PUTTING BACK THE PIECES

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The Knife River meanders some 25 miles through small farms and woodlands in east central Minnesota before joining the Snake River near Mora. The first permanent dam on the river was constructed in 1928 about six miles above the mouth. It formed an 1100-acre reservoir now known as Knife Lake. In 1972, a 16" rainfall and resulting flood breached the county road adjoining the dam. Although a temporary dam was completed in the same summer, carp quickly became established in the lake for first time.

I made my first trip to the river in 1974 and dragged a seine through the boulder-gravel pools below the dam, where I collected my first Lake Sturgeon, barely 6" long. Although no trophy came home with me that day, the event remains one of the highlights of all my collecting experiences. In 1988, I learned of a reclamation project scheduled for the lake. Reclamation is a a radical management practice of completely wiping out the existing fish community with a fish-toxicant called rotenone, then restoring it with species deemed "desirable." The plan targeted not only the lake, but also all the Knife River and its tributaries above the lake.

The Minnesota Department of Natural Resources (MDNR) originally intended to reintroduce only game fish and one or two minnow species as a forage base. I agreed that the lake was in bad shape. I remember when its waters were clear but dark with tannin carried down from headwater bogs; now it was pea-green by June. The carp were partially to blame, but antiquated and failing lakeshore-cabin septic systems were also a cause.

I decided to attempt at least a thorough documentation of all species found above the dam. The MDNR had conducted several surveys in Knife Lake, but only two in the Knife River since 1963. In the spring of 1989, I started my own surveys just for added insurance that nothing had been missed. The last survey was conducted in October two days after the rotenone was applied. The lake showed the most dramatic results. Carp were windrowed six feet wide and two feet deep. Game fish were relatively scarce in the half-mile of shoreline I surveyed. I moved up-stream where drip stations oozed their milky, lethal load into the river. A very acrid odor permeated the air. Dead bodies of fish carpeted the bottom at every station and included an occasional large Northern Pike and Smallmouth Bass. Many fish lingered, swimming or twirling in aimless circles. Another incidental victim, a surprise to me, was the Mudpuppy (*Necturus maculosus*). Hundreds of carcasses of this unique amphibian were at every bridge crossing.

Clouds grayed the day, and the enthusiasm I began with in the morning began to wane. Even when it's raining or snowing, collecting fish is a very rewarding experience for me, but raking museum specimens off the stream bottom didn't give much of a high. I was just about to call it a day when I met a young boy pulling a

minnow trap out of a tributary stream. When he looked inside he yelled, "They're all poisoned!", and hurled the trap back into the water. This scene sparked my curiosity and I had to learn more. He immediately confided in me without hesitation that he had been collecting minnows for weeks and holding them in horse troughs. His clandestine plan was to release them again after the rotenone had dissipated. I had no idea how effective his efforts would be, but was moved that someone, especially one so young, possessed this kind of foresight.

My surveys did find Chestnut Lamprey and Northern Redbelly Dace, which had never been reported above the dam. The combined efforts of the MDNR and myself tallied 45 species representing 12 families (Table 1). Although not sampled in any survey or creel census above the Knife Lake Dam(s), several local fishermen have also reported catching Lake Sturgeon into the late 1970s.

Table 1. Fishes sampled above the Knife Lake dam from 1964 through 1989.

FAMILY Scientific name	Common name
PETROMYZONTIDAE	
1. Ichthyomyzon castaneus	Chestnut Lamprey
AMIIDAE	
2. Amia calva	Bowfin
UMBRIDAE	
3. Umbra limi	Central Mudminnow
ESOCIDAE	
4. Esox lucius	Northern Pike
CYPRINIDAE	
5. Campostoma anomalum	Central Stoneroller
6. Cyprinus carpio	Common Carp
7. Hybognathus hankinsoni	Brassy Minnow
8. Nocomis biguttatus	Hornyhead Chub
9. Notemigonus crysoleucas	Golden Shiner
10. Notropis atherinoides	Emerald Shiner
11. Notropis cornutus	Common Shiner
12. Notropis hudsonius	Spottail Shiner
13. Phoxinus eos	Northern Redbelly Dace
14. Phoxinus neogaeus	Finescale Dace
15. Pimephales notatus	Bluntnose Minnow
16. Pimephales promelas	Fathead Minnow
17. Rhinichthys atratulus	Blacknose Dace
18. Rhinichthys cataractae	Longnose Dace
19. Semotilus atromaculatus	Creek Chub
20. Semotilus margarita	Pearl Dace
CATOSTOMIDAE	
21. Catostomus commersoni	White Sucker
22. Hypentelium nigricans	Northern Hog Sucker
23. Moxostoma anisurum	Silver Redhorse

Table 1, Continued

24. Moxostoma erythrurum	Golden Redhorse
25. Moxostoma macrolepidotum	Shorthead Redhorse
ICTALURIDAE	
26. Ictalurus melas	Black Bullhead
27. Ictalurus natalis	Yellow Bullhead
28. Ictalurus nebulosus	Brown Bullhead
29. Ictalurus punctatus	Channel Catfish
30. Noturus flavus	Stonecat
31. Noturus gyrinus	Tadpole Madtom
CYPRINODONTIDAE	
32. Fundulus diaphanus	Banded Killifish
GASTEROSTEIDAE	
33. Culaea inconstans	Brook Stickleback
CENTRARCHIDAE	
34. Ambloplites rupestris	Rock Bass
35. Lepomis gibbosus	Pumpkinseed
36. Lepomis macrochirus	Bluegill
37. Micropterus dolomieu	Smallmouth Bass
38. Micropterus salmoides	Largemouth Bass
39. Pomoxis annularis	White Crappie
40. Pomoxis nigromaculatus	Black Crappie
PERCIDAE	
41. Etheostoma nigrum	Johnny Darter
42. Perca flavescens	Yellow Perch
43. Percina caprodes	Logperch
44. Stizostedion vitreum vitreum	Walleye
SCIAENIDAE	
45. Aplodinotus grunniens	Freshwater Drum

During the winter, I took a chance and proposed to the MDNR that additional nongame fishes should be reintroduced. I found one individual who strongly supported the idea, and in August of 1990, he met me with a fish transport truck to do some stocking. I still couldn't believe the MDNR was not only behind the project, but also wanted to participate. The two of us worked all day and stocked about 1500 "junk" fish in what is now called the Upper Knife River. Collections were all taken from the Snake River watershed to at least try to re-establish (we hoped) genetically similar stocks. It sounded good, anyhow. Three more trips followed, but the transport truck was diverted for higher-priority fishes (i.e.; Walleyes) and we resorted to using aluminum trash cans with bungi cords to hold the lids down. After the first year's stockings were complete, I only felt comfortable with a handful of species in the numbers actually released; however, surveys conducted annually since reclamation by the MDNR and myself have sampled 29 species above the dam (Table 2), and so far, not a single carp.

Table 2. Fishes sampled from the Upper Knife River watershed since reclamation.

UMBRIDAE
1. Central Mudminnow (Umbra limi)
CYPRINIDAE
2. Central Stoneroller (Campostoma anomalum)
3. Brassy Minnow (Hybognathus hankinsoni)
4. Common Shiner (Luxilus cornutus)
5. Pearl Dace (Margariscus margarita)
6. Hornyhead Chub (Nocomis biguttatus)
7. Golden Shiner (Notemigonus crysoleucas)
8. Northern Redbelly Dace (Phoxinus eos)
9. Finescale Dace (Phoxinus neogaeus)
10. Fathead Minnow (Pimephales promelas)
11. Blacknose Dace (Rhinichthys atratulus)
12. Longnose Dace (Rhinichthys cataractae)
13. Creek Chub (Semotilus atromaculatus)
CATOSTOMIDAE
14. White Sucker (Catostomus commersoni)
ICTALURIDAE
15. Black Bullhead (Ameiurus melas)
16. Channel Catfish (Ictalurus punctatus)
GADIDAE
17. Burbot (Lota lota)
ATHERINIDAE
18. Brook Stickleback (Culaea inconstans)
CENTRARCHIDAE
19. Rock Bass (Ambloplites rupestris)
20. Green Sunfish (Lepomis cyanellus)
21. Bluegill (Lepomis macrochirus)
22. Smallmouth Bass (Micropterus dolomieu)
23. Largemouth Bass (Micropterus salmoides)
24. White Crappie (Pomoxis annularis)
25. Black Crappie (Pomoxis nigromaculatus)
PERCIDAE
26. Johnny Darter (Etheostoma nigrum)
27. Yellow Perch (Perca flavescens)
28. Logperch (Percina caprodes)
29. Walleye (Stizostedion vitreum)

I am very pleased with these results, but remain puzzled. Did these fish somehow find refuges from the rotenone or did they have a little help from an enlightened lad--perhaps another Aldo Leopold? Maybe some day I will have the opportunity to confirm my "suspicions" and thank him.

Introductions will proceed and annual surveys will monitor the success. I have met with some resistance to reintroduction of redhorse suckers, but hope that my persistence will prevail.

Assuming my success, then come the Bowfin and bullhead proposals--that should blow a blood vessel or two. The Mudpuppies have not been forgotten, but they have been very difficult to collect. I did hit it big one hot day in 1992 when about 80 Mudpuppies could not escape my backpack shocker and were stocked in the Upper Knife River. I hope to supplement this first seeding with a "puppy" trap line, perhaps by the time of this reading. Give me ten years and see what I have wrought.

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