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**DEPARTMENT OF THE INTERIOR****Fish and Wildlife Service****50 CFR Part 17****Endangered and Threatened Wildlife  
and Plants; Proposed Endangered  
Status for Five Mississippi and  
Alabama Clams**

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

**ACTION:** Proposed rule.

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**SUMMARY:** The Service proposes to determine Marshall's mussel (*Pleurobema marshalli* Frierson), Curtus' mussel (*Pleurobema curtum* [Lea]), Judge Tait's mussel (*Pleurobema taitianum* [Lea]), the stirrup shell (*Quadrula stapes* [Lea]), and the penitent mussel (*Epioblasma* [= *Dysnomia*] *penita* [Conrad]) to be endangered species under the Endangered Species Act of 1973, as amended. These five freshwater clams are restricted to areas in the Tombigbee River system that represent remnants of their historic ranges. They have been found in moderate-to-large rivers with moderate-to-swift current. Their preferred habitats are riffle or shoal areas with stable substrates ranging from sandy gravel to gravel-cobble. Much of the historic habitat has been modified by reservoir and barge canal construction. The remaining populations

are in bendways or meanders of the Tombigbee River that were bypassed by the Tennessee-Tombigbee Waterway (TTW) and in a few tributaries of the Tombigbee River. They are away from and not affected by present operation of the completed TTW. The remaining habitat is threatened by siltation from a variety of sources and by gravel dredging. The construction of impoundments adversely impacted these five species by physical destruction during dredging, increasing siltation, reducing water flow, suffocating juveniles with sediment, and possibly disturbing host fish movements. This proposal, if made final, would implement the protection of the Endangered Species Act of 1973, as amended, for these five freshwater clams. The Service seeks relevant data and comments from the public.

**DATES:** Comments from all interested parties must be received by June 6, 1986. Public hearing requests must be received by May 22, 1986.

**ADDRESSES:** Comments and materials concerning this proposal should be sent to the Endangered Species Field Supervisor, U.S. Fish and Wildlife Service, Jackson Mail Office Center, Suite 316, 300 Woodrow Wilson Avenue, Jackson, Mississippi 39213. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

**FOR FURTHER INFORMATION CONTACT:** Mr. Dennis B. Jordan, Endangered Species Field Supervisor, at the above address (phone: 601/960-4900 or FTS 490-4900).

**SUPPLEMENTARY INFORMATION:**

**Background**

Marshall's mussel was described as *Pleurobema marshalli* by Frierson in 1927 from specimens collected by A. A. Hinkley from the Tombigbee River in Greene County, Alabama (Stansbery 1983b). Marshall's mussel is a bivalve mollusk about 60 mm long, 50 mm high, and 30 mm wide. The shell has a shallow umbonal cavity, a rounded sub-ovate or obliquely elliptical outline, nearly terminal beaks, and very low pustules or welts on the postventral surface. This mussel was historically known from the Tombigbee River main stem from just above Tibbee Creek near Columbus, Mississippi, down to Epes, Alabama (Stansbery 1983b). Studies of clams of the Gulf Coast rivers from the Escambia River to the Suwannee River by Clench and Turner (1956) and of Mississippi streams by Grantham (1969) did not reveal Marshall's mussel in those areas. Extensive surveys of the

Cahaba River by van der Schalie (1938) and Baldwin (1973) and of the Coosa River by Hurd (1974) did not find Marshall's mussel (Stansbery 1983b). This complete lack of specimens from anywhere except the Tombigbee River from Tibbee Creek to Epes, Alabama, suggests that the historical range of this species was restricted to this river reach. An extensive survey of the Tombigbee River in 1971-1976 by Williams (Stansbery 1983b) recorded Marshall's mussel in the lowermost half of the river from Tibbee Creek downstream to just above the mouth of the Noxubee River. Yokley (1978) did not find Marshall's mussel in his survey of the Buttahatchie River. The only remaining viable habitat for this species in the Tombigbee River is a gravel bar in a bendway in Sumter County, Alabama. A few individuals may survive in two Tombigbee River bendways: one each in Lowndes County, Mississippi, and Pickens County, Alabama.

Curtus' mussel was originally described as *Unio curtus* by Lea in 1859. The Service recognizes the following name combinations (based on Stansbery 1983d) as equivalent to *Pleurobema curtum* (Lea 1859):

*Unio curtus* Lea, 1859:113.  
*Margaron (Unio) curtus* (Lea).—Lea, 1870:40.

*Pleurobema curta* (Lea).—Simpson, 1900:754.

*Pleurobema curtum* (Lea).—Simpson, 1914:762.

*Obovaria (Pseudoon) curta* (Lea).—Frierson, 1927:91.

Curtus' mussel is a bivalve mollusk about 50 mm long, 35 mm high, and 30 mm wide. The shell varies from green in young shells to a dark greenish-brown in older shells. The shell is subtriangular, is inflated in front, and has a bluish-white, iridescent, thin nacre (Simpson 1914). Curtus' mussel was historically found in the main stem of the Tombigbee River. The Service considers the single record of this species from the Big Black River in Mississippi (Hinkley 1906, p. 54) to be erroneous. The species has been collected from only five locations, and only two living specimens are known to have been collected. The single remaining viable habitat is in the East Fork Tombigbee River, Mississippi. A few individuals may remain in a bendway of the Tombigbee River in Pickens County, Alabama. Grantham (1969) did not record Curtus' mussel from the Big Black River, nor have more recent surveys found it there (P. D. Hartfield, Mississippi Museum of Natural Science, pers. comm.).

Judge Tait's mussel was described as *Unio taitianus* by Lea in 1934, with the type locality being the Alabama River

(Stansbery 1983a). The Service recognizes the following abbreviated synonymy (based on Stansbery 1983a) for *Pleurobema taitianum* (Lea 1834):  
*Unio taitianus* Lea, 1834:39.

*Margarita taitianus* (Lea).—Lea, 1836:21.

*Margaron taitianus* (Lea).—1852a:25.

*Pleurobema taitiana* (Lea).—Simpson, 1900:754.

*Pleurobema taitianum* (Lea).—Simpson, 1914:764.

*Pleurobema tombigbeanum* Frierson, 1908:27.

Judge Tait's mussel is a bivalve mollusk about 50 mm long, 45 mm high, and 30 mm wide. The shell is brown to brownish-black, obliquely triangular, and inflated, with narrowly pointed beaks directed forward, a very shallow but distinct furrow, pink-tinted nacre, and shallow beak cavities (Stansbery 1983a, Simpson 1914). Judge Tait's mussel was historically found in the Tombigbee River from Tibbee Creek near Columbus, Mississippi, to Demopolis, Alabama; the Alabama River at Claiborne and Selma, Alabama; the lower Cahaba River, Alabama; and possibly the Coosa River, Alabama (Stansbery 1983a, Williams 1982). Several shells from recently dead specimens were found at one location on the Buttahatchie River, a tributary of the Tombigbee, in Mississippi (Schultz 1981). This species has also been reported from the East Fork Tombigbee River (Schultz 1981) and from the Sipsey River, Alabama. Only four sites with suitable habitat remain: these consist of localities in a bendway of the Tombigbee River, Sumter County, Alabama; the East Fork Tombigbee River, Mississippi; the Buttahatchie River, Mississippi; and the Sipsey River, Pickens and Greene Counties, Alabama. A few individuals may survive at a site in a bendway of the Tombigbee River, Pickens County, Alabama.

The stirrup shell was originally described from the Alabama River as *Unio stapes* by Lea in 1931. The Service recognizes the following name combinations (based on Stansbery 1981) as equivalent to *Quadrula stapes* (Lea 1931):

*Unio stapes* Lea, 1831:77.

*Margarita (Unio) stapes* (Lea).—Lea, 1836:15.

*Margaron (Unio) stapes* (Lea).—Lea, 1852b:22.

*Quadrula stapes* (Lea).—Simpson, 1900:775.

*Orthanymus stapes* (Lea).—Haas, 1969:316.

The stirrup shell is a bivalve mollusk about 55 mm long, 50 mm high, and 30 mm wide. The shell is yellowish-green, with the green zigzag markings of young

individuals becoming brown with age. It is irregularly quadrate, with a sharp posterior ridge, truncated posterior, tubercles, and a silvery white nacre that is thinner and iridescent behind (Simpson 1914). The stirrup shell was found historically in the Tombigbee River from Tibbee Creek near Columbus, Mississippi, downstream to Epes, Alabama; the Black Warrior River in Alabama; and in the Alabama River (Stansbery 1981, Williams 1982). One specimen was found recently in the Sipsey River, Pickens and Greene Counties, Alabama, by Dr. Paul Yokley. Only two small areas of viable habitat remain: one in the Sipsey River and the other in a bendway of the Tombigbee River in Sumter County, Alabama. Two additional bendways in the Tombigbee River, one each of Lowndes County, Mississippi, and Pickens County, Alabama, may support a few individuals.

The penitent mussel was described as *Unio penitus* by Conrad in 1834. The type locality is the Alabama River near Claiborne, Alabama (Stansbery 1983c). The Service recognizes the following name combinations (based on Stansbery 1983c) as equivalent to *Epioblasma penita* (Conrad 1834):

*Unio penitus* Conrad, 1834:33.

*Margarita (Unio) penitus* (Conrad).—

Lea, 1836:19.

*Margarita (Unio) penitus* (Conrad).—

Lea, 1852a:24

*Truncilla penita* (Conrad).—Simpson,

1900.

*Dysnomia penita* (Conrad).—Frierson,

1927:93.

*Epioblasma penita* (Conrad).—

Stansbery, 1976:46

*Plagiola (Plagiola) penita* (Conrad) [in

part].—Johnson, 1978, 254.

The penitent mussel is a bivalve mollusk about 65 mm long, 40 mm high, and 34 mm wide. The shell is yellowish, greenish-yellow, or tawny, sometimes with darker dots; is rhomboid with irregular growth lines and a radially sculptured posterior; and has white or straw-colored nacre (Simpson 1914). The females have a large radially-grooved swelling projecting behind the shell. This species was historically known from the Tombigbee River from Bull Mountain Creek above Amory, Mississippi, downstream to Epes, Alabama; the Alabama River at Claiborne and Selma; the Cahaba River below Centreville, Alabama; and the Coosa River in Alabama and Georgia (Stansbery 1983c, Williams 1982). Live specimens were found recently in the Buttahatchie River in Alabama (Yokley 1978, Schultz 1981). The only remaining viable habitats are in the Buttahatchie River, Alabama, the East Fork

Tombigbee River, and a single locality in a bendway of the Tombigbee River, Sumter County, Alabama. A few individuals may survive in a bendway of the Tombigbee River in Pickens County, Alabama.

These five species have historically been found in moderate-to-large rivers with moderate-to-swift current. Their preferred habitats are riffle-run or shoal areas with stable substrates ranging from sandy gravel to gravel-cobble (Stansbery 1976, 1980, 1981, 1983a, 1983b, 1983c, 1983d). These clams have been taken in water up to 0.7 meters deep (Williams 1982).

Land ownership in the portions of the Tombigbee and Alabama River systems where these species have been collected includes Federal, State, corporate, and individual. Governmental regulation of alterations of these habitats is primarily the responsibility of the U.S. Army Corps of Engineers (CE).

The status of each of these clams has declined owing to habitat alteration. The modification of the free-flowing Tombigbee River into a series of impoundments to form a barge canal has adversely impacted these species through physical destruction during dredging, increased siltation, reduction of water flow, and possibly disturbance of host fish movements. Remaining populations are in bendways and tributaries that are outside of the navigation channel of the Tennessee-Tombigbee Waterway (TTW). The CE has authorized channelization and snagging projects in portions of the Buttahatchie, Sipsey, Tombigbee, East Fork, and Cahaba Rivers where these species have been found.

On April 11, 1980, the Service published a notice in the Federal Register (45 FR 24004) that a status review was being conducted for these five clam species. Former Congressman David Bowen of Mississippi opposed the notice and possible listing based on a concern that Service employees opposed the construction of the TTW. The Service responds that it has based the notice and the present proposed rule to list these five clams solely on the most current biological data available, as required by the Endangered Species Act. Former Governors Fob James of Alabama and William F. Winter of Mississippi commented that the classification and life histories of these five species required clarification, and that the species were not threatened by the TTW. Both governors cited van der Schalie (1980) in support of their comments. The Service responds that it has examined the reports by Drs. van der Schalie and Stansbery and all relevant scientific literature and

museum collections and believes that the taxonomic characterizations presented in the previous paragraphs represent the soundest and most current interpretation of available data. The Service also notes that the TTW populations survive only at sites that are outside of the navigation channel, which is now completed, and conservation efforts for these species are likely to be expended on habitats that have not been altered by the waterway.

The CE submitted documents describing studies of these species and suggesting possible conservation and management procedures for remaining populations. The Service has incorporated the distributional data from these studies with data from other sources in preparing this proposed rule. As stated above, the Service has considered taxonomic questions raised in these and other studies and believes that the taxonomy employed here is most consistent with all available information. The CE's management recommendations are appreciated and will be further considered during recovery planning, should this proposed rule become final.

Three conservation groups and two individuals, including a professional malacologist, presented or cited data in support of a proposal of protective status under the Endangered Species Act for these species.

#### Summary of Factors Affecting the Species

Section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations promulgated to implement the listing provisions of the Act (codified at 50 CFR Part 424; 49 FR 38900, October 1, 1984) set forth the procedures for adding species to the Federal lists. Species may be determined to be endangered or threatened species owing to one or more of the five factors described in section 4(a)(1). These factors and their application to Marshall's mussel (*Pleurobema marshalli*), Curtus' mussel (*P. curtum*), Judge Tait's mussel (*Pleurobema taitianum*), the stirrup shell (*Quadrula stapes*), and the penitent mussel (*Epioblasma penita*) are as follows:

A. *The present or threatened destruction, modification, or curtailment of their habitat or range.* All five of the subject species have greatly declined in range and/or numbers in the Tombigbee River owing to alteration of their habitat from a free-flowing riverine system to an impounded system by the construction of the Tennessee-Tombigbee Waterway (TTW). The modification of the free-flowing Tombigbee River to a series of

impoundments adversely impacted these clams by physical destruction during dredging, increasing siltation, reducing water flow, and suffocating juveniles with sediment (Stansbery 1980, 1983b; Stein 1971; Williams 1982). These species survive in the Tombigbee River proper only in meanders or bendways that were bypassed by the TTW. The situation of these populations away from the navigation channel allowed them to escape the full force of the threats that extirpated these species elsewhere in the Tombigbee River. Dredging and snagging for channel maintenance and flood control threaten populations in tributaries of the Tombigbee River.

Marshall's mussel has been collected from only the Tombigbee River in a reach from just above the confluence with Tibbee Creek downstream to Epes, Alabama. Construction of the TTW effectively eliminated, by impoundment, the historic habitat of Marshall's mussel except for three gravel bars in the river bendways bypassed by the TTW. Siltation is rapidly filling the bendway in Pickens County, Alabama, despite dredging by the CE to maintain water flow. The only possible habitat remaining in this bendway is a small bar at the lower confluence with the TTW where currents from river flows or wave action remove sedimentation. The gravel bars in Sumter County, Alabama, and Lowndes County, Mississippi, are receiving some sedimentation. In addition, the river flows are significantly reduced by backwater from impoundments. This flow reduction impacts clams by increasing siltation and changing the fishery habitat. This latter impact may result in the loss of the fish host for glochidial development. Since Marshall's mussel has only been found in large river systems, the fish host may be a large-river species that has been adversely impacted by impoundments.

The known historic range of *Curtus* mussel is the mainstem Tombigbee River, but it is now limited to two reaches of the Tombigbee River that are separated by a distance of 60 river miles. The East Fork is the principal extension of the Tombigbee River proper, upstream from the confluence of the East Fork and Town Creek. The lower reach was impacted by construction of the TTW and resultant impoundment of a free-flowing river, and it is doubtful that *Curtus* mussel exists as a viable population at that site. The East Fork site remains similar to historic habitat but continues to face threats. The CE has approved a final supplement to the environmental impact

statement to conduct dredging and snagging activities in a 53-mile reach of the East Fork in the area where the last known collection of a live *Curtus* mussel was made. The East Fork water flows have been reduced by construction of the TTW canal, which has diverted the flow of Bull Mountain Creek, at least temporarily. Bull Mountain Creek provides nearly half the flow of the East Fork (U.S. Army Corps of Engineers 1984). Even if the flow is restored to the East Fork, the water quality will be altered. Bull Mountain Creek is a cool water stream that will be warmed to some degree when it is routed through the TTW canal.

Judge Tait's mussel is known historically from the Tombigbee River in a reach from Bull Mountain Creek above Amory, Mississippi, downstream to Demopolis, Alabama; the Alabama River at Claiborne and Selma, Alabama; the lower Cahaba River, Alabama; and the Coosa River, Alabama (Stansbery 1983a, Williams 1982). Shells of recently dead Judge Tait's mussel were found recently on the Buttahatchie River (Schultz 1981) and the Sipsey River. Judge Tait's mussel has not been collected from the Alabama and Cahaba Rivers since the 1800's (Stansbery 1983a) or the Coosa River since 1974, which was prior to impoundment of its habitat there (Williams 1982). Judge Tait's mussel was last collected from the mainstem Tombigbee River in 1972 (Stansbery 1983a). Habitat remaining there is marginal and remaining clams must cope with the continuing impacts of siltation, reduced water flows, water quality degradation, and possible loss of their fish host. Judge Tait's mussel is surviving in the Buttahatchie River (Schultz 1981), East Fork Tombigbee River, and the Sipsey River. The species is threatened in these three Tombigbee River tributaries by a 59-mile channel improvement project in the Buttahatchie, a 53-mile clearing and snagging project in the East Fork (U.S. Army Corps of Engineers 1983), and an 84.5-mile channel improvement project in the Sipsey River (U.S. Army Corps of Engineers 1981). The CE has authority to spend up to \$100,000 per year per stream for the removal of snags, clearing, and straightening for flood control purposes. Such a project has been carried out on the East Fork upstream of Mill Creek (U.S. Army Corps of Engineers 1984). The East Fork population is also impacted by water diversion. Bull Mountain Creek is a cool water stream that contributes nearly half the flow of the East Fork. During construction on the canal, the entire flow of Bull Mountain Creek was diverted. When

flow is restored, water quality changes will occur. The cool inflow from Bull Mountain Creek will undoubtedly be warmed as it mixes with the canal water, resulting in warming of the East Fork. Changes in water temperatures can be physiologically stressful to clams, alter their food supply, and impact their fish host.

The stirrup shell is known historically from the Alabama River and the Tombigbee River. Museum records indicate the stirrup shell was restricted historically to the lowermost part of the Alabama River (Stansbery 1981). The lack of fresh shells or living specimens from the Alabama River for several decades indicates the likely extirpation of the stirrup shell from this portion of the historic range. This species has been collected from a reach of the Tombigbee River from near Epes, Alabama, upstream to just above the confluence of Tibbee Creek. One specimen was recently collected by Yokley in the lower Sipsey River, and a recent survey by Fish and Wildlife Service biologists found a fresh stirrup shell at the same site. The present known distribution of this clam is limited to a single Tombigbee River bendway and the Sipsey River. This limited distribution continues to be threatened by habitat modification. Impoundment of the Tombigbee River has altered water flows and increased siltation on the gravel bars. This alteration suffocated mussels with silt and may have modified habitat so as to eliminate the fish host if the host is a riverine species that is intolerant of impoundments. The CE has a channel improvement project for 84.5 miles of the Sipsey River that includes 32 miles of clearing and snagging (U.S. Army Corps of Engineers 1981). Channel modifications adversely impact clams by alteration of the substrate, increased siltation, altered water flows, and direct mortality of mussels from dredging and snagging activities.

The penitent mussel is known historically from the Tombigbee River from the confluence of the East Fork and Bull Mountain Creek above Amory, Mississippi, downstream to Epes, Alabama; the Alabama River at Claiborne and Selma; the Cahaba River below Centerville, Alabama; and the Coosa River in Alabama and Georgia (Stansbery 1983c, Williams 1982). Live specimens were found recently on the Buttahatchie River (Yokley 1978, Schultz 1981). The penitent mussel has not been collected from the Alabama and Cahaba Rivers since the 1800's (Stansbery 1983c) or the Coosa River since 1974, prior to impoundment of its habitat there.

(Williams 1982). The penitent mussel was last collected from the mainstem Tombigbee River in 1972 (Stansbery 1983c). Remaining habitat in the Tombigbee River is in two bendways. This habitat is marginal and is subject to siltation, reduced water flows, water quality degradation, and possible loss of habitat of the fish host. The penitent mussel is surviving in the Buttahatchie River (Yokley 1978, Schultz 1981) and the East Fork Tombigbee River. The species is threatened in these two Tombigbee River tributaries by a 59-mile channel improvement project in the Buttahatchie (U.S. Army Corps of Engineers 1981) and a 53-mile clearing and snagging project in the East Fork (U.S. Army Corps of Engineers 1983). The CE has the authority to spend up to \$100,000 per year per stream for the removal of snags, clearing, and straightening for flood control purposes. Such a project has been conducted on the East Fork upstream of Mill Creek (U.S. Army Corps of Engineers 1984). The East Fork population is also impacted by water diversion. Bull Mountain Creek is a cool water stream that contributes nearly half the flow of the East Fork. During construction of the canal, the entire flow of Bull Mountain Creek was diverted. When flow is restored, water quality changes will occur. The cool inflow from Bull Mountain Creek will be warmed as it mixes with the canal water, resulting in warmer water temperatures in the East Fork. Changes in water temperatures can physiologically stress clams, alter their food supply, and impact their fish host.

**B. Overutilization for commercial, recreational, scientific, or educational purposes.** These rare species occur in such low numbers that collection for private collections and scientific purposes poses an additional threat. Considering the historic rarity of these species and their loss of historic habitat by construction of the TTW, collection of live specimens could result in the loss of a significant proportion of surviving individuals.

**C. Disease or predation.** There is no evidence of threats from disease or predation.

**D. The inadequacy of existing regulatory mechanisms.** These species occur in Mississippi and Alabama. Both States have regulations that require a permit to take clams. Enforcement of this regulation is very difficult and limited. Limited enforcement results from several factors, including limited enforcement resources, enforcement priorities, and the difficulty of apprehending violators. In addition,

these regulations do not affect habitat degradation, a major threat to these species.

**E. Other natural or manmade factors affecting their continued existence.** Marshall's mussel is restricted to the lower half of the Tombigbee River and is found in free-flowing riffle areas (Stansbery 1983b). Construction of the TTW effectively eliminated this entire reach of free-flowing river except for the three sites discussed earlier. One of these is heavily silted and may no longer support this species or any other clams. The isolation of the remaining populations, along with very low population sizes, increases vulnerability to any single adverse event. Reproduction becomes increasingly difficult owing to isolation and resulting reduction in fertility.

Curtus' mussel is also limited to the Tombigbee River system. The population in Pickens County, Alabama, has likely been extirpated by the TTW, which leaves the East Fork Tombigbee River as the only remaining occupied habitat. The historic low numbers and difficulties in successful reproduction for such a rare species increase the likelihood of a further decline.

Judge Tait's mussel is threatened by limited range and low numbers. The five remaining populations are isolated from each other by the TTW. This effectively isolates these small gene pools and leaves them susceptible to the loss of genetic variation, and thereby limits their adaptability to changing conditions. Isolation of populations and individuals also decreases the likelihood of successful reproduction because this species depends upon water currents to transport gametes from one individual to another.

The stirrup shell is restricted to the Sipsey River and three sites in the Tombigbee River. The remaining habitat in bendways of the mainstem Tombigbee River may no longer support viable populations for reasons discussed earlier. If so, the Sipsey River supports the only viable population, and this population is threatened by low numbers and the associated difficulties of successful reproduction.

The penitent mussel is threatened by limited range and low numbers. The remaining populations are isolated from each other by the TTW. This effectively creates isolated gene pools of small size that are therefore subject to loss of genetic variability. Isolation of populations and low density of individuals also decreases the likelihood of successful reproduction, since this and the other four clam species depend

upon water currents to transport gametes from one individual to another.

All five species are affected by runoff of fertilizers and pesticides. Runoff of fertilizers into small streams can exceed the assimilation ability of the stream and result in algal blooms and excesses of other aquatic vegetation. This condition can produce stream eutrophication and result in the death of the native fauna. Herbicides, insecticides, fungicides, and other pesticides are easily washed from fields into streams along with silt particles to which they adhere. While being transported downstream, they may be ingested by filter feeders, which include these native clams. Pesticide laden silt particles eventually settle to and become a part of the substrate. This increases the concentration of pesticide in the clams' habitat.

All five species may also be adversely affected by loss of their fish hosts. Although the host fish for these particular species have not been identified, the hosts of clams from riffle habitats tend to be riffle-dwelling species (Fuller 1974) and are likely to decline or become extirpated as this habitat is modified.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by these five species of clams in determining to propose this rule. Based on this evaluation, the preferred action is to list Marshall's mussel, Curtus' mussel, Judge Tait's mussel, the stirrup shell, and the penitent mussel as endangered. Endangered status is proposed because of the loss of historic habitat in the Tombigbee River by construction of the TTW and the reduction in quality of the remaining habitat owing to reduced water velocity and resulting sedimentation. Tributary populations also face threats. Threatened status would not be appropriate because these species are restricted to very limited areas, are reduced to low numbers, and remain vulnerable to a single catastrophic event. The Tombigbee River populations are close to extinction. Critical habitat is not proposed for these species for reasons given in the next section.

#### Critical Habitat

Section 4(a)(3) of the Act, as amended, requires that to the maximum extent prudent and determinable, the Secretary designate any habitat of a species that is considered to be critical habitat at the time the species is determined to be endangered or threatened. The Service finds that designation of critical habitat

is not prudent for the five Tombigbee mussels at this time owing to lack of benefit from such designation. The CE is the Federal agency most involved and is already aware of the location of the remaining populations of these five species. The CE has conducted numerous studies of the Tombigbee River system fauna and is very knowledgeable of the fauna and of project impacts. No additional benefits would accrue from the critical habitat designation that do not already accrue from the listing. In addition, these species are so rare that taking for scientific purposes and private collections is a threat. The publication of critical habitat maps and other publicity accompanying critical habitat designation would increase that threat. The locations of populations of these species have consequently been described only in general terms in this proposed rule. Precise locality data are available to appropriate Federal agencies through the Service office described in the ADDRESSES section.

#### Available Conservation Measures

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

Section 7(a) of the Act as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened, and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR Part 402, and are now under revision (see proposal at 48 FR 29990; June 29, 1983). Section 7(a)(4) requires Federal agencies to confer informally with the Service on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. If a species is subsequently listed, section 7(a)(2) requires Federal agencies to ensure that

activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

Federal involvement is expected to include CE projects for flood control and navigation and Soil Conservation Service watershed projects on Tombigbee River tributary streams. The CE will conduct annual maintenance dredging for navigation on the TTW and will manage a number of the bendways for recreation and other beneficial values. This will require the maintenance of some river flow and of boat access from one or both ends of these bendways. Structural management will be required at 12 bendways. Structural management actions include blockage structures, using dredged material, at the upstream end of seven bendways to prevent sedimentation. The downstream ends of bendways would remain open for access. The upstream ends of five bendways would be dredged initially and maintained to pre-TTW channel dimensions, plus sediment basins designed to contain the projected annual sediment deposition would be dredged and maintained (U.S. Army Corps of Engineers 1984). This management action would maintain water flows and boat access, but would require periodic dredging to remove sediment. The remaining 22 bendways will be monitored to determine the need for further structural management measures. Other CE projects that occur in rivers where these species have been found are: 84.5 miles of channel improvement and 32 miles of clearing and snagging in the Sipsey River (U.S. Army Corps of Engineers 1981); 53 miles of clearing and snagging in the East Fork (U.S. Army Corps of Engineers 1983); and 70 miles of clearing, snagging, enlargement, channels, and cutoffs in 18 streams for flood control on the Tombigbee River (U.S. Army Corps of Engineers 1983). The Soil Conservation Service has eight watersheds in operation, one in the planning stage, and one application for planning in the western tributaries of the Tombigbee River in Mississippi (U.S. Department of Agriculture 1983). Channelization activities with watershed projects could increase siltation and adversely affect potential habitat. If this rule is made final, the above agencies would be required to consult with the Service on such activities to ensure that they are

not likely to jeopardize the continued existence of any of these species.

The Act and implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take, import or export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce listed species. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that had been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Regulations governing permits are at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities. In some instances, permits may be issued during a specified period of time to relieve undue economic hardship that would be suffered if such relief were not available.

#### Public Comments Solicited

The Service intends that any final rule adopted will be accurate and as effective as possible in the conservation of endangered or threatened species. Therefore, any comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning any aspect of this proposed rule are hereby solicited. Comments particularly are sought concerning:

(1) Biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to Marshall's mussel, Curtus' mussel, Judge Tait's mussel, the stirrup shell, or the penitent mussel;

(2) The location of any additional populations of these species and the reasons why any habitat should or should not be determined to be critical habitat as provided by Section 4 of the Act;

(3) Additional information concerning the range and distribution of these species; and

(4) Current or planned activities in the subject area and their possible impacts on these species.

Final promulgation of the regulations on Marshall's mussel, Curtus' mussel,

Judge Tait's mussel, the stirrup shell, and the penitent mussel will take into consideration the comments and any additional information received by the Service, and such communications may lead to adoption of a final regulation that differs from this proposal.

The Endangered Species Act provides for a public hearing on this proposal, if requested. Requests must be filed within 45 days of the date of the proposal. Such requests must be made in writing and addressed to the Endangered Species Field Supervisor at the location given in the ADDRESSES section.

#### National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined by the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the Federal Register on October 25, 1983 (48 FR 49244).

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#### Authors

The primary authors of this proposed rule are James H. Stewart and John J. Pulliam III (see ADDRESSES section). Contact by telephone at 601/960-4900 or FTS 490-4900.

#### List of Subjects in 50 CFR Part 17

Endangered and threatened wildlife, Fish, Marine mammals, Plants (agriculture).

#### Proposed Regulations Promulgation

##### PART 17—[AMENDED]

Accordingly, it is hereby proposed to amend Part 17, Subchapter B of Chapter I, Title 50 of the Code of Federal Regulations, as set forth below:

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

Authority: Pub. L. 93-205, 87 Stat. 384; Pub. L. 94-359, 90 Stat. 911; Pub. L. 95-632, 92 Stat. 3751; Pub. L. 96-159, 93 Stat. 1225; Pub. L. 97-304, 98 Stat. 1411 (16 U.S.C. 1531 *et seq.*).

2. It is proposed to amend § 17.11(h) by adding the following, in alphabetical order under CLAMS, to the List of Endangered and Threatened Wildlife:

DDJ 75 - 00557

§ 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							
Mussel, Curtus	<i>Pleurobema curtum</i>	U.S.A. (AL, MS)	Entire	E		NA	NA
Mussel, Judge Tai's	<i>Pleurobema taiianum</i>	U.S.A. (AL, MS)	do	E		NA	NA
Mussel, Marshall's	<i>Pleurobema marshalli</i>	U.S.A. (AL, MS)	do	E		NA	NA
Mussel, penitent	<i>Epioblasma (Dysnomia) penita</i>	U.S.A. (AL, MS)	do	E		NA	NA
Stirrup shell	<i>Quadrula stapes</i>	U.S.A. (AL, MS)	do	E		NA	NA

Dated: February 28, 1986.  
 P. Daniel Smith,  
 Assistant Secretary for Fish and Wildlife and  
 Parks.  
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