

DEPARTMENT OF COMMERCE
BUREAU OF FISHERIES

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MUSSEL STREAMS OF EASTERN OKLAHOMA.*

This work, done during the years 1910-1912, was part of a wide series of investigations conducted by the Bureau of Fisheries in relation to the mussel resources of the country. The region is not especially rich in economic shells, and this particular investigation was not a commercial survey so much as a study of the natural history and distribution of mussels and the conditions determining their abundance. The principal results will be embodied in a report which is now in course of preparation. Some of the data, however, are of character to warrant this preliminary summary for the purposes of those having commercial interests in the shelling industry.

ARKANSAS AND RED RIVER DRAINAGES.

These rivers furnish a complete outlet for all the surface waters of Oklahoma. The master streams are typical plains rivers, with broad channels and light shifting sandy stream floors. Few mussels are found in the Arkansas or Red, but in the tributaries a good supply of shells may be secured.

TRIBUTARIES OF THE ARKANSAS.

Over a dozen tributaries of the Arkansas River were investigated, of which four may be classed as having commercial possibilities; only the Neosho, Verdigris, and Chikaskia Rivers and Salt Creek need be mentioned in the present paper.

The Neosho or Grand River flows across southeastern Kansas, uniting with the Spring River at Wyandotte, Ottawa County, Okla., to form the Grand River. The Neosho is a clear-water stream of fair size, with a good current, and its bottom is composed of sand, gravel, and mud in various combinations in different situations. The Grand portion of the Neosho-Grand system was examined from Wagoner, Okla., to the mouth of the Grand; mussels are wanting, their absence being attributed to the character of the bottom, a coarse gravel. The Neosho was studied at Miami, Ottawa County, and at Chetopa, Cherokee County, Kans. It is the most promising shell stream in the region, and the Neosho shells are now being used by a button factory at Iola, Kans. At Miami, Okla., two shellers had

* By F. B. Isely, whose complete report will be published by the Bureau later.

been at work a short time before my visit, prospecting for shells to supply a proposed blank factory at this place. For some reason the factory plans did not materialize, although quite a quantity of shells were gathered. Examination of three shell heaps, containing, as estimated, about 20 tons of shells, enabled the observer to form a good idea of the kind of mussels present and the relative abundance in which the several species occurred. The leading forms were: Three-ridge (*Quadrula undulata*), pig-toe (*Q. pyramidata*), washboard (*Q. heros*), mucket (*Lampsilis ligamentina*), butterfly (*Plagiola securis*), and slough sand-shell (*L. fallaciosa*).^a I was told that the shellers worked about two weeks and considered the collecting good. When the factory project fell through, the sand-shells and the butterflies were sacked up and shipped away, being regarded of excellent quality.

At Chetopa, Kans., north of the Oklahoma State line, a number of excellent beds were found. The species were about the same as the ones listed at Miami. The Neosho doubtless has many good beds throughout its lower course. The shells collected for considerable distances above such points as Chetopa or Miami could easily be transported down to these places by barge during high water; a number of opportunities for such transportation are usually offered each summer.

The Verdigris River rises in south-central Kansas and flows in a general southeasterly direction across north-central Oklahoma to join the Arkansas at Muskogee. About 50 miles of the Verdigris were examined from Catoosa to Wagoner, Okla. The Verdigris, though called a clear-water stream, is quite different in character from the Neosho. The shoals are far apart and from a quarter to half a mile in length, while between them lie ponded stretches, miles in length, having depths of from 3 to 15 feet. The banks are quite steep and the bottom is made up of mud, gravel, broken shale, and sand in the several localities. Mussels are very abundant in some portions of the Verdigris. Good beds were located east of Catoosa, northwest of Inola, above the mouth of Bull Creek, and a mile below the Mingo Ferry west of Wagoner. The leading species were three-ridge (*Q. undulata*), pig-toe (*Q. pyramidata*), sand-shell (*L. fallaciosa*), maple leaf (*Q. nobilis*), and monkey-face (*Q. metacynra*). As in the case of the Neosho, the catch in the Verdigris could be transported downstream to a convenient point at times of high water. Collecting over beds in shallow water could be rapidly done so that a daily catch of 500 or more pounds might be expected. Over the shoals at low water the Verdigris is navigated with difficulty, even in a small boat.

^a While I have listed this as the slough sand-shell, it is indistinguishable from the yellow sand-shell (*L. anodontoides*). The green rays of *L. fallaciosa* are entirely wanting, although the shells are more cylindrical and smaller than the large sand-shells of the Mississippi; these were considered, however, good commercial shells.

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The Chikaskia River is a small sandy-bottom stream that flows southeast through Kingman, Harper, and Sumner Counties, Kans., and Kay County, Okla. A good supply of shells is found in the river at Tonkawa, Okla., and near Braman, Okla. The important species are three-ridge (*Q. undulata*), maple-leaf (*Q. lachrymosa*), and warty-back (*Q. pustulosa*). The shells of the first two are of good size and very easy to gather; the quality appears to be good.

Salt Creek is a small rocky stream in the Osage country with a number of beds located near Fairfax. It would not take long to exhaust the full supply, but the shells are unusually large and heavy. *Q. undulata* is the chief species.

TRIBUTARIES OF THE RED RIVER.

The tributaries of the Red River here mentioned are all found in the southeastern portion of the State. The Washita was examined, but, while a number of species were found, they were too scattering to be of value for practical fishing.

The Blue River is a clear sandy stream and is reported to have an abundance of shells in parts of its course. It was studied at Durant, Bryan County, at Milburn, Johnston County, and in the lower stretch 10 miles from the mouth. Seventeen species were collected in the Blue River, of which the most abundant were the three-ridge (*Q. undulata*), and *Q. rubiginosa*, the latter species being similar to the pig-toe but not a well-known shell among mussel fishermen. The aggregate quantity of shells is not large.

The Boggy River is a muddy-bottom stream with long ponded stretches and slow current. Boggy and Clear Boggy were examined at three stations (1) Lower Boggy above Davis Ferry; (2) Clear Boggy northwest of Boswell, Choctaw County, (3) Clear Boggy at Olney, Coal County. At the first station, about a mile above the Davis Ferry, at a point on the river known as Rock Shoals, is found the largest mussel bed observed by us in the Red River system. This bed was 80 to 100 yards long and several yards wide. The bed undoubtedly contained several tons of shells. Ninety per cent of these shells were three-ridge (*Q. undulata*). This was the most abundant mussel on all the beds of the stations on the Boggy. Others that were common are the buck-horn (*T. tuberculata*) and sand-shell (*L. fallaciosa*).

The Kiamichi River rises in the mountains of eastern Oklahoma and is an important factor in the drainage of the southeast corner of the State. The water is clear and the bottom generally sand and gravel. Fort Towson, Roby (Choctaw), and Tuskahoma (Pushmataha) were the stations examined. The mussels of the Kiamichi are below the average size. Twenty-nine species were noted in this stream. Of the commercial species, three-ridge (*Q. undulata*), mucket (*L. liga-*

mentina), buck-horn (*T. tuberculata*), and warty-back (*Q. pustulosa*) were the common kinds.

The stations on the Lower Boggy, on the Blue River at Durant and Milburn, and on the Kiamichi at Roby and Tuskahoma have a sufficient supply of mussels to make it possible to gather 200 to 500 pounds of shells a day. While the aggregate quantity is not large when compared with the Wabash or White Rivers, these streams will doubtless be worked commercially when conditions for marketing are more favorable. At present the freight rates are too high to make it profitable to ship the shells to the factories.

PEARLS.

The Boggy, Verdigris, Kiamichi, and Little Rivers are listed by writers upon fresh-water pearl production as having produced paying pearls. There was ample evidence of pearl-hunting along the banks of these streams. Pearl-ers were actually at work on the Verdigris and on the Little River at Garvin, though the results were reported as "very poor." Slugs were found abundantly by us, chiefly in two species not otherwise considered of commercial value—the "purply" (*L. purpurata*) and the paper-shell (*L. gracilis*).

CONCLUSIONS.

The Oklahoma streams as a whole are not to be classed with the rich shell-producing streams of Arkansas, Iowa, and Illinois; nevertheless, paying quantities of raw material can be secured in some stretches of the rivers here reported upon, and many other shell beds may be found when the region is worked commercially. The ease with which mussels can be secured by hand collecting will make large catches possible, and in consequence the work will be profitable for the sheller while it lasts. The time is coming, in the opinion of some close observers of the shell industry, when it will be common to ship sacked shells in small lots. When this practice is developed, thousands of tons of shells will come from sources now unknown or practically so. Furthermore, hundreds of miles of creek bottom in eastern Oklahoma could perhaps be made profitable areas by artificial propagation of mussels. An intelligent farmer might soon learn the methods of artificial infection and, with little work and scarcely any outlay of cash, stock a suitable creek on his farm annually. The species best suited to these streams would be three-ridge, sand-shell, and maple-leaf. The work of gathering the crop could be done during the slack season, thus increasing the margin of profit. Only experience can determine the results to be obtained, but the proposition would appear to be a feasible one in many localities, subject to favorable local conditions, intelligent interest, and accessible markets.