppermost and lowermost locations as occupied habitat, as discussed below.

Georgia pigtoe

The Georgia pigtoe is currently known to survive only in a 52-km (32-mi) reach of the Upper Conasauga River extending from Polk County, Tennessee, downstream into Murray and Whitfield Counties, Georgia (Johnson and Evans 2000, p. 106; Evans 2001, pp. 33–34). The Georgia pigtoe has been recently collected from three shoals within this reach: one located at each end of the reach, and one additional site in the lower third of the reach. Other shoals within the reach continue to be inhabited by a diverse mussel community, including the federally endangered triangular kidneyshell and southern pigtoe and the threatened fine-lined pocketbook. These species historically co-occurred in the same shoal habitats with the Georgia pigtoe, and their persistence indicates the presence of PCEs for the pigtoe throughout the reach. Therefore, we consider the entire 52-km (32-mi) reach between the uppermost and lowermost recent collection sites for the Georgia pigtoe as occupied habitat. In the area proposed for critical habitat below, boundaries extend from the nearest downstream landmark at both of ends of the reach.

Interrupted rocksnail

The interrupted rocksnail is known to survive in several shoals along a 12-km (7.4-mi) reach of the Oostanaula River between Ship Island and the confluence of Armuchee Creek, Gordon–Floyd County, Georgia (Johnson and Evans 2000, pp. 45–46; Johnson and Evans 2001, pp. 2, 25). Although rocksnails live attached to the stream bottom, they are small and often difficult to locate when their population numbers are low. Therefore, we consider the reach of the Oostanaula River between Ship Island and the confluence of Armuchee Creek as habitat occupied by interrupted rocksnail. Attempts to reintroduce the species into the Lower Coosa River, Elmore County, Alabama, have also been made by the ADCNR. Although we do not yet know if this population is viable, it is within the range of the interrupted rocksnail as proposed in this listing; therefore, we are considering the 1-km (0.6-mi) localized area in the Lower Coosa River, where the species was reintroduced, as occupied habitat. ADCNR attempted to reintroduce the interrupted rocksnail into Gray Island Shoals in the Lower Coosa River, about 3.2 km (2 mi) below Jordan Dam, Elmore County, Alabama. Although we do not yet know if this reintroduced population is viable, it is within the historical range of the interrupted rocksnail as proposed in this listing, and we are considering the 1-km (0.6-mi) reach encompassing Gray Island Shoals in the Lower Coosa River as occupied habitat.

Rough hornsnail

The rough hornsnail is known to survive at only two locations. One of these consists of a population known from only a few hundred meters of stream in Yellowleaf Creek near Alabama Highway 25, Shelby County, Alabama, and we consider Yellowleaf Creek 1.6 km (1.0 mi) above and 1.6 km (1.0 mi) below Alabama Highway 25 as habitat occupied by the rough hornsnail. In addition, collections in the 1990s in the Lower Coosa River, Elmore County, Alabama, show the rough hornsnail extended from the shoals below Jordan Dam, downstream to just below the Fall Line at Wetumpka, Alabama (FLMNH 2006). Therefore, we consider this 14-km (8-mi) reach as habitat occupied by the rough hornsnail.

*Stream Reaches Not Currently Occupied*

In identifying unoccupied stream reaches that are essential to the conservation of each species (Georgia pigtoe, interrupted rocksnail, and rough hornsnail), we first considered the availability of potential habitat throughout their historical ranges that may be suitable for the survival and persistence of each species. A large proportion of the streams that formerly supported each species have been modified by dams and their impounded waters, and we eliminated these areas from consideration, because none of these species can survive under the

modified conditions (see ''Primary Constituent Elements'' section, above). We also eliminated from consideration free-flowing streams without any historical records of occurrence. We eliminated from consideration other streams with historical occurrence records because of limited habitat availability, isolation, degraded habitat, or low management value or potential (such as Coosawattee River and Etowah River).

All of the areas proposed as critical habitat that are currently not known to be occupied meet one or more of the following criteria:

(1 The stream habitat contains sufficient PCEs (for example, such characteristics as geomorphically stable channels, perennial water flows, adequate water quality, and appropriate benthic substrates) to support life history functions of the mollusks (all proposed unoccupied critical habitat units);

(2) The stream supports diverse aquatic molluscan communities, including the presence of closely related species requiring PCEs similar to the Georgia pigtoe, interrupted rocksnail, and rough hornsnail (all proposed unoccupied critical habitat units);

(3) The stream reaches are adjacent to currently occupied areas where there is potential for natural dispersal and reoccupation by the Georgia pigtoe, interrupted rocksnail, or rough hornsnail (Oostanaula River, Lower Coosa River, and Yellowleaf Creek);

(4) The stream reaches lack major anthropogenic disturbance (Hatchet Creek);

(5) Areas are remote from currently occupied areas and have experienced improvements in water quality or quantity during the past decades due to implementation of minimum flows below dams, changes in adjacent land uses, or implementation of the Clean Water Act (Coosa River below Weiss Dam and Jordan Dam, Terrapin Creek, and Hatchet Creek); and

(6) The stream reaches have potential for reoccupation by the species through future reintroduction efforts (all proposed unoccupied critical habitat units).

Based on the above factors, all unoccupied stream reaches included in the proposed designations for each of these three species are essential to their conservation.

Georgia pigtoe

We have identified 101 km (63 mi) of habitat in two stream reaches that are currently unoccupied by the Georgia pigtoe and that meet several of the criteria for designation as critical habitat. Historical records of Georgia pigtoe occur from the Coosa River near the present location of Weiss Dam and from Terrapin Creek, from its confluence with the Coosa River upstream to the vicinity of Alabama Highway 9. Terrapin Creek flows into the Coosa River approximately 11 km (7 mi) below Weiss Dam in Cherokee County, Alabama. Together these two confluent stream reaches encompass 35 km (22 mi) of stream habitat that meet Criteria 1, 2, 5, 6, and 7 listed above in this section. Terrapin Creek and this short reach of the Coosa River support diverse mollusk and fish communities. Water quality in Terrapin Creek meets current State criteria for Fish and Wildlife. The Mobile River Basin Mollusk Restoration Committee (2008, p. 36) recognizes this reach of the Coosa River and Terrapin Creek as an appropriate reintroduction site for the Georgia pigtoe. Based on the information we have to date, which does not necessarily suggest there is an increased probability of Georgia pigtoe conservation in specific areas within the reach, we propose to designate the entire reach of Terrapin Creek and the Coosa River as critical habitat.

Historical records of Georgia pigtoe occur from an approximately 66-km (41-mi) reach of Hatchet Creek between Clay County Road 4 downstream to the confluence with Swamp Creek in Coosa County, Alabama. This stream reach meets Criteria 1, 2, 4, 5, 6, and 7 listed above in this section and has been identified by the Mobile River Basin Mollusk Restoration Committee (2008, p. 40) as having high conservation potential for the reintroduction of imperiled mollusks. Hatchet Creek supports diverse mollusk and fish communities and has been designated as an Outstanding Alabama Water, the highest protective classification assigned by the State. Based on the information we have to date, which does not necessarily suggest there is an increased probability of Georgia pigtoe conservation in specific areas within the reach, we propose to designate the entire reach of Hatchet Creek as critical habitat.

Interrupted rocksnail

We have identified 88 km (55 mi) of habitat in three stream reaches that are currently unoccupied by the interrupted rocksnail and that meet several of the criteria for designation as unoccupied habitat. The Coosa River from Weiss Dam to just below the confluence of Terrapin Creek (11 km (7 mi)) is within the historical range of the interrupted rocksnail, and meets Criteria 1, 2, 5, 6, and 7 listed above in this section. Several mollusk species requiring similar PCEs currently inhabit a portion of the reach. Projected minimum flows (Weiss Bypass Working Group 2005, pp. 6–8) will improve PCEs in the remainder of the reach, and reservoir-stored water will provide protection from nonpoint source pollution and reduce the potential of stochastic threats. The Mobile River Basin Mollusk Restoration Committee (2008, p. 53) recognizes this reach of the Coosa River as an appropriate reintroduction sites for interrupted rocksnail.

The interrupted rocksnail is currently known to inhabit shoals along a 12-km (7.4-mi) reach of the Oostanaula River between Ship Island and the Confluence of Armuchee Creek, Gordon and Floyd Counties, Georgia. However, appropriate habitat extends approximately 49 km (30 mi) above Ship Island to the Conasuaga-Coosawattee confluence in Gordon County, Georgia, and approximately 16 km (10 mi) below the confluence of Armuchee Creek to the Georgia Highway 1 Loop in Floyd County, Georgia. This unoccupied area encompasses an additional 65 km (40 mi) of river habitat that meets Criteria 1, 2, 3, 6, and 7 listed above in this section. The unoccupied upstream and downstream reaches of the Oostanaula River contain one or more of the PCEs required by the species, including geomorphically stable channels and natural flows. They are adjacent to areas currently occupied by interrupted rocksnail, and there is potential for natural dispersal and re-occupation by the Georgia pigtoe. These areas are also currently occupied by other mollusk species with similar habitat requirements.

The Lower Coosa River below Jordan Dam is within the historical range of the interrupted rocksnail, and a small population of the species has been reintroduced into a shoal there (ADCNR, p. 33). Apparently suitable habitat extends approximately 13 km (8 mi) from the tailwaters of Jordan Dam to Alabama Highway 111 in Elmore County, Alabama. This reach meets Criteria 1, 2, 3, 5, 6, and 7 listed above in this section. The steep river gradient below the dam to the Fall Line at Alabama Highway 111 in Wetumpka results in the presence of numerous high-quality and stable shoals and pools characteristic of habitats formerly inhabited by the rocksnail. The reach is occupied by other species of pleurocerid snails, as well as a diverse mussel fauna, indicating the presence of PCEs in this reach. Minimum flows that have been established from Jordan Dam have eliminated historical threats, such as seasonal loss of flow and low dissolved

oxygen levels. The Mobile River Basin Mollusk Restoration Committee (2008, p. 53) recognizes this reach of the Coosa River as an appropriate reintroduction site for interrupted rocksnail, and the ADCNR has initiated attempts to reintroduce the species to the reach.

Rough hornsnail

We have identified 8.5 km (7 mi) of habitat in two stream reaches that are unoccupied by the rough hornsnail but that meet Criteria 1, 2, 3, 6, and 7 listed above in this section. The species inhabits a 14-km (8-mi) reach of the Lower Coosa River below Jordan Dam; however, appropriate habitat extends an additional 7 km (5 mi) downstream of currently occupied areas. This stream reach is available for natural recolonization and contains one or more of the PCEs required by the rough hornsnail, including a geomorphically stable channel and adequate water quality and substrate, as indicated by the presence of closely related pleurocerids and other mollusk species with similar habitat requirements.

The rough hornsnail currently inhabits a small area in Yellowleaf Creek near Alabama Highway 25 in Shelby County, Alabama. A 3.5-km (2-mi) reach upstream of this area is available for natural recolonization. This reach is currently inhabited by closely related pleurocerids and other mollusk species with similar habitat requirements and contains one or more of the PCEs required by the rough hornsnail, including a geomorphically stable channel, a natural hydrograph, and adequate water quality and substrate.

**Proposed Critical Habitat Designation**

We are proposing three units as critical habitat for the Georgia pigtoe (GP 1, 2, and 3), three units for interrupted rocksnail (IR 1, 2, and 3), and two units for rough hornsnail (RH 1 and 2). The critical habitat areas described below constitute our best assessment of areas that currently meet the definition of critical habitat for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail. Table 1 identifies the proposed units for each species; shows the occupancy of the units, the approximate extent proposed as critical habitat for the Georgia pigtoe (GP), interrupted rocksnail (IR), and rough hornsnail (RH); and provides information on the ownership of lands within the proposed unit. Critical habitat is proposed for the stream channel within the ordinary high water line only. In Alabama and Georgia, the State owns navigable stream bottoms within the ordinary high water line, and all proposed units in Alabama and Georgia are considered navigable. In Tennessee, the riparian landowner owns the stream bottom to the middle of the channel.

TABLE 1. OCCUPANCY AND OWNERSHIP OF PROPOSED CRITICAL HABITAT UNITS FOR GEORGIA PIGTOE (GP), INTERRUPTED ROCKSNAIL (IR), AND ROUGH HORNSNAIL (RH)

| Unit | Location | Occupancy | Private Ownership River Kilometers (Miles) | State Ownership River Kilometers (Miles) |
|---|---|---|---|---|
| GP 1 | Conasauga River | Occupied | 5 (3) | 47 (29) |
| GP 2 | Terrapin Creek and Coosa River | Unoccupied | 0 | 35 (22)[1] |
| GP 3 | Hatchet Creek | Unoccupied | 0 | 66 (41) |
| Total | | | 5 (3) | 148 (92) |
| IR 1 | Coosa River | Unoccupied | 0 | 11 (7)[1] |
| IR 2 | Oostanaula River | Occupied | 0 | 12 (7.4) |
| | | Unoccupied | 0 | 65 (40.6) |
| IR 3 | Lower Coosa River | Occupied | 0 | 1 (0.6)[2] |
| | | Unoccupied | 0 | 12 (7.4)2 |
| Total | | | 0 | 101 (63) |
| RH 1 | Lower Coosa River | Occupied | 0 | 14 (9)2 |
| | | Unoccupied | 0 | 7 (4) |
| RH 2 | Yellowleaf Creek | Occupied | 0 | 3.2 (2) |
| | | Unoccupied | 0 | 3.2 (2) |
| Total | | | 0 | 27.4 (17) |

[1] IR 1 overlaps in part with GP 2.
[2] IR 3 overlaps in part with RH 1. See Unit descriptions, below.

We present brief descriptions of all units and reasons why they meet the definition of critical habitat for each species below. The proposed critical habitat units include the creek and river channels within the ordinary high water line. For this purpose, we have applied the definition found at 33 CFR 329.11, and consider the ordinary high water line on nontidal rivers to be the line on the shore established by the fluctuations of water and indicated by physical characteristics, such as a clear, natural line impressed on the bank; shelving; changes in the character of soil; destruction of terrestrial vegetation; the presence of litter and debris; or other appropriate means that consider the characteristics of the surrounding areas. For each stream reach proposed as a critical habitat unit, the upstream and

downstream boundaries are described generally below; more precise estimates are provided in the Proposed Regulation Promulgation section at the end of this proposed rule.

Unit GP 1: Conasauga River, Bradley and Polk Counties, Tennessee, and Murray and Whitfield Counties, Georgia

Unit 1 for the Georgia pigtoe includes 52 km (32 mi) of the Upper Conasauga River from the confluence of Minnewaga Creek near Willis Springs, Polk County, Tennessee, downstream to U.S. Highway 76 in Murray and Whitfield Counties, Georgia. Critical habitat is proposed for the stream channel within the ordinary high water line only. In Tennessee, the riparian landowner owns the stream bottom to the middle of the channel. Therefore, 5 km (3 mi) of GP 1 in Tennessee is privately owned. In Georgia, the State owns navigable stream bottoms within the ordinary high water line, and the Conasauga is considered navigable. Therefore, the State of Georgia owns 47 km (29 mi) of Unit GP 1.

The Georgia pigtoe has been collected from three shoals within the reach of the Conasauga River proposed as GP 1, one located at each end of the reach and one site in between (Johnson and Evans 2000, p. 106; Evans 2001, pp. 33–34). Therefore, we consider the entire reach of the Conasauga River that composes GP 1 as occupied. Other shoals within the reach continue to be inhabited by a diverse mussel community, including the endangered triangular kidneyshell and southern pigtoe and the threatened fine-lined pocketbook. These species historically co-occurred in the same shoal habitats with the Georgia pigtoe, they have similar habitat requirements, and their persistence indicates the presence of PCEs 1, 2, 3, and 4 for the pigtoe. The persistence of the Georgia pigtoe within three shoals of this reach also indicates the presence of an appropriate fish host (PCE 5). This small population of Georgia pigtoe is at a high risk of extinction due to changes in flow, habitat or water quality, and stochastic events such as drought. Threats to the Georgia pigtoe and its habitat that may require special management of the PCEs include the potential of anthropogenic activities (such as channelization, impoundment, and channel excavation) that could cause aggradation or degradation of the channel bed elevation or significant bank erosion; the potential of significant changes in the existing flow regime due to such activities as impoundment, water diversion, or water withdrawal; the potential of significant alteration of water chemistry or water quality; and the potential of significant changes in stream bed material composition and quality by activities such as construction projects, livestock grazing, timber harvesting, off-road vehicle use, and other watershed and floodplain disturbances that release sediments or nutrients into the water.

Unit GP 2: Terrapin Creek and Coosa River, Cherokee County, Alabama

Unit 2 for the Georgia pigtoe includes 24 km (15 mi) of Terrapin Creek from Alabama Highway 9 downstream to its confluence with the Coosa River, and 11 km (7 mi) of the Coosa River from Weiss Dam downstream to approximately 1.6 km (1 mi) below the confluence of Terrapin Creek in Cherokee County, Alabama. The State of Alabama owns navigable stream bottoms within the ordinary high water line, and both Lower Terrapin Creek and the Coosa River are considered navigable streams.

The Georgia pigtoe is not currently known to occur in Terrapin Creek or the Coosa River. However, Unit 2 is essential to the conservation of the Georgia pigtoe due to the high degree of stochastic threats to the single surviving population in the Conasauga River, and the need to re-establish the species within other portions of its historical range in order to reduce threats from stochastic events.

Lower Terrapin Creek and the Coosa River are within the species' historical range, and we consider them to be essential to the conservation of the Georgia pigtoe. Terrapin Creek flows into the Coosa River below Weiss Dam. Terrapin Creek continues to support a diverse mollusk assemblage, including the endangered southern pigtoe, a closely related species that co-occurs with the Georgia pigtoe in the Conasauga River, indicating the presence of PCEs 1, 2, 3, and 4. The endangered southern clubshell, the threatened fine-lined pocketbook, and other mussel and snail species requiring PCEs 1, 2, 3, and 4 similar to the Georgia pigtoe continue to survive in the Coosa River just below the confluence of Terrapin Creek. Additionally, a diverse fish fauna, including potential fish hosts for the Georgia pigtoe (PCE 5), is known from Terrapin Creek and Coosa River.

Minimum flows from Weiss Dam into the Coosa River will be implemented upon completion of the Alabama Power Company Coosa River hydropower relicensing process with FERC (Weiss Bypass Working Group 2005, pp. 6–8) currently in progress. These minimum flows will improve the PCEs necessary for the survival of the Georgia pigtoe in the Coosa River, particularly above the confluence with Terrapin Creek. Because the minimum flows will originate from the large reservoir impounded by Weiss Dam, there is little threat of nonpoint source pollution and reduced potential of stochastic threats, such as drought and spills. ADCNR recognizes this reach of the Coosa River as having high conservation potential for imperiled mollusks in Alabama and is planning to reintroduce imperiled mollusks, including the Georgia pigtoe, following initiation of minimum flows. Over the past few decades, changes in land uses, implementation of best management practices for agriculture and forestry activities in the watershed, and implementation of State water quality standards have resulted in improved water quality and shoal habitats in Terrapin Creek. The Mobile River Basin Mollusk Restoration Committee (2008, p. 40) recognizes Terrapin Creek as an appropriate reintroduction opportunity for the Georgia pigtoe.

Unit GP 3: Hatchet Creek, Coosa and Clay Counties, Alabama

Unit 3 for the Georgia pigtoe includes approximately 66 km (41 mi) of Hatchet Creek, extending from Clay County Road 4, Clay County, downstream to the confluence of Swamp Creek at Coosa County Road 29, Coosa County, Alabama. The State of Alabama owns navigable stream bottoms within the ordinary high water line, and Hatchet Creek is considered navigable.

The Georgia pigtoe does not currently occupy Hatchet Creek. However, historical records of the species show their presence in this stream from its confluence with the Coosa River, Coosa County, upstream into Clay County, Alabama. An extensive reach of Hatchet Creek is occupied by the threatened fine-lined pocketbook, along with other mollusk species that currently or historically co-occur with Georgia pigtoe, indicating the presence of PCEs 1, 2, 3, and 4. A diverse fish fauna, including several potential fish hosts for the pigtoe (PCE 5), is also known to inhabit Hatchet Creek. Water quality and shoal habitats in this stream have improved relative to past historical conditions due to changes in land uses, implementation of best management practices in agriculture and forestry activities in the watershed, and implementation of State water quality standards. Due to these improvements, Hatchet Creek has been designated as an Outstanding Alabama Water, which also provides for increased water quality protections. The Mobile River Basin Mollusk Restoration Committee (2008, p. 40) recognizes Hatchet Creek as

having high conservation potential for reintroduction of the Georgia pigtoe.

Re-establishing Georgia pigtoe in Hatchet Creek will significantly reduce the level of stochastic threats to the species' survival and is essential to the conservation of the species. We do not know which specific shoals or reaches of Hatchet Creek may be capable of supporting the Georgia pigtoe. Therefore, we propose to designate all apparently suitable habitat within the historical range of the species in Hatchet Creek as critical habitat essential to the conservation of Georgia pigtoe.

Unit IR 1: Coosa River, Cherokee County, Alabama (overlaps in part with GP 2, described above)

Unit 1 for the interrupted rocksnail includes approximately 11 km (7 mi) of the Coosa River extending from Weiss Dam downstream to about 1.6 km (1 mi) below the confluence of Terrapin Creek, Cherokee County, Alabama. The State of Alabama owns navigable stream bottoms within the ordinary high water line, and the Coosa River is considered navigable.

The interrupted rocksnail historically inhabited the Coosa River in Cherokee County. Although the species does not currently occupy the area, Unit 1 is essential to the conservation of the interrupted rocksnail due to the high degree of stochastic threats to the single surviving population in the Ostanaula River and the need to re-establish the species within other portions of its historical range. The presence of the endangered southern clubshell, the threatened fine-lined pocketbook, and other mussel and snail species in the Coosa River at and below the confluence of Terrapin Creek indicates the presence of PCEs 1, 2, 3, and 4 for the interrupted rocksnail.

Minimum flows from Weiss Dam into the Coosa River will be implemented upon completion of the Alabama Power Company Coosa River hydropower relicensing process with FERC (Weiss Bypass Working Group 2005, pp. 6–8) currently in progress. These minimum flows will improve the PCEs necessary for the survival of the interrupted rocksnail in about 11 km (7 mi) of the Coosa River, between Weiss Dam downstream to the confluence with Terrapin Creek. Implementation of minimum flows from Weiss Dam (Weiss Bypass Working Group 2005, pp. 6–8) will improve PCEs necessary for the survival of the interrupted rocksnail. The majority of flow into the reach above the confluence of Terrapin Creek originates from Weiss Dam. Therefore, there is little threat of nonpoint source pollution, and reduced potential of stochastic threats such as drought and spills. ADCNR recognizes this reach as having high conservation potential for imperiled mollusks in Alabama and is planning to reintroduce imperiled mollusk species, including the interrupted rocksnail, into the reach following initiation of minimum flows. Re-establishing the interrupted rocksnail into the Coosa River will significantly reduce stochastic threats to the survival of the species and is essential to its conservation.

Unit IR 2: Oostanaula River, Gordon and Floyd Counties, Georgia

Unit 2 for the interrupted rocksnail includes approximately 77 km (48 mi) of the Oostanaula River from the Conasauga–Coosawattee confluence in Gordon County, downstream to Georgia Highway 1 loop in Floyd County, Georgia. The State of Georgia owns navigable stream bottoms within the ordinary high water line, and the Oostanaula River is considered navigable.

The interrupted rocksnail occupies shoals along a 12-km (7.4-mi) reach of the Oostanaula River, extending from the confluence of Johns Creek in Gordon and Floyd Counties, downstream to the confluence of Armuchee Creek in Floyd County, Georgia. Threats to the interrupted rocksnail and its habitat in the Oostanaula River that may require special management of the PCEs include the potential of activities (such as channelization, impoundment, and channel excavation) that could cause aggradation or degradation of the channel bed elevation or significant bank erosion; the potential of significant changes in the existing flow regime due to activities such as impoundment, hydropower generation, water diversion, or water withdrawal; the potential of significant alteration of water chemistry or water quality; and the potential of significant changes in stream bed material composition and quality by activities such as construction projects, livestock grazing, timber harvesting, off-road vehicle use, and other watershed and floodplain disturbances that release sediments or nutrients into the water.

Although there are no recent collections of the species from shoal habitats above and below the currently inhabited reach, these currently unoccupied areas contain three of the PCEs required by the species, including geomorphically stable stream channels, natural flows, and appropriate substrates (PCEs 1, 2, and 4). The presence of other mollusk species with similar habitat requirements as the interrupted rocksnail in this reach, including the endangered triangular kidneyshell, along with more common species of pleurocerid snails, also indicates the potentially suitable presence of appropriate water quality (PCE 3). Shoals within the 65 km (40.6 mi) of currently unoccupied reaches of the Oostanaula River are available to natural recolonization of the species. Expanding the range of the interrupted rocksnail into adjacent shoals in the river would greatly reduce the degree of threat from stochastic events, and is essential to the conservation of the interrupted rocksnail.

Unit IR 3: Lower Coosa River, Elmore County, Alabama

Unit 3 for the interrupted rocksnail includes 13 km (8 mi) of the Lower Coosa River between Jordan Dam and Alabama Highway 111 in Elmore County, Alabama. The State of Alabama owns navigable stream bottoms within the ordinary high water line, and the Coosa River is considered navigable.

The Lower Coosa River is within the historical range of the species, and a small population of the interrupted rocksnail has been reintroduced into a 1-km (0.6-mi) portion of a shoal there (ADCNR 2004, p 33). However, this reintroduced population will likely require augmentations over several years before population size can reach self-sustainable levels. The remaining 12 km (7.4 mi) of this reach, from Jordan Dam downstream to the Fall Line at Wetumpka, contains numerous high-quality shoals and pools characteristic of the large river habitats historically occupied by the species. Several other species of pleurocerid snails, the endangered tulotoma snail, and a diverse mussel fauna are currently found throughout the reach, indicating the presence and suitability of PCEs 1, 2, 3, and 4 for the interrupted rocksnail in this reach. Historical threats, including seasonal loss of flow and low dissolved oxygen, were eliminated in 1990 by implementation of minimum flows from Jordan Dam by the Alabama Power Company. As noted, ADCNR recognizes the Lower Coosa River as an appropriate location for imperiled mollusk reintroductions and has begun efforts to reestablish the interrupted rocksnail into this reach. Due to the extremely limited distribution of the interrupted rocksnail and the high degree of stochastic threats to the single natural population, reestablishing the species in the Lower Coosa River is essential to the conservation of the interrupted rocksnail.

Unit RH 1: Lower Coosa River, Elmore County, Alabama (overlaps in part with IR 3, described above)

Unit 1 for the rough hornsnail includes 21 km (13 mi) of the Lower Coosa River extending from Jordan Dam, downstream to the confluence of the Tallapoosa River in Elmore County, Alabama. The State of Alabama owns navigable stream bottoms within the ordinary high water line, and the Coosa River is considered navigable. We believe PCEs 1, 2, 3, and 4 to be suitable throughout the reach, due to the presence of rough hornsnail colonies or other closely related pleurocerid snail species that are known to co-occur with the hornsnail and have similar habitat requirements.

Early 1990 records of rough hornsnail from the reach of the Coosa River between Jordan Dam and the Fall Line (FLMNH 2006), and more recent records of the hornsnail extending 2 km (1.2 mi) below the Fall Line (J. Garner and P. Hartfield pers. obsv. 2001), indicate an occupied range of 14 km (9 mi) in the Lower Coosa River. An additional 7-km (4-mi) channel reach extending downstream to the confluence of the Tallapoosa River is not currently occupied. This downstream unoccupied area is available for natural recolonization, and contains PCEs 1, 2, 3, and 4, including a geomorphically stable channel, and adequate flow, water quality, and substrate, as indicated by the presence of closely related pleurocerids and other mollusk species with similar habitat requirements. Expanding the range of rough hornsnail into the currently unoccupied downstream habitat would reduce the level of stochastic threats to the species, and is essential to its conservation.

Threats to the rough hornsnail and its habitat in the Coosa River that may require special management of the PCEs include the potential of activities (such as channelization, impoundment, and channel excavation) that could cause aggradation or degradation of the channel bed elevation or significant bank erosion; the potential of significant changes in the existing flow regime due to such activities as hydropower generation, water diversion, or water withdrawal; the potential of significant alteration of water chemistry or water quality due to discharges or land use activities; and the potential of significant changes in stream bed material composition and quality by activities such as construction projects, livestock grazing, timber harvesting, and other watershed and floodplain disturbances that release sediments or nutrients into the water.

Unit RH 2: Yellowleaf Creek, Shelby County, Alabama

Unit 2 for the rough hornsnail includes approximately 6.4 km (4 mi) of the Yellowleaf Creek channel from the confluence of Morgan Creek, downstream to 1.6 km (1 mi) below the Alabama Highway 25 crossing in Shelby County, Alabama. The State of Alabama owns navigable stream bottoms within the ordinary high water line, and the lower reach of Yellowleaf Creek is considered navigable.

The rough hornsnail occupies a 3.2-km (2-mi) reach of Yellowleaf Creek above and below Alabama Highway 25. We are also proposing a 3.2-km (2-mi) reach of currently unoccupied habitat above this reach. This upstream reach is characterized by a stable channel, natural flows, and appropriate water quality and substrates (PCEs 1, 2, 3, and 4). The shoals and pools within the unoccupied reach are inhabited by the endangered triangular kidneyshell, southern clubshell, and cylindrical lioplax snail, as well as other more common species of mussels and snails that require similar PCEs as the hornsnail. Increasing the range and numbers of the rough hornsnail into this currently unoccupied area will decrease the vulnerability of this population and the species to stochastic threats, and is essential to its conservation.

Threats to the rough hornsnail and its habitat in Yellowleaf Creek that may require special management of PCEs 1, 2, 3, and 4 include the potential of activities (such as channelization, impoundment, and channel excavation) that could cause aggradation or degradation of the channel bed elevation or significant bank erosion; the potential of significant changes in the existing flow regime due to such activities as water diversion or water withdrawal; and the potential of significant alteration of water chemistry or water quality due to discharges or nonpoint source pollution; the potential of significant changes in stream bed material composition and quality by activities such as construction projects, livestock grazing, timber harvesting, and other watershed and floodplain disturbances that release sediments or nutrients into the water.

**Effects of Critical Habitat Designation**

Section 7 Consultation

Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that actions they fund, authorize, or carry out are not likely to destroy or adversely modify critical habitat. Decisions by the courts of appeals for the Fifth and Ninth Circuits have invalidated our definition of ''destruction or adverse modification'' (50 CFR 402.02) (see *Gifford Pinchot Task Force* v. *U.S. Fish and Wildlife Service*, 378 F.3d 1059 (9th Cir. 2004) and *Sierra Club* v. *U.S. Fish and Wildlife Service*, 245 F.3d 434, 442 (5th Cir. 2001)), and we do not rely on this regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat. Under the provisions of the Act, we determine destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional (or retain the current ability for the PCEs to be functionally established) to serve its intended conservation role for the species. 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. This is a procedural requirement only, as any conservation recommendations in a conference report or opinion are strictly advisory.

The primary utility of the conference procedures is to allow a Federal agency to maximize its opportunity to adequately consider species proposed for listing and proposed critical habitat and, if we list the proposed species or designate proposed critical habitat, to avoid potential delays in implementing their proposed action because of the section 7(a)(2) compliance process. We may conduct conferences either informally or formally. We typically use informal conferences as a means of providing advisory conservation recommendations to assist the agency in eliminating conflicts that the proposed action may cause. We typically use formal conferences when we or the Federal agency believes the proposed action is likely to jeopardize the continued existence of the species proposed for listing or adversely modify proposed critical habitat.

We generally provide the results of an informal conference in a conference report, while we provide the results of a formal conference in a conference opinion. We typically prepare conference opinions on proposed species or critical habitat in accordance with procedures contained at 50 CFR 402.14, as if the proposed species were already listed or the proposed critical habitat was already designated. We may adopt the conference opinion as the

biological opinion when the species is listed or the critical habitat is designated, if no substantial new information or changes in the action alter the content of the opinion (see 50 CFR 402.10(d)).

If a species is listed or critical habitat is designated, 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 to destroy or adversely modify its critical habitat. Activities on State, tribal, local, or private lands requiring a Federal permit (such as a permit from the U.S. Army Corps of Engineers under section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq.*) or a permit from the Service under section 10 of the Act) or involving some other Federal action (such as funding from the Federal Highway Administration, Federal Aviation Administration, or the Federal Emergency Management Agency) are subject to the section 7(a)(2) consultation process. Federal actions not affecting listed species or critical habitat, and actions on State, Tribal, local, or private lands that are not federally funded, authorized, or permitted, do not require section 7(a)(2) consultations.

If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency (action agency) must enter into consultation with us. As a result of this consultation, we document compliance with the requirements of section 7(a)(2) through our issuance of:

(1) A concurrence letter for Federal actions that may affect, but are not likely to adversely affect, listed species or critical habitat; or

(2) A biological opinion for Federal actions that may affect, and are likely to adversely affect, listed species or critical habitat.

When we issue a biological opinion concluding that a project is likely to jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat, we also provide reasonable and prudent alternatives to the project, if any are identifiable. We define ''reasonable and prudent alternatives'' at 50 CFR 402.02 as alternative actions identified during consultation that:

- Can be implemented in a manner consistent with the intended purpose of the action,
- Can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction,
- Are economically and technologically feasible, and
- Would, in the Director's opinion, avoid jeopardizing the continued existence of the listed species or destroying or adversely modifying critical habitat.

Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of the project. Costs associated with implementing a reasonable and prudent alternative are similarly variable.

Regulations at 50 CFR 402.16 require Federal agencies to reinitiate consultation on previously reviewed actions in instances where we have listed a new species or subsequently designated critical habitat that may be affected and the Federal agency has retained discretionary involvement or control over the action (or the agency's discretionary involvement or control is authorized by law). Consequently, Federal agencies may sometimes need to request reinitiation of consultation with us on actions for which formal consultation has been completed, if those actions with discretionary involvement or control may affect subsequently listed species or designated critical habitat.

*Application of the ''Adverse Modification'' Standard*

The key factor related to the adverse modification determination is whether, with implementation of the proposed Federal action, the affected critical habitat would continue to serve its intended conservation role for the species, or would retain its current ability for the PCEs to be functionally established. Activities that may destroy or adversely modify critical habitat are those that alter the PCEs to an extent that appreciably reduces the conservation value of critical habitat for each species (the Georgia pigtoe, interrupted rocksnail, and rough hornsnail).

Section 4(b)(8) of the Act requires us to briefly evaluate and describe, in any proposed or final regulation that designates critical habitat, activities involving a Federal action that may destroy or adversely modify such habitat, or that may be affected by such designation.

Activities that, when carried out, funded, or authorized by a Federal agency, may affect critical habitat and therefore should result in consultation for each species (Georgia pigtoe, interrupted rocksnail, and rough hornsnail) include, but are not limited to:

(1) Actions that would alter the geomorphology of their stream and river habitats. Such activities could include, but are not limited to, instream excavation or dredging, impoundment, channelization, and discharge of fill materials. These activities could cause aggradation or degradation of the channel bed elevation or significant bank erosion and result in entrainment or burial of these mollusks, and could cause other direct or cumulative adverse effects to these species and their life cycles.

(2) Actions that would significantly alter the existing flow regime. Such activities could include, but are not limited to, impoundment, water diversion, water withdrawal, and hydropower generation. These activities could eliminate or reduce the habitat necessary for growth and reproduction of these mollusks.

(3) Actions that would significantly alter water chemistry or water quality (for example, temperature, pH, contaminants, and excess nutrients). Such activities could include, but are not limited to, hydropower discharges, or the release of chemicals, biological pollutants, or heated effluents into surface water or connected groundwater at a point source or by dispersed release (non-point source). These activities could alter water conditions that are beyond the tolerances of these mollusks and result in direct or cumulative adverse affects to the species and their life cycles.

(4) Actions that would significantly alter stream bed material composition and quality by increasing sediment deposition or filamentous algal growth. Such activities could include, but are not limited to, construction projects, livestock grazing, timber harvest, off-road vehicle use, and other watershed and floodplain disturbances that release sediments or nutrients into the water. These activities could eliminate or reduce habitats necessary for the growth and reproduction of these mollusks by causing excessive sedimentation and burial of the species or their habitats, or nutrification leading to excessive filamentous algal growth. Excessive filamentous algal growth can cause reduced nighttime dissolved oxygen levels through respiration, cover the hard substrates required by aquatic snails for egg deposition, and prevent mussel glochidia from settling into stream sediments.

**Exemptions and Exclusion**

Application of Section 4(a)(3) of the Act

The Sikes Act Improvement Act of 1997 (Sikes Act) (16 U.S.C. 670a) required each military installation that includes land and water suitable for the conservation and management of

natural resources to complete an integrated natural resources management plan (INRMP) by November 17, 2001. An INRMP integrates implementation of the military mission of the installation with stewardship of the natural resources found on the base. Among other things, each INRMP must, to the extent appropriate and applicable, provide for fish and wildlife management; fish and wildlife habitat enhancement or modification; wetland protection, enhancement, and restoration where necessary to support fish and wildlife; and enforcement of applicable natural resource laws.

The National Defense Authorization Act for Fiscal Year 2004 (Pub. L. 108-136) amended the Act to limit areas eligible for designation as critical habitat. Specifically, section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) now provides: ''The Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation.''

There are no Department of Defense lands with a completed INRMP within the proposed critical habitat designation for any of the three species.

Application of Section 4(b)(2) of the Act

Section 4(b)(2) of the Act states that the Secretary must designate or make revisions to critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, national security impact, and any other relevant impact of specifying any particular area as critical habitat. The Secretary may exclude an area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific data available, that the failure to designate such area as critical habitat will result in the extinction of the species. In making that determination, the legislative history is clear that the Secretary has broad discretion regarding which factors to use and how much weight to give to any factor.

Under section 4(b)(2) of the Act, we must consider the economic impact, national security impact, and any other relevant impact of specifying any particular area as critical habitat. For example, we consider whether there are lands owned or managed by the Department of Defense (DOD) where a national security impact might exist. We also consider whether landowners have developed any conservation plans for the area, or whether there are conservation partnerships that would be encouraged by designation of, or exclusion of lands from, critical habitat. In addition, we look at any tribal issues, and consider the government-to-government relationship of the United States with tribal entities. We also consider the economic impacts, environmental impacts, and any social impacts that might occur because of the designation.

This discussion of the potential economic and other impacts of critical habitat designation is separate from and has not been considered in the proposed listing rule. The inclusion of this information in the proposed rule is solely for the purpose of soliciting public comments on the proposed critical habitat designation, not the proposed listing.

Under section 4(b)(2) of the Act, in considering whether to exclude a particular area from the designation, we must identify the benefits of including the area in the designation, identify the benefits of excluding the area from the designation, and determine whether the benefits of exclusion outweigh the benefits of inclusion. If, based on this analysis, we determine that the benefits of exclusion outweigh the benefits of inclusion, we can exclude the area only if such exclusion would not result in the extinction of the species.

In preparing this proposed rule, we have determined that the lands within the proposed designation of critical habitat for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail are not owned or managed by the Department of Defense; there are currently no HCPs for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail; and the proposed designation does not include any tribal lands or trust resources. At this time, we have not identified areas for which the benefits of exclusion outweigh the benefits of inclusion; therefore, we are not identifying any specific proposed exclusions for the designation of critical habitat for interrupted rocksnail, rough hornsnail, or Georgia pigtoe.

*Economics*

Section 4(b)(2) of the Act allows the Secretary to exclude areas from critical habitat for economic reasons if the Secretary determines that the benefits of such exclusion exceed the benefits of designating the area as critical habitat. However, this exclusion cannot occur if it will result in the extinction of the species concerned.

We are evaluating the economic impacts of proposing critical habitat for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail. We will announce the availability of the draft economic analysis as soon as it is completed, at which time we will seek public review and comment. At that time, copies of the draft economic analysis will be available for downloading from the Internet at the *Federal eRulemaking Portal*: *http://www.regulations.gov*, or by contacting the Mississippi Fish and Wildlife Office directly (see **FOR FURTHER INFORMATION CONTACT**). We may exclude areas from the final rule based on the information in the economic analysis.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies; groups; and individuals. The Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Federal agencies are required to confer with us informally on any action that is likely to jeopardize the continued existence of a proposed species, or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to 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 formal consultation with the Service.

Federal activities that may affect the Georgia pigtoe, interrupted rocksnail, and rough hornsnail include, but are not

limited to, the carrying out or the issuance of permits for reservoir construction, stream alterations, discharges, wastewater facility development, water withdrawal projects, pesticide registration, mining, and road and bridge construction. It has been the experience of the Service, however, that nearly all section 7 consultations have been resolved so that the species have been protected and the project objectives have been met.

Listing the Georgia pigtoe, interrupted rocksnail, and rough hornsnail initiates the development and implementation of rangewide recovery plans for each species. These plans will bring together Federal, State, and local agency efforts for the conservation of these species. Recovery plans will establish a framework for agencies to coordinate their recovery efforts. The plans will set recovery priorities and estimate the costs of the tasks necessary to accomplish the priorities. They also will describe the site-specific actions necessary to achieve conservation and survival of each species.

Listing also will require us to review any actions on Federal lands and activities under Federal jurisdiction that may affect the three species; allow State plans to be developed under section 6 of the Act; encourage scientific investigations of efforts to enhance the propagation or survival of the species under section 10(a)(1)(A) of the Act; and promote habitat conservation plans non-Federal lands and activities under section 10(a)(1)(B) of the Act.

The Act and its implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt any of these), import or export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It also is illegal to possess, sell, deliver, carry, transport, or ship any wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwiseprohibited activities involving endangered wildlife species under certain circumstances. Regulations governing permits are set forth at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities.

Under the Interagency Cooperative Policy for Endangered Species Act Section 9 Prohibitions, published in the **Federal Register** on July 1, 1994 (59 FR 34272), we identify to the maximum extent practicable those activities that would or would not constitute a violation of section 9 of the Act if the Georgia pigtoe, interrupted rocksnail, and rough hornsnail are listed. The intent of this policy is to increase public awareness as to the effects of these proposed listings on future and ongoing activities within a species' range. We believe, based on the best available information, that the following actions will not result in a violation of the provisions of section 9 of the Act, provided these actions are carried out in accordance with existing regulations and permit requirements:

(1) Possession, delivery, or movement, including interstate transport that does not involve commercial activity, of specimens of these species that were legally acquired prior to the addition of these three mollusks on the **Federal Register** of the Federal List of Endangered or Threatened Wildlife;

(2) Discharges into waters supporting the Georgia pigtoe, interrupted rocksnail, and rough hornsnail, provided these activities are carried out in accordance with existing regulations and permit requirements (e.g., activities subject to section 404 of the Clean Water Act and discharges regulated under the National Pollutant Discharge Elimination System (NPDES));

(3) Development and construction activities designed and implemented under State and local water quality regulations and implemented using approved best management practices; and

(4) Any actions that may affect the Georgia pigtoe, interrupted rocksnail, and rough hornsnail that are authorized, funded, or carried out by a Federal agency (such as bridge and highway construction, pipeline construction, hydropower licensing), when the action is conducted in accordance with the consultation requirements for listed species under section 7 of the Act.

Potential activities that we believe will likely be considered a violation of section 9 of the Act if these species become listed, include, but are not limited to, the following:

(1) Unauthorized possession, collecting, trapping, capturing, killing, harassing, sale, delivery, or movement, including interstate and foreign commerce, or harming, or attempting any of these actions, of the Georgia pigtoe, interrupted rocksnail, and rough hornsnail;

(2) Unlawful destruction or alteration of their habitats (such as unpermitted instream dredging, impoundment, channelization, or discharge of fill material) that impairs essential behaviors, such as breeding, feeding, or sheltering, or results in killing or injuring any of these species;

(3) Violation of any discharge or water withdrawal permit that results in harm or death to any of these species or that results in degradation of their occupied habitat to an extent that essential behaviors such as breeding, feeding and sheltering are impaired; and

(4) Unauthorized discharges or dumping of toxic chemicals or other pollutants into waters supporting the Georgia pigtoe, interrupted rocksnail, and rough hornsnail that kills or injures these species, or otherwise impairs essential life-sustaining requirements, such as reproduction, food, or shelter.

Other activities not identified above will be reviewed on a case-by-case basis to determine if a violation of section 9 of the Act may be likely to result from such activity should these mollusks become listed. The Service does not consider these lists to be exhaustive and provides them as information to the public.

If you have questions regarding whether specific activities will likely violate the provisions of section 9 of the Act, contact the Mississippi Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**). Requests for copies of regulations regarding listed species and inquiries about prohibitions and permits should be addressed to the U.S. Fish and Wildlife Service, Ecological Services Division, 1875 Century Boulevard, Atlanta, GA 30345 (phone 404–679–7313; fax 404–679–7081).

**Peer Review**

In accordance with our joint policy 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 such review is to ensure that our proposed actions are based on scientifically sound data, assumptions, and analyses. We will send copies of this proposed rule to these peer reviewers immediately following publication in the **Federal Register**. We will invite these peer reviewers to comment, during the public comment period, on the specific assumptions and conclusions regarding the proposed listing and designation of critical habitat.

We will consider all comments and information received during the comment period on this proposed rule during preparation of a final rulemaking. Accordingly, the final decision may differ from this proposal.

**Public Hearings**

The Act provides for one or more public hearings on this proposal, if requested. Requests for public hearings must be made in writing within 45 days of the publication of this proposal (see DATES and **ADDRESSES** sections). We will schedule public hearings on this proposal, if any are requested, and announce the dates, times, and places of those hearings in the **Federal Register** and local newspapers at least 15 days prior to the first hearing.

Persons needing reasonable accommodations to attend and participate in the public hearings should phone Connie Dickard at 601–321–1121 as soon as possible. To allow sufficient time to process requests, please call no later than one week before the hearing date. Information regarding the proposal is available in alternative formats upon request.

**Regulatory Planning and Review**

The Office of Management and Budget (OMB) has determined that this rule is not significant under Executive Order 12866 (E.O. 12866). OMB bases its determination upon the following four criteria:

(a) Whether the rule will have an annual effect of $100 million or more on the economy or adversely affect an economic sector, productivity, jobs, the environment, or other units of the government.

(b) Whether the rule will create inconsistencies with other Federal agencies' actions.

(c) Whether the rule will materially affect entitlements, grants, user fees, loan programs, or the rights and obligations of their recipients.

(d) Whether the rule raises novel legal or policy issues.

**Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*)**

Under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effects of the rule on small entities (small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of the agency certifies the rule will not have a significant economic impact on a substantial number of small entities. The SBREFA amended the Regulatory Flexibility Act (RFA) to require Federal agencies to provide a statement of the factual basis for certifying that the rule will not have a significant economic impact on a substantial number of small entities. We currently have some information available but have not evaluated it for the three species. At this time, we lack the economic information necessary to provide an adequate factual basis for the required RFA finding. This includes information on hydroelectric generation, transportation, mining, permitted discharges, as well as other economic factors within the Coosa River Basin. We will evaluate that information and solicit additional information, if needed, to determine potential economic impacts of the critical habitat designation.

Our draft economic analysis will provide updated and more complete information to enable us to verify or change this initial finding as to the proposed designation of critical habitat for each species. Upon completion of the draft economic analysis, we will announce availability of the draft economic analysis of the proposed designation in the **Federal Register** and reopen the public comment period for the proposed designation. We will include with this announcement, as appropriate, an initial regulatory flexibility analysis or a certification that the rule will not have a significant economic impact on a substantial number of small entities accompanied by the factual basis for that determination.

**Unfunded Mandates Reform Act (2 U.S.C. 1501 *et seq.*)**

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501), the Service makes the following findings:

(a) This rule will not produce a Federal mandate. In general, a Federal mandate is a provision in legislation, statute or regulation that would impose an enforceable duty upon State, local, tribal governments, or the private sector and includes both ''Federal intergovernmental mandates'' and ''Federal private sector mandates.'' These terms are defined in 2 U.S.C. 658(5)–(7). ''Federal intergovernmental mandate'' includes a regulation that ''would impose an enforceable duty upon State, local, or tribal governments'' with two exceptions. It excludes ''a condition of Federal assistance.'' It also excludes ''a duty arising from participation in a voluntary Federal program,'' unless the regulation ''relates to a then-existing Federal program under which $500,000,000 or more is provided annually to State, local, and tribal governments under entitlement authority,'' if the provision would ''increase the stringency of conditions of assistance'' or ''place caps upon, or otherwise decrease, the Federal Government's responsibility to provide funding,'' and the State, local, or tribal governments ''lack authority'' to adjust accordingly. At the time of enactment, these entitlement programs were: Medicaid; AFDC work programs; Child Nutrition; Food Stamps; Social Services Block Grants; Vocational Rehabilitation State Grants; Foster Care, Adoption Assistance, and Independent Living; Family Support Welfare Services; and Child Support Enforcement. ''Federal private sector mandate'' includes a regulation that ''would impose an enforceable duty upon the private sector, except (i) a condition of Federal assistance or (ii) a duty arising from participation in a voluntary Federal program.''

The designation of critical habitat does not impose a legally binding duty on non-Federal government entities or private parties. Under the Act, the only regulatory effect is that Federal agencies must ensure that their actions do not jeopardize the continued existence of the species, or destroy or adversely modify critical habitat under section 7. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency. Furthermore, to the extent that non-Federal entities are indirectly impacted because they receive Federal assistance or participate in a voluntary Federal aid program, the Unfunded Mandates Reform Act would not apply; nor would listing these species or designating critical habitat shift the costs of the large entitlement programs listed above on to State governments.

(b) We do not believe that the proposed designation of critical habitat for the Georgia pigtoe, interrupted rocksnail, or rough hornsnail will significantly or uniquely affect small governments because these mollusk species occur primarily in State-owned river channels, or in remote privately owned stream channels. As such, a Small Government Agency Plan is not

required. We will, however, further evaluate this issue as we conduct our economic analysis and revise this assessment if appropriate.

**Takings**

In accordance with Executive Order 12630 (''Government Actions and Interference with Constitutionally Protected Private Property Rights''), we have analyzed the potential takings implications of designating critical habitat for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail in a takings implications assessment. The takings implications assessment concludes that this designation of critical habitat for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail does not pose significant takings implications.

**Federalism**

In accordance with Executive Order 13132 (Federalism), the rule does not have significant Federalism effects. A Federalism assessment is not required. In keeping with DOI and Department of Commerce policy, we requested information from, and coordinated development of this proposed critical habitat designation with, appropriate State resource agencies in Alabama, Georgia, and Tennessee. The critical habitat designation may have some benefit to these governments in that the areas that contain the features essential to the conservation of the species are more clearly defined, and the PCEs of the habitat necessary to the conservation of the species are specifically identified. While making this definition and identification does not alter where and what federally sponsored activities may occur, it may assist these local governments in long-range planning (rather than waiting for case-by-case section 7 consultations to occur).

Where State and local governments require approval or authorization from a Federal agency for actions that may affect critical habitat, consultation under section 7(a)(2) of the Act would be required. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency.

**Civil Justice Reform**

In accordance with Executive Order 12988, the Office of the Solicitor has determined that the rule does not unduly burden the judicial system and meets the requirements of sections 3(a) and 3(b)(2) of the Order. We have proposed designating critical habitat for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail in accordance with the provisions of the Act. This proposed rule uses standard property descriptions and identifies the PCEs within the designated areas to assist the public in understanding the habitat needs of the Georgia pigtoe, interrupted rocksnail, and rough hornsnail.

**Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*)**

This rule does not contain any new collections of information that require approval by OMB under the Paperwork Reduction Act. This rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

**National Environmental Policy Act (NEPA) (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 of 1969, need not be prepared in connection with regulations adopted under section 4(a) of the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

Also, it is our position that, outside the jurisdiction of the United States Court of Appeals for the Tenth Circuit, we do not need to prepare environmental analyses as defined by NEPA (42 U.S.C. 4321 *et seq.*) in connection with designating critical habitat under the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). This assertion was upheld by the Circuit Court of the United States for the Ninth Circuit (*Douglas County* v. *Babbitt*, 48 F.3d 1495 (9th Cir. 1995), cert. denied 516 U.S. 1042 (1996)).

**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:

(a) Be logically organized;

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

(c) Use clear language rather than jargon;

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

(e) 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 the **ADDRESSES** section. 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.

**Government-to-Government Relationship with Tribes**

In accordance with the President's memorandum of April 29, 1994, ''Government-to-Government Relations with Native American Tribal Governments'' (59 FR 22951), Executive Order 13175, and the Department of Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal tribes on a government-to-government basis. We have determined that there are no tribal lands occupied at the time of listing contain the features essential for the conservation and no tribal lands that are unoccupied areas that are essential for the conservation of the Georgia pigtoe, interrupted rocksnail, and rough hornsnail. Therefore, designation of critical habitat for the Georgia pigtoe, interrupted rocksnail, and rough hornsnail has not been proposed on Tribal lands.

**Energy Supply, Distribution, or Use**

On May 18, 2001, the President issued an Executive Order (E.O. 13211; Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use) on regulations that significantly affect energy supply, distribution, and use. E.O. 13211 requires agencies to prepare Statements of Energy Effects when undertaking certain actions. We do not expect the designation of critical habitat for the Georgia pigtoe, interrupted rocksnail, or rough hornsnail to significantly affect energy supplies, distribution, or use. Although two of the proposed units are below hydropower reservoirs, current and proposed operating regimes have been deemed adequate for the species, and therefore their operations will not be affected by the proposed listing or designation of critical habitat. All other proposed units are remote from energy

supply, distribution, or use activities. Therefore, we have determined that this action is not a significant energy action, and no Statement of Energy Effects is required. However, we will further evaluate this issue as we conduct our economic analysis, and review and revise this assessment as warranted.

**References Cited**

A complete list of all references cited in this rulemaking is available upon request from the Field Supervisor, Mississippi Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT** section).

**Author(s)**

The primary author of this package is Paul Hartfield (see **FOR FURTHER INFORMATION CONTACT** section).

**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—[AMENDED]**

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

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

2. Amend § 17.11(h) as follows:

a. Add ''Pigtoe, Georgia'' in alphabetical order under ''CLAMS;'' and

b. Add ''Rocksnail, interrupted'' and ''Hornsnail, rough'' in alphabetical order under ''SNAILS,'' to the List of Endangered and Threatened Wildlife to read as follows:

*§ 17.11 Endangered and threatened wildlife.*

* * * * *

(h) * * *

| Species | | Historic range | Vertebrate population where endangered or threatened | Status | When listed | Critical habitat | Special rules |
|---|---|---|---|---|---|---|---|
| Common name | Scientific name | | | | | | |
| * * * * * * * | | | | | | | |
| CLAMS | | | | | | | |
| * * * * * * * | | | | | | | |
| Pigtoe, Georgia | *Pleurobema hanleyianum* | U.S.A. (AL, GA, TN) | NA | E | | 17.95(f) | NA |
| * * * * * * * | | | | | | | |
| SNAILS | | | | | | | |
| * * * * * * * | | | | | | | |
| Hornsnail, rough | *Pleurocera foremani* | U.S.A. (AL) | NA | E | | 17.95(f) | NA |
| * * * * * * * | | | | | | | |
| Rocksnail, interrupted | *Leptoxis foremani* | U.S.A. (AL, GA) | NA | E | | 17.95(f) | NA |
| * * * * * * * | | | | | | | |

3. Amend § 17.95(f) by adding entries for ''Georgia pigtoe (*Pleurobema hanleyianum*)'', ''Interrupted Rocksnail (*Leptoxis foremani*)'', and ''Rough Hornsnail (Pleurocera foremani)'' at the end of the paragraph to read as set forth below:

*§ 17.95 Critical habitat fish and wildlife.*

* * * * *

(f) *Clams and Snails.*

* * * * *

Georgia Pigtoe (*Pleurobema hanleyianum*)

(1) Critical habitat units are depicted for Cherokee, Coosa, and Clay Counties, Alabama; Murray and Whitfield Counties, Georgia; and Bradley and Polk Counties, Tennessee, on the maps below.

(2) The primary constituent elements (PCEs) of critical habitat for the Georgia pigtoe are the habitat components that provide:

(i) Geomorphically stable stream and river channels and banks (channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation).

(ii) A hydrologic flow regime (the magnitude, frequency, duration, and seasonality of discharge over time) necessary to maintain benthic habitats where the species are found. Unless other information becomes available, existing conditions at locations where the species occur will be considered as minimal flow requirements for survival.

(iii)Water quality (including temperature, pH, hardness, turbidity, oxygen content, and chemical constituents) that meets or exceeds the current aquatic life criteria established under the Clean Water Act (33 U.S.C. 1251–1387).

(iv) Sand, gravel, cobble, boulder, or bedrock substrates with low to moderate amounts of fine sediment and attached filamentous algae.

(v) The presence of fish host(s) for the Georgia pigtoe (species currently unknown). Diverse assemblages of native fish will serve as a potential indication of presence of host fish.

(3) Critical habitat does not include manmade structures existing on the effective date of this rule and not containing one or more of the PCEs, such as buildings, bridges, aqueducts, airports, and roads, and the land on which such structures are located.

(4) *Critical habitat unit maps*. Maps were developed from USGS 7.5' quadrangles, and critical habitat unit upstream and downstream limits were then identified by longitude and latitude using decimal degrees.

(5) *Note*: Index map of critical habitat units for the Georgia pigtoe follows:

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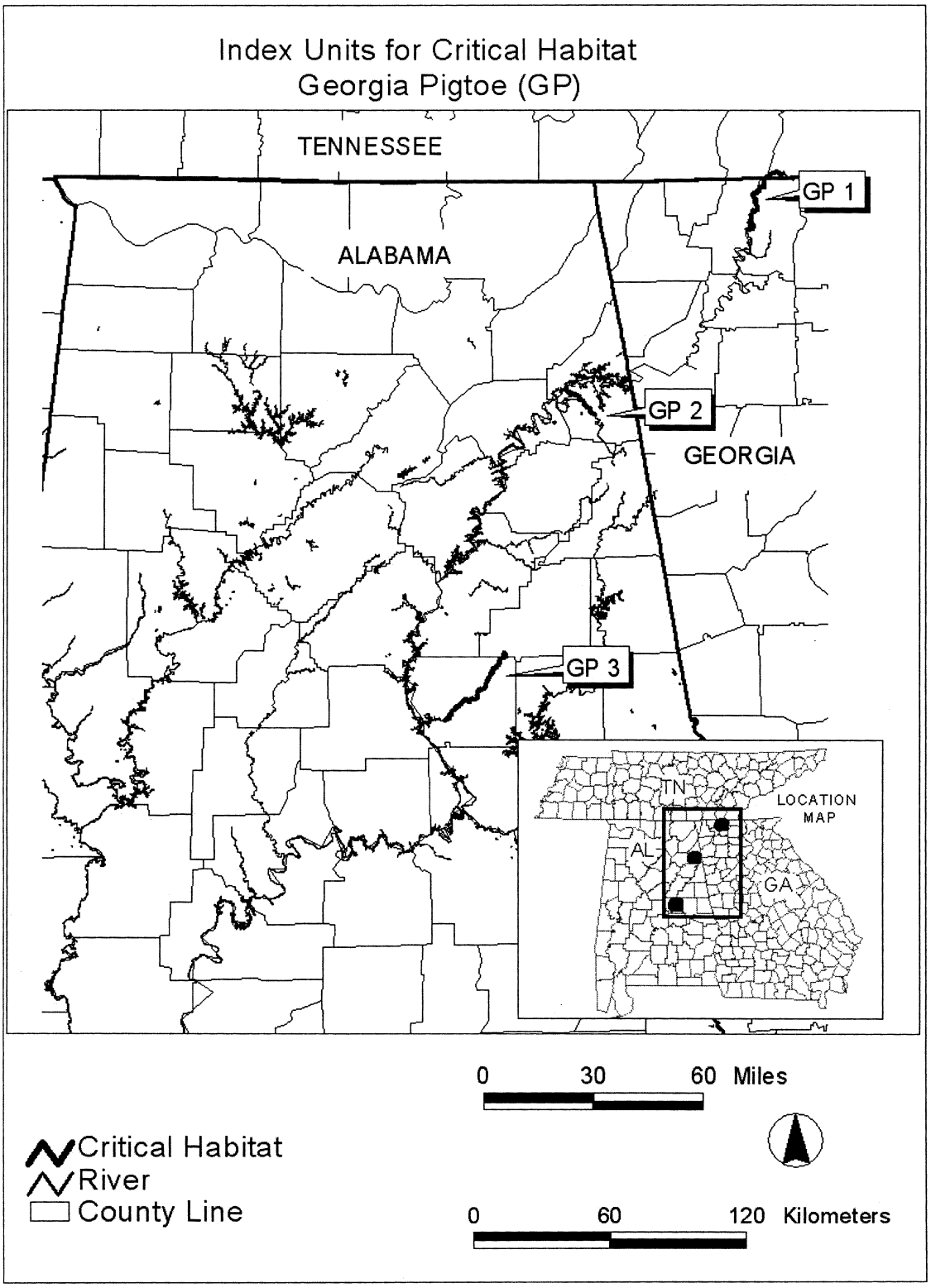
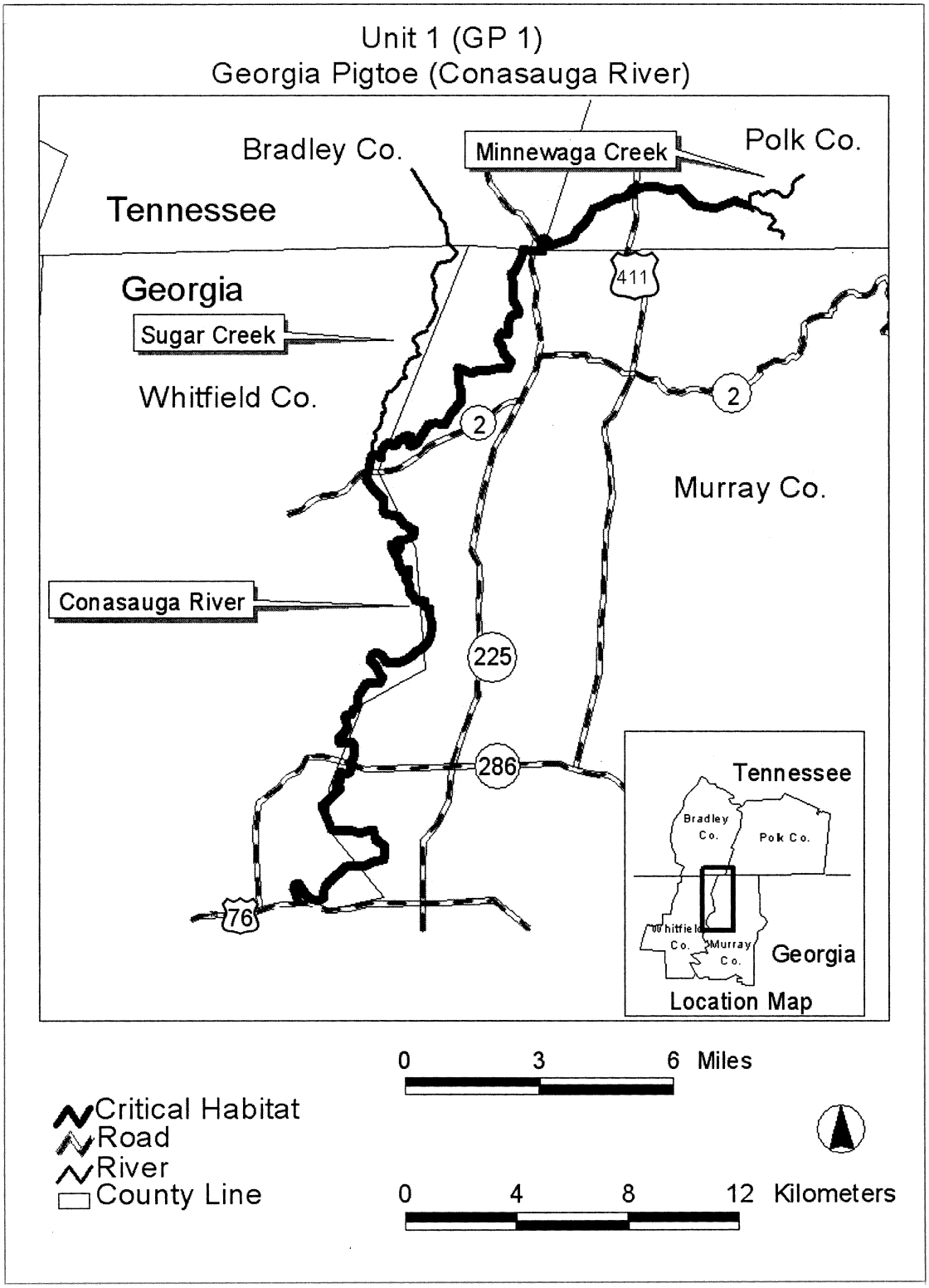


(6) Unit 1 for Georgia pigtoe (GP 1): Conasauga River, Bradley and Polk Counties, Tennessee; Murray and Whitfield Counties, Georgia.

(i) Unit GP 1 includes the channel of the Conasauga River from the confluence of Minnewaga Creek (longitude 84.690540, latitude 35.003703), Polk County, Tennessee, downstream to U.S. Highway 76 (longitude 84.873083, latitude 34.783154), Murray/Whitfield County, Georgia.

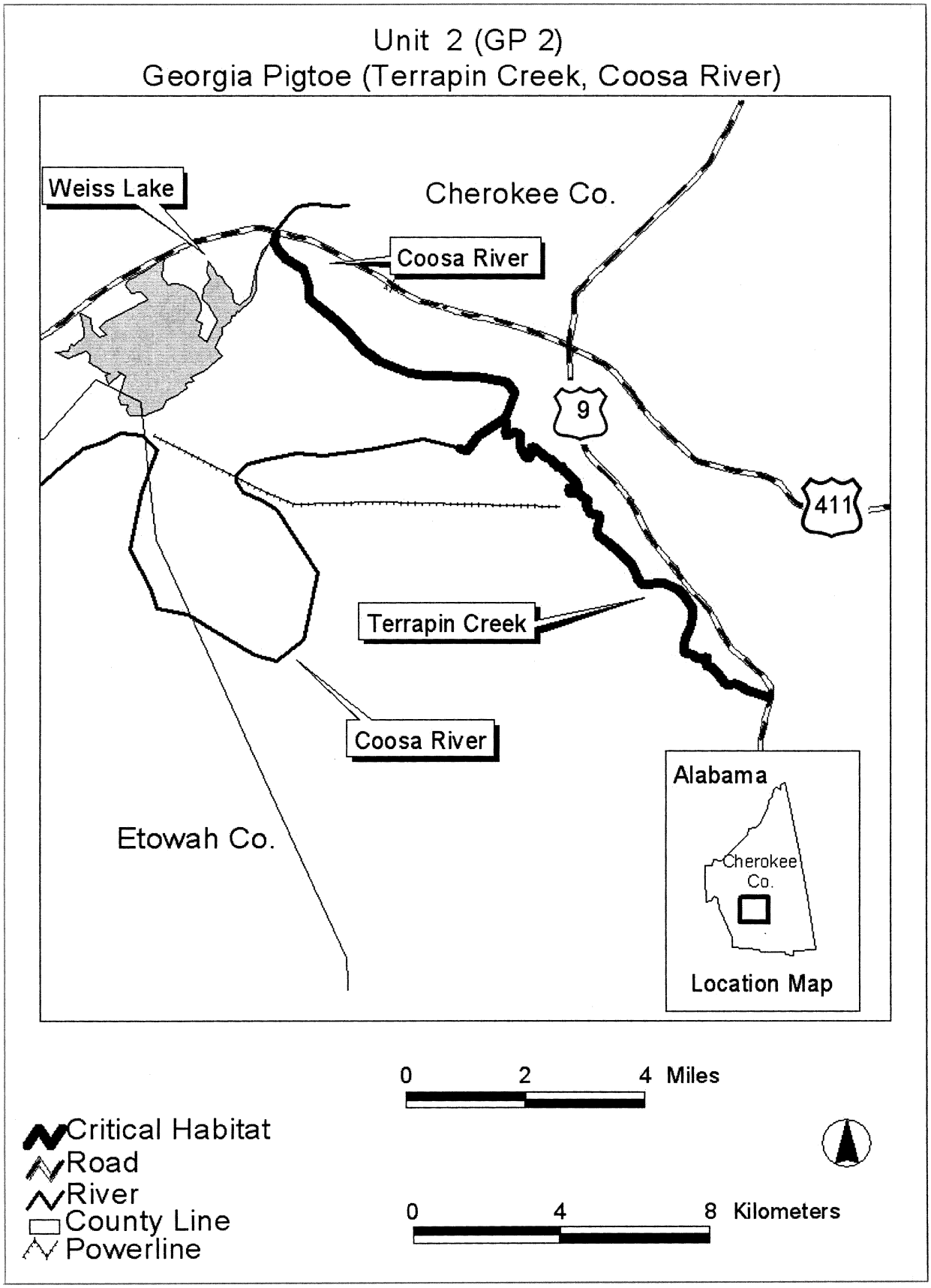
(ii) *Note*: Map of Unit 1 (GP 1) for Georgia pigtoe (Conasauga River) follows:



(7) Unit 2 for Georgia pigtoe (GP 2), Terrapin Creek and Coosa River, Cherokee County, Alabama.

(i) Unit GP 2 includes the channel of Terrapin Creek from Alabama Highway 9 (longitude 85.612250, latitude 34.062972), downstream to the confluence with the Coosa River (longitude 85.687750, latitude 34.13084), Cherokee County, Alabama; and the Coosa River channel from Weiss Dam (longitude 85.753667, latitude 34.172361), downstream to a point 1.6 km (1 mi) below the confluence of Terrapin Creek (longitude 85.701407, latitude 34.123895), Cherokee County, Alabama.

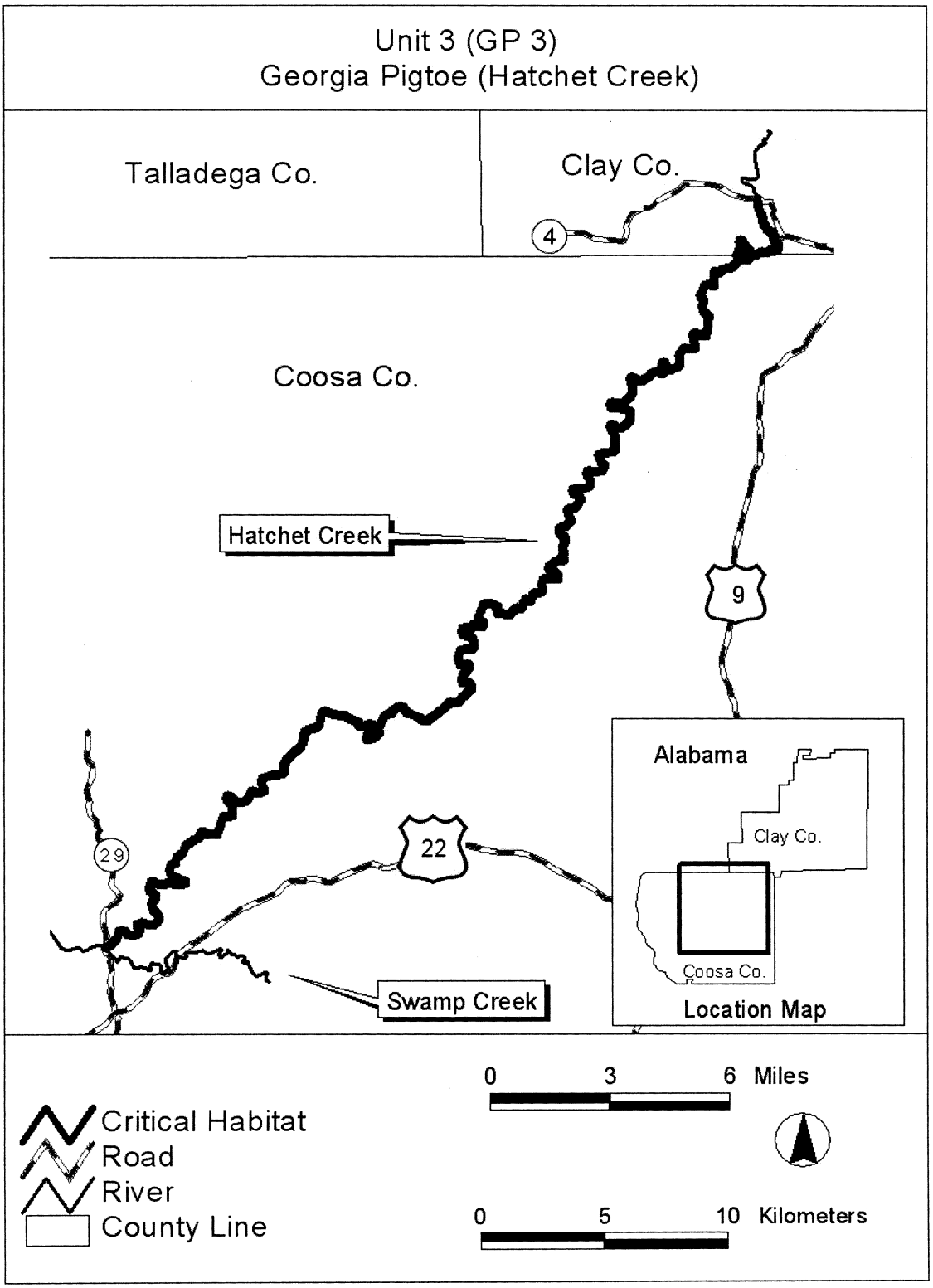
(ii) *Note*: Map of Unit 2 (GP 2) for Georgia pigtoe (Terrapin Creek and Coosa River) follows:


Unit 2 (GP 2)
Georgia Pigtoe (Terrapin Creek, Coosa River)
Weiss Lake
Cherokee Co.
Coosa River
9
411
Terrapin Creek
Coosa River
Etowah Co.
Alabama
Cherokee Co.
Location Map
0 2 4 Miles
Critical Habitat
Road
River
County Line
Powerline
0 4 8 Kilometers

(8) Unit 3 for Georgia pigtoe (GP 3): Hatchet Creek, Coosa and Clay Counties, Alabama.

(i)Unit GP 3 includes the channel of Hatchet Creek from Clay County Road 4 (longitude 86.054306, latitude 33.129472), Clay County, downstream to the confluence of Swamp Creek at Coosa County Road 29 (longitude 86.338361, latitude 32.860944), Coosa County, Alabama.

(ii)*Note*: Map of Unit 3 (GP 3) for Georgia pigtoe (Hatchet Creek) follows:



Interrupted Rocksnail (*Leptoxis foremani*)

(1) Critical habitat units are depicted for Cherokee and Elmore Counties, Alabama, and Gordon and Floyd Counties, Georgia, on the maps below.

(2) The primary constituent elements (PCEs) of critical habitat for the interrupted rocksnail are the habitat components that provide:

(i) Geomorphically stable stream and river channels and banks (channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation).

(ii) A hydrologic flow regime (the magnitude, frequency, duration, and seasonality of discharge over time) necessary to maintain benthic habitats where the species are found. Unless other information becomes available, existing conditions at locations where the species occur will be considered as minimal flow requirements for survival.

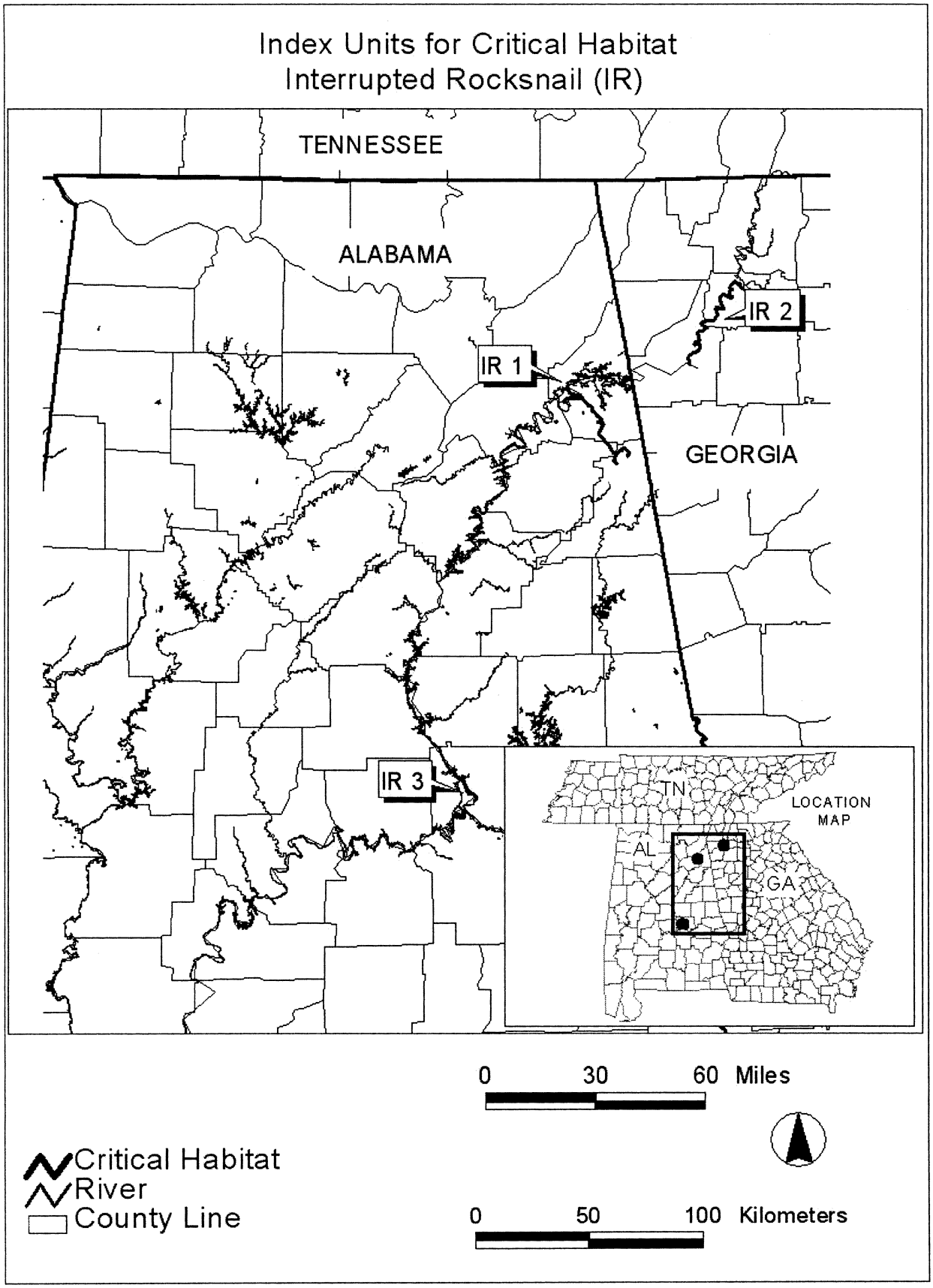
(iii) Water quality (including temperature, pH, hardness, turbidity, oxygen content, and chemical constituents) that meets or exceeds the current aquatic life criteria established under the Clean Water Act (33 U.S.C. 1251–1387).

(iv) Sand, gravel, cobble, boulder, or bedrock substrates with low to moderate amounts of fine sediment and attached filamentous algae.

(3) Critical habitat does not include manmade structures existing on the effective date of this rule and not containing one or more of the PCEs, such as buildings, bridges, aqueducts, airports, and roads, and the land on which such structures are located.

(4) *Critical habitat unit maps*. Maps were developed from USGS 7.5' quadrangles, and critical habitat unit upstream and downstream limits were then identified by longitude and latitude using decimal degrees.

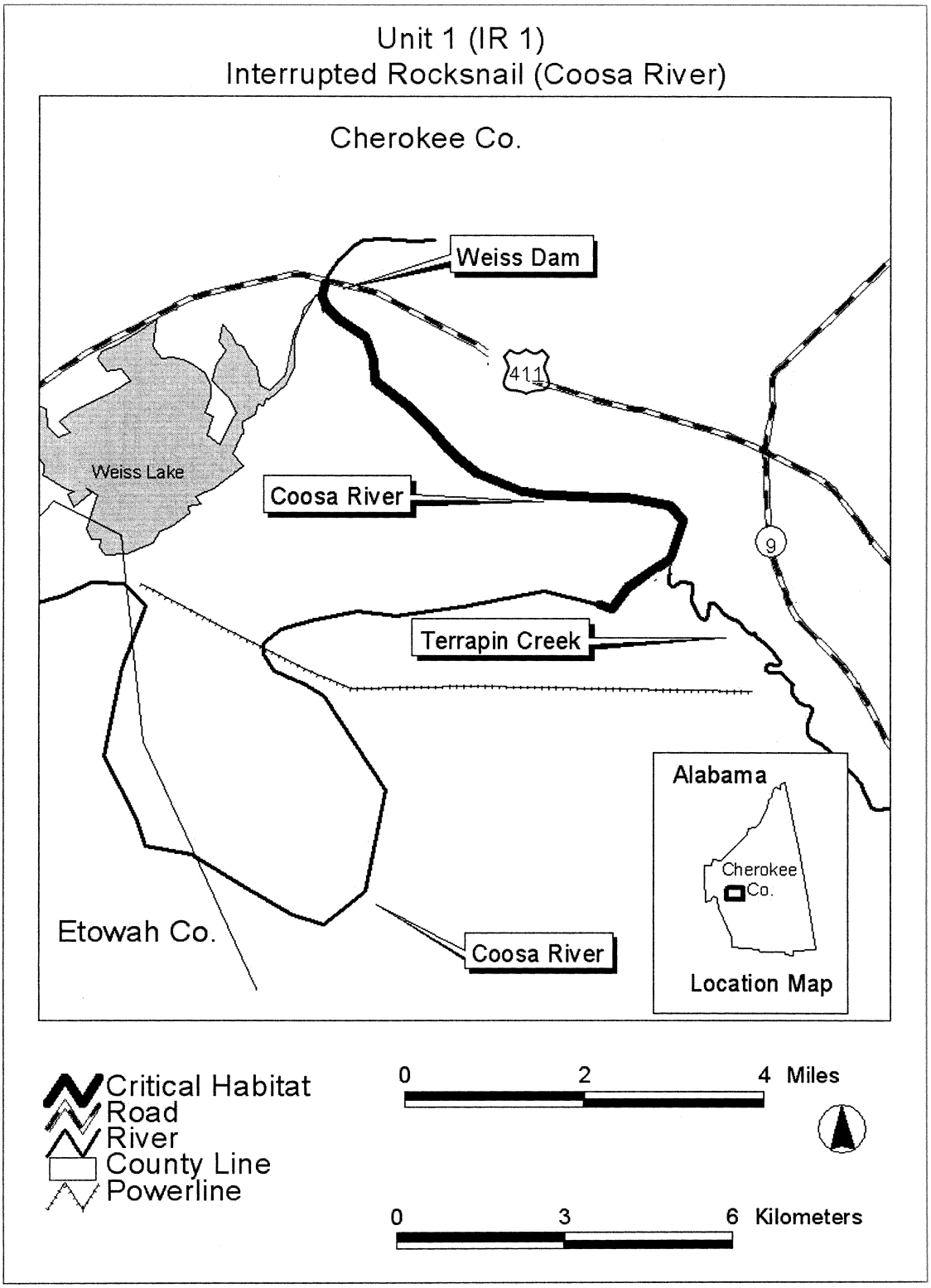
(5) *Note*: Index map of critical habitat units for the interrupted rocksnail follows:


Index Units for Critical Habitat
Interrupted Rocksnail (IR)
TENNESSEE
ALABAMA
GEORGIA
IR 1
IR 2
IR 3
TN
AL
GA
LOCATION MAP
0 30 60 Miles
0 50 100 Kilometers
Critical Habitat
River
County Line

(6) Unit 1 for interrupted rocksnail (IR 1): Coosa River, Cherokee County, Alabama.

(i) Unit IR 1 includes the Coosa River channel from Weiss Dam (longitude 85.753667, latitude 34.172361), downstream to a point 1.6 km (1 mi) below the confluence of Terrapin Creek (longitude 85.701407, latitude 34.123895), Cherokee County, Alabama.

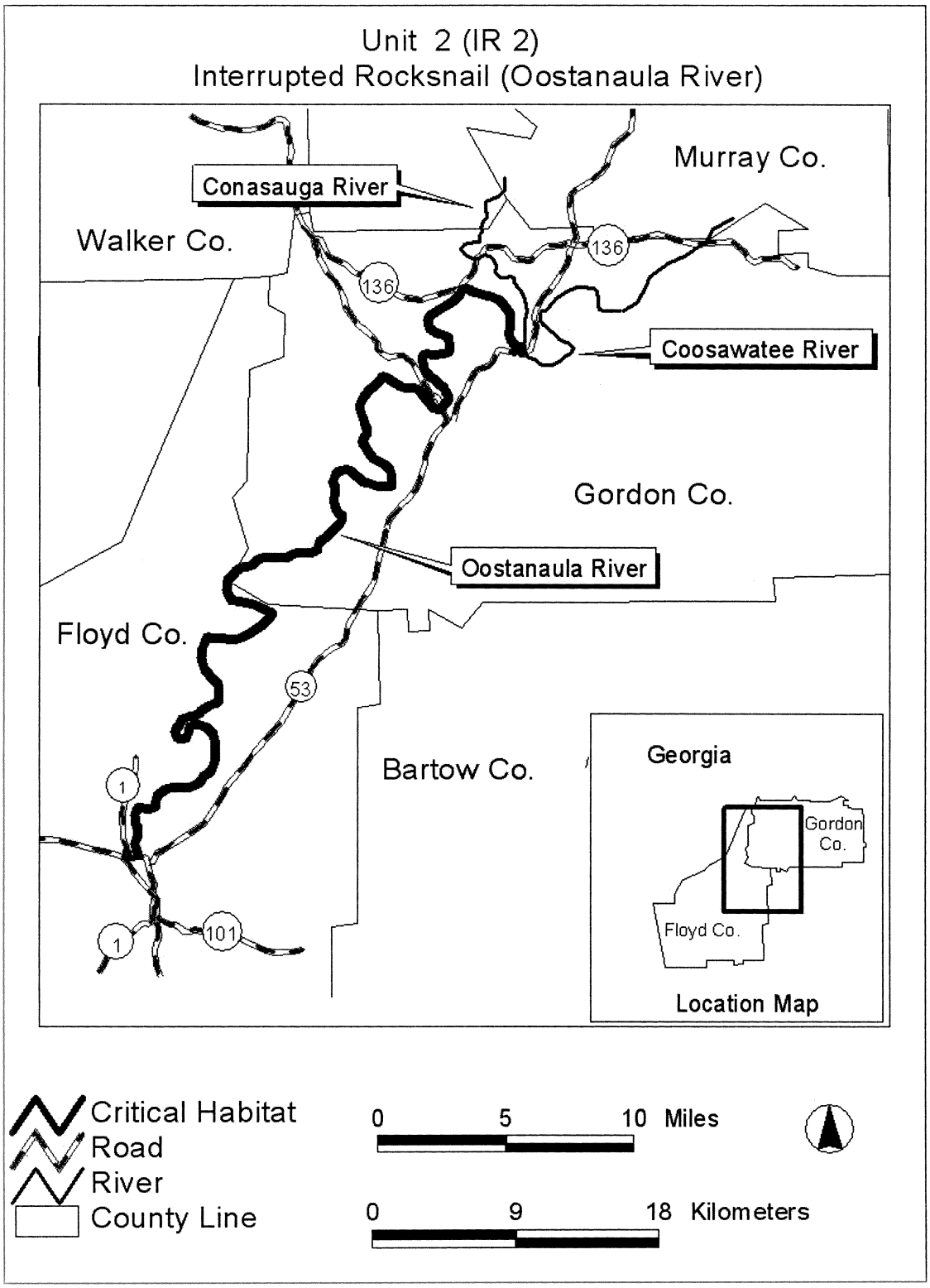
(ii) *Note*: Map of Unit 1 (IR 1) for interrupted rocksnail (Coosa River) follows:



(7) Unit 2 for interrupted rocksnail (IR 2): Oostanaula River, Gordon and Floyd Counties, Georgia.

(i) Unit IR 2 includes the primary channel of the Oostanaula River from the confluence of the Conasauga and Coosawattee Rivers (longitude 84.904611, latitude 34.544833), Gordon County, downstream to Georgia Highway 1 Loop (longitude 85.171417, latitude 34.260694), Floyd County, Georgia.

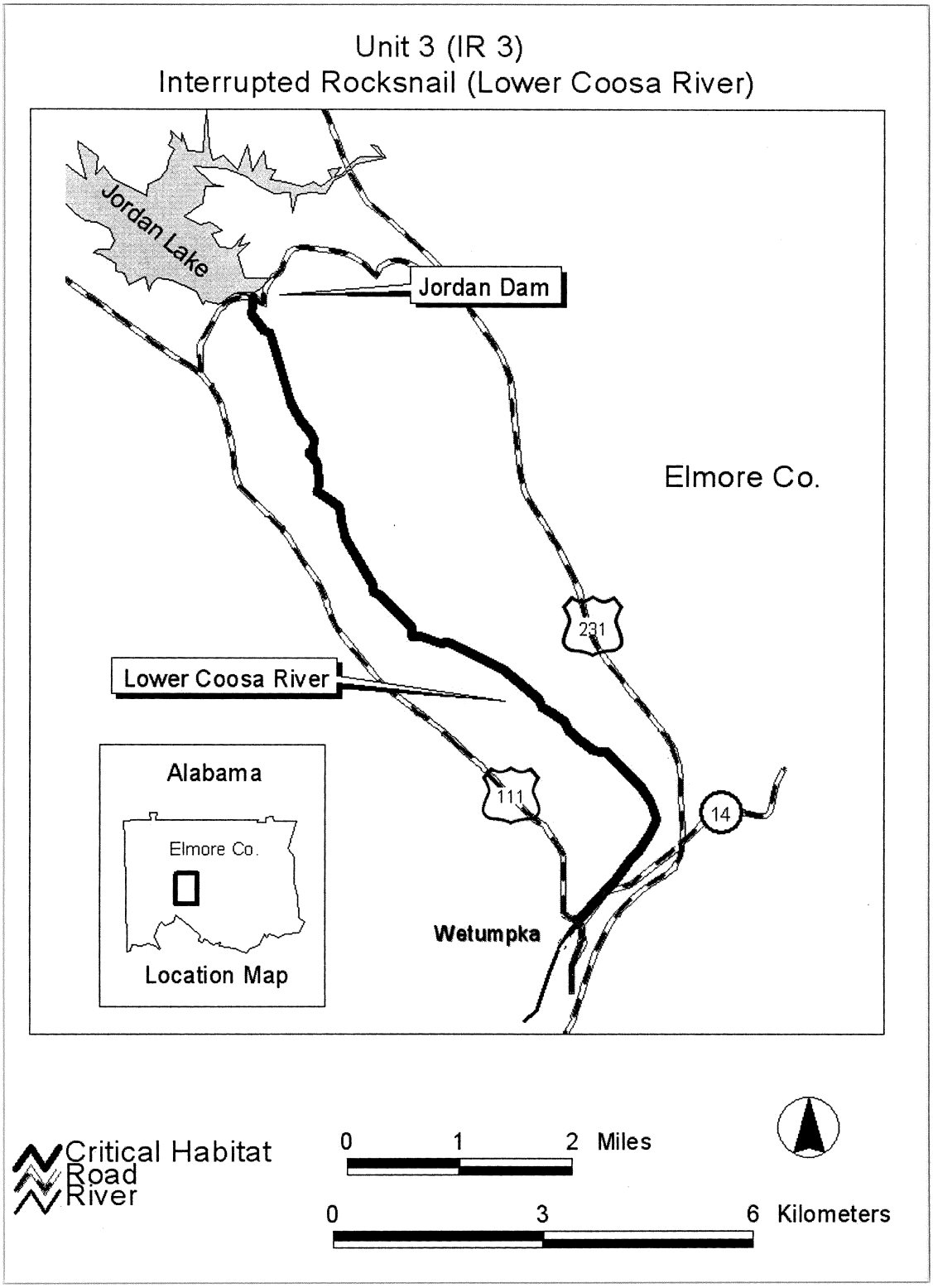
(ii) *Note*: Map of Unit 2 (IR 2) for interrupted rocksnail (Oostanaula River) follows:



(8) Unit 3 for interrupted rocksnail (IR 3): Lower Coosa River, Elmore County, Alabama.

(i) Unit IR 3 includes the Coosa River channel from Jordan Dam (longitude 86.254611, latitude 32.618250), downstream to Alabama Highway 111 Bridge (longitude 86.208500, latitude 32.535250), Elmore County, Alabama.

(ii) *Note*: Map of Unit 3 (IR 3) for interrupted rocksnail (Lower Coosa River) follows:



Rough Hornsnail (*Pleurocera foremani*)

(1) Critical habitat units are depicted for Elmore and Shelby Counties, Alabama, on the maps below.

(2) The primary constituent elements (PCEs) of critical habitat for the rough hornsnail are the habitat components that provide:

(i) Geomorphically stable stream and river channels and banks (channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation).

(ii) A hydrologic flow regime (the magnitude, frequency, duration, and seasonality of discharge over time) necessary to maintain benthic habitats where the species are found. Unless other information becomes available, existing conditions at locations where the species occur will be considered as minimal flow requirements for survival.

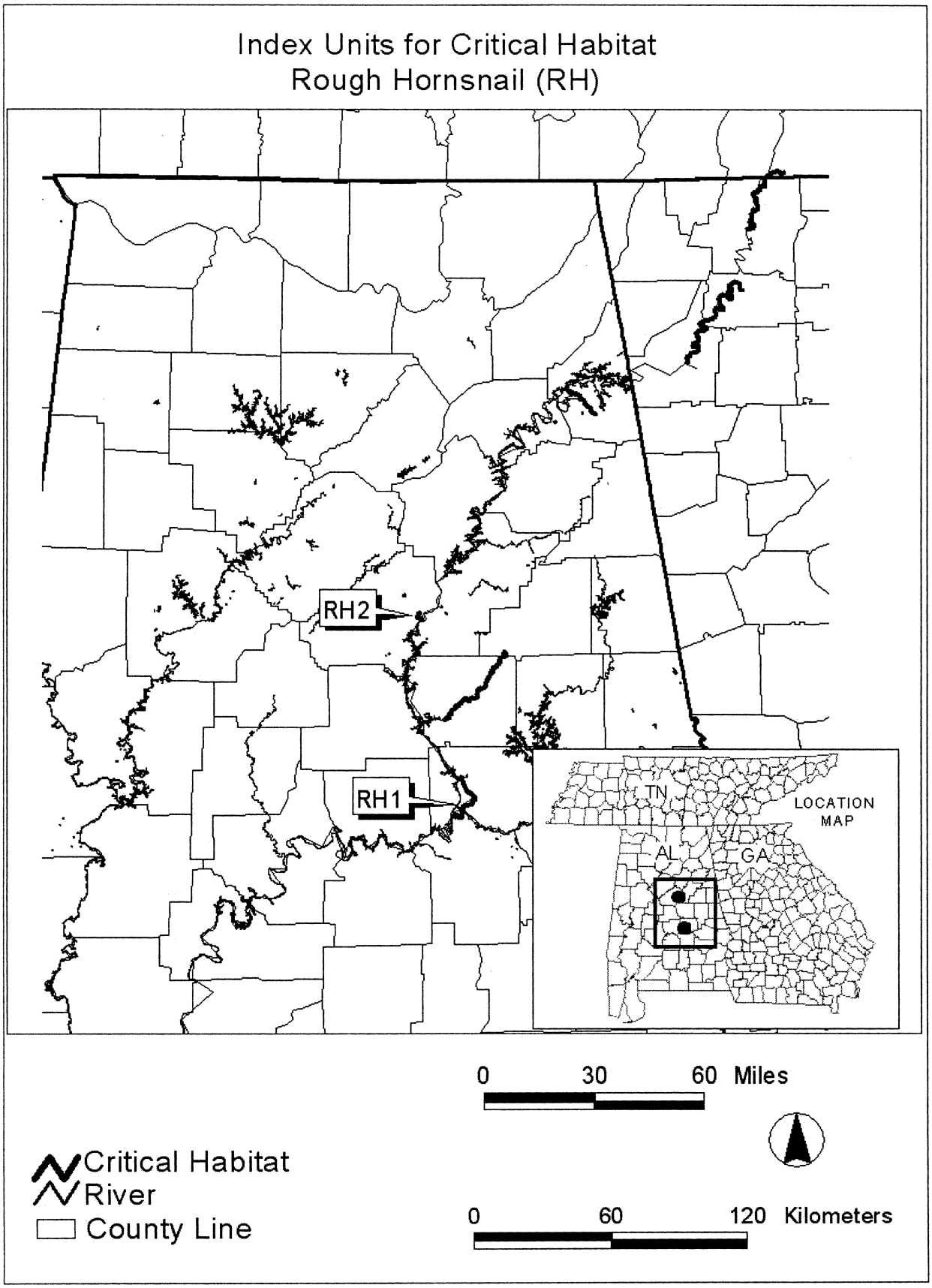
(iii) Water quality (including temperature, pH, hardness, turbidity, oxygen content, and chemical constituents) that meets or exceeds the current aquatic life criteria established under the Clean Water Act (33 U.S.C. 1251–1387).

(iv) Sand, gravel, cobble, boulder, or bedrock substrates with low to moderate amounts of fine sediment and attached filamentous algae.

(3) Critical habitat does not include manmade structures existing on the effective date of this rule and not containing one or more of the primary constituent elements, such as buildings, bridges, aqueducts, airports, and roads, and the land on which such structures are located.

(4) *Critical habitat unit maps.* Maps were developed from USGS 7.5' quadrangles, and critical habitat unit upstream and downstream limits were then identified by longitude and latitude using decimal degrees.

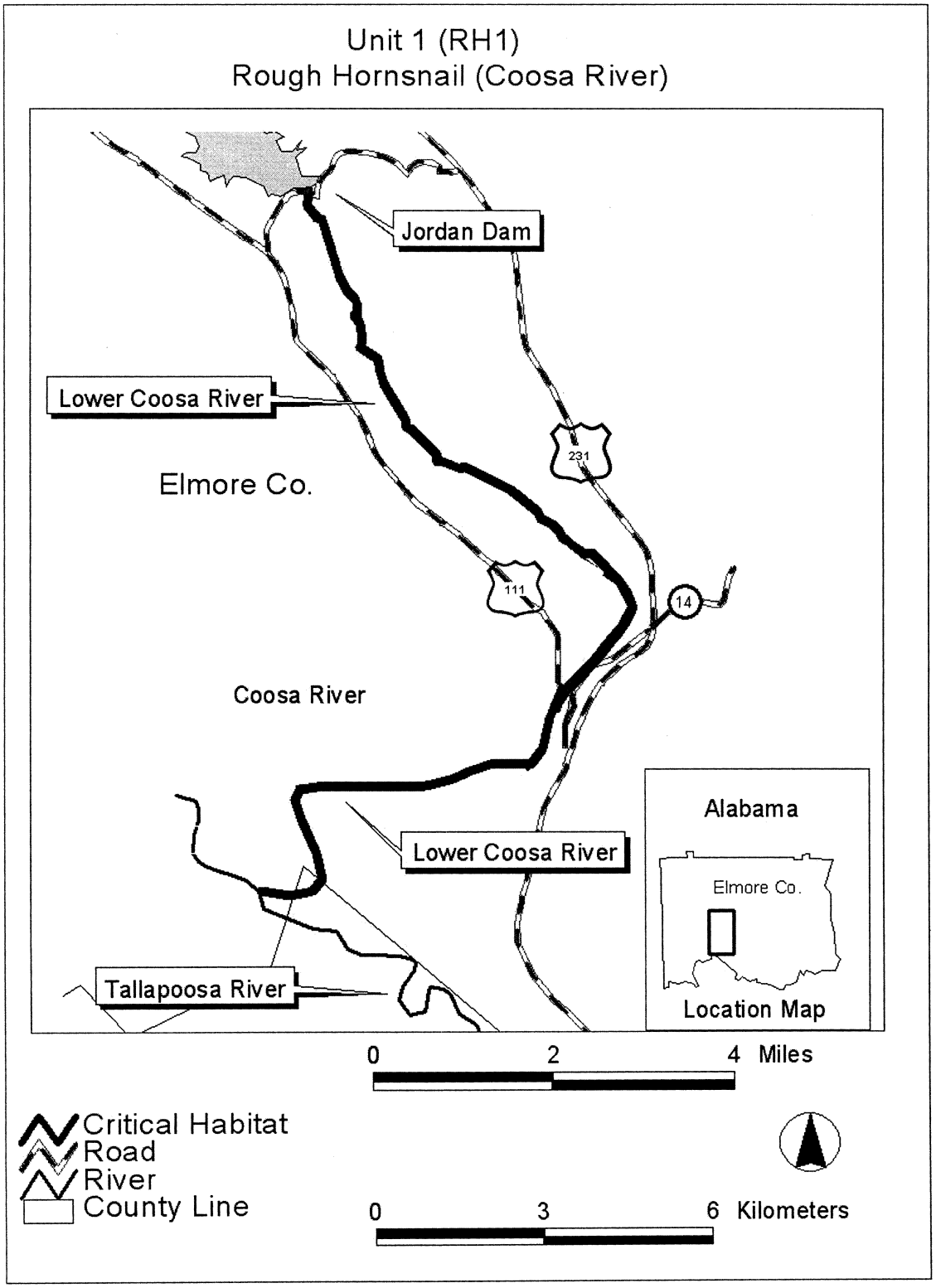
(5) *Note*: Index map of critical habitat units for the rough hornsnail follows:


Index Units for Critical Habitat
Rough Hornsnail (RH)
RH2
RH1
TN
LOCATION MAP
AL
GA
0 30 60 Miles
0 60 120 Kilometers
Critical Habitat
River
County Line

(6) Unit 1 for rough hornsnail (RH 1): Lower Coosa River, Elmore County, Alabama.

(i) Unit RH 1 includes the Coosa River channel from Jordan Dam (longitude 86.254611, latitude 32.618250), downstream to the confluence of the Tallapoosa River (longitude 86.265417, latitude 32.515417), Elmore County, Alabama.

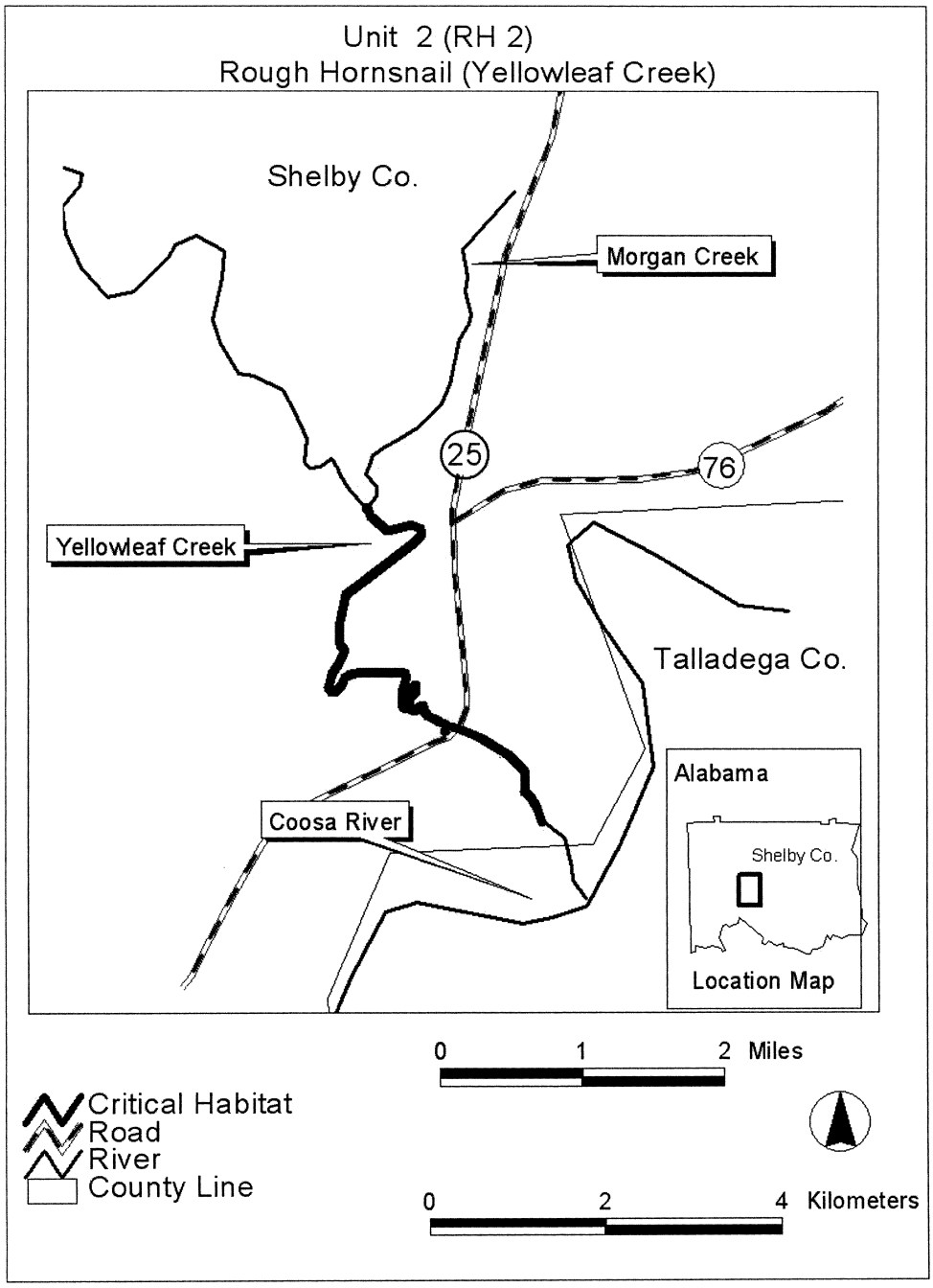
(ii) *Note*: Map of Unit 1 (RH 1) for rough hornsnail (Lower Coosa River) follows:



(7) Unit 2 for rough hornsnail (RH 2): Yellowleaf Creek, Shelby County, Alabama.

(i) Unit RH 2 includes the channel of Yellowleaf Creek from the confluence of Morgan Creek (longitude 86.459972, latitude 33.283667), downstream to 1.6 km (1 mi) below Alabama Highway 25 (longitude 86.438583, latitude 33.251306), Shelby County, Alabama.

(ii) *Note*: Map of Unit 2 (RH 2) for rough hornsnail (Yellowleaf Creek) follows:




Dated: May 27, 2009

**Jane Lyder**

*Deputy Assistant Secretary for Fish and Wildlife and Parks*

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