



OLD FISH, The Changing Face NEW FISH, of Flathead Lake BIG FISH

by Jim Vashro

MY ROD TIP SUDDENLY POPPED UPRIGHT, then bent over in a tight arc as my downrigger release did its job. The fish bulldogged deep for 10 minutes, then yielded to the unrelenting pressure of the rod and slid into my landing net. It was a cream-spotted lake trout weighing about 14 pounds, a little heavier than the three other "Macs" I'd landed that afternoon on Flathead Lake.

As the evening shadows lengthened, I pointed my boat toward West Shore State Park where campfire smoke curled up through the trees. Kids scrambled around on the shore, fishing for westslope cutthroat or bull trout. To the north, sailboats darted about like brightly colored dragonflies. As the setting sun washed the peaks of Glacier National Park and the Swan Range with a rosy hue, reflected in the quiet surface of the lake, I drank in the beauty of the moment. Ironically, the serene image gave no clue either to the profound changes occurring beneath the water's

surface or to the controversy and debate that presently swirls around the lake.

Flathead Lake itself had a turbulent beginning. Starting 12,000 years ago, four successive glaciers ground relentlessly down from the north, gouging out a deep, narrow trough. Thousands of feet thick, the ice pushed up terminal moraines or ridges near the present town of Polson. The glaciers then receded, filling the trough with water and eroding sediments into a delta that would become the Flathead Valley. Over the next 10,000 years, the outflow from the vast lake eroded the moraine in a mindless attempt to empty the lake, an effort first slowed by bedrock and then halted, at least temporarily, by construction of Kerr Dam.

As the waters cleared of glacial silts, fish populated the lake and river system. Westslope cutthroat trout and pygmy and mountain whitefish foraged for zooplankton and insects, along with northern squawfish, peamouths, long-

nose and largescale suckers, redbreasted shiners, and sculpins. Bull trout were the only major predators in the system. All of these species were well adapted to live in the cold, clear, almost sterile waters of the Flathead.

The Salish Indian tribes arrived in the area at least 800 years ago and, impressed by the hospitable climate and other attractions, began to settle around the lake. Unburdened by the prejudices of future angling purists, the Indians relished squawfish and suckers as well as trout and whitefish. This peaceful existence was disturbed only by an occasional raiding party of Blackfoot Indians until the arrival of white explorers, trappers, and missionaries beginning in the early 1800s, and later, settlers. These newcomers soon began to tinker with the lake and its finny inhabitants. To date, their efforts have been dominated by concrete and two unfortunate mistakes.

The concrete came in the form of



DIANE ENSIGN

spawning, particularly the kokanee that used to spawn in fall along the lakeshore.

The third dam—Hungry Horse—was built in 1953 for flood control and to power a post-war economic boom. But the dam also flooded 77 miles of the South Fork of the Flathead River and its tributaries and cut off more than 40% of the spawning and rearing habitat historically used by Flathead fish. Hungry Horse Reservoir is one of three uppermost storage reservoirs in the Columbia River hydropower system and as such is used heavily to provide flows to downstream reservoirs. Recent drought years have drawn the reservoir down more than 140 feet and have frustrated attempts to improve the fishery.

The mistakes mentioned earlier refer to several of many species introductions that have occurred since the late 1800s. Through the years man has planted

largemouth and smallmouth bass; white crappie; pumpkinseed; black bullhead; yellow perch; Lake Superior whitefish; grayling; lake, rainbow, brook, and Yellowstone cutthroat trout; and chinook, coho (silver), and kokanee (sock-eye) salmon. Under this Johnny Appleseed approach some fish have flourished, while others have disappeared or exist only as remnant populations.

The kokanee was introduced by mistake in a plant of chinook salmon in 1916; the chinook disappeared, but the kokanee stayed on and by 1930 had evolved into a fishery that would dominate the lake for the next 50 years. Other introduced fish, such as lake trout, lake whitefish, and yellow perch, have also flourished; in fact, a creel census in 1981 showed that introduced species accounted for 98% of the total annual harvest. In the early 1980s, this combination of fish offering both tro-

The calm exterior of Flathead Lake gives no clue to the profound changes occurring beneath the surface. Today, yellow perch account for up to 75% of the fish harvested from the lake. Along with lake trout and whitefish, they have replaced kokanee as the mainstay of the fishery.

dams—three so far.

The first was Bigfork Dam, built in 1902 on the Swan River just over a mile upstream from Flathead Lake. Although only 12 feet high, the dam severed access to 18% of the suitable spawning habitat in the Flathead drainage for migratory cutthroat trout, bull trout, and whitefish.

Kerr Dam, at the outlet of Flathead Lake, became operational in 1938. Kerr Dam keeps the lake full through summer and then draws the water down 10 feet in late fall and winter for power generation. The drawdown affects fish that use the shoreline for feeding and



CHARLES B. PLACT, III

phies and lots of good eating was producing over 100,000 days of fishing each year and a harvest of more than 300,000 fish—enough to make Flathead the second most popular lake in the state (surpassed only by Canyon Ferry Reservoir). Then the second mistake occurred.

In 1981, *Mysis* shrimp were detected in Flathead Lake. The *Mysis*, or opossum shrimp, had been introduced into Whitefish and Swan lakes by the Department of Fish, Wildlife & Parks (FW&P) in an effort to grow larger trout and salmon. Surveys in Kootenay Lakes, British Columbia, showed that kokanee feeding on *Mysis* were growing to four pounds or better. In a tidal wave of enthusiasm, *Mysis* were planted in dozens of lakes around the Pacific Northwest, and anglers and biologists settled back to wait for the big fish to appear. Too late, they found out that the Kootenay Lake experience was a quirk of nature and that in most other lakes *Mysis* not only didn't provide extra food for salmon but actually competed for the same zooplankton that salmon eat.

During the day, *Mysis* live in deep water on the bottom of lakes while salmon are feeding far above. At night, after the salmon quit feeding, *Mysis* begin their long journey to the upper layers of the lake where they dine in peace on the same zooplankton the kokanee need. Approaching daylight sends the *Mysis* back into the depths, safe from the hungry kokanee. *Mysis* are such efficient predators that they deplete zooplankton populations, delaying and depressing their population peaks, often with drastic impacts on fish that rely on zooplankton.

Soon after the *Mysis* from Swan or Whitefish lakes drifted down to Flathead Lake, the kokanee fishery began to collapse (although the *Mysis* were probably only the final nail in the coffin, as will be explained later). The collapse of the kokanee, which provided 90% of the recreational fishery, and the resulting ripple effect through the remaining fish community, touched off a firestorm of debate over the future of fish management in the lake.

Faced with mounting controversy, the FW&P and the Confederated Salish and

Kootenai Tribes (CS&KT) initiated a management plan process in 1988. The tribes were gradually increasing their management authority on the south half of Flathead Lake, which lies within the Flathead Reservation, based on the Hellgate Treaty, court cases, and tribal resource management ordinances. Since fish move freely across the jurisdictional boundary, both sides agreed it was in the best interests of the fishery to develop a joint management plan. The plan would set mutual objectives, establish a strategy for kokanee recovery, protect native fishes, and set the stage for mitigating the impacts of Kerr and Hungry Horse dams. With these objectives in mind, biologists held scoping meetings around the region, prepared a draft plan for public comment, and distilled all the comments into a final "Upper Flathead System Fisheries Management Plan, 1989-1994" that was adopted by the CS&KT Tribal Council and the Montana Fish and Game Commission on August 8, 1989.

The plan set forth a number of steps to be taken in the next five years. Although it occupies a deceptively small portion of the plan, protection and enhancement of aquatic habitat and water quality is the cornerstone of the program. To this end, FW&P and CS&KT will work with conservation districts, Flathead and Lake counties, and the U.S. Army Corps of Engineers to review the more than 200 stream and lakeshore alteration projects proposed each year. Cooperative studies are under way with the Flathead Basin Commission, U.S. Forest Service, Plum Creek Timberlands, Montana Department of State Lands, and other groups to define the relationships between land management, water quality, sediment in streams, and impact of sediment on fish. Reviews of forestry practices, timber sales, mining, and other resource development proposals are also ongoing. Perhaps the biggest job lies yet ahead as FW&P and CS&KT document the fisheries impacts arising from construction and operation of Kerr and Hungry Horse dams and prepare and implement mitigation plans.

During the scoping meetings, almost everyone supported protection of habi-

tat and water quality, but debate soon arose over fish management. Anglers were about evenly divided over restoring the kokanee fishery versus protecting and enhancing native trout, but indicated a strong desire to maintain the trophy lake trout fishery. Based on public comment and the changing conditions in the lake, the management plan set forth a middle-of-the-road approach with modest changes in fishing regulations and experimental hatchery plants to augment kokanee, cutthroat, and bull trout populations. The plants represented a change from the past management objective of establishing wild, self-sustaining fisheries, but biologists felt this was the only way to offset the impacts of the dams and increasing angler demands. Following is a brief summary of the status and management issues for some of the major game fish.

KOKANEE

Kokanee were the cornerstone of the past fishery, providing both a very popular summer fishery and forage for trophy lake and bull trout. Kokanee, however, began decreasing in abundance in the mid-1960s. It appears that changes in operation of Kerr Dam and later Hungry Horse Dam reduced lake-shore and river spawning success, respectively, as kokanee laid their eggs in shallow areas that were later dewatered during changes in power production. Fishermen also began to have an impact as summer trolling, ice fishing in Skidoo and Blue bays, and snagging grew in popularity and efficiency. The FW&P and CS&KT responded by reducing the daily limit from 35 to 20 and finally to 10 kokanee, and successively closing the snagging and winter fisheries, but it was too little, too late. Also, large trout had always eaten a hefty portion of the kokanee; as the salmon population shrank, predation took a proportionately larger share. Although 12 to 20 million kokanee fry were being produced naturally each year, only 80,000 to 120,000, or roughly 1%, were surviving to adulthood and spawning after the accumulated impacts had taken their toll. It would take very little to wipe out that meager return, and the last straw was *Mysis*. The mechanism isn't



MIKE ADERHOLD

In an attempt to restore the ailing kokanee fishery, 3 million to 5 million young salmon are being stocked each year. The average kokanee in Flathead Lake (right) matures at 3 1/2 years of age and 12 to 14 inches in length.



MIKE ADERHOLD

fully understood and may involve an interaction with lake trout predation, but soon after *Mysis* appeared, the salmon spawning runs dwindled to a few hundred fish. The summer fishery collapsed, sending shock waves through the tourism-based economy and raising fears that trophy lake trout, which depended on kokanee for up to 70% of their diet, would also fade away.

Because some salmon fisheries (lakes Pend Oreille and Tahoe) have recovered with hatchery plants, FW&P proposed an experimental program involving the stocking of 3 million to 5 million salmon each year. These fish are being

raised to about two inches in length and planted over a wide area in the lake to reduce predation and *Mysis* competition. Net pens are being used to acclimate the fish to the lake and also serve as an economical means of expanding hatchery space.

The 3 million to 5 million planting goal was based on existing egg supplies and hatchery space, but it immediately came under fire from opposing groups. One group, led by Trout Unlimited, branded kokanee an interloper that competes with native fish. They claimed the plants were too expensive, that the majority of recovery plants in other

places had failed, and that the program should be dropped in favor of native trout. The other side, led by the newly formed Flathead Fishing Association, called for recovery of the popular kokanee fishery through construction of a new hatchery and plants of 15 million salmon. Although conceding that 15 million salmon might be needed to fully test the system, FW&P officials could only commit to planting all available kokanee (about 4 million) for four years to test recovery.

WESTSLOPE CUTTHROAT TROUT

The Flathead contains one of the strongest existing populations of westslope cutthroat trout, a fish now designated as a species of special concern because of declines in abundance and distribution. Westslope cutthroat can provide a lot of fishing in spring and fall, although they are generally deep and unavailable to anglers during the more popular summer season. The management plan calls for planting 1 million four- to six-inch fish annually to replace fish lost to dam construction. Trout Unlimited and others have criticized this action on the basis that hatchery plants will jeopardize the genetic integrity of wild fish, and have instead called for restricted harvest through catch and release to build the population. But the harvest is already small, about 30,000 fish annually, and catch and release would not satisfy anglers used to harvesting salmon. Even so, the lake limit has been dropped from five to two until the population can be increased. Also, the westslope cutthroat trout broodstock has been completely revamped in recent years under the direction of the University of Montana Genetics Department. The majority of brood fish come from the Flathead and geneticists contend that hatchery fish will have little impact on genetic integrity of wild fish.

BULL TROUT

Bull trout grow to over 20 pounds and embark on spawning migrations up to 140 miles that attract trophy fishermen. Because they are vulnerable to habitat degradation, overfishing, and poaching,

bull trout are now listed as a species of special concern. Anglers catch about 5,000 bulls each year, but another 3,000 adults survive to spawn. The population appears stable, although sediments accumulating in spawning gravels due to land management activities have the potential to hamper reproduction. The daily limit has been reduced to one fish, and most spawning streams have been closed to fishing to help hold the line. The management plan calls for experimental plants of 260,000 eight-inch bull trout annually to increase angling opportunity. Critics call the plants an expensive experiment that will alter bull trout genetics, but biologists see no other alternative, other than a ban on fishing, that would appreciably increase the population.

LAKE TROUT

The lake trout or Mackinaw fishery has national stature, with fish averaging 30 inches and weighing more than 12 pounds, and occasionally exceeding 20 and even 30 pounds. Unlike other fish species in Flathead, however, lake trout have been increasing—perhaps too much for their own good, since some trophy fisheries have boomed into stunted populations. *Mysis* have been a paradox, increasing the food supply for small lake trout while decreasing the food supply (kokanee) for larger ones. Fisheries managers hope that lake trout will learn to eat other abundant prey such as perch and whitefish, but in the meantime FW&P and CS&KT have increased the limit to seven lake trout daily with only one over 26 inches. This should encourage the harvest of smaller lake trout and help keep the population in balance, while at the same time protecting the larger trophy fish (lake trout take 10 years to grow 28 inches in Flathead Lake).

Some commercial outfitters and trophy fishermen feel this plan is too conservative; they would like to see more restrictive regulations and introduction of a new forage fish to keep lake trout size from declining. Others caution that adding a forage species now could aggravate the ongoing changes in the fishery. Some anglers contend that trophy trout require expensive and so-

phisticated boats and equipment, and that the large fish are oily and unpalatable. On the other hand, many anglers are delighted with the smaller fish now appearing. These three to six-pounders are catchable from shore or near shore, and their heavy diet of *Mysis* gives them tasty orange flesh.

YELLOW PERCH

No one pays much attention to yellow perch, but a lot of anglers must fish for them. In fact, the lowly perch now accounts for up to 75% (50,000 fish) of the harvest from Flathead Lake. Their excellent flavor makes them a good alternative for anglers who want to harvest a lot of fish. Studies by CS&KT indicate perch populations are healthy and may be growing. Perch are also becoming an important food item for shoreline feeders such as bull trout, small lake trout, and lake whitefish.

LAKE SUPERIOR WHITEFISH

Lake Superior whitefish are definitely the most overlooked game fish in the lake. They may also be one of the key species in determining future management. Originally introduced to provide a commercial fishery (which never developed), they increased slowly and steadily—until recently, when numbers jumped dramatically, possibly in response to *Mysis* or to lack of competition from kokanee. They now make up 80% of the fish in the lake and are major competitors for food and space. Predation on young kokanee and perch by lake whitefish also appears more extensive than previously thought.

Lake whitefish numbers will probably have to be reduced to successfully introduce more fish or new fish to Flathead Lake. Bull trout appear to be the only major predator of lake whitefish at present, although biologists hope lake trout will learn to feed on whitefish and so maintain their trophy size. Although anglers tend to scorn whitefish, lake whitefish are better tasting than their river-run cousins and have the added advantage of being great fighters and easy to catch. As such, they are an ideal substitute for former kokanee fishermen.

The Flathead fishery is currently in a tremendous state of change, as the food chain shifts from a mid-water, free-ranging population of kokanee and zooplankton to one dominated by bottom-dwelling *Mysis*, lake trout, and lake whitefish. Managing the fisheries at this point is like trying to hit a moving target. There have been many requests to introduce new fish, such as a forage fish or another trophy fish (e.g., Kamloops rainbow, chinook or coho salmon). Indeed, introduced fish have been successful and have produced a tremendous amount of recreation over the years. But the current situation with *Mysis* dictates more caution in the future, and new introductions will only be approached through careful environmental analysis and public involvement.

The management picture is further confused by the complex and sometimes conflicting jurisdictions in the Flathead. The Flathead system originates in a foreign country (Canada), flows past Glacier National Park, through wilderness, national forests, public and private lands, the sovereign nation of the Flathead Reservation, and into the state of Idaho. Each entity has its own interests and needs. But as Ric Smith, angler and sometime journalist from Polson, points out, "Flathead Lake can't be all things to all people." Should we manage the system for wild, native fish, and let it find its own equilibrium? Or should we go for broke with massive fish plants and habitat manipulation to maximize the fishery? Each option has its positive and negative aspects. FW&P and CS&KT feel the present management plan combines the best of both sides by protecting habitat and wild fish while using hatchery fish to fill in the gaps. The management process, which is guided by citizen and technical steering groups, will be an adaptive one that will allow us to learn from our successes and failures.

Old fish, new fish, big fish, lots of fish—anglers' demands sound like a Dr. Seuss nursery rhyme. Will the management plan be a fairy tale where everyone lives happily ever after? Or will *Mysis* be the Grinch that stole Christmas? And will man or nature write the final chapter for the Flathead fishery? ■