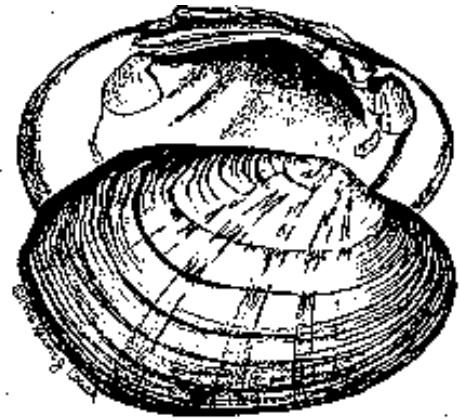


# Kansas PEARLY MUSSEL Newsline



KANSAS DEPT. WILDLIFE & PARKS  
Edwin J. Miller: Editor

Spring 1997

## Coming Soon: An Illustrated Guide to Unionid Mussels of Kansas by Karen J. Couch

The first book exclusively on Kansas unionids in 35 years is expected to be available by August/September 1997. The book features over 100 pages and a large (8.5 x 11") format. Each of the 45 species including those rare and extirpated, will be represented with full color drawings accompanied by brief, easy-to-understand text. The book will be useful to persons of various levels of interest in Kansas mussels, and will double as an art book for those who like nature art reminiscent of the 1800's. Approximate price: \$45.00; tax and shipping extra. Notification of publication will be sent to those on mailing list; order directly from author. Autographed copies will be available. To be on the mailing list, contact Karen Couch, 12 Ventura Lane, Olathe, KS 66061-3057.\*\*\*

## DEEP-WATER MUSSEL SURVEY IN THE NEOSHO RIVER

During the summer of 1996, seven deep-water stream sites were sampled for freshwater mussels using SCUBA in the Neosho River. Purposes of this study were to: (i) assess populations of mussels in deep-water habitats; (ii) evaluate selected deep-water stretches of the Neosho River for habitat potentially suitable for mussels; and, (iii) determine the reproductive potential of aged threeridge and washboard mussels. A total of 299 mussels of 16 species was caught, with the threeridge (*Amblema plicata*) being the most frequently collected species, followed by the pimpleback (*Quadrula pustulosa*) and Wabash pigtoe (*Fusconaia flava*). CPUE was significantly lower for searches in deeper habitats, although mussels were recovered at depths up to 4.5 m. Pipe probes revealed that bedrock and gravel were the predominant substrate types.

Additional sampling of mussels will continue during summer 1997 to further delineate the extent of suitable mussel habitat in deep-water stretches of the Neosho River. An assessment of the reproductive potential of aged mussels will also be conducted. \*\*\* (Brian K. Obermeyer)



## KDWP STREAM TEAM MUSSEL COLLECTIONS

Four stream teams of the Kansas Department of Wildlife and Parks (KDWP) surveyed the state's lotic waters in 1995-96. Collections of fishes and macro-invertebrates (including freshwater mussels) were made at each of 203 sampling sites. Four areas of the state were targeted for sampling: state-wide (STWD), Neosho River Basin (NRB), Kansas Lower Republican River Basin (KLR), and Johnson County (JoCo). Sampling crews conducted 1 hour searches at each site for live mussels as well as for the presence of dead shell material. At sites where dead shell material was scarce, all mussel shells encountered were bagged.

A total of 203 sites were sampled by the four survey crews. Eighty of these sites (40 each in 1995 and 1996) were represented by >50 streams in the Neosho River Basin (NRB). The state-wide survey crew (STWD) sampled >40 streams at 45 sites during 1996. The Kansas Lower Republican River sampling crew (KLR) sampled >30 streams at 45 sites. The Johnson County team (JoCo) sampled 33 sites—primarily in Tomahawk and Wolf creeks.

A total of 33 native mussel species were collected; *Corbicula fluminea* (Asian clam) was also found in NRB, STWD, and JoCo samples (Table 1; see page 3). Several mussel species lacked extant representatives from most or all of the sites sampled (Table 1). NRB samples yielded 27 mussel species (24 = recent; 25 = weathered). The most commonly collected extant species in NRB samples were *Pyganodon grandis* (giant floater), *Ligumia subrostrata* (pondmussel), and *Unio tetrasmus* (pondhorn), whereas *L. subrostrata*, *Amblema plicata* (threeridge), and *P. grandis* were the most common weathered species. The NRB crew found a single relic valve of *Lampsilis rafinesqueana* (Neosho mucket) in Middle Creek (Chase County) in 1996. The collection represents a stream record for this species. Collections from STWD revealed 29 species (24 = recent; 25 = weathered), with *Quadrula quadrula* (mapleleaf), *L. subrostrata*, and *P. grandis* the most frequently collected extant species, and *L. subrostrata*, *A. plicata*, and *P. grandis* the most common weathered species. A single valve of *Alasmodonta marginata* (elktoe) was also collected by the STWD team at a Marais des Cygnes River site in Osage County, which represents a county record for the species. Moreover, its collection represents only the second *A. marginata* ever found in the Osage River system in Kansas. KLR sites yielded 19 species (11 = recent; 17 = weathered). *Pyganodon grandis*, *U. tetrasmus*, and *Q. quadrula* were the most frequently collected species represented by recent shell material, whereas *A. plicata*, *L. subrostrata*, *Fusconaia flava* (Wabash pigtoe), and *U. tetrasmus* were the most common weathered species. Samples from JoCo revealed 12 species. *Ligumia subrostrata*, *U. tetrasmus*, and *P. grandis* comprised the most common extant representatives, whereas *L. subrostrata*, *A. plicata*, and *U. tetrasmus* were the most common weathered species.\*\*\*  
(Brian K. Obermeyer)

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"The last word of ignorance is the man who says of an animal or plant: 'What good is it?' If the land mechanism as a whole is good, then every part is good whether we recognize it or not."  
(Aldo Leopold)

Table 1. Number of sites for each mussel species found during 1995-96 KDWP stream surveys.

Species:	Total # sites:	NRB		STWD		KLR		JoCo		Totals		
		80		45		45		33		203		
		r	w	r	w	r	w	r	w	r	w	
Unionidae												
<i>Actinonaias ligamentina</i>		mucket	...	...	...	1	...	...	...	...	...	1
<i>Alasmidonta marginata</i> ***		elktoe	...	...	...	1	...	...	...	...	...	1
<i>Amblyema plicata</i>	3	21	6	16	...	14	1	15	...	...	10	66
<i>Ellipsaria lineolata</i> **	...	1	...	...	...	...	...	...	...	...	...	1
<i>Elliptio dilatata</i> *	...	9	...	...	...	2	...	...	...	...	...	11
<i>Fusconaia flava</i> *	2	14	3	11	1	10	...	7	...	...	6	42
<i>Lampsilis cardium</i>	3	5	1	3	...	2	...	...	...	...	4	10
<i>Lampsilis rafinesqueana</i> ***	2	5	...	...	...	...	...	...	...	...	2	5
<i>Lampsilis silicoidea</i> *	...	...	1	9	...	4	...	...	...	...	1	13
<i>Lampsilis teres</i> *	16	16	2	6	...	3	...	...	...	...	17	25
<i>Lasmigona complanata</i>	17	12	8	9	4	8	1	...	...	...	30	29
<i>Leptodea fragilis</i>	20	10	6	7	7	2	1	...	...	...	36	19
<i>Ligumia recta</i>	...	...	...	1	...	1	...	...	...	...	...	2
<i>Ligumia subrostrata</i>	33	31	13	19	5	12	27	22	...	...	78	84
<i>Obliquaria reflexa</i>	3	3	3	1	...	...	...	...	...	...	6	4
<i>Pleurobema coccineum</i> *	1	5	1	2	...	...	...	...	...	...	2	7
<i>Potamilus alatus</i>	...	...	1	...	...	1	...	...	...	...	1	1
<i>Potamilus ohioensis</i>	5	5	1	...	5	3	1	...	...	...	12	8
<i>Potamilus purpuratus</i>	12	6	4	2	...	...	...	...	...	...	16	8
<i>Ptychobranchus occidentalis</i> **	1	5	...	1	...	...	...	...	...	...	1	6
<i>Pyganodon grandis</i>	35	21	11	15	12	9	8	6	...	...	66	51
<i>Quadrula cylindrica</i> ***	...	1	...	...	...	...	...	...	...	...	...	1
<i>Quadrula metanewa</i>	2	2	1	1	...	...	...	...	...	...	3	3
<i>Quadrula nodulata</i> *	2	...	...	...	...	...	...	...	...	...	2	...
<i>Quadrula pustulosa</i>	6	10	8	6	...	3	...	...	...	...	16	21
<i>Quadrula quadrula</i>	16	11	15	10	9	7	2	3	...	...	42	31
<i>Strophitus undulatus</i> *	1	4	5	5	2	4	...	...	...	...	8	13
<i>Toxolasma parvus</i>	6	2	2	2	3	...	4	2	...	...	15	6
<i>Tritogonia verrucosa</i>	10	6	6	4	...	2	...	1	...	...	16	13
<i>Truncilla donaciformis</i> *	1	3	1	...	...	...	...	...	...	...	2	3
<i>Truncilla truncata</i> *	...	...	1	2	...	...	...	...	...	...	1	2
<i>Unio merus tetralasmus</i>	21	14	5	9	12	10	17	12	...	...	55	45
<i>Utterbackia imbecillis</i>	1	...	1	...	1	...	6	...	...	...	9	...
Corbiculidae												
<i>Corbicula fluminea</i>	5	3	3	...	...	...	5	1	...	...	13	4

r = recently dead specimens; w = weathered valves.

\*\*\* = endangered; \*\* = threatened; \* = SINC.



Pearly mussel newsletter/1997/3

## 1996 Kansas Mussel Harvest Summary

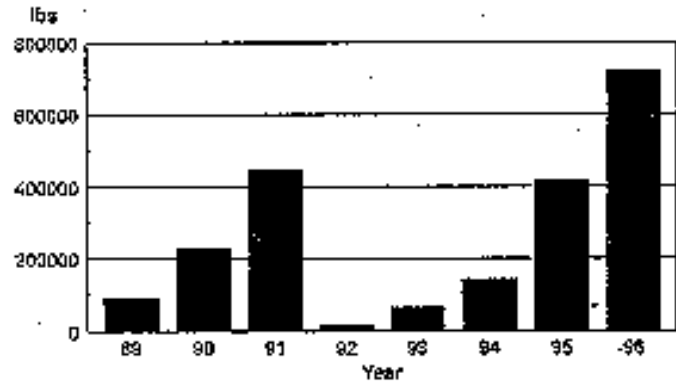
During 1996, 209 mussel harvester and 3 mussel buyer permits were sold by the Kansas Department of Wildlife & Parks. This represents an increase of 64.5% from 1995, and was 2.9 times greater than 1994. Of these, 199 harvesters were Kansas residents while 10 harvesters were nonresidents. All of the buyers were Kansas residents.

Musselers harvested approximately 721,082 lb of mussels in Kansas during 1996. This represents a 43% increase over the estimated harvest of 1995, and a four-fold increase from 1994.

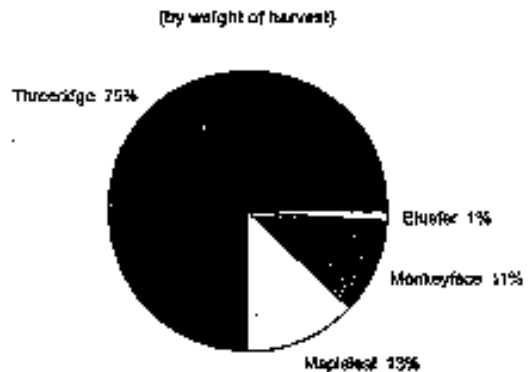
Threeridge mussels (*Amblema plicata*) accounted for the greatest portion (75%) of the harvest in 1996. Harvesters reported 487,403 lbs of harvest, with another 49,690 lbs sold to Kansas buyers but not reported by permit holders. This harvest represents an increase of 112,516 lbs (26.5%) from 1995. Most threeridge mussels were harvested in rivers (98%), and reflected the habitat where these mussels are most common. The Neosho River accounted for 48% of the total harvest, while 34% were harvested from the Verdigris River, and 13% from the Fall River. The majority of threeridge mussels were sold as unprocessed animals, probably because there was little difference in the price paid for processed shells.

The mapleleaf (*Quadrula quadrula*) was the second in total harvest in 1996. Permit holders reported harvesting 85,952 lbs, while another 9,416 lbs were sold to buyers but not reported. The 1996 harvest was 61% greater than during 1995. Most of these shells (71%) were harvested from reservoirs because of the higher quality shell and thus higher value than those harvested in rivers.

## Commercial mussel harvest: 1989-1996

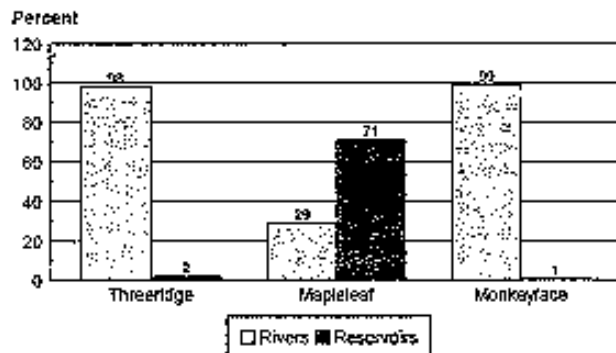


## Proportion of mussel species commercially harvested in 1996.



Mapleleaf mussels harvested in reservoirs were more likely to be sold as processed shells than those in rivers. This difference was likely caused by the difference of shell prices for processed and live shells in the reservoirs when compared to river shells. El Dorado Reservoir sustained the highest harvest with 18,282 lbs reported, while Perry Reservoir was second with 8,210 lbs reported. Reported harvest at Fall River Reservoir continued to decline from 22,276 lbs in 1994 to 11,435 in 1995 and 5,694 lbs in 1996. In contrast, the reported harvest in the Neosho River increased from 3,450 lbs in 1995 to 12,674 lbs in 1996.

## Mussels harvested in rivers versus reservoirs in 1996



The reported harvest of monkeyface mussels (*Quadrula metanewa*) increased 289% from 18,955 lbs in 1995 to 73,810 lbs in 1996, and non-reported harvest increased from 624 lbs in 1995 to 73,810 lbs in 1996. This increase reflected the greater price paid for monkeyface mussels in 1996, and the increase in harvest within Kansas rivers. All but 0.7% of these were harvested in rivers, and reflects their preferred habitat. Reported harvest of monkeyface from the Neosho River accounted for 71% of the total, while the Verdigris and Fall rivers accounted for 15% and 12%, respectively.

Only 6,583 pounds of bleufcr mussels (*Potamilus purpuratus*) were reported to be harvested in 1996.

As in 1995, most shell harvesting activity took place in rivers during 1996. This reflects the higher prices paid for river shells in 1995 and 1996 compared to 1994, and the greater population numbers and ease of harvest compared to reservoir populations.\*\*\* (Tom Mosher, KDWP)

## Kansas Mussel Workshop....Summer 1997

The dates are set, but the site is tentative. The annual mussel workshop sponsored by Kansas Department of Wildlife and Parks is set for Thursday and Friday, August 7 and 8. The probable location for the workshop is Ottawa with survey searches at selected sites on the Marais des Cygnes River. The field trip this year will be more systematic with teams searching and recording species, number, and time searched on flagged sections of the river.

A more detailed agenda will be sent out at a later date. Anyone wanting on the agenda, please let me know.\*\*\* (Ed.)



Pearly mussel newslines/1997/5

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## UNIONIDS FROM SIX NEOSHO RIVER TRIBUTARIES

Greetings from Pitts State!! My project consisted of sampling 40 sites within six tributaries of the lower Neosho River in southeast Kansas. The streams were Labette, Cherry, Lightning, Hickory, Flatrock, and Canville Creeks. The streams are in Neosho, Crawford, Labette, and Cherokee counties. All the streams had six sites, except for Labette and Lightning creeks, which had eight. At every site, a line 100 meters long was set along the bank of the stream with perpendicular transects marked every ten meters. Square meter quadrats were utilized along each of the eleven transects across the width of the stream. Sampling was completed in the spring and fall of 1996.

A total of 16 species were found in the six streams (Table 1). The most abundant species were *Pyganodon grandis* (giant floater) with 29.5% of the total specimens, and *Ligumia subrostrata* (common pond mussel) with 14.3%. Five species were found at all six streams: *P. grandis*, *Lasmigona complanata*, *Quadrula quadrula*, *Unio merus tetralasmus*, and *Leptodea fragilis*. Recruitment was found on five or the six streams and consisted of three species. Five SINC (species in need of conservation) species were found.

A special thanks to Dr. Joe Arruda and Edwin Miller for guidance in this endeavor. Also thanks to Kansas Dept. Wildlife and Parks for funding. Anyone wanting more information may contact me at 11185 Hwy 59, Erie, KS 66733 until mid-May. After mid-May, I can be contacted at P.O. Box 286, Gustavus, AK 99826.\*\*\* (Dan VanLeeuwen, Pittsburg State University)

**Table 1.** Total specimen summary, including live and recently dead specimens from 40 sites located on six Neosho River tributary streams.

Scientific	Common	Status	Total Specimens	Total Percent	Found on # Streams	Total Sites
<i>Pyganodon grandis</i>	Giant Floater	CS	442	29.5	6	34
<i>Lasmigona complanata</i>	White floater	CS	196	13.1	6	25
<i>Megalania nervosa</i>	Washboard	SINC	3	0.2	1	1
<i>Nitidulana verrucosa</i>	Pistolgrip	CS	30	2.0	3	6
<i>Quadrula quadrula</i>	Mapleleaf	CS	64	4.3	6	13
<i>Quadrula pustulosa</i>	Pimpleback	CS	22	1.5	4	9
<i>Quadrula metameva</i>	Mockeyfoot	CS	8	0.5	2	3
<i>Quadrula nebulosa</i>	Wartyback	SINC	6	0.4	3	5
<i>Ambloma pilcata</i>	Threeidge	CS	116	7.7	5	15
<i>Fusconata flava</i>	Wabash Floater	SINC	8	0.5	2	2
<i>Unio merus tetralasmus</i>	Pondhorn	CS	165	11.0	6	17
<i>Leptodea fragilis</i>	Fragile Paper Shell	CS	101	6.7	6	21
<i>Potamula purpurata</i>	Bleeder	CS	23	1.5	4	7
<i>Ligumia subrostrata</i>	Common Pond	CS	214	14.3	5	29
<i>Lampsis teres</i>	Yellow Sandshell	SINC	101	6.7	5	16
<i>Lampsis siliquoides</i>	Fat Mucket	SINC	2	0.1	2	2
Total Specimens			1501	100.0		
Total Species			16			

CS = Considered stable  
SINC = Species in need of conservation

Pearly mussel newsletter/1997/6

## **COMPLAINTS ABOUT SHELLERS INCREASING**

The number of landowners complaining about shellers' trespassing seems to be at an all time high. Depleted mussel beds and high shell prices apparently have increased the risks shellers are willing to take. Desperate shellers have invaded off-limit rivers, streams, and even designated refuges. Some shellers have resorted to paying landowners access fees to get on certain stretches of river. The Montgomery County Supervisors had enough landowner complaints that they gathered information at one of their meetings and sent a letter to Kansas Wildlife & Parks requesting the termination of commercial mussel harvest on all Kansas rivers.

A group of illegal shellers was also cited for removing mussels from the Verdigris River mussel refuge. One of the affected landowners said that shellers drove over his bean field to get to a mussel site. The path cut through the beans was one-half mile long and the farmer was irate. He posted the road and spiked a board and hid it in the path. However, he forgot to tell the local Conservation Officer who patrolled the area and, later, had three flat tires. Other landowners have felt intimidated about confronting bold shellers.

The word from the commercial shell buying companies is that the demand for shell has collapsed due to weather and associated disease problems affecting the pearl oyster culture beds. If this is true, shell prices should plummet. However, competition between companies to stockpile shell may keep prices higher than current demand would dictate. Meanwhile, the local buyers are getting ready for another season.

This year is evaluation time for this activity in Kansas. The current harvest rate is certainly not sustainable in the open rivers. What percent of shells came from closed areas is only a-guess, but could be significant. Information is needed that documents the harvest effect on populations of commercial shells and the amount of trespassing that occurs. When prices are high the risks shellers take to trespass or steal mussels from closed areas increases. Furthermore, the point of diminishing returns is shifted and even sparse mussel beds are more thoroughly searched.\*\*\*

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## **NATIONAL NATIVE MUSSEL CONSERVATION COMMITTEE EXISTS**

In February, representatives from academia, federal and state agencies, and commercial shelling companies met in St. Louis. They formed a national committee focusing on the conservation of mussels, aptly named The National Native Mussel Conservation Committee. This committee evolved from a Mississippi Interstate Cooperative Resource Association (MICRA) mussel committee and the inherent interests in finalizing and implementing the draft National Strategy for the Conservation of Freshwater Mussels.

The priorities of the national committee are to maintain and promote the national strategy, provide a vehicle for information exchange, coordination, and mussel conservation advocacy. Several subcommittees were formed: symposia, status and distribution, information exchange, outreach, sampling guidelines/techniques, water quality/habitat alteration/zebra mussels, propagation/restoration/reproduction, and commercial harvest. L. Drees (USFWS), T. Mosher (KDWP), and E. Miller (KDWP) attended from Kansas. \*\*\*

## 1996 Spring River Field Trip Successful

The 1996 field trip held in conjunction with the freshwater mussel workshop (53 people attended) was a success at revealing the diversity of aquatic life in the Spring River. The predominant mussel at the site was the Neosho mucket (*Lampsilis rafinesqueana*). Obermeyer's prior qualitative searches of the site recorded that 75% of the unionids found were Neosho muckets. It was not unusual to find fluted shells (*Lasmigona costata*) or Ouachita kidneyshells (*Ptychobranchus occidentalis*) at the site. Some of the most interesting finds included 4 live rabbitsfoot (*Quadrula cylindrica*) and 2 Western fanshells (*Cyprogenia aberti*). However, the best find was a live elktoe (*Alasmodonta marginata*) which few people had seen alive before the field trip. Twenty-one species of live mussels were located at the site including fat muckets (*Lampsilis siliquoidea*) and round pigtoes (*Pleurobema coccineum*). Some of the more interesting fish seined at the site included northern hogsuckers (*Hypentelium nigricans*) and spotfin shiners (*Cyprinella spiloptera*). Spotfin shiners are a known fish host for the rabbitsfoot mussel. A special thanks to Brian Obermeyer for getting permission to access this site and to the Pierce's (the landowners) who granted us access.\*\*\*

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## The Unionid Mollusks of the Smokey Hill River System of Western Kansas

The unionid mollusks of the Smokey Hill River and its major tributaries, the Saline River and the Solomon River, has been relatively unstudied, and published references on the bivalves of the region are limited. As part of a larger study to document the bivalve distributions of the central plains, a survey of this area was conducted in 1983 and 1985. A total of 125 sites were sampled in those years in the Smokey Hill River, and its tributaries.

The presence or former presence of 20 unionids was documented for the region. Eleven unionids: *Pyganodon grandis*, *Anodonta imbecillis*, *Anodontoides ferussacianus*, *Lasmigona complanata*, *Quadrula quadrula*, *Quadrula p. pustulosa*, *Fusconia flava*, *Unio merus tetralasmus*, *Leptodea fragilis*, *Potamius ohioensis*, and *Toxolasma parvus* were collected live or as fresh empty shells during the survey.

The remaining nine unionids were represented only by weathered shells, indicating a possible loss of almost half of the region's original bivalve diversity. The species recovered only as weathered shells are *Sirophitus u. undulatus*, *Tritogonia verrucosa*, *Amblema p. plicata*, *Obovaria olivaria*, *Truncilla donaciformis*, *Ligumia subrostrata*, *Lampsilis t. teras*, *Lampsilis siliquoidea*, and *Lampsilis cardium*.

Species diversity was heavily concentrated in the eastern portion of the study area, and most sites in this area were productive. Unionids were rarely encountered in the western third of the basin, due to a near total absence of stream flow in this region. Dewatering and overgrazing of the riparian habitat are significant factors restricting bivalve distributions in the region.\*\*\*

(F. Ellet Hoke; Excerpted from Triannual Unionid Report #10, September 1996)



Pearly mussel newsletter/1997/8



## **Couch Named as Kansas Wildlife Federation's Water Conservationist of the Year for 1996**

Karen Couch, Olathe, received recognition at the Kansas Wildlife Federation's annual banquet in March. She was named the Water Conservationist of the Year for 1996. The following is excerpted from the award announcement;

"Karen has used her lifelong interest in shells to advance the awareness of water conservation and to alert Kansans about this valuable and often rapidly disappearing resource... Karen's real love is mussels and she has been zealous and untiring in trying to determine the cause of mussel depletion throughout Kansas...Her artistic endeavors have been recognized out of state - she won the coveted DuPont Award while showing a display at the Philadelphia Academy of Science two years ago. Because of this, she was invited to show at the American Malacological Union Conference at the Field Museum in Chicago in June, 1996...All this effort has been undertaken with her own resources and through her own personal determination. She wants nothing more than to raise people's awareness of this unique natural resource and its link to water quality problems, stream habitat degradation, and stream dewatering...Many Kansans have been very impressed with Karen's tenacity and dedication, whether it is at a conference or slogging through muddy creeks or walking sandbars of our rivers." Congratulations Karen.

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## **Pistolgrip Host Fishes Reported**

The fish hosts for the pistolgrip (*Tritogonia verrucosa*) are no longer totally unknown. Vanessa Pepi and Mark Hove (Univ. of Minnesota) reported the yellow bullhead (*Ameiurus natalis*) as a suitable host for this mussel. Interestingly, the black bullhead (*Ameiurus melas*) was not a suitable host fish. Bob Howells (Texas Parks & Wildlife) reported that the flathead catfish (*Pylodictus olivaris*) was also a suitable host for the pistolgrip.

The unusual mantle display of the pistolgrip occurs during glochidial release according to Pepe and Hove. The portion of the mantle dorsal to the excurrent siphon is inflated and crenulated with blue-gray edges and a tan-colored interior. The researchers speculate that the mantle may be specialized to release a chemical attractant to lure prospective fish hosts.\*\*\*  
(Excerpted from Triannual Unionid Report #11, March 1997)

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## **The Mucket Reported from the Marais des Cygnes River**

The mucket (*Actinoaias ligamentina*), not to be confused with the Neosho mucket (*Lampsilis rafinesqueana*), was documented from a site on the Marais des Cygnes River near Ottawa. Bob Angelo (KDHE) found one live and also a fresh dead shell which was later verified. Recent past mussel searchers near this stretch of the Marais des Cygnes River have also documented rock pocketbooks (*Arcidens confragosus*) found by K. Couch and an eiktoe (*Alasmidonta marginata*) found by D. Blean (Wichita State University).

This area is a probable search site for the field trip during the 1997 Mussel Workshop.\*\*\*

## Reproduction and fish hosts of the western fanshell, *Cyprogenia aberti*

The western fanshell, *Cyprogenia aberti*, is one of the rarest species in Kansas, and comprised only about 0.2% of the mussels examined in recent surveys by Obermeyer et al. (1995). The only other member of this genus, *Cyprogenia stegaria*, is Federally endangered, and little is known of the biology of either species. Southwest Missouri State University (SMSU) graduate students Andy Roberts, Frank Riussech and I are investigating the reproductive biology of *C. aberti* in order to determine what factors might limit reproduction.

Last fall, with Ed Miller and Brian Obermeyer, we searched for fanshells in the Spring River. Six individuals were located and caged in the river at a site near the point of capture. We examined the mussels monthly, and found three of the six were gravid in early December. These mussels were returned to SMSU for observations and for tests to determine which species of fish can serve as hosts for the parasitic glochidia larvae.

The gravid fanshells have released conglutinates periodically this spring, and what interesting conglutinates they are! Each is a white, worm-like structure several inches in length. The "head" end is enlarged and has several openings (see sketch). Each conglutinate consists of about 30 thousand eggs, only about 20% of which are fertile and contain glochidia larvae. The rest are sterile eggs that form the conglutinate and presumably act as a lure to entice the host fish.

The role of the conglutinates in attracting and infecting host fish is extremely interesting. With the help of Dr. Bill Reston of Forsyth, we videotaped fishes attacking the fanshell conglutinates as they were released from the mussels. Each conglutinate is extruded slowly over several hours. They are tough and elastic, and the glochidia larvae are arrayed on the surface so that they are easily dislodged as fish attempt to pull the conglutinate free from the mussel. Much "coughing" ensues as the larvae clamp onto the fishes gills, but the fish keep coming back for more. Must be a little like Texas chili.

At this time, we have tested 24 species of fishes as hosts of the western fanshell, and only fantail darters (*Etheostoma flabellare*) and banded sculpins (*Cottus carolinae*) have supported transformation of the larvae to the juvenile stage. We plan to continue host tests, particularly with other darter species, and we are also making quantitative descriptions of the conglutinates and larvae. Thanks to KDWP and MDC for support!\*\*\* (M.C. Barnhart, Dept. of Biology, SMSU, Springfield, MO)

Illustration of western fanshell and conglutinates.

