THREATENED FISHES OF OKLAHOMA

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A survey of museum collections and recent intensive collecting throughout Oklahoma have revealed a number of fish species to be threatened by man's activities. An annotated list of the 34 forms considered threatened in the state is presented. Five species are believed to be rare and endangered. Hopefully, clarification of the status of these 34 forms will aid in their protection and perpetuation.

The first attempt to compile a list of threatened native fishes for each of the 50 United States was made by Miller (1). McAllister (2) had previously listed rare and endangered fishes of Canada. Prior to these, the Red Book of Rare and Endangered Fish and Wildlife of the United States (1968) published by the U. S. Department of the Interior and the IUCN Red Data Book (Vol. 4, Pisces, 1969) stood alone as efforts to provide a record of the status of threatened fishes throughout the United States and the world, respectively. An upsurge in state ichthyofaunal surveys within the past few years has helped dramatically to clarify the status of individual species occurring within state boundaries and helped to solicit more concern at local levels.

Factors responsible for diminution of fish faunas as presented by Miller (1) were pollution (industrial, agricultural, and domestic, including toxic chemicals and pesticides), excessive damming of rivers, deforestation and overgrazing, channelization, excessive removal of ground water, and introduction of exotic species. Certainly many of these factors are at work in Oklahoma, sometimes with disastrous results.

A species may be rare and/or endangered in one geographical area of its range, while relatively common and, apparently, safe in another area. It is the responsibility of the concerned scientist to elucidate the status of locally threatened species and subspecies in order to instigate appropriate legislative action for the protection and perpetuation of many of them. The abundance of individual species may change, often dramatically, if proper steps are taken. The opposite of this is also possible with continued decline and eventual extinction being the fate of neglected populations.

Miller's list acknowledged only three fish species as threatened in Oklahoma (1). The three, Stizostedion vitreum platypus (the shovelnose sturgeon), Etheostoma cragini (the Arkansas darter), and Percina pantherina (the leopard darter), were all considered to be rare and endangered. The status of many other fish species is in need of study.

This study is a preliminary effort to clarify the status of certain fishes occurring in Oklahoma waters that we believe are threatened. Fish collections and field notes representing over 20 years of collecting effort housed at Oklahoma State University, University of Oklahoma and Tulsa University have been examined.

Of a total of 167 species of fishes known from Oklahoma (3), 34 forms are considered to be threatened (Table 1). Of these, we consider five species to be rare and endangered. Without careful study and proper safeguards many of these fishes may disappear from Oklahoma waters within the foreseeable future.

We are aware of recent extensive collections made primarily in the Kiamichi basin, but the results of this work were not available to us. When such data are made available, some emendations of the status accorded several species (such as Hiodon tergisus, Carpioidees velifer, Cyprinus elongatus and Notropis oreinburgeri) may be in order.

### Table 1. Threatened fishes of Oklahoma.

<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
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<tbody>
<tr>
<td><strong>Acipenseridae</strong></td>
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<tr>
<td><em>Acipenser platorynchus</em> (Rafinesque)</td>
<td>Shovelnose sturgeon</td>
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<tr>
<td><strong>Clupeidae</strong></td>
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<tr>
<td><em>Alosa alabamae</em></td>
<td>Jordan and Evermann</td>
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<tr>
<td><strong>Hiodontidae</strong></td>
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<tr>
<td><em>Hiodon albovittatus</em></td>
<td>(Rafinesque)</td>
</tr>
<tr>
<td><em>Hiodon latus</em></td>
<td>Leseuer</td>
</tr>
<tr>
<td><strong>Esocidae</strong></td>
<td></td>
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<tr>
<td><em>Esox niger</em></td>
<td>Leseuer</td>
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<tr>
<td><strong>Catosomidae</strong></td>
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<tr>
<td><em>Carpiodes ector</em></td>
<td>Rafinesque</td>
</tr>
<tr>
<td><em>C. elongatus</em></td>
<td>Leseuer</td>
</tr>
<tr>
<td><em>Moxostoma macrolepidotum</em></td>
<td>piscilobrump</td>
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<tr>
<td><strong>Cyprinidae</strong></td>
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<tr>
<td><em>Hybopsis amblopi</em></td>
<td>(Rafinesque)</td>
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<tr>
<td><em>H. gracilis</em></td>
<td>(Richardson)</td>
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<tr>
<td><em>Notropis amnis</em></td>
<td>Hubbs and Greene</td>
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<tr>
<td><em>N. atrocanalis</em></td>
<td>Evermann</td>
</tr>
<tr>
<td><em>N. bullimus</em></td>
<td>(Girard)</td>
</tr>
<tr>
<td><strong>Lepomisidae</strong></td>
<td></td>
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<tr>
<td><em>Lepomis cyanellus</em></td>
<td>(Jordan and Meek)</td>
</tr>
<tr>
<td><em>N. chalybeus</em></td>
<td>(Cope)</td>
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<tr>
<td><em>N. maculatus</em></td>
<td>(Hay)</td>
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<tr>
<td><strong>Percidae</strong></td>
<td></td>
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<tr>
<td><em>Percina maculata</em></td>
<td>(Girard)</td>
</tr>
<tr>
<td><em>P. marina</em></td>
<td>(Bailey)</td>
</tr>
<tr>
<td><strong>Cyprinodontidae</strong></td>
<td></td>
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<tr>
<td><em>Fundulus heteroclitus</em></td>
<td>(Cope)</td>
</tr>
</tbody>
</table>

### TERMINOLOGY

Use of scientific names follows Bailey, et al. (4), except that we follow Moore (5) in retaining the genus *Crystallaria* rather than *Ammocrypta* for the crystal darter (*C. asprella*).

Definition of terms employed for determining the status of individual species are amended slightly from those used by the Endangered Species Committee of the American Fisheries Society, as presented below.

**Endangered.** A species or subspecies that is actively threatened with extinction. Continued survival of the form is unlikely without the implementation of special protective measures.

**Rare.** While not under immediate threat of extinction, the species or subspecies occurs in such small numbers that it could quickly disappear if its habitat is altered or destroyed. An additional criterion for the status of rare is that, although possibly locally abundant, the form occurs in only
a few localities or in a restricted habitat. All species or subspecies regarded as rare require careful monitoring in the future.

Indeterminate. A species or subspecies that is apparently threatened, but insufficient data are currently available for reliable assessment of status.

**ACIPENSERIDAE**

   Oklahoma distribution. Eastern portion of the Arkansas and Red rivers including some of their larger tributaries.
   Remarks. The shovelnose sturgeon is an inhabitant of the main rivers, entering the smaller streams in the spring to spawn. Confined primarily to eastern Oklahoma, westward distribution may be limited by dams on these rivers (3).
   Construction of future dams may further prevent access to necessary spawning areas and bring about decline of this species. *S. platyrognchus* should be regarded as rare and endangered in Oklahoma.

**CLUPEIDAE**

   Oklahoma distribution. Known only from the Poteau River (Arkansas River system) and the Little River system.
   Remarks. Hutchins and Hall (6) first reported *A. alabamae* in Oklahoma from the stilling basin below Wister Dam. Cross and Moore (7) incorrectly reported young specimens of *A. alabamae* as *Pomolobus (=Alosa) chrysobloris*, thus providing evidence that Oklahoma streams are used as spawning areas by this species. Although probably not occurring throughout the year, *A. alabamae* must be considered as rare in Oklahoma.

**HIODONTIDAE**

   Oklahoma distribution. Little River system.
   Remarks. *H. tergisus* was first reported from the Little River system by Hall (8), and is known also from the Kiamichi River. The mooneye seems to prefer larger clear streams and rivers; it appears to have little tolerance for turbid waters. Because it ascends streams to spawn, further damming of these rivers may seriously affect the abundance of this species in Oklahoma. *H. tergisus* is regarded as rare.

**ESOCIDAE**

   Oklahoma distribution. Arkansas and Red river systems in eastern Oklahoma; occurs as far west as Fort Cobb Reservoir (Washita River).
   Remarks. During its first ten years of impoundment Lake Texoma supported an abundant population of the goldeye (9). Although *H. aldosoides* apparently experienced a decline in abundance in past years (Carl Riggs, personal communication), it has been taken regularly, though in small numbers, in recent years (Loren Hill, personal communication). Records elsewhere in the state are few. Because of its continued decline in Oklahoma the goldeye is given a provisional status of indeterminate until further evidence is gathered to ascertain more fully its proper status within the state.

**ESOCIDAE**

   Oklahoma distribution. Known only from Pushmataha County and Lake Texoma.
   Remarks. Extremely rare in Oklahoma. Since there are no recent records of *E. niger* from the state, it would perhaps be prudent to list this species as indeterminate until the status of this fish is better known.

**CATOSTOMIDAE**

   Oklahoma distribution. Of sporadic occurrence in larger streams of the Arkansas River system (Neosho, Poteau, and Illinois rivers) and the Red River system.
   Remarks. The highfin carpsucker is usually found in larger streams or the main channel of large rivers; however, it is uncommon to find great numbers anywhere. Branson (10) reported that it was abundant in Ft. Gibson Reser-
voir, but did not occur in any of the other reservoirs of the Neosho drainage.


Oklahoma distribution. Lake Texoma and Grand Lake.

Remarks. The blue sucker is an inhabitant of deep, swift channels in large rivers. Moore and Cross (11) presented the first Oklahoma records of *Cycleptus elongatus* from Lake Texoma shortly after its impoundment. Young *Cycleptus* have also been collected by Gordon Hall from Grand Lake. Riggs and Bonn (9) reported the blue sucker from Lake Texoma and only slightly more common in the tailwaters. Pflieger (12) reported the blue sucker as less abundant in neighboring Missouri in 1971 than in the early 1900's. Construction of impoundments which result in decreased current velocity and increased siltation is unfavorable to *C. elongatus*. A decline in *C. elongatus* was noted by Coker (13) in the upper Mississippi River following construction of a dam in Iowa. It is taken occasionally from the service generator tubes of Denison Dam. We regard the blue sucker as rare in Oklahoma.


Oklahoma distribution. Clear eastern tributaries of the Arkansas River system; one record from the Red River system.

Remarks. The pealip redhorse is generally confined to clear, continuously flowing, eastern tributaries of the Arkansas River system, although it is known in areas west of the Ozark Region. One recent record comes from Lake Texoma (Red River system) (14). Because of the paucity of Oklahoma records we regard *M. m. pisolabrum* as rare in the state.

**CYPRINIDAE**


Bigeye chub.

Oklahoma distribution. Confined primarily to the eastern edge of the state in the Arkansas River drainage.

Remarks. While never collected in great numbers, the bigeye chub is known from localities throughout the eastern Arkansas River drainage in Oklahoma. It has not been collected as often in recent years. Trautman (15) and Zahuranec (16) have called attention to dwindling abundance of *H. amblops* in Ohio, attributable to recent accumulations of silt over stream bottoms that were formerly composed of clean sand or gravel. *H. amblops* prefers clear streams with moderate gradients in the Ozark Region and should be regarded as rare in Oklahoma.

10. *Hybopsis gracilis* (Richardson).

Flathead chub.

Oklahoma distribution. South Canadian and western Cimarron rivers.

Remarks. This uncommon large river minnow has been collected in Oklahoma only from the South Canadian and western Cimarron rivers. Found primarily in turbid mainstreams of these rivers, *H. gracilis* will probably not be greatly affected by increased siltation and other factors increasing the turbidity of the plains streams. In future years the flathead minnow may actually increase in abundance. The present scarcity of collections of *H. gracilis* may be a reflection of improper sampling methods. Until further studies are made we view the status of the flathead chub as indeterminate.

11. *Notropis amnis* Hubbs and Greene.

Pallid shiner.

Oklahoma distribution. Eastern tributaries of the Arkansas River including the Poteau River, Lee's Creek, and the Red River system extending west to Clear Boggy Creek.

Remarks. Cross and Moore (7) reported *N. amnis* as a conspicuous member of the Poteau River ichthyofauna. However, the pallid shiner is rarely taken throughout its range in Oklahoma and then only in small numbers. In Missouri *N. amnis* has shown a marked decline in abundance (12), probably due to increased siltation and turbidity, and may possibly be extirpated from the state. We regard the pallid shiner as rare in Oklahoma.


Blackspot shiner.
Oklahoma distribution. Little River and Red River systems (Gates Creek and some other tributaries).

Remarks. First reported from Oklahoma by Moore and Cross (11), *N. atrorubens* is known from only a few localities in southeastern Oklahoma, where it may be locally abundant. Destruction or alteration of these sites could precipitate a change from its present rare to an endangered status.


Remarks. This typically large river shiner is seldom taken in Oklahoma waters, although it has been collected from the Arkansas and Red rivers and occasionally is found as a wanderer in larger tributaries of these rivers. Zahuranec (16) noted increased abundance of *N. blemius* in the Scioto River in Ohio and associated the increase with a decrease in silt and/or other pollutants. It is regarded as rare in Oklahoma.

14. *Notropis camurus* (Jordan and Meek). Bluntface shiner. Oklahoma distribution. Northeastern corner of the state (Neosho and Illinois River drainages, Greenleaf Creek, and Bayou Manard); several records extend its range to Kay County.

Remarks. The bluntface shiner is a rare member of the Oklahoma fauna. It has been taken primarily in the Illinois and Neosho River drainages of eastern Oklahoma with several records west to Kay County.


Remarks: Ortenburger and Hubbs (17) in the first report of this species in Oklahoma referred to 10 specimens collected from the Mountain Fork River, 10 miles southeast of Broken Bow, as *Notropis maculatus*. Hubbs (personal communication) has re-examined the specimens and concluded that they are *N. chalybeus*. We know of no other Oklahoma records. Further drainage of swampy areas in McCurtain County may spell doom for the ironcolor shiner in Oklahoma if indeed it is not gone already. It definitely should be regarded as rare and endangered within Oklahoma.


Remarks. The taillight shiner, though uncommon, has been found in oxbow lakes and backwater areas in McCurtain County. Warren Adams (personal communication) reports that at least one oxbow lake in McCurtain County has been drained in order to use its bed for raising cotton. Further drainage of backwater areas in McCurtain County could eliminate *N. maculatus* from Oklahoma. It is currently recognized as rare.


Remarks. Disjunct populations of this species make interpretation of its distribution and status difficult. Specimens from the Verdigris River (18) could be bait releases because, since first reported, *N. ortenburgeri* has not been collected there. Generally, *N. ortenburgeri* is confined to the southeast corner of the state where it inhabits the Kiamichi, Little River system and the Poteau River (Arkansas River drainage). Although it may occasionally be locally abundant, present data suggest that in Oklahoma the Kiamichi shiner must be regarded as rare.


Remarks. Soelson and Jenkins (19) reviewed all past material of *N. perpallidus* from Oklahoma, where is is limited to the lower reaches of tributary streams of the Little River system and the Kiamichi. It should be regarded as rare.

Oklahoma distribution. Known only from the Illinois River.
Remarks: The first specimen of the spotfin shiner from Okloma was actually taken in July, 1936, by W. F. Blair and F. A. Blair, although it was then misidentified as *N. whipplei*. Moore collected *N. spiloterus* in 1941. Gibbs (20) reported on all Oklahoma material of *N. spiloterus*. Subsequent collecting in Oklahoma has revealed few specimens of the spotfin shiner; we regard it as rare.

20. *Ictalurus nebulosus* (Lesueur).

Brown bullhead.
Oklahoma distribution. Kiamiebi River and Little River system.
Remarks. Meek (21) first reported *Amia (= Ictalurus) nebulosus* from Oklahoma in the Kiamiebi River. Hall (8) later reported specimens from the Little River system. Except for Meek’s (21) record, McCurtain County is the only area where this species has been taken in the state. While *I. nebulosus* in Oklahoma should be treated as rare, considerable stocking in stripmine lakes, oxbows, and river cutoffs in Arkansas, Missouri, and Kansas may result in the appearance of *I. nebulosus* in other areas of the state.


Mountain madtom.
Oklahoma distribution. Little River system.
Remarks. The mountain madtom was known in Oklahoma only from the Mountain Fork River until Adams (personal communication) discovered an additional population in the Little River proper. These populations constitute the western edge of its known range. While sometimes locally abundant, *N. eleutherus* must be considered rare in Oklahoma.


Neosho madtom.
Remarks. The Neosho madtom, first described by Taylor (22), is the only member of the *furiosus* species group found west of the Mississippi River. It occurs as an endemic species in the main channels of the Neosho and Illinois rivers. The small geographical range makes it necessary to place *N. placdus* on the list of threatened Oklahoma fishes and it is designated as rare.

23. *Fundulus sciadicus* Cope.

Plains topminnow.
Remarks. Hubbs and Ortenburger (23) first reported the plains topminnow from Oklahoma. It was not reported again until Branson (10) described three collections from the Neosho River drainage. We have discovered a population of *F. sciadicus* in Cloud Creek, a tributary of the Illinois River; however, in Oklahoma the plains topminnow remains rare.


Ozark cavefish.
Oklahoma distribution. Cave streams in northeastern Oklahoma.
Remarks. *Amblyopsis rosae* is the most recent addition to the Oklahoma ichthyofauna (24, 25). Only 23 specimens are known from the state (1-OSUMZ 7105, 1-OSUMZ 7106, 20-OSUMZ 7271, and 1 uncatalogued specimen) and all are from its northeastern corner. Due to strict habitat requirements and scarcity, *A. rosae* must be considered as rare in Oklahoma.


Southern cavefish.
Oklahoma distribution. Cave Spring near Peoria, Ottawa County.
Remarks. Hall (8) first reported the southern cavefish from Oklahoma on the basis of one specimen (KU 3210) taken from Cave Spring in Ottawa County. This single specimen was later used by Woods and Inger (26) as the lone Oklahoma record of this species in their study of the Amblyopsidae. Subsequent collecting has yielded only a handful of specimens from the state. This paucity necessitates a designation of rare for *T. subterraneus* in Oklahoma.
PERCICHTHYIDAE

Oklahoma distribution. Eastern and southeastern portions of Oklahoma in a few lakes in Wagoner, Muskogee, and McCurtain counties.
Remarks. Information regarding the yellow bass in Oklahoma is scarce. Apparently *M. mississippiensis* is a lake species and continued damming of streams could conceivably contribute to an increase in its abundance in Oklahoma. Until this increase occurs, the yellow bass should be considered as rare.

PERCIDAЕ

Oklahoma distribution. Little River system.
Remarks. Only two specimens of the crystal darter were known from Oklahoma prior to the recent collection of 27 specimens in the Little River by Adams (personal communication). Even with the discovery of the new specimens, *C. aspella* must be regarded as rare in Oklahoma. The crystal darter is extremely sensitive to siltation and pollution, and continued damming of the tributaries of the Little River system could place this species on the endangered list. *C. aspella* has already been extirpated from much of its range in eastern United States (27).

Arkansas darter.
Oklahoma distribution. Neosho River drainage.
Remarks: The Arkansas darter is confined to an extremely specialized habitat of spring-fed streams containing watercress in the Neosho River drainage in Oklahoma. Completion of Grand Lake destroyed populations of *E. cragini* occurring in the lake basin. Because of the scarcity of its specialized habitat *E. cragini* should be regarded as rare and endangered in Oklahoma.

Oklahoma distribution. Little River system.
Remarks. The scaleyhead darter is one of the rarest of Oklahoma's fishes. Only a handful of specimens are known from the state. Drainage of oxbow lakes in McCurtain County could adversely affect *E. fusiforme barratti* and conceivably eliminate this species from the state. We regard the scaleyhead darter as rare and endangered.

Oklahoma distribution. Eastern Arkansas River drainage and Blue River of Red River system.
Remarks. The least darter occurs in a habitat similar to that of *E. cragini*, i.e., clear, spring-fed streams with dense vegetation at the edges of pools or backwater areas. *E. microperca* may not be able to compete successfully with the more common *E. proeliiare*. Cross and Moore (7) found *E. microperca* to be supplanted by *E. proeliiare* in the Poteau River. We regard the least darter as rare in Oklahoma.

Oklahoma distribution. Southeastern Oklahoma.
Remarks. The goldstripe darter is known only from Gates Creek in Choctaw County and the Mountain Fork River in McCurtain County; it is not abundant in either location. *E. parvipinna* is considered rare in Oklahoma.

Oklahoma distribution. Eastern Oklahoma.
Remarks. A fish of deep riffles, *P. maculata* is nowhere abundant in collections. Blair (28) reported it from only two locations in northeastern Oklahoma. The blackside darter is regarded as a rare member of Oklahoma fauna.

Oklahoma distribution. Known only from the Poteau River and Lee's Creek (Arkansas River drainage).
Remarks. The longnose darter is quite rare in Oklahoma. Its close relative, *P. phoxocephalus*, is much more common. While we currently regard *P. nasuta* as rare in Oklahoma, its status...
may be changed to endangered in the near future. Warren Adams (personal communication) reports that attempts to collect this species in Lee’s Creek were fruitless after large-scale spraying of pesticides in the area caused a huge fish kill there. However, more recent collecting by one of us (R. J. M.) has yielded three specimens of _P. nasuta_ from Lee’s Creek.

34. _Percina pantherina_ (Moore and Reeves). Leopard darter. Oklahoma distribution. Little River system.

Remarks. Recent collecting in Arkansas and Oklahoma has revealed a much wider distribution of _P. pantherina_ in the Little River system than in the headwaters of the Mountain Fork River, as previously believed (29). Discovery of additional populations establishes this species more firmly in Oklahoma. Nevertheless, the leopard darter must still be considered as rare and endangered.

REFERENCES