

Final Report
CFM 227

Critical Habitat Recommendations for the Dromedary
Pearly Mussel - Dromus dromas (Lea 1834)

Final Report

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by

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Scientific Name: Dromus dromas (Lea 1834)

Common Name: Dromedary Pearly Mussel

Status: First proposed as an endangered species in September 1975 (Federal Register 40(188):44329-44333) and was listed in June 1976 (Federal Register 41(115):24062-24067).

Type Locality: Harpeth River, Tennessee (Lea)

Cumberland River, Nashville, Tennessee (Lea)

Clinch River, Tennessee (Lea)

Historic Distribution:

Cumberland River - Warren, Russell, Cumberland, and Pulaski Counties, Kentucky
Clay, Smith, Jackson, and Davidson Counties, Tennessee

Big South Fork Cumberland River - McCreary and Pulaski Counties, Kentucky

Caney Fork River - Smith and DeKalb Counties, Tennessee

Obey River - Clay County, Tennessee

Tennessee River - Knox, Hamilton, Rhea, and Marion Counties, Tennessee
Morgan, Jackson, and Lauderdale Counties, Alabama

Limestone Creek - Limestone County, Alabama

Elk River - Giles County, Tennessee

Little Tennessee River - Monroe County, Tennessee

Holston River - Knox, Hamblen, Grainger, and Hancock Counties, Tennessee

* Clinch River - Roane, Anderson, Claiborne, and Hancock Counties, Tennessee

Powell River - Campbell, Claiborne, and Hancock Counties, Tennessee
Lee County, Virginia

Present Distribution:

- * Clinch River - (TVA June 1979) - Live and freshly dead specimens were found at seven sites between Lawson Mill Dam (CRM 169.8 - Hancock County, Tennessee) and Kyles Ford (CRM 189.3 - Hancock County, Tennessee). Quantitative sampling using a 1/4-meter square quadrat sampler revealed population densities at one site.

*20 mile section
of Clinch R. (CRM
169-189) in Hancock
County, TN*

<u>River Mile</u>	<u>County/State</u>	<u>Number of Specimens</u>	
		<u>Qualitative</u>	<u>Quantitative</u>
169.8	Hancock/Tennessee	1 live	-
172.2	Hancock/Tennessee	-	1 live in 40 quadrat samples
174.8	Hancock/Tennessee	5 freshly dead	-
179.4	Hancock/Tennessee	1 freshly dead	-
181.8	Hancock/Tennessee	1 live	-
187.0	Hancock/Tennessee	1 freshly dead	-
189.3	Hancock/Tennessee	1 freshly dead	-

Clinch River - (TVA unpublished field records) - Live and freshly dead specimens were found at six sites between Swan Island, October 1978 (CRM 172.3 - Hancock County, Tennessee) and Brooks Island (CRM 183.5 - Hancock County, Tennessee).

<u>River Mile</u>	<u>County/State</u>	<u>Number of Specimens</u>	
		<u>Qualitative</u>	<u>Quantitative</u>
172.3	Hancock/Tennessee	1 freshly dead	-
174.2	Hancock/Tennessee	5 freshly dead	-
177.4	Hancock/Tennessee	1 live	-
178.2	Hancock/Tennessee	15 freshly dead	-
178.7	Hancock/Tennessee	11 freshly dead	-
183.5	Hancock/Tennessee	2 freshly dead	-

189-200
Clinch River - (Bates and Dennis 1978) - Live and freshly dead specimens were found at Kyles Ford (CRM 189.5 - Hancock County, Tennessee) and Horton Ford (CRM 200.2 - Hancock County, Tennessee). Actual specimen counts are not included in this report.

Powell River - (Ahlstedt and Brown 1980) - Live and freshly dead specimens were found at six sites between Buchanan Ford (PRM 99.2 - Claiborne County, Tennessee) and Highway 833 bridge crossing (PRM 120.3 - Lee County, Virginia). Quantitative sampling using a meter square quadrat sampler revealed population densities at two sites.

<u>River Mile</u>	<u>County/State</u>	<u>*Number of Specimens</u>	
		<u>Qualitative</u>	<u>Quantitative</u>
99.2	Claiborne/Tennessee	30 freshly dead (estimate)	2 live in 10 quadrat samples
103.3	Hancock/Tennessee	2 freshly dead	-
106.6	Hancock/Tennessee	8 freshly dead	4 live in 10 quadrat samples
111.7	Hancock/Tennessee	1 freshly dead	-
117.4	Lee/Virginia	1 freshly dead	-
120.3	Lee/Virginia	1 freshly dead	-

*Actual number of specimens found were not included in this report. These numbers represent a compilation of records and specimens collected from the Powell River between 1975 and 1978.

Powell River - (TVA June 1979) - Live and freshly dead specimens were found at 17 sites between Double "S" Bend (PRM 80.4 - Claiborne County, Tennessee) and Tyler Bend (PRM 126.4 - Lee County, Virginia). During this survey, a total of 441 quadrat samples were taken using a 1/4-meter square quadrat sampler. Specimens of this species were found in these samples at two sites.

<u>River Mile</u>	<u>County/State</u>	<u>Number of Specimens</u>	
		<u>Qualitative</u>	<u>Quantitative</u>
80.4	Claiborne/Tennessee	2 freshly dead	-
94.8	Claiborne/Tennessee	10 freshly dead	-
105.2	Hancock/Tennessee	1 freshly dead	-
106.5	Hancock/Tennessee	1 freshly dead	-
106.9	Hancock/Tennessee	1 live	1 live in 39 quadrat samples
109.7	Hancock/Tennessee	1 freshly dead	-
110.2	Hancock/Tennessee	5 freshly dead	-
112.2	Hancock/Tennessee	-	1 live in 20 quadrat samples
112.8	Hancock/Tennessee	1 freshly dead	-
114.3	Hancock/Tennessee	1 freshly dead	-
115.4	Hancock/Tennessee	6 freshly dead	-
115.8	Lee/Virginia	1 freshly dead	-
117.3	Lee/Virginia	1 freshly dead	-
117.9	Lee/Virginia	2 freshly dead	-
119.3	Lee/Virginia	2 freshly dead	-
123.4	Lee/Virginia	1 freshly dead	-
126.4	Lee/Virginia	1 freshly dead	-

Tennessee River - (TVA January 1979) - Three live specimens were found

below Watts Bar Dam at Tennessee River Mile 520.2, 520.5, and 520.8 in Rhea and Meigs County, Tennessee.

Cumberland River - (Bogan and Parmalee 1979) - One freshly dead specimen

was found in a commercial sheller's cull pile along the Cumberland River in Smith County, Tennessee.

Cumberland River - (TVA, September 1976) - Two live specimens were found at Bartlett's Bar (CRM 296.8 - Smith County, Tennessee).

Potential Threats:

Dromus dromas populations in the Clinch and Powell Rivers may already be affected by effluents from sewage treatment plants, urban development, and silt from strip mining and coal washing.

The Tennessee and Cumberland Rivers are affected by mainstream impoundments.

Critical Habitat:

Based upon the preceding information, the following selected portions of the Clinch, Powell, Tennessee, and Cumberland Rivers are recommended critical habitat necessary for the continued survival of this species:

Clinch River - from the backwaters of Norris Reservoir (CRM 150.0 - Claiborne - Grainger Counties, Tennessee) upstream to Speer's Ferry (CRM 211.8 - Scott County, Virginia) Figure 1.

Powell River - from the backwaters of Norris Reservoir (PRM 50.0 - Claiborne County, Tennessee) upstream to Sewell Bridge (PRM 143.2 - Lee County, Virginia) Figure 2.

Tennessee River - from Blythe Ferry (TRM 499.5 - Rhea and Meigs County, Tennessee) upstream to Watts Bar Dam (TRM 530.0 - Rhea and Meigs County, Tennessee) Figure 5.

Cumberland River - from Belcher's Bluff (CRM 275.5 - Trousdale County, Tennessee) upstream to Cordell Hull Dam (CRM 313.5 - Smith County, Tennessee) Figure 6.

Comments:

The upper and lower limits of critical habitat have been extended 20 river miles beyond the extreme collection site to serve as a "buffer zone" for the protection of the mussel's fish host(s) and will discourage development in these areas.

Reference Materials

- Ahlstedt, Steven A. and Steven Brown. 1980. The naiad fauna of the Powell River in Virginia and Tennessee (Bivalvia: Unionacea). Bull. of the Amer. Mala. Union for 1979. In press.
- Bates, John M. and Sally D. Dennis. 1978. The mussel fauna of the Clinch River, Tennessee and Virginia. *Sterkiana*, 69-70:3-23.
- Bogan, Arthur and Paul Parmalee. 1979. Tennessee's rare mollusks, IN: Tennessee's Rare Wildlife, Draft Report, TWRA, Tennessee Dept. of Conservation and Tennessee Heritage Program, June 1979. University of Tennessee, Knoxville. 360 pp.
- Cahn, Alvin R. 1936. The molluscan fauna of the Clinch River below Norris Dam upon completion of that structure. Tennessee Valley Authority, Forestry Development, Norris, TN 37828. 27 pp.
- Hickman, Mary E. 1937. A contribution to the mollusca of east Tennessee. Unpublished thesis, University of Tennessee, Knoxville, TN 37828. 165 pp.
- Hinkley, A. A. 1906. Some shells of Mississippi and Alabama. *Nautilus*, 20(3):34-36, 20(4):40-44, 20(5):52-55.
- Isom, Billy G. 1972. Mussels in the unique Nickajack Dam construction site, Tennessee, 1965. *Malac. Rev.*, 5:4-6.
- Isom, Billy G., Paul Yokley, and Charles Gooch. 1973. Mussels of the Elk River Basin in Alabama and Tennessee, 1965-1967. *Am. Midl. Nat.*, 89(2):437-442.
- Lea, Isaac. 1834. Observations on the genus Unio, together with description of new genera and species in the families Naiades, Conchae, Colimacea, Lymnaeana, Melaniana, and Peristomiana. Vol. 1, 4 leaves, 233 pp., 46 pl.
- _____. 1845. Descriptions of new fresh water and land shells. *Proc. Am. Phil. Soc.*, 4:162-168.
- Lewis, James. 1870. On the shells of the Holston River, *Am. J. Conch.*, 6(3):216-228.
- _____. 1876. Fauna of Alabama. Freshwater and land shells. *Ala. Geol. Surv., Prog. Report.*, 1876:61-100.

- Morrison, J.P.E. 1942. Preliminary reports on mollusks found in the mounds of Pickwick Landing Basin in the Tennessee River Valley. IN: William S. Webb and David L. De Jarnette, an archaeological survey of Pickwick Basin in the adjacent portions of the states of Alabama, Mississippi, and Tennessee. Bur. Am. Ethnol. Bull., 129:337-392.
- Neel, Joe Kendall and William Ray Allen. 1964. The mussel fauna of the upper Cumberland basin before its impoundment. Malacologia, 1(3):427-459.
- Ortmann, Arnold E. 1918. The naiades (freshwater mussels) of the upper Tennessee drainage. With notes on synonymy and distrib. Proc. Am. Phil. Soc., Phil., 57:521-626.
- _____. 1925. The naiad-fauna of the Tennessee River system below Walden Gorge. Am. Midl. Nat., 9(7):321-372.
- Pilsbry, Henry and Samuel N. Rhoads. 1897. Contributions to the zoology of Tennessee, No. 4, Mollusks. Proc. Acad. Nat. Sci., Phil., pp. 487-506.
- Simpson, Charles T. 1900. Synopsis of the naiades, or pearly freshwater mussels. Proc. U.S. Nat. Mus., 22(1205):501-1044.
- _____. 1914. A descriptive catalogue of the naiades, or pearly freshwater mussels. Bryant Walker, Detroit, MI, 3 Vols., 1540 pp.
- Stansbery, David H. 1973. A preliminary report on the naiad fauna of the Clinch River in the southern Appalachian mountains of Virginia and Tennessee (Mollusca: Bivalvia: Unionidae). Am. Malac. Union Bull., 1972:20-22.
- _____. 1976. Naiad Mollusks. IN: Endangered and threatened plants and animals of Alabama. Bull. Alabama Mus. Nat. Hist., No. 2:42-52.
- Tennessee Valley Authority - Unpublished field records collected by Steven Ahlstedt (Clinch River), Division of Water Resources, Fisheries and Aquatic Ecology Branch, Norris, TN 37828.
- Tennessee Valley Authority. 1976. Mussel fauna of the Cumberland River in Tennessee. September 1976. Unpublished Report. Division of Environmental Planning, Water Quality and Ecology Branch, Muscle Shoals, Alabama; and the Division of Forestry, Fisheries and Wildlife Development, Norris, TN 37828.
- _____. 1978. Recent mollusk investigations on the Tennessee River. Unpublished Report. Division of Environmental Planning, Water Quality and Ecology Branch, Muscle Shoals, AL. 126 pp.

- _____. June 1979. An evaluation of mussel populations in the Powell River, Tennessee and Virginia. Unpublished Report. Division of Water Resources, Fisheries and Aquatic Ecology Branch, Norris, TN 37828. 15 pp.
- _____. August 1979. An evaluation of mussel populations in the Clinch River, Tennessee and Virginia. Unpublished Report. Division of Water Resources, Fisheries and Aquatic Ecology Branch, Norris, TN 37828. 14 pp.
- University of Michigan, Museum of Zoology, Mollusk Division (museum records for Dromus dromas), Ann Arbor 48109.
- Warren, Robert E. 1975. Prehistoric Unionacean (freshwater mussel) utilization at the Widows Creek site (1 Ja 305), northeast Alabama. Unpublished master's thesis, Anthropology, Univ. of Nebraska, Lincoln.
- Wilson, Charles B. and H. Walton Clark. 1914. The mussels of the Cumberland River and its tributaries. Dept. of Fish. Doc., No. 781, 66 pp.