SOUTH DAKOTA SMALL GRANTS PROGRAM 1998

FINESCALE DACE & LAKE CHUB SURVEY

BY

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Background

The SD GF&P Small Grants Program funded this survey and report. My survey was conducted to search and delineate the presence of the Lake Chub (*Couesius plumbeus*) and Finescale Dace (*Phoxinus neogaeus)* in western South Dakota. I conducted this survey under South Dakota Scientific Collecting Permit No. 54 and Wyoming Chapter 33 Permit ID No. 184.

When applying for this grant the Lake Chub was categorized, as historically known, by the South Dakota Heritage Database. The Lake Chub was documented in Black Hills streams from 1929 to the 1950s (Bailey and Allum, 1962). The Lake Chub had not been collected in the Black Hills since, until the SD GF&P Rapid City Fisheries staff reported finding specimens in Deerfield Reservoir in 1996. The Lake Chub was documented in the Little Missouri River in the 1950's (Bailey and Allum, 1962) and in the 1970's (Bich & Scalet, 1977).

The Finescale Dace is a state-endangered fish in South Dakota. Historically the Finescale Dace inhabited Cox Lake, both Mirror Lakes, Mud Lake, Crow Creek and Redwater Creek in Lawrence County in South Dakota (Evermann and Cox, 1896) (Bailey and Allum, 1962). The finescale dace occurs in the Redwater Creek drainage and at the mouth of the Niobrara River in Wyoming.

DISCUSSION

My project's primary goal was to confirm the presence or absence of Lake Chubs and Finescale Dace in historic sites. My secondary goals were to document new sites for these species and to delineate the populations if possible.

In regard to the Finescale Dace, my plan was to check the Redwater Creek Watershed as thoroughly as possible within my time and monetary restrictions. I planned to survey the Redwater Drainage in South Dakota and Wyoming. The Wyoming part of my survey was not conducted with South Dakota Small Grants funds. I know someone will ask, why Wyoming if this is funded by the South Dakota Small Grants Program? Fish species do not seem to care about state borders in their movements and life cycles. My assumption was that if they still existed in the upper watershed (Wyoming), there was always a chance of repopulating the lower watershed (South Dakota). I wanted to inspect the habitat in the upper watershed for signs of negative impacts. It is very true that factors that negatively effect the upper parts of a watershed do indeed effect the lower part of a watershed. Most often negative factors will generally intensify in the lower parts of the watershed, primarily because they culminate into a single stream or river from the many branches of the upper watershed. There are records from the late 1970's showing the Finescale Dace in the upper watershed of the Redwater Drainage in Wyoming. The Cheyenne River Drainage near Hot Springs, SD, was another area I was planning to survey. The SDGF&P collected Finescale Dace specimens from that area in 1985. The personnel that collected the specimens cannot recall the exact collection site (pers. comm.).

In 1997 I surveyed in historic locations to locate Lake Chubs (Small Grants Report, 1997). The survey area included many of the streams in the Cheyenne River Watershed and the Little Missouri River and is tributaries. The Lake Chubs were present at only one location, that being Deerfield Reservoir. In 1998 the Belle Fourche Watershed in South Dakota was my planned survey area. The Lake Chub is documented in the Belle Fourche Watershed in Wyoming (Patton, 1997).

METHODS & MATERIALS

The streams and rivers were sampled using three different seines. An Erickson seine (a modified dipnet). A standard wall seine, 4'x 8' with 1/4" mesh. A bag seine, 4' x 10' with 1/8" mesh. Standard two man seine hauls were made where terrain allowed. The Erickson seine was utilized in pools and undercut banks. Fish were identified using the following scientific keys: The Fishes of Missouri, How to Know the Freshwater Fish, Fishes of Kansas, and Fishes of Wyoming.

A list of species found at each station is provided in the following pages. Mature trout are identified by species. Fingerlings are listed as Trout sp.. The silvery minnow is listed as *Hybognathus sp.*. I did not attempt to split them by species as *Hybognathus placitus* or *Hybognathus argyritis*.

Belle Fourche River Watershed

1. Belle Fourche River, Butte Co., SD, T9N,R1E, S36 July 1, 1998

Shorthead Redhorse	*Moxostoma macrolepidotum*
Flathead Chub	*Platygobio gracilis*
Stonecat	*Noturus flavus*
Hybognathus sp.	
Mountain Sucker	*Catostomus platyrhchus*
White Sucker	*Catostomus commersoni*

2. Belle Fourche River, Butte Co. SD, T9N, R1E, S35 July 1, 1998

Shorthead Redhorse	*Moxostoma macrolepidotum*
Flathead Chub	*Platygobio gracilis*
Stonecat	*Noturus flavus*
Longnose Dace	*Rhinichthys cataractae*
Sand Shiner	*Notropis stramineus*
Hybognathus sp.	
White Sucker	*Catostomus commersoni*

3. Slaughter Reservoir, July 1, 1998

Black Crappie	*Pomoxis nigromaculatus*

4. Hay Creek, June 28, 1998

Creek Chub	*Semotilus atromaculatus*
Fathead Minnow	*Pimephales promelas*
White Sucker	*Catostomus commersoni*

5. Middle Creek, Butte Co., SD, July 1, 1998

Fathead Minnow	*Pimephales promelas*
Green Sunfish	*Lepomis cyanellus*
Sand Shiner	*Notropis stramineus*
Black Bullhead	*Ameiurus melas*

6. Owl Creek, Butte Co., SD, July 1, 1998

Fathead Minnow	*Pimephales promelas*
Sand Shiner	*Notropis stramineus*
Hybognathus sp.	
Green Sunfish	*Lepomis cyanellus*

7. Crow Creek, Butte Co., SD, July 1. 1998

Creek Chub	*Semotilus atromaculatus*
Sand Shiner	*Notropis stramineus*
Black Bullhead	*Ameiurus melas*
Yellow Perch	*Perca flavescens*
Fathead Minnow	*Pimephales promelas*

8. Middle Creek, Butte Co., SD, July 1, 1998

Fathead Minnow	*Pimephales promelas*

9. Indian Creek, Butte Co., July 1,1998

Sand Shiner	*Notropis stramineus*

Box Elder Creek Watershed

1. Bogus Jim Creek, Pennington Co., SD, T2N, R6E, S20 July 1, 1998

Mountain Sucker	*Catostomus platyrhchus*
Longnose Dace	*Rhinichthys cataractae*
Brook Trout	*Salvelinus fontinalis*

2. Jim Creek, Pennington Co., SD, T2N, R5E, S8 August 24, 1998

Brook Trout	*Salvelinus fontinalis*

3. Estes Creek, Pennington Co., SD, T2N, R5E, S3 August 24, 1998

Brook Trout	*Salvelinus fontinalis*

4. Roubaix Lake, Meade Co., SD, T3N, R4E, S20 August 24, 1998

Longnose Dace	*Rhinichthys cataractae*
Green Sunfish	*Lepomis cyanellus*
White Sucker	*Catostomus commersoni*
Mountain Sucker	*Catostomus platyrhynchus*

5. Box Elder Creek, Meade Co., SD, T3N, R4E, S21 August 24, 1998

Green Sunfish	*Lepomis cyanellus*

Redwater River Watershed

1. Crow Creek, Lawrence Co., SD, T7N, R1E, S16 June 30, 1998

Longnose Sucker	*Catostomus catostomus*
Brown Trout	*Salmo trutta*
White Sucker	*Catostomus commersoni*
Longnose Dace	*Rhinichthys cataractae*
Green Sunfish	*Lepomis cynaellus*
Rainbow Trout	*Oncorhynchus mykiss*

2. Crow Creek, Lawrence Co., SD, T7N, R1E, S29 June 28, 1998

Brown Trout	*Salmo trutta*
Longnose Dace	*Rhinichthys cataractae*
Mountain Sucker	*Catostomus platyrhynchus*

3. Montana Lake Creek, Lawrence Co. SD, T7N,R1E,S19 June 28,1998

Green Sunfish	*Lepomis cyanellus*

4. Beaver Creek, Lawrence Co. SD, T7N, R1E, S29 June 28, 1998

Brown Trout	*Salmo trutta*
Longnose Dace	*Rhinichthys cataractae*

5. Sand Creek, Crook Co. WY, T51N, R60W, S21 June 29,1998

Brook Trout	*Salvelinus fontinalis*

6. Sand Creek, Crook Co. WY, T51N, R61W, S1 August 24,1998

Brook Trout	*Salvelinus fontinalis*

7. Sand Creek, Crook Co. WY, T53N, R60W, S31 June 28, 1998

Brown Trout	*Salmo trutta*
Longnose Sucker	*Catostomus catostomus*

8. Redwater Creek, Crook Co. WY T53N, R60W, S29 June 28,1998

Brown Trout	*Salmo trutta*
White Sucker	*Catostomus commersoni*
Longnose Sucker	*Catostomus catostomus*
Longnose Dace	*Rhinichthys cataractae*
Mountain Sucker	*Catostomus platyrhynchus*

9. Redwater Creek, Lawrence Co. SD, T7N, R1E, S9 June 30, 1998

Brown Trout	*Salmo trutta*
Mountain Sucker	*Catostomus platyrhynchus*
Longnose Dace	*Rhinichthys cataractae*
Longnose Sucker	*Catostomus catostomus*
Green Sunfish	*Lepomis cyanellus*

10. Montana Lake, Crook Co. WY, T53N, R60W, S28 June 30, 1998

Finescale Dace	*Phoxinus neogaeus*

11. Hemler Reservoir, Crook Co. WY, T52N, R63W, S2 Sept. 16, 1998

Finescale Dace	*Phoxinus neogaeus*

12. Cook Lake, Crook Co. WY, T53N, R63W, S15 Sept. 16,1998

Fathead Minnow	*Pimephales promelas*
Bluegill	*Lepomis macrochirus*

13. N.F. Redwater Creek, Crook Co.,WY, T53N,R63W,S13 SEP 16

No fish found

14. M.F. Redwater Creek, Crook Co., WY, T53N,R62W,S29 SEP 16

Creek Chub	*Semotilus atromaculatus*
Longnose Dace	*Rhinichthys cataractae*

15. S.F. Redwater Creek, Crook Co., WY, T52N, R61W, S18 SEP 16

Longnose Dace	*Rhinichthys cataractae*

Cheyenne River Watershed

1. **Hot Brook Creek, Fall River Co., SD, T7S, R5E, S10 AUG 3, 1998**

Plains Topminnow	*Fundulus sciadicus*
Bluegill	*Lepomis macrochirus*

2. **Hot Brook Creek, Fall River Co., SD, T7S, R5E, S16 AUG 3, 1998**

White Sucker	*Catostomus commersoni*
Green Sunfish	*Lepomis cyanellus*
Plains Topminnow	*Fundulus sciadicus*

3. **Red Canyon Creek, Fall River Co., SD, T8S, R3E, S8 AUG 3, 1998**

Plains Killifish	*Fundulus zebrinus*

4. **Fall River, Fall River Co., SD, T7S, R6E, S33 August 4, 1998**

White Sucker	*Catostomus commersoni*
Mountain Sucker	*Catostomus Platyrhynchus*
Sand Shiner	*Notropis stramineus*

5. **Elm Creek, Fall River Co., SD, T**

No fish found

6. **Beaver Creek, Custer Co., SD, T6S, R7E, S19 August 4,1998**

Creek Chub	*Semotilus atromaculatus*
White Sucker	*Catostomus commersoni*
Longnose Dace	*Rhinichthys cataractae*

7. Lame Johnny Creek, Custer Co., SD, T5S, R7E, S21 August 4, 1998

Green Sunfish	*Lepomis cyanellus*
Creek Chub	*Semotilus atromaculatus*
White Sucker	*Catostomus commersoni*

8. French Creek, Custer Co., SD, T4S, R7E, S26 August 4, 1998

White Sucker	*Catostomus commersoni*
Creek Chub	*Semotilus atromaculatus*

SUMMARY

Redwater River Watershed

I learned many things about the Redwater Drainage that didn't appear on topographical maps. The major surprise to me was that the branches of Redwater Creek in Wyoming supply very little water to the system. Where the Redwater Creek meets Sand Creek near Beulah, Wyoming is start of any real water flow in what there actually becomes the Redwater River (what it is called in South Dakota). At the point they meet Redwater Creek is approximately 2 feet wide and 6 inches deep, and that is indicative of all three branches of Redwater Creek I checked in Wyoming. Sand Creek at that point is 15 to 20 feet across, with a depth from 1 to 5 feet, and a flow of approximately 200-cfs. By looking at a topo map, you would then surmise that Cold Springs Creek which turns into Sand Creek about 10 miles south of Beulah, WY and runs for about 30 land miles would be the major contributor. My assumption was wrong, Cold Springs Creek was actually dry for almost it whole stretch. In reality during the summer Sand Creek actually only has a constant flow for about 7 miles. All this water flowing in Sand Creek starts at Ranch A, an old USFWS hatchery about 7 miles south of Beulah. Sand Creek does maintain some flowing water up near its headwaters along the South Dakota/Wyoming border, but this returns underground within 1 or 2 miles. Sand Creek is the major contributor to the Redwater River in the upper watershed. Crow Creek in South Dakota is the only other significant contributor to the Redwater River. These are very important facts to remember and consider when doing fishery management and projects that could negatively impact the watershed. Negative impacts on this 7-mile stretch of Sand Creek will greatly effect the Redwater River.

One positive of my sampling was the finding of many Longnose Suckers (*Catostomus catostomus*) a South Dakota state-threatened species in the Redwater River Watershed. They were collected in Crow Creek and the Redwater River in South Dakota. Longnose Suckers were collected in Sand Creek and the Redwater River in Wyoming. There were several age classes of Longnose Suckers indicating recent reproduction. Recent SD GF&P Fishery Reports were showing the Longnose Sucker declining in the Redwater River Drainage. The Longnose Sucker inhabited the areas of the streams where trout were in very low numbers or absent. Areas of the streams that were warmer or turbid (areas not conducive to trout) yielded the most Longnose Suckers, other suckers and cyprinad species.

Finescale Dace

During my 1998 surveys in South Dakota the Finescale Dace was collected in only two locations. These sites were Cox Lake and a spring hole along Crow Creek in Lawrence County. Cox Lake is a historic location where they were documented since the 1890's. Cox Lake is approximately 2 acres in size and is a gigantic spring hole. Sustaining populations of Finescale Dace are in Cox Lake. In 1997 a student from Black Hills State University discovered the Finescale Dace present in the spring hole. The spring hole area consists of three separate spring holes about 30 feet in diameter. Beavers dam up the bottom two at times forming pools. The top spring hole appears to maintain a population of Finescale Dace, and the bottom two have Finescale Dace when the beaver dams are in place. They repopulate from runoff of the top spring hole. This spring hole area is along side Crow Creek, but higher than the creek and therefore basically isolated from it. Spring hole area runoff does percolate into Crow Creek. I sampled other spring hole areas in the area, but they were either void of fish or Green Sunfish were present. I did not collect any Finescale Dace from other historic sites (Mirror Lakes, Mud Lake, Redwater River, and Crow Creek) or any new locations in South Dakota.

In Wyoming Finescale Dace were collected at Montana Lake and Hemler Reservoir. Montana Lake is another location that was first documented in the 1890's. Finescale Dace had not been documented from Montana Lake since 1964 and many people assumed they were no longer present as it dried up during a drought in the 1980's. Montana Lake is a spring hole lake of an approximate size of one acre. A sustaining population does exist but only a few specimens were collected or observed. The Finescale Dace was limited to the main spring hole area. A record from 1979 was the only one I found for Finescale Dace in Hemler Reservoir. Hemler Reservoir is manmade lake of about 2 acres. It water source is the North Fork of Redwater Creek. The population appears to be viable. I collected specimens with very little effort, thus I would estimate the population as sizable. I sampled the creek upstream and downstream from the reservoir and did not collect any Finescale Dace. I did not collect Finescale Dace anywhere else in Wyoming. I sampled the SF Redwater Creek, MF Redwater Creek, Sand Creek and Cook Lake without success.

Lake Chub

I did not collect any Lake Chubs in 1998. I sampled the Belle Fourche River Watershed, Box Elder Creek Watershed, and Redwater River Watershed. Even though it was not in my contract I rechecked historic collection sites of the Cheyenne River Drainage without success. Time and monetary restrictions stopped me from sampling the upper Belle Fourche Watershed in Wyoming.

RECOMMENDATIONS

LAKE CHUB

I stated in my 1997 Small Grant Report and reiterate in this report that the Lake Chub meets the requirements to be state listed. My suggestion would be state-endangered as it only exists in one location (Deerfield Reservoir). I will explain my best biological guess why this minnow still exists in Deerfield Reservoir but not in historic stream locations. Trout have been introduced into every stream where the Lake Chub historically existed. Predation and competition for food by trout and other introduced predators are probably major factors influencing the demise of the Lake Chub. Habitat alterations (dams, housing projects, Etc.) have also probably played a role. In streams the Lake Chubs didn't have a refugee area to escape from the trout. In Deerfield Reservoir they have shoreline vegetation which acts as refuge in which the Lake Chubs can carry on life cycles. These vegetated shoreline areas are warmer than the main lake thus not being conducive to trout and the vegetation makes predation more difficult. The recent introduction of Rock Bass by unknown origin might significantly impact the Lake Chub population. Rock Bass will utilize this shoreline habitat year-round, most definitely leading to predation and competition for food at all life cycles with Lake Chubs by this species. Before the Rock Bass introduction, as Deerfield Reservoir is a major trout fishery, I knew the SD GF&P would never stop stocking this lake with introduced predator fish, just to protect this native cyprinad. The Lake Chubs might have survived this reservoir being managed as a trout fishery, but the introduction of Rock Bass will upset the balance of the lake. As chemical renovation is not an alternative, as this would probably assure the elimination of the Lake Chub in South Dakota. I recommend the following suggestion. Select several stretches of streams or complete streams that were historic Lake Chub locations. Several historic stream locations are marginal for trout, and are put and take fisheries at best. Stop stocking these areas, if trout still exist in these areas, remove them by whatever means available (netting, electrofishing, chemical, etc.). Reintroduce and monitor Lake Chubs taken from Deerfield Reservoir. I am positive if some kind of reintroduction plan is not implemented the Lake Chub will soon disappear from South Dakota. I will be submitting a document to the South Dakota Secretary of Game Fish & Parks bringing to his attention the needs of South Dakota state listed fish species to ensure there existence.

Finescale Dace

The Finescale Dace is a South Dakota state-endangered fish. My 1998 survey supports this listing. The Finescale Dace needs the protection that it is already afforded by state law. My recommendations are in my opinion the minimum actions needed to be taken to insure the survival of Finescale Dace in South Dakota. Stocking trout in Cox Lake needs to be totally stopped. Cox Lake needs to be closed to fishing. The access road needs to be closed. My reasons are addresses in the following paragraph. Trout and Finescale Dace have coexisted in Cox Lake for many years. The main reason the Finescale Dace are still present, is the shallow vegetated shoreline that acts as a refuge from the trout, and provides a spawning area. If something ever happened to the vegetation the Finescale Dace would lose their refuge. The trout would heavily prey on them and with spawning and feeding habitat eliminated the dace would disappear. I have lobbied to implement these suggestions for 4 years. Just this year a sign was erected stating that no baitfish are allowed at Cox Lake. Since 1995 I complained to the SD GF&P that fishermen were catching and using Finescale Dace to catch the trout at Cox Lake. The dace are a state- listed fish species and need to be protected. My main worry is that another predator, especially the Green Sunfish, will be introduced. The Mirror Lakes and Mud Lake were historic Finescale Dace locations, the no longer exist there, but Green Sunfish are present. The Green Sunfish prey on the dace and compete for food in their vegetated refuges. My other suggestion is to chemical renovate Mud Lake to remove Green Sunfish. Restock Mud Lake with Finescale Dace from Cox Lake. Mud Lake is so close to Cox Lake, if my recommendations are followed, it will be just a matter of time until Green Sunfish are introduced into Cox Lake. Cox Lake is just a few acre put and take trout fishery. Closing it to vehicle access and fishing is not much to give up to perpetuate a species in South Dakota.

REMARKS

I have conducted cyprinid surveys in South Dakota since 1993. I have conducted surveys or been a part of surveys conducted for USFWS, USFS, SD GF&P, and Indian Tribes. My input attributed to the addition, removal and reclassification of several fish species during the last revamp of South Dakota protected species list. I am writing this last paragraph in hopes that my recommendations will be considered, in order to perpetuate fish species in South Dakota. As I stated earlier I will be sending the Secretary of Game Fish & Parks a more detailed, scientific document.

ACKNOWLEDGEMENTS

I wish to thank Bob Paulson (Black Hills ,The Nature Conservancy) for all his help with landowner contacts, and access to TNC land. Bobs help was greatly appreciated and needed in order to conduct this survey. The SD GF&P Small Grants Program for funding this project. The Wyoming Game & Fish for their permit that allowed me to obtain a better understanding of the watersheds and their fish distribution. The Wyoming TNC Database records helped very much in finding historic sites (Thank You).

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