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Current Projects Involving Freshwater Mussels

	Title	Funding Agency
1.	Reestablish populations of eight federally listed mussel species and two federally listed fish species into Shoal Creek, Lawrence County, Tennessee	Tennessee Wildlife Resources Agency, and Alabama Game and Fish Division
2.	Zebra mussel impacts on endangered mussels	Tennessee Wildlife Resources Agency, and Kentucky Department of Fish and Wildlife Resources
3.	Instream flow incremental methodology (IFIM) studies	Tennessee Department of Environment and Conservation
4.	Developing technology for long-term holding of mussels in captivity	Tennessee Wildlife Resources Agency
5.	The relation between mussel density and survival during quarantine	U.S. Army Corps of Engineers
6.	Development of a marking technique for juvenile mussels	USGS/Biological Resources Division
7.	Propagation and ecology of juvenile mussels	U.S. Fish and Wildlife Service
8.	Propagation of the endangered *Lampsilis abrupta*	Alabama Game and Fish Division
9.	Reintroduction of freshwater mussels into the Tennessee River and its major tributaries	U.S. Fish and Wildlife Service
10.	Relationship between stream discharge and mussel recruitment	U.S. Fish and Wildlife Service
11.	Maintenance and production of Ohio River mussels	U.S. Army Corps of Engineers

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Highlights of Current Research Activities

Long-term Holding

As of December 1997, we are holding 8,491 adult mussels of 44 species at five locations (2 reservoirs, and raceways at 3 hatcheries in TN & KY. Successful spawning occurred in captive populations. See Table 1 for list of species in captivity.

Quarantining Mussels

Between July1, 1996 and December 31, 1997, we have quarantined 14,860 mussels of 21 species. Results - survival highly variable among population, species, density during quarantine, season of collection, and between years. Ongoing activities include monitoring of physiological condition of mussels quarantined.

Mussel Reintroductions

In 1997, we collected, quarantined, and translocated 4,440 adult mussels to the lower French Broad River. The mussels were distributed at a uniform density of 12 individuals/m^2 throughout two locations with permanently marked boundaries. Little (<5%) mortality of translocated mussels occurred after 2 months.

Propagation and Culture

Lampsilis cardium juveniles cultured in a hatchery raceway for 120 days following metamorphosis reached a mean length of 21 mm. At the end of the second growing season, we 'harvested' 823 juveniles of this cohort (mean length = 54.5 mm). Two hundred of these juveniles were returned to the parental stream. *Lampsilis fasciola* cultured in a raceway for two years reached a mean length of 44mm.

We are currently holding gravid *Lampsilis abrupta* (endangered) in captivity. Propagation of this species and other species will begin this spring.

Highlights of Current Research Activities (continued)

Stream Hydraulics

As an extension of our previous research in this area, we are currently examining relations between historic stream discharge and mussel recruitment. The size and age structure of two mussel populations was determined from 969 quadrat (0.25 m^2) samples and >500 thin-sections prepared from shells collected from muskrat middens. These data are being analyzed to determine year-class strength, and ultimately examined with respect to discharge.

Marking Juveniles

Initial research has been directed towards determining concentrations and immersion times for four chemical markers that result in high marking success and survival.

Host Fishes

Hosts have been identified for *Actinonaias pectorosa* and the endangered *Lampsilis abrupta*. A comparative evaluation of the suitability of reported hosts for *Ligumia recta* was completed.

juvenile mussel tag

Table 1. Species and numbers of adult mussels being held in captivity by the Tennessee Cooperative Fishery Research Unit at five holding facilities as of December 1997.

Species	Number	Species	Number
Actinonaias ligamentina	190	*Ligumia recta*	63
Actinonaias pectorosa	17	*Megalonaias nervosa*	183
Amblema plicata	1172	*Obliquaria reflexa*	48
Arcidens confragosus	8	*Obovaria olivaria*	77
Cyclonaias tuberculata	210	*Plethobasus cicatricosus*	3
Cyprogenia stegaria	2	*Plethobasus cooperianus*	7
Ellipsaria lineolata	258	*Pleurobema coccineum*	19
Elliptio crassidens	145	*Pleurobema cordatum*	304
Elliptio dilatata	371	*Pleurobema pyramidatum*	10
Epioblasma capsaeformis	18	*Potamilus alatus*	39
Fusconaia barnesiana	5	*Ptychobranchus fasciolaris*	121
Fusconaia ebena	4191	*Ptychobranchus subtentum*	18
Fusconaia flava	211	*Pyganodon grandis*	1
Fusconaia subrotunda	22	*Quadrula cylindrica*	1
Lampsilis abrupta	15	*Quadrula metanevra*	142
Lampsilis cardium	14	*Quadrula nodulata*	82
Lampsilis fasciola	5	*Quadrula pustulosa*	309
Lampsilis ovata	4	*Quadrula quadrula*	13
Lampsilis siliquoidea	13	*Tritogonia verrucosa*	96
Lasmigona costata	36	*Truncilla truncata*	3
Leptodea fragilis	3	*Villosa taeniata*	3
Lexingtonia dolabelloides	38	*Villosa vanuxemensis*	1
	TOTAL	8491	

Tennessee Cooperative Fishery Research Unit

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