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FRESHWATER MUSSELS IN THE GULF RE-  
GION: ALABAMA.—The southeastern United  
States has the greatest diversity of freshwater bi-

TABLE 1. Margaritiferid and unionid species in Alabama, common name, and conservation status.

Species <sup>a</sup>	Common name <sup>b</sup>	National status		Conservation status <sup>b</sup>	
		National status	Current status in Alabama <sup>c</sup>	National status	Current status in Alabama <sup>c</sup>
<b>Margaritiferidae</b>					
<i>Cumberlandia monodonta</i> (Say)	Spectaclecase	T	I	I	State listed
<i>Margaritifera merrillana</i> R. I. Johnson	Alabama pearlshell	E	I	I	State listed
<b>Unionidae</b>					
<i>Actinonaias ligamentina</i> (Lamarck)	Mucket	CS	I	I	
<i>A. pectorosa</i> (Conrad)	Pheasantshell	SC	Possibly A*		
<i>Alasmidonta marginata</i> Say	Elktoe	SC	SC		
<i>Alasmidonta moccoidi</i> Athearn	Coosa elktoe	E*	I*		
<i>A. triangulata</i> (Say)	Triangle floater	—	I		
<i>A. viridis</i> (Rafinesque)	Slippershell mussel	SC	SC		State listed
<i>Amblema plicata</i> (Conrad)	Threeridge	CS	CS		
<i>A. elliptii</i> (Lea)	Coosa fiveridge	—	U		
<i>Anodonta suborbiculata</i> Say	Flat floater	CS	CS		
<i>Anodontoides radiatus</i> (Conrad)	Rayed creekshell	SC	SC		
<i>Aridens confragosus</i> (Say)	Rock pocketbook	CS	CS		
<i>Cydonaias tuberculata</i> (Rafinesque)	Purple wartyback	SC	CS		
<i>Cyprogenia stegaria</i> (Rafinesque)	Fanshell	E	E, 1991		State listed A*
<i>Dromus dromas</i> (Lea)	Dromedary pearlymussel	E	E, 1976		State listed A*
<i>Ellipsaria lineolata</i> (Rafinesque)	Butterfly	SC	CS		
<i>Elliptio arca</i> (Conrad)	Alabama spike	T	I		
<i>E. arcata</i> (Conrad)	Delicate spike	SC	SC		
<i>E. chipolanensis</i> Walker	Chipola slabshell	T	T, 1998		
<i>E. complanata</i> (Lighthfoot)	Eastern elliptio	CS	CS		State listed A*
<i>E. crassidens</i> (Lamarck)	Elephantear	CS	CS		
<i>E. dilatata</i> (Rafinesque)	Spike	CS	CS		
<i>E. fraternna</i> (Lea)	Brother spkie	E	I*		
<i>E. iderina</i> (Conrad)	Variable spike	CS	CS		
<i>E. mcmichaeli</i> Clench and Turner	Fluted elephantear	SC	SC		
<i>E. nigella</i> (Lea)	Winged spike	E	I*		
<i>Elliptioideus shoafianus</i> (Lea)	Purple banklimber	T	A*		
<i>Epiplatasma arcaeformis</i> (Lea)	Sugarspoon	E*	I*		
<i>E. biemarginata</i> (Lea)	Angled riffleshell	E*	I*		
<i>E. brevidens</i> (Lea)	Cumberlandian combshell	E	E, 1997		State listed

TABLE I. Continued.

Species <sup>a</sup>	Common name <sup>a</sup>	Conservation status <sup>b</sup>		
		National status	Current status in Alabama <sup>c</sup>	State listed
<i>E. capsaeformis</i> (Lea)	Oyster mussel	E	E, 1997	State listed
<i>E. flexuosa</i> (Rafinesque)	Leafshell	E*	I*	
<i>E. florentina</i> (Lea)	Yellow blossom	E*	E*, 1976	State listed
<i>E. haysiana</i> (Lea)	Acornshell	E*	I*	
<i>E. lenior</i> (Lea)	Narrow catspaw	E*	I*	
<i>E. lewisii</i> (Walker)	Forkshell	E*	I*	
<i>E. metastriata</i> (Conrad)	Upland combshell	E	E, 1993	State listed
<i>E. obliquata obliquata</i> (Rafinesque)	Catspaw	E	E, 1990	State listed
<i>E. otholobogensis</i> (Lea)	Southern acornshell	E	E, 1993	State listed
<i>E. penita</i> (Conrad)	Southern combshell	E	E, 1987	State listed
<i>E. personata</i> (Say)	Round combshell	E*	I*	
<i>E. propinqua</i> (Lea)	Tennessee riffleshell	E*	I*	
<i>E. stuardsonii</i> (Lea)	Cumberland leafshell	E*	I*	
<i>E. torulosa torulosa</i> (Rafinesque)	Tubercled blossom	E*	I*	State listed
<i>E. triquetra</i> (Rafinesque)	Snuffbox	I	I	
<i>E. virgida</i> (Lea)	Turgid blossom	E*	E*, 1976	State listed
<i>Fusconata barnesiana</i> (Lea)	Tennessee pigtoe	SC	SC	
<i>F. cerna</i> (Conrad)	Gulf pigtoe	CS	CS	
<i>F. cor</i> (Conrad)	Shiny pigtoe	E	E, 1976	State listed
<i>F. cuneolus</i> (Lea)	Fine-rayed pigtoe	E	E, 1976	State listed
<i>F. ebena</i> (Lea)	Ebonyshell	CS	CS	
<i>F. exambia</i> Clench and Turner	Narrow pigtoe	T	I	State listed
<i>F. subrotunda</i> (Lea)	Longsolid	SC	SC	
<i>F. succava</i> (Lea)	Purple pigtoe	SC	SC	
<i>Globula rotundata</i> (Lamarck)	Round pearlshell	CS	CS	
<i>Hemistena lata</i> (Rafinesque)	Cracking pearlymussel	E	E, 1989	State listed
<i>Lampsilis abrupta</i> (Say)	Pink mucket	E	E, 1976	State listed
<i>L. albilis</i> (Conrad)	Fineined pocketbook	T	T, 1993	State listed
<i>L. australis</i> Simpson	Southern sandshell	T	I	State listed
<i>L. binominata</i> Simpson	Lined pocketbook	E*	I*	
<i>L. cardium</i> Rafinesque	Plain pocketbook	SC	SC	
<i>L. fasciola</i> Rafinesque	Wavy-rayed lampmussel	CS	SC	
<i>L. haddletoni</i> Athearn	Haddleton lampmussel	E	I	
<i>L. ornata</i> (Conrad)	Southern pocketbook	SC	SC	

TABLE 1. Continued.

Species <sup>a</sup>	Common name <sup>b</sup>	National status		Conservation status <sup>b</sup>	
		National status	Current status in Alabama <sup>c</sup>	National status	Current status in Alabama <sup>c</sup>
<i>L. ovata</i> (Say)	Pocketbook	SC	SC	SC	State listed
<i>L. perovialis</i> (Conrad)	Orangenacre mucket	T	T	T, 1993	State listed
<i>L. straminea clabornensis</i> (Lea)	Southern fatmucket	CS	CS	CS	
<i>L. s. straminea</i> (Conrad)	Rough fatmucket	SC	SC	CS	
<i>L. subangulata</i> (Lea)	Shinyrayed pocketbook	T	T	T, 1998	State listed
<i>L. tersa</i> (Rafinesque)	Yellow sandshell	CS	CS	CS	
<i>L. virens</i> (Lea)	Alabama lampmussel	E	E	E, 1976	State listed
<i>Lasimigona complanata alabamensis</i> Clarke	Alabama heelsplitter	SC	SC	SC	
<i>L. c. complanata</i> (Barnes)	White heelsplitter	CS	CS	SC	
<i>L. costata</i> (Rafinesque)	Flutedshell	CS	CS	CS	
<i>L. holstonia</i> (Lea)	Tennessee heelsplitter	SC	SC	SC	
<i>L. subnitida</i> (Conrad)	Green floater	T	T	A*	
<i>Lemiox rimosus</i> (Rafinesque)	Birdwing pearlymussel	E	E	I	A*
<i>Leptodea fragilis</i> (Rafinesque)	Fragile papershell	CS	CS	CS	
<i>L. leptodon</i> (Rafinesque)	Scateshell	E	E	A*	
<i>Lexingtonia dolabelloides</i> (Lea)	Slabside pearlymussel	T	T	I	State listed
<i>Ligamta recta</i> (Lamarck)	Black sandshell	SC	SC	SC	
<i>L. subrostrata</i> (Say)	Pondmussel	CS	CS	CS	
<i>Medionidius acutissimus</i> (Lea)	Alabama moccasinshell	T	T	T, 1993	State listed
<i>M. conradicus</i> (Lea)	Cumberland moccasinshell	SC	SC	SC	State listed
<i>M. megalantriae</i> van der Schalie	Tombigbee moccasinshell	E*	E*	I*	
<i>M. parvulus</i> (Lea)	Goosa moccasinshell	E	E	E, 1993	State listed
<i>M. penicillatus</i> (Lea)	Gulf moccasinshell	E	E	E, 1998	State listed
<i>Megalancias nervosa</i> (Rafinesque)	Washboard	CS	CS	CS	
<i>Obliquaria reflexa</i> Rafinesque	Threhorn waryback	CS	CS	CS	
<i>Obovaria jacksoniana</i> (Frierson)	Southern hickorynut	SC	SC	SC	
<i>O. olivaria</i> (Rafinesque)	Hickorynut	CS	CS	CS	
<i>O. retusa</i> (Lamarck)	Ring pink	E	E	E, 1989	State listed
"O." rotulata (Wright)	Round ebonyshell	E	E	I	
<i>O. subrotunda</i> (Rafinesque)	Round hickorynut	SC	SC	SC	
<i>O. unicolor</i> (Lea)	Alabama hickorynut	SC	SC	SC	
<i>Pegias fabula</i> (Lea)	Litdwelling pearlymussel	E	E	E, 1998	State listed
<i>Plectomerus dombyanus</i> (Valenciennes)	Bankclimber	CS	CS	CS	A*
<i>Platobasis cicatricosus</i> (Say)	White waryback	E	E	E, 1976	State listed

TABLE 1. Continued.

Species <sup>a</sup>	Common name <sup>a</sup>	National status		Conservation status <sup>b</sup>	
		National status	Current status in Alabama <sup>c</sup>	E, 1976	State listed
<i>P. cooperianus</i> (Lea)	Orangefoot pimpleback	E		E, 1976	State listed
<i>P. phyllus</i> (Rafinesque)	Sheepnose	T		I	State listed
<i>Pleurobema altum</i> (Conrad)	Hightnut	E		I*	
<i>P. arellanum</i> Simpson	Hazel pigtoe	E		I*	
<i>P. chattanoogaense</i> (Lea)	Painted clubshell	E		I*	
<i>P. clava</i> (Lamarck)	Clubshell	E		E, 1993	A*
<i>P. cordatum</i> (Rafinesque)	Ohio pigtoe	SC		SC	
<i>P. curtum</i> (Lea)	Black clubshell	E		E, 1987	A*
<i>P. decisum</i> (Lea)	Southern clubshell	E		E, 1993	State listed
<i>P. flavidulum</i> (Lea)	Yellow pigtoe	U		I*	
<i>P. furvum</i> (Conrad)	Dark pigtoe	E		E, 1993	State listed
<i>P. georgianum</i> (Lea)	Southern pigtoe	E		E, 1993	State listed
<i>P. hogleri</i> (Frierson)	Brown pigtoe	—		I*	
<i>P. hanleyanum</i> (Lea)	Georgia pigtoe	E		I*	A*
<i>P. johannis</i> (Lea)	Alabama pigtoe	U		I*	
<i>P. marshalli</i> Frierson	Flat pigtoe	E		E, 1987	A*
<i>P. murrayense</i> (Lea)	Coosa pigtoe	E		I*	
<i>P. nuctopsis</i> (Conrad)	Longnut	E		I*	
<i>P. oviforme</i> (Conrad)	Tennessee clubshell	SC		SC	
<i>P. parvatum</i> (Conrad)	Ovate clubshell	E		E, 1993	State listed
<i>P. plenum</i> (Lea)	Rough pigtoe	E		E, 1976	State listed
<i>P. rubrum</i> (Rafinesque)	Pyramid pigtoe	—		I	State listed
<i>P. pyriforme</i> (Lea)	Oval pigtoe	E		E, 1998	State listed
<i>P. rubellum</i> (Conrad)	Warrior pigtoe	E		I*	
<i>P. sinuata</i> (Rafinesque)	Round pigtoe	—		I	State listed
<i>P. strodianum</i> (Wright)	Fuzzy pigtoe	SC		I	
<i>P. taitianum</i> (Lea)	Heavy pigtoe	E		E, 1987	State listed
<i>P. troscheianum</i> (Lea)	Alabama clubshell	E		I*	
<i>P. varum</i> (Lea)	True pigtoe	E		I*	
<i>Potamitus alatus</i> (Say)	Pink heelsplitter	CS		CS	
<i>P. inflatus</i> (Lea)	Inflated heelsplitter	T		T, 1990	State listed
<i>P. ohioensis</i> (Rafinesque)	Pink papershell	CS		CS	
<i>P. purpuratus</i> (Lamarck)	Bleufer	CS		CS	
<i>Psychobranchius fasciatus</i> (Rafinesque)	Kidneyshell	CS		SC	

TABLE 1. Continued.

Species <sup>a</sup>	Common name <sup>a</sup>	National status		Conservation status <sup>b</sup>	
		National status	E, 1993	Current status in Alabama <sup>c</sup>	State listed
<i>P. greenii</i> (Conrad)	Triangular kidneyshell	E	E, 1993	State listed	
<i>P. jonesi</i> (van der Schalie)	Southern kidneyshell	T	I	State listed	
<i>P. subtenentum</i> (Say)	Fluted kidneyshell	SC	I	State listed	A*
<i>Pyganodon cataracta</i> (Say)	Eastern floater	CS	CS		
<i>P. grandis</i> (Say)	Giang floater	CS	CS		
<i>Quadrula apiculata</i> (Say)	Southern mapleleaf	CS	CS		
<i>Q. asperata</i> (Lea)	Alabama orb	SC	CS		
<i>Q. cylindrica cylindrica</i> (Say)	Rabbitsfoot	T	I	State listed	
<i>Q. fragosa</i> (Conrad)	Winged mapleleaf	E	E, 1991	A*	
<i>Q. intermedia</i> (Conrad)	Cumberland monkeyface	E	E, 1976	A*	
<i>Q. metanera</i> (Rafinesque)	Monkeyface	CS	CS		
<i>Q. nuchata</i> (Rafinesque)	Wartyback	CS	CS		
<i>Q. pustulosa pustulosa</i> (Lea)	Pimpleback	CS	CS		
<i>Q. quadrula</i> (Rafinesque)	Mapleleaf	CS	CS		
<i>Q. rumphiana</i> (Lea)	Ridged mapleleaf	SC	SC		
<i>Q. stapes</i> (Lea)	Stirrupshell	E	E, 1987		
<i>Quincuncina horkii</i> Walker	Tapered pigtoe	T	I		
<i>Q. infucata</i> (Conrad)	Sculptured pigtoe	SC	SC		
<i>Strophitus connasatigarrisis</i> (Lea)	Alabama creekmussel	SC	SC		
<i>S. subvexus</i> (Conrad)	Southern creekmussel	SC	SC		
<i>S. undulata</i> (Say)	Creeper	CS	Possibly A*		
<i>Toxolasma cornucultus</i> (Lea)	Southern purple lilliput	U	I		
<i>T. cylindrellus</i> (Lea)	Pale lilliput	E	E, 1976	State listed	
<i>T. lividus</i> (Rafinesque)	Purple lilliput	SC	SC		
<i>T. parvus</i> (Barnes)	Lilliput	CS	CS		
<i>T. paulus</i> (Lea)	Iridescent lilliput	CS	CS		
<i>Tritogonia verrucosa</i> (Rafinesque)	Pistolgrip	CS	CS		
<i>Truncilla donaciformis</i> (Lea)	Fawnsfoot	CS	I		
<i>T. truncata</i> Rafinesque	Deertoe	CS	SC		
<i>Unionneris caroliniana</i> (Bosc)	Florida pondhorn	CS	CS		
<i>U. deitrus</i> (Say)	Tapered pondhorn	CS	CS		
<i>U. tetralasmus</i> (Say)	Pondhorn	CS	CS		
<i>Utterbackia imbecillis</i> Say	Paper pondshell	CS	CS		
<i>U. paggae</i> (Johnson)	Florida floater	CS	CS		

TABLE I. Continued.

Species <sup>a</sup>	Common name <sup>c</sup>	Conservation status <sup>b</sup>	
		National status	Current status in Alabama <sup>d</sup>
<i>Villosa choctawensis</i> Athearn	Choctaw bean	T	I
<i>Villosa fabalis</i> (Lea)	Rayed bean	SC	SC
<i>V. iris</i> (Lea)	Rainbow	CS	CS
<i>V. lianosa</i> (Conrad)	Little spectadecase	CS	CS
<i>V. nebulosa</i> (Conrad)	Alabama rainbow	T	CS
<i>V. taeniata</i> (Conrad)	Painted creekshell	CS	CS
<i>V. trabalis</i> (Conrad)	Cumberland creekshell	E	E, 1976
<i>V. vanuxemensis umbrans</i> (Lea)	Coosa creekshell	SC	SC
<i>V. v. vanuxemensis</i> (Lea)	Mountain creekshell	SC	SC
<i>V. videx</i> (Conrad)	Southern rainbow	CS	CS

<sup>a</sup> Scientific and common names follow Turgeon et al. (1998) with the exception of *Potamides inflatus*, which is the inflated heelsplitter not the Alabama heelsplitter.  
<sup>b</sup> Conservation status follows Williams et al. (1993) for entire distribution and Carney, Harfield, and Williams (unpubl. data) for Alabama. The conservation status for the entire range of the species and at the state level is identical if only one is given. Federally listed species are denoted as E = endangered, T = threatened, followed by the date of listing. Species not protected under the Federal Endangered Species Act are considered imperiled (I = species considered endangered or threatened by professional biologists, but not formally protected by the Endangered Species Act), special concern (SC), currently stable (CS), undetermined (U), presumed extirpated (E\* if federally listed, I\* if not federally listed), extirpated in Alabama (A\*).

<sup>c</sup> State-listed = species that are afforded protection at the state level.

valves or mussels of the families Margaritiferidae and Unionidae in the world (Williams et al., 1993; Lydeard and Mayden, 1995; Williams and Neves, 1995; Neves et al., 1997). Ninety-one percent (269 species) of the 297 species of the United States and Canada are found in the Southeast. Alabama is the most diverse state in the United States, with 177 species (Table 1) representing nearly 60% of all species found in the United States and Canada (Lydeard and Mayden, 1995; Williams and Neves, 1995; Neves et al., 1997). Tennessee has the second highest number of species (132 species), followed by Kentucky (103 species) and Georgia (98 species) (Neves et al., 1997).

The tremendous diversity of freshwater unionacean bivalves in Alabama can be attributed to the history of the drainages in which the organisms are found (Ward et al., 1992). Three major and several minor coastal river watersheds drain Alabama and adjacent states and flow into the northeastern Gulf of Mexico. The major drainages include the Mobile, Tennessee, and Apalachicola rivers; the minor rivers include the Escatawpa, Perdido, Escambia, Blackwater, Yellow and Choctawhatchee in the southeastern part of the state. Another factor contributing to the wealth of diversity of freshwater bivalves is the presence of a distinct array of physiographic regions including the Cumberland Plateau, Valley and Ridge, Piedmont, and Coastal Plain. The different physiographic regions possess a variety of unique geological and hydrological features that influence the physicochemical features of the drainages found within them. Many of the larger rivers within Alabama have flowed since Mesozoic times, allowing ample time for isolation and subsequent speciation. The aforementioned factors are largely responsible for the species richness of freshwater bivalves found in the state and a rich diversity of other aquatic organisms as well, including fishes, turtles, and gastropods (Lydeard and Mayden, 1995).

Freshwater mussels play a prominent role in many river and stream ecosystems and have a fossil record dating back to the Triassic Period over 200 million years ago. They are a large component of the total biomass of many aquatic ecosystems, serve as a food source for many organisms, and filter wastes from the water (McMahon, 1991). Freshwater mussels have a fascinating life history. Males release sperm into the water column, the sperm are taken up by females via their inhalent siphons, and eggs are fertilized internally. Females brood larvae (=glochidia) in specially modified compartments of their gills, called marsupia. Variation

exists among species with regard to types of brood chambers as well as to the number of gill chambers modified as marsupia (McMahon, 1991). Brooding periods may be relatively short, with glochidia released during the same summer that fertilization took place, or relatively long, with glochidia held in the marsupia over winter. Females release the glochidia in a variety of manners, and many species have evolved elaborate mechanisms to attract appropriate fish hosts (e.g., Haag et al., 1995; Hartfield and Butler, 1997). Glochidia attach to the gills or fins of fish, depending on the bivalve species, and eventually metamorphose and drop off to begin life on the river bottom. Freshwater mussels are either host generalists (glochidia metamorphose on a variety of fish species) or host specialists (one or very few fish species are used); however, hosts of many unionacean species remain unknown. Numerous specific species accounts can be found in Cummings et al. (1997) and Parmalee and Bogan (1998). Freshwater mussels are long lived, with some species having life spans estimated at more than 50 yr. Reviews of the general ecology and physiology of unionid bivalves can be found in McMahon (1991) and Parmalee and Bogan (1998).

*Conservation status.*—Unionids are one of the most endangered groups of animals in the world, with 70% of the species considered imperiled (i.e., formally listed species via the Endangered Species Act or informally considered threatened or endangered; Williams et al., 1993; Neves et al., 1997; Master et al., 1998).

The conservation status of unionid and margaritiferid species in Alabama is as follows: 29 species (16.4%) are presumed extinct; 23 (12.9%) species are extirpated from Alabama but still exist outside the state; 43 (24.3%) species or subspecies are listed as endangered or threatened via the Endangered Species Act of 1973, as amended; 53 (29.9%) species are afforded some protection by the state; 31 (17.5%) species are of special concern; and 46 (25.9%) are currently stable.

The primary threat to freshwater bivalves is habitat destruction and/or modification. The most dramatic form of habitat destruction is impoundment of flowing waters. Most major rivers and streams of North America have been impounded (Benke, 1990), which completely alters the physical, chemical, and biological aspects of the ecosystem. Many mollusk species above and below impoundments have been lost largely because of the building of dams (Williams et al., 1992; Neves et al., 1997). In-



deed, Alabama's Coosa River has lost more than a dozen bivalve and 36 gastropod species after the impoundment of nearly the entire mainstem (Neves et al., 1997). Some land-use practices also have a negative impact on Alabama bivalves. These practices include poor forestry and agricultural practices and poorly planned urban and suburban development. Inadequate precautions during these activities result in pesticides, herbicides, fertilizers, and other contaminants being washed into nearby rivers and streams. Construction and development along streams, without maintaining adequate riparian buffer zones, result in sediment washing into the streams. Additionally, replacement of natural ground cover with buildings, driveways, and parking lots elevates runoff levels, which can cause increased stream-bank erosion.

The introduction of nonnative species such as the zebra mussel (*Dreissena polymorpha*) has negatively impacted freshwater unionids. The zebra mussel currently occurs in low densities throughout the Tennessee River within the boundaries of the state of Alabama but has not been documented in Mobile Basin or Gulf Coast streams. Further details on causes of freshwater mussel decline can be found in Neves et al. (1997).

Efforts are ongoing to protect species in a variety of ways, including artificial propagation, genetic studies, and development of watershed management strategies (Burkhead et al., 1997; Neves, 1997; Shute et al., 1997).

*Regulation and commercial harvest.*—Unionids have been exploited by humans since prehistoric times. Initially, they served as a valuable resource for Native Americans, providing tools, food, and jewelry. Evidence for the use of mussels by Native Americans can be found along many rivers and streams of the southeastern United States in the form of shell middens (Parmalee and Bogan, 1998). During the late 1800s and early 1900s, freshwater mussels were harvested for button production, but this industry collapsed after WWII and the arrival of plastic buttons. Since the mid-1900s, freshwater mussels have been exported to Japan for the cultured pearl industry. Freshwater mussels are sliced, and beads produced from the shells are inserted into pearl oysters to serve as "seeds" or nuclei for pearl production. Jenkinson and Todd (1997) provided an excellent review of the history of freshwater mussel resource management. Specific state accounts can be found in Cummings et al. (1993). Between 1993 and 1998, 70–99% of the annual

commercial harvest in Alabama came from the Tennessee River (mostly Pickwick and Wheeler reservoirs); most of the remainder came from the Alabama and Coosa rivers, with small amounts of shell harvested from the Black Warrior and Tombigbee rivers (Garner, unpubl.). Because of the effects of impoundment, the composition of unionid populations has changed, resulting in shifts among species valued for export (Ahlstedt and McDonough, 1993). For example, an 8 mile reach of Wheeler Reservoir in 1957 contained approximately 39 million individual mussels, of which 21 million were the commercially important *Pleurobema cordatum*. In 1991, estimates decreased to only 14 million mussels, of which the most abundant was the commercially undesirable *Elptio crassidens*. Today, the most important commercial species are *Megaloniais nervosa* and *Fusconaia ebena*, but other commercial species include *Amblema plicata*, *Quadrula quadrula*, *Quadrula metanevra*, *Quadrula apiculata*, *Tritogonia verrucosa*, *Fusconaia ebena*, and *Obliquaria reflexa*.

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