

## The ongoing challenge of managing Lake Koocanusa—a scenic, 90-mile-long reservoir that sits in both the United States and Canada BY BEN ROMANS

**L**ake Koocanusa, a huge and remote reservoir in the state's northwestern corner, is one of the few places in Montana where fly-anglers catch rainbow trout over 10 pounds.

But leave your waders and drift boat at home. This is not your usual fly-fishing water.

From motorboats, Koocanusa anglers troll large bucktail and bear hair streamers that imitate wounded baitfish or juvenile kokanee salmon. The flies twitch and dart just beneath the water surface behind planer boards, which take the streamers 200 yards out from either side of the craft. Crankbaits such as Rapalas work well, too.

"We pick up some really big rainbows up to 12 pounds in the fall," says Bob Orsua, who has been operating Mo Fisch Charters on Koocanusa for the last ten years. "On average, we're catching 3- to 5-pound trout. At that size, when a rainbow hits, it's pretty violent. A strong fish can peel off 300 feet of line in no time."

If you've never heard of Koocanusa's rainbows—much less its big bull trout and small-but-abundant kokanee—you're not alone. Though one of the largest reservoirs in Montana, Koocanusa is known mainly to locals and Canadians who flock to its clear waters and scenic shorelines in spring, summer, and fall.

Even if you don't fish, Koocanusa is well worth a visit. The clean, turquoise water, sandstone cliffs, and surrounding mountains make it as pretty as any lake in the state. The 90-mile-long impoundment, 50 miles of it in Montana, is ringed by national forest right up to its shoreline. A highway runs its entire length, offering abundant access to picnic, swim, or take a nap.

In a region best known for forests, mountains, and unspoiled nature, Koocanusa is an anomaly. It provides a scenic expanse of water stretching as far as the eye can see, and some great big-water fishing to boot. It is also a totally artificial construct that transformed—for both good and bad—the land underneath its waters and the river downstream.



**CARIBBEAN OF THE NORTH** A clifftop beach overlooks Lake Koocanusa near Eureka. The remote northwestern Montana reservoir offers miles of secluded campsites and picnic spots, all with stunning views of Koocanusa's turquoise waters and surrounding mountains.

### The Ktunaxa

To fully appreciate Lake Koocanusa (technically a reservoir) requires some history of the river it impounds. The Kootenai begins as a trickle deep in the mountains of British Columbia, eventually growing into the second-largest tributary to the Columbia River. The river drops 7,000 feet in elevation over 481 miles as it makes a horseshoe-shaped route south through eastern British Columbia and northwestern Montana, northwest across the tip of Idaho's Panhandle, and then into Canada's Kootenay Lake before eventually joining the Columbia River.

The people native to this isolated river basin are the Ktunaxa. The term "Kootenai" (used in the United States and spelled Kootenay in Canada) is an anglicization of the word the Blackfeet Indians used to refer to the Ktunaxa. The Ktunaxa fished and hunted the region for hundreds of years, periodically venturing east over the Continental Divide to hunt bison.

Europeans encountering the tribe in the early 20th century described a full and rich culture. The Ktunaxa fished using woven traps and bone hooks, traveled on rivers in canoes of hollowed tree trunks, and hunted bear, deer, woodland caribou, and waterfowl. The Montana band of the Ktunaxa is today part of the Confederated Salish and Kootenai Tribes of the Flathead Nation.

Not long after Lewis and Clark completed their expedition to the Pacific and back, Canadian explorer David Thompson established several trading posts throughout the area. Eventually, westward expansion enveloped the river basin. After prospectors discovered gold, silver, and galena, fortune seekers appeared on steamboats and railroad cars, followed by loggers and settlers. Since then, copper and silver have replaced gold and coal as the basin's principal resources. As economies shift to tourism-based markets, officials on both sides of the border are keeping a close eye on the mining industry's effects on water quality (see "The Selenium Issue," page 34).

Though mining has affected the Kootenai for more than a century, it was the construc-

tion of Libby Dam, a 422-foot-tall, 3,055-foot-long concrete wall, that transformed the river into a massive reservoir and completely altered the river's fishery.

### A reservoir out of nowhere

Libby Dam was built partially in response to a tragedy two decades earlier and more than 400 miles away. In 1948, a section of a dike holding back the Columbia River broke, sending torrents of water downstream that wiped out the small community of Vanport, Oregon, and killed 15 people. To prevent future tragedies in the Columbia River Basin, and also to meet growing needs for hydropower, the United States and Canada signed the Columbia River Treaty in 1961. Three dams were built in Canada. Construction on the fourth, Libby Dam, began in 1966 and was completed in 1972.

Nearly half of the newly created Lake Koocanusa—a name combining the first three letters of Kootenai, Canada, and USA—extended across the northern U.S. border into Canada. In exchange for the United States not having to compensate British Columbia for submerging land and displacing residents, the treaty said that Canada would not have to pay for power it would receive from the dam.

Montana Fish, Wildlife & Parks began managing the fishery of the newly formed reservoir as soon as the dam was completed. According to Mike Hensler, FWP fisheries biologist in Libby, biologists tried stocking



**A BASIN IN FLUX** Above: The original people of the Kootenai Basin were the Ktunaxa, later called Kootenai (spelled Kootenay in Canada). Below: Overharvest, pollution, and habitat loss helped drive the basin's massive white sturgeon to near extinction. Top right: A devastating flood in Oregon in 1948 spurred development of Libby Dam (below right), completed in 1972. Far right: Looking south from Lake Koocanusa, the reservoir that the dam created.



westslope cutthroat to complement the Kootenai River's rainbow fishery, which exploded immediately after the dam filled. "But we had no luck at all, even after trying all kinds of stocking combinations—from fry to fingerlings to one- and even two-year-old fish," he says.

### Newcomers arrive

While FWP was experimenting with cutthroat stocking, their counterparts north of the border were inadvertently sending new, non-native salmonids into the lake. The Kootenay Trout Hatchery is a British Columbia facility that was built in 1965 on what a few years later would become Lake Koocanusa's northeastern shore. The hatchery reared, among other species, kokanee, a landlocked sockeye salmon native to inland British Columbia that was stocked in the province's southern tributaries and lakes. During the 1970s, while trying to figure out why some of their kokanee were dying after hatching, the hatchery flushed large numbers of kokanee thought to be dead into Lake Koocanusa. It turned out that some were very much alive.

While doing annual survey netting, FWP biologists spotted the first kokanee adults in the reservoir in 1979. The species thrived in

Koocanusa, still enriched by the nutrient burst following inundation. "We don't know why the cutthroat didn't do well, but the kokanee feed mostly on zooplankton, and that food source was hugely abundant for a number of years," says Jim Dunnigan, FWP fisheries biologist in Libby. Anglers caught abundant 12- and 13-inch kokanee up until about 2000. Since then, the average size has declined to about 9 to 11 inches. "Basically the overall productivity of the reservoir started to taper off, and so there has been less zooplankton available for kokanee and the dozen or so other fish species there, and that can lead to smaller fish," says Dunnigan.

The biologist notes that just a few inches of kokanee can make a big difference for anglers. "They generally keep kokanee 10 inches and longer, and when they reach a foot or more, that's considered a respectable fish. A 13-incher weighs about twice what a 9-incher weighs," Dunnigan says.

Anglers are allowed a liberal limit of 50 kokanee per day. "You don't catch big kokanee, but you can take home lots of small ones," Dunnigan says.

### Rainbows and bulls

Rich in fat, kokanee are considered an excellent food fish. In summer, barbecue grills



throughout the area sizzle with grilled salmon. Also enjoying the fish are the reservoir's native bull trout and stocked Gerrard-strain rainbow trout. A unique strain native to British Columbia's Kootenay Lake, the Gerrard rainbow evolved to feed on kokanee, making Koocanusa prime habitat. FWP stocks roughly 30,000 fin-clipped Gerrard rainbows each year. Dunnigan notes that the bigger 3- to 5-pound rainbows that anglers catch, along with the occasional 10-plus-pounders, are

### Quite a combo

The name Koocanusa—from the first letters of Kootenai, Canada, and USA—was created by Alice Beers of Rexford, Montana, in response to a contest to name the new reservoir. With the damming of the river, the original site of Rexford was flooded, and the town was moved to its current location, approximately 10 miles west of Eureka.



mostly wild rainbows that have created a self-sustaining population in the reservoir.

During the past decade, kokanee have also boosted numbers of federally endangered bull trout. In 1994 biologists counted just 104 bull trout spawning redds in British Columbia's Wigwam River, the reservoir's main spawning tributary. By 2003, redd numbers had grown to more than 2,000. Encouraged by the increase, FWP successfully petitioned the U.S. Fish & Wildlife Service for Montana to allow some bull trout harvest on the reservoir's U.S. half. In 2004, FWP began allowing a limit of two bull trout per person per year. Anglers were required to obtain a free "catch card"—on which they recorded vital information about bull trout they harvested—and then send the card to FWP.

The bull trout boom was short lived. After peaking at around 2,300 in 2006, Wigwam River redd counts quickly began to decline. By 2010, biologists could find only about 1,100. In response, FWP made bull trout catch-and-release only.

What accounted for the population fluctuations? One factor may have been post-release mortality of the estimated 15,000 bull trout caught and released between 2004 and 2011. "Even if just 10 percent of



**HORSESHOE ROUTE** From its origin in eastern British Columbia, the Kootenai flows south into Montana, then across the Idaho Panhandle up into Kootenay Lake before meeting with the Columbia River just north of the Washington border.

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**LINCHPIN** Left: Kokanee, a small salmon native to British Columbia, shown spawning in a tributary to Lake Koocanusa. The oil-rich species not only creates a popular sport fishery (above), it also feeds the reservoir's large rainbows and bull trout.

released fish died—from deep hooking, bleeding, and handling—it adds up to a lot of fish,” says Hensler. Yet another factor, says Dunnigan, “could be that the population overshot the Wigwam River’s juvenile bull trout rearing capacity. There wasn’t enough room for that many young trout, so numbers declined.” What’s more, for years British Columbia allowed liberal bull trout limits on the Kootenay River and its half of Lake Koocanusa.

Because redd counts in the past few years have risen and then leveled out at around 1,400, FWP is considering allowing some bull trout harvest on the Montana side starting next year. Biologists on both sides of the border are working to make harvest regulations throughout the reservoir similar.

Dunnigan notes that if not for kokanee, the reservoir’s bull trout and rainbow numbers would be much lower. “We can’t emphasize enough how important the kokanee have

been to those fisheries—not to mention the kokanee fishery itself,” he says. “Koocanusa had just over 30,000 angler-days in 2013, the most recent angler survey we’ve done. Most of that was anglers targeting kokanee, and the rest was anglers catching rainbows or bull trout that feed on kokanee. That single species is the linchpin of the reservoir’s entire sport fishery.”

#### Enjoying the lake

Anglers aren’t the only ones enjoying Lake Koocanusa’s clean, sparkling blue-green water and surrounding Salish and Purcell Mountains of the Kootenai National Forest. The reservoir provides miles of secluded beaches and picnic spots, accessed on the west shore via a winding paved road and on the east shore by Montana Highway 37, otherwise known as the Lake Koocanusa Scenic Byway.

Ten miles southwest of Rexford, Lake Koocanusa Bridge spans the reservoir, providing

access to both shorelines. The bridge is part of the Pacific Northwest National Scenic Trail—a 1,200-mile hiking route connecting Washington’s Olympic Peninsula with Montana’s Continental Divide.

Visitors will find a half-dozen U.S. Forest Service campgrounds and picnic areas scattered up and down the reservoir’s Montana half, as well as several private campgrounds and marinas.

Randy Burch, co-owner of Lake Koocanusa Resort and Marina, near Libby Dam, says visitation has grown in recent years. “I’ve already got people calling for 2016,” he says. “Probably 60 percent of our business comes from Alberta.” Though the increased use can create crowded conditions, Burch says that Koocanusa is so big it’s not hard to find solitude: “My marina is crazy busy during the summer, but if you boat only a mile or so away, you’ll feel like you have the lake to yourself.”

CLOCKWISE FROM BOTTOM: LEFT: USW; STEVEN GNAM; RANDIE BURCH; CHUCK HANEY

## The Kootenai River downstream

Libby Dam has been a mixed blessing for Kootenai River fisheries. The structure has moderated water flows, which before dam construction averaged 65,000 cubic feet per second (cfs) during spring runoff each year, then could drop to below 3,000 cfs in August. Now flows average 10,000 cfs during summer after a spring pulse of up to 25,000 cfs. The more stable flows, along with water temperatures kept cooler in summer and warmer in winter with strategic dam releases, have helped boost trout numbers between the dam and Kootenai Falls, 50 miles downstream.

The hydropower structure also traps phosphorus and nitrogen in Lake Koocanusa, thus depriving aquatic life below the dam of much-needed nutrients. A study found that 63 percent of the phosphorus and 25 percent of the nitrogen that enters the reservoir binds with sediment and becomes trapped behind the dam. “Keep in mind that even before the dam, the Kootenai River was in a part of the state that geologically made the river far less productive than, say, the Bighorn or the Madison,” says Jim Dunnigan, FWP fisheries biologist in Libby. “So that nutrient loss downstream is significant.”

The biggest concern is how the dam affects federally endangered white sturgeon. White sturgeon are prehistoric fish that historically migrated to and from the Pacific Ocean. The fish in Montana’s portion of the Kootenai became landlocked about 10,000 years ago when retreating glaciers in British Columbia created Bonnington Falls. As the region was settled by Europeans, clear-cutting and mining polluted rivers with silt, heavy metals, and toxins that killed aquatic insects that sturgeon eat. Dikes that drained bottomlands for farming and housing eliminated many river wetlands where young sturgeon previously hid and grew. The slow-growing species was also aggressively harvested for meat.

Making matters worse was construction of Libby Dam. The structure seems to have hampered the species’ reproductive success downstream, though biologists are not sure why. “All we know for certain is that after they spawn, either the eggs or larvae aren’t surviving,” says Mike Hensler, FWP fisheries biologist in Libby. “We haven’t given up on the white sturgeon, but the picture certainly isn’t rosy.”

Another issue that may affect the Kootenai’s fisheries is the abnormal spread of *Didymosphenia geminata*, known as Didymo or rock snot. For reasons that remain unclear, the native algae has been growing into

large mats that absorb already low amounts of phosphorus in the system, depressing growth of the algae that aquatic insects eat (they don’t like Didymo). FWP and the U.S. Army Corps of Engineers are studying factors that might contribute to the prolific blooms of Didymo below Libby Dam and searching for methods to control the algae species. FWP biologists are also studying how the ecological disruption caused by Didymo might affect rainbow trout growth and survival.

Though nitrogen and phosphorus levels in the Kootenai downstream from Libby Dam are low, the river has received an unexpected nutrient bonus in the form of kokanee salmon. In the late 1980s and early 1990s, fisheries managers for Koocanusa and the Kootenai River saw an overall jump in the average size of rainbow and bull trout. It turns out that oil-rich kokanee are like double bacon cheeseburgers to big trout. Below the dam, trout feed on the small salmon that come through the turbines. That calorie-rich food source grew the massive rainbow that was caught in 1997 by Jack Housel, Jr. The 33.1-pound monster, Montana’s state record rainbow, has drawn attention to the tailrace fishery ever since. Local guides and FWP biologists say that the 3-mile stretch below the dam does contain big fish—dozens over 28 inches are caught each year—but they’ve yet to see anything that would put Housel, Jr.’s record at risk. Anglers catch the big fish deep in the river channel with lures, or with streamers on sinking fly line.

Farther downstream from the dam, the Kootenai’s bread-and-butter trout are 12- to 14-inch rainbows, which one guide describes as “solid muscle and shaped like a fist.” The fish are known to punch far above their weight class, with a 13-incher peeling off line like an 18-incher in other rivers. Throughout the Kootenai, anglers also occasionally catch westslope cutthroat averaging about 15 inches.

Fish size and density on the relatively infertile Kootenai are low compared to those on Montana’s other big trout rivers. Yet far fewer anglers compete for trout on the Kootenai. Even during peak season, the river seems remote, with drift boats few and far between. Add to that the timbered mountains rising above both banks, and the crystal clear Kootenai can at times feel like a remote wilderness river. The occasional bull trout that anglers catch (but must release) adds to the river’s backcountry ambiance. ■



Teck Coal open-pit coal mine at Sparwood, British Columbia

## THE SELENIUM ISSUE

Though tourism has largely replaced mining and logging as an economic staple in northwestern Montana, both extractive industries are still booming in British Columbia, especially near the Kootenai River’s headwaters. The Elk River watershed alone is home to five open-pit mines, owned and operated by Teck Coal, with plans for extensive expansion.

Much of the mines’ waste rock contains high concentrations of selenium—an element that can kill embryos of fish and aquatic insects. Rain and snow falling on the waste rock stockpiles leaches selenium into the river system and then to Lake Koocanusa. When scientists with the Montana Department of

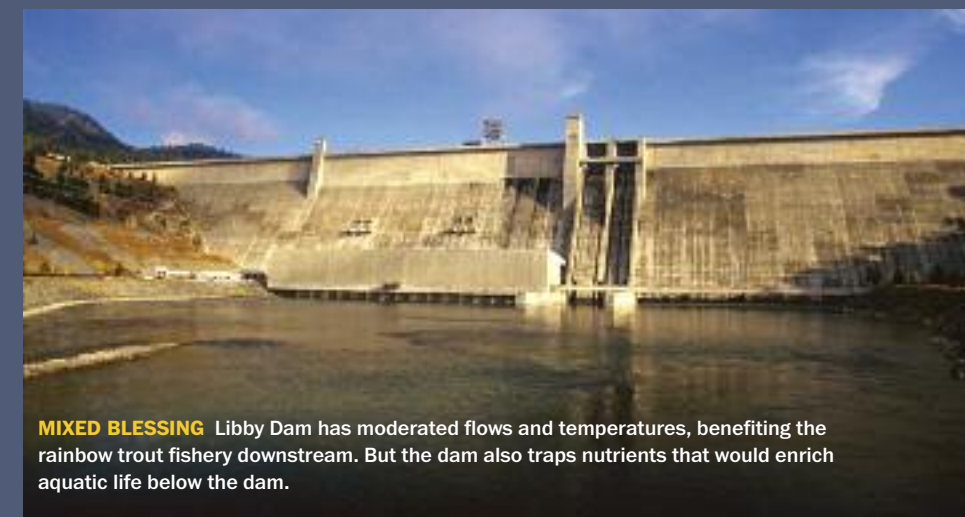
Environmental Quality (DEQ) discovered elevated selenium concentrations in the lake in the mid-2000s, the issue escalated to the governor’s office and Washington, D.C.

The combination of negative press and political pressure persuaded Teck Coal to meet with representatives from the United States and British Columbia to create a plan in which the company will self-regulate harmful selenium deposits by investing hundreds of millions of dollars in water treatment facilities.

“Unlike mercury, selenium is an essential mineral and can be metabolized by most living creatures,” says Mike Hensler, FWP biologist in Libby. “If the environmental selenium is kept to a reasonable level, fish and other aquatic organisms should still be able to

thrive in Lake Koocanusa. But that’s a big ‘if.’”

A 2014 report by researchers from Wake Forest University concluded that further increases in selenium contamination would likely cause the Elk River’s valuable cutthroat trout population to collapse. “On this side of the border, we’re concerned about the effects [of selenium] on fish species in Koocanusa,” says Jim Dunnigan, FWP fisheries biologist in Libby. Biologists with both DEQ and FWP continue to monitor selenium levels in fish from both Lake Koocanusa and the Kootenai River. Though state water quality guidelines in Koocanusa’s Montana portion have not been exceeded, selenium levels have increased in recent years. ■



**MIXED BLESSING** Libby Dam has moderated flows and temperatures, benefiting the rainbow trout fishery downstream. But the dam also traps nutrients that would enrich aquatic life below the dam.