

Species	Historic range	Status	When listed	Critical habitat	Special
Scientific name	Common name				
Asteraceae—Aster family:					
<i>Erigeron parishii</i>	Parish's aster	U.S.A. (CA)	E	NA	NA
Brassicaceae—Mustard family:					
<i>Lesquerella kingii</i> ssp. <i>bernardina</i>	San Bernardino Mountains dropwort	U.S.A. (CA)	E	NA	NA
Fabaceae—Pea family:					
<i>Astragalus albens</i>	Cushenbury milk-vetch	U.S.A. (CA)	E	NA	NA
Polygonaceae—Buckwheat family:					
<i>Enogonum ovalifolium</i> var. <i>vineum</i>	Cushenbury buckwheat	U.S.A. (CA)	E	NA	NA
<i>Oxytheca parishii</i> var. <i>goodmaniana</i>	Cushenbury oxytheca	U.S.A. (CA)	E		NA

Dated: October 21, 1991
 Richard N. Smith
 Director, U.S. Fish and Wildlife Service.
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 GPO CODE 4310-55-M

50 CFR Part 17

RIN 1018-AB66

Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for Eight Freshwater Mussels and Proposed Threatened Status for Three Freshwater Mussels in the Mobile River Drainage

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: The Service proposes the upland combshell (*Epioblasma metastrata*), southern acornshell (*Epioblasma othcaloogensis*), Coosa moccasinshell (*Medionidus parvulus*), southern clubshell (*Pleurobema decisum*), dark pigtoe (*Pleurobema furvum*), southern pigtoe (*Pleurobema georgianum*), ovate clubshell (*Pleurobema perovatum*), and triangular kidneyshell (*Ptychobrancheus greeni*) to be endangered species; and the fine-lined pocketbook (*Lampsilis altilis*), orange-nacre mucket (*Lampsilis perovalis*), and Alabama moccasinshell (*Medionidus acutissimus*) to be threatened species under the authority of the Endangered Species Act of 1973, as amended (Act). These eleven species are found in localized portions of the Mobile River drainage in Alabama, Georgia, Mississippi and Tennessee. They have been eliminated from much of their former ranges by impoundments,

channel modification, and water quality degradation. Habitat alteration and water quality degradation continue to threaten the remaining populations. There is also a presently developing threat from incidental take associated with commercial mussel harvesting. This proposal, if made final, would implement the protection of the Act for these species. The Service seeks relevant data and comments from the public.

DATES: Comments from all interested parties must be received by March 18, 1992. Public hearing requests must be received by January 3, 1992.

ADDRESSES: Comments and materials concerning this proposal should be sent to Complex Field Supervisor, U.S. Fish and Wildlife Service, 6578 Dogwood View Parkway, Jackson, MS 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: Paul Hartfield at the above address (telephone 601/965-4900 or FTS 490-4900).

SUPPLEMENTARY INFORMATION:

Background

The Mobile River basin drains approximately 43,700 square miles and is the largest Gulf Coast drainage east of the Mississippi River. The basin is composed of seven major river systems: The Mobile Delta (Mobile and Tensaw Rivers), Tombigbee, Black Warrior, Alabama, Cahaba, Coosa, and Tallapoosa Rivers and their tributaries. These rivers drain a variety of physiographic provinces, including the Appalachian Plateau, Alabama Valley

and Ridge, Piedmont Upland, and East Gulf Coastal Plain. The basin's size, diversity of habitat, and geographical isolation, have resulted in a high degree of variation and endemism in the unionid mussel (mussels) fauna. This proposed rule addresses 11 species that are known to have been collected from the Mobil drainage within the past 20 years. These species are believed to currently exist in the drainage. Historic distributions are based on the scientific literature, technical reports, and museum records. The names used in this rule follow mollusk nomenclature suggested by the American Fisheries Society (Turgeon *et al.* 1988).

The upland combshell (*Epioblasma metastrata* (Conrad 1838)) is a bivalve mollusk that rarely exceeds 60 millimeters (mm) (2.4 inches (in.)) in length. The shells are rhomboidal to quadrate in outline and are sexually dimorphic. Males are moderately inflated with a broadly curved posterior ridge. Females are considerably inflated, with a sharply elevated posterior ridge that swells broadly post-ventrally forming a well-developed sulcus (the groove anterior to the posterior ridge). The posterior margin of the female is broadly rounded and comes to a point anterior to the posterior extreme. Periostracum (the epidermis) color varies from yellowish-brown to tawny, and may or may not have broken green rays, or small green spots. Hinge teeth are well-developed and heavy. Johnson (1978) considered the upland combshell to be a variation of the southern combshell (= penitent mussel, *Epioblasma penita*) and synonymized the two. Stansbery (1983a) recognized consistent morphological differences between the two and considered both

1589

species to be valid taxa. The upland combshell is distinguished from the southern combshell by the diagonally straight or gently rounded posterior margin of the latter, which terminates at the post-ventral extreme of the shell (Stansbery 1983a). The U.S. Fish and Wildlife Service (Service) recognizes *Unio metastratus* Conrad and *Unio compactus* Lea as synonyms of *Epioblasma metastrata*.

The upland combshell was described from the Mulberry Fork of the Black Warrior River near Blount Springs, Alabama. The historic range included the Black Warrior River and tributaries (Mulberry Fork and Valley Creek); Cahaba River and tributaries (Little Cahaba River, Buck Creek); and the Coosa River and tributaries (Choccolocco Creek, Etowah, Conasauga, and Chatooga Rivers). The present range has declined substantially and this species now appears to be restricted to the Conasauga River in Georgia. It is possible that small populations may exist in portions of the upper Black Warrior and Cahaba River drainages. Hurd (1974) did not find the upland combshell during a 1971-73 mussel survey of the Coosa River drainage. However, he noted that Stansbery and Athearn had collected the species from that drainage during a 1966-68 survey. The most recent record from the Coosa River drainage is a Conasauga River collection of a single specimen by a Service biologist in 1988 (Richard Biggins, U.S. Fish and Wildlife Service, pers. comm., 1990). Pierson (1991) did not locate the species during his 1990 survey of the Coosa River drainage. The most recent records of the upland combshell in the Cahaba River drainage were made by Baldwin (1973). He reported the species to be greatly reduced as compared to a 1938 Cahaba River survey by van der Schalie. Pierson (1991) failed to find the species during a 1990 survey of the Cahaba River drainage. The most recent Black Warrior River drainage collections of the upland combshell were made by H.H. Smith in the early 1990's. More recent surveys of the drainage, conducted in 1974 (J. Williams, U.S. Fish and Wildlife Service, *in litt.*), 1980-82 (R. Hanley, Greenville, SC, *in litt.* 1990), 1985 (Dodd *et al.* 1986), and 1990 (Hartfield 1991), did not encounter the species.

The southern acornshell (*Epioblasma othcaloogensis* (Lea 1857)) is a small species that may grow up to 30 mm (1.2 in.) in shell length. The shells are round to oval in outline and sexually dimorphic, with a swollen posterior ridge in females. The periostracum is smooth, shiny, and yellow in color.

Johnson (1978) included *Epioblasma othcaloogensis* in his synonymy of *Epioblasma penita*, and considered the southern acornshell to be an ecomorph of the latter. Stansbery (1983a) believed *Epioblasma othcaloogensis* was distinct, and belonged in a different subgenus. The southern acornshell is distinguished from the upland combshell and the southern combshell by its smaller size, round outline, a poorly developed sulcus, and its smooth, shiny, yellow periostracum. The Service recognizes *Unio othcaloogensis* Lea and *Unio modicellus* Lea as synonyms of *Epioblasma othcaloogensis*.

The southern acornshell was described from Othcalooga Creek, Gordon County, Georgia. Historically, the species occurred in the upper Coosa River system, including the Conasauga River, Cowan's Creek, and Othcalooga Creek. Collections from the Cahaba River above the fall line have also been reported. The present range of the southern acornshell appears to be restricted to streams in the Coosa River drainage in Alabama and Georgia. The most recent collections from this drainage were by Stansbery and Athearn in 1966-68 (Hurd 1974) and by Hurd (1974). However, the continued presence of the species in the Coosa River drainage has not been recently confirmed (Biggins, pers. comm., 1990; Williams, pers. comm., 1991; Pierson 1991). Several Cahaba River records exist in the literature and museum collections. The most recent of these was made by van der Schalie (1938), who collected two specimens from the Cahaba River at Lily Shoals in Bibb County which he tentatively identified as southern acornshells. Several specimen lots taken by Smith during the early 1900's from the Cahaba River tributary of Buck Creek, Shelby County, Alabama, are in the Florida Museum of Natural Science mollusk collection. Surveys of the Cahaba River drainage by Baldwin (1973) and Pierson (1991) have not relocated the species in that drainage.

The fine-lined pocketbook (*Lampsilis altilis* (Conrad 1834)) is a medium-sized mussel, suboval in shape, and rarely exceeds 100 mm (4 in.) in length. The ventral margin of the shell is angled posteriorly in females, resulting in a pointed posterior margin. The periostracum is yellow-brown to blackish and has fine rays on the posterior half. The nacre is white, become iridescent posteriorly. The fine-lined pocketbook can be distinguished from a similar species, the orange-nacre mucket (*Lampsilis perovalis*) by its more elongate shape, thinner shell,

white nacre, pointed posterior, and ray ornamentation. The Service recognizes *Unio altilis* Conrad, *Unio clarkianus* Lea, and *Unio gerhardtii* Lea as synonyms of *Lampsilis altilis*.

The fine-lined pocketbook was described from the Alabama River near Claiborne, Monroe County, Alabama. This species was historically recorded from the Sipsey and Buttahatchee Rivers in the Tombigbee River drainage; Black Warrior River and tributaries (Sipsey Fork, Brushy and Capsey Creeks); Cahaba River and tributaries (Little Cahaba and Buck Creeks); Alabama River and a secondary tributary, Tatum Creek; Chewacla and Opintlocco Creeks in the Tallapoosa River drainage; and the Coosa River and tributaries (Choccolocco and Talladega Creeks). The current distribution of the fine-lined pocketbook appears to be limited to the headwaters of the Sipsey Fork of the Black Warrior River drainage; Tatum Creek in the Alabama River drainage; Conasauga River in the Coosa River drainage and one site in the main channel; and Chewacla and Opintlocco Creeks in the Tallapoosa drainage. The species has not been reported from the Tombigbee River drainage since H.H. Smith's early 1900 collections from the Buttahatchee and Sipsey Rivers (Stansbery 1983b). The species had not been reported from the Black Warrior River since the early 1900's. However, Dodd *et al.* (1986) made recent collections of this species from the Black Warrior River tributaries Sipsey Fork, Brushy and Capsey Creeks. The species was not relocated during 1990 survey of these streams by Service biologists (Hartfield 1991). Baldwin's (1973) survey of the Cahaba River drainage reported the fine-lined pocketbook to be fairly abundant in the main channel and tributaries. Hanley (*in litt.* 1990) collected a single shell from the Cahaba River in 1979, and Pierson (1991) did not encounter the species during his Cahaba River survey. The most recent Alabama River records of the species are the type collections in 1834. However, R. Hanley (*in litt.* 1990) collected two shells of the fine-lined pocketbook in 1981 from Tatum Creek, a tributary of Bogue Chitto Creek in the Alabama River drainage. Hurd (1974) recorded collections of the fine-lined pocketbook from 24 sites in the Coosa River drainage. Pierson's (1991) more recent survey of 15 sites in the Coosa River drainage found weathered dead shells in a short reach of the main channel below Jordan Dam, and fresh dead shells in a reach of the Conasauga River. Pierson (1991) also found the species in Chewacla and Opintlocco Creeks in the Tallapoosa

River drainage. Van der Schalie (1938), Baldwin (1973) and Williams (*in litt.* 1991) reported that the fine-lined pocketbook primarily inhabited small river and creek habitats. With the exception of Pierson's (1991) recent Coosa and Conasauga River records, this species may be eliminated from most river habitat throughout its range. Currently, it appears to be restricted to creek habitat.

The orange-nacre mucket (*Lampsilis perovalis* (Conrad 1834)) is a medium-sized mussel, 50–90 mm (2–3.6 in.) in length. The shell is oval in shape, moderately thick, and inflated. The posterior margin of the shell of mature females is obliquely truncate. The nacre is usually rose colored, pink, or occasionally white. Its periostracum varies from yellow to dark reddish brown, and with or without green rays. Hurd (1974) included the orange-nacre mucket under *Lampsilis altilis*; however, he provided no justification for his synonymy. Stansbery (1983b) and Hanley (1983) have presented information that indicates both species deserve recognition. As noted previously, this species may be distinguished from the fine-lined pocketbook, *Lampsilis altilis*, by subtle shell characters, including shell shape and nacre color. When present, the rays are generally much wider in the orange-nacre mucket than they are in the fine-lined pocketbook. The Service recognizes the following names as synonyms of *Lampsilis perovalis*:

Unio perovalis Conrad
Unio doliaris Lea
Unio placitus Lea
Unio spillmani Lea

The orange-nacre mucket was described from the Alabama River near Claiborne, Monroe County, Alabama. It is historically known from Lubbub Creek, Buttahatchee, Sipsey and East Fork Tombigbee Rivers in the Tombigbee River drainage; Brushy Creek, Mulberry and Sipsey Forks in the Black Warrior River drainage; the Alabama River; and the Little Cahaba River in the Cahaba River drainage. The species continues to occur in the Buttahatchee River and in a short reach of the East Fork Tombigbee River (Hartfield and Jones 1989, 1990), the headwaters of the Sipsey Fork (Dodd *et al.* 1986) and in the Sipsey and Little Cahaba Rivers (Pierson 1991). A recent survey by Service biologists indicates the orange-nacre mucket may have been eliminated from the Mulberry Fork of the Black Warrior River (Hartfield 1991). The species has not been reported from the Alabama River since its description. Limited searches by Service biologists

tend to confirm its absence from this river.

The Alabama moccasinshell (*Medionidus acutissimus* (Lea 1831)) is a small, delicate species, approximately 30 mm (1.2 in.) in length. The shell is narrowly elliptical, thin, with a well-developed, acute, posterior ridge terminating in an acute point on the posterior ventral margin. The posterior slope is finely corrugated. The periostracum is yellow to brownish yellow, with broken green rays across the entire surface of the shell. The thin nacre is translucent along the margins and salmon-colored in the umbos (beak cavity). The Alabama moccasinshell is distinguished from a similar species, the Coosa moccasinshell (*Medionidus parvulus*) by its acute posterior ridge, sharply pointed posterior apex, salmon colored nacre, and smaller size. The Service recognizes *Unio acutissimus* Lea and *Unio rubellinus* Lea as synonyms of *Medionidus acutissimus*.

The Alabama moccasinshell was described from the Alabama River, Alabama. Literature and collection records of the species are known from the Alabama River; Tombigbee River and tributaries (Luxapallila Creek, Buttahatchee and Sipsey Rivers); Black Warrior River and tributaries (Mulberry Fork, Brushy Creek); Cahaba River; and Coosa River and tributaries (Talladega, Choccolocco Creeks, Chatooga River). The species occurs in the Luxapallila Creek, Buttahatchee and Sipsey Rivers in the Tombigbee River drainage; the headwaters of the Sipsey Fork (Brushy Creek) in the Black Warrior River drainage; and the Conasauga River. It has not been found in the Tombigbee River since construction of the Tennessee-Tombigbee Waterway. Recent surveys of the Black Warrior River drainage (Hartfield 1991) and the Cahaba River and tributaries (Pierson 1991) have failed to locate the Alabama moccasinshell. As recently as 1985, Dodd *et al.* (1986) collected the species from Brushy Creek, a Sipsey Fork tributary. The last known collections in the Cahaba River drainage were in 1973 (Baldwin 1973). In 1974, Hurd (1974) collected only four lots from the Coosa River drainage. Service biologists collected a single specimen from the Conasauga River in 1990. Pierson (1991) did not find the species in the Coosa River drainage.

The Coosa moccasinshell (*Medionidus parvulus* (Lea 1860)) is a small species occasionally exceeding 40 mm (1.6 in.) in length. The shell is thin and fragile, elongate and elliptical to rhomboidal in outline. The posterior ridge is inflated, smoothly rounded, terminating in a broadly rounded point;

the posterior slope is finely corrugated. The periostracum is yellow-brown to dark brown and has fine-green rays. The nacre is blue, occasionally with salmon-colored spots. As noted previously, the Coosa moccasinshell can be distinguished from the Alabama moccasinshell by its size, broadly rounded posterior ridge and apex, and nacre color. The Service recognizes *Unio parvulus* Lea as equivalent to *Medionidus parvulus*. The Coosa moccasinshell was described from the Coosa River, Alabama, and the Chatooga River, Georgia. The species has been collected from the Cahaba River; the Sipsey Fork of the Black Warrior River; and the Coosa River and tributaries (Choccolocco Creek, Chatooga, Conasauga and Little Rivers). In 1985, a Service biologist (J. Pulliam) collected a single specimen in the headwaters of the Sipsey Fork (Black Warrior River drainage). The most recent collection from the Little River is a single specimen taken by Hanley (*in litt.* 1990) in 1981. The existence of the Conasauga River population has been confirmed by Pierson (1991) and a collection made by Service biologists in 1990. Other Coosa River drainage records have not been recently confirmed. Mussel surveys in the Cahaba River by van der Schalie (1938), Baldwin (1973) and Pierson (1991) did not find the species.

The southern clubshell (*Pleurobema decisum* (Lea 1831)) is a medium sized mussel about 70 mm (2.8 in.) long, with a thick shell, and heavy hinge plate and teeth. The shell outline is roughly rectangular, produced posteriorly with the umbos terminal with the anterior margin, or nearly so. The posterior ridge is moderately inflated and ends abruptly with little development of the posterior slope at the dorsum of the shell. The periostracum is yellow to yellow-brown with occasional green rays or spots on the umbo in young specimens. The southern clubshell is distinguished from a closely related species, the black clubshell (= Curtus' pearly mussel, *Pleurobema curtum*) by its elongate shape, lighter color, and the presence of a well-defined sulcus in the latter species. The Service recognizes the following names as synonyms of *Pleurobema decisum*:

Unio decisus Lea
Unio anaticulus Lea
Unio crebrivittatus Lea
Unio pallidovolvus Lea

The southern clubshell was described from the Alabama River, Alabama. Except for the Mobile Delta, this species was formerly known from every major

stream system in the Mobile River basin. This includes the Alabama River and Bogue Chitto Creek; Tombigbee River and tributaries (Buttahatchee, East Fork Tombigbee, and Sipsey Rivers and Bull Mountain, Luxapallila, and Lubbub Creeks); Black Warrior River; Cahaba and Little Cahaba Rivers; two Tallapoosa tributaries, Uphapee and Chewacla Creeks; and the Coosa River and tributaries (Oostanaula, Conasauga, Etowah, Chatooga, and Coosawattee Rivers and Kelly, Talladega and Shoal Creeks). Currently, the species is known in Bogue Chitto Creek in the Alabama River drainage; Buttahatchee, East Fork Tombigbee and Sipsey Rivers in the Tombigbee River drainage; and Chewacla Creek in the Tallapoosa River drainage. The most recent Coosa River drainage records are from the late 1960's and 1970's in the Conasauga River, and Shoal and Kelly Creeks. The most recent Cahaba River drainage records were Baldwin's (1973) collections in the Cahaba River. Pierson (1991) was unable to confirm the continued existence of the species in either the Coosa or Cahaba River drainages.

The dark pigtoe (*Pleurobema furvum* (Conrad 1834)) is a small to medium-sized mussel, occasionally reaching 60 mm (2.4 in.) in length. The shell is oval in outline, and moderately inflated. Beaks are located in the anterior portion of the shell. The posterior ridge is abruptly rounded and terminates in a broadly rounded, subcentral, posterior point. The periostracum is dark, reddish brown with numerous and closely spaced, dark growth lines. The hinge plate is wide and the teeth are heavy and large, especially in older specimens. The nacre approaches white in the umbos, and is highly iridescent on the posterior margin. Specimens of the dark pigtoe are occasionally confused with the Warrior pigtoe, *Pleurobema rubellum* (Conrad 1834). This confusion can be attributed to a paucity of recent specimens of either species, and an incorrect association of the nomenclature with specimens. The Warrior pigtoe is a smaller species, suborbicular in outline, with the beaks more centrally located, and with pink or purplish nacre. The dark pigtoe may also be confused with old specimens of the southern pigtoe, *Pleurobema georgianum*. The latter is more elliptical in outline, is not as pointed posteriorly, and is more compressed than the dark pigtoe. Its hinge plate and teeth are smaller than those of the black pigtoe. The southern pigtoe has yellow to yellow-brown periostracum, and occasionally has broken green rays along the posterior slope and ridge. It

has a white nacre. The Service recognizes *Unio furvus* Conrad as equivalent to *Pleurobema furvum*.

The dark pigtoe was described from the Black Warrior River, Alabama. The historic distribution of the dark pigtoe was probably restricted to the Black Warrior River above the fall line. Dodd *et al.* (1986) recently collected this species, misidentified as *Pleurobema rubellum* (Hartfield pers. obs., February 1990), from the headwaters of the Sipsey Fork. Shells from this population were collected by a Service biologist in 1990 (Hartfield 1991). Badly weathered specimens were also found in the Locust Fork of the Black Warrior River near the Jefferson-Blount County line.

The southern pigtoe (*Pleurobema georgianum* (Lea 1841)) is a small to medium-sized mussel occasionally exceeding 60 mm (2.4 in.) in length. The shell is elliptical to oval in outline and somewhat compressed. The posterior slope is smoothly rounded. The pseudocardinal teeth are small but well-developed, and the nacre is white. The periostracum is yellow to yellow-brown. Growth lines are numerous and may be dark brown. Small specimens may have green spots at the growth lines along the posterior ridge and near the umbo. As discussed for the previous species, older specimens of the southern pigtoe may be confused with the dark pigtoe, *Pleurobema furvum*. The Service recognizes *Unio georgiana* as equivalent to *Pleurobema georgiana*.

The southern pigtoe was described from the upper Coosa River drainage in Georgia. The historic distribution appears to have been restricted to the Coosa River drainage. Service biologists have examined museum records of this species from the Coosa River, Shoal Creek, and the Chatooga and Conasauga Rivers. The most recent record of the species is a single specimen taken by a Service biologist (Richard Biggins) from the Conasauga River in 1990. Hurd (1974) reported collecting seven lots of southern pigtoes, and examined 35 museum lots from the Coosa River and its tributaries. However, Pierson (1991) did not encounter the species in the Coosa River drainage.

The ovate clubshell (*Pleurobema perovatum* (Conrad 1834)) is a small to medium-sized mussel that rarely exceeds 50 mm (2.0 in.) in length. The shell is oval to elliptical in shape, and has nearly terminal, inflated umbos. The posterior ridge is well-developed, broadly rounded, and often concave. The posterior slope is produced well beyond the posterior ridge. Periostracum color varies from yellow to dark brown, and occasionally has broad green rays

that may cover most of the umbo and posterior ridge. The nacre is white. Due to the nearly terminal umbos in some specimens, ovate clubshells may be mistaken for young southern clubshells (*Pleurobema decisum*). They may be distinguished from the latter by their thinner shells, and a gently sloping, well developed posterior slope. The Service recognizes the following names as synonyms of *Pleurobema perovatum*:

Unio perovatus Conrad
Unio nux Lea
Unio cinnamonicus Lea
Unio pinkstoni Wright
Unio concolor Lea
Unio flavidulus Lea
Unio johannis Lea

The ovate clubshell was described from small streams in Greene County, Alabama. The species occurred in the Tombigbee River and tributaries (Buttahatchee and Sipsey Rivers; Luxapallila, Coalfire and Lubbub Creeks); Black Warrior River and tributaries (Locust Fork; Village, Prairie, Big Prairie, Brushy and Blackwater Creeks); Alabama River; Cahaba River and the tributary Buck Creek; Chewacla, Uphapee and Opintlocco Creeks in the Tallapoosa drainage; and the Coosa River and tributaries (Conasauga and Etowah Rivers, and Holly Creek). Currently, the species is known from the Buttahatchee and Sipsey Rivers in the Tombigbee River drainage; Blackwater Creek and Locust Fork in the Black Warrior drainage; and Chewacla Creek in the Tallapoosa drainage (Dodd *et al.* 1986, Hartfield and Jones 1989, Pierson 1991). The most recent records from the Coosa drainage are two lots collected by Hurd (1974). The ovate clubshell was last collected in the Cahaba River in 1978 by Hanley (*in litt.* 1990). Pierson (1991) did not find the ovate clubshell in the Coosa River drainage or the Cahaba River drainage.

The triangular kidneyshell (*Ptychobranthus greeni* (Conrad 1834)) is oval to elliptical in outline, and may approach 100 mm (4.0 in.) in length. The shell is generally compressed, and may be flattened ventral to the umbos. The posterior ridge is broadly rounded and terminates in a broad round point post-ventrally. The pseudocardinal teeth are heavy, and the laterals are heavy, gently curved and short. The periostracum is straw-yellow in young specimens, but becomes yellow-brown in older ones. It may have fine and wavy, or wide and broken, green rays anterior to the posterior ridge. This species is morphologically variable and may be confused with some species of *Pleurobema*. Ecomorphs of this species

are best identified by a process of elimination. The Service recognizes the following names as synonyms of *Ptychobranthus greenii*:

Unio greenii Conrad
Unio brumbleyanus Lea
Unio brumbyanus Lea
Unio foremanianus Lea
Unio woodwardius Lea
Unio woodwardianus Lea
Unio trinacrus Lea
Unio flavescens Lea
Unio simplex Lea

The triangular kidneyshell was described from the headwaters of the Black Warrior River, Alabama. The historic range includes the Black Warrior River and tributaries (Mulberry Fork, Locust Fork, North and Little Warrior Rivers, Brushy Creek, Sipsey Fork); Cahaba River; and the Coosa River and tributaries (Choccolocco Creek; Chatooga, Conasauga, and Etowah Rivers). The species is currently known from the headwaters of the Sipsey Fork and Little Warrior River in the Black Warrior River drainage (Dodd *et al.* 1986, Hartfield 1991); and in the Conasauga River in the Coosa drainage (Pierson 1991). The triangular kidneyshell was last collected from the Cahaba River in 1979 by Hanley (*in litt.* 1990). Recent surveys have failed to find other historically known populations (Hartfield 1991; Pierson 1991; J. Williams, pers. comm., 1991).

All of these mussels are usually found on stable gravel and sandy-gravel substrates in high quality lotic habitats. Little else is known of the habitat requirements of these species. Their life histories are presumed to follow that of other, better known, related species. Sexes in unionid mussels are usually separate. Males release sperm into the water column, which enter the incurrent siphons of females through normal respiratory and feeding activities. Eggs are held in the females gills where they may come into contact with the sperm. Fertilized eggs develop into larva called glochidia. Mature glochidia are released into the water column and they must find and attach to the gills or fins of a suitable host fish species. Once attached, they metamorphose to a juvenile mussel. The duration of the parasitic stage varies with water temperature, mussel species, and perhaps host species. After metamorphosis, the juvenile mussels release from the host. To survive, they must drop onto a suitable substrate (Oesch 1984). Host species and duration of the parasitic stage are unknown for the mussel species considered in this proposed rule.

The orange-nacre mussel (*Lampsilis perovalis*) was included as a category 2 species in the May 22, 1984, **Federal Register** (49 FR 21675). This species was again included as a category 2 species in the January 6, 1989, **Federal Register** (54 FR 578-579), along with the upland combshell (*Epioblasma metastrata*), southern combshell (*E. othcaloogensis*), and fine-lined pocketbook (*Lampsilis altilis*). Category 2 species are those for which there is some evidence of vulnerability, but for which there are not enough data to support listing proposals at the time the notice is published. There are no Service actions in the public record for any of the other species in this proposal.

Summary of Factors Affecting the Species

Section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR Part 424) promulgated to implement the listing provisions of the Act set forth the procedures for adding species to the Federal lists. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to the upland combshell (*Epioblasma metastrata*), southern acornshell (*Epioblasma othcaloogensis*), Coosa moccasinshell (*Medionidus parvulus*), southern clubshell (*Pleurobema decisum*), dark pigtoe (*Pleurobema furvum*), southern pigtoe (*Pleurobema georgianum*), ovate clubshell (*Pleurobema perovatum*), triangular kidneyshell (*Ptychobranthus greenii*), fine-lined pocketbook (*Lampsilis altilis*), orange-nacre mucket (*Lampsilis perovalis*), and Alabama moccasinshell (*Medionidus acutissimus*) are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* Habitat modification, sedimentation, and water quality degradation represent the major threats to the 11 species discussed above. None of the species are known to tolerate impoundments. More than 1000 miles of large and small river habitat in the Mobile River drainage has been impounded for navigation, flood control, water supply, and/or hydroelectric production purposes. Impoundments adversely affect riverine mussels by: Killing them during construction and dredging; suffocation by accumulating sediments; lowered food and oxygen availability by the reduction of water flow; and the local extirpation of host fish. Other forms of habitat modification such as channelization, channel clearing and de-snagging, and gravel mining

result in stream bed scour and erosion, increased turbidity, reduction of groundwater levels, sedimentation, and changes in the aquatic community structure. Sedimentation may cause direct mortality by deposition and suffocation (Ellis 1936) and eliminate or reduce recruitment of juvenile mussels (Negus 1966). Suspended sediments can also interfere with feeding (Dennis 1984). Activities that historically and currently cause sedimentation of streams and rivers in the drainages where these mussel species occur include: channel modification, agriculture, forestry, mining, and industrial and residential development.

Other types of water quality degradation from both point and non-point sources affect these mussel species. Stream discharge from these sources may result in decreased dissolved oxygen concentration, increased acidity and conductivity, and other changes in water chemistry which may impact mussels and/or their host fishes. Point sources of water quality degradation include municipal and industrial effluents, and coalbed methane produced water discharge. Non-point sources include runoff from cultivated fields, pastures, private wastewater effluents, agricultural feed-lots and poultry houses, active and abandoned coal mine sites, and highway and road drainage.

The orange-nacre mucket, Alabama moccasinshell, southern clubshell, and ovate clubshell have been found in the Tombigbee River and some of its tributaries (van der Schalie 1981; Hartfield and Jones 1989, 1990; U.S. Army Corps of Engineers 1975). Six lock and dams, constructed by the U.S. Army Corps of Engineers (COE) between Coffeeville, Alabama and Aberdeen, Mississippi, have impounded the Tombigbee River. Almost 300 miles of free-flowing riverine habitat has been eliminated. The lower portions of the Sipsey, Buttahatchee, and East Fork Tombigbee Rivers have also been affected by these impoundments. The COE (1990) estimated that approximately 200 linear miles of streams had been channelized in the Tombigbee River basin by Federal agencies, and an additional 321 miles of future channel modifications were authorized.

The southern clubshell has been collected from Bull Mountain Creek in the upper Tombigbee River drainage (Pierson 1991). The canal section of the Tennessee-Tombigbee Waterway (Waterway) bisected Bull Mountain Creek, impounding and isolating a

portion of the stream that provided habitat for this species.

The East Fork Tombigbee River provides habitat for the southern clubshell and the orange-nacre mucket in a short reach between the confluence of Bull Mountain Creek and the Waterway's Lock B spillway (Hartfield and Jones 1989). Bull Mountain Creek flood flows have been redirected by the Waterway from the natural creek drainage at the upper end of this reach to the Lock B spillway at the lower end. This change in the hydrological regime will eventually result in the accumulation of finer sediments over the gravel substrates above the spillway that the mussels now occupy (COE 1988). Western tributaries draining into the East Fork Tombigbee River have been channelized, have degraded, and as a result, have contributed almost two million tons of sediment into the river annually (COE 1989). Sedimentation of the upper river has resulted in channel blockage in the near past. The COE currently conducts annual channel maintenance in the East Fork Tombigbee River above the mussel habitat. This maintenance project may contribute to siltation in that portion of the river that provides mussel habitat.

The Buttahatchee River provides habitat for the orange-nacre mucket, Alabama moccasinshell, southern clubshell and ovate clubshell (Hartfield and Jones 1990). However, these species have been eliminated from the lower reach of the river (below U.S. Highway 45) by impoundment of the Tombigbee River and stream capture by gravel mines (Hartfield and Jones 1990). Above Highway 45, the mussels are affected by runoff from abandoned kaolin mines. These mines are estimated to deliver as much as 27,000 tons of fine sediments into the system per year (COE 1990). The COE has been authorized to do a 59 mile channel modification project in the Buttahatchee River (COE 1977) that would impact existing mussel habitat.

Luxapallila Creek provided habitat for the southern clubshell near its confluence with the Tombigbee River (Pierson 1991). This portion of the creek has been affected by impoundment of the Waterway. It has also been dredged and channelled for flood control. The Alabama moccasinshell has been collected from the middle reaches of the Luxapallila Creek in Mississippi (Hartfield, pers. obs., 1984). The COE (1985) has been authorized and funded to do channel modification and desnagging for flood control in this portion of Luxapallila Creek. Upstream of the Alabama State line, the creek has been extensively channelized, has

aggraded, and has sedimentation problems.

The lower half of Sipsey River in Tuscaloosa and Greene Counties, Alabama, provides habitat for the orange-nacre mucket, southern clubshell, and ovate clubshell (Pierson 1991). Historic populations of these species and the fine-lined pocketbook in the upper half of the drainage (van der Schalie 1981) have not been recently found (Hartfield, pers. obs.). The Alabama Department of Environmental Management (ADEM) has received permit applications for discharge of produced waters from coalbed methane wells into the Sipsey River. The effect of these discharges on mussel survival and reproduction is unknown. The COE (1977) has been authorized to modify 84.5 miles of Sipsey River channel. This action will impact existing mussel habitat.

The Black Warrior River basin provided habitat for the upland combshell, fine-lined pocketbook, orange-nacre mucket, Alabama moccasinshell, Coosa moccasinshell, southern clubshell, dark pigtoe, ovate clubshell and triangular kidneyshell (van der Schalie 1981, Hartfield 1991). Mussel surveys over the past 20 years suggest some of these species may be extirpated, and others have been severely restricted in distribution (Hartfield 1991). More than 170 miles of the main channel of the Black Warrior River, and portions of its lower tributaries, have been impounded by a series of four locks and dams. None of these species have been collected from the main channel of the Black Warrior River, or its coastal plain tributaries, for at least 20 years (Williams, pers. comm., 1990; Hartfield 1991). The effects of the upper-most structure, John Hollis Bankhead Lock and Dam, extend at least 20 miles into the lower Locust Fork and over 40 miles into the lower Mulberry Fork.

North River, a Black Warrior River tributary, provided habitat for the triangular kidneyshell (van der Schalie 1981). At least 30 miles of the North River was impounded in 1969 by the City of Tuscaloosa to create a municipal water supply. This impoundment, as well as point and non-point pollution, has apparently eliminated most riverine mussel species from the North River (Hartfield 1991).

Another tributary of the Black Warrior River, Sipsey Fork, was impounded by Alabama Power Company in 1961 for hydroelectric generation. This impoundment has affected over 60 miles of river and stream habitat. The Coosa and Alabama

moccasinshells exist in a short reach of the unimpounded headwaters of the Sipsey Fork (Hartfield 1991). The fine-lined pocketbook, orange-nacre mucket, dark pigtoe, and triangular kidneyshell have recently been collected from the same portion of the Sipsey Fork, as well as from an unimpounded headwater reach of its tributary, Brushy Fork (Dodd *et al.* 1986, Hartfield 1991).

Additional smaller impoundments have also been constructed in the Black Warrior River drainage, and other major impoundments are planned. The Birmingham Water Works and Sewer Board is planning to construct a dam on the Locust Fork near the Blount-Jefferson County line that would impound about 3000 acres. Construction of this reservoir will likely impact the only location where the ovate clubshell and triangular kidneyshell have recently been collected in the main channel of the Locust Fork (Dodd *et al.* 1986).

Pollution is a major problem in the Black Warrior River basin. Pollution sources are located throughout the area, but are particularly concentrated in and around the Birmingham-Jefferson County area. Organic pollution from poultry and cattle feedlot operations has been implicated in the decline of native mollusks of the free-flowing Mulberry and Locust Forks in Cullman and Blount Counties (Hartfield 1991). The upper Black Warrior River basin is underlain by the Black Warrior and Plateau coal fields. Surface coal mines have had a significant impact on the aquatic resources of the basin. Acidification, increased mineralization, and sediment loading from surface mines has resulted in the local exclusion of fish species (Mettee *et al.* 1989b). The enforcement of recent, more stringent, mining regulations has reduced the impact of mines in compliance with the new regulations. However, past mining practices, mines that are not in compliance, and abandoned mines may still be contributing sediment and chemical pollution to the streams in this portion of the basin.

The Alabama River drainage provided historic habitat for the fine-lined pocketbook, orange-nacre mucket, Alabama moccasinshell, southern clubshell, and ovate clubshell (Conrad 1834; Lea 1831, 1860). Dredging of the Alabama River channel began in 1878 and has continued to the present. Locks and dams on this river were completed in the 1960's, impounding more than 200 miles of the main channel from Claiborne, Alabama, to the confluence of the Coosa and Tallapoosa Rivers. Many Alabama River tributaries in the impounded portion of the drainage are

affected in their lower reaches by backwater. Of the species listed above, only the fine-lined pocketbook (Tatum Creek) and the southern clubshell (Bogue Chitto Creek) have been recently confirmed to continue to exist in the Alabama River drainage (Hanley, *in litt.*, 1990; Pierson 1991).

The upland combshell, southern combshell, fine-lined pocketbook, Alabama moccasinshell, Coosa moccasinshell, southern clubshell, southern pigtoe, ovate clubshell, and triangular kidneyshell were known from the Coosa River and tributaries (Hurd 1974). Recent records of these seven species in the Coosa River drainage are from the Conasauga River above Dalton, Georgia. Only one species, the fine-lined pocketbook mussel, has recently been collected in the Coosa River (Pierson 1991). Approximately 230 river miles of the Coosa River has been impounded for hydropower by a series of six dams. The Coosawattee River has been impounded in Murray and Gilmer Counties, Georgia, and a dam on the Etowah River in Bartow County, Georgia, has impounded a significant portion of that drainage.

Hurd (1974) noted the local extirpation of historically known mussel communities from several streams due to water quality degradation. These streams included the Conasauga River below Dalton, Georgia, the Chatooga River and Tallaseehatchee Creek. These waters polluted by textile and carpet mill wastes. He also noted that the unionid fauna had been extirpated, perhaps because of organic pollution and siltation, from the Etowah River, Talladega and Swamp Creeks, and from many of the lower tributaries of the Coosa River.

None of the 11 species considered in this review are known to have been collected in the Tallapoosa River. However, three species (fine-lined pocketbook, southern clubshell, ovate clubshell) are known from the Uphapee Creek and its tributary, Chewacla Creek, in the Tallapoosa River drainage (Jenkinson 1973, Pierson 1991). Uphapee Creek populations of the southern clubshell and the ovate clubshell have not been recently confirmed. Sand and gravel mining operations along Uphapee Creek have caused an increase in siltation and shifting sand in the stream channel (Pierson 1991). All three species, however, have been recently collected in Chewacla Creek (Pierson 1991).

The upland combshell, southern acornshell, fine-lined pocketbook, orange-nacre mucket, Alabama moccasinshell, Coosa moccasinshell, southern clubshell, ovate clubshell and triangular kidneyshell were known from the Cahaba River system (van der

Schalie 1938, Baldwin 1973). Of these nine species, only the orange-nacre mucket has been recently found in the drainage (Pierson 1991). The most recent records of the southern acornshell, ovate clubshell and the Coosa moccasinshell were made by van der Schalie (1938). Van der Schalie also noted that the southern clubshell was the most abundant species of *Pleurobema* encountered in the Cahaba River drainage at that time. Baldwin (1973) reported an apparent decline in the numbers of southern clubshells in the Cahaba River since van der Schalie's earlier collections. In 1990, Pierson (1991) found only a few badly weathered and eroded southern clubshell shells from two locations in the Cahaba River drainage. Baldwin's (1973) collections of the upland combshell, fine-lined pocketbook, Alabama moccasinshell and triangular kidneyshell are the most recent records of these species in the drainage.

Water quality degradation is a major problem in the Cahaba River basin (Pierson 1991). There are 10 municipal wastewater treatment plants, 35 surface mining areas, one coalbed methane operation and 67 other permitted discharges in the Cahaba River Basin (ADEM, *in litt.*, 1990). Water quality in the drainage is also affected by siltation from surface mining, road construction, and site preparation for drilling operations. No major impoundments have been constructed in the main channel of the Cahaba River. However, the lowermost reach of the river has been affected by the impoundment of the Alabama River, and one headwater channel, the Little Cahaba River, has been impounded as a water supply for the City of Birmingham. Current plans to enlarge this impoundment have the potential to alter low water flows in the upper river.

B. Overutilization for commercial, recreational, scientific, or educational purposes. These species may be dislodged from the substrate, or taken in routine commercial mussel harvest. Commercial mussel harvest is expanding in Alabama, and Mississippi has recently passed legislation that may eventually result in the opening of selected State waters to commercial harvest of mussels. The small rivers and streams where these species occur have not traditionally supported a commercial mussel harvest. However, a dramatic increase in the price of shell and increased competition is attracting commercial shellers to these areas. As these species become more uncommon, the interest of scientific and recreational collectors increases. Populations of the mussels considered in this rule are

generally localized, exposed during low flow periods, and are vulnerable to take for fish bait, curiosity, or vandalism.

C. Disease or predation. Diseases of freshwater mussels are virtually unknown. However, an unidentified disease may be implicated in a series of localized mussel dieoffs that occurred primarily in the Mississippi River basin during the past ten years. Juvenile and adult mussels are prey items for some invertebrate predators and parasites, and provide prey for a few vertebrate predators. Predation by native animals is a normal aspect of the population dynamics of a healthy mussel population. However, Neves and Odum (1989) have suggested that muskrat predation may jeopardize the recovery of some endangered mussels and might cause local extirpation of rare mussel species. Muskrat predation on mussels has been observed in all of the drainages where these 11 mussel species are found.

D. The inadequacy of existing regulatory mechanisms. None of these species are given any special consideration when project impacts are reviewed for compliance with existing State and Federal environmental laws and regulations. All the States where these species occur require scientific collecting permits. However, enforcement of these permit requirements is difficult.

E. Other natural or manmade factors affecting its continued existence. The ranges of these species have been fragmented by reservoirs, resulting in the isolation of populations within and among drainages. Isolation may also cause a decrease in genetic diversity and reduce the reproductive and recruitment potential. All extant populations of these species are susceptible to extirpation by a single catastrophic event, such as a chemical spill or major channel modification.

These endemic Mobile basin mussels would be adversely affected by the loss of the fish hosts essential to their parasitic glochidial stage. Although their fish hosts are unknown, the host is usually a specific component of the ecosystem where the mussel species is found. Impoundment, water quality degradation, and siltation have been identified as factors in the fragmentation, isolation and local extirpation of fish species in the Mobile River basin (Mettee *et al.* 1989a, 1989b; Boschung 1989; Pierson *et al.* 1989).

The rapid spread of the introduced asiatic clam, *Corbicula fluminea*, may impact the native bivalve mussels in the Mobile River basin. This species may actively compete with native mussels

for space and nutrients (Clarke 1988). Hurd (1974) was concerned that the introduction of the asiatic clam would disrupt the cyclical prey-predator balance between muskrats and native mussels. Prior to the introduction of the asiatic clam, muskrat predation on native mussels was probably naturally regulated by the migration of muskrats when the mussel populations declined. Hurd suggested the high reproductive and growth potential of asiatic clams might eliminate the need for muskrats to migrate when native mussel numbers decreased. Consequently, predation pressure would continue regardless of the abundance of native mussels. He was also concerned that large numbers of asiatic clams would allow the muskrat population to expand, thus increasing predatory pressure on native mussels. Recently, it has been noted that in many drainages the only shells found in muskrat middens are asiatic clams (Hartfield 1991, Pierson 1991).

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by these 11 species of freshwater mussels in determining to propose this rule. Based on this evaluation, the preferred action is to list the upland combshell (*Epioblasma melastriata*), southern combshell (*Epioblasma othcaloogensis*), Coosa moccasinshell (*Medionidus parvulus*), southern clubshell (*Pleurobema decisum*), dark pigtoe (*Pleurobema furvum*), southern pigtoe (*Pleurobema georgianum*), ovate clubshell (*Pleurobema perovatum*), and triangular kidneyshell (*Ptychobranchus greeni*) as endangered. It is also the preferred action to list the fine-lined pocketbook (*Lampsilis altilis*), orange-nacre mucket (*Lampsilis perovalis*), and the Alabama moccasinshell (*Medionidus acutissimus*) as threatened. Endangered status is appropriate for eight of these species because of the loss of habitat to impoundment, channelization and water quality degradation, and the increased vulnerability to take. The currently known populations of these species are fragmented, isolated, and threatened by channel modification projects and water quality degradation. The remaining three species are confronted with similar threats, but are more widely distributed throughout their historical range making threatened status more appropriate. Critical habitat is not proposed for these species for reasons discussed in the following section.

Critical Habitat

Section 4(a)(3) of the Act, as amended, requires that, to the maximum extent

prudent and determinable, the Secretary propose critical habitat at the time a species is proposed to be endangered or threatened. The Service does not believe that the designation of critical habitat is presently prudent for any of these 11 mussel species. As discussed under Factor B in the Summary of Factors Affecting the Species, these mussels are subject to take by scientific and recreational collectors, and take incidental to commercial harvest. Publicity generated by the listing and publication of critical habitat descriptions and maps can be expected to make these mussels more vulnerable by exacerbating the potential for take. These species co-occur with commercial mussel species, and are indicative of high quality, relatively undisturbed mussel habitat. The identification of this habitat by the designation of critical habitat could attract the commercial mussel industry and increase incidental commercial take. Such taking is difficult to control, and even if intentional collection is avoided, listed mussels dislodged by the take of commercial species are likely to have reduced survival. Publication of critical habitat maps would only contribute to a difficult enforcement situation and increase the potential for unregulated take. All appropriate agencies have been notified of the location of these mussel species and the importance of protecting their habitat. Since there are potential negative effects, the Service concludes that critical habitat designation presently is not prudent for the upland combshell, southern combshell, Coosa moccasinshell, southern clubshell, dark pigtoe, southern pigtoe, ovate clubshell, triangular kidneyshell, fine-lined pocketbook, orange-nacre musket, and Alabama moccasinshell. Protection of these species' habitat will be addressed through the recovery process, the section 7 consultation process, and section 9 prohibitions on take.

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. The protection required of Federal agencies

and the prohibitions against taking and harm are discussed, in part, below.

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

Federal involvement is expected to include the Environmental Protection Agency through the Clean Water Act's provisions for pesticide registration and waste management actions. The Corps of Engineers will consider these species in project planning and operation and during the permit review process. The Federal Highway Administration will consider impacts of federally funded bridge and road construction when known habitat may be impacted. Continuing urban development within the drainage basins may involve the Farmers Home Administration and their loan programs. The Soil Conservation Service will consider the species during project planning and under their farmer's assistance programs.

The Act and implementing regulations found at 50 CFR 17.21 for endangered species, and 17.21 and 17.31 for threatened species set forth a series of general prohibitions and exceptions that apply to all endangered or threatened wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, or collect; or to attempt any of these), import or export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the

Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered or threatened wildlife species under certain circumstances. Regulations governing permits are at 50 CFR 17.22, 17.23 and 17.32. 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. For threatened species, there are also permits for zoological exhibition, educational purposes, or special purposes consistent with the purpose of the Act.

In some instances, permits may be issued for a specified time to relieve undue economic hardship that would be suffered if such relief were not available. Though these species coexist with commercial mussels, they are not currently the target of trade. Therefore, no permit requests are expected.

Public Comments Solicited

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

(1) Biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to these species;

(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, distribution, and population size 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 these species will take into consideration the comments and any additional information received by the Service, and such communications may lead to a final regulation that differs from this proposal.

The Endangered Species Act provides for a public hearing on this proposal, if requested. Request must be received within 45 days of the date of publication of the proposal. Such requests must be made in writing and addressed to the Complex Field Supervisor (see ADDRESSES section).

National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined under the authority of 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).

References Cited

A complete list of all references cited herein, as well as others, is available upon request from the Complex Field Supervisor (see ADDRESSES section).

Author

The primary author of this proposed rule is Paul Hartfield (see ADDRESSES section).

List of Subjects in 50 CFR Part 17

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

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: 16 U.S.C. 1361-1407; 16 U.S.C. 1531-1544; 16 U.S.C. 4201-4245; Pub. L. 90-625, 100 Stat. 3500; unless otherwise noted.

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:

§ 17.11 Endangered and threatened wildlife.

(b)

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
Acomshell, southern	<i>Epioblasma otchaloogensis</i>	U.S.A. (AL, TN, GA)	NA	E		NA	NA
Clubshell, ovate	<i>Pleurobema parvatum</i>	U.S.A. (AL, GA, MS, TN)	NA	E		NA	NA
Clubshell, southern	<i>Pleurobema decisum</i>	U.S.A. (AL, GA, MS, TN)	NA	E		NA	NA
Combshell, upland	<i>Epioblasma metastriata</i>	U.S.A. (AL, GA, TN)	NA	E		NA	NA
Kidneyshell, triangular	<i>Ptychobanachus greeni</i>	U.S.A. (AL, GA, TN)	NA	E		NA	NA
Moccasinshell, Alabama	<i>Medionidus acutissimus</i>	U.S.A. (AL, GA, MS)	NA	T		NA	NA
Moccasinshell, Coosa	<i>Medionidus parvulus</i>	U.S.A. (AL, GA, TN)	NA	E		NA	NA
Mucket, orange-nacre	<i>Lampsilis perovallis</i>	U.S.A. (AL, MS)	NA	T		NA	NA
Pigtoe, dark	<i>Pleurobema funum</i>	U.S.A. (AL)	NA	E		NA	NA
Pigtoe, southern	<i>Pleurobema georgianum</i>	U.S.A. (AL, GA, TN)	NA	E		NA	NA
Pocketbook, fine-lined	<i>Lampsilis aitifia</i>	U.S.A. (AL, GA)	NA	T		NA	NA

Dated: October 16, 1991.

Richard N. Smith,

Acting Director, Fish and Wildlife Service.

[FR Doc. 91-27818 Filed 11-18-91; 8:45 am]

BILLING CODE 4310-55-M

50 CFR Part 17

RIN 1018-A-073

Endangered and Threatened Wildlife and Plants: Proposed Endangered Status for the Oregon Chub

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: The U.S. Fish and Wildlife Service (Service) proposes to determine the Oregon chub (*Oregonichthys crameri*) an endangered species throughout its range, pursuant to the Endangered Species Act of 1973, as amended (Act). The Oregon chub is a small cyprinid fish that formerly inhabited sloughs and overflow ponds throughout the Willamette River drainage in Oregon. The only remaining established populations are restricted to a 30 kilometer (18.6 mile) stretch of the Middle Fork Willamette River drainage. Remaining populations occur near rail, highway, and power transmission corridors and within public park and campground facilities. These populations continue to be threatened by (1) direct mortality from chemical spills; (2) competition or predation from nonindigenous fishes; and (3) loss of habitat from siltation, unauthorized fill activities, and changes in water level or flow conditions. The proposed rule, if made final, would extend the Act's protection to the Oregon chub. The Service seeks data and comments from the public on this proposed rule.

DATES: Comments from all interested parties must be received by January 21, 1992. Public hearing requests must be received by January 15, 1992.

ADDRESSES: Comments and materials concerning this proposal should be sent to the Field Supervisor, U.S. Fish and Wildlife Service, Port and Field Station, 2600 S.E. 98th Avenue, suite 100, Portland, Oregon, 97266. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

FOR FURTHER INFORMATION CONTACT: Russell D. Peterson, Field Supervisor, at the above address, (503/231-6179 or FTS 429-6179).

SUPPLEMENTARY INFORMATION*
Background

Taxonomy and Life History Summary

The genus *Oregonichthys* has recently been recognized as taxonomically distinct from *Hypobopsis* (Mayden 1989) and is thus the only endemic genus of fish in the State of Oregon. In the past, the common name "Oregon chub" has been used to refer to all *Oregonichthys* from both the Umpqua and Willamette River drainages. However, the Umpqua River form of *Oregonichthys* has been formally described (Markle *et al.* 1991) as a full species (Umpqua chub, *O. kalawatseti*) distinct from the *Oregonichthys* in the Willamette River drainage which retains the earlier name *O. crameri*. Use of the term "Oregon chub" therefore refers only to *O. crameri*.

The Oregon chub was formerly distributed throughout the lower elevation backwaters of the Willamette River drainage (Pearsons 1989). Known established populations of the Oregon chub are now restricted to a 30 kilometer (18.6 mile) stretch of the Middle Fork Willamette River in the vicinity of Dexter and Lookout Point Reservoirs in Lane County, Oregon. Small numbers of chubs (one to four fish) have also been observed in recent years on the lower North Santiam River which forms the boundary between Linn and Marion Counties and in Gray Creek within the Finley National Wildlife Refuge in Benton County. The size and viability of the potential Gray Creek and North Santiam River populations remain unknown.

Decline of the Oregon chub is attributed to channel and elimination of its backwater habitats. The mainstem of the Willamette River was formerly a braided channel with numerous secondary channels, meanders, oxbows, and overflow ponds which may have provided habitat for the chub. However, the construction of flood control projects and revetments have altered historical flooding patterns and eliminated much of the braided channel pattern of the river (Corps of Engineers 1970, Li *et al.* 1987). The period of construction of flood control structures coincides with the period of decline. In addition, the introduction of nonindigenous species (e.g., bass, crappie, mooneye fish) may have exacerbated the species decline and limit the potential for the Oregon chub to expand beyond its present restricted range.

Habitat at all remaining population sites of the Oregon chub is typified by low- and zero-velocity water flow conditions, deposition substrates, and abundant aquatic vegetation. Life history information of the Oregon chub

was derived primarily from observations made at the Shady Dell Pond in Lane County, Oregon (Pearsons 1989). Spawning occurred from the end of April through early August when water temperatures ranged from 16° to 28°C. Males greater than 25 mm in standard length (SL) were involved in spawning. Males over 35 mm SL defended territories in or near aquatic vegetation (mostly *Antennularia antipyretica*). The number of eggs produced per female ranged from 147 to 671. During the May sampling period, adult Oregon chub (27 to 58 mm SL) fed most heavily on copepods, cladocerans, and chironomid larvae (Markle *et al.* 1991).

Petition and Listing History

On April 10, 1990, the Service received a petition to list the Oregon chub, *Oregonichthys crameri*, as an endangered species and to designate all waters and tributaries of the Middle Fork of the Willamette River from the base of Dexter Dam upstream to its confluence with the North Fork of the Middle Fork as critical habitat. The petition and supporting documentation were submitted by Dr. Douglas F. Markle and Mr. Todd N. Pearsons, both of Oregon State University. The petitioners submitted taxonomic, biological, distributional, and historic information and cited numerous scientific articles in support of the petition. The petition and accompanying data described the Oregon chub as endangered because of a 98 percent reduction in the range of the species and potential threats at existing known population sites. The Service made a 90-day finding that substantial information had been presented which indicated that the requested action may be warranted and published this finding in the *Federal Register* on November 1, 1990 (55 FR 46080). A status review was initiated at that time.

The Service included the Oregon chub on the December 30, 1982, Notice of Review for vertebrate wildlife as a category 2 candidate species (47 FR 58454). A category 2 candidate species is one for which information contained in Service files indicates that proposing to list is possibly appropriate but additional data is needed to support a listing proposal. The Oregon chub was also included in the September 18, 1985 (50 FR 37958) and January 6, 1989 (54 FR 554) Animal Notices of Review as a category 2 candidate. All inclusions on the Notice of Review have been under the earlier name *Hypobopsis crameri*. Important new data on the ecology, distribution, and taxonomic status of