COMMERCIAL HARVEST OF MUSSELS IN OKLAHOMA 1966-1971

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The commercial harvest of mussels from Oklahoma waters was inaugurated in 1966. Unofficially, 1.5 million pounds were reported as harvested from the Verdigris River during that year. During the period 1967-1971, the mussel harvest totaled 651,256 pounds. The Kiamichi and Verdigris Rivers were the only areas of commercial harvest in Oklahoma. Background information on the mussel industry, Oklahoma harvest methods, and future prospects for the mussel industry in Oklahoma are presented.

Freshwater mussels were used by the pearl button industry from the late 1800's until the mid 1960's. For many years during this period, the Mississippi Valley mussel industry constituted a multi-million dollar economic entity. The use of plastic in the button market greatly influenced the decline of the pearl button industry. The present market for freshwater mussels originated as a result of the Japanese pearl-culture industry. Small sections (pellets) cut from the mussel shell are inserted into the mantle of live oysters to initiate the pearl production process. There are only a few species with thick, solid, white nacre that can be used in pearl culture; Oklahoma waters contain limited populations of these species.

Commercial mussel harvest in Oklahoma was unofficially initiated in 1966 with approximately 750 tons of shells being harvested during that year. With interest being shown in Oklahoma mussels, the need for regulations was evident. The Oklahoma Wildlife Conservation Commission adopted a resolution, in November, 1966, which was designed to manage and conserve the mussel resource. Resolution F-11-66 was patterned after current mussel laws used by southern states of the Mississippi River drainage. Mussel harvest gear types and minimum size limits were designated for various species. License requirements, open seasons, penalties and harvest reporting procedures were also described.

HARVEST METHODS

In Oklahoma mussels are harvested by hand picking while wading or using diving equipment in the deeper areas of streams. A second method involves the use of a crowfoot bar. Although other harvest methods are permitted by law, the morphometry of Oklahoma streams makes most of these methods unfeasible.

Live mussels are sold by pickers to buyers either by weight or by volume. The shell buyer steams the mussels in a large metal "cooker" until the shell separates. The entrails (25% by weight) are then cleaned from the shell and the shells are graded to size and readied for export.

ANNUAL HARVEST

A total of 133 mussel picker licenses and three buyer permits were issued during the 1967 season. The total harvest reported was 77,845 pounds of raw shell (Table 1). The Verdigris River yielded 75,812 pounds which had an average "cooked-out" value of $125 per ton. Mussel pickers received approximately $75 per ton for live mussels. The annual harvest also included 2,020 pounds reported from the Kiamichi River, but these mussels were not marketed due to poor shell quality.

Mussel harvest operations were curtailed statewide and throughout most of the Midwest in June, 1967. Accumulations of shells in Japan reduced the demand to small quantities of the highest quality species. Low demand continued in 1968 and only four mussel picker licenses were sold. No shells were reported as marketed during that season. Market conditions improved in 1969 and one of the major shell companies in the United States (Tennessee Shell Company) recruited crews to work the Verdigris River. A total of 45 mussel pickers havested 411,363 pounds of raw shell during the season. Prices paid for live shells were approximately the same as in 1967, but

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"cooked-out" value of shells was approximately $150 per ton.

The 1970 mussel harvest was located on the upper Verdigris River from Oologah Reservoir to the Kansas state line. High flows and low water temperatures were the main factors limiting harvest. Harvest efforts were confined to a smaller area due to the construction of the McClellan-Kerr Navigation Project in the lower Verdigris River. One mussel buyer's license and 29 mussel pickers licenses were issued. The total harvest was 162,050 pounds of raw shells. The pickers were paid an average of $50 per ton. The "cooked-out" value of the shells was approximately $150 per ton.

Raw shell surpluses in Japan again curtailed harvest activities in Oklahoma during 1971. Only 1 mussel picker was licensed; no harvest was reported.

TOTAL HARVEST

The official 6-year harvest of mussels totaled 651,256 pounds (Table I). The unofficial 1966 harvest of 1.5 million pounds occurred before regulations required annual harvest reports. These unofficial reports also indicated minor harvests from the Poteau River and from several other streams.

A summary of the total harvest as reported by common names and appropriate percentages (Table I) indicates ten species were commercially harvested. The three-ridge was the principal species taken, accounting for 88% (575,361 pounds). Next in importance were three kinds of mussels commonly known as monkey-face, maple-leaf and ebenus, which constituted 8% of the harvest. The dominance of certain species in the harvest probably reflects their population densities, although mussel pickers select the larger, more valuable species. Monkey-face and ebenus are generally more valuable but weigh one-third to one-half less than the three-ridge.

PROSPECTS

The success of the Oklahoma mussel industry in the next few years will depend on several factors: (1) the value and demand for raw shell from the pearl-culture industry in Japan, (2) the ability of valuable species to recruit and adjust to new flow rates and turbidity loads in the rechanneled sections of the Verdigris River, and (3) the identification of mussel resources in other waters of the state.

John Latendresse, president of the Tennessee Shell Company (personal communication), reports market prospects as favorable for the immediate future in Japan. Raw shell surpluses should be depleted by the spring of 1972. Currently all shells used in Japanese pearl-culture are exported by the United States. Lopinot (1) reported that Red China also has a freshwater mussel resource, but this resource has not been found suitable for Japanese operations. The value of raw shell is expected to rise in the next few years.

The Verdigris River resource still holds attraction for commercial harvest. Reports indicate that less than 20% of the resource in the upper Verdigris River has been harvested. The impoundment of Lake Oologah is expected to have detrimental effects on the resident population in that area of the

TABLE 1. *The commercial mussel harvest in Oklahoma during the years 1966-1971.*[a]

Mussel "species"	POUNDS 1967 Verdigris	1967 Kiamichi	1969 Verdigris	1970 Verdigris	Total	Percentage by weight
Three-ridge	53,303	1,000	378,454	142,604	575,361	88.35
Ebenus	985	101	8,227	1,621	10,934	1.68
Maple-leaf	—	28	10,284	4,862	15,174	2.33
Mucket	—	400	—	—	400	0.06
Monkey-face	9,630	101	8,227	6,482	24,440	3.75
Butterfly	—	200	—	—	200	0.03
Pimpleback	607	150	4,114	3,241	8,112	1.25
Eggshell	—	40	—	—	40	0.01
Washboard	2,351	—	2,057	1,620	6,028	0.92
Pigtoe	4,246	—	—	—	4,246	0.65
Other	4,701	—	—	1,620	6,321	0.97
Total	75,823	2,020	411,363	162,050	651,256	

[a] Unofficial 1966 harvest, 1.5 million pounds; no report available for 1968 and 1971.

Verdigris. Species such as the three-ridge may briefly repopulate the reservoir, although siltation will probably limit survival as the reservoir ages. Maple-leaf and several other smaller species have adjusted to reservoir environments in other areas.

Stream dredging and channelization, as well as construction of new channels, which created low flow oxbows, greatly altered the environment of the Verdigris River. In the lower Verdigris there should be an ample stock of mussels for recruitment, but success may not be apparent for eight to ten years. Wilson (2) and Williams (3) indicated the lock and dam construction on the Tennessee River greatly increased the population of mussels after approximately ten years. Many of the species present in the TVA system are also present in the Verdigris River system.

Mussel populations in other streams and lakes have been reported by shell company representatives, but the major limiting factor is shell quality. An effort is therefore being made to conduct a general statewide reconnaissance of mussels and an assessment of shell quality in addition to monitoring the mussel recruitment in the Verdigris River.

REFERENCES

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3. R. H. WILSON, *The freshwater mussel shell and button industry*, U. S. Dept. of Interior Fish and Wildlife Service, Fishery leaflet 346 (revised), 1956.