DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AU87

Endangered and Threatened Wildlife and Plants; Critical Habitat for Five Endangered and Two Threatened Mussels in Four Northeast Gulf of Mexico Drainages

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to designate critical habitat for the endangered fat threeridge, shinyrayed pocketbook, Gulf moccasinshell, Ochlockonee moccasinshell, and oval pigtoe, and the threatened Chipola slabshell and purple bankclimber (collectively referred to as the seven mussels), pursuant to the Endangered Species Act of 1973, as amended (Act). We propose to designate 11 units encompassing approximately 1,864 kilometers (1,158 miles) of river and stream channels as critical habitat. Proposed critical habitat includes portions of the Econfina Creek drainage in Florida, the Apalachicola—Chattahoochee—Flint River drainage in Alabama, Florida, and Georgia, the Ochlockonee River drainage in Florida and Georgia, and the Suwannee River drainage in Florida.

DATES: We will accept comments from all interested parties until August 7, 2006. We must receive requests for public hearings, in writing, at the address shown in the **ADDRESSES** section by July 21, 2006.

ADDRESSES: If you wish to comment, you may submit your comments and materials concerning this proposal by any one of the following methods:

1. You may submit written comments and information to the Field Supervisor, U.S. Fish and Wildlife Service, 1601 Balboa Avenue, Panama City, Florida 32405.

2. You may hand-deliver written comments to our office, at the above address.

3. You may send comments by electronic mail (e-mail) to *FW4ESFRPanamaCity@FWS.gov.* Please see the ''Public Comments Solicited'' section under **SUPPLEMENTARY INFORMATION** for file format and other information about electronic filing.

4. You may fax your comments to 850–763–2177.

5. Federal eRulemaking Portal: *http://www.regulations.gov.* Follow the instructions for submitting comments.

Comments and materials received, as well as supporting documentation used in the preparation of this proposed rule, will be available for public inspection, by appointment, during normal business hours at U.S. Fish and Wildlife Service, 1601 Balboa Avenue, Panama City, Florida 32405 (telephone 850–769–0552).

FOR FURTHER INFORMATION CONTACT: Jerry Ziewitz at the address above (telephone 850–769–0552 ext. 223; facsimile 850–763–2177).

SUPPLEMENTARY INFORMATION:

Public Comments Solicited

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

(1) The reasons any habitat should or should not be determined to be critical habitat as provided by section 4 of the Act (16 U.S.C. 1531 *et seq.*), including whether the benefit of designation will outweigh any threats to the species due to designation;

(2) Specific information on the amount and distribution of habitat for the seven mussels, including areas occupied by the seven mussels 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;

(3) Whether the middle section of the Flint River complex, between the confluence of Gum Creek and the confluence of Auchumpkee/Ulcohatchee Creek, has the Primary Constituent Elements for the mussels, is occupied by the mussels, or is essential to the conservation of the mussels;

(4) Land use designations and current or planned activities in the subject areas and their possible impacts on proposed critical habitat;

(5) Any foreseeable economic, national security, or other potential impacts resulting from the proposed designation and, in particular, any impacts on small entities; and

(6) 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.

If you wish to comment, you may submit your comments and materials concerning this proposal by any one of several methods (see **ADDRESSES** section). Please submit e-mail comments to *FW4ESFRPanamaCity@FWS.gov* in ASCII file format and avoid the use of special characters or any form of encryption. Please also include ''Attn: 7 mussels—RIN 1018–AU87'' in your e-mail subject header, and your name and return address in the body of your message. If you do not receive a confirmation from the system that we have received your message, contact us directly by calling our Panama City, Florida, Fish and Wildlife Office at phone number 850–769–0552. Please note that the e-mail address *FW4ESFRPanamaCity@FWS.gov* will be closed out at the termination of the public comment period.

Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home addresses from the rulemaking record, which we will honor to the extent allowable by law. There also may be circumstances in which we would withhold from the rulemaking record a respondent's identity, as allowable by law. If you wish us to withhold your name or address, you must state this prominently at the beginning of your comment, but you should be aware that the Service may be required to disclose your name and address pursuant to the Freedom of Information Act. However, we will not consider anonymous comments. We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

Role of Critical Habitat in Actual Practice of Administering and Implementing the Act

Attention to and protection of habitat is paramount to successful conservation actions. The role that designation of critical habitat plays in protecting habitat of listed species, however, is often misunderstood. There are significant limitations on the regulatory effect of designation under Act section 7(a)(2). In brief, (1) designation provides additional protection to habitat only where there is a Federal nexus; (2) the protection is relevant only when, in the

absence of designation, destruction or adverse modification of the critical habitat would in fact take place (in other words, other statutory or regulatory protections, policies, or other factors relevant to agency decision-making would not prevent the destruction or adverse modification); and (3) designation of critical habitat triggers the prohibition of destruction or adverse modification of that habitat, but it does not require specific actions to restore or improve habitat.

Currently, only 475 species, or 36 percent of the 1,311 listed species in the U.S. under the jurisdiction of the Service, have designated critical habitat. We address the habitat needs of all 1,311 listed species through conservation mechanisms such as listing, section 7 consultations, the section 4 recovery planning process, the section 9 protective prohibitions of unauthorized take, section 6 funding to the States, the section 10 incidental take permit process, and cooperative, non-regulatory efforts with private landowners. The Service believes that it is these measures that may make the difference between extinction and survival for many species.

In considering exclusions of areas proposed for designation, we evaluated the benefits of designation in light of *Gifford Pinchot Task Force* v. *United States Fish and Wildlife Service (378 F. 3d 1059 (9th Cir 2004).* In that case, the Ninth Circuit invalidated the Service's regulation defining ''destruction or adverse modification of critical habitat.'' In response, on December 9, 2004, the Director issued guidance to be considered in making section 7 adverse modification determinations. This proposed critical habitat designation does not use the invalidated regulation in our consideration of the benefits of including areas in this final designation. Rather, it relies on the guidance issued by the Director in response to the *Gifford Pinchot* decision (see ''Adverse Modification Standard'' discussion below). The Service will carefully manage future consultations that analyze impacts to designated critical habitat, particularly those that appear to be resulting in an adverse modification determination. Such consultations will be reviewed by the Regional Office prior to finalizing to ensure that an adequate analysis has been conducted that is informed by the Director's guidance.

On the other hand, to the extent that designation of critical habitat provides protection, that protection can come at significant social and economic cost. In addition, the mere administrative process of designation of critical habitat is expensive, time-consuming, and controversial. The current statutory framework of critical habitat, combined with past judicial interpretations of the statute, make critical habitat the subject of excessive litigation. As a result, critical habitat designations are driven by litigation and courts rather than biology, and made at a time and under a time frame that limits our ability to obtain and evaluate the scientific and other information required to make the designation most meaningful.

In light of these circumstances, the Service believes that additional agency discretion would allow our focus to return to those actions that provide the greatest benefit to the species most in need of protection.

Procedural and Resource Difficulties in Designating Critical Habitat

We have been inundated with lawsuits for our failure to designate critical habitat, and we face a growing number of lawsuits challenging critical habitat determinations once they are made. These lawsuits have subjected the Service to an ever-increasing series of court orders and court-approved settlement agreements, compliance with which now consumes nearly the entire listing program budget. This leaves the Service with little ability to prioritize its activities to direct scarce listing resources to the listing program actions with the most biologically urgent species conservation needs.

The consequence of the critical habitat litigation activity is that limited listing funds are used to defend active lawsuits, to respond to Notices of Intent (NOIs) to sue relative to critical habitat, and to comply with the growing number of adverse court orders. As a result, listing petition responses, the Service's own proposals to list critically imperiled species, and final listing determinations on existing proposals are all significantly delayed.

The accelerated schedules of court-ordered designations have left the Service with limited ability to provide for public participation or to ensure a defect-free rulemaking process before making decisions on listing and critical habitat proposals, due to the risks associated with noncompliance with judicially imposed deadlines. This in turn fosters a second round of litigation in which those who fear adverse impacts from critical habitat designations challenge those designations. The cycle of litigation appears endless and is expensive, thus diverting resources from conservation actions that may provide relatively more benefit to imperiled species.

The costs resulting from the designation include legal costs, the cost of preparation and publication of the designation, the analysis of the economic effects and the cost of requesting and responding to public comment, and in some cases the costs of compliance with the National Environmental Policy Act (NEPA; 42 U.S.C. 4371 *et seq.*). These costs, which are not required for many other conservation actions, directly reduce the funds available for direct and tangible conservation actions.

Background

In this proposed rule, we intend to discuss only information about the seven mussels that is directly relevant to the designation of critical habitat. For more information about these seven mussels, please refer to our final rule listing fat threeridge, shinyrayed pocketbook, Gulf moccasinshell, Ochlockonee moccasinshell, and oval pigtoe as endangered, and Chipola slabshell and purple bankclimber as threatened published in the **Federal Register** on March 16, 1998 (63 FR 12664) and to our final recovery plan, which is available from the Panama City, Florida Fish and Wildlife Office or online at *http://www.fws.gov/endangered/recovery/Index.html#plans.* The purple bankclimber (*Elliptoideus sloatianus*), Gulf moccasinshell (*Medionidus penicillatus*), Ochlockonee moccasinshell (*Medionidus simpsonianus*), oval pigtoe (*Pleurobema pyriforme*), shinyrayed pocketbook (*Lampsilis subangulata*), Chipola slabshell (*Elliptio chipolaensis*), and fat threeridge (*Amblema neislerii*) are variously distributed in four river basins that flow into the northeast Gulf of Mexico: Econfina Creek, Apalachicola River (a large basin generally labeled with the names of its major tributaries, the Chattahoochee and Flint rivers, as the ACF River Basin), Ochlockonee River, and Suwannee River.

The endangered fat threeridge is a medium-sized to large, subquadrate, inflated, solid, and heavy-shelled mussel that reaches a length of 10.2 centimeters (cm) (4.0 inches (in)). Large specimens are so inflated that the width approximates the height. The umbos (bulges near the hinge of the shell) are in the anterior quarter of the shell. The dark brown to black shell is strongly sculptured with seven or eight prominent horizontal parallel plications (ridges).

The endangered shinyrayed pocketbook is a medium-sized mussel that reaches approximately 8.4 cm (3.3 in) in length. The shell is generally elongated, with broad, somewhat inflated umbos and a rounded posterior ridge. The shell is thin but solid. The

surface is smooth and shiny and ranges from straw-yellow to chestnut-brown with a variable number of black to bright emerald-green rays, which emanate from the umbo across the disk.

The shinyrayed pocketbook was listed as federally endangered under the scientific name *Lampsilis subangulata.* The shinyrayed pocketbook and three other *Lampsilis* species that are not federally listed are now assigned to the newly recognized genus *Hamiota* (Roe and Hartfield 2005, p. 1). Several characteristics, including glochidia packaging in a superconglutinate, placement and shape of the marsupia, and glochidia release through the excurrent siphon, support recognition of these species as a distinct genus (Roe and Hartfield 2005, p. 1), and we plan to implement the name change in a separate rule-making.

The endangered Gulf moccasinshell is a small mussel that reaches a length of about 5.6 cm (2.2 in), is elongate-elliptical or rhomboidal in outline, fairly inflated, and has relatively thin valves. The ventral margin is nearly straight or slightly rounded. The posterior ridge is rounded to slightly angled and intersects the end of the shell at the base line. Females tend to have the posterior point above the ventral margin and are more inflated than males.

The endangered Ochlockonee moccasinshell is small, generally under 5.6 cm (2.2 in) long. It is slightly elongate-elliptical in outline, the posterior end obtusely rounded at the median line, and the ventral margin broadly curved. The posterior ridge is moderately angular and covered in its entire length with well-developed, irregular plications. Sculpturing may also extend onto the disk below the ridge. The periostracum (outside surface of the shell) is smooth. The color is light brown to yellowish green, with dark green rays formed by a series of connected chevrons or undulating lines across the length of the shell.

The endangered oval pigtoe is a small-to-medium-sized mussel that attains a length of about 6.1 cm (2.4 in). The shell is suboviform and compressed. The periostracum is shiny smooth; yellowish, chestnut, or dark brown; rayless; and with distinct growth lines. The posterior slope is biangulate and forms a blunt point on the posterior margin. The umbos are slightly elevated above the hingeline.

The endangered oval pigtoe is the only species among the seven mussels of this proposed rule that occurs in all four Gulf of Mexico river basins comprising their collective range: Econfina Creek, ACF, Ochlockonee, and Suwannee. Morphological variation across this broad range has led to the description of several nominal species since it was originally described as *Unio pyriformis* (Lea 1857, p. 169–172). Williams and Butler (1994, p. 111) recognized the form distributed in the Ochlockonee and Suwannee River systems as the Florida pigtoe, *Pleurobema reclusum* (Wright 1898, p. 111–112), consistent with Simpson (1914, p. 1–1540). However, Turgeon *et al.* (1998, p. 36) recognized the forms from all four basins as one species, *P. pyriforme*, which was the taxonomic classification upon which we relied on for the 1998 final rule listing this species as endangered. A recent study using molecular genetic techniques compared tissue samples from three of the four basins (Econfina Creek, ACF, and Suwannee), and concluded that the Suwannee samples were distinctive and warranted specific status as *P. reclusum* (Kandl *et al.* 2001, p. 10). We acknowledged these findings in our 2003 final recovery plan, but have deferred any revisions to the listing taxonomy pending review of an analysis that includes samples from the Ochlockonee Basin as well. Peer review and publication of a genetic analysis of samples from all four basins is expected sometime in 2006 (J.D. Williams, USGS, pers. comm. 2005).

The threatened Chipola slabshell is a medium-sized species reaching a length of about 8.4 cm (3.3 in). The shell is ovate to subelliptical, somewhat inflated, and with the posterior ridge starting out rounded but flattening to form a prominent biangulate margin. The periostracum is smooth and chestnut-colored. Dark brown coloration may appear in the umbo region, and the remaining surface may exhibit alternating light and dark bands.

The threatened purple bankclimber is a large, heavy-shelled, strongly sculptured mussel reaching lengths of 20.5 cm (8.0 in). A well-developed posterior ridge extends from the umbo to the posterior ventral margin of the shell. The posterior slope and the disk just anterior to the posterior ridge are sculptured by several irregular plications that vary greatly in development. The umbos are low, extending just above the dorsal margin of the shell.

Life History

The seven mussels are all bivalve mollusks (clams) of the family Unionidae. Unionid mussels generally live embedded in the bottom of rivers, streams, and other bodies of water. They siphon water into their shells and across four gills that are specialized for respiration and food collection. Known food items include detritus (disintegrated organic debris), diatoms, phytoplankton, zooplankton, and other microorganisms (Coker *et al.* 1921, p. 88; Churchill and Lewis 1924, p. 462; Fuller 1974, p. 221). Adults are filter feeders and generally orient themselves on or near the substrate surface to take food and oxygen from the water above them (Kraemer 1979, p. 1085–1096). Juveniles typically burrow completely beneath the substrate surface and are pedal (foot) feeders (bringing food particles inside the shell for ingestion that adhere to the foot while it is extended outside the shell) until the structures for filter feeding are more fully developed (Gatenby *et al.* 1996, p. 604; Yeager *et al.* 1994, p. 221).

Sexes in unionid mussels are usually separate. Males release sperm into the water, which females take in through their siphons during feeding and respiration. Eggs are fertilized and retained in the gills of the female until the larvae (glochidia) fully develop. The glochidia of most unionid species, including all seven species addressed in this proposed rule, require a parasitic stage on the fins, gills, or skin of a fish to transform into juvenile mussels (for species-specific information, see ''Primary Constituent Elements—Fish Hosts''). Females release glochidia either separately or in masses termed conglutinates, depending on the mussel species. Exceptionally large conglutinates, such as those of the shinyrayed pocketbook, are termed superconglutinates. The duration of the parasitic stage varies by mussel species, water temperature, and perhaps host fish species. When the transformation is complete, juvenile mussels normally detach from their fish host and sink to the stream bottom where, given suitable conditions, they grow and mature to the adult form.

Distribution

The historical and current range of the seven mussels includes portions of four river basins of the northeast Gulf of Mexico in Alabama, Florida, and Georgia: Econfina Creek, ACF, Ochlockonee, and Suwannee. Of these four basins, the ACF is the largest and the only one that extends beyond the Coastal Plain physiographic province into the Piedmont of Georgia and Alabama. Two or more of the seven mussels occur in each of the four basins, except the Suwannee, in which only the oval pigtoe is found. Because large reservoirs are unsuitable as habitat for these mussels and the dams that impound them are barriers to the movement of their host fishes, their

range within two of the basins (ACF and Ochlockonee) is divided into two or more sub-basins that likely represent the maximum spatial extent of potentially interbreeding populations. We estimate that the five species listed as endangered are each extirpated from over half of their historical ranges, and the two threatened species are extirpated from about one-third of their historical ranges (USFWS 2003, p. 77).

Summary of Threats to Surviving Populations

The declining range and abundance of the seven mussels is due mostly to changes in their riverine habitats resulting from dams, dredging, mining, channelization, pollution, sedimentation, and water withdrawals, and possibly also the introduction of nonnative species, such as the Asian clam. Each of these threats affect one or more of the physical and biological habitat features that we have identified as essential to the conservation of the seven mussels, which we discuss in detail under ''Primary Constituent Elements.''

More than 350 kilometers (km) (217 miles (mi)) of large and small river habitat in the ACF and Ochlockonee basins within the current range of the seven mussels is inundated by reservoirs. None of the seven species are known to persist in impoundments, although a single purple bankclimber was found in an impounded portion of the Chattahoochee River (C. Stringfellow, Columbus State University, pers. comm. 2000). Obligate riverine fishes, some of which may serve as hosts for larvae of the seven mussels, are also eliminated by dams and impoundments. Several populations of the seven species persist in relatively small fragments of the four major river basins that are isolated from other populations by impoundments or other large patches of unsuitable habitat and by dams or other barriers to dispersal via their fish hosts. Habitat fragmentation reduces the probability of population persistence (Wilcox and Murphy 1985, p. 879–884), because smaller, more isolated populations are less able to rebound from chance adverse environmental, demographic, and genetic events (Shaffer 1981, p. 131; Lande 1988, p. 1455).

A variety of activities may induce channel instability that adversely affects habitat conditions for mussels. Because impoundments block the natural downstream movement of sediment, channel degradation is commonly observed in the tailwaters of dams (Williams and Wolman 1984, p. 14; Lignon *et al.* 1995, p. 187). The mean bed elevation of the Apalachicola River downstream of Jim Woodruff Lock and Dam, which is located at the confluence of the Chattahoochee and Flint rivers, has degraded about 1.2 to 1.5 meters (m) (4 to 5 feet (ft)) since its construction in the late 1950s (Light *et al.* 1998, p. 21). The main channel of the river widened at a rate of about 0.45 m (1.5 ft) per year, based on cross sections measured by the U.S. Army Corps of Engineers (USACE) between 1980 and 2001 (USACE 2002, p. 1.1–8.3). The Apalachicola River near the Chattahoochee-Flint confluence once supported a particularly rich mussel bed, which included large numbers of fat threeridge and purple bankclimber, but this bed had declined substantially in diversity and numbers by the early 1970s (Heard 1975, p. 1–31). Although the purple bankclimber persists, the fat threeridge is now rare in the upper river (Brim Box and Williams 2000, p. 89). Quantitative sampling using substrate sieves at two locations in the upper river failed to detect juveniles of any unionid mussels (Richardson and Yokley 1996, p. 137). The decline of the rich mussel fauna of the Chattahoochee River was attributed partly to erosion from intensive farming before the Civil War (van der Schalie 1938, p. 56; Clench 1955, p. 96), although substantial erosion continued for several more decades (Glenn 1911, p. 1–137; Trimble 1972, p. 454–457). The most striking example of this erosion and resulting stream channel instability is in the headwaters of Turner Creek, a Chattahoochee River tributary in Stewart County, Georgia. The massive amount of sediment that washed away was conveyed via Turner Creek over time to the Chattahoochee River.

Channelization

Channelization (straightening a stream course by artificial cutoffs and other means for flood control and navigation), dredging, snagging (removal of large woody debris), in-stream gravel mining, and other forms of direct stream channel modifications may induce channel instability. A well-documented example of how direct modifications to a stream induced substantial instability is the Homochitto River in Mississippi, which incised 5 m (16.4 ft) and widened 450 percent following channelization (Kesel and Yodis 1992, p. 99). Hartfield (1993, p. 131–141) and Neves *et al.* (1997, p. 71–72) reviewed the adverse effects of channel modifications on freshwater mollusks. Dredging in the Apalachicola River to maintain navigability may be contributing to observed channel instability in that system (letter from G. Carmody, Service, to R. Keyser, USACE, dated August 8, 2003). Channel instability induced by gravel mining has probably played a significant role in extirpating the Gulf moccasinshell and oval pigtoe from the Uchee Creek system (Howard 1997, p. 157), where a small population of the shinyrayed pocketbook persists. A recent Service stream habitat condition survey in the Ochlockonee Basin found evidence of substantial channel instability (actively eroding banks) at only 9 of 181 sites surveyed, but classified over half of the sites (99) as having a moderate risk of bank erosion (H. Blalock-Herod, Service, pers. comm. 2006).

Sedimentation

Sedimentation is widely reported as a contributing factor in the decline of stream mussel populations (Kunz 1898, p. 328; Ellis 1931, p. 5; 1936, p. 29; Imlay 1972, p. 76; Coon *et al.* 1977, p. 279; Marking and Bills 1979, p. 204; Dennis 1985, p. 1–171; Aldridge *et al.* 1987, p. 17; Schuster *et al.* 1989, p. 84; Wolcott and Neves 1990, p. 74; Houp 1993, p. 93–97; Richter *et al.* 1997a, p. 1090; Brim Box 1999, p. 1–108). Sedimentation is the process by which water detaches, transports, and deposits soil materials on the substrates of streams, lakes, and wetlands. In geomorphically stable stream reaches, sediment input is balanced by sediment output, resulting in no net accumulation or loss of sediment from the stream bed. Sediment input is increased by a variety of human activities that are common in the range of the seven mussels. Substantial sediment accumulation is one factor that may induce channel instability. Lesser amounts may also adversely affect substrate quality for mussels by altering its texture (usually by increasing the percentage of fine materials) and by introducing harmful pollutants.

Waters (1995, p. 173–176) reviewed the biological effects of sediments in streams, and Mount (1995, p. 1–359) provided an overview of the effects of various land uses on stream systems. Brim Box and Mossa (1999, p. 99–117) reviewed the effects of sediments and land uses specifically on mussels. They identified several activities that may affect mussels through sedimentation, including logging, farming, ranching, mining, and urbanization. Without adequate measures to control erosion, these activities may deliver sediment to streams via upland gullies, unpaved roads, road-side ditches, construction sites, and other areas of soil disturbance. All of these activities are widespread in the current range of the seven mussels.

Sediment samples from several ACF Basin streams contained elevated

concentrations of two heavy metals that are harmful to mussels: Copper (found throughout the Piedmont) and cadmium (found in large Coastal Plain tributaries of the Flint River) (Frick *et al.* 1998, p. 19). Elevated concentrations of heavy metals (such as chromium and cadmium) were measured in Asian clams and in sediment samples collected downstream of two abandoned battery salvage operations on the Chipola River (Winger *et al.* 1985, p. 141, 144). Farther downstream in the Chipola River, the chromium concentrations found in the sediments of Dead Lake (Winger *et al.* 1985, p. 141, 144) are toxic to mussels (Havlik and Marking 1987, p. 1–20).

Impoundments

The operations of several dams and withdrawals of surface and groundwater may alter flow regimes to a degree that adversely affects mussels. Four portions of the range of the seven mussels are immediately downstream of major mainstem dams. The Apalachicola River is downstream of Jim Woodruff Lock and Dam (JWLD), which impounds Lake Seminole, a large but shallow reservoir in the southwest corner of Georgia with a storage capacity of about 86 million meters^3 (70,000 acre-feet). Seminole is the downstream-most reservoir in a series of much larger reservoirs on the Chattahoochee River with a cumulative capacity of about 2.2 billion m^3 (1.8 million ac-ft), which represents about 11 percent of the average annual discharge from JWLD (USACE 1998, p. 4.10, 4.48, 4.56). During extended periods without substantial rainfall, however, as during 1999 to 2002, the flow of the Apalachicola River may consist mostly of releases from storage in the Chattahoochee reservoirs.

The Flint River is impounded by two mainstem reservoirs, Lake Blackshear and Lake Worth. By impeding passage of host fishes, these dams separate individuals of the shinyrayed pocketbook, Gulf moccasinshell, oval pigtoe, and purple bankclimber into at least three populations within the basin. Both dams are used for hydropower and are licensed to operate generally in a run-of-river mode (releases approximately equal reservoir inflow) (USACE 1998, p. 4.48, 4.56), but short-term alterations of river flow may occur. A mainstem dam on the Ochlockonee River creates Lake Talquin, which is licensed and operated in a similar fashion. No dams have been constructed on Econfina Creek or the Suwannee River and its major tributaries within the range of the seven mussels.

Water Withdrawals

Water withdrawals for agricultural, municipal, and industrial use may reduce stream flow and affect mussels. In the Dougherty Plain of the lower Flint River Basin and upper Chipola River Basin, irrigated agriculture is the largest consumptive water use (Marella *et al.* 1993, p. 6, 13, 29, 42). Major crops in the region include cotton, peanuts, corn, and soybeans, with the largest acreage irrigated by groundwater using center pivot sprinkler systems. Due to the porous limestone underlying this area, ground and surface waters are highly connected, and the base flow of many streams is supported by the discharge of springs (Torak *et al.* 1996, p. 1–106). This area is also the center of the current range of several of the seven mussels. Approximately 172,125 hectares (ha) (425,000 acres (ac)) of cropland were irrigated using center pivot systems in a 16-county area of Georgia in the lower Flint River Basin, with an additional 30,375 ha (75,000 ac) irrigated with surface waters (Litts *et al.* 2001, p. 23). Using models representing surface water—groundwater dynamics in the lower Flint–upper Chipola area, Albertson and Torak (2002, p. 22) found that 8 of 37 streams examined (7 of these 37 support listed mussels) were highly sensitive to groundwater withdrawal and that during droughts these streams may go dry.

Water supply for municipal and industrial needs are greatest in the areas of greatest human population. Several large urban areas (population greater than 100,000) are near or within the current range of the seven mussels, including Dothan, Alabama; Panama City and Tallahassee, Florida; and Albany, Atlanta, and Columbus, Georgia. The largest of these is the Atlanta metro area, which extends into the headwaters of the Flint River Basin. Population in the 16-county metro area is forecast to increase from about 4 million people in 2000 to about 8 million in 2030, when regional water planning authorities predict water demand will equal available water supply from existing and presently planned sources (Ashley 2005, p. 1). Water use will likely increase along with increasing human population in each of the four basins that support the seven mussels.

Water Quality

Water quality is reported as impaired or potentially impaired in some portions of all four river basins within the current range of the seven mussels, according to the water quality agencies of the three States in their periodic assessments under Section 305(b) of the Clean Water Act (CWA). Although water quality in the smallest of the four basins, Econfina Creek, is generally good, mercury accumulation in fish populations was cited as a potential impairment in Florida's most recent basin status report (FDEP 2003a, p. 71). Barrios and Chelette (2004, p. 7) described the hydrologic setting of Econfina Creek, which strongly influences its water quality characteristics. Except during periods of high rainfall, most of the flow in Econfina Creek derives from the discharge of a series of at least 39 spring vents from the Floridan Aquifer in the middle section of the creek. The ground water contribution zone for these springs is large and encompasses a significant portion of the creek's surface water basin. Water quality in the Floridan Aquifer is vulnerable to land use activities in this contribution zone.

Water quality in the largest of the four basins, the ACF, varies considerably. Two small portions of the seven mussels' current range in the ACF are within the State of Alabama: The entire Uchee Creek watershed (a Chattahoochee River tributary) and the headwaters of the Chipola River watershed (an Apalachicola River tributary). In the latter, the Alabama Department of Environmental Management (2004, p. 7) reports that Cypress Creek is impaired due to organic enrichment and low dissolved oxygen (DO). We have no records of the seven mussels in Cypress Creek; however, three of the species are known to occur within a few miles downstream of its mouth. In the Florida portion of the ACF, several stream segments that support one or more of the seven mussels in the Chipola and Apalachicola watersheds are potentially impaired due to excessive coliform bacteria, nutrients, un-ionized ammonia, or turbidity (FDEP 2003b, p. 1–208). Mercury-based fish advisories apply to one or more segments of both watersheds. The current range of the seven mussels in the Flint River Basin includes 131 km (81 mi) that are reported as not supporting or partially supporting designated uses due to departures from Georgia's standards for DO or biological integrity, or are under mercury-based fish consumption advisories (GDNR–EPD 2002, p. 1/1–9/2). The streams listed include such Flint River tributaries as Spring Creek and Kinchafoonee Creek, but not the mainstem. The conditions in an additional 58 km (36 mi) of Flint River tributaries occupied by the mussels violate the coliform bacteria standard.

Water quality is considered impaired in a majority of the mussels' range in the Ochlockonee River Basin of Florida and Georgia. In both States, the entire mainstem length of the river is impaired or potentially impaired by excessive coliform bacteria or nutrients, low DO, or is under mercury-based fish consumption advisories (FDEP 2003c, p. 1–141; GDNR—EPD 2002, p. 1/1–9/2). A study of water and sediment quality in the basin in relation to mussels found that sites with low DO or elevated levels of lead, manganese, or ammonia no longer supported their historical mussel assemblages, including the listed species (Hemming *et al.* 2005, p. 2).

The range of the seven mussels in the Suwannee River Basin is limited to one species (the oval pigtoe), to the Florida portion of the basin, and to one watershed within that portion (the Santa Fe River watershed). The oval pigtoe is currently known only from the New River and a short segment of Santa Fe itself downstream of the mouth of the New River. Most of the New River was listed as impaired due to excessive coliform bacteria, excessive nutrients, and low DO in 1998, and remains potentially impaired under Florida's current standards (FDEP 2003d, p. 1–159).

Agricultural sources of contaminants in the ACF and Suwannee basins include nutrient enrichment from poultry farms and livestock feedlots, and pesticides and fertilizers from row crop agriculture (Couch *et al.* 1996, p. 1–58; Frick *et al.* 1998, p. 1–36; Berndt *et al.* 1998, p. 1–32). A study by the U.S. Soil Conservation Service (1993, p. 26) (now the Natural Resources Conservation Service) in the Flint River system determined that between 72 and 75 percent of the nutrients entering Lake Blackshear were derived from agricultural sources. Organochlorine pesticides were found at levels in ACF Basin streams that often exceeded chronic exposure criteria for the protection of aquatic life (Buell and Couch 1995, p. 1; Frick *et al.* 1998, p. 11). Cotton is raised in much of the region inhabited by these mussels. One of the most important pesticides used in cotton farming, malathion, affects mussels physiologically and may decrease respiration and feeding ability (Kabeer *et al.* 1979, p. 71–73). Within the Suwannee River basin, nutrient concentrations were greater in agricultural areas and nitrates were found to exceed U.S. Environmental Protection Agency (USEPA) drinking water standards in 20 percent of the surficial aquifer groundwater samples (Berndt *et al.* 1998, p. 6). Mostly in urban areas, pesticide concentrations were found to exceed criteria for protection of aquatic life.

Many pollutants in the ACF Basin originate from urban stormwater runoff, developmental activities, and municipal waste water facilities, primarily upstream of the fall line (the line marking the relatively abrupt elevation transition between the Piedmont physiographic province and the coastal plain) (Frick *et al.* 1998, p. 1–36). Urban catchments in Piedmont drainages have higher concentrations of nutrients, heavy metals, pesticides, and organic compounds than do agricultural or forested ones (Lenat and Crawford 1994, p. 185; Frick *et al.* 1998, p. 1–36), and at levels sufficient to affect fish health (Ostrander *et al.* 1995, p. 213). Couch *et al.* (1996, p. 50) counted 137 municipal wastewater treatment facilities in the ACF Basin.

Host Fish

Collectively, eight species of fish are now considered probable primary hosts for the larval life stage of four of the seven mussels: Largemouth bass, spotted bass, bluegill, redear sunfish, weed shiner, sailfin shiner, blackbanded darter, and brown darter (O'Brien and Brim Box 1999, p. 136; O'Brien and Williams 2002, p. 150–152) (*see* ''PCEs—Fish Hosts''). According to Lee *et al.* (1980, p. 1–854), the range of each of these fishes encompasses the range of the respective mussel(s) that successfully parasitized each species in laboratory tests, with the possible exception of the sailfin shiner—oval pigtoe association. The sailfin shiner does not occur far upstream of the fall line in the ACF basin (B. Albanese, GA DNR Wildlife Division, pers. comm. 2006), but the oval pigtoe does; therefore, at least one more fish likely serves as a host for this species. None of the eight fishes is protected under the Act or considered imperiled rangewide (Williams *et al.* 1989, p. 2–20); however, Georgia recognizes the sailfin shiner as a species of special concern (State rank ''S3''; rare or uncommon in State). The four centrarchid fishes (the two basses, bluegill, and redear sunfish) are each classified as game species by the three States. Riverine fish populations in the southeast generally have been adversely affected by a variety of the same habitat alterations that have contributed to the decline of the region's mussel fauna (Etnier 1997, p. 91; Neves *et al.* 1997, p. 60; Warren *et al.* 1997, p. 106, 123–125, 127, 131).

Non-Native Species

Asian Clam

The invasion of non-native aquatic species has contributed to the decline of several North American mussel species (Neves *et al.* 1977, p. 72–75; Strayer 1999, p. 74). Some native mussels may go extinct due to the continued spread of the zebra mussel (*Dreissena polymorpha*), a species not yet established in the southeast (Ricciardi *et al.* 1998, p. 618). Another non-native bivalve, the Asian clam (*Corbicula fluminea*), is well-established and almost ubiquitous in the range of the seven mussels. Reports of Asian clam density vary considerably, from 9 per square foot (Flint River, Sickel 1973, p. 11) to over 195 per square foot (Santa Fe River, Bass and Hitt 1974, p. 16). In the New River (Suwannee River drainage), Blalock and Herod (1999, p. 145–151) found an overall density of 8 Asian clams per square foot in an area where oval pigtoe density was 0.003 per square foot (Blalock-Herod 2000, p. 1–72). In one reach of the Apalachicola River immediately downstream of Jim Woodruff Lock and Dam, the stream bed is almost entirely covered with a layer of live and dead Asian clams several inches deep (J. Ziewitz, personal observation). Several researchers have suggested that the Asian clam competes with native mussels for food, nutrients, and space (Heard 1977, p. 1–177; Kraemer 1979, p. 1094; Clarke 1986, p. 8), particularly with juvenile unionids (Neves and Widlak 1987, p. 6). Yeager *et al.* (2000, p. 257) determined that high densities of Asian clams reduced survival and growth of newly metamorphosed juvenile mussels. However, Asian clams are present at almost all locations where the seven mussels for which we are proposing critical habitat in this proposed rule are currently found, and the specific impact of this species upon native mussels is largely unresolved (Leff *et al.* 1990, p. 415; Strayer 1999, p. 90).

Black Carp

The black carp (*Mylopharyngodon piceus*) is another introduced species that may pose a threat to the seven mussels. Largest of the Asiatic carp species, the black carp eats mollusks (snails and mussels), and sterile fish are sometimes used in catfish aquaculture to control snails that are the intermediate hosts of a catfish parasite (Nico *et al.* 2001, p. 1–124). Escape of substantial numbers of the sterile fish could significantly reduce numbers of native mussels where the escape occurs, and the establishment of non-sterile black carp in the wild could

conceivably extirpate entire mussel populations.

Previous Federal Actions

We listed the seven mussels under the Act on March 16, 1998 (63 FR 12664), and approved a final recovery plan for the seven species on September 19, 2003 (68 FR 56647; October 1, 2003). In the final 1998 rule, we determined that designation of critical habitat was not prudent. On March 15, 2004, the Center for Biological Diversity (Center) filed a lawsuit in the U.S. District Court for the Northern District of Georgia (Civil Action No. 1:04 CV–0729–GET) alleging that we violated the Act by failing to designate critical habitat for the seven mussels. We entered a settlement agreement with the Center on August 31, 2004, which stipulates that the Service would submit for publication in the **Federal Register**, on or before May 30, 2006, a new prudency determination, and if designation was determined to be prudent, a proposed rule designating critical habitat. This publication is our new prudency determination and our proposed rule designating critical habitat for the seven mussels.

Critical Habitat

Critical habitat is defined in section 3 of the Act as—(i) 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 (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and (ii) 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 which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary.

Critical habitat receives protection under section 7 of the Act through the prohibition against destruction or adverse modification of critical habitat with regard to actions carried out, funded, or authorized by a Federal agency. Section 7 requires consultation on Federal actions that are likely to result in the destruction or adverse modification of critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Such designation does not allow government or public access to private lands.

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. Critical habitat designations 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, as defined at 50 CFR 424.12(b)).

Habitat occupied at the time of listing may be included in critical habitat only if the essential features thereon may require special management or protection. Thus, we do not include areas where existing management is sufficient to conserve the species. Accordingly, when the best available scientific data do not demonstrate that the conservation needs of the species so require, we will not designate critical habitat in areas outside the geographical area occupied by the species at the time of listing. An area currently occupied by the species but was not known to be occupied at the time of listing is likely, but not always, essential to the conservation of the species and is typically included in the critical habitat designation.

The Service's Policy on Information Standards Under the Endangered Species Act, published in the **Federal Register** on July 1, 1994 (59 FR 34271), and Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106–554; H.R. 5658) and the associated Information Quality Guidelines issued by the Service, provide criteria, establish procedures, and provide guidance to ensure that decisions made by the Service represent the best scientific data available. They require Service 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 determining which areas are critical habitat, a primary source of information is generally the listing package for the species. Additional information sources 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. All information is used in accordance with the provisions of Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106–554; H.R. 5658) and the associated Information Quality Guidelines issued by the Service.

Section 4 of the Act requires that we designate critical habitat on the basis of the best scientific data available. 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 may eventually be determined to be necessary for the recovery of the species. For these reasons, critical habitat designations do not signal that habitat outside the designation is unimportant or may not be required for recovery.

Areas that support populations, but are outside the critical habitat designation, will continue to be subject to conservation actions implemented under section 7(a)(1) of the Act and to the regulatory protections afforded by the section 7(a)(2) jeopardy standard, as determined on the basis of the best available information at the time of the 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, or other species conservation planning efforts, if new information available to these planning efforts calls for a different outcome.

Prudency Determination

Section 4(a)(3) of the Act and its implementing regulations (50 CFR 424.12) require that, to the maximum extent prudent and determinable, we designate critical habitat at the time a species is listed as 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) such designation of critical habitat would not be beneficial to the species. In our March 16, 1998, final rule (63 FR 12664), we determined that designating critical habitat was not prudent for the seven mussels because it would result in no known benefit to the species and could further pose a threat to them through publication of their site-specific localities. However, several of our determinations that the

designation of critical habitat would not be prudent have been overturned by court decisions (for example, *Conservation Council for Hawaii* v. *Babbitt* (2 F. Supp. 2d 1280 [D. Hawaii 1998]); and *Natural Resources Defense Council* v. *U.S. Department of the Interior* (113 F. 3d 1121, 1125 [9th Cir. 1997])).

We are already working with Federal and State agencies, private individuals, and organizations in carrying out conservation activities for the seven mussels, conducting surveys for additional occurrences, and assessing habitat conditions. However, critical habitat designation may provide additional information to individuals, local and State governments, and other entities engaged in long-range planning, since areas with features essential to the conservation of the species are clearly delineated and, to the extent currently feasible, the primary constituent elements of the habitat necessary to the survival of the subspecies are specifically identified. Furthermore, although the low numbers of these mussels make it unlikely that their populations could withstand even moderate collecting pressure or vandalism, we do not have specific evidence of taking, collection, vandalism, trade, or unauthorized human disturbance.

Accordingly, we withdraw our previous determination that the designation of critical habitat will not benefit the seven mussels and will increase the degree of threat to the species. We determine that the designation of critical habitat is prudent for these species. At this time, we have sufficient information necessary to identify specific areas that meet the definition of critical habitat and are, therefore, proposing critical habitat for the seven mussels.

Methods

As required by section 4(b)(1) of the Act, we used the best scientific and commercial data available in determining areas that contain the physical and biological features essential to the conservation of the seven mussels. We reviewed the available information pertaining to their historical and current distributions, life histories, host fishes, habitats, threats to mussels in general, and threats to the seven mussels in particular. This information includes our own site-specific species and habitat data; unpublished survey reports; notes and communications with other qualified biologists or experts; peer-reviewed scientific publications; the final listing rule for the seven mussels; and our final recovery plan for the seven mussels.

Our principal sources of information for identifying the specific areas within the occupied range of the seven mussels on which are found those features essential to their conservation were: the collective database of locality records for the seven mussels, which is tabulated in our 2003 final recovery plan and has been supplemented with surveys completed since then, and the peer-reviewed scientific literature on mussels' life history and habitat requirements. Our 1998 final listing rule relied extensively upon data obtained in a rangewide status survey of the seven mussels commissioned by the Service and conducted in 1991 and 1992 (cited as Butler (1993, p. 1–30) in the final listing). Most of these data were taken in the ACF basin and have since been published by Brim Box and Williams (2000, p. 3). Although mussel surveys have been conducted since publication of the final listing rule at various locations in the four river basins that encompass their known range, the 1991–1992 status survey still provides a majority of the most recent distributional records for these seven mussels. For purposes of this proposed rule, the Service considers the most recent post-1990 survey data at a particular location as representing a species' current presence or absence at that location, and we consider pre-1990 survey data as representing historical distribution. We must extend the definition of current distribution back to 1990 because mussels are sedentary, long-lived animals, some species attaining maximum life spans of 100 to 200 years (Neves and Moyer 1988, p. 185; Bauer 1992, p. 425; Mutvei *et al.* 1994, p. 163–186). It was rare in the 1991–1992 survey, and is still rare, to find juveniles of the seven mussels.

We relied on a variety of information sources for identifying occupied areas in which the features essential to the conservation of the seven mussels may require special management considerations or protection, including land and water management plans of State and regional government agencies, surveys of stream channel condition, water quality assessments, and distributional information for host fishes. We used the sources cited in our final recovery plan's summary of known threats to the seven mussels to identify which essential features may be most vulnerable in certain portions of the occupied range.

Primary Constituent Elements

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12, we are required to base critical habitat determinations on the best scientific and commercial data available and to consider within areas occupied by the species at the time of listing those physical and biological features that are essential to the conservation of the species (PCEs), and that may require special management considerations or protection. These include, but are not limited to: Space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, and rearing (or development) of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

The specific PCEs essential for the seven mussels are derived from their biological needs as described in the Background section of this proposal. Space for individual and population growth and normal behavior, and sites for reproduction and development of offspring are provided for the seven mussels on and within the streambed of stable channels with a suitable substrate, which we have captured in the PCEs regarding channel stability, substrate quality, and flow regime. Because the seven mussels are dependent on fish to complete their larval life stage, the PCE regarding fish hosts is a further requirement for successful reproduction. Various nutritional and physiological requirements are captured in the PCEs regarding flow regime and water quality. These PCEs are explained in additional detail below.

Channel Stability

Unstable channels do not favor mussels in part because adults and juveniles are relatively sedentary animals. They are unable to move quickly or across great distances from unsuitable to suitable microhabitats on and in the stream bed. Several researchers have reported direct adverse effects to mussels in aggrading (filling) and degrading (scouring) channels (Vannote and Minshall 1982, p. 4106; Kanehl and Lyons 1992, p. 7; Hartfield 1993, p. 133; Brim Box and Mossa 1999, p. 99–117). In degrading channels, mussels lose the substrate sediment in which they anchor themselves against the current. Mussels have been extirpated from streams experiencing a ''headcut'' (stream bed degradation progressing in an upstream direction) and from degrading reaches immediately downstream of dams. In aggrading channels or in channels with

actively eroding stream banks, excess sediment fouls the gills of mussels, which reduces feeding and respiratory efficiency, disrupts metabolic processes, reduces growth rates, and physically smothers mussels (Ellis 1936, p. 39; Stansbery and Stein 1971, p. 2178; Marking and Bills 1979, p. 209–210; Kat 1982, p. 123; Vannote and Minshall 1982, p. 4105–4106; Aldridge *et al.* 1987, p. 18; Waters 1995, p. 173–176; Brim Box 1999, p. 65).

In addition to the direct effects above, channel instability indirectly affects mussels and their fish hosts in several ways. Channels becoming wider and shallower via bank erosion develop more extreme daily and seasonal temperature regimes, which affects DO levels and many other temperature-regulated physical and biological processes. Mussels in wider and shallower channels are likely more susceptible to predation. Erosive channels lose the habitat complexity provided by mature bankside vegetation, which reduces diversity and abundance of fish species. Fewer fish means lower probability of mussel recruitment (see ''Fish Hosts''). The many direct and indirect adverse effects of channel instability on mussels and their fish hosts strongly suggest that channel stability is a habitat feature essential to their conservation.

Substrate Quality

Adult unionid mussels are generally found in localized patches (beds) almost completely burrowed in the substrate with only the area around their siphons exposed (Balfour and Smock 1995, p. 255–268). The composition and abundance of adult mussels have been linked to bed sediment distributions (Neves and Widlak 1987, p. 5; Leff *et al.* 1990, p. 415). Substrate texture (particle size distribution) affects the ability of mussels to burrow in the substrate and anchor themselves against stream currents (Lewis and Riebel 1984, p. 2025). Texture and other aspects of substrate composition, including bulk density (ratio of mass to volume), porosity (ratio of void space to volume), and sediment sorting may also influence mussel densities (Brim Box 1999, p. 1–86; Brim Box and Mossa 1999, p. 99–117). Although several studies have reported adult habitat selection by substrate composition, most species are found in a relatively broad range of substrate types (Tevesz and McCall 1979, p. 114; Strayer 1981, p. 411; Hove and Neves 1994, p. 36; Strayer and Ralley 1993, p. 255), with few exceptions (Stansbery 1966, p. 29–30). The seven mussels for which we are proposing critical habitat in this proposed rule are found in a variety of substrates, ranging from pockets of sand on bedrock to sandy mud, but not in substrates composed of predominantly fine materials (more than 50 percent silt or clay by dry weight) (Brim Box and Williams 2000, p. 1–143; Blalock-Herod 2000, p. 1–72).

Interstitial spaces (pores) in coarse stream substrates may become clogged when fine sediment input to streams is excessive (Gordon *et al.* 1992, p. 1–444). Reduced pore space and pore flow rates reduce habitat for juvenile mussels, which tend to burrow entirely beneath the substrate surface, and for some adult mussels as well (Brim Box and Mossa 1999, p. 99–117). At least some species of juvenile unionids feed primarily on particles associated with sediments and pore water during their early development (Yeager *et al.* 1994, p. 221). Fine sediments act as vectors in delivering contaminants such as nutrients, heavy metals, and pesticides to streams (Salomons *et al.* 1987, p. 13). Most toxicity data for freshwater mussels is from tests with water-only exposures, despite reports that contaminated sediments have contributed to mussel declines (Newton 2003, p. 2543; Wilson *et al.* 1995, p. 213–218).

Because the juveniles and adults of the seven mussels live in relatively coarse and not predominantly fine-grained substrates, and the introduction of fine-grained sediments and various pollutants is likely detrimental to one or more of their life stages, we have determined that substrate quality is a habitat feature essential to their conservation.

Flow Regime

The species that are the subject of this proposed rule are all riverine unionid mussels and are not found in natural or manmade ponds and lakes. One known exception is a single large (and presumably old) purple bankclimber found in Goat Rock Reservoir on the Chattahoochee River by malacologist C. Stringfellow (Columbus State University) in 2000 (pers. comm. 2000). Otherwise, none of the seven mussels tolerate impounded conditions or persist in intermittent streams (Brim Box and Williams 2000, p. 1–141); therefore, continuously flowing water is a habitat feature associated with all potentially viable populations. Flowing water transports food items to the sedentary juvenile and adult life stages and provides oxygen for mussel respiration at depths that would be anoxic in a pond setting. At least three of the seven mussels are known to attract host fishes visually by apparently disguising their glochidia as potential prey items (O'Brien and Brim Box 1999, p. 135–136; O'Brien and Williams 2002, p. 154), and some of these mechanisms appear to require flowing water to function effectively as lures. For example, flowing water is required to suspend the several-feet-long superconglutinate of the shinyrayed pocketbook in the water column so that the glochidia packet at the end of it, which resembles a small fish, is visible to fish (O'Brien and Brim Box 1999, p. 135, 138).

Quantifying the amount of flowing water that is essential to the conservation of the seven mussels is complicated by the broad size range of streams they inhabit, from small tributaries near watershed headwaters to the Apalachicola River, which is the world's 82nd-largest river by discharge (Leopold 1994, p. 101). These seven mussels are often found near the toe of stable stream banks associated with roots and other instream cover or structure. A flow sufficient to inundate the stream bed from bank toe to bank toe with adequately oxygenated water deep enough to deter terrestrial predators is several orders of magnitude greater at a site on the lower Apalachicola River compared to a site on a tributary stream in the upper Ochlockonee River.

Quantifying the amount of flowing water that is essential to the conservation of the seven mussels is also complicated by their dependency on various species of fishes to serve as hosts for their glochidia. Mussel population viability is likely dependent on features of the flow regime that influence fish host population density as well as features that directly affect adult and juvenile mussel survival. For example, the largemouth bass, which is a lab-verified host for the fat threeridge and shinyrayed pocketbook (O'Brien and Brim Box 1999, p. 136; O'Brien and Williams 2002, p. 150), is known to utilize seasonally inundated floodplain habitats for spawning and rearing (Kilgore and Baker 1996, p. 291–294), habitats which do not support adult or juvenile mussels because they are dry for several months of most years. Year class strength of largemouth bass has been positively correlated with flows in several river systems due to the additional habitat available in high-flow years (Raibley *et al.* 1997, p. 852–853), and fish host density is a factor in mussel recruitment (see ''Fish Hosts'' discussion below). Year class strength is abundance of a cohort (born in a particular year) relative to other cohorts. A strong year class is represented in much greater numbers than a weak year class, presumably because the strong

year class experienced more favorable conditions for recruitment.

Riverine ecologists have recognized that variable flow creates variable physical and chemical conditions that limit the distribution and abundance of riverine species (Power *et al.* 1995, p. 166; Resh *et al.* 1988, p. 443). Altering natural long-term patterns of flow changes the structure, composition, and function of riverine communities (Bain *et al.* 1988, p. 382–392; Hill *et al.* 1991, p. 198–210; Sparks 1995, p. 172–173; Scheidegger and Bain 1995, p. 134). Poff *et al.* (1997, p. 770) and Richter *et al.* (1997b, p. 243) concluded that the accumulated research on the relationship between hydrologic variability and riverine ecological integrity overwhelmingly supported a ''natural flow paradigm,'' that is, the patterns of variability in a river's natural flow regime are critical in sustaining its ecological integrity. Richter *et al.* (1996, p. 1165, 1997b, p. 236) proposed a set of parameters collectively termed ''indicators of hydrologic alteration'' (IHA) for characterizing ecologically relevant features of a flow regime.

The Service and USEPA adapted a subset of the IHA parameters as instream flow guidelines for protecting riverine ecosystems under a possible interstate water allocation formula between Alabama, Florida, and Georgia for the ACF Basin (USFWS and USEPA 1999, p. 1). Although the three States failed to agree upon an allocation formula and the ACF Compact authorizing their negotiations expired, the Service has applied the instream flow guidelines in consultations with Federal agencies on actions affecting the species addressed in this proposed rule. The Service–USEPA guidelines are definitions of measures of flow magnitude, duration, frequency, and seasonality that may serve as thresholds for ''may affect'' determinations for proposed Federal actions that would alter a flow regime (for example, water withdrawals and dam operations). The thresholds are computed from long-term flow records appropriate to the proposed action, such as daily flow records from a stream gage in the action area. The Service–USEPA guidelines are designed as a tool for site-specific analyses and such efforts as this proposed rule.

Water Quality

The ranges of several standard physical and chemical water quality parameters (such as temperature, DO, pH, conductivity) that define suitable habitat conditions for the seven mussels have not been specifically investigated. As sedentary animals, mussels must tolerate the full range of these parameters to persist in that stream. Quantifying water quality tolerances for the seven mussels is further complicated by the dependency of mussels on fish hosts, which may exhibit different tolerances.

Most mussels are considered sensitive to low DO levels and high temperatures (Fuller 1974, p. 245). Johnson (2001, p. 8–11) monitored water quality and mussel mortality during a drought year in the lower Flint River Basin. Low DO levels, which occurred during low flow periods, were associated with high weekly mussel mortality. Species-specific mortality varied considerably. The shinyrayed pocketbook and Gulf moccasinshell were among the species with the highest mortality rates when exposed to DO concentrations less than 5 milligrams per liter (mg/L). The oval pigtoe demonstrated moderate, but significantly higher than average, mortality when DO was less than 5 mg/L.

Juvenile mussels may spend their first few years buried in the sediments of the stream bed. Interstitial water (pore water) in sediments is generally less oxygenated than flowing water in the stream above (Sparks and Strayer 1998, p. 129). Sparks and Strayer (1998, p. 132) observed marked differences in behavior between juvenile Eastern elliptio (*Elliptio complanata*), congener of the Chipola slabshell, that were exposed to DO levels of 2 mg/L and 4 mg/L, and most juveniles of this species that were exposed to 1.3 mg/L for a week died. In general, juveniles are sensitive to low DO levels. Interstitial DO levels in streams of the eastern United States are usually less than 4 mg/L in the summer and may fall below 1 mg/L (Sparks and Strayer 1998, p. 132).

Water temperature affects the amount of oxygen that can be dissolved in water and the toxicity of various pollutants. The toxic effects of ammonia are more pronounced at higher temperatures and at higher pH (Mummert *et al.* 2003, p. 2545, 2550; Newton 2003, p. 2543). High temperatures or decreasing pH may increase the toxicity of metals to unionids (Havlik and Marking 1987, p. 14). Watters and O'Dee (2000, p. 136) suggested that the release of glochidia is regulated by water temperature. In Texas, exceptionally warm temperatures appeared to prompt early initiation of mussel reproductive activity, and cool temperatures appeared to delay activity (Howells 2000, p. 40). Temperature may affect immune system response in fish. Some fish species that reject infections by mussel glochidia at higher temperatures are infected at lower temperatures (Roberts and Barnhart 1999, p. 484).

Various contaminants in point- and non-point-source discharges can degrade water and substrate quality and adversely affect mussel populations (Horne and McIntosh 1979, p. 119–133; Neves and Zale 1982, p. 53; McCann and Neves 1992, p. 77–81; Havlik and Marking 1987, p. 1–20). Naimo (1995, p. 341) suggested that chronic, low-level contamination of streams may explain the widespread decreases in mussel density and diversity. Mussels appear to be among the organisms most sensitive to heavy metals (Keller and Zam 1991, p. 539), several of which are lethal at relatively low levels (Havlik and Marking 1987, p. 3). Cadmium appears to be the most toxic (Havlik and Marking 1987, p. 3), although copper, mercury, chromium, and zinc may also impair physiological processes (Jacobson *et al.* 1993, p. 879; Naimo 1995, p. 353–355; Keller and Zam 1991, p. 539–546; Keller and Lydy 1997, p. 3). Metals stored in mussel tissues indicate recent or current exposure (Havlik and Marking 1987, p. 12), while concentrations in shell material indicate past exposure (Imlay 1982, p. 7; Mutvei *et al.* 1994, p. 163–186). Highly acidic pollutants such as metals may contribute to mussel mortality by dissolving shells (Stansbery 1995, p. 2–3). Low levels of some metals may inhibit glochidial attachment (Huebner and Pynnönen 1992, p. 2349). Mussel recruitment may be reduced in habitats with low but chronic heavy metal and other toxicant inputs (Yeager *et al.* 1994, p. 221; Naimo 1995, p. 341; Ahlstedt and Tuberville 1997, p. 72–77).

Water pollutants associated with agricultural activity may adversely affect mussels. Arsenic trioxide, which is used in the poultry industry as a feed additive, is lethal to adult mussels at concentrations of 16.0 parts per million (ppm), and ammonia is lethal at concentrations of 5.0 ppm (Havlik and Marking 1987, p. 3, 13). Ammonia is associated with animal feedlots, nitrogenous fertilizers, and the effluents of older municipal wastewater treatment plants. Ammonia causes a shift in glucose metabolism (Chetty and Indira 1995, p. 84) and alters the utilization of lipids, phospholipids, and cholesterol (Chetty and Indira 1994, p. 693). Stream ecosystems are altered when nutrients are added at concentrations that cannot be assimilated (Stansbery 1995, p. 2–3). Excessive nutrients promote the growth of filamentous algae in streams, which may render substrates unsuitable for mussels of all life stages and degrade water quality by consuming oxygen during night-time respiration and

during decay to levels that mussels cannot tolerate. Several studies have described adverse effects of pesticides on mussels (Fuller 1974, p. 215–257; Havlik and Marking 1987, p. 13; Moulton *et al.* 1996, p. 131). Commonly used pesticides were cited as the likely cause of a mussel die-off in a North Carolina stream (Fleming *et al.* 1995, p. 877–879).

Gourdreau *et al.* (1993, p. 211–230) examined mussel populations relative to the discharges of two municipal wastewater treatment plants on the Clinch River in Tazewell County, Virginia. Mussels were absent or present in low numbers immediately downstream of these discharges, but occurred in greater diversity and abundance immediately upstream and farther downstream. The investigators hypothesized that, in addition to chemicals of known toxicity to glochidia, the bacteria and protozoans associated with wastewater discharges may also adversely affect mussel reproduction. Glochidia are vulnerable to attack by bacteria and protozoans before and after they are released from the adult female mussel (Fuller 1974, p. 219; Goudreau *et al.* 1993, p. 221).

Adults of some mussel species may tolerate short-term exposure to various contaminants by closing their valves (Keller 1993, p. 701). Juveniles and glochidia appear more sensitive than adults to heavy metals (McCann and Neves, 1992, p. 77–81) and to ammonia (Goudreau *et al.* 1993, p. 224). Ammonia is lethal to juveniles at concentrations as low as 0.7 ppm total ammonia nitrogen, normalized to pH 8, and lethal to glochidia at concentrations as low as 2.4 ppm (Augspurger *et al.* 2003, p. 2569–2575). In streams, ammonia may occur at highest concentrations in substrate interstitial spaces where juvenile mussels live and feed (Whiteman *et al* 1996, p. 794; Hickey and Martin 1999, p. 38; Augspurger *et al.* 2003, p. 2569–2575).

In general, we believe the numeric standards for pollutants and water quality parameters (for example, heavy metals and DO) that are adopted by the States under the Federal Clean Water Act (CWA) represent levels that are essential to the conservation of the seven mussels. However, some State standards may not adequately protect mussels, such as the standard for ammonia (Augspurger *et al.* 2003, p. 2571; Newton *et al.* 2003, p. 2559). USEPA and FWS and National Marine Fisheries Service (the Services) agreed to a national consultation on the CWA Section 304(a) aquatic life criteria as part of a Memorandum of Agreement regarding interagency coordination under the CWA and the Act (66 FR 11202, February 22, 2001). The criteria for some pollutants, such as ammonia, are presently under review. Although the State standards adopted consistent with the USEPA criteria generally represent levels that are safe for the seven mussels, these standards are sometimes violated in some streams within their current range. Rather than specify the ranges of dozens of water quality parameters for the seven mussels, it is more practical to deal with cases where the national criteria are not protective of these and other listed species under the national consultations with USEPA. For purposes of this proposed rule, the evidence for the dependency of the seven mussels on good water quality supports identifying water quality generally as a habitat feature that is essential to their conservation.

Fish Hosts

Most unionid mussels, including the seven species, parasitize fish during the larval life stage (see ''Background''), depending on fish hosts not only for the physiological transformation from larval to juvenile form (Isom and Hudson 1982, p. 147–151), but also for spatial dispersal (Neves 1993, p. 4). The distribution and diversity of unionids is strongly related to the distribution and diversity of fish species (Watters 1992, p. 488; Haag and Warren 1998, p. 298). Bogan (1993, p. 600) identified the dependency of mussels on fish hosts, which are affected by exploitation and a variety of common habitat alterations, as one of several contributing causes in the extinction of several unionid species worldwide. Haag and Warren (1998, p. 303) identified host fish availability and density as significant factors influencing where certain mussel populations can persist.

Although female mussels may produce 75,000 to 3.5 million glochidia (Surber 1912, p. 3–10; Coker *et al.* 1921, p. 144; Yeager and Neves 1986, p. 333), contact of the glochidia with a suitable host fish is a low-probability event (Neves *et al.* 1997, p. 60). Contact is dependent on many factors, including the timely presence of the host fish, the feeding and respiratory behaviors of the fish (Dartnall and Walkey 1979, p. 36; Neves *et al.* 1985, p. 17–18), and for some species, the behavior of the mussel when the fish is present (Davenport and Warmuth 1965, p. R77; Kraemer 1970, p. 225–282). Contact between glochidia and host fish does not ensure successful larval development to the juvenile form, because some fish species have natural immunity to glochidial infestation and others acquire immunity following infestation (Watters and O'Dee 1996, p. 387). Glochidia that contact a host with natural immunity are rejected and die, usually within 11 days (Neves *et al.* 1985, p. 15, 17; Yeager and Neves 1986, p. 338; Waller and Mitchell 1989, p. 86). In the case of acquired immunity, glochidia experience decreased transformation rates with subsequent infections of an initially suitable host fish (Arey 1932, p. 372; Bauer and Vogel 1987, p. 393; Luo 1993, p. 26). The number of exposures associated with glochidial sloughing is variable (Watters and O'Dee 1996, p. 385, 387).

As few as 1 to as many as 25 fish species are known to serve as suitable hosts for particular species of mussels (Fuller 1974, p. 238; Trdan and Hoeh 1982, p. 386; Gordon and Layzer 1989, p. 1–98; Hoggarth 1992, p. 3). Some mussels are host-fish specialists that parasitize a few fish species (Zale and Neves 1982, p. 2540; Yeager and Saylor 1995, p. 4; Neves *et al.* 1985, p. 13, 17), and others are generalists that parasitize a great variety of host fishes (Trdan and Hoeh 1982, p. 386). Generally, mussels that are known host-fish specialists tend to release glochidia in conglutinates (multiple glochidia in a packet versus a stream of single glochidia) or use various means of attracting a fish host before releasing multiple glochidia (Watters 1997, p. 45). Because fish that are not naturally immune to glochidial infection develop some immunity after infection, securing a host fish is to some degree a ''first come, first served'' situation. Some researchers have hypothesized that mussels may compete for fish hosts (Watters 1997, p. 57; Trdan and Hoeh 1982, p. 384–385).

Watters (1997, p. 45–62) developed individual-based models of mussel—fish interactions to simulate unionid reproductive strategies, showing specialists tended to have lower population sizes and were less sensitive to fluctuating host fish density than generalists, which attained much higher population sizes when host fish density was high and declined when host fishdensity declined.

Haag and Warren (1998, p. 297–306) examined patterns of fish and mussel community composition in two north Alabama drainages. They found that densities of host-generalist mussels and of host-specialist mussels with elaborate host-attracting mechanisms were independent of host-fish densities, and were present throughout the two drainages. Densities of host-specialist mussels without elaborate host-attracting mechanisms were positively correlated with host-fish densities and were absent or rare near the drainages' headwaters.

Host-fish specificity has been examined in laboratory tests for five of the seven mussels: the fat threeridge, Gulf moccasinshell, oval pigtoe, purple bankclimber (O'Brien and Williams 2002, p. 151), and shiny-rayed pocketbook (O'Brien and Brim Box 1999, 136). The fat threeridge lacks mantle modifications or other morphological specializations that would serve to attract host fishes and appears to be a host-fish generalist that may infect fishes of at least three different fish families. Glochidia transformed to juveniles under laboratory conditions on five of seven fish species tested: Weed shiner (*Notropis texanus*), bluegill (*Lepomis macrochirus*), redear sunfish (*L. microlophus*), largemouth bass (*Micropterus salmoides*), and blackbanded darter (*Percina nigrofasciata*) (O'Brien and Williams 2002, p. 152).

The elaborate superconglutinate of the shiny-rayed pocketbook (see ''Background'') suggests it is a host-fish specialist that targets sight-feeding piscivorous fishes, such as bass. O'Brien and Brim Box (1999, p. 136) confirmed that largemouth bass and spotted bass (*Micropterus punctulatus*) are likely primary hosts (all fishes infected produced juvenile mussels) among 11 species tested. Low transformation rates were associated with fish such as the eastern mosquitofish (*Gambusia holbrooki*) and bluegill.

The Gulf moccasinshell is probably a host-fish specialist that primarily parasitizes darters. It visually lures host fish by undulating its dark mantle flaps against swollen white gills (O'Brien and Williams 2002, p. 154). O'Brien and Williams (2002, p. 152) lab-tested eight fish species for suitability as hosts, finding that all black-banded darters and brown darters (*Etheostoma edwini*) exposed to infection transformed glochidia to juveniles. Other fishes, including the eastern mosquitofish, also transformed glochidia, but at lower percentage rates.

The extreme rarity of the Ochlockonee moccasinshell has precluded any opportunities to explore its life history. We assume its reproductive biology is similar to its congener, the Gulf moccasinshell, which uses darters as host fish.

The oval pigtoe releases rigid white to pinkish conglutinates, which passively drift in the current and may resemble the food organisms of small-bodied fishes. O'Brien and Williams (2002, p. 152) tested 11 fish species as hosts, finding that glochidia transformed on the gills of fish such as the sailfin shiner (*Pteronotropis hypselopterus*) and eastern mosquitofish. They considered only the sailfin shiner as a primary host, as it was the only species upon which the transformation rate exceeded 50 percent.

We are aware of no studies of the reproductive biology of the Chipola slabshell. It is likely that the species expels glochidia in a conglutinate, as do several other members of the genus Elliptio that occur in the ACF Basin (Brim Box and Williams 2000, p. 34–47). Keller and Ruessler (1997, p. 402–407) identified centrarchids (sunfishes) as host fishes of other southeastern *Elliptio.*

O'Brien and Williams (2002, p. 153) observed in the laboratory that purple bankclimber conglutinates readily disintegrated when they contained mature glochidia, and these were easily suspended in the water by the aerators in their holding tanks. They speculated that the species may rely on stream currents to carry glochidia to host fish, which is typical of host-fish generalist species. Of the 14 fish species they tested as potential hosts, only a few species transformed glochidia, including the eastern mosquitofish and blackbanded darter. Only the mosquito fish was 100 percent effective (all fish tested transformed glochidia), but it is an unlikely primary host fish. The mosquito fish occupies backwater areas and stream margins with little or no current (Lee *et al.* 1980, p. 1–854), while the bankclimber is found mostly in the main channels of larger streams and rivers. The primary host fishes of the purple bankclimber are still unknown.

Data that might suggest densities of the various primary host fish species named above that are sufficient to support normal mussel recruitment and dispersal rates are not available. Stochastic simulations of fish'mussel interactions indicate that mussel populations are extirpated if a threshold host fish density is not exceeded (Watters 1997, p. 60). Further studies of fish and mussel population dynamics are necessary to quantify species-specific thresholds; however, we recognize that the presence of host fish is a biological habitat feature essential to the conservation of the seven mussels.

Primary Constituent Elements for Five Endangered and Two Threatened Mussels

Based on our current knowledge of the life history, biology, and ecology of the seven mussels, and of the habitat features necessary to support their essential life history functions in areas occupied at the time of listing, summarized above, we have determined that the PCEs are:

(1) A geomorphically stable stream channel (a channel that maintains its lateral dimensions, longitudinal profile, and spatial pattern over time without an aggrading or degrading bed elevation);

(2) A predominantly sand, gravel, and/or cobble stream substrate;

(3) Permanently flowing water;

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

(5) Fish hosts (such as largemouth bass, sailfin shiner, brown darter) that support the larval life stages of the seven mussels.

Criteria Used To Identify Critical Habitat

We are proposing to designate as critical habitat areas that were occupied at the time of listing by one or more of the seven mussels and that contain one or more of the PCEs to support life history functions essential to the conservation of the species. This section describes how we identified those streams and delineated the upstream and downstream boundaries of 11 proposed critical habitat units.

We began our analysis by examining the full extent of each species' historical and current range. As discussed under ''Summary of Threats to Surviving Populations'' above, the declining range and abundance of the seven mussels is due mostly to changes in their riverine habitats resulting from dams, dredging, mining, channelization, pollution, sedimentation, and water withdrawals. The Econfina, ACF, Ochlockonee, and Suwannee drainages contain about 54,000 km (33,500 mi) of perennial streams (USGS 1:100,000 National Hydrography Data). From mussel survey records, the historical range of the seven mussels collectively spanned about 3,300 km (2,050 mi), or 6 percent, of the river and stream channels in these drainages, but no one species accounts for more than about 2,300 km (1,445 mi) of that total (USFWS 2003, p. 78–80). We estimate that the five species listed as endangered are each extirpated from over half of their historical range, and the two threatened species are extirpated from about one-third of theirs, but none are extirpated entirely from the four major drainages in which they each occurred historically. All seven mussels were more widespread and more abundant within each of the four drainages historically.

The largest single portion of the historical range lost to the seven mussels is the mainstem of the Chattahoochee River. The

Chattahoochee comprised over 700 km (435 mi), or almost one-quarter, of the 3,300-km (2,050-mi) collective historical range, and supported the shinyrayed pocketbook, Gulf moccasinshell, oval pigtoe, and purple bankclimber. It is now impounded by several major dams for much of its length and no longer supports the listed mussels. With the exception of a single live animal found in Goat Rock Reservoir in 2000, the purple bankclimber appears extirpated from the entire Chattahoochee Basin, but at least one of the other three species persist in three of its tributaries: Uchee Creek, Sawhatchee Creek, and Kirkland Creek. Elsewhere in the four major drainages, the pattern of extirpation is more variable, with one or more of the seven species persisting in portions of a drainage where others have disappeared. The collective range of the seven species now spans about 1,900 km (1,180 mi) of river and stream channels. Within this collective range, the species presently occur in as little as 55 km (34 mi) (the Ochlockonee moccasinshell) to as much as 785 km (488 mi) (the shinyrayed pocketbook) (USFWS 2003, p. 78–80).

To identify the specific areas that were occupied at the time of listing by each of the seven mussels and that contain one or more of the PCEs, we used post-1990 mussel survey results. Because mussels are sedentary and long-lived animals, occupancy is strong evidence that some or all of the PCEs are present, except where it is apparent that one or a few adult individuals remain at a location with little or no possibility of reproducing due to substantial habitat alteration (such as the single purple bankclimber found in Goat Rock Reservoir). It is not feasible to survey all potential habitat for the seven species; therefore, to delineate a species' occupied range in the larger stream network, it is necessary to extrapolate from the available survey data. Most of the tributary streams in the four basins that may support one or more of the seven species have never been surveyed, and we do not propose any unsurveyed streams as critical habitat. We used USGS 1:100,000 digital stream maps to delineate the probable upstream and downstream limits to the seven species' distribution in streams surveyed since 1990, according to the criteria listed below. These limits form the boundaries of proposed critical habitat units as explained below.

(a) The lateral boundaries of a unit are the ordinary high-water marks on each bank of currently occupied streams. We recognize the dynamic nature of riverine systems and that floodplains and riparian areas are integral parts of those systems. Processes that occur and habitat characteristics that are found outside the stream banks are important in maintaining channel morphology, providing energy and nutrients, and protecting the instream environment from pollutants and excessive sediments. Similarly, floodplain and backwater habitats may be important in the life cycle of fish that serve as hosts for mussel larvae. Although factors affecting the PCEs may occur outside the channel, the PCEs themselves occur within the channel.

(b) The upstream boundary of a unit in an occupied stream is the first perennial tributary confluence or first permanent barrier to fish passage (such as a dam) upstream of the upstream-most current occurrence record. Many of the mussel survey sites are located near watershed headwaters. In these areas, the confluence of a tributary typically marks a significant change in the size of the stream and is a logical and recognizable upstream boundary for habitat conditions that are similar to the upstream-most occurrence record. Likewise, a dam or other barrier to fish passage marks the upstream extent to which mussels at the upstream-most occurrence may disperse via their fish hosts. Therefore, proposed segments encapsulate habitat containing essential features used by host fish and the seven mussels for successful natural reproductive process. Habitat above these boundaries does not contain features essential to the conservation of the species.

(c) The downstream boundary of a unit in an occupied stream is the mouth of the stream, the upstream extent of tidal influence, or the upstream extent of an impoundment, whichever comes first, downstream of the downstream-most occurrence record. Many survey sites are located near the mouths of streams, the upstream extent of impoundments, or the upstream extent of tidal influence. Survey locations are typically at road crossings, because that is where surveyors can most easily gain access to the stream. These road crossings do not typically represent a meaningful ecological boundary for longitudinal stream habitat conditions. Mussels are dispersed via host fish, and because these host fish traverse freely in the area between the upstream most occurrence and any existing downstream restriction to fish passage, larvae drop off their host fish at random points along the stream flow segments traversed by fish. Further, the sperm of all seven species and the conglutinates (glochidia packets) of some of the seven may be carried downstream by currents and are viable for several hours to several days unless they reach unsuitable habitat conditions, such as intolerable salinity or still water, in which either would sink to the bottom and be smothered in the sediments. Therefore, we are proposing stream segments that have mussel point locations from the upstream limit as defined in (b) above to the downstream location where the PCEs are no longer present.

The application of these criteria resulted in the identification of 11 units occupied by one or more of the seven mussels and that contain one or more of the PCEs as indicated by the presence and persistence of one or more of the listed mussels (see ''Proposed Critical Habitat Designation''). Based on fish distributional records (Lee *et al.* 1980, p. 1–854) and our experience sampling fish in these drainages, these areas also support shiners, darters, and other fishes that have been identified as hosts or potential hosts for one or more of the seven mussels. Further, on the basis of a review of the information available, we have determined that areas not currently known to be occupied by the seven mussels do not appear to be essential to their conservation. As such, we have not included any areas not known to be occupied by these mussel species in this proposed designation.

When determining the boundaries of proposed critical habitat for the seven mussels, we made every effort to avoid manmade structures existing on the effective date of this rule and not containing one or more of the primary constituent elements, such as buildings and roads. Any such structures inadvertently left inside the critical habitat boundaries have been excluded by the text in this proposed rule and are not proposed for designation.

Special Management Considerations or Protection

When designating critical habitat, we assess whether the areas determined to be occupied at the time of listing and containing the PCEs may require special management considerations or protections. Activities in or adjacent to each of the critical habitat units described in this proposed rule may affect one or more of the PCEs that are found in the unit. These activities include, but are not limited to, those listed in the Adverse Modification Standard section as activities that may destroy or adversely modify critical habitat. We find that the features essential to each of the seven mussel species contained within the areas proposed for designation may require special management considerations or protections due to known or probable

threats from these activities. We summarize here the nature of the threats and the resulting conservation needs for both the mussels and their host fish across the range of the seven mussels.

Sedimentation is an almost ubiquitous threat in the range of the seven mussels. A wide variety of activities, such as livestock grazing, road and bridge construction, clear-cut logging, and off-road vehicle use, that are common in all 11 units may increase erosion rates, either in the banks of the stream channel itself or elsewhere in the watershed, and cause the accumulation of fine sediments on the stream bed. Management considerations to deal with this threat include protecting streams from sedimentation through application of agricultural and forestry best management practices, avoiding soil- and vegetation-disturbing activity in the riparian zone, restoring unstable stream channels and other erosive areas, and other practices that prevent or reduce erosion.

Urbanization, road and bridge construction, and other large-scale alterations of land cover that substantially alter the runoff characteristics of the watershed may threaten channel stability in units near the major urban areas of Dothan, Alabama (unit 2); Panama City and Tallahassee, Florida (units 1 and 10); Albany, Atlanta, and Columbus, Georgia (units 3, 5, 6, and 7); and other cities. Management considerations to deal with the threat of channel instability include avoiding soil- and vegetation-disturbing activity in the riparian zone, limiting impervious surface area, and other urban storm water runoff control methods. Sand and gravel mining (unit 3), dredging and channelization (unit 8), and dam construction (unit 5) may also affect channel stability.

The construction and operation of dams, water withdrawals, and water diversions may alter features of the flow regime important to the mussels and their host fishes. This threat is present to some degree in all 11 proposed units, but is greatest in units 5, 6, 7, 8, and 10, which are downstream of the major mainstem dams or in areas of relatively high municipal, industrial, or agricultural water use. Measures to deal with this threat include water conservation and operational strategies that manage water storage capacity and water demands in combination to minimize departures from the natural flow regime.

Water pollution, especially from non-point (dispersed release) sources, is another almost ubiquitous threat in all 11 units. Water quality is reported as impaired or potentially impaired in some portions of all four river basins within the current range of the seven mussels, according to the water quality agencies of the three States in their periodic assessments under Section 305(b) of the Clean Water Act (CWA) (see ''Summary of Threats to Surviving Populations''). Streams that receive a high proportion of their flow from the discharge of springs are vulnerable to nutrient enrichment from fertilizers and to other pollutants applied in the recharge areas of those springs (units 1, 2, and 7), which may extend far from the streams themselves. Management considerations to deal with the threat of pollution include applying agricultural and forestry best management practices, preserving native vegetation in riparian zones, maintaining septic systems, and taking other measures to minimize pollutant-laden runoff to streams.

Proposed Critical Habitat Designation

We are proposing 11 groups of river and stream segments (units) as critical habitat for the seven mussels. The river and stream segments comprising each unit are contiguous to allow for the movement of fish hosts dispersing the larval life stages of the seven mussels within the unit. Barriers to the movement of fish hosts (dams and salt water) separate the units from each other. The critical habitat units described below constitute our best assessment at this time of areas that were occupied by one or more of the seven mussels at the time of listing (1998) and which contain the physical and biological features essential to the each of the mussel species. Each unit is designated only for those species that currently occupy it. Each unit contains one or more of the PCEs, and may require special management considerations or protection to address the threats noted above. The 11 units, and the States in which they occur, are: (1) Econfina Creek (FL), (2) Chipola River (AL, FL), (3) Uchee Creek (AL), (4) Sawhatchee Creek and Kirkland Creek (GA), (5) Upper Flint River (GA), (6) Middle Flint River (GA), (7) Lower Flint River (GA), (8) Apalachicola River (FL), (9) Upper Ochlockonee River (FL, GA), (10) Lower Ochlockonee River (FL), and (11) Santa Fe River and New River (FL). Collectively, the total length of the river and stream segments of all of the areas (units) proposed is approximately 1,864 km (1,158 mi). Table 1 shows the approximate length of rivers and streams proposed as occupied critical habitat for each of the seven mussels in the 11 units.

Species, critical habitat unit, and state(s)	Currently occupied	
	Kilometers	Miles
Fat threeridge		
2. Chipola River, AL, FL	190.0	118.1
8. Apalachicola River, FL	155.4	96.6
Total	345.4	214.7
Shinyrayed pocketbook		
2. Chipola River, AL, FL	190.0	118.1
3. Uchee Creek, AL	34.2	21.2
4. Sawhatchee Creek and Kirkland Creek, GA	37.8	23.5
5. Upper Flint River, GA	380.4	236.4
6. Middle Flint River, GA	302.3	187.8
7. Lower Flint River, GA	396.7	246.5
9. Upper Ochlockonee River, FL, GA	177.3	110.2
Total	1518.7	943.7
Gulf moccasinshell		
1. Econfina Creek, FL	31.4	19.5
2. Chipola River, AL, FL	190.0	118.1

Species, critical habitat unit, and state(s)	Currently occupied	
	Kilometers	Miles
4. Sawhatchee Creek and Kirkland Creek, GA	37.8	23.5
5. Upper Flint River, GA	380.4	236.4
6. Middle Flint River, GA	302.3	187.8
7. Lower Flint River, GA	396.7	246.5
Total	1338.3	831.8
Ochlockonee moccasinshell		
9. Upper Ochlockonee River, FL, GA	177.3	110.2
Total	177.3	110.2
Oval pigtoe		
1. Econfina Creek, FL	31.4	19.5
2. Chipola River, AL, FL	190.0	118.1
4. Sawhatchee Creek and Kirkland Creek, GA	37.8	23.5
5. Upper Flint River, GA	380.4	236.4
6. Middle Flint River, GA	302.3	187.8
7. Lower Flint River, GA	396.7	246.5
9. Upper Ochlockonee River, FL, GA	177.3	110.2
11. Santa Fe and New Rivers, FL	83.1	51.6
Total	1598.7	993.6
Chipola slabshell		
2. Chipola River, AL, FL	190.0	118.1
Total	190.0	118.1
Purple bankclimber		
5. Upper Flint River, GA	380.4	236.4
6. Middle Flint River, GA	302.3	187.8
7. Lower Flint River, GA	396.7	246.5
8. Apalachicola River, FL	155.4	96.6
9. Upper Ochlockonee River, FL, GA	177.3	110.2
10. Lower Ochlockonee River, FL	75.4	46.9
Total	1487.2	924.4
Total Proposed for All 11 Units (All Species)	1864.0	1158.3

Brief descriptions of each unit follow, listing the rivers and streams included, the upstream and downstream extent of the unit in those rivers and streams, and which of the seven mussels were present at the time of listing. Each critical habitat unit includes the channels of the rivers and streams listed between the ordinary high water mark on each bank, which is defined in 33 CFR 329.11 as ''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.'' In the unit descriptions, distances between landmarks marking the upstream or downstream extent of a particular stream in the unit are given in kilometers (km) and equivalent miles (mi), as measured tracing the course of the stream, not straight-line distance.

Unit 1: Econfina Creek, Florida

Unit 1 includes the main stem of Econfina Creek and one of its tributaries in Bay and Washington counties, Florida, encompassing a total stream length of 31.4 km (19.5 mi). The main stem of Econfina Creek as proposed extends from its confluence with Deer Point Lake at the powerline crossing located 3.8 km (2.3 miles) downstream of Bay County Highway 388, Bay County, Florida, upstream 28.6 km (17.8 mi) to Tenmile Creek in Washington County, Florida. Unit 1 also includes the tributary stream Moccasin Creek from its confluence with Econfina Creek upstream 2.8 km (1.7 mi) to Ellis Branch in Bay County. Unit 1 is designated for the Gulf moccasinshell and oval pigtoe (Blalock-Herod unpub. data 2002–03; Brim Box unpub. data 1996; Williams unpub. data 1993).

Unit 2: Chipola River, Alabama and Florida

Unit 2 includes the main stem of the Chipola River (including the reach known as Dead Lake) and six of its tributaries, encompassing a total stream length of 190.0 km (118.1 mi) in Houston County, Alabama; and in Calhoun, Gulf, and Jackson counties, Florida. The main stem of the Chipola River as proposed extends from its confluence with the Apalachicola River in Gulf County, Florida, upstream 144.9 km (90.0 mi) to the confluence of Marshall and Cowarts creeks in Jackson County, Florida. A short segment of the Chipola River that flows underground within the boundaries of Florida Caverns State Park in Jackson County, Florida, is not included in Unit 2. The downstream extent of each tributary within the unit is its mouth (its confluence with the water body named), and the upstream extent is the landmark listed. The tributaries of the Chipola River included in Unit 2 are: Dry Creek,

from the Chipola River upstream 7.6 km (4.7 mi) to Ditch Branch in Jackson County, Florida; Rocky Creek, from the Chipola River upstream 7.1 km (4.4 mi) to Little Rocky Creek in Jackson County, Florida; Waddells Mill Creek, from the Chipola River upstream 3.7 km (2.3 mi) to Russ Mill Creek in Jackson County, Florida; Baker Creek, from Waddells Mill Creek upstream 5.3 km (3.3 mi) to the confluence with Tanner Springs in Jackson County, Florida; Marshall Creek, from the Chipola River upstream 13.7 km (8.5 mi) to the Alabama-Florida State line in Jackson County, Florida (this creek is known as Big Creek in Alabama); and Big Creek, from the Alabama-Florida State line upstream 7.8 km (4.9 mi) to Double Bridges Creek in Houston County, Alabama.

This unit is designated for the fat threeridge (Brim Box and Williams 2000, p. 92–93; Miller 1998, p. 54), shinyrayed pocketbook (Williams unpub. data 2002; Brim Box and Williams 2000, p. 109–110; Smith unpub. data 2001; Blalock-Herod unpub. data 2000, 2003; Butler unpub. data 1993, 1994, 1999, 2000); Gulf moccasinshell (Butler unpub. data 1999, 2002; Brim Box and Williams 2000, p. 113–114; D.N. Shelton pers. comm. 1998); oval pigtoe (Butler unpub. data 1993, 1999, 2002; Brim Box and Williams 2000, p. 116–117; Williams unpub. data 2000); and Chipola slabshell (Butler unpub. data 1993, 2000; Brim Box and Williams 2000, p. 95–96).

Unit 3: Uchee Creek, Alabama

Unit 3 encompasses 34.2 km (21.2 mi) of the main stem of Uchee Creek from its confluence with the Chattahoochee River upstream to Island Creek in Russell County, Alabama. This unit is designated for the shinyrayed pocketbook (Brim Box and Williams 2000, p. 109–110; Gangloff unpublished data 2005).

Unit 4: Sawhatchee Creek and Kirkland Creek, Georgia

Unit 4 includes the main stems of Sawhatchee Creek and Kirkland Creek and one tributary of Sawhatchee Creek, encompassing a total stream length of 37.8 km (23.5 mi) in Early County, GA. The main stem of Sawhatchee Creek as proposed extends from its confluence with the Chattahoochee River upstream 28.6 km (17.8 mi) to the powerline crossing located 1.4 km (0.87 mi) upstream of County Road 15, Early County, GA. The main stem of Kirkland Creek extends from its confluence with the Chattahoochee River upstream 6.1 km (3.8 mi) to Dry Creek, Early County, GA. The tributary, Sheffield Mill Creek, is included from its confluence with Sawhatchee Creek upstream 3.1 km (1.9 mi) to the powerline crossing located 2.3 km (1.4 mi) upstream of Sowhatchee Road, Early County, GA. Unit 4 is designated for the shinyrayed pocketbook, Gulf moccasinshell, and oval pigtoe (Brim Box and Williams 2000, p. 109–110, 113–114, 116–117; Abbott pers. comm. 2005; Stringfellow pers. comm. 2003).

Unit 5: Upper Flint River, Georgia

Unit 5 includes the main stem of the Flint River and eight of its tributaries upstream of Lake Blackshear, plus two tributaries that flow into Lake Blackshear, encompassing a total stream length of 380.4 km (236.4 mi) in Coweta, Crawford, Crisp, Dooly, Fayette, Macon, Meriwether, Peach, Pike, Spalding, Sumter, Talbot , Taylor, Upson, and Worth counties, Georgia. The main stem of the Flint River in proposed Unit 5 extends from the State Highway 27 bridge (Vienna Road) in Dooly and Sumter counties, Georgia (the river is the county boundary), upstream 247.4 km (153.7 mi) to Horton Creek in Fayette and Spalding counties, Georgia (the river is the county boundary). The downstream extent of each tributary within the unit is its mouth (its confluence with the water body named), and the upstream extent is the landmark listed. The nine tributary streams in Unit 5 are: Swift Creek, from Lake Blackshear upstream 11.3 km (7 mi) to Rattlesnake Branch in Crisp and Worth counties, Georgia (the creek is the county boundary); Limestone Creek, from Lake Blackshear in Crisp County, Georgia, upstream 8.8 km (5.5 mi) to County Road 89 in Dooly County, Georgia; Turkey Creek, from the Flint River upstream 21.7 km (13.5 mi) to Rogers Branch in Dooly County, Georgia; Pennahatchee Creek, from Turkey Creek upstream 4.8 km (3 mi) to Little Pennahatchee Creek in Dooly County, Georgia; Little Pennahatchee Creek, from Pennahatchee Creek upstream 5.8 km (3.6 mi) to Rock Hill Creek in Dooly County, Georgia; Hogcrawl Creek, from the Flint River upstream 21.6 km (13.4 mi) to Little Creek in Dooly and Macon counties, Georgia (the creek is the county boundary); Red Oak Creek, from the Flint River upstream 21.7 km (13.5 mi) to Brittens Creek in Meriwether County, Georgia; Line Creek, from the Flint River upstream 15.8 km (9.8 mi) to Whitewater Creek in Coweta and Fayette counties, Georgia (the creek is the county boundary); and Whitewater Creek, from Line Creek upstream 21.5 km (13.4 mi) to Ginger Cake Creek in Fayette County, Georgia.

Unit 5 is designated for the shinyrayed pocketbook (Dinkins pers. comm. 1999, 2003; P.D. Johnson pers. comm. 2003; Brim Box and Williams 2000, p. 109–110; Roe 2000; L. Andrews pers. comm. 2000; Blalock-Herod unpub. data 1997; Butler and Brim Box 1995, p. 3); Gulf moccasinshell (Edwards Pittman Environmental 2004; McCafferty pers. comm. 2003; Dinkins pers. comm. 2002; Brim Box and Williams 2000, p. 113–114; Andrews pers. comm. 2000; Blalock-Herod unpub. data 1997; Butler and Brim Box 1995, p. 3); oval pigtoe (Edwards Pittman Environmental 2004; McCafferty pers. comm. 2003; Dinkins pers. comm. 2002, 2003; Stringfellow pers. comm. 2000, 2003; Abbott pers. comm. 2001; Brim Box and Williams 2000, p. 116–117; Andrews pers. comm. 2000; Blalock-Herod unpub. data 1997); and purple bankclimber (Winterringer CCR pers. comm. 2003; Dinkins pers. comm. 2003; P.D. Johnson pers. comm. 2003; Albanese pers. comm. 2003 regarding unpub. data from De Genachete and CCR; Brim Box and Williams 2000, p. 105–106; E. Van De Genachete pers. comm. 1999).

Unit 5 is divided into two maps in the Proposed Regulation Promulgation section of this proposed rule, one for the southern part and one for the northern part of the unit. The ''match line'' for joining these two maps is where the county boundary between Crawford and Upson counties, Georgia, meets the Flint River.

Unit 6: Middle Flint River, Georgia

Unit 6 includes the main stem of the Flint River between Lake Worth (impounded by the Flint River Dam near Albany) and the Warwick Dam (which impounds Lake Blackshear), and nine tributaries, encompassing a total stream length of 302.3 km (187.8 mi) in Dougherty, Lee, Marion, Schley, Sumter, Terrell, Webster, and Worth counties, Georgia. The main stem of the Flint River in Unit 6 extends from Piney Woods Creek in Dougherty County, Georgia (the approximate upstream extent of Lake Worth), upstream 39.9 km (24.8 mi) to the Warwick Dam in Lee and Worth counties, Georgia. The downstream extent of each tributary within the unit is its mouth (its confluence with the water body named), and the upstream extent is the landmark listed. The nine tributaries of the Middle Flint River in Unit 6 are: Kinchafoonee Creek, from the Lee-Dougherty county line (the approximate upstream extent of Lake Worth) upstream 107.6 km (66.8 mi) to Dry Creek in Webster County, Georgia; Lanahassee Creek, from Kinchafoonee

Creek upstream 9.3 km (5.8 mi) to West Fork Lanahassee Creek in Webster County, Georgia; Muckalee Creek, from the Lee'Dougherty county line (the approximate upstream extent of Lake Worth) upstream 104.5 km (64.9 mi) to County Road 114 in Marion County, Georgia; Little Muckalee Creek, from Muckalee Creek in Sumter County, Georgia, upstream 7.2 km (4.5 mi) to Galey Creek in Schley County, Georgia; Mill Creek, from the Flint River upstream 3.2 km (2 mi) to Mercer Millpond Creek in Worth County, Georgia; Mercer Millpond Creek, from Mill Creek upstream 0.45 km (0.28 mi) to Mercer Millpond in Worth County, Georgia; Abrams Creek, from the Flint River upstream 15.9 km (9.9 mi) to County Road 123 in Worth County, Georgia; Jones Creek, from the Flint River upstream 3.8 km (2.4 mi) to County Road 123 in Worth County, Georgia; and Chokee Creek, from the Flint River upstream 10.5 km (6.5 mi) to Dry Branch Creek in Lee County, Georgia.

Unit 6 is designated for the shinyrayed pocketbook (Crow CCR pers. comm. 2004; Edwards Pittman Environmental 2004; Albanese pers. comm. 2003 regarding unpub. data from CCR; DeGarmo unpub. data 2002; McCafferty pers. comm. 2000, 2001; Golladay unpub. data 2001, 2002; P. Johnson unpub. data 1999; Blalock-Herod unpub. data 1997; Dinkins pers. comm. 1995; Brim Box and Williams 2000, p. 109–110), Gulf moccasinshell (Wisnewski unpub. data 2005; DeGarmo unpub. data 2002; Albanese pers. comm. 2003 regarding unpub. data from D. Shelton; P. Johnson unpub. data 1999; Brim Box and Williams 2000, p. 113–114; Weston 1995), oval pigtoe (Wisnewski unpub. data 2005; Crow CCR pers. comm. 2004; Albanese pers. comm. 2003 regarding unpub. data from CCR; DeGarmo unpub. data 2002; Stringfellow unpub. data 2002; Golladay unpub. data 2001, 2002; Brim Box and Williams 2000, p. 116–117; P. Johnson unpub. data 1999; Blalock-Herod unpub. data 1997; Weston 1995), and purple bankclimber (Tarbell 2004; Brim Box and Williams 2000, p. 105–106).

Unit 6 is divided into two maps in the Proposed Regulation Promulgation section of this proposed rule, one for the western part and one for the eastern part of the unit. The ''match line'' for joining these two maps is Lake Worth in Dougherty County, Georgia.

Unit 7: Lower Flint River, Georgia

Unit 7 includes the main stem of the Flint River between Lake Seminole (impounded by the Jim Woodruff Lock and Dam) and the Flint River Dam (which impounds Lake Worth), and nine tributaries, encompassing a total stream length of 396.7 km (246.5 mi) in Baker, Calhoun, Decatur, Dougherty, Early, Miller, Mitchell, and Terrell counties, GA. The main stem of the Flint River in Unit 7 extends from its confluence with Big Slough in Decatur County, GA (the approximate upstream extent of Lake Seminole) upstream 116.4 km (72.3 mi) to the Flint River Dam in Dougherty County, GA. The downstream extent of each tributary within the unit is its mouth (its confluence with the water body named), and the upstream extent is the landmark listed. The nine tributaries of the Lower Flint River in Unit 7 are: Spring Creek, from Smith Landing in Decatur County, Georgia (the approximate upstream extent of Lake Seminole), upstream 74.2 km (46.1 mi) to County Road 35 in Early County, Georgia; Aycocks Creek, from Spring Creek upstream 15.9 km (9.9 mi) to Cypress Creek in Miller County, Georgia; Dry Creek, from Spring Creek upstream 9.9 km (6.1 mi) to Wamble Creek in Early County, Georgia; Ichawaynochaway Creek, from the Flint River in Baker County, Georgia, upstream 68.6 km (42.6 mi) to Merrett Creek in Calhoun County, Georgia; Mill Creek, from Ichawaynochaway Creek upstream 7.4 km (4.6 mi) to County Road 163 in Baker County, Georgia; Pachitla Creek, from Ichawaynochaway Creek upstream 18.9 km (11.8 mi) to Little Pachitla Creek in Calhoun County, Georgia; Little Pachitla Creek, from Pachitla Creek upstream 5.8 km (3.6 mi) to Bear Branch in Calhoun County, Georgia; Chickasawhatchee Creek, from Ichawaynochaway Creek in Baker County, GA, upstream 64.5 km (40.1 mi) to U.S. Highway 82 in Terrell County, Georgia; and Cooleewahee Creek, from the Flint River upstream 15.1 km (9.4 mi) to Piney Woods Branch in Baker County, Georgia.

Unit 7 is designated for the shinyrayed pocketbook (Gangloff 2005; McCafferty pers. comm. 2004; Stringfellow unpub. data 2003; Dinkins pers. comm. 2001, 2003; Golladay unpub. data 2001, 2002; P. Johnson unpub. data 1999; Albanese pers. comm. 2003 regarding unpub. data from CCR; Andrews pers. comm. 2000; Blalock-Herod unpub. data 1997; Brim Box and Williams 2000, p. 109–110; Butler unpub. data 1993), Gulf moccasinshell (Abbott pers. comm. 2005; Golladay unpub. data 2001, 2002; P. Johnson unpub. data 1999; Brim Box and Williams 2000, p. 113–114; Butler unpub. data 1998; Blalock-Herod unpub. data 1997), oval pigtoe (Dinkins pers. comm. 2001; Golladay unpub. data 2001, 2002; Andrews pers. comm. 2000; Brim Box and Williams 2000, p. 116–117; P. Johnson unpub. data 1999; Butler unpub. data 1998; Blalock-Herod unpub. data 1997), and purple bankclimber (S. Carlson unpub. data 2002; Brim Box and Williams 2000, p. 105–106).

Unit 7 is divided into two maps in the Proposed Regulation Promulgation section of this proposed rule, one for the western part and one for the eastern part of the unit. The western part (Map 10) depicts the Spring Creek system and the eastern part (Map 11) depicts the lower Flint River system.

Unit 8: Apalachicola River, Florida

Unit 8 includes the main stem of the Apalachicola River and two distributaries (channels flowing out of the main stem), encompassing a total stream length of 155.4 km (96.6 mi) in Calhoun, Franklin, Gadsden, Gulf, Jackson, and Liberty counties, Florida. The main channel of the Apalachicola River in Unit 8 extends from the downstream end of Bloody Bluff Island (river mile 15.3 on U.S. Army Corps of Engineers Navigation Charts) in Franklin County, Florida, upstream to the Jim Woodruff Lock and Dam in Gadsden and Jackson counties, Florida (the river is the county boundary). The upstream extent of each distributary within the unit is its point of departure from the main channel of the Apalachicola River, and the downstream extent is the landmark listed. The two distributaries of the Apalachicola River in Unit 6 are: Chipola Cutoff, from the Apalachicola River in Gulf County, Florida, downstream 4.5 km (2.8 mi) to its confluence with the Chipola River in Gulf County, Florida; and Swift Slough, from the Apalachicola River in Liberty County, Florida, downstream 3.6 km (2.2 mi) to its confluence with the River Styx in Liberty County, Florida.

Unit 8 is designated for the fat threeridge (Brim Box and Williams 2000, p. 92–93; Williams unpub. data 2000; Miller 1998, p. 54, 2000; Richardson and Yokley 1996, p. 137; Flakes 2001) and purple bankclimber (Brim Box and Williams 2000, p. 105–106; Miller 1998, p. 55, 2000; Richardson and Yokley 1996, p. 137; Butler unpub. data 1993; Flakes 2001).

Unit 9: Upper Ochlockonee River, Florida, Georgia

Unit 9 includes the main stem of the Ochlockonee River upstream of Lake Talquin (impounded by the Jackson Bluff Dam) and three tributaries, encompassing a total stream length of 177.3 km (110.2 mi) in Gadsden and

Leon counties, Florida, and Grady and Thomas counties, Georgia. The main stem of the Ochlockonee River in Unit 9 extends from its confluence with Gulley Branch (the approximate upstream extent of Lake Talquin) in Gadsden and Leon counties, Florida (the river is the county boundary), upstream to Bee Line Road/County Road 306 in Thomas County, Georgia. The downstream extent of each tributary within the unit is its mouth (its confluence with the water body named), and the upstream extent is the landmark listed. The three tributary streams in Unit 9 are: Barnetts Creek, from the Ochlockonee River upstream 20 km (12.4 mi) to Grady County Road 170/ Thomas County Road 74 in Grady and Thomas counties, Georgia (the creek is the county boundary); West Barnetts Creek, from Barnetts Creek upstream 10 km (6.2 mi) to GA Highway 111 in Grady County, Georgia; and Little Ochlockonee River, from the Ochlockonee River upstream 13.3 km (8.3 mi) to Roup Road/County Road 33 in Thomas County, Georgia.

Unit 9 is designated for the shinyrayed pocketbook (Blalock-Herod 2003, p. 1; McCafferty pers. comm. 2003; Williams unpub. data 1993), Ochlockonee moccasinshell (Brim Box and Williams 2000, p. 60; Williams and Butler 1994, p. 64), oval pigtoe (Edwards Pittman Environmental 2004; Blalock-Herod unpub. data 2003; Blalock-Herod 2003, p. 1; Williams unpub. data 1993), and purple bankclimber (Blalock-Herod unpub. data 2003; Blalock-Herod 2002, p. 1; Smith FDOT unpub. data 2001; Williams unpub. data 1993).

Unit 10: Lower Ochlockonee River, Florida

Unit 10 encompasses 75.4 km (46.9 mi) of the main stem of the Ochlockonee River from its confluence with Syfrett Creek in Wakulla County, Florida, upstream to the Jackson Bluff Dam (which impounds Lake Talquin) in Leon and Liberty counties, Florida. Unit 10 is designated for the purple bankclimber (Blalock-Herod unpub. data 2003; Williams unpub. data 1993).

Unit 11: Santa Fe River and New River, Florida

Unit 11 includes the main stem of the Santa Fe River and its tributary the New River, encompassing a total stream length of 83.1 km (51.6 mi) in Alachua, Bradford, Columbia, and Union counties, Florida. The main stem of the Santa Fe River as proposed extends from where the river goes underground in O'Leno State Park in Alachua and Columbia counties, Florida (the river is the county boundary) upstream 60.2 km (37.4 mi) to the powerline crossing located 1.9 km (1.2 mi) downstream of U.S. Highway 301 in Alachua and Bradford counties, Florida (the river is the county boundary). The New River in proposed Unit 11 extends from its confluence with the Santa Fe River at the junction of Alachua, Bradford, and Union counties, Florida, upstream 22.9 km (14.2 mi) to McKinney Branch in Bradford and Union counties, Florida (the river is the county boundary). Unit 11 is designated for the oval pigtoe (Blalock-Herod and Williams 2001, p. 5; Blalock-Herod 2000, p. 1–72; Williams unpub. data 1993, 1996–98).

Existing Critical Habitat

Of the proposed critical habitat for the seven mussels, 147.3 km (91.5 mi) are already designated critical habitat for the Gulf sturgeon (Acipenser oxyrinchus desotoi) (68 FR 13370; March 19, 2003), which was listed as a threatened species under the Act on September 30, 1991 (56 FR 49653). The area in common between the proposed mussels' habitat and the designated sturgeon habitat is entirely within Unit 8, the Apalachicola River.

Land Ownership

States were granted ownership of lands beneath navigable waters up to the ordinary high water mark upon achieving statehood (*Pollard* v. *Hagan,* 44 U.S. (3 How.) 212 (1845)). Prior sovereigns or the States may have made grants to private parties that included lands below the ordinary high water mark of some navigable waters that are included in this proposal. We believe that most, if not all, lands beneath the navigable waters included in this proposed rule are owned by the States of Alabama, Florida, and Georgia. The lands beneath most nonnavigable waters and most riparian lands along the navigable and nonnavigable waters included in this proposed rule are in private ownership. Table 2 lists the parcels of publicly owned lands within or adjacent to each proposed critical habitat unit. Units not listed do not contain publicly owned lands.

TABLE 2.—PUBLIC LANDS WITHIN OR ADJACENT TO PROPOSED CRITICAL HABITAT UNITS

Critical habitat unit	Public lands
1. Econfina Creek	Econfina Creek WtrMA.
2. Chipola River	Upper Chipola River WtrMA, South Marianna Trail and Canoe Launch, Apalachicola River WtrMA, Apalachicola River WEA, Chipola River GW, Florida Caverns SP, Judges Cave WEA, Marianna GW.
5. Upper Flint	Joe Kurz WMA, Sprewell Bluff SP and WMA, Big Lazer WMA, Montezuma NA, Flint River WMA.
7. Lower Flint	Flint River GW, Radium Springs Tract, Chickasawhatchee Flint WMA, Elmodel WMA, Lake Seminole WMA.
8. Apalachicola River	Angus Gholson Jr. Nature Park of Chattahoochee, Apalachicola River WtrMA, Apalachicola River WEA, Fort Gadsden HS, Torreya SP, Apalachicola NF.
9. Upper Ochlockonee	Joe Budd WMA, Lake Talquin SF.
10. Lower Ochlockonee	Lake Talquin SP, Lake Talquin SF, Tate's Hell SF, Apalachicola NF.
11. Santa Fe River and New River	Santa Fe River Ranch, O'Leno SP, River Rise Preserve SP, Graham CA, Palatka-Lake Butler ST.

Abbreviations: CA = Conservation Area, GW = Greenway, HS = Historic Site, NA = Natural Area, NF = National Forest, SF = State Forest, SP = State Park, ST = State Trail, WEA = Wildlife and Environmental Area, WMA = Wildlife Management Area, WtrMA = Water Management Area.

Effects of Critical Habitat Designation

Section 7 Consultation

Section 7 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. In our regulations at 50 CFR 402.02, we define destruction or adverse modification as ''a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical.'' However, recent decisions by the 5th and 9th Circuit Court of Appeals (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 et al., 245 F.3d 434, 442F (5th Cir 2001). Also see discussion on Role of Critical Habitat above) have invalidated this definition. Pursuant to current national policy and the statutory provisions of the Act, destruction or adverse modification is determined 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 the intended conservation role for the species.

Section 7(a) of the Act requires Federal agencies, including the Service, 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 proposed or designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402.

Section 7(a)(4) of the Act requires Federal agencies to confer with us 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. However, once a proposed species becomes listed, or proposed critical habitat is designated as final, the full prohibitions of section 7(a)(2) apply to any Federal action. The primary utility of the conference procedures is to maximize the opportunity for a Federal agency to adequately consider proposed species and critical habitat and avoid potential delays in implementing their proposed action as a result of the section 7(a)(2) compliance process, should those species be listed or the critical habitat designated.

Under conference procedures, the Service may provide advisory conservation recommendations to assist the agency in eliminating conflicts that may be caused by the proposed action. The Service may conduct either informal or formal conferences. Informal conferences are typically used if the proposed action is not likely to have any adverse effects on the proposed species or proposed critical habitat. Formal conferences are typically used when the Federal agency or the Service believes the proposed action is likely to cause adverse effects on proposed species or critical habitat, inclusive of those that may cause jeopardy or adverse modification.

The results of an informal conference are typically transmitted in a conference report; while the results of a formal conference are typically transmitted in a conference opinion. Conference opinions on proposed critical habitat are typically prepared according to 50 CFR 402.14, as if the proposed critical habitat were designated. We may adopt the conference opinion as the biological opinion when 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)). Any conservation recommendations in a conference report or opinion are strictly advisory.

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 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 (action agency) must enter into consultation with us. As a result of this consultation, compliance with the requirements of section 7(a)(2) will be documented through the Service's 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 are likely to adversely affect listed species or critical habitat.

When we issue a biological opinion concluding that a project is likely to result in jeopardy to a listed species or the destruction or adverse modification of critical habitat, we also provide reasonable and prudent alternatives to the project, if any are identifiable. ''Reasonable and prudent alternatives'' are defined 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, that are consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that the Director believes would avoid jeopardy to the listed species or destruction or adverse modification of 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 a new species is listed or critical habitat is subsequently designated that may be affected and the Federal agency has retained discretionary involvement or control over the action or such discretionary involvement or control is authorized by law. Consequently, some Federal agencies may request reinitiation of consultation with us on actions for which formal consultation has been completed, if those actions may affect subsequently listed species or designated critical habitat or adversely modify or destroy proposed critical habitat.

Federal activities that may affect any of the seven species or their designated critical habitat will require section 7 consultation under the Act. Activities on State, Tribal, local, or private lands requiring a Federal permit (such as a permit from the USACE under section 404 of the Clean Water Act or a permit under section 10(a)(1)(B) of the Act from the Service) or involving some other Federal action (such as funding from the Federal Highway Administration, Federal Aviation Administration, or the Federal Emergency Management Agency) will also be subject to the section 7 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 consultations.

Application of the Jeopardy and Adverse Modification Standards for Actions Involving Effects to the Seven Mussels and Their Critical Habitat

Jeopardy Standard

Prior to and following designation of critical habitat, the Service has applied an analytical framework for jeopardy analyses of the seven mussels that relies heavily on the importance of core area populations to the mussels' survival and recovery. The section 7(a)(2) analysis is focused not only on these populations but also on the habitat conditions necessary to support them.

The jeopardy analysis usually expresses the survival and recovery needs of the seven mussels in a qualitative fashion without making distinctions between what is necessary for survival and what is necessary for recovery. Generally, if a proposed Federal action is incompatible with the viability of the affected core area population(s), inclusive of associated habitat conditions, a jeopardy finding is considered to be warranted, because of the relationship of each core area population to the survival and recovery of the species as a whole.

Adverse Modification Standard

The analytical framework described in the Director's December 9, 2004, memorandum is used to complete

section 7(a)(2) analyses for Federal actions affecting the seven mussels' critical habitat. The key factor related to the adverse modification determination is 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 the intended conservation role for the species. Generally, the conservation role of the seven mussels' critical habitat units is to support viable core area populations.

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

Activities that may destroy or adversely modify critical habitat are those that alter the PCEs to an extent that the conservation value of critical habitat for the seven mussels is appreciably reduced. Activities that, when carried out, funded, or authorized by a Federal agency, may affect critical habitat and therefore result in consultation for the seven mussels include, but are not limited to:

(1) Actions that would induce channel instability or significantly alter channel morphology. Such activities could include, but are not limited to, channelization, impoundment, road and bridge construction, mining, dredging, destruction of riparian vegetation, and changes in land cover, such as urbanization and clear-cut logging, that substantially alter the runoff characteristics of the watershed. These activities may alter sediment and water discharge in the channel, which results in smothering the stream bed with, or eroding it to, materials that are unsuitable substrates for the normal behavior, growth, and survival of the adult and juvenile life stages. These activities may initiate or accelerate bank erosion, which results in wider and shallower channels, more extreme temperatures, and chemical properties that are unsuitable for the normal behavior, growth, and survival of one or more life stages.

(2) Actions that would significantly decrease the proportion of coarse sediments (sand, gravel, cobble) in the stream bed. Such activities could include, but are not limited to, sedimentation from livestock grazing, road and bridge construction, mining, dredging, timber harvest, off-road vehicle use, and other activities that increase erosion rates in the channel or the watershed and deposition of fine sediments. These activities could reduce or eliminate the coarse substrates that provide for the normal behavior, growth, and survival of all life stages, and could increase the exposure of the juvenile and adult life stages to harmful contaminants that adhere to fine sediments.

(3) Actions that would significantly alter the flow regime. Such activities could include, but are not limited to, the construction and operation of dams, water withdrawals, water diversions, and changes in land cover that substantially alter the runoff characteristics of the watershed, such as urbanization and clear-cut logging. These activities could alter the spatial distribution, timing, and duration of depths and velocities in the channel that provide for the normal behavior, growth, and survival of one or more mussel life stages.

(4) Actions that would significantly alter physical and chemical water conditions. Such activities could include, but are not limited to, the release of chemicals, nutrients, biological pollutants, or heated effluents into the surface water or connected groundwater at a point source or by dispersed release (non-point source). These activities could alter water conditions that provide for the normal behavior, growth, and survival of one or more mussel life stages. These activities could promote the excessive growth of filamentous algae and other organisms that preclude the normal behavior, growth, and survival of one or more mussel life stages.

(5) Actions that would significantly reduce the density of host fishes. Such activities could include, but are not limited to, channelization, impoundment, mining, and dredging. These activities could alter the composition of the fish community such that the rate of host fish infection and completion of the larval life stage is too low to sustain a stable or increasing mussel population and normal rates of dispersal and genetic exchange with other areas.

We consider all of the units proposed as critical habitat to contain features essential to the conservation of the seven mussels. All of the units are within the geographic range of the seven species, were occupied at the time of listing (based on surveys completed 1990 to 1998), and are likely occupied currently (based on additional surveys between 1998 and the present, and on the longevity and relative immobility of mussels). Federal agencies already consult with us on actions in areas currently occupied by and that may affect the seven mussels to ensure that these actions do not jeopardize the mussels' continued existence.

Application of Section 3(5)(a) and Exclusions Under Section 4(b)(2) of the Act

The 11 units we propose as critical habitat satisfy the definition of critical habitat under section 3(5)(A) of the Act in that each is a specific area within the geographical area occupied by one or more of the seven mussels at the time of listing within which are found those physical and biological features that are essential to their conservation and that may require special management considerations or protection (see ''Primary Constituent Elements'', ''Criteria Used to Delineate Critical Habitat'', and ''Special Management Considerations or Protection''). We considered whether conservation activity on publicly or privately managed lands within a proposed unit might remove the need for special management considerations or protection from all or part of a unit.

Several stream reaches within the proposed critical habitat units run through or adjacent to public lands that are managed wholly or partially for conservation purposes (see ''Land Ownership''). None of the management plans for these areas provide assurance of effective conservation for the mussels or features essential to their conservation, because all of the areas are affected to some degree by threats upstream and outside of their boundaries that may degrade one or more of the PCEs within their boundaries. We describe PCE- and unit-specific threats under ''Special Management Considerations or Protection.'' At this time, the Service has not received applications for or issued incidental take permits that would require an HCP for one or more of the seven mussels. Further, we do not foresee not including particular areas in this proposal that are occupied and contain the PCEs but do not require special management or protection.

Under section 4(b)(2) of the Act, we must consider the economic impact, impact on national security, and any other relevant impact of designating areas as critical habitat. We may exclude any area from critical habitat if we determine that the benefits of exclusion outweigh the benefits of inclusion.

Benefits of Inclusion

The most direct benefit of critical habitat is that actions taken, authorized, or funded by the Federal government

require consultation under section 7 of the Act to ensure that these actions are not likely to destroy or adversely modify critical habitat (see ''Effects of Critical Habitat Designation—Section 7 Consultation''). This regulatory benefit has two principal limitations. First, it applies only to Federal actions and not to other actions that may destroy or adversely modify critical habitat. Second, it ensures only that designated areas are not destroyed or adversely modified and does not require specific steps toward recovery.

Another benefit of critical habitat is that its designation serves to educate landowners, State and local governments, and the general public. By clearly delineating areas of high conservation value, designation may help focus and promote conservation efforts for the seven mussels. Designation informs State agencies and local governments about areas that they may consider for protection or conservation under State laws or local ordinances.

Benefits of Exclusion

Because the regulatory effect of critical habitat is limited to Federal actions, the non-economic impacts of critical habitat are generally limited to Federal lands, partnerships, and trust resources. We have determined that the streams within the proposed critical habitat units for the seven mussels are not owned or managed by the Department of Defense, there are currently no HCPs for the seven mussels, and the proposed designation does not include any Tribal lands. We anticipate no impact to national security, Tribal lands, partnerships, or habitat conservation plans from this critical habitat designation as proposed.

Based on the best available information, we believe that the benefits of designating each of the 11 units we propose as critical habitat outweigh the non-economic benefits of excluding any specific areas within those units. We will evaluate potential economic benefits of exclusion in a separate notice (see ''Economic Analysis'').

Economic Analysis

An analysis of the economic impacts of proposing critical habitat for the seven mussels is being prepared. 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 *http://www.fws.gov/panamacity/* or by contacting the Panama City, Florida, Fish and Wildlife Office directly (see **ADDRESSES** section). For further explanation, see the ''Regulatory Flexibility Act'' and ''Regulatory Planning and Review'' discussions below.

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 critical habitat designation is 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 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 at least 15 days prior to the close of the public comment period. We intend to schedule public hearings once the draft economic analysis is available so that we can take public comment on the proposed designation and the economic analysis simultaneously. However, we can schedule public hearings on this proposal prior to that time, 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.

Clarity of the Rule

Executive Order 12866 requires each agency to write regulations and notices that are easy to understand. We invite your comments on how to make this proposed rule easier to understand, including answers to questions such as the following: (1) Are the requirements in the proposed rule clearly stated? (2) Does the proposed rule contain technical jargon that interferes with the clarity? (3) Does the format of the proposed rule (grouping and order of the sections, use of headings, paragraphing, and so forth) aid or reduce its clarity? (4) Is the description of the notice in the **SUPPLEMENTARY INFORMATION** section of the preamble helpful in understanding the proposed rule? (5) What else could we do to make this proposed rule easier to understand?

Send a copy of any comments on how we could make this proposed rule easier to understand to: Office of Regulatory Affairs, Department of the Interior, Room 7229, 1849 C Street, NW., Washington, DC 20240. You may e-mail your comments to this address: *Exsec@ios.doi.gov.*

Required Determinations

Regulatory Planning and Review

In accordance with Executive Order 12866, this document is a significant rule in that it may raise novel legal and policy issues, but it is not anticipated to have an annual effect on the economy of $100 million or more or affect the economy in a material way. Due to the tight timeline for publication in the **Federal Register**, the Office of Management and Budget (OMB) has not formally reviewed this rule. We are preparing a draft economic analysis of this proposed action, which will be available for public comment, to determine the economic consequences of designating the specific areas as critical habitat. This economic analysis also will be used to determine compliance with Executive Order 12866, Regulatory Flexibility Act, Small Business Regulatory Enforcement Fairness Act, and Executive Order 12630.

Within these areas, the types of Federal actions or authorized activities that we have identified as potential concerns are listed above in the section on Section 7 Consultation. The availability of the draft economic analysis will be announced in the **Federal Register** and in local newspapers so that it is available for public review and comments. The draft economic analysis can be obtained from the Internet Web site at *http://www.fws.gov/panamacity/* or by contacting the Panama City, Florida, Fish and Wildlife Service office directly (see **ADDRESSES** section).

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

Our assessment of economic effect will be completed prior to final rulemaking based upon review of the draft economic analysis prepared pursuant to section 4(b)(2) of the Act and E.O. 12866. This analysis is for the purposes of compliance with the Regulatory Flexibility Act and does not reflect our position on the type of

economic analysis required by *New Mexico Cattle Growers Assn.* v. *U.S. Fish and Wildlife Service* 248 F.3d 1277 (10th Cir. 2001).

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.

At this time, the Service lacks the available economic information necessary to provide an adequate factual basis for the required RFA finding. Therefore, the RFA finding is deferred until completion of the draft economic analysis prepared pursuant to section 4(b)(2) of the Act and E.O. 12866. This draft economic analysis will provide the required factual basis for the RFA finding. Upon completion of the draft economic analysis, the Service will publish a notice of availability of the draft economic analysis of the proposed designation and reopen the public comment period for the proposed designation. The Service will include with the notice of availability, 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. The Service has concluded that deferring the RFA finding until completion of the draft economic analysis is necessary to meet the purposes and requirements of the RFA. Deferring the RFA finding in this manner will ensure that the Service makes a sufficiently informed determination based on adequate economic information and provides the necessary opportunity for public comment.

Executive Order 13211

On May 18, 2001, the President issued an Executive Order (E.O. 13211) on regulations that significantly affect energy supply, distribution, and use. Executive Order 13211 requires agencies to prepare Statements of Energy Effects when undertaking certain actions. This proposed rule to designate critical habitat for the seven mussels is a significant rule under Executive Order 12866 in that it may raise novel legal and policy issues, but it is not expected to significantly affect energy supplies, distribution, or use. Therefore, this action is not a significant energy action, and no Statement of Energy Effects is required.

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, or 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 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 critical habitat shift the costs of the large entitlement programs listed above on to State governments.

(b) We do not believe that this rule will significantly or uniquely affect small governments because the proposed units are streams, unauthorized take of the seven mussels within and outside the units is already prohibited, and critical habitat provides no incremental restrictions. 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.

Federalism

In accordance with Executive Order 13132, 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, Florida, and Georgia. The designation of critical habitat in areas currently occupied by the seven mussels, we believe, imposes little to no additional restrictions to those currently in place and, therefore, has little incremental impact on State and local governments and their activities. The 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 primary constituent elements 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).

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 in accordance with the provisions of the Act. This proposed rule uses standard property descriptions and identifies the primary constituent elements within the designated areas to assist the public in understanding the habitat needs of the seven mussels.

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

It is our position that, outside the Tenth Circuit, we do not need to prepare environmental analyses as defined by the NEPA in connection with designating critical habitat under the Endangered Species Act of 1973, as amended. 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 in the courts of the Ninth Circuit (*Douglas County* v. *Babbitt,* 48 F.3d 1495 (9th Cir. Ore. 1995), cert. denied 116 S. Ct. 698 (1996)).

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 with features essential to the conservation of the seven mussels. Therefore, critical habitat for the seven mussels has not been designated on tribal lands.

References Cited

A complete list of all references cited in this rulemaking is available upon request from the Field Supervisor, Panama City Fish and Wildlife Office (see **ADDRESSES** section).

Author

The primary author of this package is the Panama City Fish and Wildlife Office (see **ADDRESSES** 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. In § 17.11(h), revise the entries for ''Bankclimber, purple (mussel),'' ''Moccasinshell, Gulf,'' ''Moccasinshell, Ochlockonee,'' ''Pigtoe, oval,'' ''Pocketbook, shinyrayed,'' ''Slabshell, Chipola,'' and ''Threeridge, fat (mussel),'' listed in alphabetical order under ''CLAMS'' 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							
*	*	*	*	*	*		*
Bankclimber, purple (mussel).	*Elliptoideus sloatianus.*	U.S.A. (AL, FL, GA)	NA	T	633	17.95(f)	NA
*	*	*	*	*	*		*
Moccasinshell, Gulf	*Medionidus penicillatus.*	U.S.A. (AL, FL, GA)	NA	E	633	17.95(f)	NA
*	*	*	*	*	*		*
Moccasinshell, Ochlockonee.	*Medionidus simpsonianus.*	U.S.A. (FL, GA)	NA	E	633	17.95(f)	NA
*	*	*	*	*	*		*
Pigtoe, oval	*Pleurobema pyriforme.*	U.S.A. (AL, FL, GA)	NA	E	633	17.95(f)	NA
*	*	*	*	*	*		*
Pocketbook, shinyrayed.	*Lampsilis subangulata.*	U.S.A. (AL, FL, GA)	NA	E	633	17.95(f)	NA
*	*	*	*	*	*		*
Slabshell, Chipola	*Elliptio chipolaensis*	U.S.A. (AL, FL)	NA	T	633	17.95(f)	NA

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
*	*	*	*	*	*		*
Threeridge, fat (mussel).	*Amblema neislerii* ...	U.S.A. (FL, GA)	NA	E	633	17.95(f)	NA
*	*	*	*	*	*		*

3. In § 17.95, at the end of paragraph (f), add an entry for seven mussel species (in four northeast Gulf of Mexico drainages) to read as follows:

§ 17.95 Critical habitat—fish and wildlife.

* * * * *

(f) *Clams and snails.*

* * * * *

Seven mussel species (in four northeast Gulf of Mexico drainages): purple bankclimber (*Elliptoideus sloatianus*), Gulf moccasinshell (*Medionidus penicillatus*), Ochlockonee moccasinshell (*Medionidus simpsonianus*), oval pigtoe (*Pleurobema pyriforme*), shinyrayed pocketbook (*Lampsilis subangulata*), Chipola slabshell (*Elliptio chipolaensis*), and fat threeridge (*Amblema neislerii*).

(1) Critical habitat units are depicted on the maps below for the following counties:

(i) *Alabama:* Houston and Russell;

(ii) *Florida:* Alachua, Bay, Bradford, Calhoun, Columbia, Franklin, Gadsden, Gulf, Jackson, Leon, Liberty, Union, Wakulla, and Washington; and

(iii) *Georgia:* Baker, Calhoun, Clayton, Coweta, Crawford, Crisp, Decatur, Dooly, Dougherty, Early, Fayette, Grady, Lee, Macon, Marion, Meriwether, Miller, Mitchell, Peach, Pike, Schley, Spalding, Sumter, Talbot, Taylor, Terrell, Thomas, Upson, Webster, and Worth.

(2) The primary constituent elements of critical habitat for the purple bankclimber (*Elliptoideus sloatianus*), Gulf moccasinshell (*Medionidus penicillatus*), Ochlockonee moccasinshell (*Medionidus simpsonianus*), oval pigtoe (*Pleurobema pyriforme*), shinyrayed pocketbook (*Lampsilis subangulata*), Chipola slabshell (*Elliptio chipolaensis*), and fat threeridge (*Amblema neislerii*) are:

(i) A geomorphically stable stream channel (a channel that maintains its lateral dimensions, longitudinal profile, and spatial pattern over time without an aggrading or degrading bed elevation);

(ii) A predominantly sand, gravel, and/or cobble stream substrate;

(iii) Permanently flowing water;

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

(v) Fish hosts (such as largemouth bass, sailfin shiner, brown darter) that support the larval life stages of the seven mussels.

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

(4) Critical habitat unit maps. Data layers defining map units were created with USGS National Hydrography Dataset (NHD) GIS data. The 1:100,000 river reach (route) files were used to calculate river kilometers and miles. The following data sources were referenced to identify upstream and downstream extents of critical habitat units: USGS 7.5′ quadrangles; Georgia Department of Transportation county highway maps; U.S. Census Bureau 1:100,000 TIGER line road data; 1993 Georgia digital orthographic quarter quads (DOQQs); 2004 Florida DOQQs; and DeLorme Atlas and Gazetteers for Alabama, Florida, and Georgia. The projection used in mapping all units was Universal Transverse Mercator (UTM), NAD 83, Zone 16 North.

(5) **Note:** Index map (Map 1) showing critical habitat units in the States of Alabama, Florida, and Georgia for the seven mussels follows:

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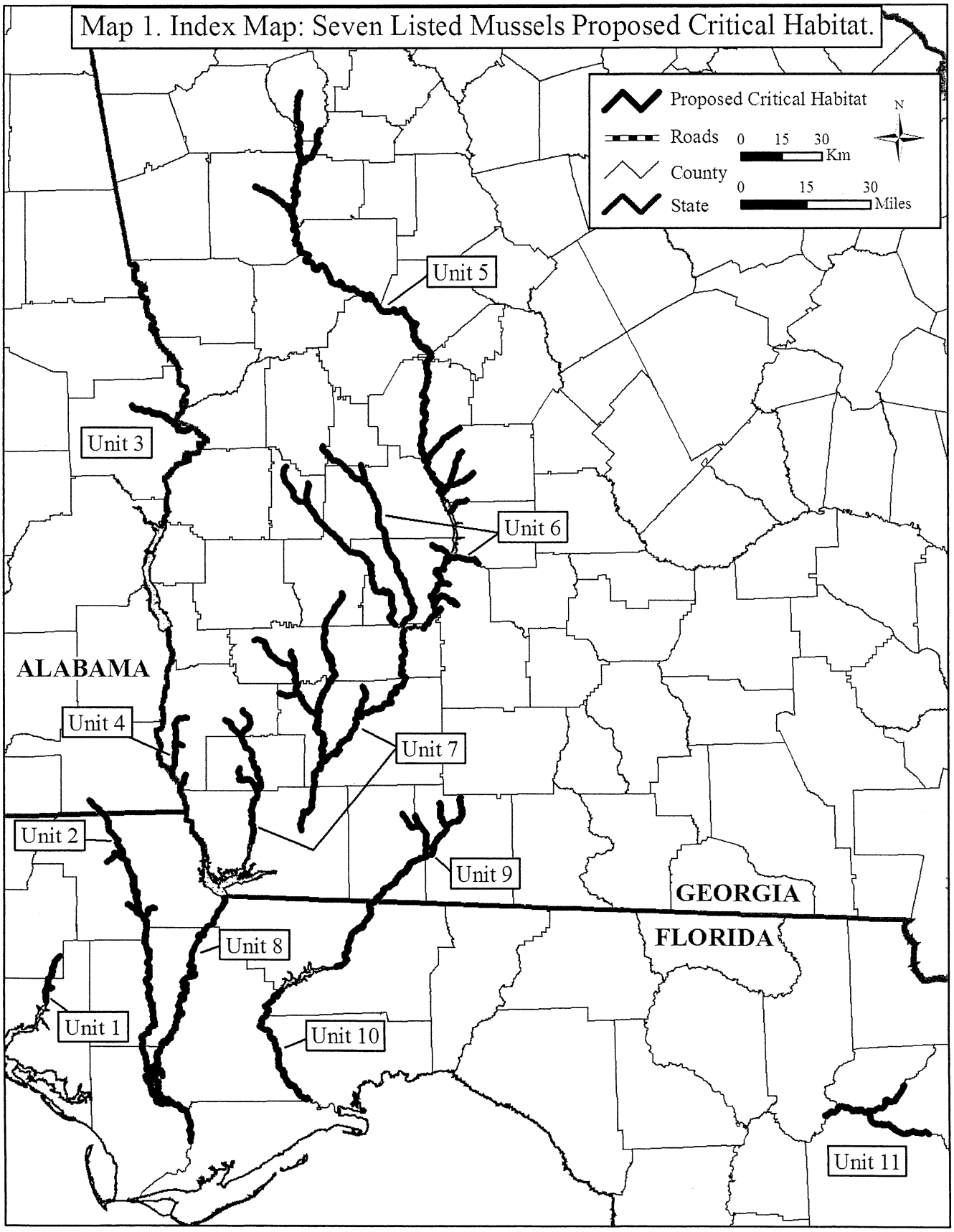


(6) Table of listed species and critical habitat units. A table showing the listed species, their respective critical habitat units, and the States that contain those habitat units follows. Detailed critical habitat unit descriptions and maps

appear below in paragraphs (7) through (17).

TABLE OF SEVEN MUSSEL SPECIES, THEIR CRITICAL HABITAT UNITS, AND STATES CONTAINING THOSE CRITICAL HABITAT UNITS

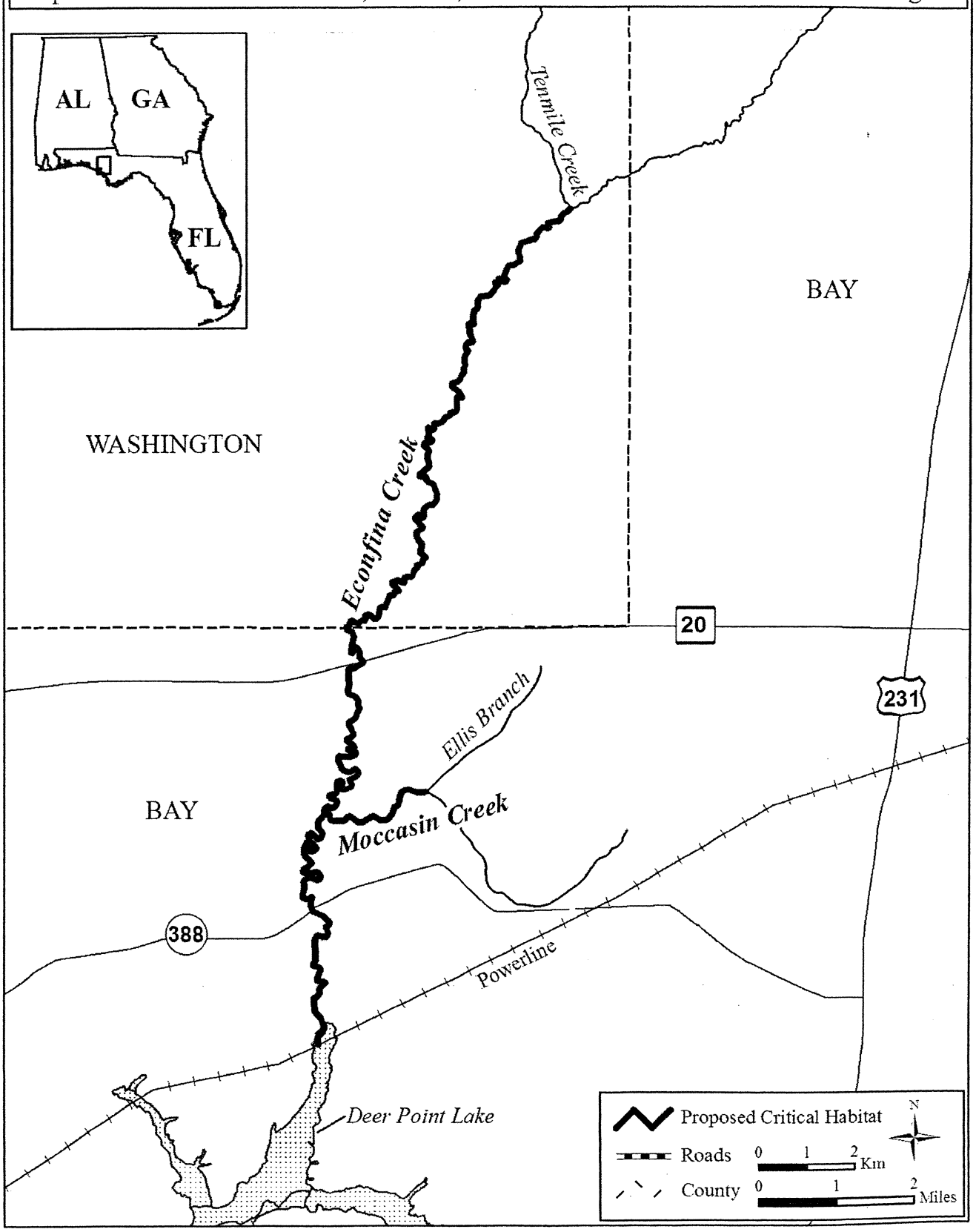
Species	Critical habitat units	States
Purple bankclimber (*Elliptoideus sloatianus*)	Units 5, 6, 7, 8, 9, 10	AL, FL, GA.
Gulf moccasinshell (*Medionidus penicillatus*)	Units 1, 2, 4, 5, 6, 7	AL, FL, GA.
Ochlockonee moccasinshell (*Medionidus simpsonianus*)	Unit 9	FL, GA.
Oval pigtoe (*Pleurobema pyriforme*)	Units 1, 2, 4, 5, 6, 7, 9, 11	AL, FL, GA.
Shinyrayed pocketbook (*Lampsilis subangulata*)	Units 2, 3, 4, 5, 6, 7, 9	AL, FL, GA.
Chipola slabshell (*Elliptio chipolaensis*)	Unit 2	AL, FL.
Fat threeridge (*mussel*) (*Amblema neislerii*)	Units 2, 8	AL, FL, GA.

(7) Unit 1. Econfina and Moccasin creeks, Bay and Washington Counties, Florida. This is a critical habitat unit for the Gulf moccasinshell and oval pigtoe.

(i) *General Description:* Unit 1 includes the main stem of Econfina Creek and one of its tributaries, Moccasin Creek, encompassing a total stream length of 31.4 kilometers (km) (19.5 miles (mi)). The main stem of Econfina Creek extends from its confluence with Deer Point Lake at the powerline crossing located 3.8 km (2.3 mi) downstream of Bay County Highway 388 (−85.56 longitude 30.36 latitude), Bay County, Florida, upstream 28.6 km (17.8 mi) to Tenmile Creek (−85.50 longitude, 30.51 latitude), Washington County, Florida; and Moccasin Creek from its confluence with Econfina Creek upstream 2.8 km (1.7 mi) to Ellis Branch (−85.53 longitude, 30.41 latitude), Bay County, Florida.

(ii) **Note:** Unit 1 map (Map 2) follows:

Map 2. Unit 1: Econfina Creek, Florida, for the Gulf Moccasinshell and Oval Pigtoe.

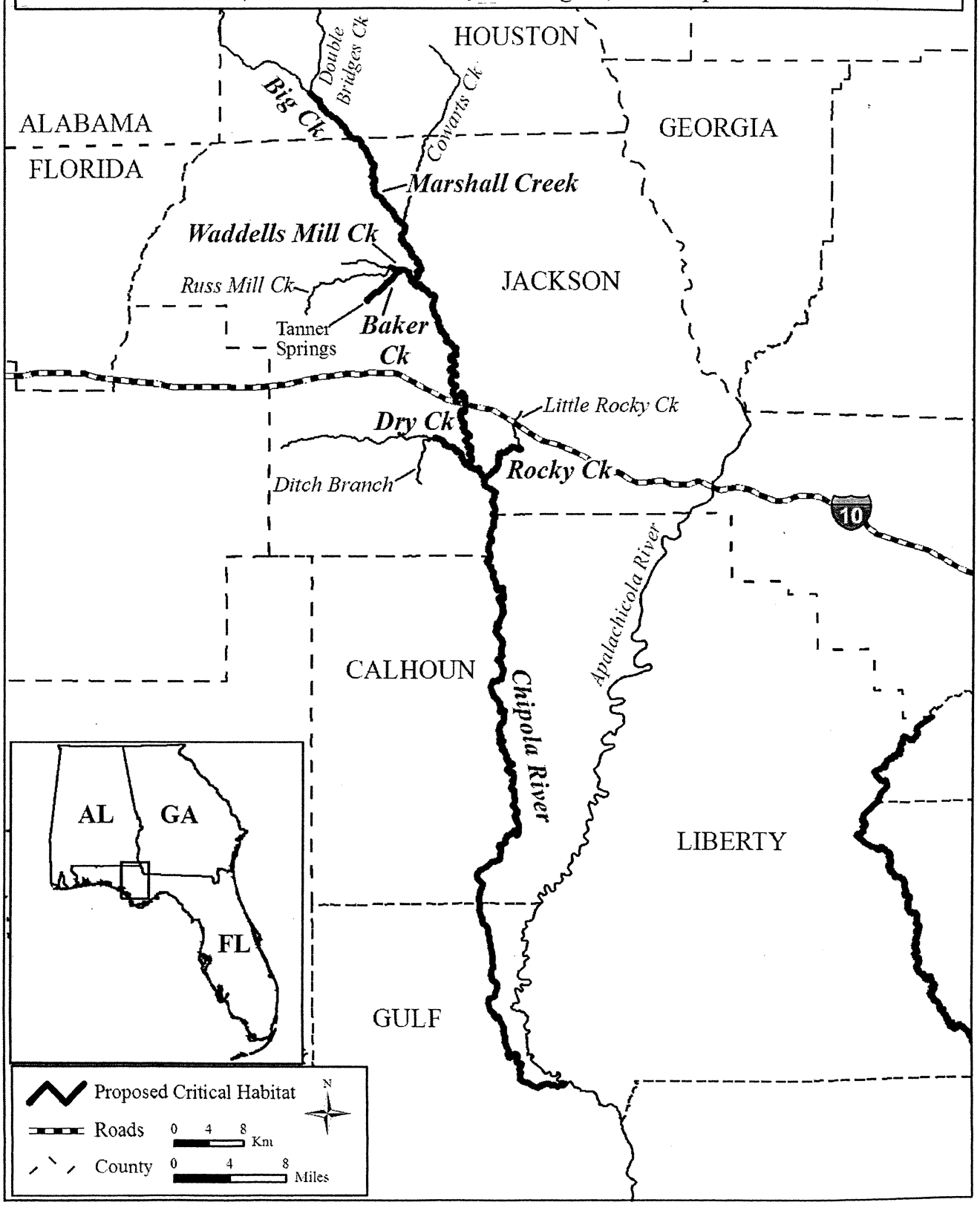


(8) Unit 2. Chipola River and Dry, Rocky, Waddells Mill, Baker, Marshall, and Big Creeks; Houston County, Alabama; and Calhoun, Gulf, and Jackson counties, Florida. This is a critical habitat unit for the fat threeridge, shinyrayed pocketbook, Gulf moccasinshell, oval pigtoe, and Chipola slabshell.

(i) *General Description:* Unit 2 includes the main stem of the Chipola River and six of its tributaries, encompassing a total stream length of 190.0 km (118.1 mi). The main stem of the Chipola River extends from its confluence with the Apalachicola River (−85.09 longitude, 30.01 latitude) in Gulf County, Florida, upstream 144.9 km (90.0 mi), including the reach known as Dead Lake, to the confluence of Marshall and Cowarts creeks (−85.27 longitude, 30.91 latitude) in Jackson County, Florida; Dry Creek from the Chipola River upstream 7.6 km (4.7 mi) to Ditch Branch (−85.53 longitude, 30.41 latitude), Jackson County, Florida; Rocky Creek from the Chipola River upstream 7.1 km (4.4 mi) to Little Rocky Creek (−85.13 longitude, 30.68 latitude), Jackson County, Florida; Waddells Mill Creek from the Chipola River upstream 3.7 km (2.3 mi) to Russ Mill Creek (−85.29 longitude, 30.87 latitude), Jackson County, Florida; Baker Creek from Waddells Mill Creek upstream 5.3 km (3.3 mi) to Tanner Springs (−85.32 longitude, 30.83 latitude), Jackson County, Florida; Marshall Creek from the Chipola River upstream 13.7 km (8.5 mi) to the Alabama-Florida State line (−85.33 longitude, 31.00 latitude), Jackson County, Florida; and Big Creek from the Alabama-Florida State line upstream 7.8 km (4.9 mi) to Double Bridges Creek (−85.38 longitude, 31.05 latitude), Houston County, Alabama. The short segment of the Chipola River that flows underground within the boundaries of Florida Caverns State Park is not included within this unit.

(ii) **Note:** Unit 2 map (Map 3) follows:

Map 3. Unit 2: Chipola River, Alabama and Florida, for the Fat Threeridge, Shinyrayed Pocketbook, Gulf Moccasinshell, Oval Pigtoe, and Chipola Slabshell.

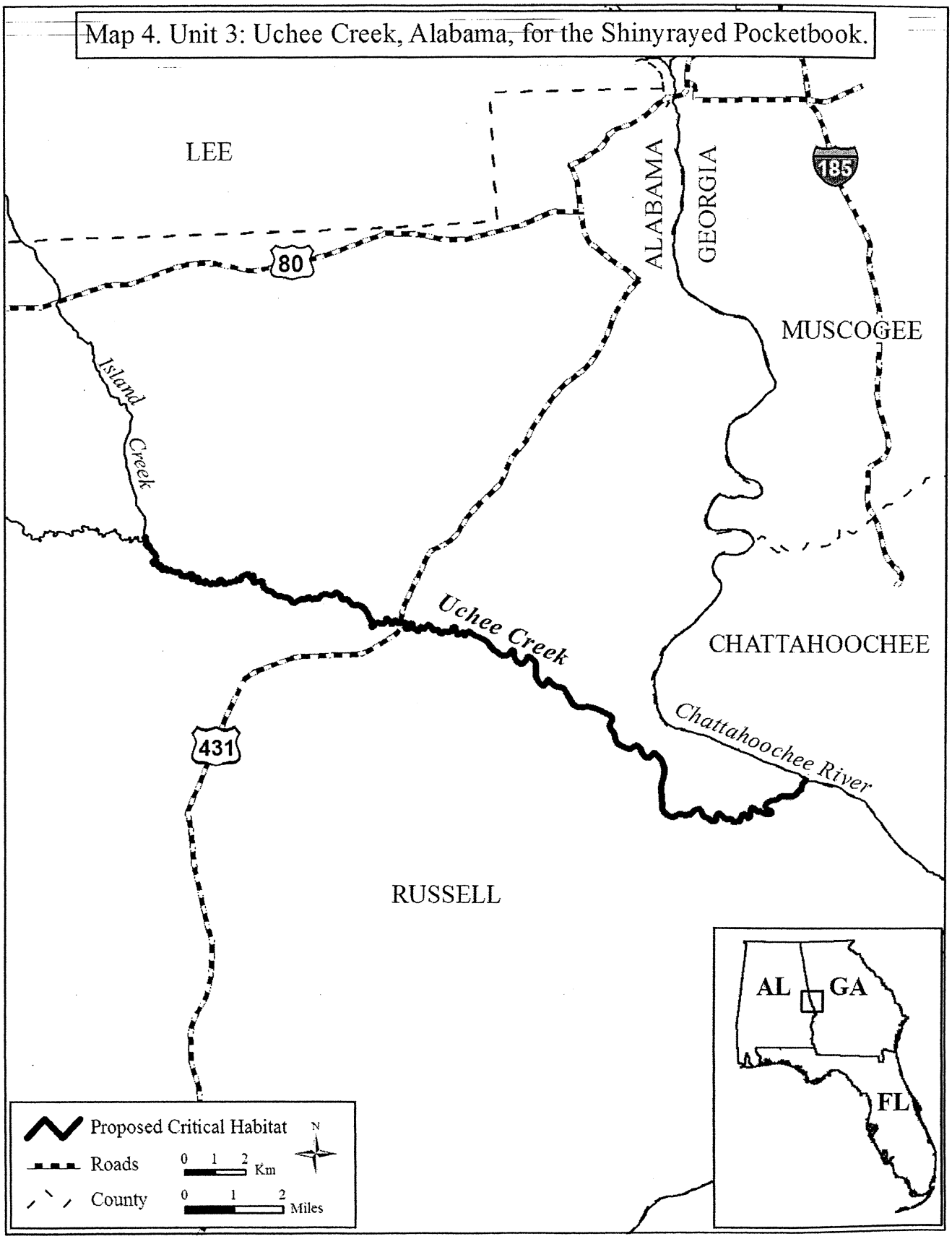


(9) Unit 3. Uchee Creek, Russell County, Alabama. This is a critical habitat unit for the shinyrayed pocketbook.

(i) *General Description:* Unit 3 includes the main stem of Uchee Creek

from its confluence with the Chattahoochee River upstream 34.2 km (21.2 mi) to Island Creek (−85.18 longitude, 32.38 latitude), Russell County, Alabama, encompassing a total stream length of 34.2 km (21.2 mi).

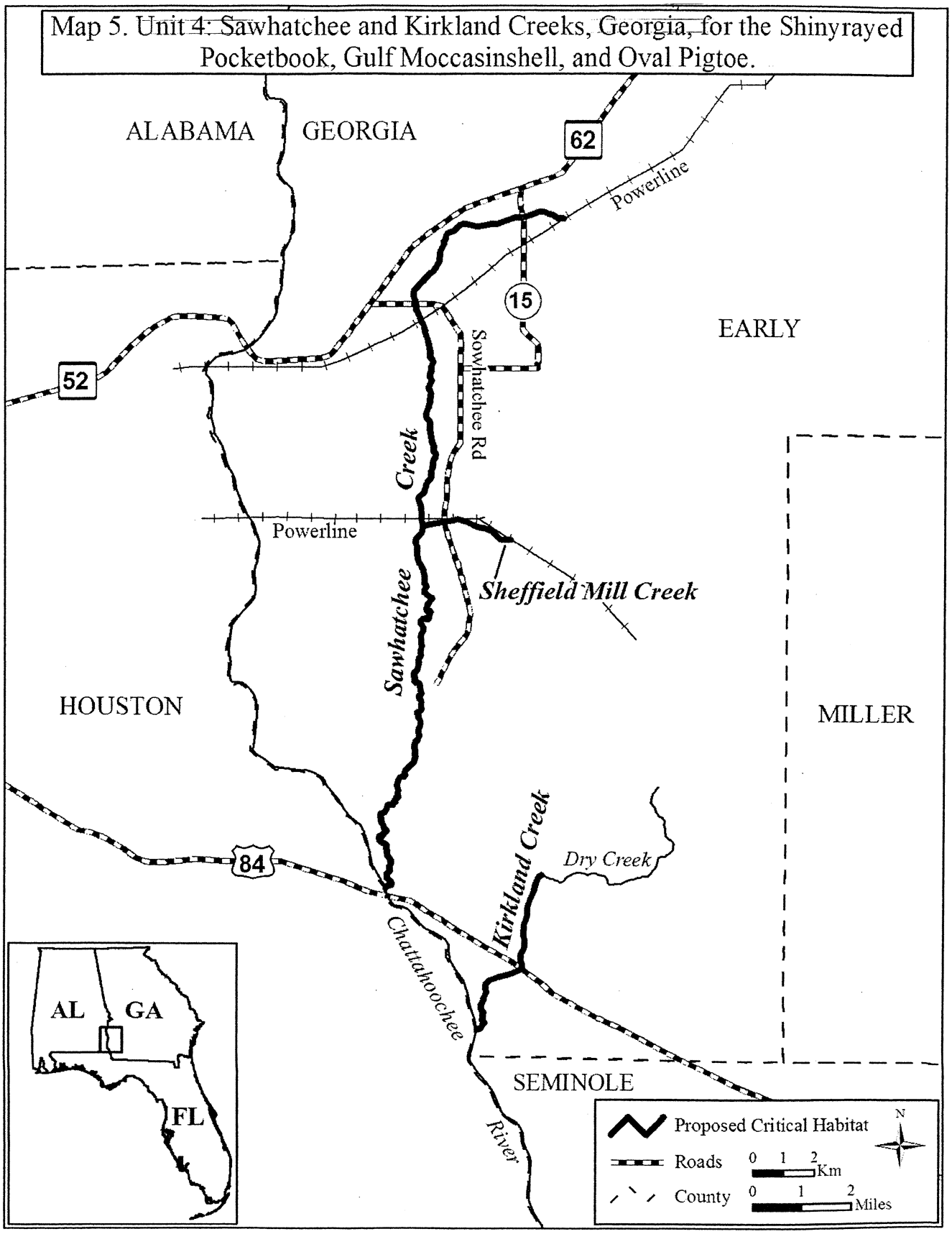
(ii) **Note:** Unit 3 map (Map 4) follows:


Map 4. Unit 3: Uchee Creek, Alabama, for the Shinyrayed Pocketbook.
LEE
ALABAMA
GEORGIA
185
80
MUSCOGEE
Island Creek
Uchee Creek
CHATTAHOOCHEE
Chattahoochee River
431
RUSSELL
AL
GA
FL
Proposed Critical Habitat
Roads
County
N
0 1 2 Km
0 1 2 Miles

(10) Unit 4. Sawhatchee, Sheffield Mill, and Kirkland creeks, Early County, Georgia. This is a critical habitat unit for the shinyrayed pocketbook, Gulf moccasinshell, and oval pigtoe.

(i) *General Description:* Unit 4 includes the main stems of Sawhatchee and Kirkland creeks, and one tributary, encompassing a total stream length of 37.8 km (23.5 mi). Sawhatchee Creek from its confluence with the Chattahoochee River upstream 28.6 km (17.8 mi) to the powerline crossing located 1.4 km (0.87 mi) upstream of Early County Road 15 (−84.99 longitude, 31.32 latitude); Sheffield Mill Creek, the tributary, from its confluence with Sawhatchee Creek upstream 3.1 km (1.9 mi) to the powerline crossing located 2.3 km (1.4 mi) upstream of Sowhatchee Road (−85.01 longitude, 31.23 latitude); Kirkland Creek from its confluence with the Chattahoochee River upstream 6.1 km (3.8 mi) to Dry Creek (−85.00 longitude, 31.13 latitude).

Note: Unit 4 map (Map 5) follows:

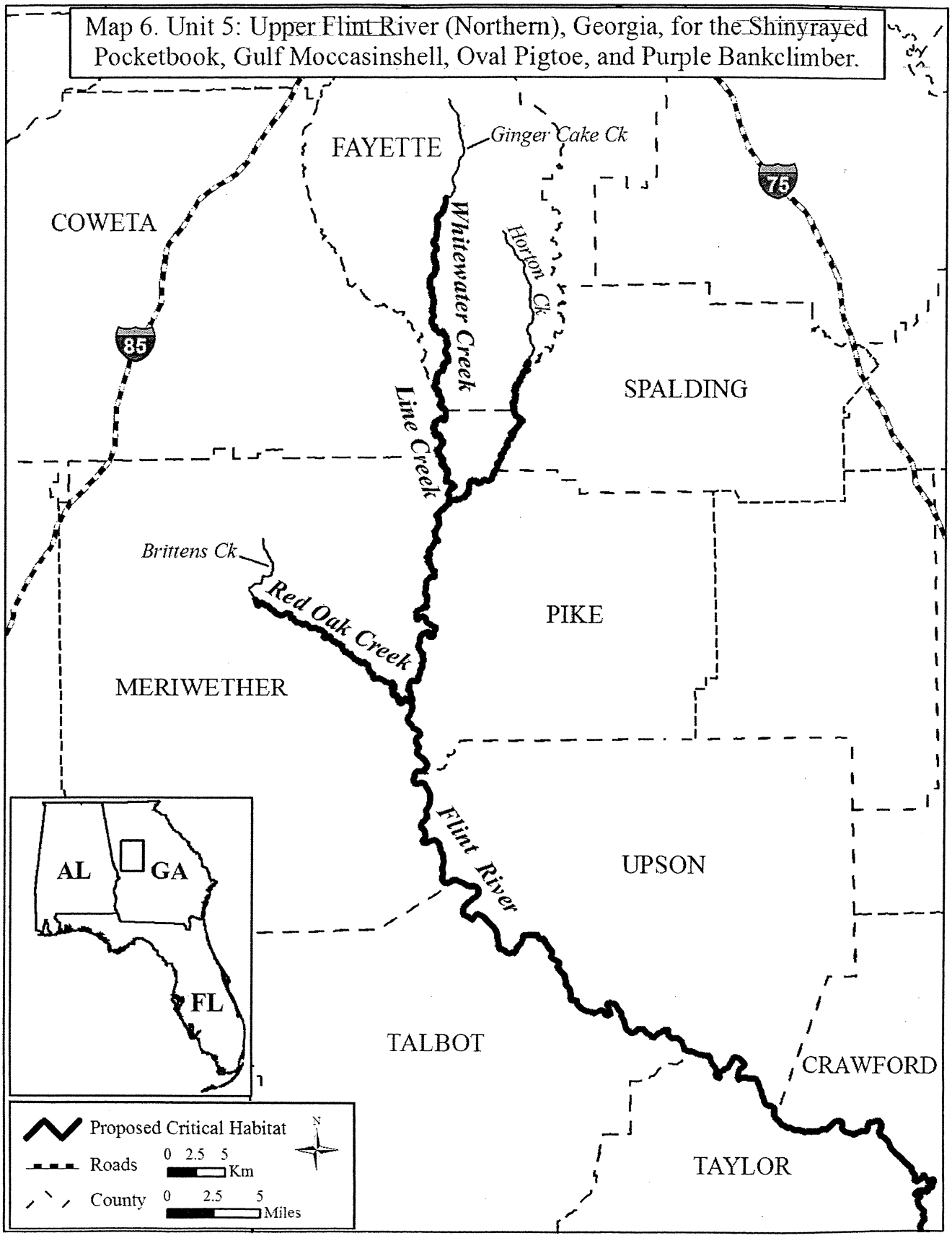


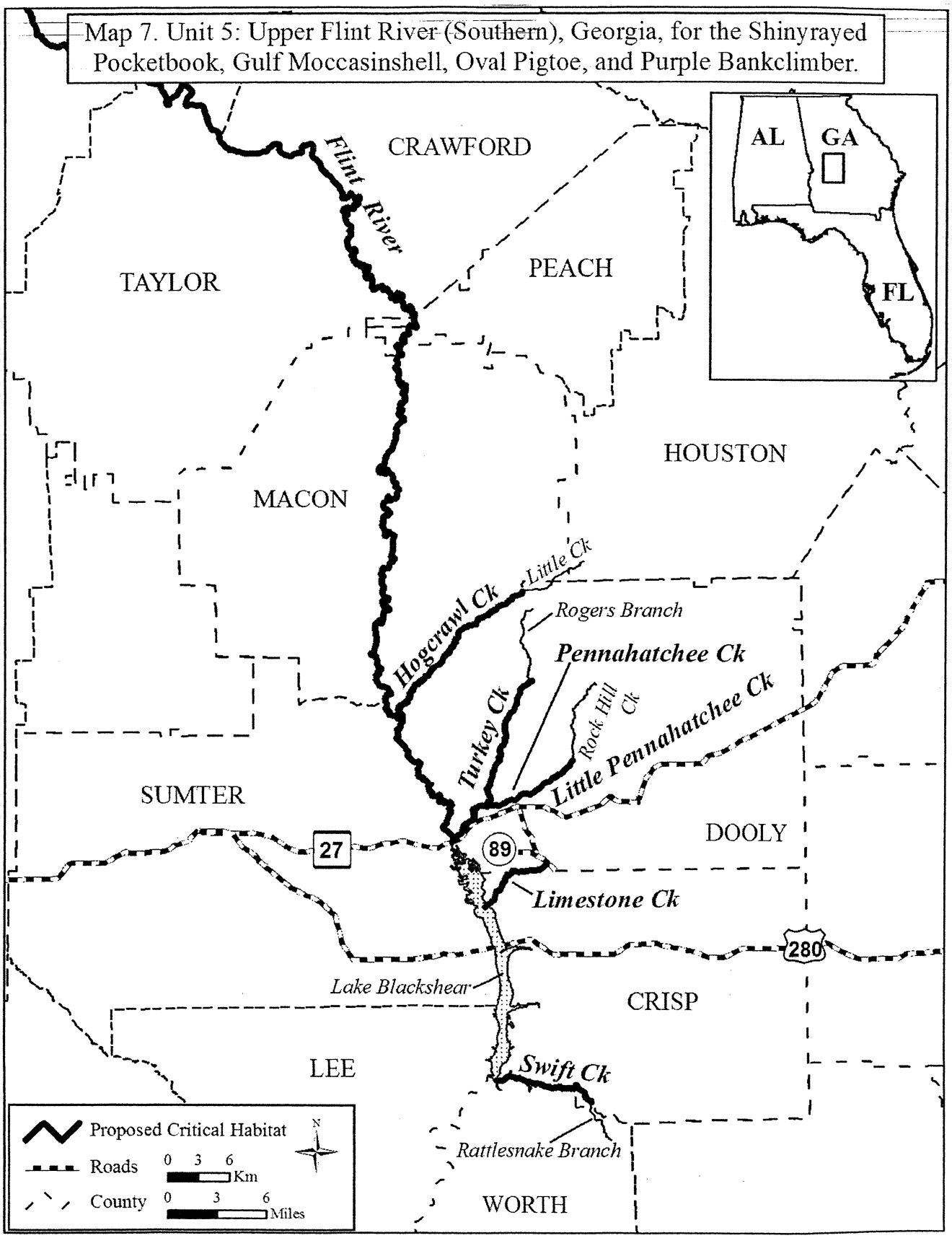
(11) Unit 5. Upper Flint River and Swift, Limestone, Turkey, Pennahatchee, Little Pennahatchee, Hogcrawl, Red Oak, Line, and Whitewater creeks in Coweta, Crawford, Crisp, Dooly, Fayette, Macon,

Meriwether, Peach, Pike, Spalding, Sumter, Talbot, Taylor, Upson, and Worth counties, Georgia. This is a critical habitat unit for the shinyrayed pocketbook, Gulf moccasinshell, oval pigtoe, and purple bankclimber.

(i) *General Description:* Unit 5 encompasses a total stream length of 380.4 km (236.4 mi) and includes the Flint River from the State Highway 27 bridge (Vienna Road) (−83.98 longitude, 32.06 latitude) in Dooly and Sumter counties, Georgia (the river is the county boundary), upstream 247.4 km (153.7 mi) through Macon, Peach, Taylor, Crawford, Talbot, Upson, Pike, Meriwether, and Coweta counties, to Horton Creek (−84.42 longitude, 33.29 latitude) in Fayette and Spalding counties, Georgia (the river is the county boundary); Swift Creek from Lake Blackshear upstream 11.3 km (7 mi) to Rattlesnake Branch (−83.84 longitude, 31.82 latitude), Crisp and Worth counties, Georgia (the creek is the county boundary); Limestone Creek from Lake Blackshear, Crisp County, Georgia, upstream 8.8 km (5.5 mi) to County Road 89 (−83.88 longitude, 32.04 latitude), Dooly County, Georgia; Turkey Creek from the Flint River upstream 21.7 km (13.5 mi) to Rogers Branch (−83.89 longitude, 32.20 latitude), in Dooly County, Georgia; Pennahatchee Creek from Turkey Creek upstream 4.8 km (3 mi) to Little Pennahatchee Creek (−83.89 longitude, 32.10 latitude), Dooly County, Georgia; Little Pennahatchee Creek from Pennahatchee Creek upstream 5.8 km (3.6 mi) to Rock Hill Creek (−83.85 longitude, 32.13 latitude), Dooly County, Georgia; Hogcrawl Creek from the Flint River upstream 21.6 km (13.4 mi) to Little Creek (−83.90 longitude, 32.28 latitude), Dooly and Macon counties, Georgia (the creek is the county boundary); Red Oak Creek from the Flint River upstream 21.7 km (13.5 mi) to Brittens Creek (−84.68 longitude, 33.11 latitude), Meriwether County, Georgia; Line Creek from the Flint River upstream 15.8 km (9.8 mi) to Whitewater Creek (−84.51 longitude, 33.28 latitude), Coweta and Fayette counties, Georgia (the creek is the county boundary); and Whitewater Creek from Line Creek upstream 21.5 km (13.4 mi) to Ginger Cake Creek (−84.49 longitude, 33.42 latitude), Fayette County, Georgia.

(ii) **Note:** Two maps of unit 5 (Map 6, northern part of unit 5; and Map 7, southern part of unit 5) follow:


Map 6. Unit 5: Upper Flint River (Northern), Georgia, for the Shinyrayed Pocketbook, Gulf Moccasinshell, Oval Pigtoe, and Purple Bankclimber.
FAYETTE
Ginger Cake Ck
COWETA
Whitewater Creek
Horton Ck
SPALDING
Lime Creek
Brittens Ck
Red Oak Creek
PIKE
MERIWETHER
Flint River
UPSON
AL
GA
FL
TALBOT
CRAWFORD
TAYLOR
Proposed Critical Habitat
Roads
County
0 2.5 5 Km
0 2.5 5 Miles
N

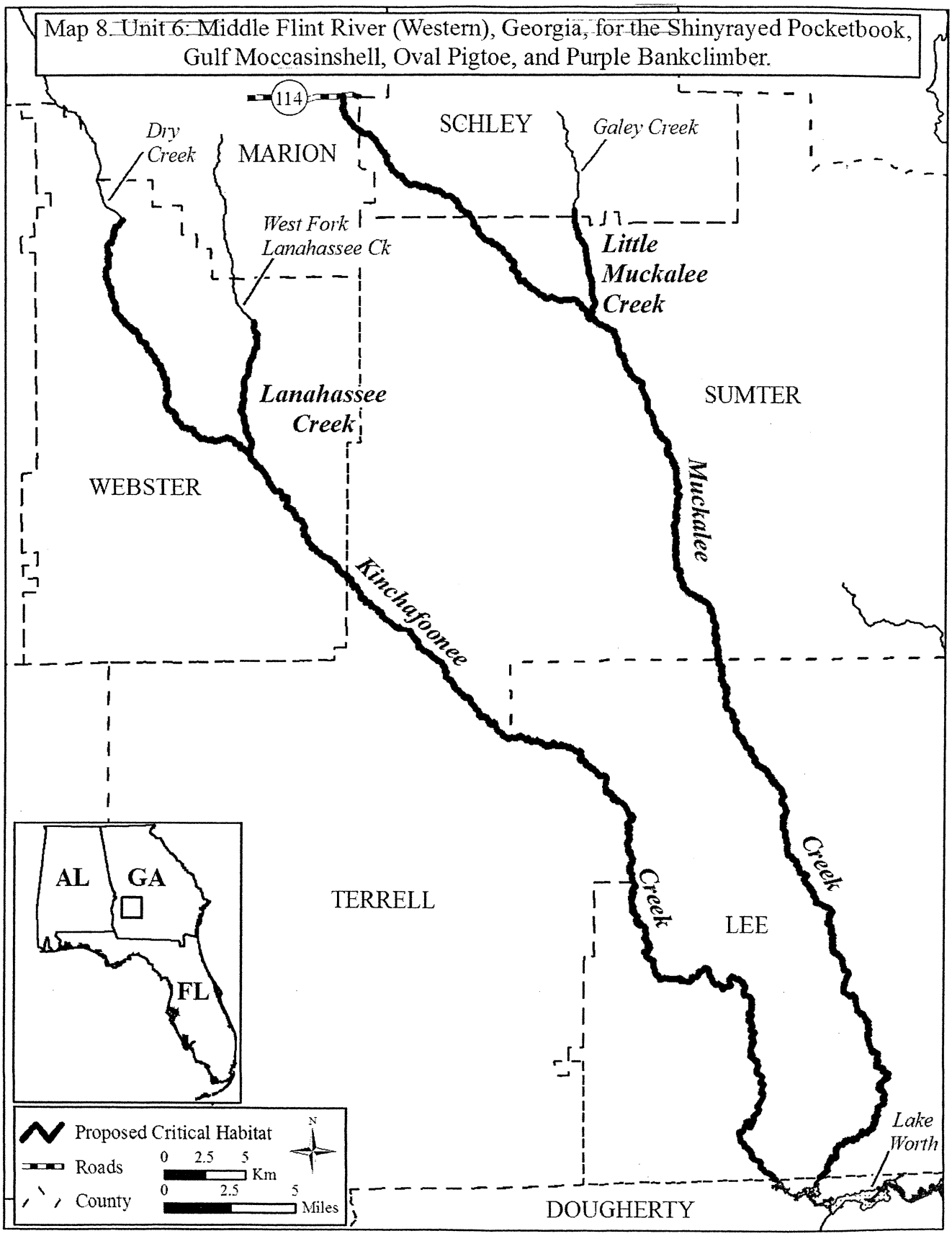


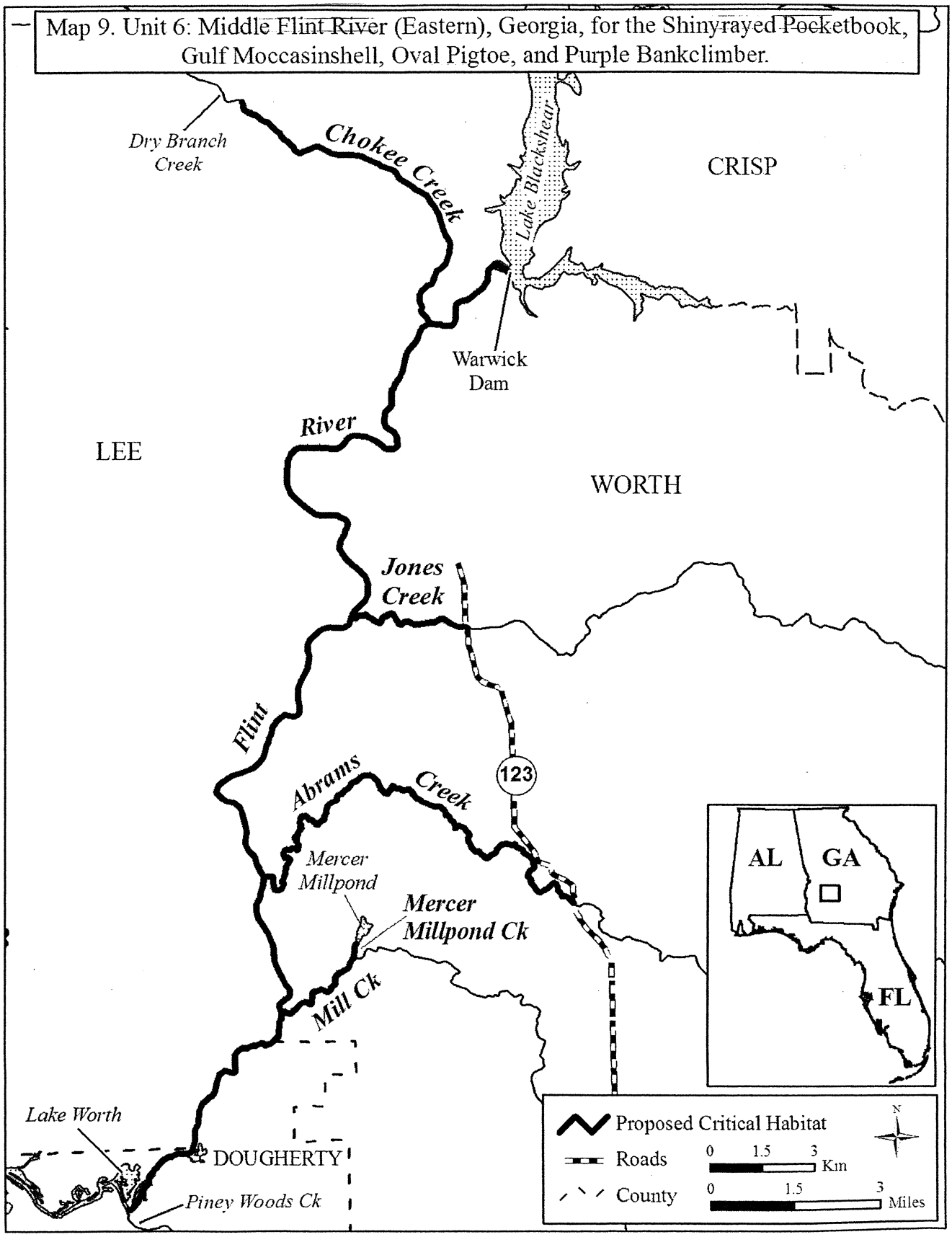
(12) Unit 6. Middle Flint River and Kinchafoonee, Lanahassee, Muckalee, Little Muckalee, Mill, Mercer Mill Pond, Abrams, Jones, and Chokee creeks; Dougherty, Lee, Marion, Schley, Sumter, Terrell, Webster, and Worth counties,

Georgia. This is a critical habitat unit for the shinyrayed pocketbook, Gulf moccasinshell, oval pigtoe, and purple bankclimber.

(i) *General Description:* Unit 6 encompasses a total stream length of 302.3 km (187.8 mi) and includes the Flint River from Piney Woods Creek (−84.06 longitude, 31.61 latitude) in Dougherty County, Georgia (the upstream extent of Lake Worth), upstream 39.9 km (24.8 mi) to the Warwick Dam (−83.94 longitude, 31.85 latitude), Lee and Worth counties, Georgia; Kinchafoonee Creek from its confluence with Lake Worth at the Lee-Dougherty county line (−84.17 longitude, 31.62 latitude), upstream 107.6 km (66.8 mi) through Terrell and Sumter Counties, Georgia, to Dry Creek (−84.58 longitude, 32.17 latitude), Webster County, Georgia; Lanahassee Creek from Kinchafoonee Creek upstream 9.3 km (5.8 mi) to West Fork Lanahassee Creek (−84.50 longitude, 32.11 latitude), Webster County, Georgia; Muckalee Creek, from its confluence with Lake Worth at the Lee-Dougherty county line (−84.14 longitude, 31.62 latitude), upstream 104.5 km (64.9 mi) to County Road 114 (−84.44 longitude, 32.23 latitude), Marion County, Georgia; Little Muckalee Creek, from Muckalee Creek in Sumter County, Georgia, upstream 7.2 km (4.5 mi) to Galey Creek (−84.29 longitude, 32.17 latitude), Schley County, Georgia; Mill Creek from the Flint River upstream 3.2 km (2 mi) to Mercer Millpond Creek (−83.99 longitude, 31.67 latitude), Worth County, Georgia; Mercer Millpond Creek from Mill Creek upstream 0.45 km (0.28 mi) to Mercer Mill Pond (−83.99 longitude, 31.68 latitude), Worth County, Georgia; Abrams Creek from the Flint River upstream 15.9 km (9.9 mi) to County Road 123 (−83.93 longitude, 31.68 latitude), Worth County, Georgia; Jones Creek from the Flint River upstream 3.8 km (2.4 mi) to County Road 123 (−83.96 longitude, 31.76 latitude), Worth County, Georgia; and Chokee Creek, from the Flint River upstream 10.5 km (6.5 mi) to Dry Branch Creek (−84.02 longitude, 31.89 latitude), Lee County, Georgia.

(ii) **Note:** Two maps of unit 6 (Map 8, western part of unit 6; and Map 9, eastern part of unit 6) follow:


Map 8. Unit 6: Middle Flint River (Western), Georgia, for the Shinyrayed Pocketbook, Gulf Moccasinshell, Oval Pigtoe, and Purple Bankclimber.
114
SCHLEY
Galey Creek
Dry Creek
MARION
West Fork Lanahassee Ck
Little Muckalee Creek
Lanahassee Creek
SUMTER
WEBSTER
Muckalee
Kinchafoonee
Creek
Creek
TERRELL
LEE
AL
GA
FL
Lake Worth
DOUGHERTY
Proposed Critical Habitat
Roads
County
N
0 2.5 5 Km
0 2.5 5 Miles

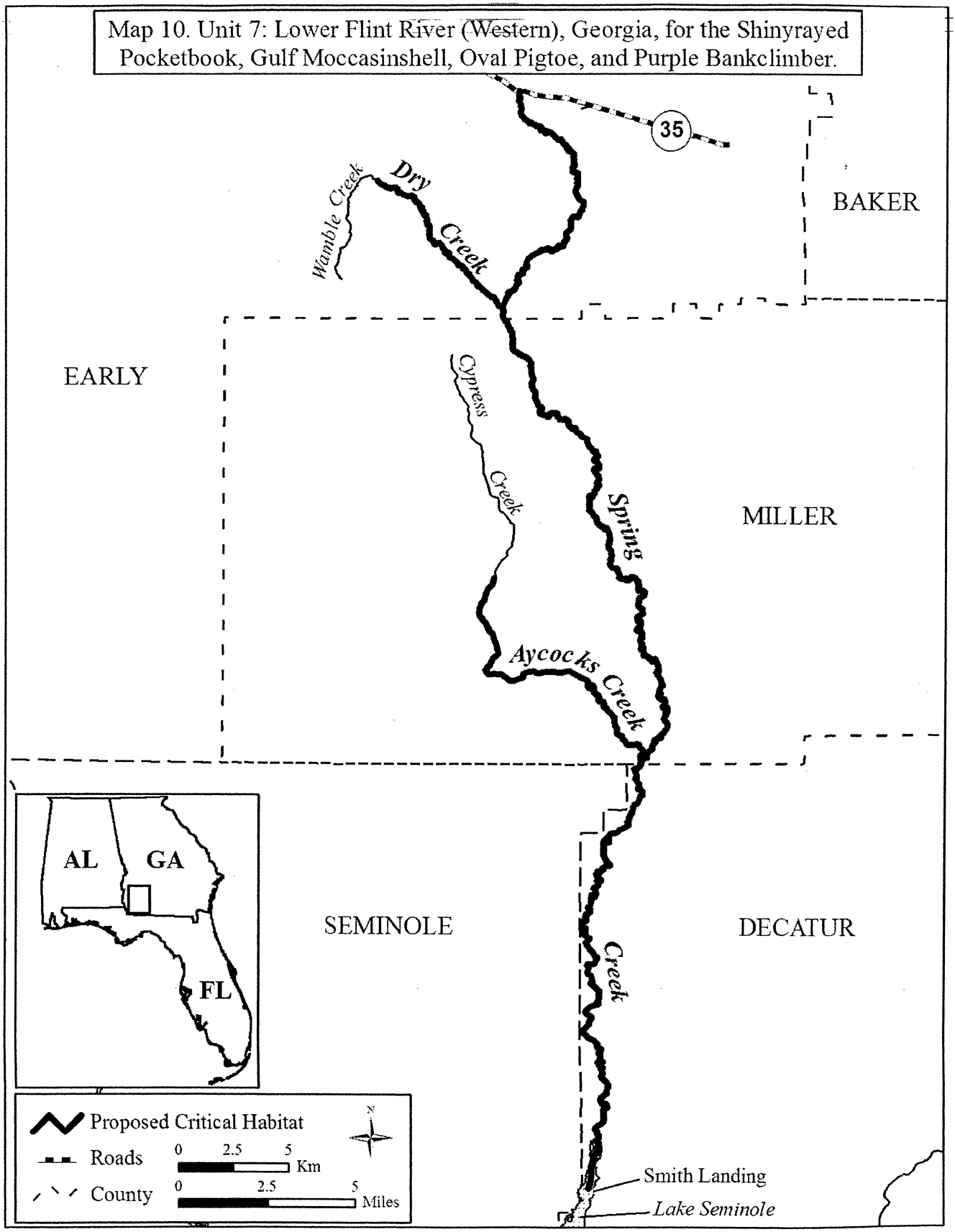


(13) Unit 7. Lower Flint River and Spring, Aycocks, Dry, Ichawaynochaway, Mill, Pachitla, Little Pachitla, Chickasawhatchee, and Cooleewahee creeks in Baker, Calhoun, Decatur, Dougherty, Early, Miller,

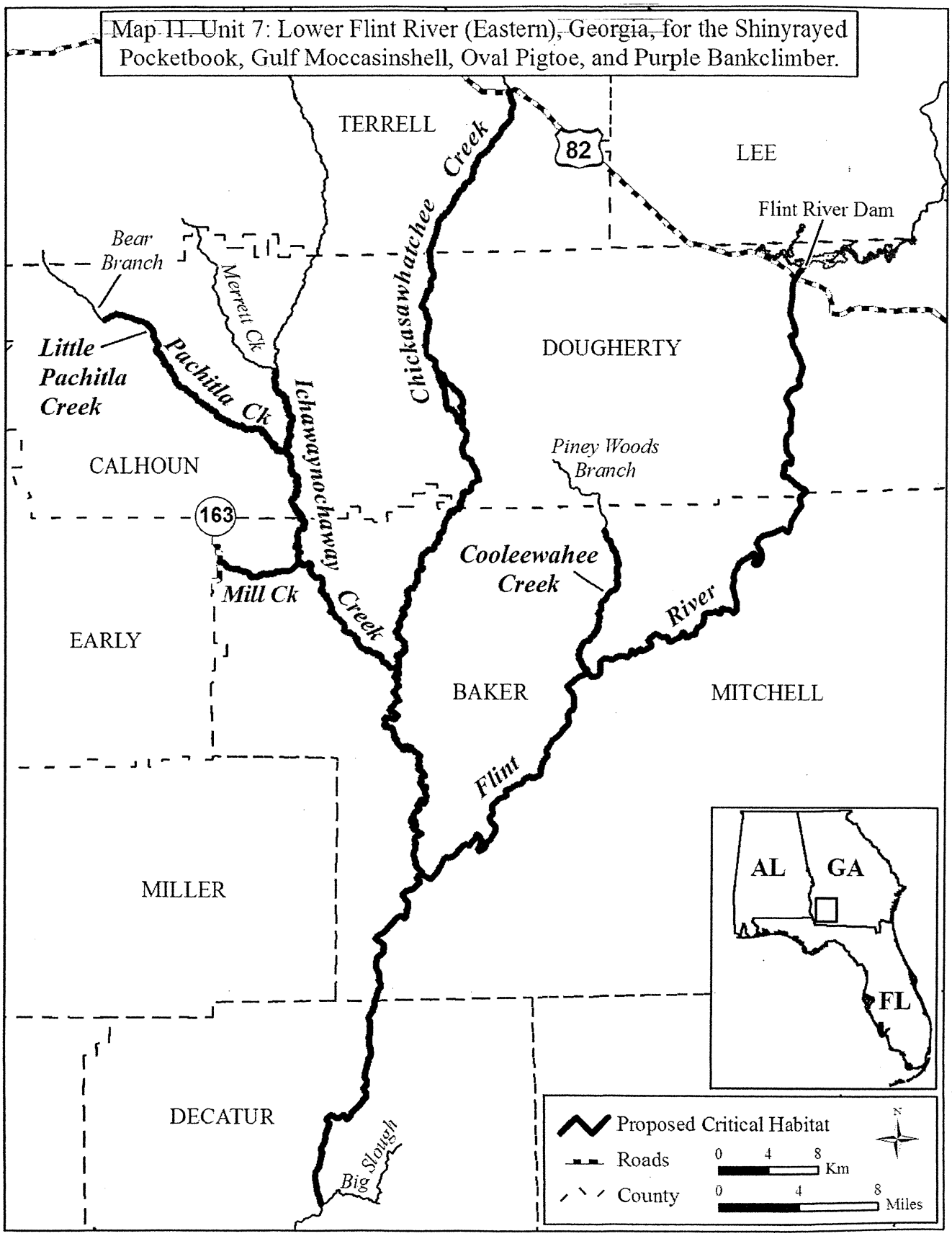
Mitchell, and Terrell counties, Georgia. This is a critical habitat unit for the shinyrayed pocketbook, Gulf moccasinshell, oval pigtoe, and purple bankclimber.

(i) *General Description:* Unit 7 encompasses a total stream length of 396.7 km (246.5 mi) and includes the Flint River from its confluence with Big Slough (−84.56 longitude, 30.93 latitude), Decatur County, Georgia, upstream 116.4 km (72.3 mi) through Baker and Mitchell Counties, Georgia, to the Flint River Dam (which impounds Lake Worth) (−84.14 longitude, 31.60 latitude), Dougherty County, Georgia; Spring Creek, from its confluence with Lake Seminole at Smith Landing (−84.75 longitude, 30.89 latitude), Decatur County, Georgia, upstream 74.2 km (46.1 mi) to County Road 35 (−84.78 longitude, 31.34 latitude), Early County, Georgia; Aycocks Creek from Spring Creek upstream 15.9 km (9.9 mi) to Cypress Creek (−84.79 longitude, 31.15 latitude), Miller County, Georgia; Dry Creek from Spring Creek upstream 9.9 km (6.1 mi) to Wamble Creek (−84.84 longitude, 31.31 latitude), Early County, Georgia; Ichawaynochaway Creek from the Flint River, Baker County, Georgia, upstream 68.6 km (42.6 mi) to Merrett Creek (−84.58 longitude, 31.54 latitude), Calhoun County, Georgia; Mill Creek from Ichawaynochaway Creek upstream 7.4 km (4.6 mi) to County Road 163 (−84.63 longitude, 31.40 latitude), Baker County, Georgia; Pachitla Creek, from Ichawaynochaway Creek upstream 18.9 km (11.8 mi) to Little Pachitla Creek (−84.68 longitude, 31.56 latitude), Calhoun County, Georgia; Little Pachitla Creek from Pachitla Creek upstream 5.8 km (3.6 mi) to Bear Branch (−84.72 longitude, 31.58 latitude), Calhoun County, Georgia; Chickasawhatchee Creek from Ichawaynochaway Creek, Baker County, Georgia, upstream 64.5 km (40.1 mi) to U.S. Highway 82 (−84.38 longitude, 31.74 latitude), Terrell County, Georgia; and Cooleewahee Creek from the Flint River upstream 15.1 km (9.4 mi) to Piney Woods Branch (−84.31 longitude, 31.42 latitude), Baker County, Georgia.

(ii) **Note:** Two maps of unit 7 (Map 10, western part of unit 7; and Map 11, eastern part of unit 7) follow:



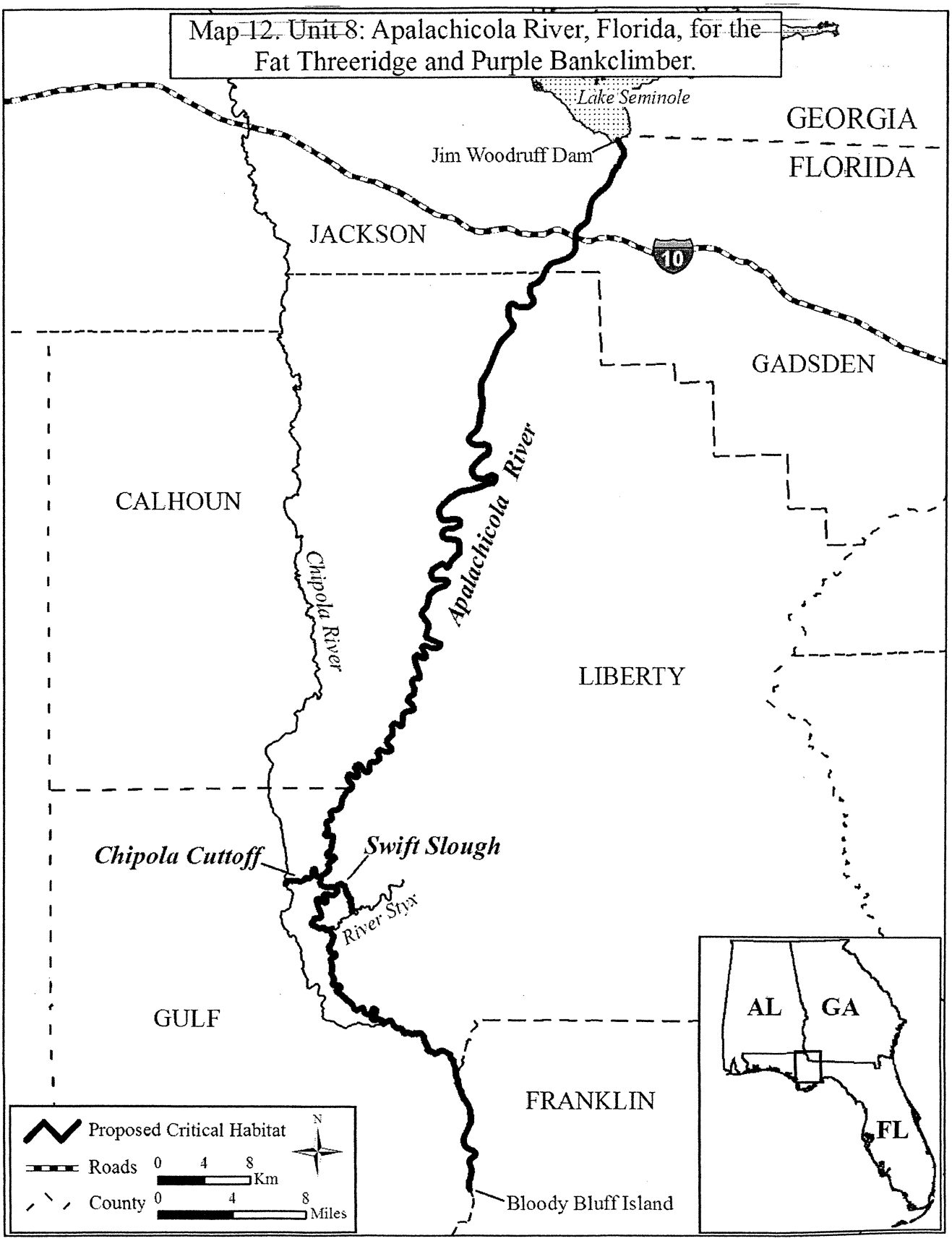
Map 10. Unit 7: Lower Flint River (Western), Georgia, for the Shinyrayed Pocketbook, Gulf Moccasinshell, Oval Pigtoe, and Purple Bankclimber.



(14) Unit 8. Apalachicola River and the Chipola Cutoff and Swift Slough in Calhoun, Franklin, Gadsden, Gulf, Jackson, and Liberty counties, Florida. This is a critical habitat unit for the fat threeridge and purple bankclimber.

(i) *General Description:* Unit 8 includes the main stem of the Apalachicola River and two of its distributaries, Chipola Cutoff and Swift Slough, encompassing a total stream length of 155.4 km (96.6 mi). The main stem of the Apalachicola River extends from the downstream end of Bloody Bluff Island (river mile 15.3 on U.S. Army Corps of Engineers Navigation Charts) (−85.01 longitude, 29.88 latitude), Franklin County, Florida, through Calhoun and Liberty Counties, Florida, upstream to the Jim Woodruff Lock and Dam (which impounds Lake Seminole) (−84.86 longitude, 30.71 latitude), Gadsden and Jackson counties, Florida; Chipola Cutoff from the Apalachicola River in Gulf County, Florida, downstream 4.5 km (2.8 mi) to its confluence with the Chipola River, Gulf County, Florida; Swift Slough from the Apalachicola River, Liberty County, Florida, downstream 3.6 km (2.2 mi) to its confluence with the River Styx (−85.12 longitude, 30.10 latitude), Liberty County, Florida.

(ii) **Note:** Unit 8 map (Map 12) follows:

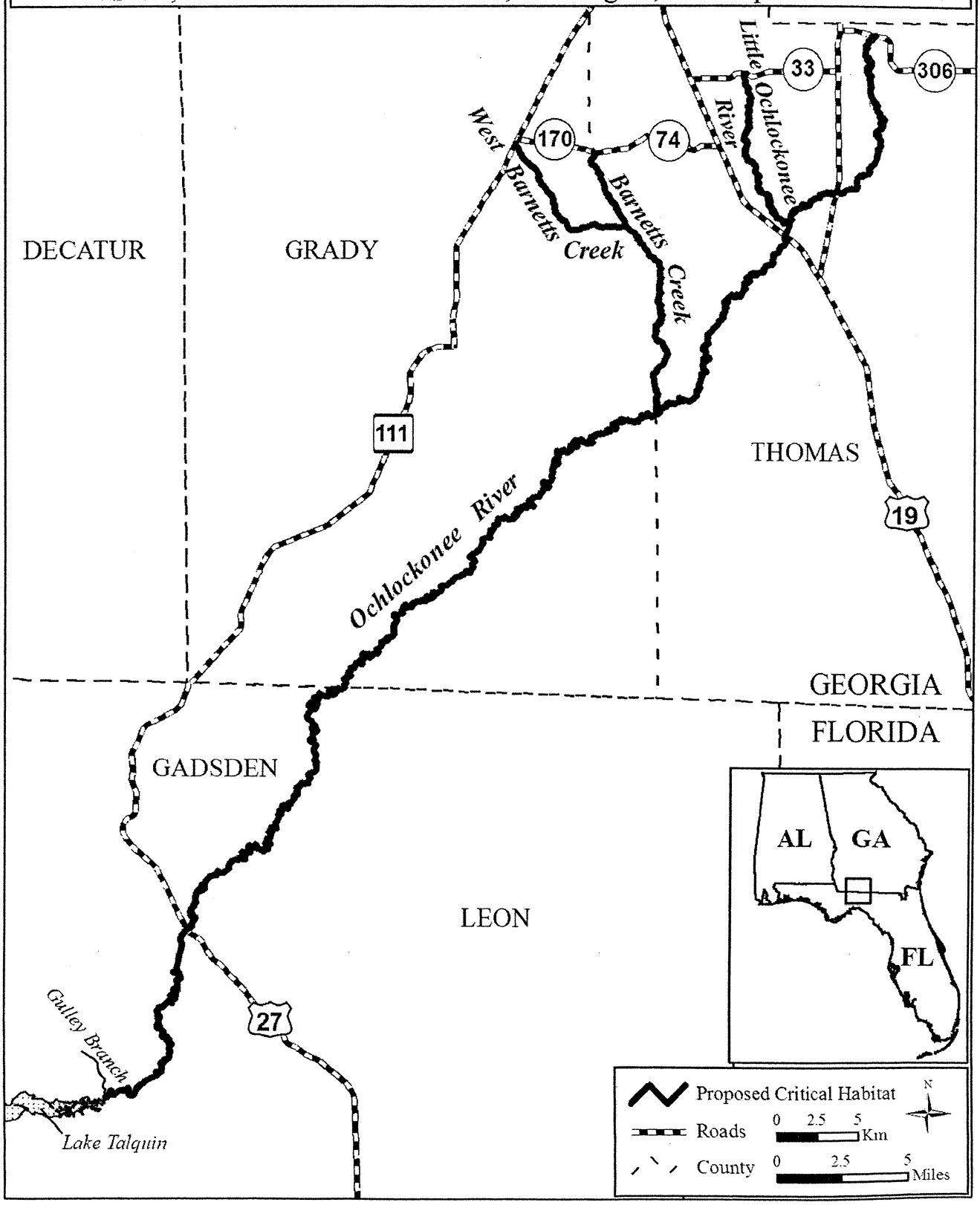

Map 12. Unit 8: Apalachicola River, Florida, for the Fat Threeridge and Purple Bankclimber.
Lake Seminole
GEORGIA
FLORIDA
Jim Woodruff Dam
JACKSON
10
GADSDEN
CALHOUN
Apalachicola River
Chipola River
LIBERTY
Chipola Cuttoff
Swift Slough
River Styx
GULF
FRANKLIN
Bloody Bluff Island
AL
GA
FL
Proposed Critical Habitat
Roads
County
N
0 4 8 Km
0 4 8 Miles

(15) Unit 9. Upper Ochlockonee River and Barnetts and West Barnetts creeks, and the Little Ochlockonee River in Gadsden and Leon counties, Florida, and Grady and Thomas counties, Georgia. This is a critical habitat unit for the shinyrayed pocketbook, Ochlockonee moccasinshell, oval pigtoe, and purple bankclimber.

(i) *General Description:* Unit 9 includes the main stem of the Ochlockonee River upstream of Lake Talquin and three tributaries encompassing a total stream length of 177.3 km (110.2 mi). The main stem of the Ochlockonee River extends from its confluence with Gulley Branch (the approximate upstream extent of Lake Talquin) (−84.44 longitude, 30.46 latitude), Gadsden and Leon counties, Florida, upstream 134.0 km (83.3 mi) to Bee Line Road/County Road 306 (−83.94 longitude, 31.03 latitude), Thomas County, Georgia; Barnetts Creek from the Ochlockonee River upstream 20 km (12.4 mi) to Grady County Road 170/Thomas County Road 74 (−84.12 longitude, 30.98 latitude), Grady and Thomas counties, Georgia; West Barnetts Creek from Barnetts Creek upstream 10 km (6.2 mi) to Georgia Highway 111 (−84.17 longitude, 30.98 latitude), Grady County, Georgia; and the Little Ochlockonee River from the Ochlockonee River upstream 13.3 km (8.3 mi) to Roup Road/County Road 33 (−84.02 longitude, 31.02 latitude), Thomas County, Georgia.

(ii) **Note:** Unit 9 map (Map 13) follows:

Map 13. Unit 9: Upper Ochlockonee River, Georgia and Florida, for the Shinyrayed Pocketbook, Ochlockonee Moccasinshell, Oval Pigtoe, and Purple Bankclimber.



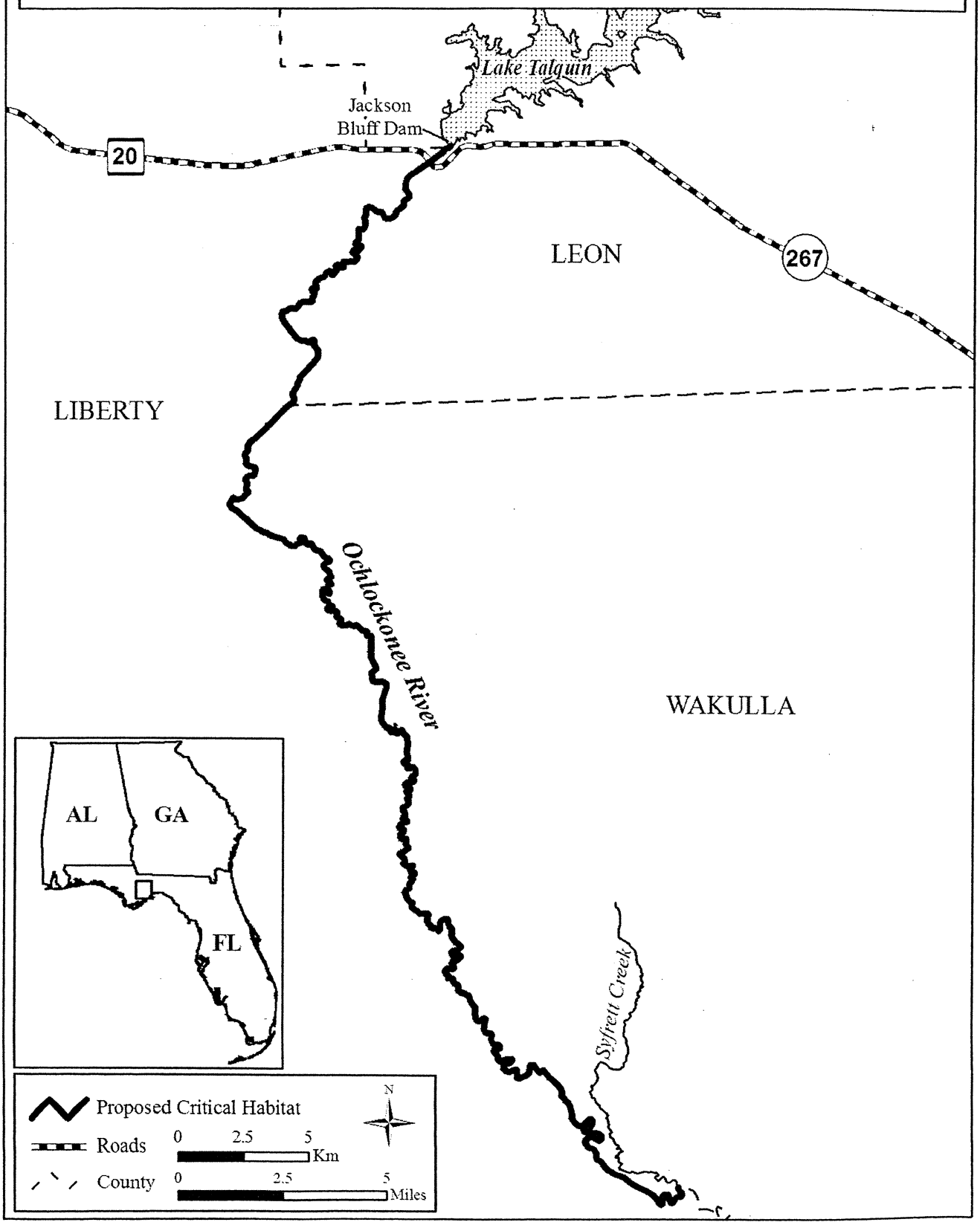
(16) Unit 10. Lower Ochlockonee River in Leon, Liberty, and Wakulla counties, Florida. This is a critical habitat unit for the purple bankclimber.

(i) *General Description:* Unit 10 encompasses a total stream length of

75.4 km (46.9 mi) and includes the main stem of the Ochlockonee River from its confluence with Syfrett Creek (−84.56 longitude, 30.02 latitude), Wakulla County, Florida, upstream 75.4 km (46.9 mi) to the Jackson Bluff Dam (which impounds Lake Talquin) (−84.65 longitude, 30.39 latitude), Leon and Liberty counties, Florida.

(ii) **Note:** Unit 10 map (Map 14) follows:

Map 14. Unit 10: Lower Ochlockonee River, Florida, for the Purple Bankclimber.

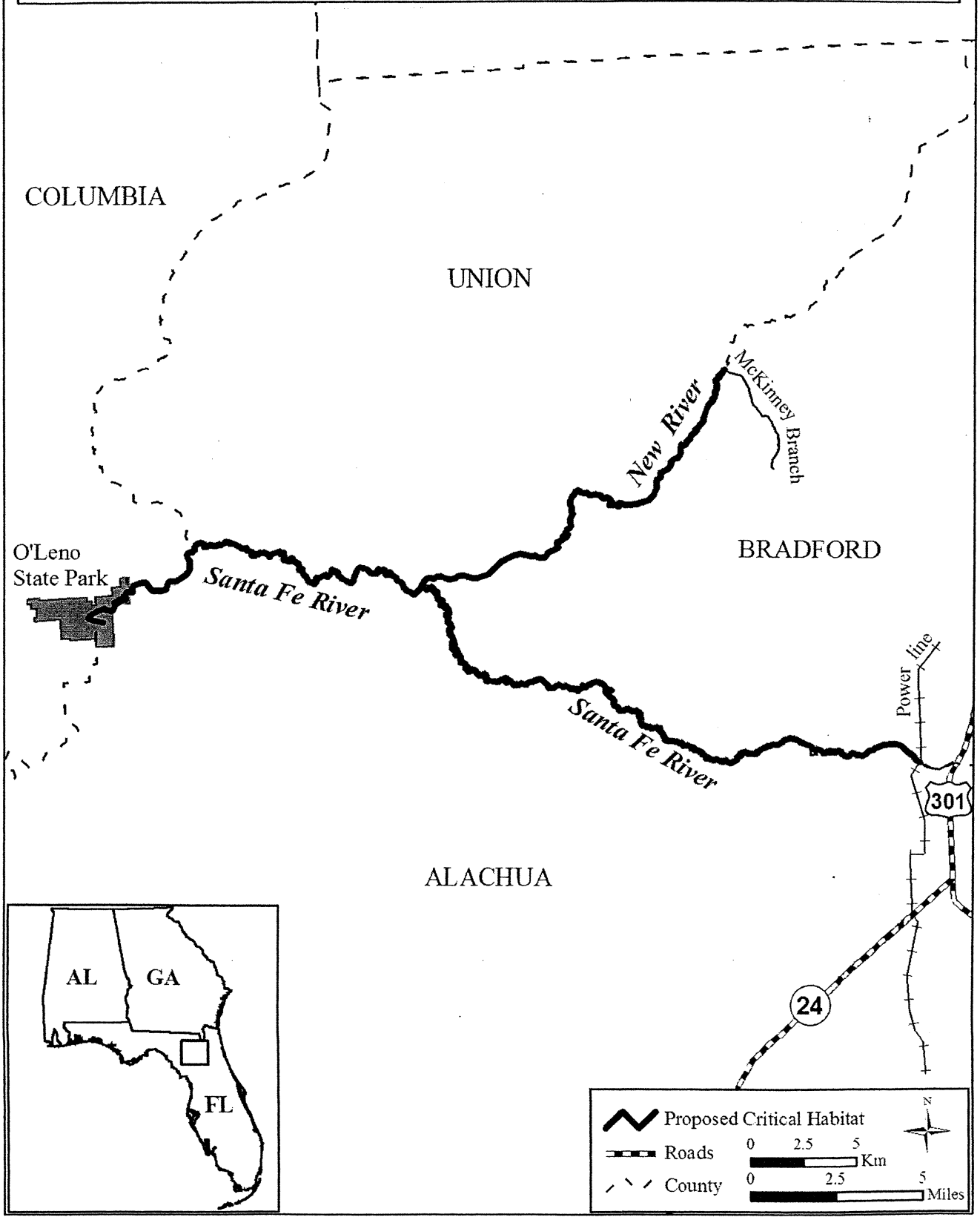


(17) Unit 11. Santa Fe River and New River in Alachua, Bradford, Columbia, and Union counties, Florida. This is a critical habitat unit for the oval pigtoe.

(i) *General Description:* Unit 11 includes the main stem of the Santa Fe River and its tributary the New River encompassing a total stream length of 83.1 km (51.6 mi). The main channel of the Santa Fe River extends from where the river goes underground in O'Leno State Park (−82.57 longitude, 29.91 latitude), Alachua and Columbia counties, Florida, upstream 60.2 km (37.4 mi) to the powerline crossing located 1.9 km (1.2 mi) downstream from the U.S. Highway 301 bridge (−82.18 longitude, 29.84 latitude) in Alachua and Bradford counties, Florida; and the New River from its confluence with the Santa Fe River at the junction of Alachua, Bradford, and Union counties, Florida, upstream 22.9 km (14.2 mi) to McKinney Branch (−82.27 longitude, 30.01 latitude) in Bradford and Union counties, Florida.

(ii) **Note:** Unit 11 map (Map 15) follows:

Map 15. Unit 11: Santa Fe River and New River, Florida for the Oval Pigtoe.



* * * * *

Dated: May 30, 2006.

Matt Hogan,

Acting Assistant Secretary for Fish and Wildlife and Parks.

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BILLING CODE 4310–55–C