

Yellow Light on the Yellowstone

FWP proceeds with caution as it works to maintain the lower Yellowstone River's diverse native fishery in the face of diversion dams, water withdrawals, and growing numbers of anglers.

By Parker Heinlein

I've always found solitude on the Yellowstone River. Even in rare instances when the parking lot at a ramp is full, it's usually easy to distance myself from other boaters once I'm on the water and riding the river's strong current.

I learned to row a drift boat on the Yellowstone near Livingston. I've fished the river from its humble beginnings above Yellowstone Lake to as far downstream as Columbus. But never have I felt so isolated on the river as I did during a 2005 trip from Intake Diversion Dam to the confluence with the Missouri River at Fort Buford.

Photographer Erik Petersen and I launched my 15-foot aluminum fishing boat into the Yellowstone just below the dam shortly after dawn. As rain fell from thick clouds overhead, I lowered the 40-hp outboard, fired it up, and pointed the

boat downstream. We hadn't gone 50 yards when the prop hit a rock. I shut off the motor, raised the outboard, and hung on as the boat bounced off the bottom through a shallow riffle.

It was going to be a long day.

Plenty of guidebooks cover the upper Yellowstone River, from Big Timber upstream to Yellowstone National Park. Local fly-fishing shops post river conditions daily. Shuttles are available, access is plentiful, and riverside homes abound.

Not so downstream. In his book *Floating and Recreation on Montana Rivers*, author Curt Thompson devotes only two paragraphs to the entire lower Yellowstone (generally considered the portion between Billings and the confluence with the Missouri). And on this final 70-mile stretch of river we were completely on our own. None of the few people we saw could tell us how long it

SLOW-MOVING SLEEPER Named for the limestone cliffs lining its banks, the lower Yellowstone is a warmwater river that in any other state would be a star fishing attraction. But in trout-obsessed Montana, the lazy river receives little attention except from the relatively few anglers who have discovered its abundant sauger, catfish, walleye, and smallmouth bass.

JOHN LAMBING



would take to reach the Missouri.

We eventually trimmed the outboard enough for it to stay clear of the bottom. But we took a couple of wrong turns down channels that became too shallow to navigate and had to hop out and push the boat back upstream to deeper water. Not wanting to spend the night on the river, we decided there was no time to fish. Shortly before dusk we reached the confluence at the Fort Buford Historic Site in North Dakota. We'd seen hardly a soul all day, just a couple of agate hunters walking the banks.

Other than our vehicle, the parking lot at the Fort Buford boat ramp was empty.

Rediscovering the Yellowstone

Since then the river has seen some dramatic changes, many caused by oil. In July 2011, an ExxonMobil pipeline running under the river

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near Laurel ruptured, spilling more than 60,000 gallons of crude into the Yellowstone. The oil fouled 70 miles of riverbank and took months to clean. Long-term consequences to the river's aquatic life are unknown.

Oil is also partly responsible for a rise in recreation on the Yellowstone. Over the past six years, jet-boat traffic has markedly increased, no doubt driven by high wages in the Bakken oil field to the northeast. "From Billings to the confluence, jet-boating keeps getting bigger," says Matthew Lothspeich at Riverside Marine in Miles City. "The oil patch is definitely having an effect on sales."

Jet boats are propelled by engines that eject a powerful stream of water, allowing the craft to move through shallow, rocky riffles like those on parts of the lower Yellowstone. "People didn't know about the river, but now they see jet boats out there and want to give it a try," says Lothspeich, whose best seller runs about \$20,000.

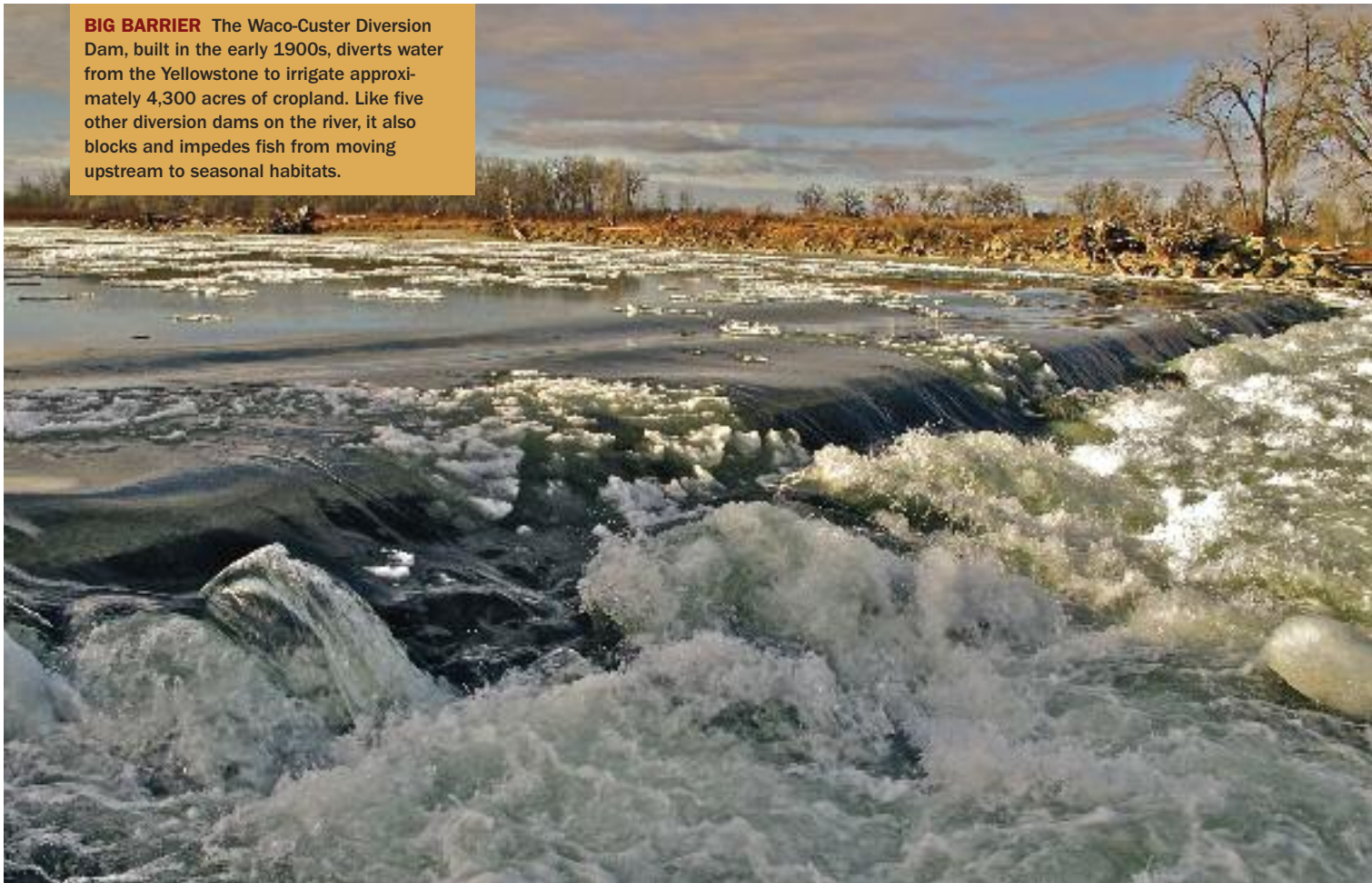
High oil field wages aren't the only thing

driving renewed interest in the Yellowstone. Anglers are discovering that the lower river holds more than paddlefish and catfish. Mike Backes, FWP regional fisheries manager at Miles City, says sauger fishing is excellent throughout most of the lower Yellowstone. So is angling for walleye, the sauger's larger, non-native cousin.

Fishing for the river's rapidly growing and expanding population of smallmouth bass, another non-native, has become a huge attraction. Backes says bass entered the Yellowstone via the Tongue and Bighorn Rivers after they were stocked years ago in upstream reservoirs. Smallies are now found as far up the Yellowstone as Big Timber and are plentiful downstream to the mouth of the Powder River. (Below there, the river is generally too turbid for the sight-feeding predators to find prey fish.)

While the increasingly popular smallmouth bass fishery thrives on its own, FWP works primarily on managing the river's 33

BIG BARRIER The Waco-Custer Diversion Dam, built in the early 1900s, diverts water from the Yellowstone to irrigate approximately 4,300 acres of cropland. Like five other diversion dams on the river, it also blocks and impedes fish from moving upstream to seasonal habitats.



CLOCKWISE FROM LEFT: NATHAN COOPER; RICHARD E. KUNDA; RICHARD E. KUNDA; ERIK PETERSEN; NATHAN COOPER



GROWING POPULARITY Long ignored by anglers intent on visiting Montana's storied trout waters to the west, the lower Yellowstone in recent years has seen a rise in recreational use. Clockwise from upper left: Jet boats allow anglers to navigate the river's shallow, rocky riffles; the fishing for native sauger, a superb food fish, can be phenomenal on the Yellowstone; some people use the river as a swimming hole; channel catfish up to 20 pounds are not uncommon.



native species, especially sauger, channel catfish, paddlefish, and the federally endangered pallid sturgeon. The biggest challenge to keeping those diverse populations healthy, says Ken Frazer, FWP regional fisheries manager in Billings, is diversion dams.

Although it's commonly referred to as the longest undammed river in the Lower 48, six diversion dams exist on the Yellow-

stone. These 3- to 12-foot-high concrete or rock structures span the river and divert water into canals that irrigate thousands of acres of cropland in the river valley. The dams also block fish migration—most significantly that of the pallid sturgeon. The cream-colored, shark-shaped fish, which can weigh 80 pounds, was once plentiful in the Yellowstone, considered one of its best

habitats. Today the species has been reduced to an adult population estimated at just 120 wild fish, living in the lower Yellowstone and the Missouri River below Fort Peck Dam. The Yellowstone hasn't been truly undammed since water was first diverted at Intake in 1906, a century after Captain William Clark floated down the river on his return trip from the Oregon

coast.

Big-river fish evolved to make long migrations. Sauger tagged at Miles City have been caught 319 river miles downstream at Lake Sakakawea in North Dakota and upstream 160 river miles just below Huntley Diversion Dam. Shovelnose sturgeon tagged just below Fort Peck Dam have been caught 360 river miles away at Miles City after swimming

“There's definitely an increase in traffic. But people out there have a respect for the river.”

down the Missouri then up the Yellowstone. “Fish need different types of habitat throughout the year, for spawning, for newly hatched fry to escape predators, and for spending the winter,” says Frazer. “You block that move-

ment and fish suffer the consequences.”

Movement blockers

Progress to help fish negotiate the dams comes in fits and starts. A passageway built to allow fish to swim around Huntley Dam

FWP requests new options at Intake for pallid recovery

The U.S. Army Corps of Engineers has recently proposed building a new concrete diversion dam at Intake that would be taller than the existing rock dam, already the largest on the Yellowstone River. That, along with other recent decisions on Intake by the Corps and other federal agencies, has FWP officials concerned. “We don't think these new proposals are in the best interests of federally endangered pallid sturgeon or the many other game and nongame species that occupy the lower Yellowstone,” says Jeff Hagener, FWP director.

The Corps is proposing the new structure as a way to build up a higher water level—or “hydraulic head”—behind the dam to feed a new headgate. The headgate controls water diverted from the Yellowstone into a network of canals used to irrigate 55,000 acres of cropland along the river in Montana and North Dakota. Built in 2012, the headgate includes screens that reduce fish “entrainment”—the loss of sauger, young pallid sturgeon, and other species diverted into the irrigation canal. The new structure was built 200 yards upstream of the old one and requires a higher water level behind Intake Dam to provide enough irrigation flow.

Building the screens was part of the Corps's obligation under the federal Endangered Species Act to recover pallid sturgeon. The U.S. Fish & Wildlife Service (USFWS) determined the Corps was responsible for pallid recovery because the Fort Peck (Montana) and Garrison (North Dakota) Dams it owns and operates on the Missouri River have contributed to the almost complete disappearance of naturally produced pallid stur-

geon, currently reduced to just 120 adult wild fish (which also use the Yellowstone below Intake). Most of these remaining pallids are more than 60 years old. Though they spawn, they haven't successfully added new young sturgeon into the population in decades because the larval fish can't survive in the altered river conditions. By impounding the Missouri, the dams also rob the pallid sturgeon of vital habitat and fluctuating water cycles the species has evolved with over millions of years.

In the mid-2000s the Corps announced that the most cost-effective way to recover pallid sturgeon would be to create natural upstream fish passage at Intake Diversion Dam on the Yellowstone, the other river that historically held large populations. In

spring the bottom-hugging sturgeon are unable to move past the 12-foot-tall rock structure, owned and operated by the Bureau of Reclamation (BOR), to reach upstream spawning habitats. “A dam that's 12 feet high is as big a barrier to a pallid sturgeon as a dam that's 1,200 feet high,” says Hagener. “For these endangered fish, Intake Dam might as well be Hoover Dam.”

In 2010, the Corps and BOR decided the best option for helping pallids bypass the dam would be to replace it with a concrete weir that spanned the channel, behind which would be built a shallow-sloped “rock ramp” made of boulders. The weir would impound enough water to feed the irrigation system while the ramp's gentle incline would allow pallids and other

species to swim over the weir during spring runoff. In addition, a new headgate would be built to include fish screens that reduced entrainment of any young pallids resulting from the increased sturgeon reproduction made possible by the ramp.

The rock ramp would be “the least cost[ly] option,” the two federal agencies wrote in their final Environmental Assessment (EA), issued in 2010, and “would [also] be easier for pallid sturgeon to navigate than the other alternatives.” (Alternatives were (1) to maintain Intake Dam as it was, or (2) construct a new 2.4-mile-long main river channel sloped in a way that would provide ample water for irrigation while improving upstream fish passage.)

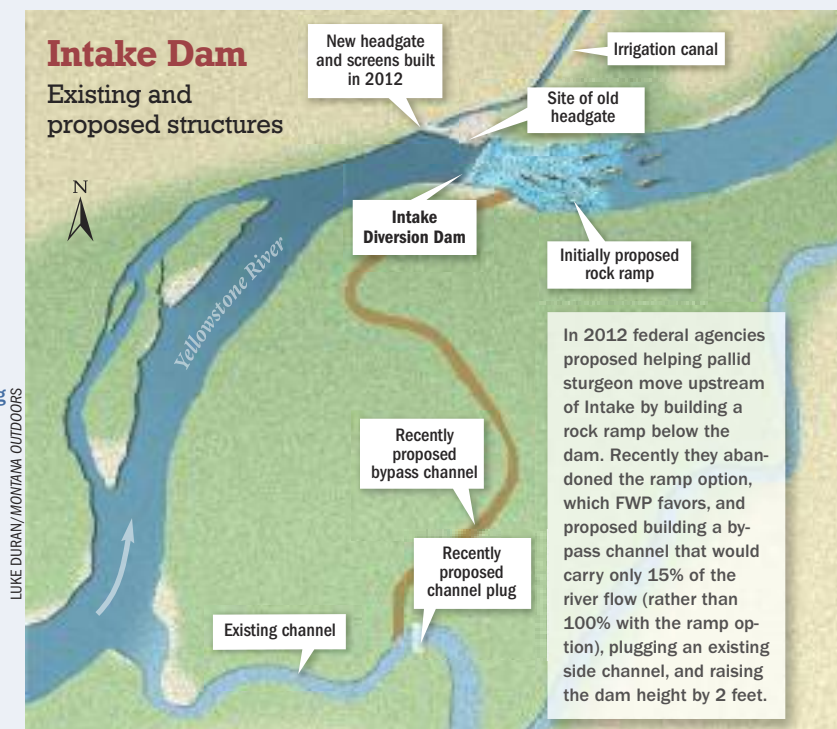
As the new headgate was being built in 2012, the Corps announced it had vastly underestimated its cost as well as the expense and engineering feasibility of the rock ramp. Instead of the ramp, they proposed constructing a fish “bypass”—a new chan-



1 OF 120 FWP fisheries biologist Dave Fuller releases a wild adult pallid sturgeon, one of the rarest fish in North America.

STURGEON STOPPER

At 12 feet tall, Intake is the largest of the six diversion dams on the lower Yellowstone River. The structure diverts water into a canal system that irrigates 55,000 acres of cropland. It also blocks the upstream migration of federally endangered pallid sturgeon. Prevented from reaching spawning and larval habitat, the bottom-hugging fish have been unable to successfully reproduce for decades.



“For these endangered fish, Intake Dam might as well be Hoover Dam.”

nel built around Intake Dam—and building a new concrete dam on the Yellowstone that would be 2 feet taller than the existing one. In addition, a small existing side channel that currently allows some fish passage in high water would be blocked off.

FWP has long stated that if the existing dam were to stay in place, the rock ramp was its preferred alternative. “Instead of pallid sturgeon having 100 percent of the river

flow as proposed with the rock ramp, they would only receive, with the bypass, about 15 percent,” Hagener says. “We are also faced with the very real possibility of an even taller dam at Intake. Along with the loss of fish passage in the existing side channel, we are unsure if the net results would do much to help sturgeon.”

In January 2013, the USFWS announced that if the Corps built the fish passage at Intake, then the agency could be absolved of any future responsibility for pallid recovery—even if the structure didn't result in significant wild sturgeon natural reproduction and recovery. “This latest decision, if made final, brings to question a previous promise by the USFWS that the Corps would be held accountable for using biologically based criteria to judge the success of any passage modifications at Intake,” says Hagener.

“It also appears to negate promises made that the Corps would still be responsible for recovery actions on the Missouri River, like adjusting Fort Peck Dam flows to improve pallid spawning conditions downstream.”

The Corps plans to issue a draft EA on the new taller dam proposal for public comment later this year.

“What we'd like is to see all the options back on the table—including the rock ramp and the option of removing any dam at Intake altogether and pumping water from the river into the irrigation system,” says Hagener. “We recognize that irrigation water is the lifeblood of this region's farm-based economy, and we recognize those needs must be met. But the current proposal of the bypass channel and a new, taller weir is not the only way to fulfill the needs of irrigators. It's certainly an expensive option for taxpayers, and we think there are definitely better solutions for fish passage at Intake.”

—Tom Dickson

in 1997 has never worked correctly. And only recently were screens installed at the headgate above Intake Dam to prevent fish from being diverted into the irrigation system. "We were losing half a million adult fish a year down that ditch," Frazer says.

Though they block fish migration, diversion dams aren't tall enough to fully impound the Yellowstone. During high-water years, the structures sometimes even disappear beneath the muddy torrent, allowing some species to swim over or around them. Backes says the 2011 flood washed boulders off the top of Intake Dam, creating a channel that allowed a record upstream migration of walleye and northern pike the following spring. "They were able to access areas they hadn't reached in years," he says. In 2012 the Bureau of Reclamation replaced the boulders, so the dam continues to impede fish movement as before.

Even if fish could find a way past the dams, they would still struggle without adequate water. "Allocation of river water for growing municipal and agricultural use is a huge issue," Backes says. "In this dry envi-

ronment, there's not an endless supply."

Sauger mystery

Another challenge facing native fish is competition from non-native species. Sauger, especially, must compete with walleye and smallmouth bass for habitat and food. While the sauger population is healthy in the lower reaches of the river, there are far fewer of the fish from the mouth of the Clarks Fork of the Yellowstone downstream to Forsyth. Mike Ruggles, an FWP fisheries biologist in Billings who studies sauger, says a population decline in that stretch during the 1980s was blamed on drought. Yet numbers have remained low since then despite years of higher water. Are irrigation dams blocking upstream sauger movement? Is the problem "entrainment"—the loss of sauger down irrigation canals? Is the river's growing smallmouth population, which is steadily moving upstream, hampering sauger production?

Whatever the cause, DNA analysis shows those sauger to be genetically unique. That may be due to the barrier-like effect of the diversion dams that restricts free movement and interchange of genetic material with

sauger in lower stretches of the Yellowstone. Ruggles says repairs to the fish passageway at Huntley, scheduled for later this year, should increase genetic exchange among sauger and allow them and other species to expand their range and multiply.

Another species receiving close scrutiny is the paddlefish, a primitive species that can weigh over 100 pounds and is caught for its meat and eggs (made into caviar). Because paddlefish grow slowly—females don't reproduce until age 12 to 15—FWP closely monitors the recreational take. In recent years the agency has reduced bag limits to protect the population from overharvest.

Biologists also keep tabs on the lower Yellowstone's small native fish, such as flathead chubs, emerald shiners, longnose dace, and other minnow species eaten by game fish. As smallmouth bass numbers increase, the voracious predators could be taking a bite out of minnow populations—to the detriment of native game species. Another potential problem is commercial minnow seining. Streams in the Yellowstone drainage have become the main source of minnows for bait

shops throughout eastern Montana. Overharvest by commercial seiners could devastate minnow populations and reduce this important forage base, necessary for maintaining game fish populations. Commercial seining also could spread disease and invasive species. Frazer says the state needs tougher commercial seining restrictions. "Montana's are liberal compared to other states," he says. "We're looking into whether additional ones might be necessary."

Another concern is access. Of the 51 Fishing Access Sites (FAS) on the Yellowstone, more than half are in the first 185 river miles from Gardiner to Billings. From there to the confluence, 382 miles downriver, the sites are few and far between. Use continues to grow from increasing numbers of people drawn to jobs in the nearby Bakken.

Steve Marx, an FWP warden in Glendive who regularly patrols the river, says on a typical summer day half the people he sees on the river are fishing and the other half are hunting the gravel bars for Yellowstone

(moss) agates, a legal activity. Though increasing river use means he writes more citations for fishing and boating violations, most folks he runs into are well behaved. "We don't have a ton of problems on the Yellowstone," the warden says. "There's definitely an increase in traffic, but the people out there have respect for the river."

Even so, the combination of more anglers and faster jet boats moving quickly between hot spots means added pressure on the Yellowstone's fishery, says Backes. "Right now game fish populations are doing well, but we want to maintain those fishing opportunities as use increases."

Lower Yellowstone River

The lower Yellowstone is generally considered the 400-mile stretch beginning at the mouth of the Clarks Fork downstream to the confluence with the Missouri River at Fort Buford Historic Site in North Dakota. In addition to diversion dams (see sidebar page 22), FWP fisheries crews monitor the effects to native fish populations from:

- ▶ harvest of slow-growing paddlefish
- ▶ loss of river water for irrigation needs
- ▶ commercial seining of native forage fish
- ▶ loss of sauger and other species down irrigation canals
- ▶ competition from increasing numbers of non-native smallmouth bass
- ▶ increasing pressure on the relatively small number of fishing access sites



Common sport fish on the lower Yellowstone

* Native		* Non-native	
Sauger*	Brown and rainbow trout*	Smallmouth bass*	Paddlefish*
Channel catfish*	Black crappie*	Walleye*	Northern pike*
			Burbot*

NORTH DAKOTA

SOUTH DAKOTA

MAP GRAPHIC: LUKE DURAN/MONTANA OUTDOORS. SOURCE: FWP. FISH ILLUSTRATIONS BY JOSEPH TOMELLERI

More coming

On a late January afternoon, the parking lot at the Fort Buford Historic Site is empty except for my vehicle, even though the visitor center is open. From inside the building a row of south-facing windows offers a scenic view of the confluence. Surprisingly, a dozen or so ice-fishing shacks are scattered across the mouth of the Yellowstone, the unstable river ice apparently no deterrent to some winter anglers.

To the east of the ice shanties, on a prominent point above the two rivers, is the site where Captain Clark camped on his return trip in August 1806.

Behind the visitor center, a few hundred yards to the north, a derrick methodically pumps oil from the ground. A 4-foot-high flame of natural gas burns brightly nearby, a process known as flaring. To the north and east is the hustle and bustle of the Bakken oil patch. A seemingly endless line of oil field trucks rumbles along Montana Highway 16,

which follows the river south to Glendive.

Truck drivers barreling past catch only an occasional glimpse of the lower Yellowstone as it braids and weaves through the cottonwoods that grow thick along the river bottom. With summer, the river again will become a recreational centerpiece of eastern Montana, attracting more anglers, agate hunters, and boaters than the year before. The Yellowstone here has undergone dramatic changes in recent years. Undoubtedly, more are coming, both up-

Some changes on the Roche Jaune

For roughly 12,000 years the lower Yellowstone region has attracted hunters, anglers, and others drawn to the lush valleys, abundant water, and plentiful fish and game. Named by Indians for its limestone cliffs, the river was also called Roche Jaune ("Yellow Rock") by French trappers.

Almost all of what *National Geographic* called the nation's "last best river" still contains the warm, murky water and countless braided channels, sandbars, and islands that early explorers encountered. Though these features continue to provide essential fish habitat, several changes over the past century have altered the river's historic fishery.

The first came in the early 1900s, when the federal government built diversion dams and extensive irrigation systems. In addition to blocking and impeding upstream fish movement, the dams divert sauger, channel catfish, and other species into irrigation canals, where they are either pumped out



People have lived along the lower Yellowstone and its tributaries for thousands of years, attracted by the area's abundant water and plentiful fish and wildlife. Shown here: a 1908 photograph of an Apsáalooke (Crow) encampment on the Little Bighorn River by Edward S. Curtis.



The completion of Yellowtail Dam on the Bighorn River in 1967 cut off historic flows of warm, turbid water to the Yellowstone River.

into fields or left stranded in the ditches.

Another major development was the completion, in 1967, of Yellowtail Dam on the Bighorn River. Built to control flooding and generate hydropower, the dam vastly reduced the flow of warm, turbid water that attracts spawning pallid sturgeon, paddlefish, and other species. Though cold water from the dam's base has created the Bighorn's world-class trout population, biologists say the river's contribution to the Yellowstone's warmwater fishery has been greatly reduced.

Riprap and levees are another problem. For decades railroads, municipalities, and farmers have built shoreline dikes (levees) to prevent flooding on their property, and have lined banks with boulders (riprap) to lessen erosion of rail beds and irrigated cropland. But by narrowing the river, the cumulative effect of hundreds of shoreline reinforcements increases water speed and energy, leading to greater flooding and increased erosion downstream.

—Tom Dickson



AS CLARK SAW IT The lower Yellowstone meanders past cottonwood forest, sagebrush steppe, and cropland along its 600-mile route to the confluence with the Missouri. Despite diversion dams, non-native fish species, and growing recreational use, the river still looks much like it must have looked in 1806. That's when Captain William Clark carved his signature at Pompeys Pillar before continuing with his men downstream to meet the rest of the Corps of Discovery on the Missouri River in today's North Dakota.

LEFT TO RIGHT: WIKIPEDIA.COM; LIBRARY OF CONGRESS; ERIK PETERSEN