

The Recent Distribution of Sturgeon Chub
(Macrhybopsis gelida) in Montana

Submitted to:

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Introduction

In March 1993, a draft report entitled Status Report on the Sturgeon chub (Macrhybopsis gelida), a Candidate Endangered or Threatened Species was circulated by the U.S. Fish and Wildlife Service's Ecological Services Office in Bismarck, North Dakota (Werdon 1993). This document largely discounted collections made prior to 1989 and showed the recent range of the sturgeon chub in Montana was limited to the Powder and lower Yellowstone rivers (Fig. 1). The U. S. Fish and Wildlife Service asked for comments on this draft report and was informed the Montana distributional information was incomplete. Montana State University (MSU) had recent collections of this species from the Missouri River as well. However, in August 1993, the final report entitled Status Report on Sturgeon Chub (Macrhybopsis gelida) a Candidate Endangered Species (Werdon 1993) was issued with the original incomplete distributional information on the sturgeon chub in Montana. Thus, the final report presented a more restricted recent distribution of this species in Montana than actually existed.

To obtain additional and more current information, the Montana Department of Fish, Wildlife and Parks contracted for a survey of known and potential sturgeon chub waters in Montana. The following is a report of findings from that survey.

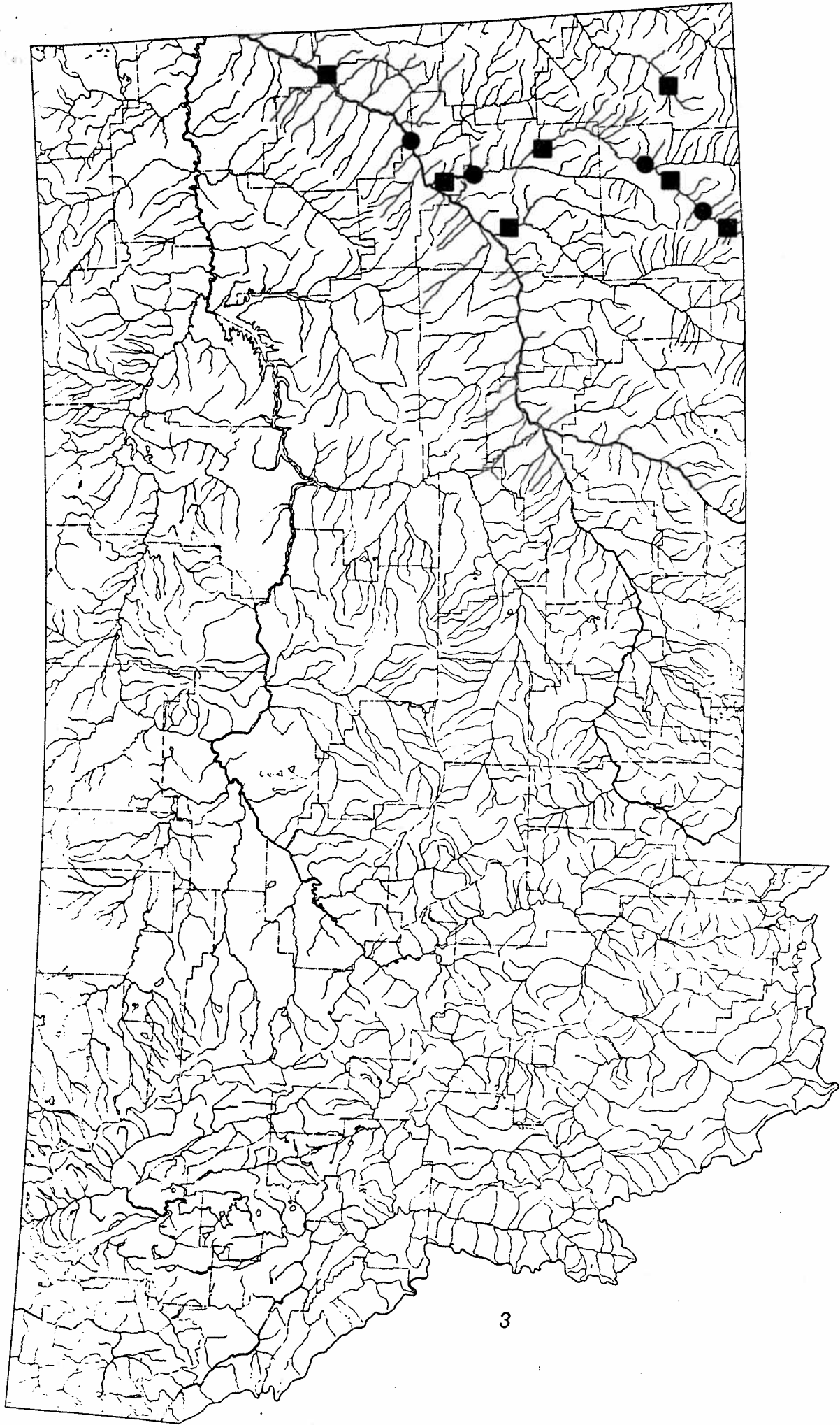


Figure 1. Montana sites Werdon (1993) sampled for sturgeon chub during 1989-90.

● Chubs present
■ Chubs absent

Methods

Sampling stations were chosen to include waters where sturgeon chub had been collected in the past and waters that did not have records of sturgeon chub but might contain them. Streams draining into both the Yellowstone and Missouri rivers were sampled.

A 6.1 m long and 1.2 m high seine having a 4.8 mm square mesh was used at each station sampled. A number of seine hauls were made at each station including hauls made through the most likely sturgeon chub habitat present. When sturgeon chub were collected, a series of measurements were made of the site. Water depths and velocities were recorded on a transect across the site, temperature was taken, substrate size was estimated and a turbidity sample collected. Also, we recorded the kinds of fish captured at each sampling site. Several potential sampling sites were examined but not seined because they contained large deposits of mud and/or woody debris.

Results

Twenty six sites were seined (Table 1). Sites numbered 1-20 were located in the Yellowstone and Little Missouri drainages while sites 21-26 were in the Missouri River basin.

Table 1. Sites seined for sturgeon chub (*Macrhybopsis gelida*) in Montana during 1994. Sites with sturgeon chub have *.

| Collection site | | |
|-----------------|------------------------------------|----------------------------------|
| Number | Name | Location |
| 1. | O'Fallon Creek near mouth | T12N R52E S2; Prairie Co. |
| 2. | O'Fallon Creek near Mildred | T11N R54E S29; Prairie Co. |
| 3. | O'Fallon Creek near Ismay | T9N R55E S33; Custer Co. |
| 4. | Boxelder Creek at FAS277 | T4S R59E S8; Carter Co. |
| 5. | Boxelder Creek near Belltower | T2S R60E S6; Carter Co. |
| 6. | Little Missouri River at FAS 323 | T7S R61 S1; Carter Co. |
| 7. | Little Powder River near Biddle | T8S R52E S34; Powder River Co. |
| 8. | Little Powder River at Highway 212 | T5S R52E S28; Powder River Co. |
| 9. | Powder River near Wyoming border | T9S R47E S36; Powder River Co. * |
| 10. | Powder River near Broadus | T5S R51E S13; Powder River Co. * |
| 11. | Tongue River near I-94 | T7N R47E S3; Custer Co. |
| 12. | Mizpah Creek near Mizpah | T6N R51E S24; Custer Co. |
| 13. | Powder River near Mizpah | T6N R52E S30; Custer Co. * |
| 14. | Powder River near mouth | T11N R50E S3; Dawson Co. * |
| 15. | Tongue River at mouth | T8N R47E S32; Custer Co. |
| 16. | Tongue River near Pumpkin Creek | T6N R48E S29; Custer Co. |
| 17. | Yellowstone River at Rosebud | T6N R42E S14; Rosebud Co. |
| 18. | Yellowstone River at Forsyth | T6N R40E S23; Rosebud Co. |
| 19. | Sunday Creek near Miles City | T8N R47E S3; Custer Co. |
| 20. | Sunday Creek near Miles City | T9N R47E S35; Custer Co. |
| 21. | Teton River near Fort Benton | T24N R8E S9; Chouteau Co. |
| 22. | Missouri River at Fort Benton | T24N R8E S24; Chouteau Co. |
| 23. | Marias River near Loma | T25N R9E S12; Chouteau Co. |
| 24. | Poplar River near Poplar | T27N R50E S12; Roosevelt Co. |
| 25. | Redwater River north of Circle | T26N R50E S18; McCone Co. * |
| 26. | Musselshell River near Melstone | T10N R31E S21; Musselshell Co. |

Twenty five species were collected (Table 2). Flathead chub, longnose dace and Catostomus spp. were encountered at more stations than other species. Six species were only taken at one site.

Sturgeon chub were collected at four sites, all on the Powder River. Associated with the sturgeon chub were Catostomus spp., shorthead redhorse, river carpsucker, flathead chub, longnose dace, fathead minnow, Hybognathus spp. and stonecat. The flathead chub was the most common species taken with the sturgeon chub. Rehwinkel (1978), in an extensive survey of the Powder River, reported finding 16 species associated with sturgeon chub, with the flathead chub being the most common fish.

The physical characteristics of the four collection sites of sturgeon chub are presented in Table 3. Chub were found in both the wide single and narrow multi channel areas of the Powder River in areas of moderate depths and velocities with substrates of rocks imbedded in sand and clay.

Table 2. A list of fishes collected in the sturgeon chub (*Macrhybopsis gelida*) survey during 1994.

| | Collection site number (Table 1) | |
|-----|--------------------------------------|--|
| | Common name of fish | Scientific Name |
| 1. | Goldeye | 1, 12, 19, 21 |
| 2. | White sucker/longnose sucker | 1, 2, 3, 4, 5, 7, 8, 11, 12, 13, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26 |
| 3. | Mountain sucker | 1, 16, 17, 18, 23 |
| 4. | Shorthead redhorse | 1, 9, 11, 15, 16, 17, 18, 21, 22, 24 |
| 5. | River carpsucker | 1, 6, 12, 14, 16, 19, 20, 21, 22, 24, 26 |
| 6. | Flathead chub | 1, 2, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26 |
| 7. | Sand shiner | 1, 2, 3, 5, 6, 7, 8, 11, 12, 15, 16, 17, 19, 25 |
| 8. | Longnose dace | 1, 2, 3, 7, 8, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26 |
| 9. | Common carp | 1, 2, 5, 7, 8, 17, 18, 20, 21, 22, 25 |
| 10. | Emerald shiner | 1, 17, 18, 23 |
| 11. | Fathead minnow | 2, 3, 4, 6, 7, 8, 11, 12, 13, 16, 17, 18, 19, 20 |
| 12. | Golden shiner | 4 |
| 13. | Lake chub | 4 |
| 14. | Plains minnow/western silvery minnow | 1, 4, 8, 10, 12, 16, 17, 18, 19, 20, 21, 23, 26 |
| 15. | Sturgeon chub | 9, 10, 13, 14 |
| 16. | Stonecat | 1, 7, 8, 9, 11, 16, 21 |
| 17. | Channel catfish | 2, 5, 8, 11, 16, 19, 20, 26 |
| 18. | Black bullhead | 19 |
| 19. | Mountain whitefish | 23 |
| 20. | Plains killifish | 2, 19, 20 |
| 21. | Mottled sculpin | 23 |
| 22. | Green sunfish | 5, 7 |
| 23. | Smallmouth bass | 16, 17, 18, 24 |
| 24. | White crappie | 24 |
| 25. | Sauger/walleye | 1, 21, 25 |

Table 3. Characteristics of sampling sites with sturgeon chub in the Powder River during 1994.
Depth and velocity measurements were made only in areas with current.

| Location | Stream width (m) | Average (SD) depth (cm) | Average (SD) velocity (cm/s) | | Large rock size (cm) | Turbidity (JTU) | Water temp. (C) |
|-------------------------------------|---------------------|----------------------------|------------------------------|---------|-------------------------|--------------------|--------------------|
| | | | 6/10 depth | bottom | | | |
| Near Wyoming T9S R47E S36 | 36 | 30 (6) | 46 (12) | 34 (9) | 15 | > 1,000 | 21 |
| Near Broadus T5S R51E S3 | 8* | 15 (6) | 31 (15) | 27 (12) | 23 | > 1,000 | 22 |
| Near Mizpah T6N R52E S30 | 25 | 37 (6) | 49 (9) | 27 (9) | < 5 | > 1,000 | 20 |
| Near Yellowstone R. T11N R50E S3 | 6* | 15 (6) | 34 (15) | - | < 8 | > 1,000 | 25 |

* Side channel.

Discussion

Montana has two core areas with sturgeon chub. In recent years, (1993-1994) chub have been collected from sites on:

- (1) The entire approximately 320 km length of the Powder River (Werdon 1993, this survey).*
- (2) The Yellowstone River from the mouth of the Powder River downstream about 198 km to below Sidney (Werdon 1993, M.S.U. collections) and*
- (3) About 135 km of the Missouri River upstream of the C.M.R. Wildlife Refuge (Grant Grisak, MDFWP, personal communication) and near the North Dakota border (Tews 1993).*

Thus, the total range of the sturgeon chub encompasses some 653 km of stream in Montana (Fig. 2) and is much greater than the distribution reported in the final status report of the U.S. Fish and Wildlife Service.

It also appears that sturgeon chub may at least periodically inhabit other streams in Montana. Previous reports indicate it has been collected from the Tongue, Teton and Little Missouri rivers and Boxelder Creek (Elser et al. 1977, Elser et al. 1980, Holton 1980). Although chub were not found in these streams in the 1989-1990 (Werdon 1993) and present surveys, populations may establish themselves in some of these areas during years or seasons of suitable flows. The drought of recent years may have eliminated these peripheral populations. In this survey, a sampling site on

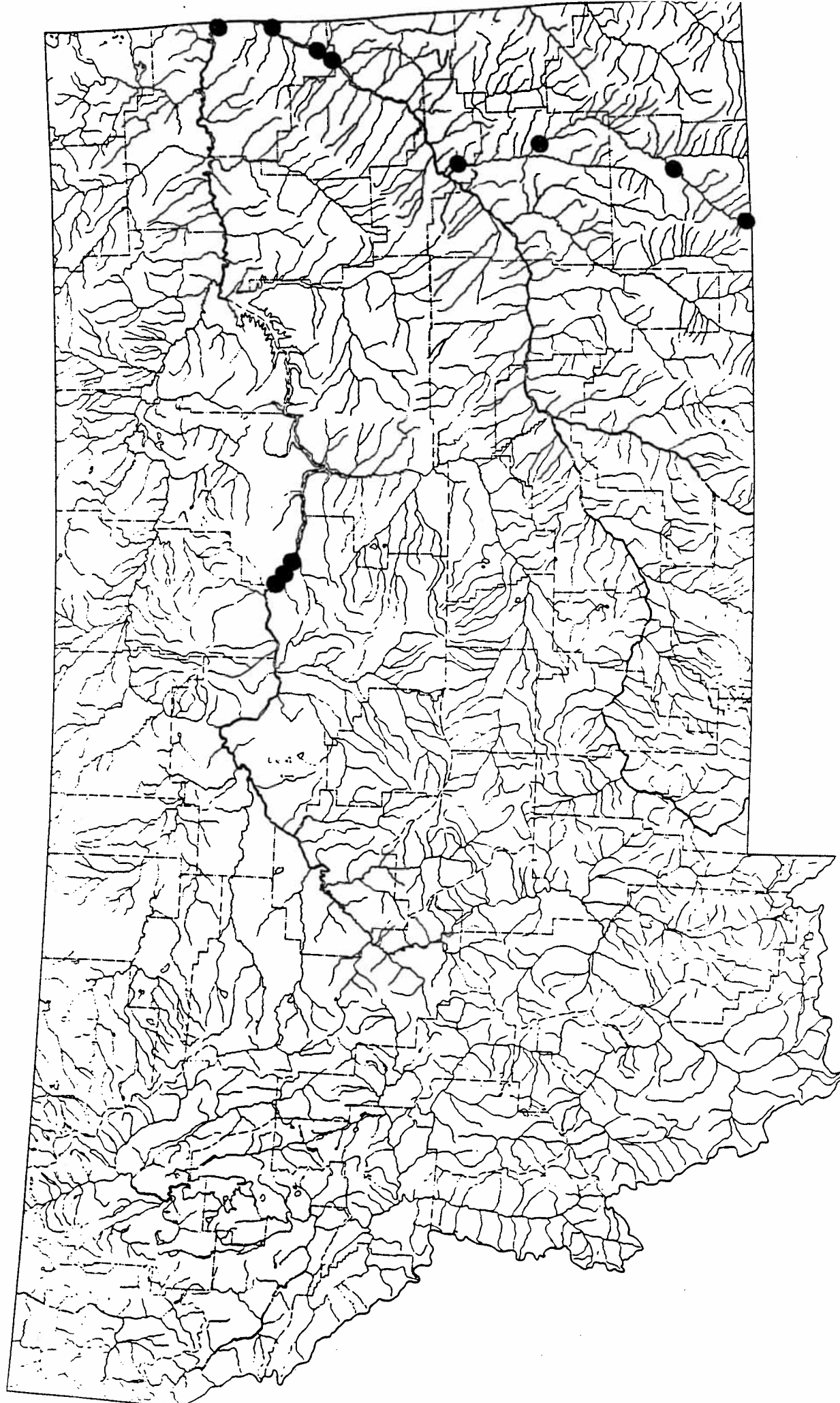


Figure 2. Distribution of recent collections (1993-1994) of sturgeon chub (*Macrhybopsis gelida*) in Montana.

the Teton River was dry, a site on the Milk River was covered with a thick layer of silt and a site on Box Elder Creek contained a large amount of mud and woody debris. Weldon (1992) reported sturgeon chub were absent from locations with >10% clay substrate.

The habitat of sturgeon chub in the Powder River in Montana and Wyoming is similar. Chubs in both states were taken in areas with rock and gravel substrates, high turbidity, no vegetation, and at depths less than 0.6 m (Stewart 1981, this survey). Velocities (6/10 depth) at Montana collection sites were slightly less than those in Wyoming. However, since sturgeon chub are bottom fish, they are probably more closely associated with the reported bottom velocities (Table 3) than 6/10 depth velocities.

Sturgeon chub in Montana certainly inhabit a wider range of habitat features than the turbid shallow water found in the Powder River (Stewart 1981, this study). The collections from both the lower Yellowstone and Missouri rivers came from sites with lesser turbidities, greater depths and different temperature regimens. Future study of these collection sites will provide a more complete understanding of the habitat features of sturgeon chub.

Recommendations

The current possible federal listing of the sturgeon chub has created a need to obtain more information about this species in Montana. Additional information on this species can be obtained by:

- 1. Encouraging fisheries personnel from Billings to Great Falls and eastward to examine and collect unfamiliar minnows during their routine sampling.*
- 2. Sampling selected streams in riffles, runs or edges with moderate velocities. Night electrofishing might be effective for this apparently negatively phototropic species in water less turbid than the Powder River.*
- 3. Having personnel send samples of suspected or known sturgeon chub with the collection data to M.S.U., for inclusion in M.S.U.'s permanent collections.
(Some previous reports of sturgeon chub are suspect because the site habitat does not appear suitable and no specimens from the location have been accessioned to document the collection.)*
- 4. Periodically sampling the core areas to determine the chubs range and well being.*

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Addendum

1. *Sturgeon chub from the Powder River were ripe or nearly ripe. Males had enlarged testes and females had large eggs (0.9 - 1.1 mm).*
2. *This survey provided 11 range extensions for MSU collections.*