DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AU87

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

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), are designating critical habitat for the endangered fat threeridge (*Amblema neislerii*), shinyrayed pocketbook (*Lampsilis subangulata*), Gulf moccasinshell (*Medionidus penicillatus*), Ochlockonee moccasinshell (*Medionidus simpsonianus*), and oval pigtoe (*Pleurobema pyriforme*), and the threatened Chipola slabshell (*Elliptio chipolaensis*) and purple bankclimber (*Elliptoideus sloatianus*) (collectively referred to as the seven mussels) under the Endangered Species Act of 1973, as amended (Act). The total length of streams designated is approximately 1,185.9 river miles (river mi) (1,908.5 river kilometers (river km)). The critical habitat is located in Houston and Russell counties, Alabama; in Alachua, Bay, Bradford, Calhoun, Columbia, Franklin, Gadsden, Gulf, Jackson, Leon, Liberty, Union, Wakulla, and Washington counties, Florida; and in Baker, Calhoun, 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 counties, Georgia.

DATES: This rule becomes effective on December 17, 2007.

ADDRESSES: Comments and materials received, as well as supporting documentation used in the preparation of this final rule, will be available for public inspection, by appointment, during normal business hours, at the U.S. Fish and Wildlife Service, Panama City Ecological Services Office, 1601 Balboa Avenue, Panama City, FL 32405 (telephone 850–769–0552). The final rule, economic analysis, and maps will also be available via the Internet at *http://www.fws.gov/panamacity/.*

FOR FURTHER INFORMATION CONTACT: Gail Carmody, Field Supervisor, Panama City Ecological Services Office, 1601 Balboa Avenue, Panama City, FL 32405; telephone 850–769–0552; facsimile 850–763–2177. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Background

It is our intent to discuss only those topics directly relevant to the designation of critical habitat in this final rule. For additional information on the seven mussels, refer to the final listing rule published in the **Federal Register** on March 16, 1998 (63 FR 12664), the final recovery plan that was approved September 19, 2003 (available from our Panama City, Florida Office or online at *http://www.fws.gov/endangered/recovery/Index.html#plans*), and the proposed critical habitat rule published in the **Federal Register** on June 6, 2006 (71 FR 32746).

The shinyrayed pocketbook was listed as federally endangered under the scientific name *Lampsilis subangulata.* The shinyrayed pocketbook and three other Lampsilis species are now assigned to the newly recognized genus *Hamiota* (Roe and Hartfield 2005, p. 1). The Service intends to implement the name change in a separate rulemaking. In November 2006, an Auburn University scientist working under contract for the Service identified eight mussels as shinyrayed pocketbooks that he found in a segment of Econfina Creek (M. Gangloff, personal communication November 3, 2006). This stream segment is within the area designated in this rule as critical habitat for the Gulf moccasinshell and oval pigtoe. If the identification is correct, this find represents the first record of the shinyrayed pocketbook in the Econfina Creek Basin, which was previously known only from the Apalachicola-Chattahoochee-Flint (ACF) and Ochlockonee basins. The Service intends to conduct further surveys to confirm whether the species is in Econfina Creek and, if so, to estimate its range and abundance in the basin. In this rule, we do not designate Econfina Creek as critical habitat for the shinyrayed pocketbook.

Previous Federal Actions

On March 15, 2004, the Center for Biological Diversity (Center) filed a lawsuit against the Department of the Interior and the Service (Civil Action No. 1:04 CV–0729–GET) challenging the failure to designate critical habitat for the seven mussels. In a settlement agreement dated August 31, 2004, the Service agreed to reevaluate the prudency of critical habitat for the seven mussels and, if prudent, submit a proposed designation of critical habitat to the **Federal Register** by May 30, 2006, and a final designation by May 30, 2007. On March 7, 2007, the court granted an extension and set the new final designation deadline for October 31, 2007.

We published the proposed critical habitat rule for the seven mussels in the **Federal Register** on June 6, 2006 (71 FR 32746). We accepted public comments on the proposal for 60 days until August 7, 2007. We completed a draft economic analysis (DEA) for the proposed designation on June 6, 2007, and published a notice of availability for this DEA in the **Federal Register** on June 21, 2007 (72 FR 34215). The public comment period for the DEA was open until August 6, 2007.

For more information on previous Federal actions concerning the seven mussels, refer to the proposed critical habitat designation (71 FR 32746, June 6, 2006) and our notice of availability of the draft economic analysis (72 FR 34215, June 21, 2007). This final rule complies with the settlement agreement.

Summary of Comments and Recommendations

We requested written comments from the public on the proposed designation of critical habitat for the seven mussels in the proposed rule, and again in the subsequent notice of availability (72 FR 34215). On both occasions, we contacted appropriate Federal, State, and local agencies; scientific organizations; and other interested parties and invited them to comment on the proposed rule. Three public hearings were held during the second comment period on July 9, 2007, in Columbus, Georgia, July 10, 2007, in Albany, Georgia, and July 11, 2007, in Tallahassee, Florida.

During the first comment period that opened on June 6, 2006, and closed on August 7, 2006, we received comments from 30 entities that directly addressed the proposed critical habitat designation: one from a peer reviewer, 3 from Federal agencies, 16 from State and local governmental agencies, and 10 from organizations or individuals. We received 4 requests for a public hearing, all from entities in the LaGrange and Columbus, Georgia, area. During the second comment period that opened on June 21, 2007, and closed on August 6, 2007, including the three public hearings, we received comments from 25 entities that directly addressed the proposed critical habitat designation or the draft economic analysis: 4 from peer reviewers, 3 from Federal agencies, 7

from State and local governmental agencies, and 11 from organizations or individuals. Of the comments provided during both comment periods, six commenters supported the designation of critical habitat for the seven mussels and nine opposed the designation. Forty commenters provided suggestions or information, but did not indicate support or opposition to the critical habitat designation. We received comments that were grouped into 70 issues specifically relating to the proposed critical habitat designation for the seven mussels, and are addressed in the following summary and incorporated into the final rule as appropriate.

Peer Review

In accordance with our policy published on July 1, 1994 (59 FR 34270), we solicited expert opinions from seven knowledgeable individuals with scientific expertise that included familiarity with the species, the geographic region in which the species occurs, and conservation biology principles. We received responses from four of the peer reviewers. The peer reviewers generally concurred with our methods and conclusions, and provided additional information, clarifications, and suggestions to improve the final critical habitat rule. We address peer reviewer comments in the following summary and incorporate into the final rule as appropriate.

We reviewed all comments received from the peer reviewers and the public for substantive issues and new information regarding critical habitat for the seven mussels, and address them in the following summary.

Peer Reviewer Comments

(1) *Comment:* The Service stated in the proposed rule that ''Most of the tributary streams in the four basins that may support one or more of the seven species have never been surveyed.'' This seems to cast doubt on the adequacy of the data used to designate critical habitat. Most streams in this region that are large enough to support these species have been surveyed at least to some extent.

Our Response: We acknowledge that a substantial fraction of the unsurveyed tributary streams in the region are probably not large enough to support populations of the seven mussels. However, the drainage area associated with the upstream-most location in most of the occupied watersheds is often quite small (e.g., less than about 5,000 ha (20 mi^2)), and we have no data for a majority of locations in the four basins that drain areas of this size. Regardless, we have considered all available survey data in our analysis for identifying critical habitat. We designated only where presence is confirmed by surveys.

(2) *Comment:* The designation of critical habitat should consider whether re-establishing populations in streams where a species formerly occurred is necessary to fully recover the species.

Our Response: The Act provides for designating areas that are unoccupied at the time of listing when such areas are essential for the conservation of a listed species. We listed the seven mussels based on a substantial decline in range and abundance and threats to their habitats. Our recovery plan (USFWS 2003:76–83) quantifies the amount of range expansion into formerly occupied areas that we believe is necessary to achieve recovery for the five species we listed as endangered. By delineating critical habitat units as the collective extent of occurrence of all seven listed species within a sub-basin, our proposed critical habitat included a stream length that met the recovery plan's geographic range recovery criteria for each of the five endangered species. We do not believe a substantial increase in extent of occurrence is either feasible or necessary for the recovery of the two threatened species, which have experienced a lesser decline in range than the five endangered species. The seven mussels historically occupied overlapping but also different portions of the eleven units, and it is not necessary for each species to occupy all suitable habitat within its designated critical habitat units to achieve recovery. We considered designating units for species that are entirely extirpated from those units but determined that doing so is not essential for their conservation.

(3) *Comment:* Characterizing the stream substrates that are essential to the conservation of the seven mussels as composed of predominantly coarse materials is too simplistic and potentially misleading. Fine sediments (silts and clays) are a natural component of stream substrates in the coastal plain, including substrates used by the seven listed species. In this region, very coarse substrates are often associated with channel scouring and are devoid of mussels.

Our Response: We agree that some amount (generally less than 50 percent by dry weight) of fine sediment is a normal component of the substrate that is essential to the conservation of the seven mussels. Coarse sands without any silt or clay, for example, lack cohesiveness and do not appear to support many mussels, including the listed species. By emphasizing the adverse affects of excessive amounts of fine sediments, we may have implied that the seven mussels are altogether intolerant of fine sediments, which is not the case. Therefore, we have revised the substrate primary constituent element (PCE) and our discussion of substrate quality to acknowledge the appropriate role of fine sediments in substrate quality.

(4) *Comment:* The proposed rule stated that the three other species reassigned from the genus *Lampsilis* to the newly recognized genus *Hamiota* are not federally listed, but two of these are: *H. altilis* and *H. perovalis*. The third, *H. australis*, is considered a candidate for protection under the Act.

Our Response: The comment is correct. We erred in stating that the three other species are not federally listed, and we have revised the text of the final rule accordingly.

(5) *Comment:* Because other portions of the Uchee Creek sub-basin besides those proposed for designation have supported the shinyrayed pocketbook and other listed species as recently as 1973, but have not been surveyed much or at all since then, the rule should designate all portions of this sub-basin below the Fall Line as critical habitat.

Our Response: Riverine habitats are dynamic and subject to a variety of threats, which makes survey data about the presence of particular mussel species time-specific. It is not feasible to routinely survey the full range of the seven species, which collectively spans over 1,000 river miles. We chose post-1990 live occurrence records as a criterion for evidence that a site has supported recent occupancy because a great deal of our data comes from a range-wide status survey conducted in 1991 and 1992, shortly before the species were proposed for listing in 1994. Occurrence records from 1973 do not meet the criterion we set for evidence of recent occupancy; therefore, we did not designate other portions of the Uchee Creek sub-basin. Our method of identifying stream segments that meet the criterion of recent occupancy by one or more of the listed species and then delineating units as contiguous groups of these stream segments resulted in designating a total length of stream habitat meets our recovery plan's geographic range recovery criteria for each of the seven mussels (see response to Comment #2). Therefore, we believe that designating additional areas for which we do not have evidence of recent occupancy is not essential to their conservation. Listed species that may occur outside of designated critical habitat still receive protection under the

jeopardy standard of section 7 and the take prohibition of section 9 of the Act.

(6) *Comment:* Because Sawhatchee and Kirkland creeks are separated by unsuitable habitat in an impounded section of the Chattahoochee River, these creeks should be designated as separate critical habitat units.

Our Response: We have grouped Sawhatchee and Kirkland creeks in the same unit because they share two of three listed species in common and flow unimpeded by fish passage barriers into a common water body. Host fish, such as largemouth bass, could conceivably transport glochidia between these two streams.

Comments from States

Section 4(i) of the Act states, ''the Secretary shall submit to the State agency a written justification for his failure to adopt regulations consistent with the agency's comments or petition.'' We address comments received from States regarding the proposal to designate critical habitat for the seven mussels below.

(7) *Comment:* The designation is overly broad because it includes areas at high elevations within the lateral boundaries and areas between the upstream and downstream boundaries that do not support the mussels.

Our Response: Our regulations allow the inclusive designation of occupied and unoccupied areas in proximity to each other that are each essential to the conservation of a species (50 CFR 424.12(d)). We agree that the adult seven mussels are seldom found at or near the ordinary high water marks in a stream, as this portion of the stream bed is inundated only during relatively high flows; however, we have determined that the entire stream channel between the ordinary high water marks is essential to their conservation as the larval life stage of these mussels while attached to a fish host or drifting in the current could ''occupy'' all habitats that the fish visits or the current takes them, including places at or near the ordinary high water marks during high water conditions. The location of suitable areas for mussel habitat is dependent on fluvial dynamics that occur mostly within the channel up to the ordinary high water marks. A stable stream bank that is laterally adjacent to but vertically above a mussel bed is essential to the viability of the mussel bed. Further, our regulations prescribe the use of reference points and lines as found on standard topographic maps for describing the boundaries of critical habitat (50 CFR 424.12(c)). The ordinary high water marks as defined in the Corps' navigation regulations (33 CFR 329.11) roughly correspond to how river channels are represented on standard topographic maps. We agree also that the adult seven mussels are not found at all locations between the upstream and downstream boundaries given the unit descriptions. However, as with the lateral boundaries, we have determined that the entire stream channel between the upstream and downstream limits is essential to their conservation. Riverine habitats are dynamic, and locations that provide suitable conditions for mussels may shift over time between these upstream and downstream limits. Connectivity between the upstream and downstream limits provides for host fish movement, gametes transport, dispersal into newly suitable habitats, and food items transport. Therefore, we have kept these areas in the designation.

(8) *Comment:* The designation is contrary to the Act because it includes areas that do not contain all of the physical and biological features that the Service determined are essential to the conservation of a listed species and may require special management (PCEs). For example, Unit 8 (Apalachicola River) includes the distributary Swift Slough, which has aggraded (filled with sediment) in recent years and no longer flows continuously.

Our Response: Each of the 11 units designated as critical habitat contains all of the PCEs, and each stream segment listed in the unit descriptions contains one or more of the PCEs. Neither the Act nor our regulations require that all portions of a designated critical habitat unit contain all of the PCEs. Mobile animals typically satisfy various life history requirements by relying upon different habitat features in different portions of their range. While juveniles and adults of the seven mussels are relatively immobile animals, their glochidia (larvae) and host fish are not. Dispersal via fish hosts is how the species colonize new areas and is necessary to achieve recovery, although mussels are also sometimes moved into new areas by high-flow events. Mussels will best survive and reproduce in specific areas that consistently provide all of the PCEs, but do not necessarily persist permanently in any one area given the dynamic nature of the riverine environment. Interrupted flow due to the accumulation of sediment in the bed of Swift Slough has recently led to substantial mortality of listed mussels in this stream during periods of low-flow in the Apalachicola River. However, it does not follow that this or any particular area within a critical habitat unit that lacks all of the PCEs cannot be included in a critical habitat unit. Stream bed aggradation in Swift Slough signals the need for special management of the channel stability PCE in at least the Swift Slough portion of Unit 8. While permanently flowing water, channel stability, etc., are features essential to the conservation of the seven mussels in each designated unit, we recognize that some portions of all 11 units have problems with at least one of the PCEs that may require special management or protections.

(9) *Comment:* Florida Fish and Wildlife Conservation Commission personnel found shell material of the listed species in the Brushy Creek ''feeders'' (floodplain distributaries of the Apalachicola River that flow into Brushy Creek). The Service must determine whether the Brushy Creek feeders were likely occupied in 1998 (the time of listing), and if so, designate those streams if they otherwise qualify as critical habitat. Areas like the Brushy Creek feeders, currently unoccupied, should be designated anyway if they are essential for the conservation of the species. Areas like the Brushy Creek feeders are key to the recovery of mussels because they can act as nursery areas and provide for population expansion.

Our Response: We relied upon post-1990 live occurrence records to provide evidence that areas were likely occupied at the time of listing, and we have no such evidence for the Brushy Creek feeders. Dead shells found recently in these distributaries, which receive flow directly from a part of the main channel of the Apalachicola River where listed species are known to occur, is not evidence that these streams support the listed species now or at the time of listing. It is more likely that the shells found in the Brushy Creek feeders were transported by currents from the main channel. We believe that areas for which we have no evidence of recent occupancy are not essential to the conservation of the listed mussels (see responses to comments #2 and #5). We do not believe that the Brushy Creek feeders or other similar sites not included in this designation provide ''nursery'' areas for mussels that are necessary for their recovery. The concept of a nursery area implies that mussels occupy one area as juveniles and another as adults. We have no evidence that such movements are occurring.

Public Comments

(10) *Comment:* Line Creek in Unit 5 (Upper Flint River) does not provide suitable habitat for the listed mussels.

Our Response: Live listed species have been found in Line Creek downstream of its confluence with Whitewater Creek since 1990, and this segment contains PCEs. Consistent with our criteria for identifying critical habitat, we included this section of Line Creek in Unit 5.

(11) *Comment:* Critical habitat designation will add costly delays to permitting a recreational reservoir on Tired Creek, which is upstream of designated habitat in Unit 9 (Upper Ochlockonee River).

Our Response: The Service is designating critical habitat only where the mussels are currently present. Therefore, a Federal action that ''may affect'' critical habitat (and would trigger formal interagency consultation) would also result in a ''may affect'' determination for one or more mussel species (requiring formal consultation in and of itself). Our regulations prescribe specific timeframes in which to complete the formal consultation process with Federal agencies. These timeframes are the same whether or not critical habitat is designated and consulted upon during the required consultation process. Critical habitat designation does not create a separate consultation process. While the need to consult on adverse modification on critical habitat does not increase the statutorily allowed amount of time for consultation, it could increase the amount of effort that goes into the consultation process due to the different criteria for a jeopardy consultation versus an adverse modification consultation. Consideration of designated critical habitat in other environmental requirements (such as National Environmental Policy Act (42 U.S.C. 4321 *et seq.*)), similarly would not add to the length of time needed to comply with those requirements.

(12) *Comment:* The proposed critical habitat for the seven mussels overlooks large areas of potential habitat and essentially disregards the Service's own recovery goals for these species. The Service should designate unoccupied areas containing PCEs within the historical range of the seven mussels.

Our Response: Our June 6, 2006, proposed rule explained how we delineated the upstream and downstream limits of proposed critical habitat using the collective current distribution (post-1990 surveys) of all seven mussels and landscape features (e.g., tributary confluence, upstream extent of a reservoir) that indicated a significant change in aquatic habitat conditions (71 FR 32757–32758 ''Criteria Used To Identify Critical Habitat''). This approach resulted in 11 hydrologically and ecologically contiguous units, each of which is a collection of stream segments that flow unimpeded by fish passage barriers into a common reservoir or estuary. Moreover, as we noted in our response to peer-review comment #2, the total stream length delineated by these methods meets the geographic range recovery criteria in the recovery plan (Service 2003) for each of the five species listed as endangered.

(13) *Comment:* Currently occupied habitat is insufficient for conservation of the seven mussels and, therefore, the critical habitat designation must include unoccupied habitat. Unsurveyed tributary creeks that likely support the seven mussels are excluded from the proposed critical habitat because the Service cannot confirm that mussels are present.

Our Response: Our recovery plan for the seven mussels (Service 2003) notes that re-introduction in presently unoccupied habitat is needed for the conservation of the five mussels listed as endangered, but not for the two threatened, species. The two threatened species, the Chipola slabshell and the purple bankclimber, each occupy well more than 50 percent of the historical range, which is the criterion we adopted for range expansion as a measure of recovery in the recovery plan. For the five endangered species, the stream length included in the designation meets the recovery plan's geographic range recovery criteria (see our responses to peer-review comment #2). Therefore, we believe the units designated provide a sufficient amount of habitat to support recovery, which precludes the need to designate unsurveyed tributaries that are not known to support the seven mussels. Nevertheless, we would recognize the contribution towards recovery of any populations found in previously unsurveyed streams in our periodic reviews of the conservation status of the seven species.

(14) *Comment:* While permanently flowing water is essential to the seven mussels' survival, flowing water alone is insufficient for the conservation of these species. The final rule should adopt the Service-Environmental Protection Agency (EPA) instream flow guidelines as the flow-related PCE.

Our Response: We discussed in the June 6, 2006, proposed rule the role of natural variability in the flow regime to the structure, composition, and functioning of riverine biological communities. The Service-EPA flow guidelines are measures of flow variability that may serve as thresholds for ''may affect'' determinations for proposed Federal actions that would alter a flow regime (e.g., water withdrawals, dam operations). It was not practical or useful to compute the flow guidelines for the entire region that this designation spans, because the guidelines were designed as a tool for site- and project-specific analysis. Further, the guidelines do not establish a general standard or ''bottom line'' for flow regime features that are essential to the conservation of listed species. Recognizing the many complexities involved in quantifying essential flow regime features for the seven mussels, we adopted a qualitative expression that applies throughout the range of the seven mussels and is clearly necessary for their recovery: ''permanently flowing water.''

(15) *Comment:* Riparian buffers are essential to the conservation of the seven mussels and should be designated as primary constituent elements. If the final rule does not include intact riparian buffers as a primary constituent element, it should address riparian zones as a necessary element of related primary constituent elements.

Our Response: Many factors operating outside the channel in the larger watershed affect streams and their inhabitants. Conditions in the riparian zone are among the most influential of these factors by virtue of immediate proximity to the stream channel, but the seven mussels do not occur in the riparian zone. A wide array of riparian buffer dimensions and vegetative characteristics are associated with the mussels. Activities within the riparian zone are among those that may adversely affect the PCEs, and likewise, some conservation actions to protect or enhance the PCEs may occur within the riparian zone. However, specific biological and physical features within the riparian zone are themselves not essential to the conservation of the seven mussels. We have used the ordinary high water marks of the channel as the lateral bounds for this designation (see also our response to comment #7), which encompasses all of the PCEs that we have defined for this designation.

(16) *Comment:* One PCE recognizes fish hosts as necessary to ''support the larval life stages of the seven mussels,'' but none address the habitat needs of the host fish species. The final critical habitat designation should be consistent with the rule for five Tennessee and Cumberland River mussels, which defined ''Fish hosts with adequate living, foraging, and spawning areas for them'' as a PCE, and also linked the ''flow regime'' and ''water quality'' PCEs

for the mussels with the needs of the host fish.

Our Response: PCEs are essential physical and biological features that are found within critical habitat, the lateral boundaries of which we have delimited as the ordinary high water marks of the stream channel. The final critical habitat rule for five endangered mussels in the Tennessee and Cumberland River basins also used the same criteria (ordinary high water mark) to define the lateral boundaries of critical habitat. Therefore, while the wording of the PCEs might be different, the protection levels are the same since both use the ordinary high water mark to delineate the lateral boundaries of critical habitat.

Several fish species that have been identified through laboratory tests as potential hosts for the seven mussels are known to spawn most successfully in floodplain habitats (e.g., largemouth bass), which occur outside the critical habitat boundaries. We agree that the habitat needs of host fish are important considerations in mussel conservation, but as with our response to Comment #15 regarding riparian buffers, we distinguish between PCEs and factors that may affect PCEs. The timely presence of appropriate host fish is the habitat feature that is essential for the survival and recovery of the mussels (i.e., the PCE itself), whereas the habitat requirements of the host fish are factors affecting that PCE.

(17) *Comment:* The rule does not contain the summary of data on which the proposal is based, does not show the relationship of such data to the rule proposed, or provide citations to the mussel surveys relied upon, as required by the Service's regulations at 50 CFR 424.16.

Our Response: Our summary of data supporting the PCEs is provided in the ''Primary Constituent Elements'' section. Our summary of data supporting the delineation of units is given in the ''Criteria Used To Identify Critical Habitat'' section. The mapping process involved an overlay of all available site-specific locality data for the seven mussels, which itself was not included in the published proposed rule and is not included in this final rule. The sources for all mussels survey data used in the mapping process are cited at the conclusion of each unit's description, where we list the species for which each unit is designated. A complete list of these and all references cited in this rulemaking is available upon request from the Panama City Ecological Services Office (see **ADDRESSES**).

(18) *Comment:* The Service should not designate Swift Slough, which is part of Unit 8 (Apalachicola River), because it does not have the permanently flowing water PCE.

Our Response: It is not necessary for all PCEs to be present in all portions of critical habitat at all times (see our response to Comment #8). Habitat features change over time, and different portions of a unit will provide a different mix of the PCEs. At the time we initially drafted the proposed rule, we were not yet aware of sediment accumulation in Swift Slough that now results in its disconnection from the main channel of the Apalachicola River during low flows. Although mussels in Swift Slough have suffered considerable mortality since the summer of 2006, some animals persist from what was apparently a relatively large population. Swift Slough still meets the criteria we used to identify critical habitat; therefore, it is still included in the designation.

(19) *Comment:* Water withdrawals are mentioned as causing changes in riverine habitats. This is a mis-statement of facts. If water is withdrawn and used and properly treated and returned to the basin of origin, it does not change the riverine habitat.

Our Response: Most out-of-stream uses of water return less than 100 percent of the water that is withdrawn, due to evaporation and other losses. In 2005, about half of the water withdrawn for municipal and industrial use in the Chattahoochee Basin upstream of West Point Dam was not returned to the river (Georgia Environmental Protection Division, unpublished data). Water withdrawals may affect aquatic habitat conditions and aquatic communities, depending on their timing and magnitude relative to stream flow. For example, fish assemblages were significantly less diverse downstream from relatively large water withdrawals and downstream from water supply reservoirs in the lower Piedmont region of Georgia (Freeman 2005).

(20) *Comment:* The fact that the fecal coliform bacteria standard is violated in some reaches of the critical habitat has no effect on mussels. This standard is set to protect humans engaging in whole body contact with the water such as swimming.

Our Response: We agree that fecal coliform bacteria standards are established to protect human health and violations of these standards do not necessarily indicate conditions that are harmful to mussels. However, it is possible that some of the bacteria and protozoans associated with wastewater discharges, which often includes fecal coliform bacteria, may adversely affect mussel reproduction (Goudreau *et al.* 1993:221). High fecal coliform levels may also derive from non-point sources such as pastures and farms following rain events. Because the overland runoff that delivers fecal coliform bacteria from non-point sources to streams may also carry pesticides, fertilizers, and other pollutants, elevated levels of other pollutants are often associated with high coliform counts.

(21) *Comment:* The statements that ''Many pollutants in the ACF Basin originate from * * * and municipal waste water facilities'' in the proposed rule implies that waste water facilities are the source of pollutants that are harmful to the mussels. This is not correct if the waste water facilities are in compliance with National Pollutant Discharge Elimination System (NPDES) permits. All NPDES permits are required to ''not violate water quality standards,'' therefore the mussels would be protected. The fact that someone counted 137 municipal waste water facilities in the ACF basin is not relevant to the protection of the mussels assuming that these facilities all have NPDES permits and are in compliance. To arbitrarily assume that these facilities are not in compliance without factual data is wrong and is unscientific.

Our Response: Municipal waste water treatment processes remove most but generally not 100 percent of all pollutants. Although treatment facilities and other point-source discharges may comply with NPDES permit conditions, the combined pollutant loading from all sources in a watershed may contribute to a total loading such that some reaches do not meet one or more water quality standards. When a stream is identified as impaired under the Clean Water Act (33 U.S.C. 1251 *et seq.*), the States initiate a process for developing total maximum daily load regulations under their delegated administration of the Clean Water Act. Our proposed rule indicated which critical habitat units contain stream segments on the impaired waters lists of the States. Our reference to the number of treatment facilities in the ACF Basin was part of describing the environmental setting of the critical habitat units. We did not assume or mean to imply that treatment facilities in the ACF were or were not in compliance with NPDES permits.

(22) *Comment:* These two statements in the proposed rule contradict each other: (1) ''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;'' and (2) ''Various contaminants in point and non-point

source discharges can degrade water and substrate quality and adversely affect mussel populations.''

Our Response: Our reference to ''several standard physical and chemical water quality parameters'' did not include contaminant concentrations. Parameters are those that aquatic biologists routinely measure with instruments in the field. Concentrations of contaminants that are known to adversely affect mussels, such as ammonia and heavy metals, are generally measured using water or sediment samples taken to a laboratory and not using instruments in the field. We have revised the rule language to avoid the apparent contradiction of these two statements.

(23) *Comment:* There is no scientific basis given for implying that septic systems are responsible for mussel threats.

Our Response: We include maintaining septic systems among the management considerations to deal with the threat of pollution to mussel habitats because inadequately maintained systems may contribute nutrients and other pollutants to ground water that can seep into surface water bodies. Nutrient loading can lead to algal blooms and low dissolved oxygen levels that adversely affect mussels, which we discuss under the water quality PCE.

(24) *Comment:* The impacts associated with Whitewater Creek Park are minimal; therefore, the Service should exclude Macon County, Georgia, from the designation.

Our Response: We do not include Whitewater Creek and Whitewater Creek Park in Macon County in designated critical habitat for the seven mussels. However, we do include a different Whitewater Creek in Fayette County, Georgia. We also include the main channel of the Flint River and Hogcrawl Creek in Macon County as parts of Unit 5 (Upper Flint River).

(25) *Comment:* Critical habitat for the seven mussels is not determinable because the Service has insufficient data. Most of the mussel distributional records are from the early 1990s and further studies are needed to define suitable habitat conditions for the seven mussels.

Our Response: Much of the survey data upon which we relied dates from the early 1990s, but this does not in and of itself render critical habitat undeterminable. The Act contemplates critical habitat designation ''at the time it [the species] is listed'' (Sect. 3(5)(A)(i)); therefore, we must necessarily rely on distributional data from the time of listing as well as more recent data. It happens that most of our records are from the early 1990s because the most comprehensive survey effort in the range of the seven mussels immediately preceded the listing proposal, which was published on August 3, 1994 (59 FR 39524). Due to a moratorium on listing actions declared by Congress shortly thereafter, we did not publish a final rule until March 16, 1998 (63 FR 12664). We agree that further studies are needed to more quantitatively define the seven mussels habitat requirements; however, the best available information regarding those requirements is sufficient to define qualitative but workable and meaningful PCEs. Further, the PCEs adopted in this rule are generally consistent with those adopted in previous rules designating critical habitat for freshwater mussels.

(26) *Comment:* Contrary to the Service's regulations at 50 CFR 424.12(c), the Service has used an imprecise ephemeral boundary, the ordinary high water marks, to define the lateral extent of the proposed critical habitat area.

Our Response: Although the ordinary high water marks of a stream may shift location over time, they do not disappear. The intent of the regulation cited is avoiding reliance in critical habitat descriptions on ephemeral features, i.e., features that last a relatively short time. We agree that the ordinary high water marks are not a precise or a fixed set of coordinates over time, but they are an appropriate descriptor for dynamic riverine habitat. A fixed set of coordinates that would fully encompass the areas we have determined are essential would either become quickly obsolete through natural or human-induced lateral channel migration, or would delineate an overly broad area by including a fair amount of terrestrial habitat.

(27) *Comment:* The analysis of what activities may affect the proposed critical habitat designation set forth in the proposed rule is both misleading and incomplete. As a result some persons may conclude by default that any and all activities affecting portions of the critical habitat, however minimally, will require consultation under section 7 of the Act.

Our Response: The section 7 consultation process applies only to Federal actions. Federal agencies are responsible for determining whether their actions may affect listed species or designated critical habitats. Action for which the action agency makes ''no effect'' determinations does not require further consultation with the Service. Service concurrence is required for other determinations, and the Service routinely assists Federal agencies in defining classes of actions that may comply with section 7 through informal consultation. The formal consultation process, which requires the Service to prepare a biological opinion, applies to those actions that Federal agencies determine may adversely affect the listed species or designated habitat. We do not expect the designation of critical habitat to appreciably increase either the number of actions per year to which the consultation process applies or for which formal consultation is required.

(28) *Comment:* The proposed rule provides no guidance for determining which features of the flow regime are important to mussels and their host fishes. Therefore, it is impossible to determine whether the Service has actually made a determination that certain activities presumptively ''may affect'' critical habitat. The Service-United States Environmental Protection Agency instream flow guidelines referenced in the proposed rule do not provide a sufficient or appropriate basis for evaluating proposed activities, because the guidelines are not self-explanatory and are not obviously relevant to the seven mussels.

Our Response: The measures of flow magnitude, duration, frequency, and seasonality that are included in the Service-USEPA instream flow guidelines (USFWS and USEPA 1999) may be used to determine whether Federal actions may affect listed species. This is the express purpose of the guidelines, which is relevant to the seven mussels. Application of the guidelines for this purpose is a site-specific and data-intensive process that involves computing long-term flow statistics for a project area with and without a proposed Federal action. Actions that would alter the flow parameters included in the guidelines, e.g., increase the maximum number of days per year that flow is less than 25 percent of average annual discharge, may adversely affect listed species and require formal consultation. The process for computing and applying the guidelines is explained in the guidelines document. However, to provide more information about the guidelines in this designation, we have added a listing of the flow regime features that are included in the guidelines to the flow regime PCE discussion.

(29) *Comment:* The Service should follow the procedures prescribed by the National Environmental Policy Act (NEPA) as part of this rulemaking.

Our Response: It is our position that, outside the jurisdiction of the Tenth Federal Judicial Circuit, we are not required to prepare environmental analyses as defined by NEPA in

connection with designating critical habitat under the Endangered Species Act of 1973, as amended (see Required Determinations—NEPA).

(30) *Comment:* The Service fails to note that impoundments are very efficient in removing sediment, with large southeastern reservoirs trapping 80–90% of the incoming sediment.

Our Response: In the ''Summary of Threats to Surviving Populations'' section, we note how impoundments block the natural downstream movement of sediment, which commonly leads to channel degradation in the tailwaters of dams built in alluvial rivers (Williams and Wolman 1984, p. 14; Lignon *et al.* 1995, p. 187). Rather than providing a net benefit to mussels by trapping excessive sediment loads, dams may largely remove native riverine mussels from tailwater areas through channel scouring processes as well as from stream segments inundated by reservoirs. For example, the fat threeridge was formerly abundant but is now rare in the upstream reaches of the Apalachicola River, most likely due to substantial channel incision resulting from the construction of Jim Woodruff Lock and Dam.

(31) *Comment:* The Service fails to note that impoundments with large storage capacity may increase base flows downstream during periods of drought. Increased minimum flow may benefit downstream mussel habitat. The storage capacity of large reservoirs may also reduce the impact of flood flows that historically would result in scour and bank erosion.

Our Response: The seven mussels evolved under natural flow regimes that include droughts and floods. Human consumptive uses of water may decrease stream flow below naturally occurring levels, and releases from reservoirs may offset the impact of this depletion, depending on how reservoirs are operated. However, reservoirs generally reduce the average annual discharge of a river by increasing evaporative losses via a greater water surface area. Increasing river flow with releases from reservoir storage necessarily requires decreasing river flow at other times to replenish storage, which may adversely affect mussels. However, we are aware of no evidence that the magnitude, frequency, duration, or timing of flood flows has been appreciably altered by dams in the stream reaches that are included in this critical habitat designation.

(32) *Comment:* Relative to the application of the jeopardy and adverse modification standards, the Service provides no evidence that the operation of dams would alter flows in a manner that would destroy or adversely modify critical habitat.

Our Response: Federal actions that would destroy or adversely modify critical habitat are those that alter the PCEs to an extent that the conservation value of the habitat is appreciably reduced. We included dam operations as an activity that could, but does not necessarily, significantly alter flow regimes. Determining whether dam operations may adversely affect critical habitat is a site- and project-specific analysis. The Service-USEPA instream flow guidelines (USFWS and USEPA 1999) are an appropriate tool for making such determinations (see comment #28). It is not necessary to establish that an action, such as dam operations, is certain to adversely modify critical habitat in order to name it in our designation among the actions that could do so.

(33) *Comment:* The Service is required to list the specific PCEs for each individual mussel in each unit designated as critical habitat. The Service does not provide evidence, explanations, or citations detailing the requirements of each species relative to each of the PCEs.

Our Response: The Act and our regulations do not prohibit multi-species critical habitat designation rules, and the Service has previously issued several multi-species critical habitat rules in which a common set of PCEs applies to more than one species (for example, July 17, 2007, final rule for Peck's Cave amphipod, Comal Springs dryopid beetle, and Comal Springs riffle beetle, 72 FR 39248). We acknowledge that each of the seven mussels has a unique life history and niche in the riverine environment, but that these are similar enough to describe PCEs for the seven mussels as a group. Although the PCEs are the same for all seven mussels, the mix of units designated as critical habitat for each species is unique, reflecting differences in their spatial distribution.

(34) *Comment:* The rule should address the threat of dam removal to the mussels and include dam removal as an action that could appreciably alter the channel stability and flow PCEs.

Our Response: The Service is unaware of dam removal proposals within the areas we are designating as critical habitat. Dam removal could conceivably initiate channel instability; however, the most likely motivation for a dam removal project would be restoration of free-flowing conditions that were previously impaired by impoundment. This is the motivation for the proposed removal of the Eagle-Phenix Dam and the City Mills Dam, which would restore a total of approximately 2.3 miles of the biologically significant Fall Line shoal habitat in the Chattahoochee River. Although this area has not been designated as critical habitat, it is within the historical range of some of the seven mussels. Eagle-Phenix and City Mills dams do not store an appreciable volume of water, and removing these dams would not affect downstream flow regimes.

(35) *Comment:* The proposed rule cites no evidence to support the assertion that the seven mussels are not found in impoundments.

Our Response: Brim Box and Williams (2000) surveyed 324 sites in the ACF, including several sites within several impoundments, including Lake Seminole, Lake Walter F. George, and West Point Lake. They found no live individuals of the listed species within any of the impoundments.

Economic Analysis—Policy Issues

(36) *Comment:* Multiple commenters requested the economic analysis consider those impacts due solely to the designation of critical habitat for the seven mussels.

Our Response: Appendix B of the Final Economic Analysis (FEA) estimates the potential incremental impacts of critical habitat designation for the seven mussels. It does so by attempting to isolate those direct and indirect impacts that are expected to be triggered specifically by the critical habitat designation. The incremental conservation efforts and associated impacts included in Appendix B would not be expected to occur absent the designation of critical habitat for the seven mussels. Total present value potential incremental impacts are estimated to be $501,000. All other impacts quantified in the FEA are considered baseline impacts and are not expected to be affected by the critical habitat designation.

(37) *Comment:* Several commenters stated the Initial Regulatory Flexibility Analysis does not adequately estimate the potential impacts to small entities.

Our Response: Appendix C in the FEA has been revised and now considers the extent to which the incremental impacts analysis described in Appendix B could be borne by small entities and the energy industry as opposed to fully co-extensive impacts quantified in Sections 3 though 6. The incremental impacts of the rulemaking are considered most relevant for the small business and energy impacts analyses as they are expected to stem from the critical habitat designation, and are therefore not expected to occur in the case that critical habitat is not

designated for the seven mussels. The analysis concludes that one hydropower operator and 10 deadhead logging companies may be affected by critical habitat designation as proposed.

(38) *Comment:* One commenter states that the Draft Economic Analysis (DEA) explains that no estimates of minimum flow have been developed by the Service or any other entity. In order to assess ultimate hydropower impacts, these estimates must be made, and included in the economic analysis.

Our Response: In the absence of information on minimum flow levels for the seven mussels the FEA relies on the best available information solicited from resource managers on the likely efforts that would be needed to protect the seven mussels to estimate the potential future impacts associated with conservation efforts in areas proposed for designation.

(39) *Comment:* One commenter indicates that the impacts of implementing the U.S. Army Corps of Engineers (USACE) Modified Interim Operating Plan (Modified IOP) need to be distributed between gulf sturgeon and mussels, as it considers both.

Our Response: The Modified IOP is intended to protect the mussels, their host fish, and gulf sturgeon. Specific information on which species generated which conservation efforts in the plan is not available. This analysis therefore quantifies the full impact of the plan as co-extensive with seven mussels conservation. Appendix B in the Final Economic Analysis (FEA) estimates the incremental impacts associated solely with the designation of critical habitat for the seven mussels; impacts associated with the Modified IOP are not considered to be incrementally due to critical habitat.

(40) *Comment:* Several commenters state that potential benefits of critical habitat designation should be quantified.

Our Response: The economic analysis conducted for this rule points out that there are some potential benefits of critical habitat designation. However, it is difficult to develop credible estimates of such values, as they are not readily observed through typical market transactions and can only be inferred through advanced, tailor-made studies that are time consuming and expensive to conduct. We currently lack both the budget and time needed to conduct such research before meeting our court-ordered final rule deadline. The economic analysis is done primarily to provide decisionmakers with information about potential exclusions from the rule. Given the impracticality of conducting this additional analysis we do not believe it is necessary to quantify the positive consequences of this rule in order to weigh the benefits of including versus excluding areas from the rule. The Congress has already determined that the benefits of species recovery are high. Therefore, we do not require quantification of how high in order to make a sound decision.

Economic Analysis—Economic Issues

(41) *Comment:* One commenter states that the DEA did not desegregate impacts in Unit 8, Apalachicola River to focus on Swift Slough, River Styx, and Kennedy Slough.

Our Response: The water management adopted per Reasonable and Prudent Measure (RPM) 3 of the Biological Opinion for USACE operations at Jim Woodruff Dam raised the minimum flow in the Apalachicola River to 6,500 cfs when composite storage (all reservoirs combined) is above zone 3, at which time it reverts to 5,000 cfs. At this time the Service does not anticipate maintaining higher minimum flows for Swift Slough, River Styx, and Kennedy Slough than already considered in the Modified IOP. Therefore, the FEA does not estimate any additional impacts associated with these tributaries.

(42) *Comment:* One stakeholder commented that the Modified IOP is an interim plan and can change soon. Another commenter noted that the USACE 2007 Environmental Assessment quoted in Section 4 of the report has not been vetted through an official process, and that a May 16, 2007, letter from USACE to the Service indicates that changes to Modified IOP operations are ongoing, and make USACE statements suspect as they are subject to change.

Our Response: The USACE currently manages its operations in accordance with the 1989 Draft Water Control Plan for the Apalachicola-Chattahoochee-Flint (ACF) reservoir system and makes minor adjustments as necessary to accommodate changes in current needs. Current management under the Draft Water Control Plan is set out in the Modified IOP. The Modified IOP reflects how the USACE is regulating the minimum releases and maximum fall rates at Jim Woodruff Dam. In 2007, the USACE completed an Environmental Assessment of the Modified IOP. Finalization of the Draft Water Control Plan depends on the result of ongoing litigation filed by the State of Alabama in 1990. Although it is expected that the Water Control Plan, and the Modified IOP will be updated subsequent to the resolution of the litigation process, information is not available to identify what changes to management may occur. The FEA therefore applies the best information available, i.e., the Modified IOP and Draft Water Control Plan, regarding water management and acknowledges the uncertainty regarding this activity in the future.

(43) *Comment:* A few commenters stated that the input parameters that the USACE uses for its HEC–5 hydrological model differ from the parameters used by Georgia and Florida and that the results presented in the DEA could change if these different input parameters are included in the analysis.

Our Response: To address the comment, the FEA includes additional results from Georgia Environmental and Protection Division's (EPD) analysis of the Modified IOP. Section 2 has been updated with a detailed discussion of how the USACE's assessment of the depletion of water storage in the major dams on the Chattahoochee River is consistently less than Georgia EPD's assessment. Several exhibits have been added that compare the two agencies' interpretations of the impact of the Modified IOP on reservoir storage capacity. The comparisons are made for both year 2000 and year 2030 water demand levels, and for normal and drought conditions. Section 3 of the FEA was revised to include these new estimates. Using this new information the present value of potential economic impacts to recreationists associated with conservation efforts for the seven mussels in Unit 8, Apalachicola River, increased to be between $27.7 million and $54.1 million (discounted at three percent).

(44) *Comment:* A commenter stated that the Service's use of instream flow guidelines in Section 2 of the DEA was not mentioned in the September 2006 Biological Opinion on USACE's IOP for Jim Woodruff Dam.

Our Response: Instream flow guidelines discussed in the DEA are as described by the Service in the June 6, 2006, proposed rule for the critical habitat designation of the seven mussels, not the 2006 biological opinion. The EPA–USFWS guidelines are referenced in Section 2 of the FEA.

(45) *Comment:* One commenter stated that the assumption that municipal and industrial impacts may result due to USACE's water management operations of the ACF system is directly contradicted by USACE language, which indicates that lake levels will not fall below water intake structures because of operations under the Modified IOP.

Our Response: The USACE analysis of the impacts of the Modified IOP impacts models year 2000 water demand; it does not assess the impact of the Modified IOP for year 2030 water demands.

However, Georgia EPD provides simulated lake levels for both year 2000 and year 2030 water demand levels. Section 2 of the FEA, discusses how model simulations conducted by the Georgia EPD suggest that lake levels may go below water intake structures in the future, especially under year 2030 water demand levels. This can happen even without the modifications introduced by the Modified IOP. Thus, in the case that sustained drought conditions exist in the future, the Modified IOP can potentially further decrease lake levels.

Potential Economic Impacts Related to Changes in Water Use and Management

(46) *Comment:* A few commenters have expressed reservations about attributing the impact of the Modified IOP on municipal and industrial water supply and recreation to the critical habitat of the three mussels found in the Apalachicola River complex because the Modified IOP predates the designation.

Our Response: The impact of the Modified IOP on municipal and industrial water supply is not quantified in the DEA. For recreation related impacts, which are quantified in Section 3, the FEA quantifies the fully co-extensive impacts of any Federal, State, or local regulations or guidelines that may benefit the seven mussels in the proposed critical habitat area. Appendix B of the FEA acknowledges that implementing the Modified IOP is not an incremental impact attributable to the proposed rule.

(47) *Comment:* Several commenters have indicated that water quality could become a concern at lower lake levels.

Our Response: Section 2 of the FEA notes these concerns based on Georgia EPD's analysis of how declining lake levels during sustained periods of drought could expose the water intake structures of several local governments in Georgia. Additionally, Georgia EPD concludes that the Modified IOP leads to an increase in the number of days that the desired flow for wastewater assimilation below the Columbus gage will not be met. Section 5 discusses other potential water quality-related impacts. These potential water quality impacts are associated with Modified IOP implementation and are not expected to result from the critical habitat designation as proposed.

(48) *Comment:* One commenter mentioned that there is no mechanism for the Flint River Drought Prevention Act (FRDPA) to restrict agricultural uses based solely on impacts to protected mussels.

Our Response: The DEA does not make assumptions or recommendations regarding how changes in irrigated agricultural use will occur, or who will bear the cost of changes in water management and use. As discussed in Section 6 of the FEA, the Georgia Department of Natural Resources, Wildlife Resources Division plans to develop a Habitat Conservation Plan (HCP) to address agriculture related impacts to seven mussels conservation in the Lower Flint River Basin. The HCP is expected to reduce irrigation in the Lower Flint River Basin during severe drought. In addition, there were reverse auctions conducted associated with the Flint River Drought Protection Act (2000), during which irrigation rights were purchased from farmers, during the drought periods in 2001 and 2002.

(49) *Comment:* Several commenters indicate that information necessary to quantify municipal and industrial impacts is ''readily available and should have been collected and analyzed as part of the economic analysis.''

Our Response: Section 3 of the FEA explains that it was unable to estimate the impacts of mussel conservation efforts on municipal and industrial water supply because of numerous uncertainties in the relationship between water management under the Modified IOP and water supply. To quantify these impacts, the following information is needed: (a) The relationship between lower lake levels due to the Modified IOP and the risk that municipal water use will be restricted in some way (i.e., the marginal increase in risk of droughts being declared); (b) the amount of water lost from each sector (e.g., industry) within Chattahoochee River Basin municipalities due to drought restrictions and quantification of the effect of timing restrictions on water availability; and (c) data to estimate the value of less transparent water uses (e.g., lawn watering). These data are currently not available.

(50) *Comment:* One commenter indicated that the DEA underestimates the economic impacts associated with critical habitat designation at West Point Lake, citing preliminary results from an ongoing study. The FEA indicates that impacts associated with low water levels (i.e., water levels below top pool elevations) not specifically due to the Modified IOP may be as high as $90 million. The commenter states the following: (a) Recreation visits are underestimated, (b) the DEA did not consider estimates of rapid growth associated with the greater LaGrange, Georgia area, (c) property value changes in response to changes in lake level are not analyzed, and (d) the estimate of average boating expenditures within 30 miles ($68 per trip) is low.

Our Response: The West Point Lake study described by this commenter was commissioned to investigate the economic impact of low water levels, which are only in part influenced by the mussel conservation efforts. In response to the specific points: (a, b) A new source of data on visitation to West Point Lake has been identified and incorporated into the FEA (increasing the present value estimate of potential future impacts to recreationists at West Point Lake to between $11.0 million and $16.5 million, discounted at three percent). (c) Estimating property value impacts would require a study that has: (i) Estimated how property values in the region (ideally, at West Point Lake) have changed in response to changing lake levels and (ii) is capable of characterizing the marginal change in property values of changes in lake levels. Such a study has not been identified. (d) Average boating expenditures are used in the regional impact analysis. The within 30-mile expenditure value of $68 per trip is the best estimate currently available. The $95 estimate includes nationwide travel expenditures to Lake Lanier and therefore cannot be used to estimate regional impacts.

(51) *Comment:* Several commenters indicate that McMahon et al. 2004 is inappropriate to use in the DEA to estimate potential impacts of lower lake levels on recreation. Specifically, (a) McMahon *et al.* use 1995 boater visitation data that is outdated; and (b) omitting impacts on non-boaters would result in a significant underestimate of impacts.

Our Response: An extensive literature review of the recreation literature (refer to Appendix F of the FEA) was conducted and did not identify any other studies that were transferable to the situation at Lake Lanier. McMahon et al. was selected for a few reasons: (a) The robustness of the method (Random Utility Model), (b) the geographic appropriateness of the analysis, and (c) the transferability of the results (elasticity measures). This study provided the best available information for this particular analysis. Additionally, data are not currently available on use levels to incorporate non-boater effects in the FEA. The commenter does not identify any potentially applicable studies or data.

(52) *Comment:* Several commenters indicate that recreational damages are more sensitive to changes in shoreline than changes in lake surface area, and that it is therefore not appropriate to use lake levels as a proxy for changes in

recreation. Additionally, the commenters indicate that the shapes of the different lakes vary considerably, so that the draw down of West Point Lake exposes far more shoreline than Lake Lanier, creating greater economic impacts to recreational and property interests on the shore.

Our Response: Information at this level of specificity is not currently available to relate water withdrawal to shoreline changes. Section 3 of the FEA acknowledges this limitation. However, some aspects of lake shape are implicitly incorporated into the modeled relationship between drawdown and surface levels; for example, a steep-walled lake will have very little change in surface area as water levels fall, whereas a lake with relatively flat shorelines will experience the opposite effect, and thus have a greater level of estimated impacts to recreation.

(53) *Comment:* One commenter indicated that the DEA models willingness to accept rather than willingness to pay for recreation. Because willingness to accept is generally higher than willingness to pay, the analysis overestimates impacts.

Our Response: This comment misinterprets the DEA. The analysis models the compensating variation associated with these trips, which is a measure similar to consumer surplus. These values were developed in the context of random utility models, created from a travel cost framework. Travel expenditures are most reflective of willingness to pay rather than willingness to accept values.

(54) *Comment:* Several commenters suggest that the DEA does not consider the lake elevations corresponding to water supply intakes and boat ramps in the DEA's estimation of recreational costs; therefore, costs are underestimated.

Our Response: Declines in lake levels may affect some water intakes and boat ramps. As discussed in Section 3 of the FEA, impacts may vary as water levels reach boat ramps and docks, but sufficient information on the lake levels at which boat ramps and docks are stranded and recreationists responses to these changes is not available to estimate these potential impacts.

(55) *Comment:* Several stakeholders express concerns that water may not be removed from low value uses first, and that the FEA should provide the institutional mechanisms that will drive this process. As an example, a stakeholder mentions that agricultural uses in other portions of the ACF basin will continue unabated, even during drought.

Our Response: Because of the uncertainty regarding the uses most likely to be affected by changes in water allocation this discussion has been removed from the FEA.

(56) *Comment:* One stakeholder expresses concerns that insufficient attention is paid to the adaptations that are available to minimize withdrawals for agriculture, and that the DEA therefore overestimates impacts.

Our Response: The DEA may overstate agricultural impacts due to insufficient information on the adaptive ability of irrigators. As discussed in the caveats of Section 3 of the FEA, various adaptive management strategies may be available that could reduce estimated economic impacts on agriculture. Specific information on these strategies and their applicability is unavailable.

(57) *Comment:* One commenter indicates that Exhibit 3–16 in the DEA treats expenditures foregone as an element of regional economic loss when, in fact, it is the producer surplus foregone that is the basis of the impact on the region.

Our Response: The DEA uses a software program called IMPLAN to estimate the regional economic effects of reductions in economic activity in agriculture and recreation-related industries associated with seven mussels conservation efforts. As discussed in Section 3 of the FEA, the input to this program is expenditures rather than producer surplus, as the costs to some suppliers are revenues to others further up the supply chain. Depending on the characteristics of the region (i.e., imports versus exports), these costs may therefore also accrue as revenues to the region. Regional and sectoral multipliers in IMPLAN account for this effect.

(58) *Comment:* One commenter indicates that the fixed cost of irrigation equipment should not be included an element of damage; it is a sunk cost and is not imposed by water use restrictions and cannot be avoided in the event of restrictions.

Our Response: It is appropriate to include a portion of fixed costs in the agricultural impact estimates. Unlike variable costs, fixed costs are often unrecoverable. Under these circumstances, they are an element of damage: although fixed costs themselves are not imposed by water use restrictions, the inability to recover these sunk costs of purchasing irrigation equipment is caused by the imposition of these water use restrictions.

(59) *Comment:* One commenter indicates that if voluntary auctions are held where irrigators are paid to temporarily dryland farm certain acres, then the local and regional economic impacts identified in the analysis may be partly or wholly offset.

Our Response: As indicated in Section 3 of the FEA, the FEA makes no assumptions about how the reductions in agricultural water withdrawals will occur, nor who will bear these costs. In other words, the economic analysis only uses the voluntary auctions as evidence that institutional mechanisms exist to provide water for mussels' conservation.

(60) *Comment:* Several commenters indicate that the DEA should assume a more frequent severe drought interval based on the more recent rainfall record.

Our Response: The one in 20-year drought interval is based on information provided by the Georgia State Climatologist for pre-2000 conditions. The frequency of droughts may have increased from this estimate, however, as no study has forecasted drought frequency for future years, the analysis uses the pre-2000 information. If updated frequencies were made available that indicated a shorter drought interval, forecasted impacts in the Lower Flint Basin would increase (i.e., if drought frequency increased from one in 20 years to one in 10 years, impacts would increase roughly by a factor of two).

(61) *Comment:* One commenter indicated that more appropriate data on agricultural acreages and crop yields during dry years are readily available and should be incorporated into the DEA.

Our Response: New information on crop acreages and crop yields has been incorporated into the FEA, increasing the present value of agricultural impacts over 20 years from $2.16 million to $29.0 million (discounted at three percent).

(62) *Comment:* One commenter suggests using gross revenues instead of net revenues for the irrigated versus dryland impacts to agriculture.

Our Response: For individual farmers, the FEA assumes that conversion to dryland farming will reduce revenues, but will also reduce costs. Accordingly, the agricultural subsection of Section 3 in the FEA estimates impacts on a net revenue, rather than gross revenue basis. Later in Section 3, a regional economic impact subsection is presented, where impacts to the region are estimated based on lost gross revenues.

(63) *Comment:* One commenter indicates that a consistent measurement standard should be employed to assess economic impacts, and that the study does not indicate the measurement standard that is being used. Specifically, it is not clear if the DEA is presenting marginal values or average values. The

commenter states that additionally the DEA appears to do an inconsistent job of forecasting future economic conditions. In some cases future demands are established, while in other cases they are ignored.

Our Response: Section 1 of the FEA describes the framework for the analysis including measurement standards. As discussed in Section 1, forecasting is conducted where data are available. In many instances, forecasting was not possible (e.g., forecasting agricultural water demands) given data constraints.

Potential Economic Impacts to Hydropower, Water Supply, and Other Impoundment Projects

(64) *Comment:* Several commenters state that potential impacts to hydropower are understated and should be quantified. Specific concerns relate to the lack of information on the difference in value between peaking and non-peaking power, and that any change in the capability to generate power may result in impacts.

Our Response: Quantification and monetization of the potential impacts to hydropower are not possible absent information on the potential change in operations and associated timing of releases that may result from mussel conservation efforts. Specifically, without information regarding how operations under the Modified IOP for the listed mussels in the Apalachicola River would affect timing of hydropower generation, potential impacts to hydropower generation cannot be quantified. As discussed in Section 4 of the FEA, the value of power fluctuates on an hourly basis while the data available for this analysis describe power production on a monthly basis. If releases for hydropower cannot be made, replacement power must be purchased to meet demand. While all these potential impacts are described qualitatively, the USACE states in its public comment that the allowable hydropower schedule remains unchanged from the existing hydropower operations prior to the Modified IOP. Potential impacts to hydropower are therefore uncertain.

(65) *Comment:* Two commenters state that the DEA inaccurately ascribes value to the hydropower generated at USACE projects from information provided by Southeastern Power Administration (SEPA).

Our Response: Based on follow-up communication with SEPA, these dollar amounts have been removed from the FEA. They represent a composite of various expenses and cost obligations, and are not indicative of the relative importance of the projects. The relative value or revenues associated with individual projects cannot be disaggregated from the full system from which hydropower is marketed.

(66) *Comment:* One commenter states that impacts associated with relicensing the Bartlett's Ferry and other non-Federal FERC-licensed projects on the Chattahoochee River should be included.

Our Response: The Bartlett's Ferry Project is on the Chattahoochee River. Its current FERC license will expire in 2014. The projects for which mussel conservation efforts (surveys and monitoring) associated with FERC relicensing are quantified in Section 4 of the DEA are on the Flint River bordering critical habitat, where listed mussels are present. No information is available that suggests that projects undergoing FERC relicensing on the Chattahoochee River will be required to conduct similar efforts as the river channels with which they are associated are not proposed for critical habitat designation, do not have any known populations of any of the seven mussels, and do not have the capability to affect downstream flow in the manner that the USACE-operated reservoirs do.

(67) *Comment:* One commenter stated that the number and estimated impacts of future smaller water supply projects are incorrectly estimated and inadequately described.

Our Response: The report relies on the best available information to estimate potential impacts associated with seven mussel conservation efforts. In this case, past and current permitting information from the U.S. Army Corps of Engineers, and the Georgia Department of Environmental Protection is combined with cost estimates for water projects in the same geographic area. This represents the best information available at this time. The commenter does not provide improved information.

Potential Water Quality-Related Impacts

(68) *Comment:* One commenter requested that the DEA quantify impacts to water quality management.

Our Response: As discussed in Section 5 of the FEA, agriculture, urban stormwater runoff, forestry, and industrial and municipal point sources may influence water quality in the proposed critical habitat rivers. The economic analysis determined that, overall, these activities are not among the major categories of activities that may be affected by conservation efforts for the seven mussels.

(69) *Comment:* One commenter states that the DEA fails to consider the economic effects of lost commercial navigation.

Our Response: The U.S. Army Corps of Engineers submitted in its public comment that ''the State of Florida has denied Section 401 water quality certification and Coastal Consistency Certification for the Apalachicola River portions of the federal ACF navigation project. The denial contained costly alternative provisions that are not currently funded by Congress, and it has been agreed to defer dredging unless and until additional direction from the U.S. Congress provides necessary authority and funding for the Florida requested changes to the dredged material management plan for the Apalachicola River. We have estimated the additional costs to the navigation project due to the Florida-requested provisions, but these additional costs are unrelated to mussel conservation efforts.''

Section 6 of the FEA acknowledges USACE's comment and that the federal navigation project is still authorized. Given the ongoing issues unrelated to mussels that have precluded navigation activities in the ACF basin, however, the FEA does not quantify impacts of potential changes to navigation. If Congress approves funding for the alternatives in Florida's permit conditions, and if Florida provides a permit to the USACE to continue navigation dredging activities, and if the presence of the seven mussels or their critical habitat then affects dredge material disposal or other navigation activities this report may have underestimated impacts to navigation.

(70) *Comment:* One commenter requested that the DEA quantify impacts to sand and gravel mining.

Our Response: As discussed in Section 6 of the FEA, sand and gravel extraction from riverbeds was once common in the ACF Basin, but ceased several years ago. Permitting authorities have indicated that future operations are unlikely.

Summary of Changes From Proposed Rule

We have reconsidered our proposed critical habitat designation for the seven mussels relative to comments received during the two public review periods and three public hearings, the economic analysis, and new information that has become available since we published the proposed rule on June 6, 2006. Based on information received during the first comment period, we made three changes to the proposed critical habitat designation, which we published for public comment in the June 21, 2007, notice of availability for the draft

economic analysis (72 FR 34215). We now adopt these changes in this final rule as follows:

(1) We enlarge Unit 2 (Chipola River) and Unit 8 (Apalachicola River). In Unit 2, we extend the upstream boundary of Big Creek by 5.1 km (3.2 mi), and add the downstream-most portion of Cowarts Creek (33.5 km (20.8 mi)). In Unit 8, we add the downstream-most portions of three tributaries to the Apalachicola River: River Styx, Kennedy Slough, and Kennedy Creek.

(2) We add the fat threeridge to the list of species associated with Unit 7 (Lower Flint River).

(3) We correct an error by deleting Clayton County, Georgia, from the list counties in which the proposed critical habitat units occur.

We make no further changes to the geographic description of critical habitat in this final rule. Otherwise, this final rule differs from the proposed rule by minor editorial changes, clarifying revisions to one of the PCEs, and clarifying revisions to the discussions that support the PCEs. Based on the comments and recommendations we received, we have changed the following:

(1) We revise the substrate quality PCE to clarify the role of fine sediments. While excessive amounts of silts and clays accumulating in mussel habitat via channel instability and/or erosive land uses are harmful to the seven mussels, a moderate amount of silt and clay is normal and beneficial throughout most of the range of the seven mussels. The substrate quality PCE was proposed as ''A predominantly sand, gravel, and/or cobble stream substrate'', and is now stated as: ''A predominantly sand, gravel, and/or cobble stream substrate with low to moderate amounts of silt and clay.''

(2) To avoid implying that little is known about the tolerances of mussels relative to all physical and chemical water quality parameters, we revised the statement: ''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;'' to read instead ''The temperature, dissolved oxygen (DO), pH, and conductivity ranges that define suitable habitat conditions for the seven mussels have not been specifically investigated.''

(3) We revise the discussion of the flowing water PCE to provide more information about site-specific flow regime features that are relevant to the seven mussels. Specifically, we have added a listing of the flow regime features that are included in the Service-USEPA instream flow guidelines.

(4) We correct our characterization of three congeners of the shinyrayed pocketbook that were reassigned from the genus *Lampsilis* to the genus *Hamiota* as species that are not protected under the Act. Two of three species are listed under the Act.

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 that are necessary to bring any endangered species or threatened species to the point at which the measures provided under the Act are no longer necessary.

Critical habitat receives protection under section 7(a)(2) 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 of the Act requires consultation on Federal actions that may affect critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Such designation does not allow the government or public to access private lands. Such designation does not require implementation of restoration, recovery, or enhancement measures by the landowner.

To be included in a critical habitat designation, the habitat within the geographical area occupied by the species at the time it was listed must contain 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 (i.e., areas on which are found the primary constituent elements, as defined at 50 CFR 424.12(b)).

Occupied habitat that contains the features essential to the conservation of the species meets the definition of critical habitat only if those features may require special management considerations or protection.

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

Section 4 of the Act requires that we designate critical habitat on the basis of the best scientific and commercial data available. Further, 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 are based on 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 information developed during the listing process for the species. Additional information sources may include the recovery plan for the species, articles in peer-reviewed journals, conservation plans developed by States and counties, scientific status surveys and studies, biological assessments, or other unpublished materials and expert opinion or personal knowledge. 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.

Habitat is often dynamic, and species may move from one area to another over time. Furthermore, we recognize that designation of critical habitat may not include all of the habitat areas that we may eventually determine, based on scientific data not now available to the Service, are necessary for the recovery of the species. For these reasons, critical habitat designations do not signal that habitat outside the designation is unimportant or may not be required for recovery of the species.

Areas that support populations of the seven mussels, 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 scientific information at the time of the action. Section 7(a)(1) directs all other Federal agencies to utilize their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation of listed species. 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, as any new information available to these planning efforts calls for a different outcome.

Primary Constituent Elements

In accordance with section 3(5)(A)(i) of the Act and the regulations at 50 CFR 424.12, in determining which areas occupied at the time of listing to designate as critical habitat, we consider those physical and biological features that are essential to the conservation of the species, and within areas occupied by the species at the time of listing, that may require special management considerations or protection. The physical and biological features essential to the conservation of the species are the primary constituent elements (PCEs) laid out in an appropriate quantity and spatial arrangement for recovery. These include, but are not limited to:

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

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

(3) Cover or shelter;

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

(5) Habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

The specific PCEs required for the seven mussels are derived from the biological needs of the seven mussels as described in the final listing rule (63 FR 12664, March 16, 1998), the proposed critical habitat rule (71 FR 32746, June 6, 2006), and information contained in this final rule.

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.

Based on our current knowledge of the life history, biology, and ecology of the seven mussels, and the habitat requirements for sustaining their essential life history functions, we have determined that the seven mussels require the PCEs described below.

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

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 dissolved oxygen 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 bank-side vegetation, which reduces diversity and abundance of fish species. Fewer fish means lower probability of mussel recruitment. 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.

PCE 2. A predominantly sand, gravel, and/or cobble stream substrate with low to moderate amounts of silt and clay.

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 are found in a variety of substrates, ranging from pockets of sand on bedrock to sandy mud, but only rarely 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). Although excessive amounts of fine sediments may adversely affect the seven mussels, some amount of silt and clay is a normal component of the substrate at most locations at which they are found. In stream beds composed mostly of sandy materials, moderate amounts of silt and

clay increase substrate cohesiveness and local stability.

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 a variety of substrates ranging from pockets of sand on bedrock to sandy mud, but only rarely in substrates comprised of more than 50 percent by dry weight silt and clay materials, and because 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.

PCE 3. Permanently flowing water.

The species that are the subject of this 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. 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 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). These measures include the following: monthly 1-day minima; annual low-flow duration; monthly average flow; annual 1-day maximum; annual high-flow duration. Thresholds for these measures 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. It is not practical or useful to compute the flow guidelines for the entire region that this designation spans, because the guidelines were designed as a tool for site- and project-specific analysis. Further, the guidelines do not establish a general standard or ''bottom line'' for flow regime features that are essential to the conservation of listed species. Recognizing the many complexities involved in quantifying essential flow regime features for the seven mussels,

we have adopted a qualitative expression that applies throughout the range of the seven mussels and is clearly necessary for their conservation: ''permanently flowing water.''

PCE 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 (CWA) (33 U.S.C. 1251–1387).

The temperature, dissolved oxygen (DO), pH, and conductivity ranges 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 a stream. Quantifying water quality tolerances for the seven mussels is further complicated by their dependency 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 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 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.

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

Most unionid mussels, including the seven species, parasitize fish during the larval life stage, 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 fish density 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 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.

This designation is designed for the conservation of PCEs necessary to support the life history functions of the species and the areas containing these PCEs. We propose units for designation based on sufficient PCEs being present to support at least one of the species' life history functions. Some units contain all of these PCEs and support multiple life processes, while some units contain only a portion of these PCEs, those necessary to support the species' particular use of that habitat.

Special Management Considerations or Protections

When designating critical habitat, we assess whether the occupied areas contain the features essential to the conservation of the species that may require special management considerations or protections. Activities in or adjacent to each of the critical habitat units described in this 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 affect critical habitat. We find that the features essential to each of the seven mussel species contained within the areas of this 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 units, but is greatest in units 5, 6, 7, 8, and 10, which are downstream of the major mainstem dams or are 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'' in the proposed rule published in the **Federal Register** on June 6, 2006 (71 FR 32746)). 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.

Criteria Used To Identify Critical Habitat

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 features that are 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, and 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 final 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.

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'' in the proposed rule published in the **Federal Register** on June 6, 2006, (71 FR 32746) , 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 are not designating 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 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, a unit encapsulates 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 designating 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 ''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.

When determining critical habitat boundaries, we made every effort to avoid including within the boundaries of the map contained within this final rule developed areas such as buildings, paved areas, and other structures that lack PCEs for the seven mussels. The scale of the maps prepared under the parameters for publication within the *Code of Federal Regulations* may not reflect the exclusion of such developed areas. Any such structures and the land under them inadvertently left inside critical habitat boundaries shown on the maps of this final rule have been excluded by text in the rule and are not designated as critical habitat. Therefore, Federal actions limited to these areas would not trigger section 7 consultation, unless they affect the species or PCEs in adjacent critical habitat.

We are designating 11 critical habitat units in areas that were occupied at the time of listing and contain sufficient PCEs to support life history functions essential for the conservation of the species, which may require special management considerations or protection. Each unit is a collection of stream segments that flow unimpeded by fish passage barriers into a common reservoir or estuary. One or more of the seven listed species persist at locations that are distributed across the full breadth of each unit, including one or more locations in each stream segment listed in the unit descriptions that follow. Each of the 11 units designated as critical habitat contain all of the PCEs, and each stream segment listed in the unit descriptions contains one or more of the PCEs. Most segments contain all PCEs and support multiple life processes. Some segments may contain only a portion of the PCEs necessary to support long-term use of that habitat, due to the dynamic nature of the riverine environment.

A brief discussion of each area designated as critical habitat is provided in the unit descriptions below. Additional detailed documentation concerning the essential nature of these areas is contained in our supporting record for this rulemaking.

Critical Habitat Designation

We are designating 11 groups of river and stream segments (units) as critical habitat for the fat threeridge, shinyrayed pocketbook, Gulf moccasinshell, Ochlockonee moccasinshell, oval pigtoe, Chipola slabshell, and purple bankclimber. 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. Each unit is designated only for those species that currently occupy it.

The critical habitat units described below constitute our best assessment currently of areas that meet the definition of critical habitat for the species. 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) designated is approximately 1,908.5 km (1,185.9 mi). Table 1 shows the approximate length of rivers and streams designated as occupied critical habitat for each of the seven mussels in the 11 units.

TABLE 1.—LENGTH OF CRITICAL HABITAT UNITS DESIGNATED FOR THE FAT THREERIDGE, SHINYRAYED POCKETBOOK, GULF MOCCASINSHELL, OCHLOCKONEE MOCCASINSHELL, AND OVAL PIGTOE, CHIPOLA SLABSHELL, AND PURPLE BANKCLIMBER

Species, critical habitat unit, and state(s)	Length	
	Kilometers	Miles
Fat threeridge		
2. Chipola River, AL, FL	228.7	142.1
7. Lower Flint River, GA	396.7	246.5
8. Apalachicola River, FL	161.2	100.2
Total	786.6	488.8
Shinyrayed pocketbook		
2. Chipola River, AL, FL	228.7	142.1
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	1557.4	967.7
Gulf moccasinshell		
1. Econfina Creek, FL	31.4	19.5
2. Chipola River, AL, FL	228.7	142.1
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
Total	1377.3	855.8
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	228.7	142.1
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	1637.7	1017.6
Chipola slabshell		
2. Chipola River, AL, FL	228.7	142.1
Total	228.7	142.1
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	161.2	100.2
9. Upper Ochlockonee River, FL, GA	177.3	110.2
10. Lower Ochlockonee River, FL	75.4	46.9
Total	1493.3	928
Total Designated for All 11 Units (All Species)	1,908.50	1,185.90

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 rule. We believe that most, if not all, lands beneath the navigable waters included in this 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 rule are in private ownership. Table 2 lists the parcels of publicly owned lands within or adjacent to each designated critical habitat unit. Units not listed do not contain publicly owned lands.

TABLE 2.—PUBLIC LANDS WITHIN OR ADJACENT TO DESIGNATED 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 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.

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 designated 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). PCEs in Unit 1 are vulnerable to impacts from sedimentation, urbanization, and pollution, as described under ''Special Management Considerations or Protections.''

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 designated 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); Big Creek, from the Alabama-Florida State line upstream 13.0 river km (8.1 river mi) to Limestone Creek, in Houston County, Alabama; and Cowarts Creek from the Chipola River in Jackson County, Florida, upstream 33.5 river km (20.8 river mi) to the Edgar Smith Road bridge, 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). PCEs in Unit 2 are vulnerable to impacts from sedimentation, urbanization, and pollution, as described under ''Special Management Considerations or Protections.''

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). PCEs in Unit 3 are vulnerable to impacts from sedimentation, urbanization, and pollution, as described under ''Special Management Considerations or Protections.''

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 designated 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). PCEs in Unit 4 are vulnerable to impacts from sedimentation and pollution, as described under ''Special Management Considerations or Protections.''

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 designated 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). PCEs in Unit 5 are vulnerable to impacts from sedimentation, urbanization, hydrologic alteration, and pollution, as described under ''Special Management Considerations or Protections.''

Unit 5 is divided into two maps in the Regulation Promulgation section of this 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). PCEs in Unit 6 are vulnerable to impacts from sedimentation, urbanization, hydrologic alteration, and pollution, as described under ''Special Management Considerations or Protections.''

Unit 6 is divided into two maps in the Regulation Promulgation section of this 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). PCEs in Unit 7 are vulnerable to impacts from sedimentation, urbanization, hydrologic alteration, and pollution, as described under ''Special Management Considerations or Protections.''

Unit 7 is divided into two maps in the Regulation Promulgation section of this 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; two distributaries (channels flowing out of the main stem), and three tributaries, 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 its 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. The downstream extent of each tributary within the unit is its confluence (mouth) with the main channel of the Apalachicola River, and its upstream extent is the landmark listed. The three tributaries of the Apalachicola River within the unit are: River Styx from the mouth of Swift Slough in Liberty County, Florida, downstream 3.8 km (2.4 mi) to its mouth; Kennedy Slough from −85.07 longitude, 30.01 latitude in Liberty County, Florida, downstream 0.9 km (0.5 mi) to its confluence with Kennedy Creek; and Kennedy Creek from Brushy Creek Feeder (−85.06 longitude, 30.01 latitude) in Liberty County, Florida, downstream 1.1 km (0.7 mi) to its mouth.

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). PCEs in Unit 8 are vulnerable to impacts from sedimentation, hydrologic alteration, and pollution, as described under ''Special Management Considerations or Protections.''

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). PCEs in Unit 9 are vulnerable to impacts from sedimentation and pollution, as described under ''Special Management Considerations or Protections.''

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). PCEs in Unit 10 are vulnerable to impacts from sedimentation, urbanization, hydrologic alteration, and pollution, as described under ''Special Management Considerations or Protections.''

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 designated 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 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). PCEs in Unit 11 are vulnerable to impacts from sedimentation and pollution, as described under ''Special Management Considerations or Protections.''

Section 7 Consultation

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

If a species is listed or critical habitat is designated, section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency (action agency) must enter into consultation with us. As a result of this consultation, we document compliance with the requirements of section 7(a)(2) through our issuance of:

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

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

When we issue a biological opinion concluding that a project is likely to jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat, we also provide reasonable and prudent alternatives to the project, if any are identifiable. ''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,
- Can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction,
- Are economically and technologically feasible, and
- Would, in the Director's opinion, avoid jeopardizing the continued existence of the listed species or destroying or adversely modifying critical habitat.

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

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

Application of the ''Adverse Modification'' Standard

The key factor related to the adverse modification determination is whether, with implementation of the proposed Federal action, the affected critical habitat would continue to serve its intended conservation role for the species, or would retain its current ability for the PCEs to be functionally established. Activities that may destroy or adversely modify critical habitat are those that alter the PCEs to an extent that appreciably reduces the conservation value of critical habitat for the seven mussels. 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, when carried out, funded, or authorized by a Federal agency, may affect critical habitat and, therefore, should 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 designated 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).

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

Section 4(b)(2) of the Act states that critical habitat shall be designated, and revised, on the basis of the best available scientific data after taking into consideration the economic impact, national security impact, and any other relevant impact, of specifying any particular area as critical habitat. The Secretary may exclude an area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific data available, that the failure to designate such area as critical habitat will result in the extinction of the species. In making that determination, the Secretary is afforded broad discretion, and the Congressional record is clear that, in making a determination under the section, the Secretary has discretion as to which factors and how much weight will be given to any factor.
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Economic Impacts

Economic analyses typically measure impacts against a baseline, which is normally described as the way the world would look absent the proposed action. This is often referred to as the ''incremental'' approach. In 2001, the U.S. Tenth Circuit Court of Appeals found that the incremental approach provided ''meaningless'' results and instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat, regardless of whether those impacts are attributable coextensively to other causes (*New Mexico Cattle Growers Assn* v. *U.S.F.W.S.*, 248 F.3d 1277 (10th Cir. 2001)). However, since that decision, courts in several other cases have held or implied that an incremental analysis is proper (see *Cape Hatteras Access Preservation Alliance* v. *Department of Interior*, 344 F. Supp. 2d 108 (D.D.C.); *CBD* v. *BLM,* 422 F. Supp/ .2d 1115 (N.D. Cal. 2006).

Accordingly, we have reevaluated the baseline used for critical habitat economic analyses. The economic analysis should use a traditional regulatory analysis approach and examine the economic impact of the regulatory change being considered. However, because there is interest by the courts and the public in seeing the total costs of regulation, the analyses should quantify the existing regulatory baseline. When quantifying the baseline, the analyses should look back to the time of listing.

When estimating the incremental impacts of the critical habitat designation, the Service must consider that most courts have agreed with the *New Mexico Cattle Growers* court when it determined that the Service cannot simply equate adverse modification standard and the jeopardy standard and conclude that there are no economic costs. The *New Mexico Cattle Growers* court said ''Congress clearly intended that economic factors were to be considered.'' Therefore, when conducting this analysis, it is important to attempt to distinguish between the regulation that would exist prior to the designation of critical habitat, under the jeopardy standard, and under Sections 9 and 10 of the Act, and the additional regulation that would exist with designation of critical habitat.

Following the publication of the proposed critical habitat designation, we conducted an economic analysis to estimate the potential economic effect of the designation. This draft analysis was

based on the coextensive approach only and estimated the potential future impacts associated with conservation efforts for the seven mussels in areas proposed for critical habitat designation. The draft analysis was made available for public review on June 21, 2007 (72 FR 34215). We accepted comments on the draft analysis until August 6, 2007. The final economic analysis added the incremental approach, which can be found in Appendix B of the report.

The primary purpose of the economic analysis is to estimate the potential economic impacts associated with the designation of critical habitat for the seven mussels. This information is intended to assist the Secretary in making decisions about whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation. This economic analysis considers the economic efficiency effects that may result from the designation, including habitat protections that may be coextensive with the listing of the species and the incremental impacts of the critical habitat designation itself. It also addresses distribution of impacts, including an assessment of the potential effects on small entities and the energy industry. This information can be used by the Secretary to assess whether the effects of the designation might unduly burden a particular group or economic sector. We based our decision on whether to exclude any areas due to economic reasons on the incremental impacts in the final economic analysis.

The final economic analysis evaluated the potential future effects associated with the listing of the seven mussels, as well as any potential effect of the designation of critical habitat above and beyond those regulatory and economic impacts associated with the listing. To quantify the proportion of total potential economic impacts attributable to the critical habitat designation, the analysis evaluated a ''without critical habitat'' baseline and compared it to a ''with critical habitat'' scenario. The ''without critical habitat'' baseline represented the current and expected economic activity under all modifications prior to the critical habitat designation, including protections afforded the species under Federal and State laws. The difference between the two scenarios measured the net change in economic activity attributable to the designation of critical habitat.

The economic analysis estimates total potential future impacts associated with conservation efforts for the seven mussels in areas designated to be $83.1 million to $135.0 million over the next 20 years (undiscounted). The present value of these impacts is $62.3 million to $101.0 million, using a discount rate of three percent, or $45.0 million to $71.7 million, using a discount rate of seven percent. The annualized value of these impacts is $4.13 million to $6.70 million, using a discount rate of three percent, or $4.13 million to $6.60 million, using a discount rate of seven percent. All of these impacts are baseline impacts and are not expected to be affected by critical habitat designation.

The economic analysis further refines these numbers by estimating the incremental impacts of the critical habitat designation. The incremental impacts are forecast to be $501,000 (discounted at three percent) over 20 years. These incremental impacts are of additional administrative effort in considering adverse modification in section 7 consultation.

Because our economic analysis did not identify any disproportionate costs resulting from the designation, we did not consider excluding any areas from this designation of critical habitat based on economic impacts.

A copy of the final economic analysis with supporting documents may be obtained by contacting U.S. Fish and Wildlife Service, Branch of Endangered Species (see **FOR FURTHER INFORMATION CONTACT**) or by downloading from the Internet at *http://www.fws.gov/panamacity/.*

Other Relevant Impacts

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

In this instance, we have determined that the lands within the designation of critical habitat for the seven mussels are not owned or managed by the Department of Defense, there are currently no habitat conservation plans for the seven mussels, and the designation does not include any Tribal lands or trust resources. We did not identify any social impacts that might occur based on designation. Since no ''other relevant factors'' apply to this designation, we are not considering exclusions from this final designation based on the non-economic impacts.

Based on the above analysis (i.e., of the economic and other relevant impacts), the Service is not excluding any areas from critical habitat designation under section 4(b)(2) of the Act.

Required Determinations

Regulatory Planning and Review

In accordance with Executive Order 12866, this document is a significant rule because it may raise legal and policy issues. Based on our economic analysis, the estimate of total potential future costs associated with conservation efforts for the seven mussels in areas designated is $83.1 million to 135.0 million over the next 20 years (undiscounted). The present value of these impacts is $62.3 million to 101.0 million, using a discounted rate of three percent, or $45.0 million to 71.7 million, using a discount rate of seven percent. The annualized value of these impacts is $4.13 million to $6.70 million, using a discount rate of three percent, or $4.13 million to 6.60 million, using a discount rate of seven percent. Therefore, we do not believe that the designation of critical habitat for the seven mussels would result in an annual effect on the economy of $100 million or more or affect the economy in a material way. Due to the timeline for publication in the **Federal Register**, the Office of Management and Budget (OMB) has not formally reviewed the rule or accompanying economic analysis.

Further, Executive Order 12866 directs Federal Agencies promulgating regulations to evaluate regulatory alternatives (Office of Management and Budget, Circular A–4, September 17, 2003). Pursuant to Circular A–4, once it has been determined that the Federal regulatory action is appropriate, the agency will need to consider alternative regulatory approaches. Because the determination of critical habitat is a statutory requirement under the ACT, we must then evaluate alternative regulatory approaches, where feasible, when promulgating a designation of critical habitat.

In developing our designations of critical habitat, we consider economic impacts, impacts to national security, and other relevant impacts pursuant to section 4(b)(2) of the Act. Based on the

discretion allowable under this provision, we may exclude any particular area from the designation of critical habitat providing that the benefits of such exclusion outweigh the benefits of specifying the area as critical habitat and that such exclusion would not result in the extinction of the species. As such, we believe that the evaluation of the inclusion or exclusion of particular areas, or combination thereof, in a designation constitutes our regulatory alternative analysis.

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

Under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect 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 an agency certifies the rule will not have a significant economic impact on a substantial number of small entities. The SBREFA amended the RFA to require Federal agencies to provide a statement of factual basis for certifying that the rule will not have a significant economic impact on a substantial number of small entities.

Small entities include small organizations, such as independent nonprofit organizations; small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents; as well as small businesses. Small businesses include manufacturing and mining concerns with fewer than 500 employees, wholesale trade entities with fewer than 100 employees, retail and service businesses with less than $5 million in annual sales, general and heavy construction businesses with less than $27.5 million in annual business, special trade contractors doing less than $11.5 million in annual business, and agricultural businesses with annual sales less than $750,000. To determine if potential economic impacts to these small entities are significant, we consider the types of activities that might trigger regulatory impacts under this rule, as well as the types of project modifications that may result. In general, the term ''significant economic impact'' is meant to apply to a typical small business firm's business operations.

To determine if the rule could significantly affect a substantial number of small entities, we consider the number of small entities affected within particular types of economic activities (such as housing development, grazing, oil and gas production, timber harvesting). We apply the ''substantial number'' test individually to each industry to determine if certification is appropriate. However, the SBREFA does not explicitly define ''substantial number'' or ''significant economic impact.'' Consequently, to assess whether a ''substantial number'' of small entities is affected by this designation, this analysis considers the relative number of small entities likely to be impacted in an area. In some circumstances, especially with critical habitat designations of limited extent, we may aggregate across all industries and consider whether the total number of small entities affected is substantial. In estimating the number of small entities potentially affected, we also consider whether their activities have any Federal involvement.

Designation of critical habitat only affects activities conducted, funded, or permitted by Federal agencies. Some kinds of activities are unlikely to have any Federal involvement and so will not be affected by critical habitat designation. In areas where the species is present, Federal agencies already are required to consult with us under section 7 of the Act on activities they fund, permit, or implement that may affect the seven mussels. Federal agencies also must consult with us if their activities may affect critical habitat. Designation of critical habitat, therefore, could result in an additional economic impact on small entities due to the requirement to reinitiate consultation for ongoing Federal activities.

We conducted a Final Regulatory Impact Assessment for this rule, and our FRIA concludes that, of the land use activities considered in sections 3 to 6 of this analysis, incremental impacts of critical habitat designation to the following activities may be borne by small entities:

- Water management; and
- Deadhead logging.

Water management effects may occur to one hydropower operation, and result in costs of approximately $1000 for the additional burden of consultation that considers critical habitat. Deadhead logging impacts may affect 10 businesses, for an estimated impact of $3800 per business. We do not consider these effects to be substantial.

In summary, we have considered whether this would result in a significant economic effect on a substantial number of small entities. We have determined, for the above reasons and based on currently available information, that it will not affect a substantial number of small entities.

Small Business Regulatory Enforcement Fairness Act (5 U.S.C. 801 et seq.)

Under SBREFA, this rule is not a major rule. Our detailed assessment of the economic effects of this designation is described in the economic analysis. Based on the effects identified in the economic analysis, we believe that this rule will not have an annual effect on the economy of $100 million or more, will not cause a major increase in costs or prices for consumers, and will not have significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of U.S.-based enterprises to compete with foreign-based enterprises. Refer to the final economic analysis for a discussion of the effects of this determination.

Executive Order 13211

On May 18, 2001, the President issued Executive Order 13211 (Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use) 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 final rule to designate critical habitat for the seven mussels 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 *et seq.*), we make 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 who receive Federal funding, assistance, permits or 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 onto State governments.

(b) We do not believe that this rule will significantly or uniquely affect small governments because it will not produce a Federal mandate of $100 million or greater in any year; that is, it is not a ''significant regulatory action'' under the Unfunded Mandates Reform Act. The designation of critical habitat imposes no obligations on State or local governments. As such, a Small Government Agency Plan is not required.

Takings

In accordance with Executive Order 12630 (''Government Actions and Interference with Constitutionally Protected Private Property Rights''), we have analyzed the potential takings implications of designating 1,908.5 river km (1,185.9 river mi) in portions of Alabama, Florida, and Georgia as critical habitat for the seven mussels in a takings implications assessment. The takings implications assessment concludes that this final designation of critical habitat does not pose significant takings implications for lands within or affected by the designation.

Federalism

In accordance with Executive Order 13132 (Federalism), the rule does not have significant Federalism effects. A Federalism assessment is not required. In keeping with the Department of the Interior and Department of Commerce policy, we requested information from, and coordinated development of, this final 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 may impose additional regulatory restrictions to those currently in place and, therefore, may have some incremental impact on State and local governments and their activities. The designation also may have some benefit to these governments in that the areas that contain the features essential to the conservation of the species are more clearly defined, and the PCEs of the habitat necessary to the conservation of the species are specifically identified. While making this definition and identification does not alter where and what federally sponsored activities may occur, it may assist these local governments in long-range planning (rather than waiting for case-by-case section 7 consultations to occur).

Civil Justice Reform

In accordance with Executive Order 12988 (Civil Justice Reform), 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 are designating critical habitat in accordance with the provisions of the Endangered Species Act. This final rule uses standard property descriptions and identifies the PCEs 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 (NEPA) (42 U.S.C. 4321 et. seq.)

It is our position that, outside the Jurisdiction of the Tenth Federal Circuit, we do not need to prepare environmental analyses as defined by 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 516 U.S. 1042 (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. In accordance with Secretarial Order 3206 of June 5, 1997, ''American Indian Tribal Rights, Federal—Tribal Trust Responsibilities, and the Endangered Species Act, we readily acknowledge our responsibilities to work directly with tribes in developing programs for healthy ecosystems, to acknowledge that tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to tribes. We have determined that there are no Tribal lands that were occupied by the seven mussels at the time of listing containing the features essential for their conservation, and no Tribal lands that are unoccupied by the seven mussels but are essential for their conservation. 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 Ecological Services Office (see **ADDRESSES**).

Author(s)

The primary author of this package is staff of the Panama City Ecological Services Office.

List of Subjects in 50 CFR Part 17

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

Regulation Promulgation

■ Accordingly, we 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),'' 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
*	*	*	*	*	*	*	*
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, 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 a consistent aggrading or degrading bed elevation);

(ii) A predominantly sand, gravel, and/or cobble stream substrate with low to moderate amounts of silt and clay;

(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

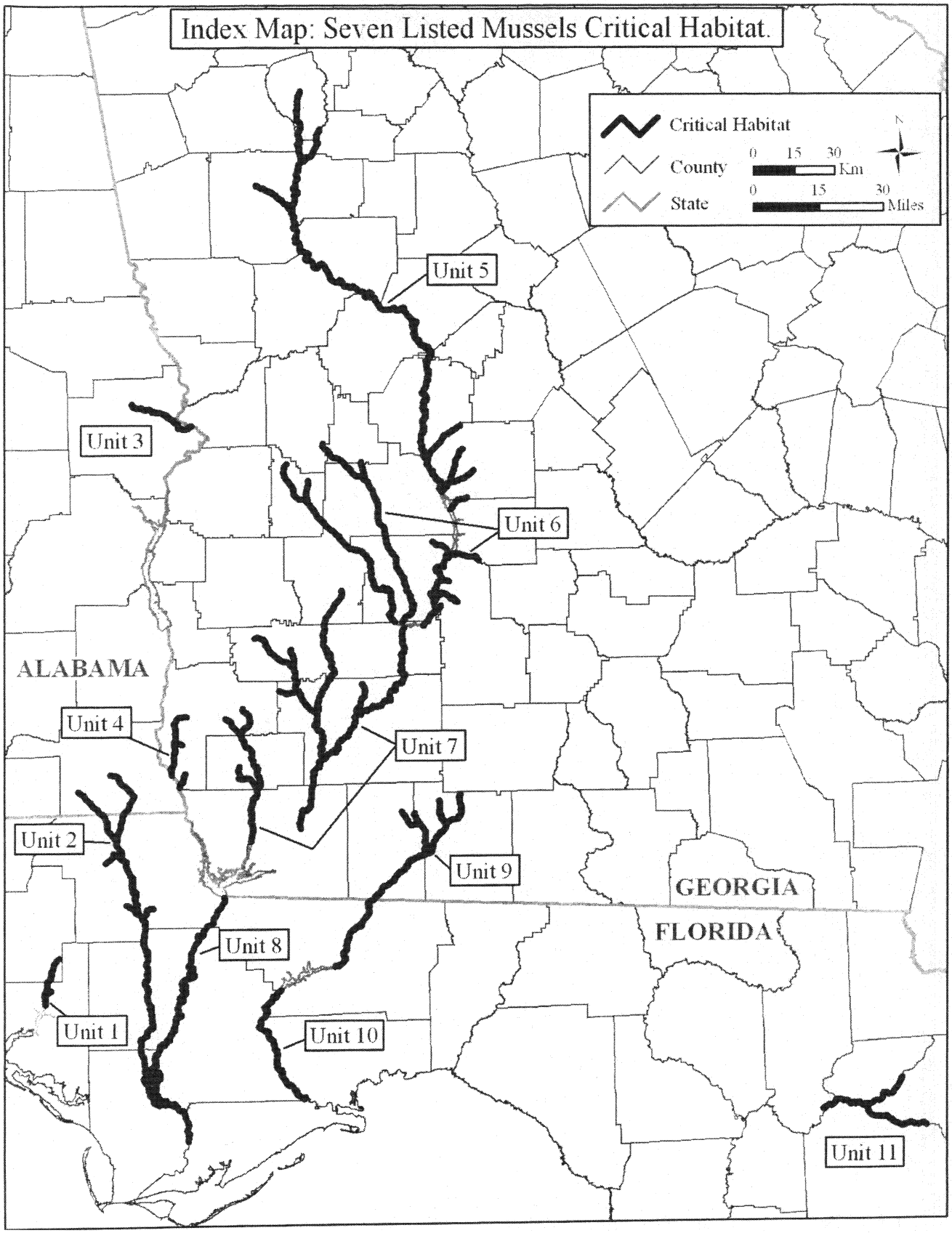
(v) Fish hosts (such as largemouth bass, sailfin shiner, brown darter) that support the larval life stages of the seven mussels.

(3) Critical habitat does not include manmade structures (such as buildings, aqueducts, airports, roads, and other paved areas) and the land on which they are located existing within the legal boundaries 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 of critical habitat units in the States of Alabama, Florida, and Georgia for the seven mussels follows:

BILLING CODE 4310–55–P


Index Map: Seven Listed Mussels Critical Habitat.
Critical Habitat
County
State
0 15 30 Km
0 15 30 Miles
N
Unit 1
Unit 2
Unit 3
Unit 4
Unit 5
Unit 6
Unit 7
Unit 8
Unit 9
Unit 10
Unit 11
ALABAMA
GEORGIA
FLORIDA

(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).

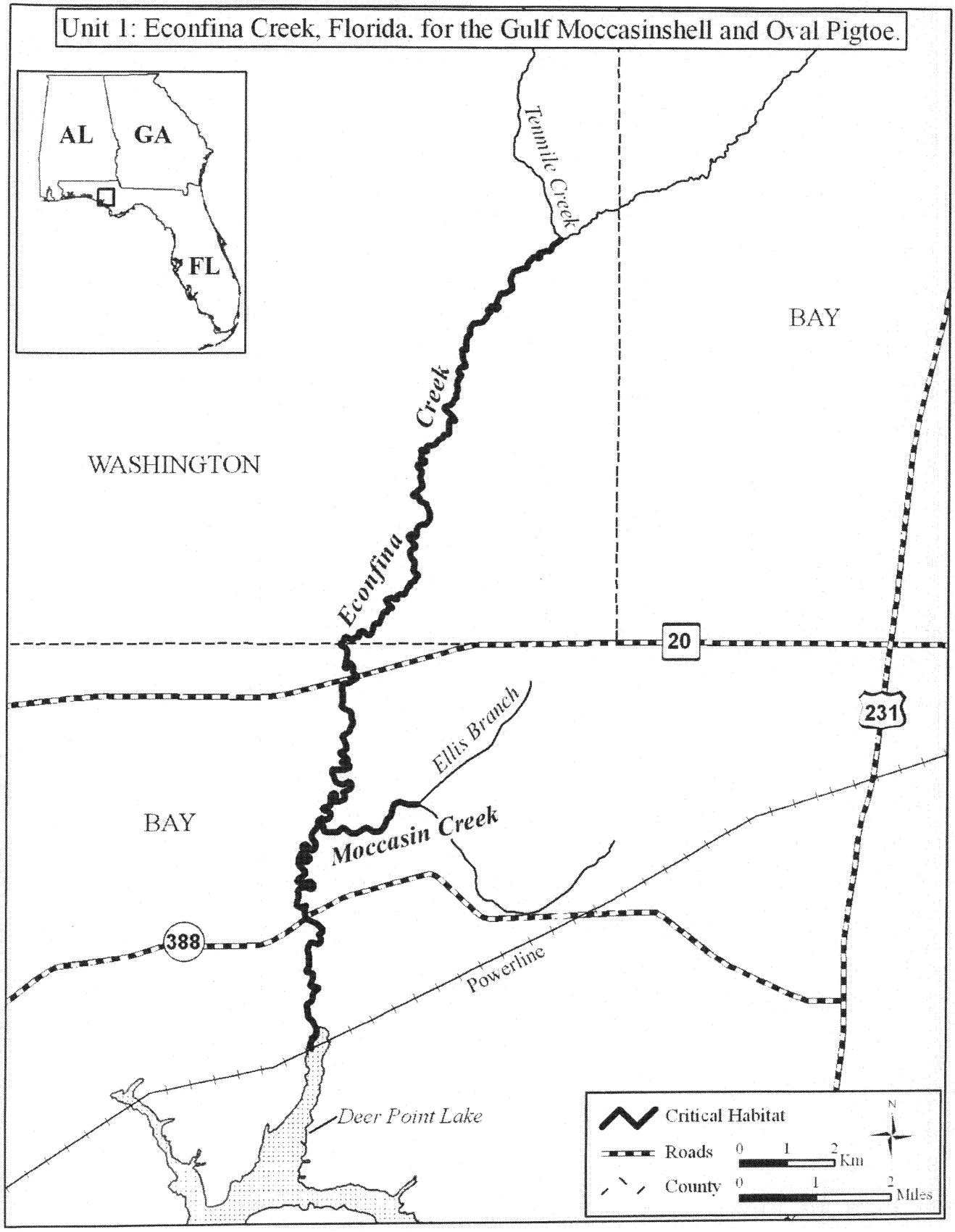
Species	Critical habitat units	States
Purple bankclimber (*Elliptoideus sloatianus*)	Units 5, 6, 7, 8, 9, 10	AL, FL, GA
Gulf moccasinshell (*Medionidus penicillatus*)	Units 1, 2, 4, 5, 6, 7	AL, FL, GA
Ochlockonee moccasinshell (*Medionidus simpsonianus*)	Unit 9	FL, GA
Oval pigtoe (*Pleurobema pyriforme*)	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, 7, 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 follows:

BILLING CODE 4310–55–P



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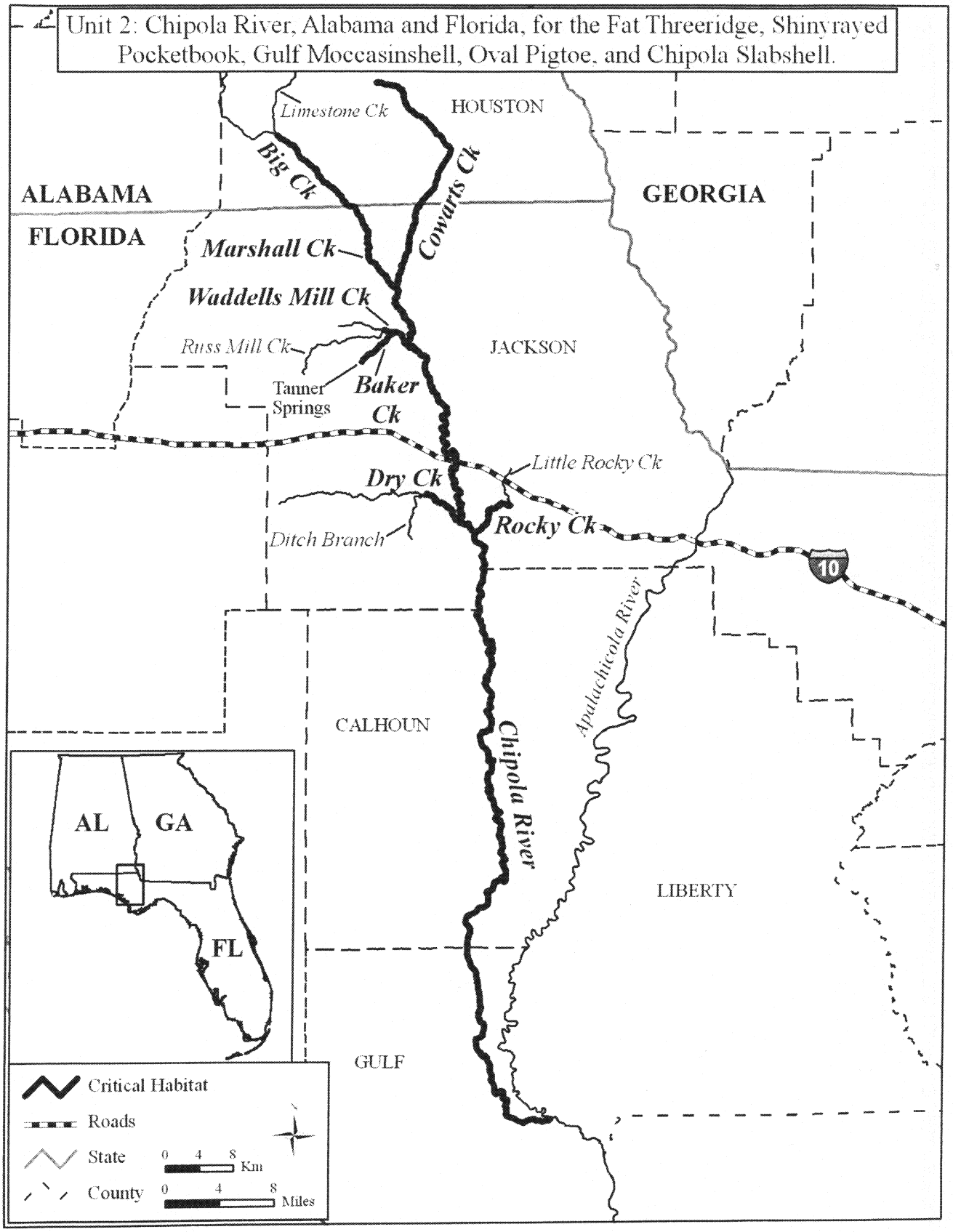
(8) Unit 2. Chipola River and Dry, Rocky, Waddells Mill, Baker, Marshall, Big, and Cowarts Creeks in Houston County, Alabama, and in Calhoun, Gulf, and Jackson counties, Florida. This is a critical habitat unit for the fat threeridge, shinyrayed pocketbook, Gulf moccasinshell, oval pigtoe, and Chipola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

(i) *General Description:* Unit 2 includes the main stem of the Chipola River and seven of its tributaries, encompassing a total stream length of 228.7 km (142.1 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 river km (90.0 river 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 river km (4.7 river mi) to Ditch Branch (−85.24 longitude, 30.69 latitude), Jackson County, Florida; Rocky Creek from the Chipola River upstream 7.1 river km (4.4 river mi) to Little Rocky Creek (−85.13 longitude, 30.68 latitude), Jackson County, Florida; Waddells Mill Creek from the Chipola River upstream 3.7 river km (2.3 river mi) to Russ Mill Creek (−85.29 longitude, 30.87 latitude), Jackson County, Florida; Baker Creek from Waddells Mill Creek upstream 5.3 river km (3.3 river mi) to Tanner Springs (−85.32 longitude, 30.83 latitude), Jackson County, Florida; Marshall Creek from the Chipola River upstream 13.7 river km (8.5 river mi) to the Alabama–Florida State line (−85.33 longitude, 31.00 latitude), Jackson County, Florida; Cowarts Creek from the Chipola River in Jackson County, Florida, upstream 33.5 river km (20.8 river mi) to the Edgar Smith Road bridge (−85.29 longitude, 31.13 latitude), Houston County, Alabama; and Big Creek from the Alabama–Florida State line upstream 13.0 river km (8.1 river mi) to Limestone Creek (−85.42 longitude, 31.08 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 follows:

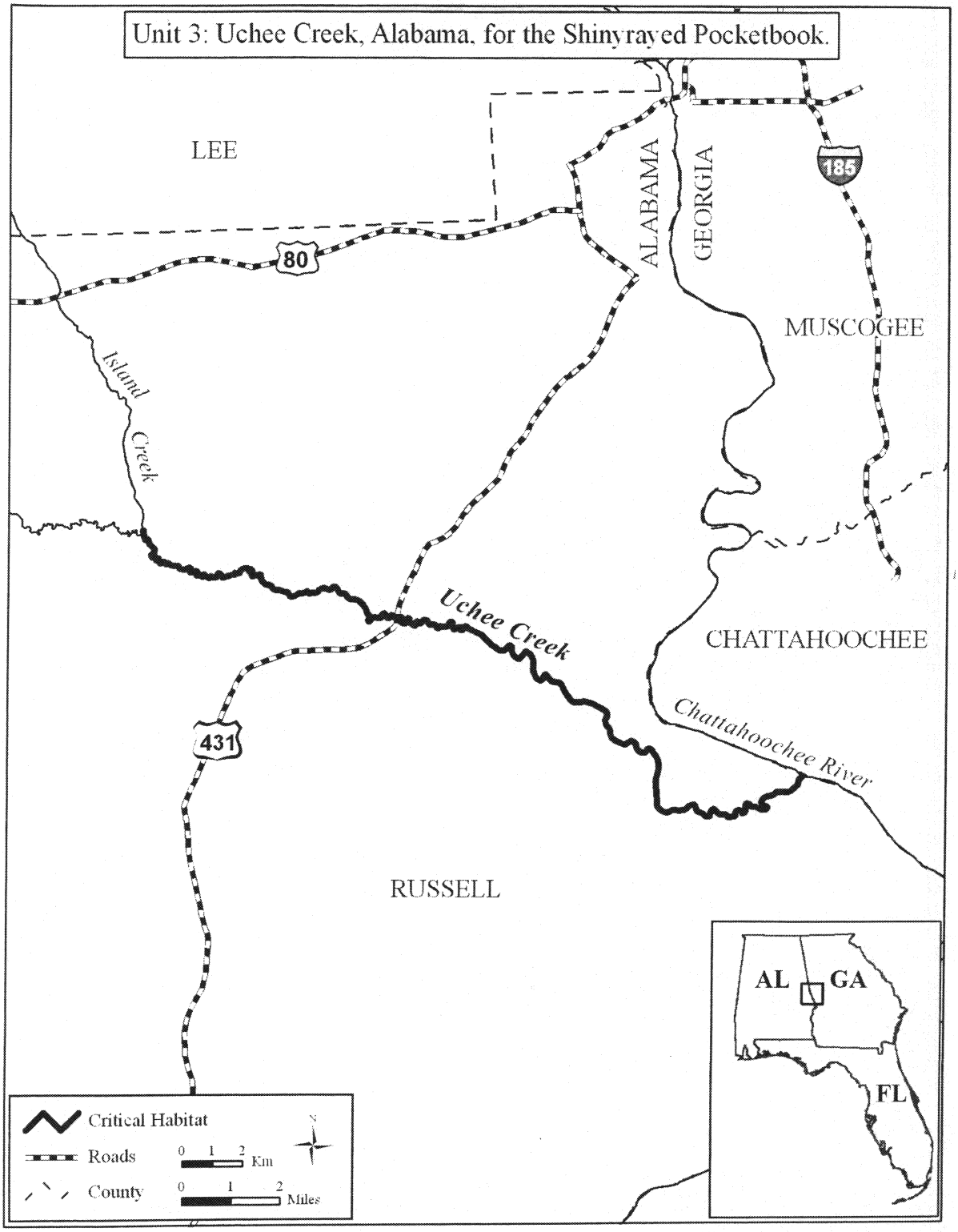
BILLING CODE 4310–55–P


Unit 2: Chipola River, Alabama and Florida, for the Fat Threeridge, Shinyrayed Pocketbook, Gulf Moccasinshell, Oval Pigtoe, and Chipola Slabshell.
Limestone Ck
HOUSTON
Big Ck
Cowarts Ck
ALABAMA
GEORGIA
FLORIDA
Marshall Ck
Waddells Mill Ck
Russ Mill Ck
JACKSON
Tanner Springs
Baker Ck
Little Rocky Ck
Dry Ck
Rocky Ck
Ditch Branch
10
Apalachicola River
CALHOUN
Chipola River
LIBERTY
GULF
AL
GA
FL
Critical Habitat
Roads
State
County
0 4 8 Km
0 4 8 Miles

(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 follows:

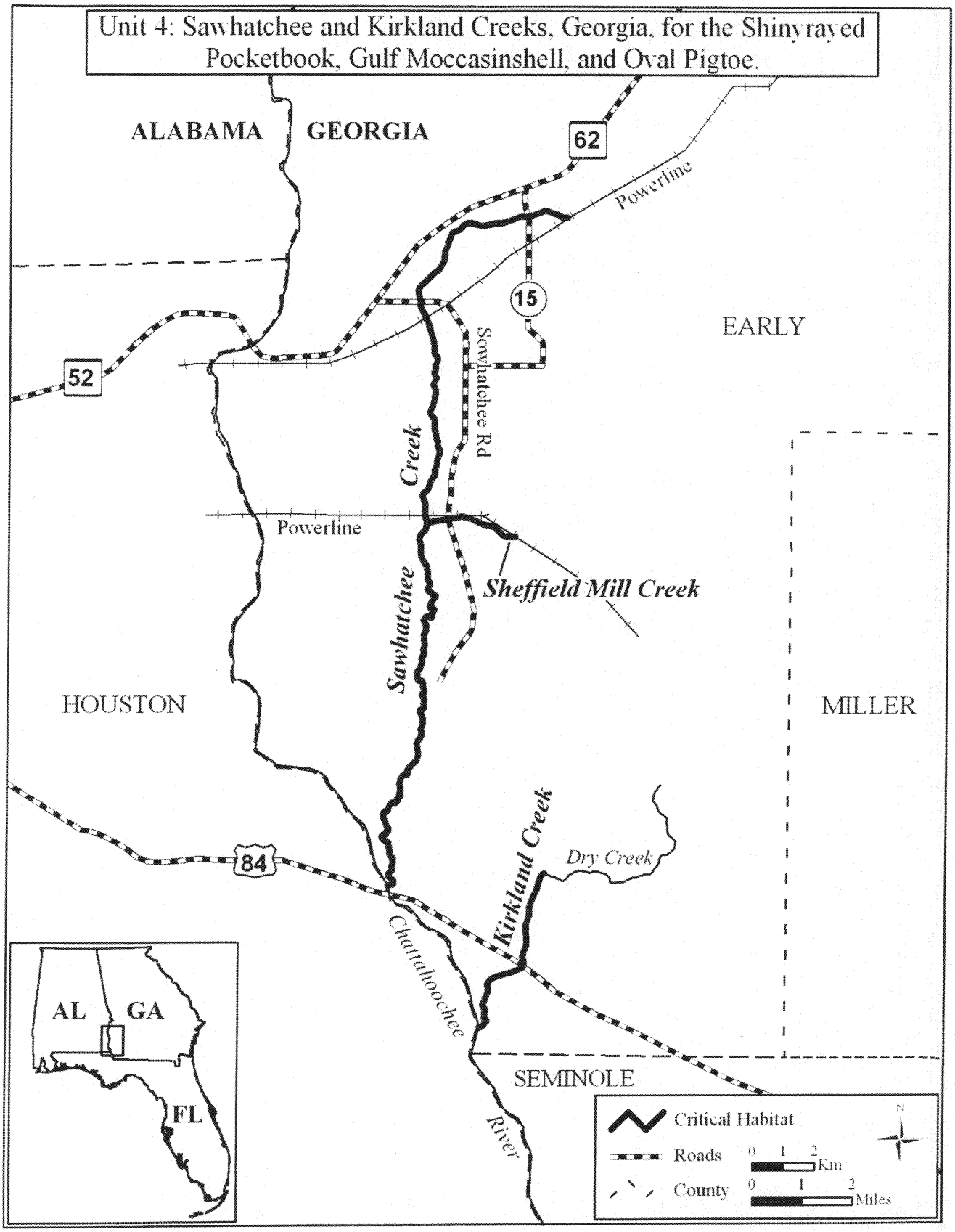


(10) Unit 4. Sawhatchee, Sheffield Mill, and Kirkland creeks, Early County, Georgia. This is a critical habitat unit for the shinyrayed pocketbook, Gulf moccasinshell, and oval pigtoe.

(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). Unit 4 includes 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).

(ii) Note: Unit 4 map follows:

BILLING CODE 4310–55–P



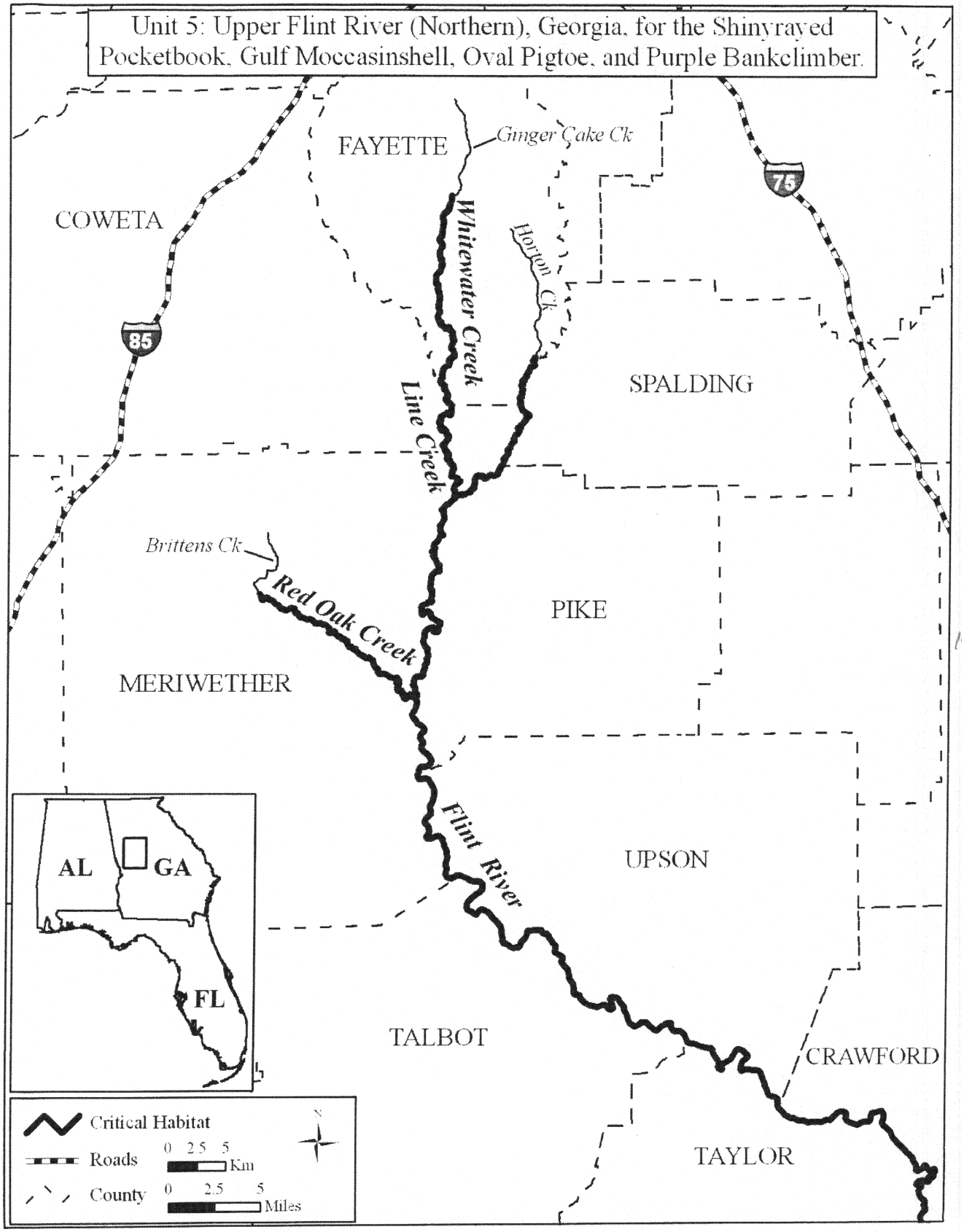
BILLING CODE 4310–55–C

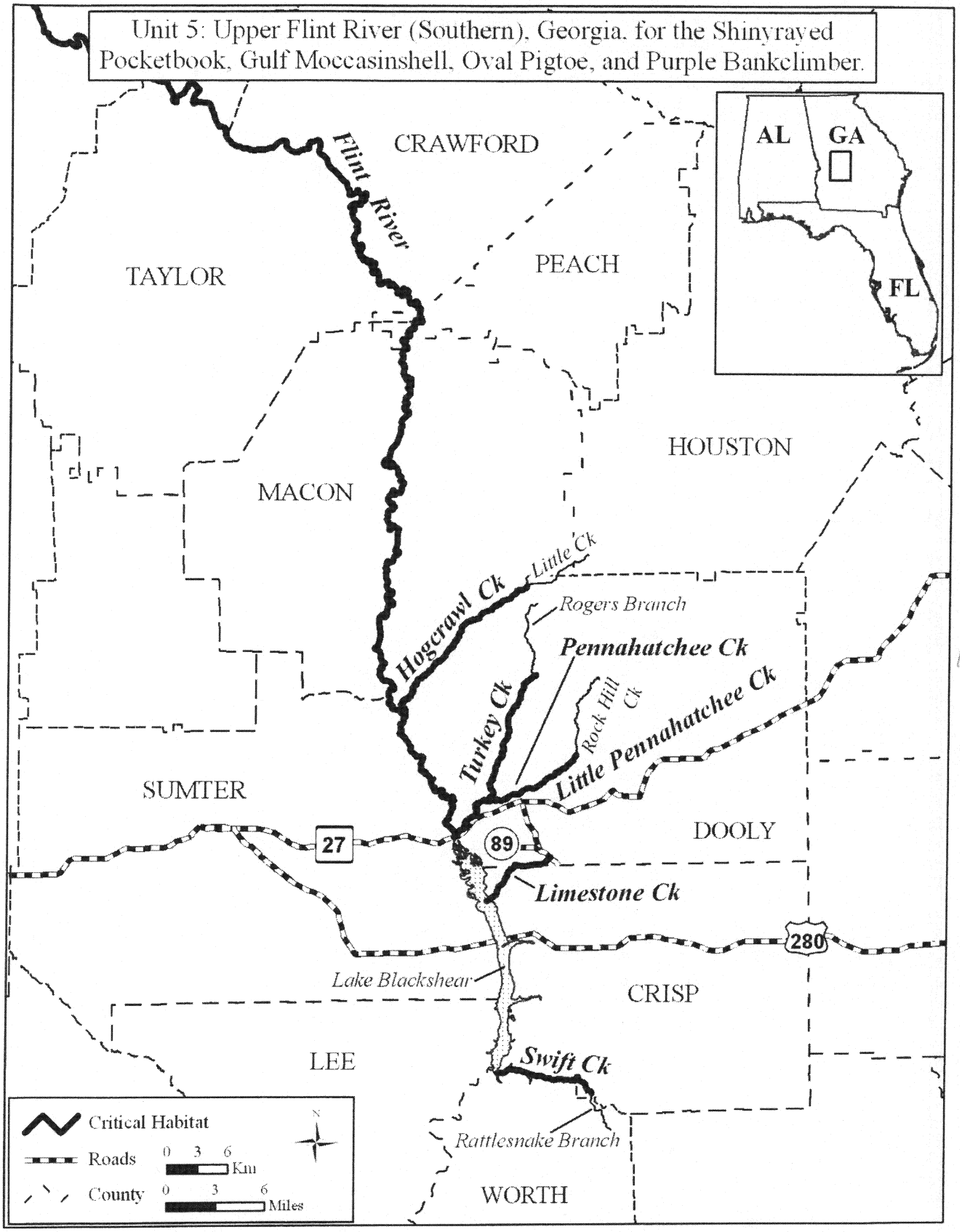
(11) Unit 5. Upper Flint River and Swift, Limestone, Turkey, Pennahatchee, Little Pennahatchee, Hogcrawl, Red Oak, Line, and Whitewater creeks in Coweta, Crawford, Crisp, Dooly, Fayette, Macon, Meriwether, Peach, Pike, Spalding, Sumter, Talbot, Taylor, Upson, and Worth counties, Georgia. This is a critical 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—northern part of unit 5 and—southern part of unit 5 follow:

BILLING CODE 4310–55–P


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
Line Creek
SPALDING
Brittens Ck
Red Oak Creek
PIKE
MERIWETHER
Flint River
UPSON
AL
GA
FL
TALBOT
CRAWFORD
TAYLOR
Critical Habitat
Roads
County
0 2.5 5 Km
0 2.5 5 Miles
N



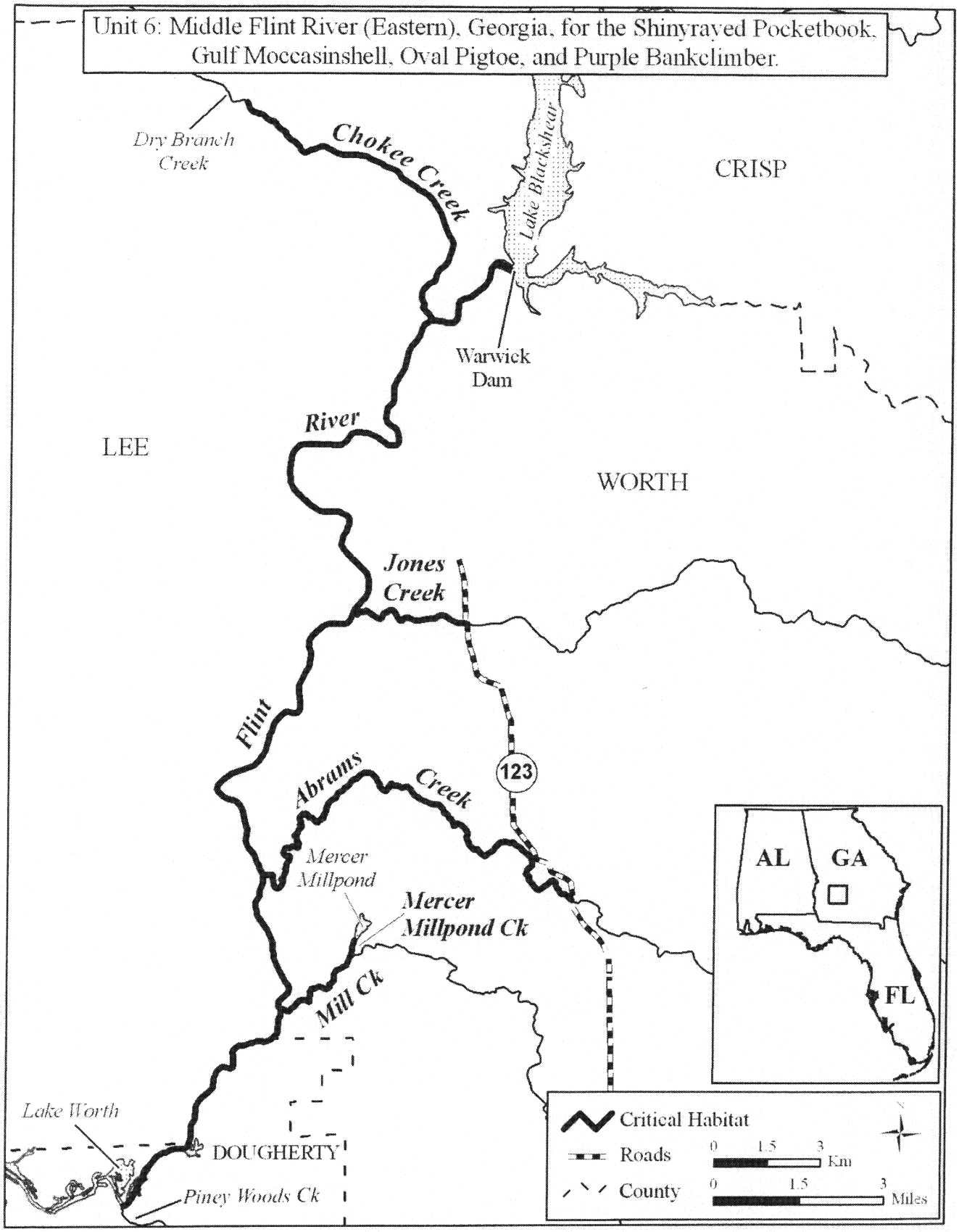
BILLING CODE 4310–55–C

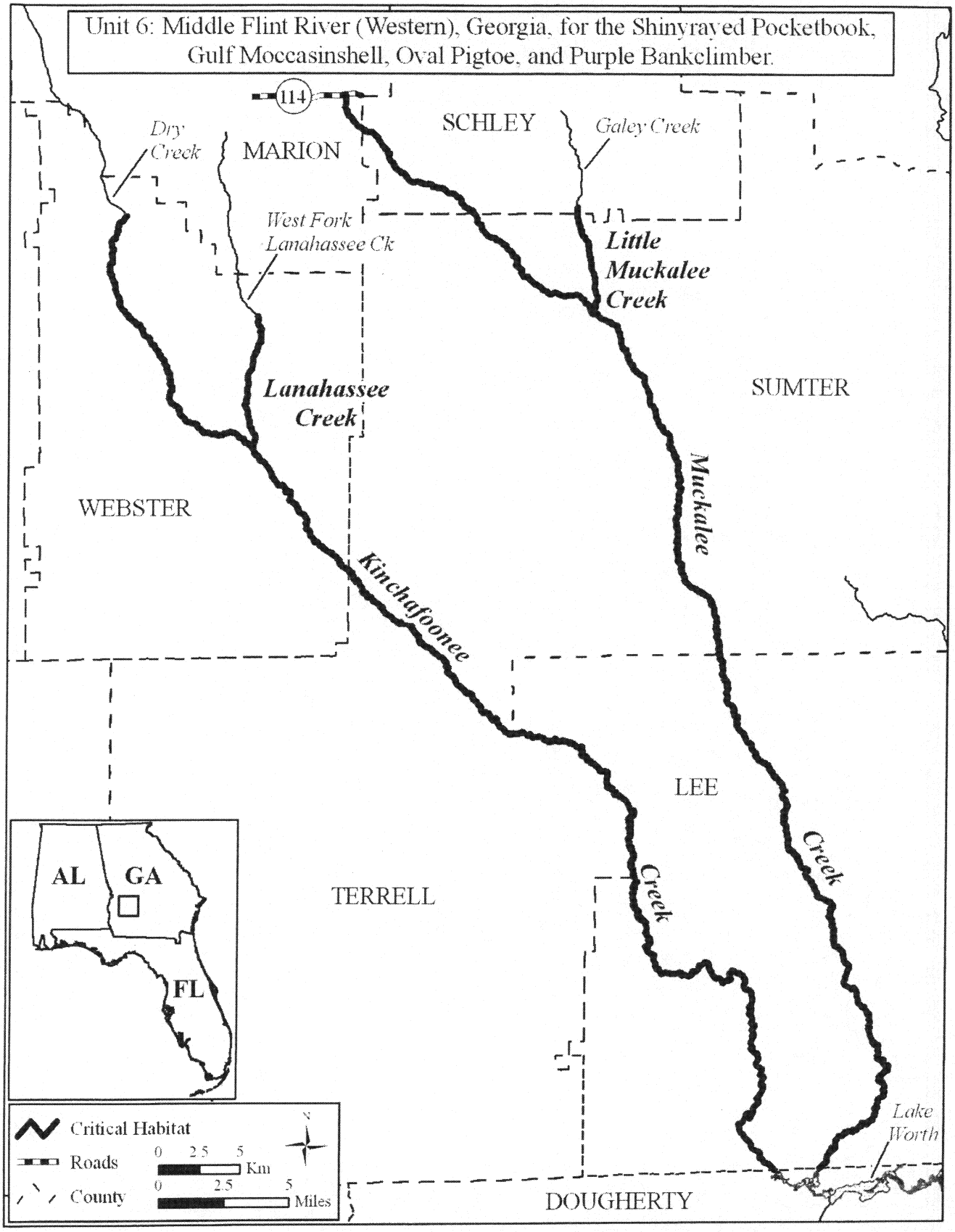
(12) Unit 6. Middle Flint River and Kinchafoonee, Lanahassee, Muckalee, Little Muckalee, Mill, Mercer Mill Pond, Abrams, Jones, and Chokee creeks in Dougherty, Lee, Marion, Schley, Sumter, Terrell, Webster, and Worth counties, Georgia. This is a critical habitat unit for the shinyrayed pocketbook, Gulf 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—western part of unit 6 and—eastern part of unit 6 follow:

BILLING CODE 4310–55–P


Unit 6: Middle Flint River (Eastern), Georgia, for the Shinyrayed Pocketbook, Gulf Moccasinshell, Oval Pigtoe, and Purple Bankclimber.
Dry Branch Creek
Chokee Creek
Lake Blackshear
CRISP
Warwick Dam
River
LEE
WORTH
Jones Creek
Flint
Abrams Creek
123
Mercer Millpond
Mercer Millpond Ck
Mill Ck
Lake Worth
DOUGHERTY
Piney Woods Ck
AL
GA
FL
Critical Habitat
Roads
County
0 1.5 3 Km
0 1.5 3 Miles



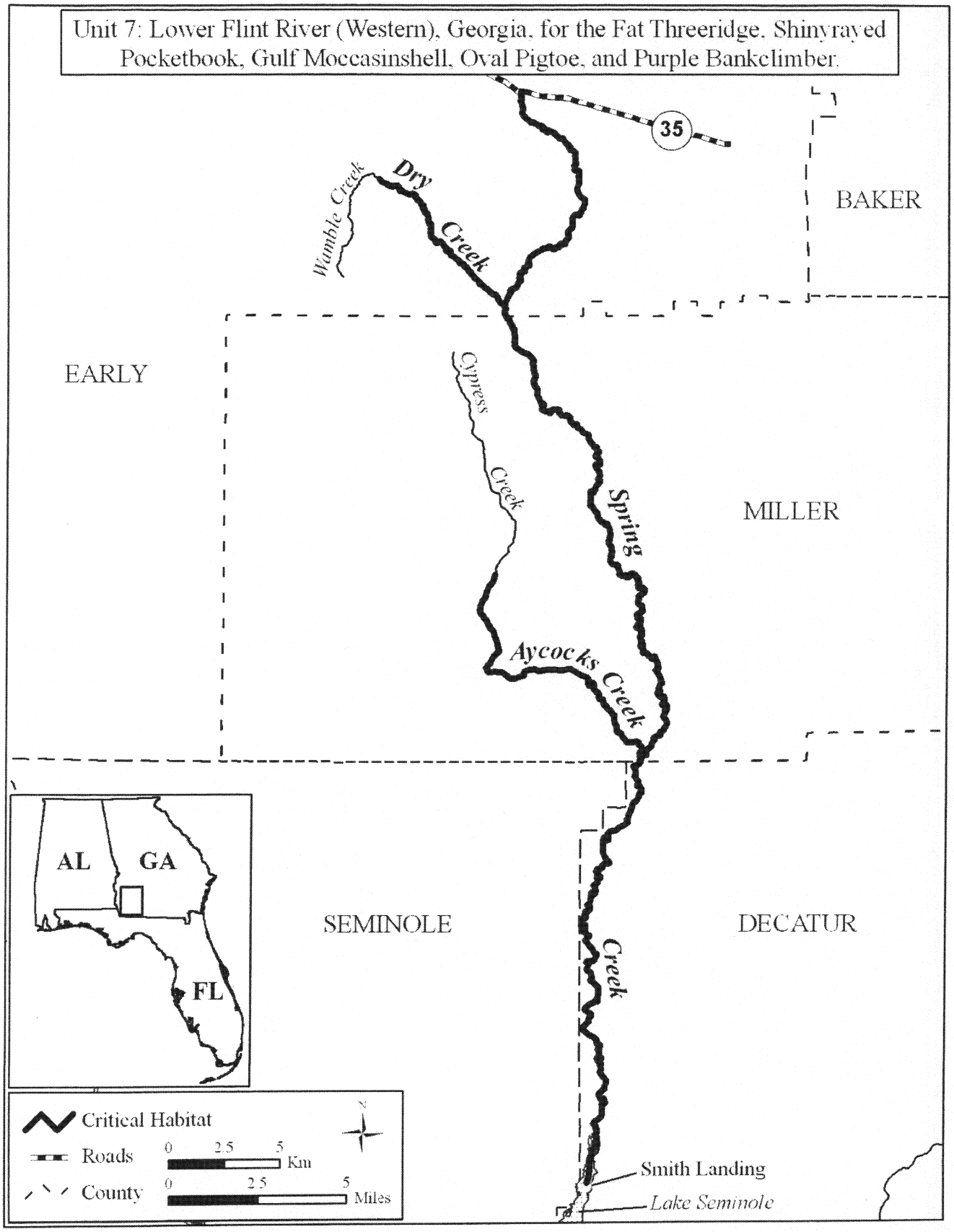
BILLING CODE 4310–55–C

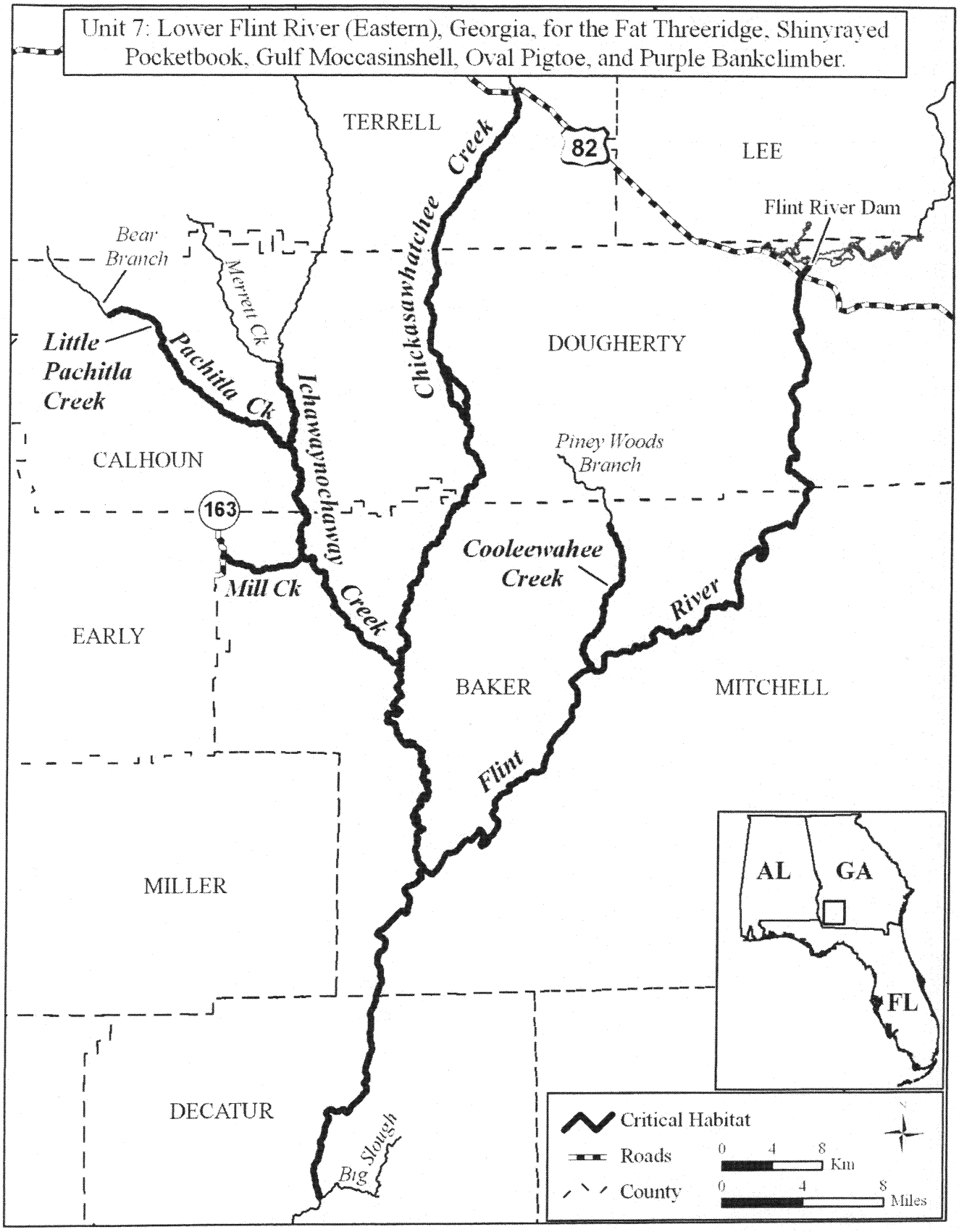
(13) Unit 7. Lower Flint River and Spring, Aycocks, Dry, Ichawaynochaway, Mill, Pachitla, Little Pachitla, Chickasawhatchee, and Cooleewahee creeks in Baker, Calhoun, Decatur, Dougherty, Early, Miller, Mitchell, and Terrell counties, Georgia. This is a critical habitat unit for the fat threeridge, shinyrayed 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—western part of unit 7 and—eastern part of unit 7 follow:

BILLING CODE 4310–55–P


Unit 7: Lower Flint River (Western), Georgia, for the Fat Threeridge, Shinyrayed Pocketbook, Gulf Moccasinshell, Oval Pigtoe, and Purple Bankclimber.
35
BAKER
EARLY
MILLER
SEMINOLE
DECATUR
Wamble Creek
Dry Creek
Cypress Creek
Spring Creek
Aycocks Creek
Creek
AL
GA
FL
Critical Habitat
Roads
County
0 2.5 5 Km
0 2.5 5 Miles
N
Smith Landing
Lake Seminole



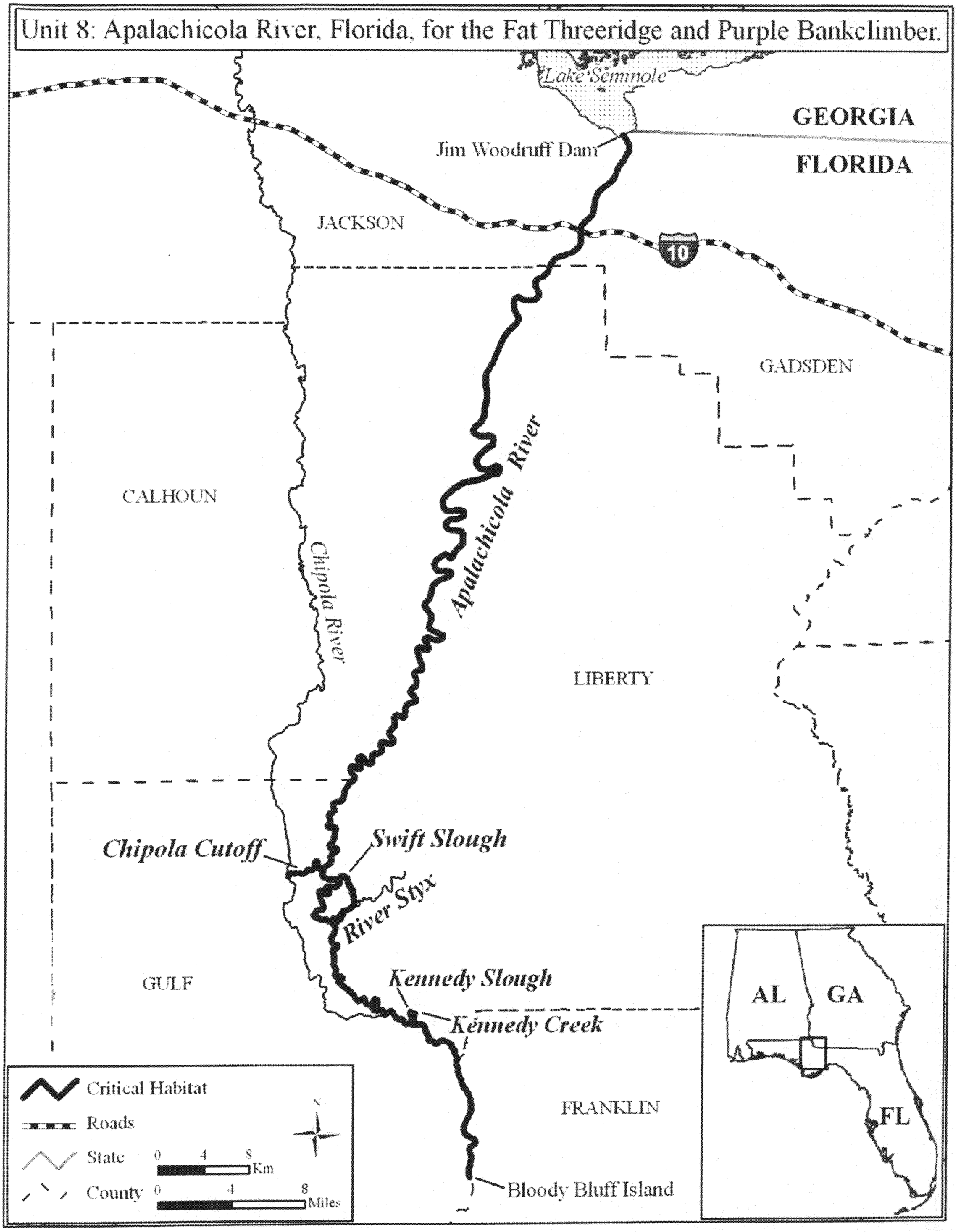
BILLING CODE 4310–55–C

(14) Unit 8. Apalachicola River, Chipola Cutoff, Swift Slough, River Styx, Kennedy Slough, and Kennedy Creek 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, two of its distributaries, Chipola Cutoff and Swift Slough, and three of its tributaries, River Styx, Kennedy Slough, and Kennedy Creek, encompassing a total length of 161.2 river km (100.2 river 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 river km (2.8 river mi) to its confluence with the Chipola River; Swift Slough from the Apalachicola River in Liberty County, Florida, downstream 3.6 river km (2.2 river mi) to its confluence with the River Styx (−85.12 longitude, 30.10 latitude); River Styx from the mouth of Swift Slough (−85.12 longitude, 30.10 latitude) in Liberty County, Florida, downstream 3.8 river km (2.4 river mi) to its confluence with the Apalachicola River; Kennedy Slough from −85.07 longitude, 30.01 latitude in Liberty County, Florida, downstream 0.9 river km (0.5 river mi) to its confluence with Kennedy Creek; and Kennedy Creek from Brushy Creek Feeder (−85.06 longitude, 30.01 latitude) in Liberty County, Florida, downstream 1.1 river km (0.7 river mi) to its confluence with the Apalachicola River.

(ii) Note: Unit 8 map follows:

BILLING CODE 4310–55–P



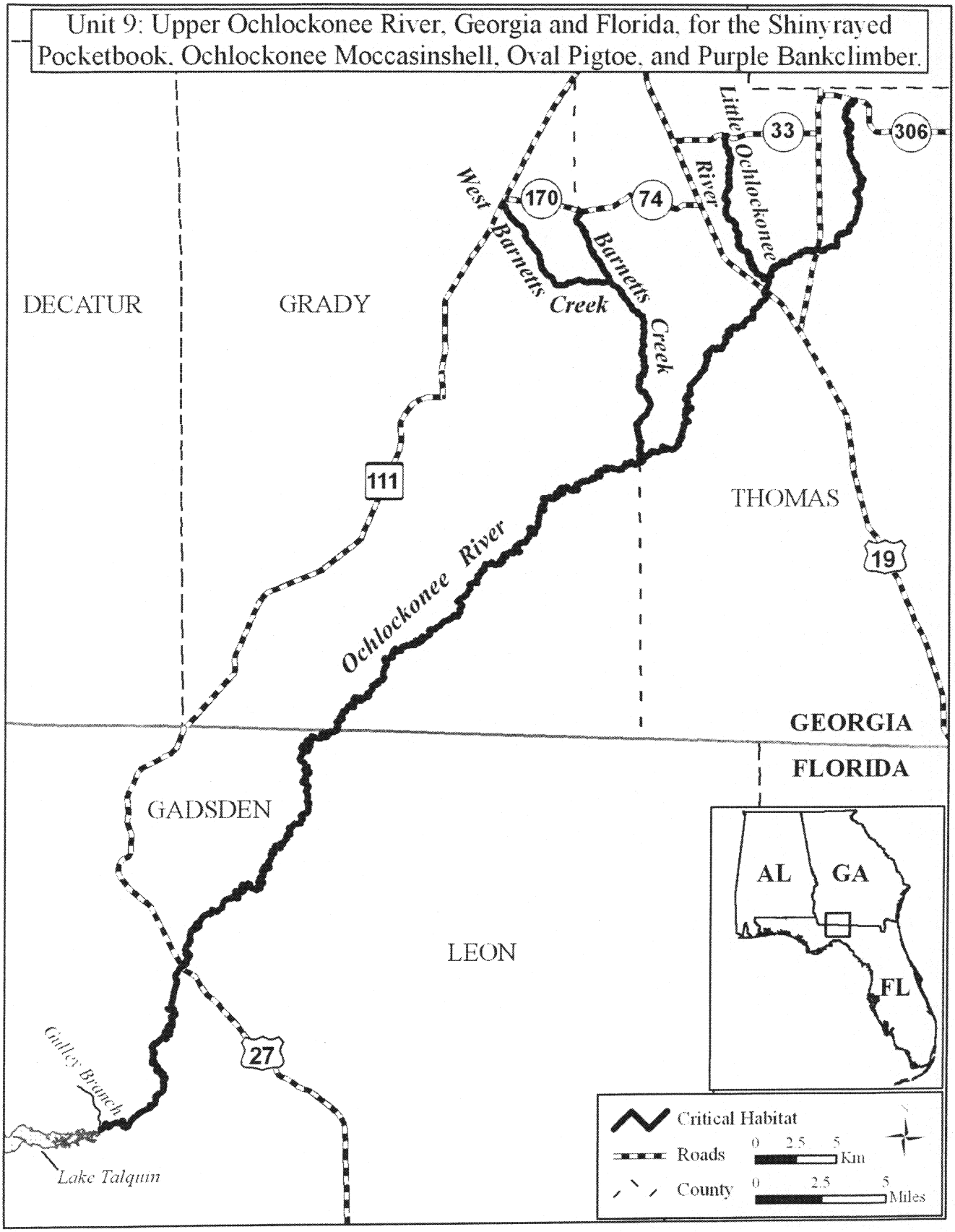
BILLING CODE 4310–55–C

(15) Unit 9. Upper Ochlockonee River and Barnetts and West Barnetts creeks, and the Little Ochlockonee River in Gadsden and Leon counties, Florida, and in 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 follows:

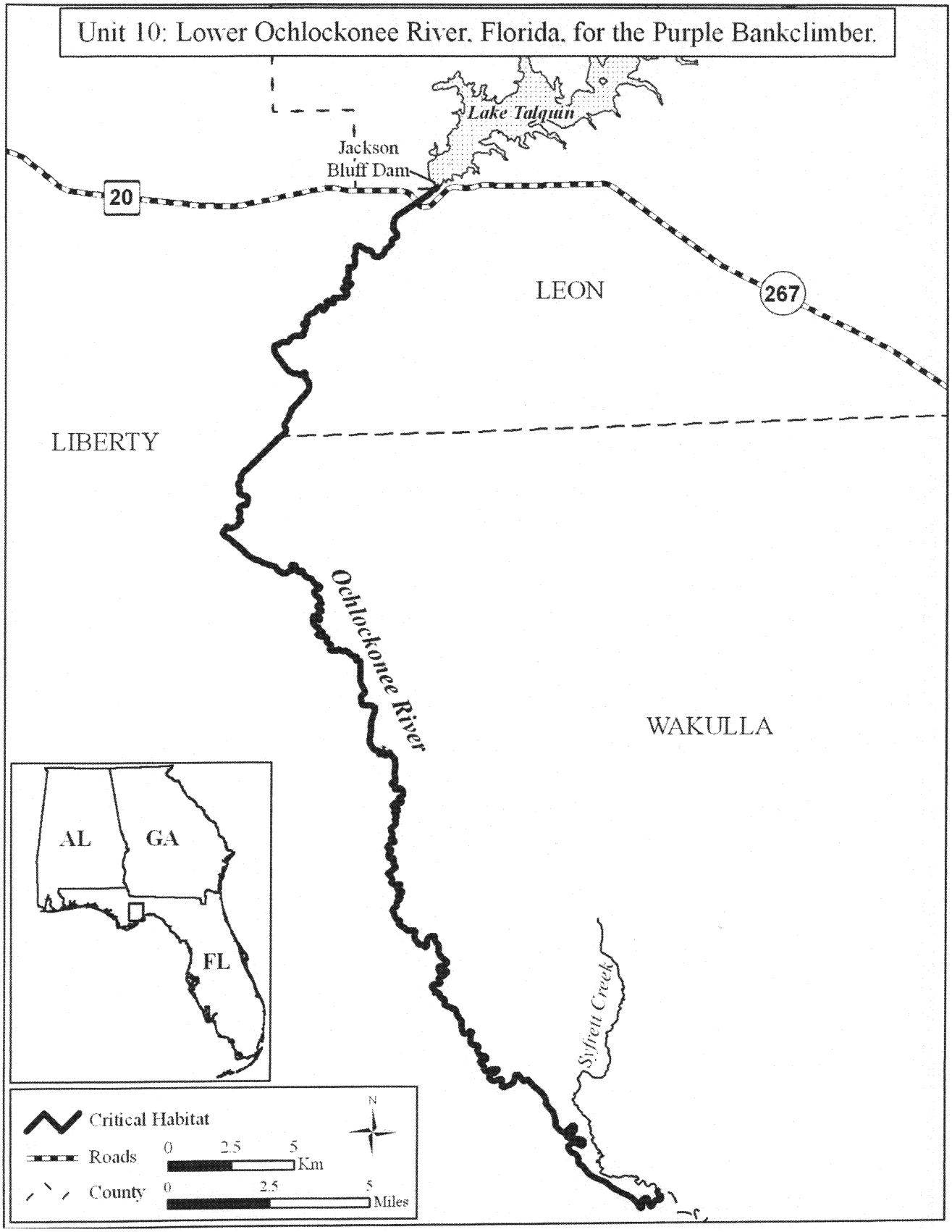
BILLING CODE 4310–55–P


Unit 9: Upper Ochlockonee River, Georgia and Florida, for the Shinyrayed Pocketbook, Ochlockonee Moccasinshell, Oval Pigtoe, and Purple Bankclimber.
DECATUR
GRADY
THOMAS
GADSDEN
LEON
GEORGIA
FLORIDA
Ochlockonee River
Little Ochlockonee River
West Barnetts Creek
Barnetts Creek
Gulley Branch
Lake Talquin
170
74
33
306
111
19
27
AL
GA
FL
Critical Habitat
Roads
County
0 2.5 5 Km
0 2.5 5 Miles

(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.

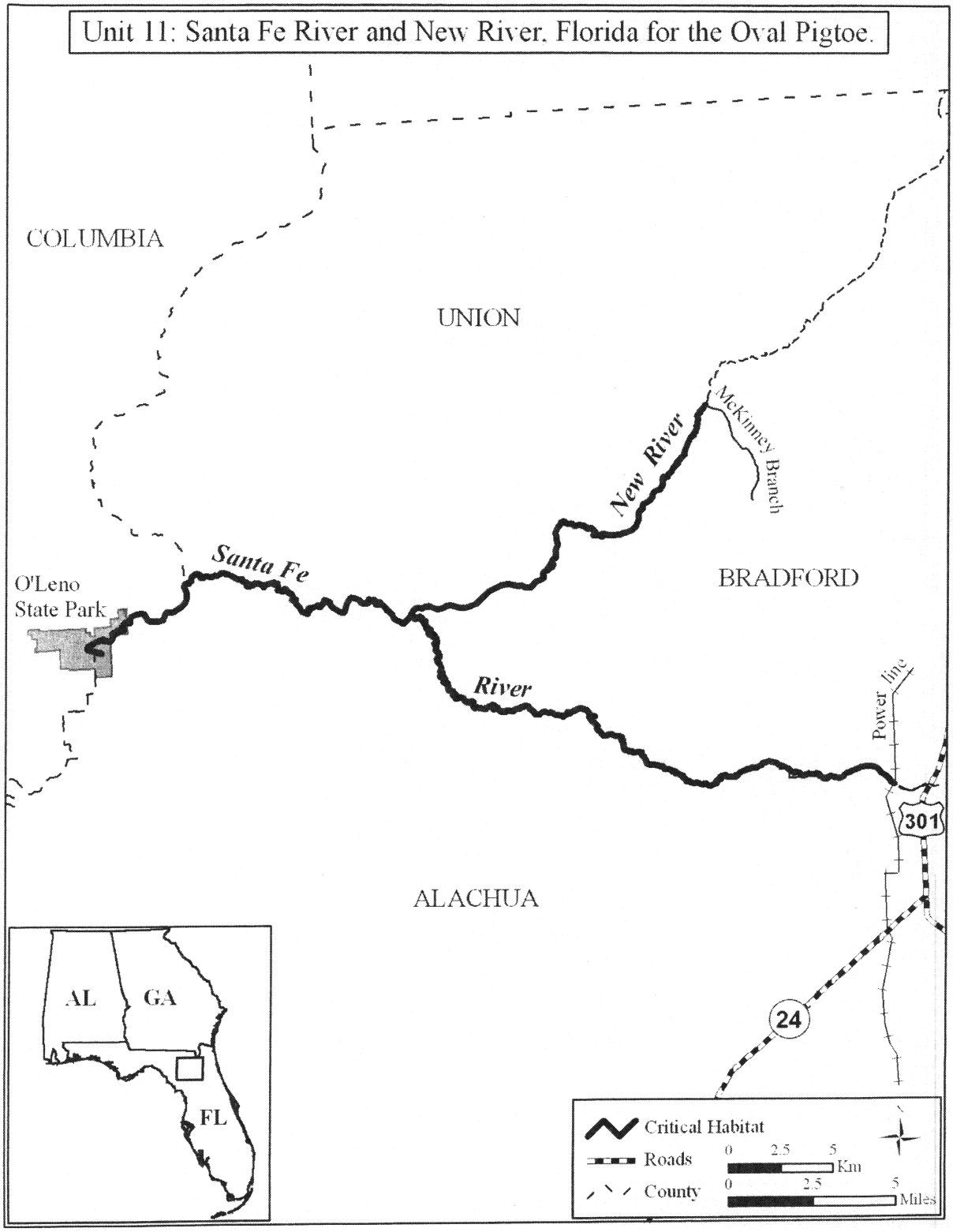
(ii) Note: Unit 10 map follows:


Unit 10: Lower Ochlockonee River, Florida, for the Purple Bankclimber.
Lake Talquin
Jackson Bluff Dam
20
267
LEON
LIBERTY
WAKULLA
Ochlockonee River
Sylvett Creek
AL
GA
FL
Critical Habitat
Roads
County
N
0 2.5 5 Km
0 2.5 5 Miles

(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 follows:



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Dated: October 31, 2007.

David M. Verhey,

Acting Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 07–5551 Filed 11–14–07; 8:45 am]

BILLING CODE 4310–55–C