

Great Rivers of the West:
MONTANA



WESTERN RIVERS
CONSERVANCY

Report prepared by Tim Palmer and Ann Vileisis



TIM PALMER

North Fork Flathead River. Cover: Yellowstone River. with Absaroka Mountains.

Letter from the President

Rivers are the great treasury of biological diversity in the western United States. As evidence mounts that climate is changing even faster than we feared, it becomes essential that we create sanctuaries on our best, most natural rivers that will harbor viable populations of at-risk species—not only charismatic species like salmon, but a broad range of aquatic and terrestrial species.



That is what we do at Western Rivers Conservancy. We buy land to create sanctuaries along the most outstanding rivers in the West – places where fish, wildlife and people can flourish.

With a talented team in place, combining more than 150 years of land acquisition experience and offices in Oregon, Colorado, California, and Washington, Western Rivers Conservancy is well positioned to fulfill its mission in 11 western states.

Yet if we are to conserve the great rivers of the West, we need to know which rivers these are. To develop an inventory of the highest quality rivers, we turned to Tim Palmer—a noted author and photographer with 35 years of experience exploring hundreds of streams throughout the West.

The principal goal of the survey was to develop a list of the most outstanding natural rivers—the great rivers of the West. Criteria included free-flowing length, natural flow regime, water quality, biological health and habitat, ecological and regional diversity and recreational suitability, among other attributes. A committee of

noted scientists and other experts reviewed the survey design, and state-specific experts reviewed the results for each state.

The result is a state-by-state list of more than 250 of the West's outstanding streams, some protected, some still vulnerable. The Great Rivers of the West is a new type of inventory to serve the modern needs of river conservation—a list that Western Rivers Conservancy can use to strategically inform its work.

This is one of 11 state chapters in the report. Also available are a summary of the entire report, as well as the full report text.

With the right tools in hand, Western Rivers Conservancy is seizing once-in-a-lifetime opportunities to acquire and protect precious streamside lands on some of America's finest rivers.

This is a time when investment in conservation can yield huge dividends for the future. We invite you to join forces with us as we work to buy and conserve high-quality lands on the Great Rivers of the West. Please visit our website at www.westernrivers.org, or you may contact me at sdoroff@westernrivers.org or 503-241-0151 to learn more.

For Our Rivers,

A handwritten signature in blue ink, appearing to read 'Sue Doroff'. The signature is stylized and fluid.

Sue Doroff
President

Introduction

Great Land, Great Rivers

Rivers and streams may be the most valuable of all natural resources in the western United States. They provide for a wide range of human needs—everything from drinking water and recreation to hydroelectricity and agriculture. At the same time, they offer crucial habitat and migration routes for fish and wildlife—often in otherwise arid landscapes. Even more fundamentally, they sustain vital natural processes—the hydrologic cycle, the flow of groundwater, and the growth of forests—that nourish all of life.

An extraordinary network of rivers flows from mountaintops to deserts, lowlands, and seashores. Among thousands of streams, several hundred remain as exemplary natural waterways.

Bound for the Pacific Ocean, rivers of the coastal states flow through remarkably varied terrain—from high elevations to sea level, and through drylands as well as the greatest temperate rainforests on earth. In California, the Smith River is the only sizable undammed river in the state and still supports runs of wild salmon. In the Sierra Nevada, the Kings, North Fork of the Kern, and other streams flow magnificently from alpine headwaters to lower foothill elevations. In Oregon, the Elk and Illinois are criterion natural rivers of the Pacific Coast Range, and the Rogue is one of few rivers that winds without development or roads as it cuts through these far-western mountains. In Washington, an incomparable suite of still-wild rivers drops from towering Mount Olympus, and in the glacier-carved North Cascades, the Skagit and Sauk River systems are among the finest for salmon, steelhead, and deep forest frontage with long, free-flowing mileage.

In the Rocky Mountains, a few rivers remain with exceptionally long reaches of undammed, watery pathways through the rugged terrain, and others are critical to fish and wildlife even though they are shorter. The Salmon of Idaho, perhaps America's premier river for combined length and natural mileage, runs for more than 400



North Fork Flathead River

miles through a geographic maze of eight major mountain ranges and still supports one of the West's most notable runs of salmon. The Selway is even wilder, pulsing down from its headwaters in the Bitterroot Mountains. Montana has the forks of the Flathead—each remarkable for its clarity, beauty, and habitat of rare bull trout and wildlife including grizzly bears and wolves. The Yellowstone flows for more than 600 miles without large dams, its nature still largely intact from Rocky Mountain heights to the heart of the Great Plains. In Wyoming, rivers of the renowned Greater Yellowstone Ecosystem include outstanding tributaries to the upper Snake and its incomparable riparian corridor beneath the craggy peaks of the Tetons. In Colorado, the Yampa has one of the finest cottonwood forests in the West and still supports endangered warm-water fishes of the Colorado River basin.

The drylands and deserts also have their riverine highlights.



Blackfoot River

TIM PALMER

The Green of Utah flows for nearly 400 miles with native fish habitat through spectacular canyonlands, and the Virgin River is centerpiece to Zion National Park and a greater region of redrock canyons. Nevada has mountain streams where the rare Bonneville and Lahontan cutthroat trout survive. New Mexico has the fabled Rio Grande and the still-wild upper Gila; Arizona has the biologically rich Verde and the one-and-only Grand Canyon of the Colorado River.

These are just a few of the rivers and tributaries that still flow with exceptional natural assets throughout the American West. Much of value remains, yet much of natural worth has been lost during the past two hundred years, and even some of the best-protected waterways are threatened by mismanagement, development, or pollution from near or distant sources.

To protect and restore the finest rivers that remain are goals of top importance for the future of the West, yet no recent comprehensive survey has been completed to identify the best natural rivers that remain. That is the intent of this report prepared by the Western Rivers Conservancy.

Great Rivers of the West: The Western Rivers Conservancy Survey of Eleven States

Western Rivers Conservancy (WRC) is dedicated to protecting the outstanding rivers of the western United States. Based in Portland, Oregon, but working throughout an eleven-state region, this nonprofit, private organization purchases riverfront property from willing, private landowners and assures that the land will be conserved as open space. In this way, the group has successfully protected dozens of critical riverfront tracts along streams such as the Sandy, Illinois, Chetco, and Willamette Rivers in Oregon; the Hoh River and Icicle Creek in Washington; the Snake River in Hells Canyon of Idaho and Oregon; the Sun River in Montana; the Smith River and Chico Creek in California. However, both the need and the opportunity to protect rivers far exceed the ability of this—or any organization—to accomplish all that should

be done. Many rivers and their landscapes must be safeguarded so that natural ecosystems can continue to function and provide for people's needs in the future.

To clarify its mission and focus its efforts, the WRC in 2005 adopted a strategic plan to “protect outstanding river ecosystems in the western United States” and to “conserve the great rivers of the West.” These are described as “healthy, natural rivers where ecological functions are still intact.” The plan emphasized “whole ecosystem protection” and recognized the importance of headwaters, riparian lands, estuaries, and regions that have “a high density of high-quality rivers.” To plot this ambitious course, the WRC recognized the need to complete a survey to identify the highest quality rivers. Simply stated, if the organization is to save the “great rivers of the West,” it needs to know which rivers these are.

To develop the survey, the WRC hired Tim Palmer—a noted author of ten books about rivers and river conservation, a planner trained in landscape architecture, a photographer, and an inveterate rivers enthusiast with thirty-five years of experience exploring hundreds of rivers throughout the West. A committee of noted river scientists and other western river experts reviewed the survey design as it was being developed, and state-specific experts reviewed the results for each state.

The survey examined rivers of Washington, Oregon, California, Idaho, Montana, Wyoming, Utah, Colorado, Nevada, Arizona, and New Mexico. For pragmatic reasons, Hawaii and Alaska were excluded.

Rather than start from scratch, the WRC survey built on past river inventories. These include significant studies following the National Wild and Scenic Rivers Act of 1968, such as the Nationwide Rivers Inventory (NRI), and a wide variety of other more recent studies, inventory lists, articles, and research papers. Typically, for each state, 15 to 20 such sources were consulted. Each of these had its own “take” on the definition of quality (e.g. native fish abundance, water quality, recreation values), and some lists addressed only specific regions within a state. None told the whole story, but in aggregate, these earlier efforts all pointed the way or offered useful evidence. If a particular river was identified as excellent by half a dozen different



Missouri River

sources, for example, it was considered likely to be a “better” natural river than one that was identified only once. To specifically consider rivers’ biological values, several experts—usually fisheries biologists or ecologists—were interviewed for each state. Their perspective and firsthand knowledge of local rivers provided essential insights for this survey’s analysis.

The Great Rivers of the West does not include of all rivers deserving protection. That would be a far larger list. To state this important point another way, if a river does not appear in this report, it implies no agreement that dams, pollution, new roads, or development can occur without significant public losses in river qualities and ecosystem functions. This survey, however, is the WRC’s attempt to identify the very best rivers that remain with outstanding natural values. Furthermore, restoration efforts for rivers that are not even mentioned in this survey might someday reinstate their natural qualities so that they, too, will again become “great rivers of the West.”

Based on this survey, the Western Rivers Conservancy will be able to better identify prime opportunities for its involvement. However,

no land will be acquired for open space simply because a river appears on our list. And in cases where open space may eventually be bought to conserve the rivers, acquisition would be only from willing sellers who voluntarily agree upon all terms. The work of the Western Rivers Conservancy and of other conservancies and land trusts simply gives property owners an opportunity to have their land protected if they want to do so.

The need for river protection is becoming more urgent as western streams are increasingly affected by pressures of a rapidly growing population; of the ten fastest growing states in the nation on a percentage basis, seven are in the West. Such growth intensifies needs for water and energy and spurs suburban development of farm and ranchlands. The urgency of conserving rivers is also heightened by the aggravating effects of global warming and by neglect of problems that have been accumulating for many years across the watersheds of the West. In this challenging context, it is the aim of this survey to inform the conservation of the best remaining rivers of the West.

Surveying Montana's Great Rivers

As the second-largest state in the West, Montana's river geography is split roughly in two. Rivers in the western part of the state are mountainous, pulsing and rushing through valleys and canyons of the northern, middle, and southern Rocky Mountain provinces. Rivers in the eastern part of the state begin in the mountains, but then wind and flow with low gradient through expansive grasslands of the semi-arid Great Plains.

The mountainous regions have wilder rivers, with public land and some well-protected national park and wilderness watersheds, though mining, logging, and now recreational and second-home development have taken a heavy toll. On the prairie, few reaches have escaped the degradation of diversions, damming, grazing, and roads, though a few relatively intact sections of waterways remain. Even in the mountainous regions, precipitation is less plentiful here than in northern Idaho and on the western slope of the Cascades



Middle Fork Flathead River

in Oregon and Washington. But still, the mountains in Montana receive far more water than the rest of the 1,000-mile-long Rocky Mountain range that extends southward through New Mexico.

As such, Montana's rivers are some of the largest (by volume) in the Rocky Mountains. The second-largest river flowing within the Rockies—the Clark Fork/Pend Oreille—also has the longest river mileage entirely within the Rocky Mountain region (the largest Rocky Mountain river in volume is the Columbia, whose length through the American portion of the Rockies is nominal). The Kootenai, which begins in Canada but then flows across far northern Montana before entering Idaho and ultimately returning to Canada, is the Rockies' fourth-largest river. The Flathead—principal tributary of the Clark Fork—is the sixth largest. The Missouri and Yellowstone rank eighth and ninth for size while they are still within the Rocky Mountain region; they flow with similar volumes where they each leave the Rockies and enter the Great Plains. The Yellowstone is actually the larger of the two at the confluence, with 13,080 cfs on average versus the Missouri's 11,000 (the Missouri grows to 76,200 cfs by the time it reaches the Mississippi, far downstream).

Montana can boast part of the third-largest block of wild and semi-wild land outside Alaska: the northern portion of the Greater Yellowstone Ecosystem (only central Idaho and the Sierra Nevada are larger). This Greater Yellowstone region includes many fine tributaries of the upper Missouri and upper Yellowstone Rivers. Another large and significant block of wild terrain is the Glacier National Park/Northern Rockies ecosystem, which is threaded by the Flathead River system and upper portions of the Two Medicine, Teton, Sun, Dearborn, and North Fork Blackfoot Rivers.

Montana has four rivers with 368 miles designated in the National Wild and Scenic Rivers system—the three forks of the Flathead plus the wild section of the Missouri. While many more rivers are deserving of protection, this is the fifth-largest contingent of Wild and Scenic rivers in the nation, behind Alaska, California, Oregon, and Idaho.

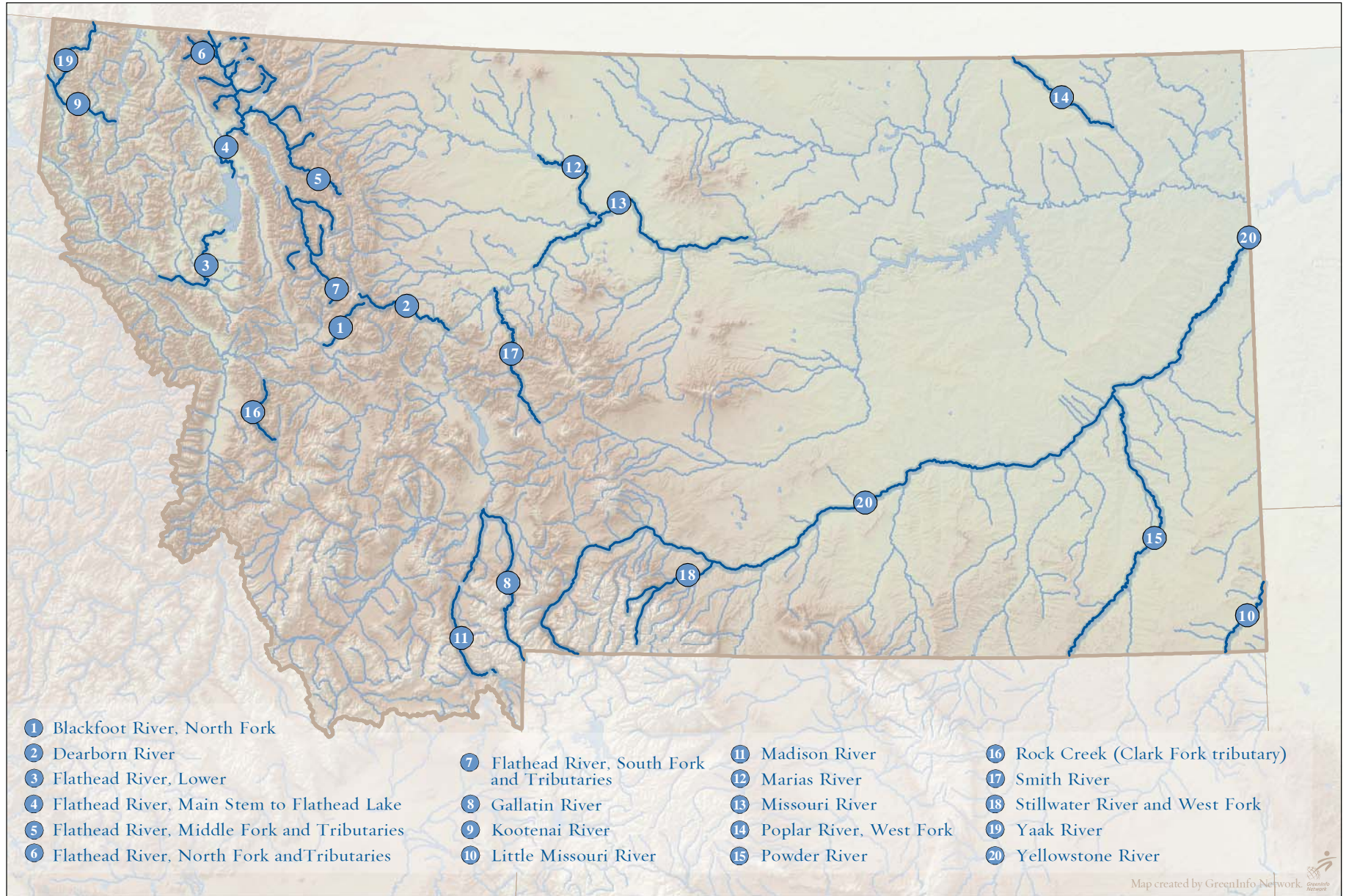
With its ample waters and wild country, Montana has perhaps the finest reputation in America for trout fishing. Excellent sport fishing on the Madison, Gallatin, Big Hole, Yellowstone, Beaverhead, Smith, and other rivers draws anglers from around the country. However, most streams across the state are biologically degraded to some extent—some of them severely. Even the reputation of the state’s “blue ribbon” trout waters typically owes to introduced species, such as rainbow and brown trout, rather than to native fishes that are more indicative of a stream’s ecological health. For example, while non-native rainbows have become common, bull trout, which once thrived on many if not most of the cold-water streams of the mountain region, are now limited to a select few waterways that retain high-quality habitat. (The upper South Fork Flathead is perhaps the only secure stronghold for these fish.) For this reason, the bull trout can be considered a good indicator species for the ecological integrity of native aquatic life in Montana streams—much as the salmon and steelhead are for rivers of the Pacific Coast.

The biological degradation of Montana’s streams owes to many factors. Dams have been built on nearly all the rivers, and diversions for irrigation are almost universal in the eastern part of the state. As soon as rivers leave the mountains and enter ranchland, diversions severely deplete flows. (Even mountainous reaches

of some streams, such as the Big Hole, are severely affected by diversions.) The invasion of exotic species—from stocked brown trout to knapweed—pose a suite of problems that affect most of Montana’s aquatic habitats. For example, whirling disease, spread by stocked fish, has already decimated or diminished some of the state’s finest sport fisheries and has posed ominous threats for native fish throughout the region. Hard-rock mining has long polluted Montana’s rivers, with some of the worst degradation owing to old and now defunct mines. As testament to this legacy, the state’s largest river, the Clark Fork/Pend Oreille, also happens to be the nation’s longest superfund toxic waste site—a 120-mile-long reach of the upper Clark Fork beginning near Butte. Current coal and gas development on the Great Plains and urbanization in resort and mountain-town areas such as Big Sky, Missoula, and Kalispell now add formidable threats to the state’s waterways.

Nevertheless, some fine river systems, or at least portions of them, remain, and several are truly exceptional from a nationwide perspective. Foremost are the Yellowstone and Flathead Rivers. Many other reaches retain important qualities, and at least some of their original wealth can be restored if adequate measures are taken to avoid further problems and to fix some of the damage of the past. ■

Montana's Great Rivers: List



 Great Rivers of Montana

 Other Rivers and Streams

Montana's Great Rivers: River Narratives

MONTANA'S "A" RIVERS

Flathead River, to Flathead Lake

The extraordinary Middle, North, and South Forks of the Flathead are among the finest river systems in Montana and in the Rocky Mountains. Though overshadowed by these stellar tributaries, the upper main stem Flathead is also a river of great value. It is effectively a long, undammed extension of both the North and Middle Forks into a rare, low-gradient, wetland riparian zone ending at Flathead Lake.

From the confluence of the North and South Forks to Flathead Lake—a natural lake that was raised by Kerr Dam—the upper main stem Flathead runs for about 38 meandering miles, most of it flatwater. The quiet river drifts through silt-filled flats that precede Flathead Lake and threads through a plethora of islands in a vast wetlands complex. With excellent habitat for waterfowl, the river also supports bull trout, cutthroat trout, and introduced trout species. Ecological problems in the lake have diminished the river's native fishery in recent years, according to the Pacific Rivers Council. Nearly all of the Flathead's sprawling wetland corridor is privately owned and is used as pasture and hayfields. This valley is one of the more substantial complexes of wetlands in the entire Rocky Mountain region.

See the "C" list of Montana rivers for the lower Flathead.

Flathead River, Middle Fork and tributaries

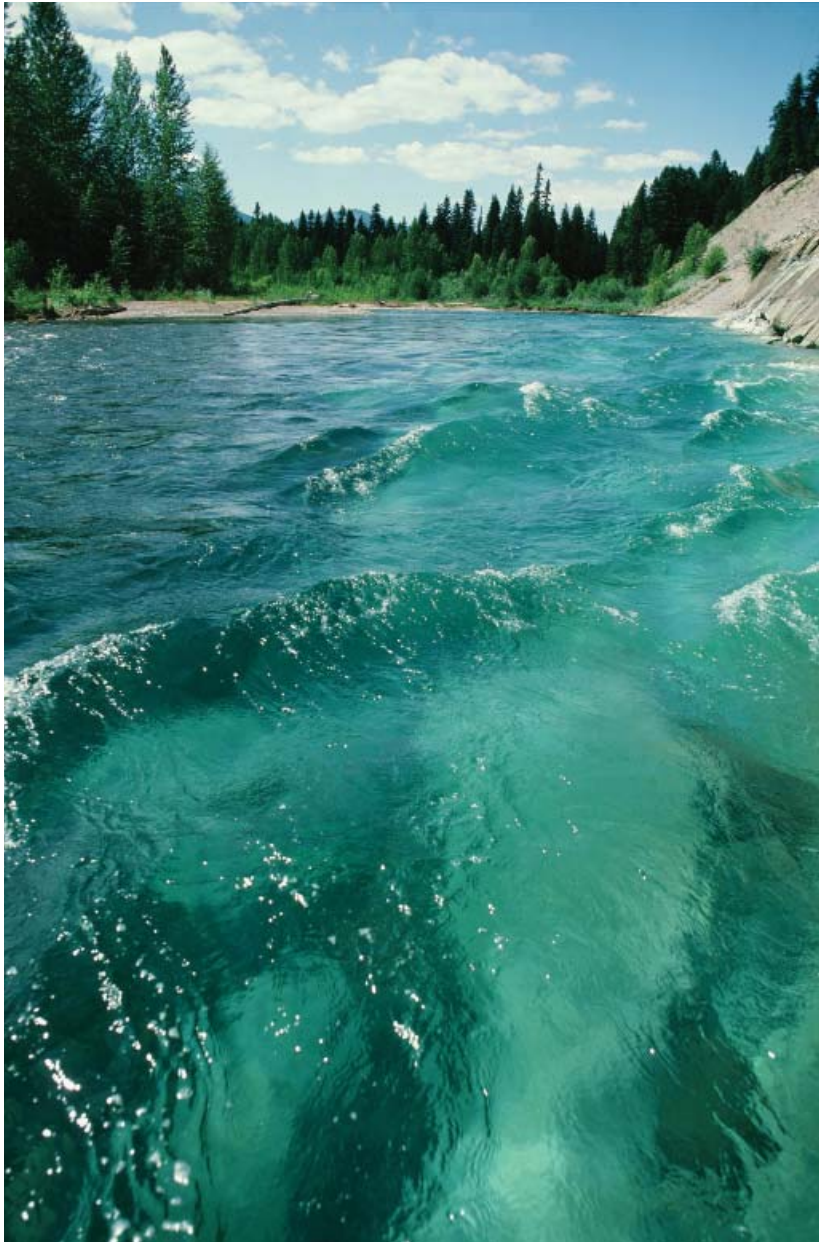
Running from the heart of one of America's great wilderness



Flathead River in Glacier National Park

areas and then along the border of Glacier National Park, the Middle Fork Flathead is free of dams and diversions for its entire 101 miles.

Uppermost headwaters are gathered by the 12-mile-long Strawberry Creek, effectively an extension of the upper Middle Fork. Then the upper river flows for 61 miles through the Bob Marshall and Great Bear Wilderness areas, which are the core of what may be the fourth-largest wild ecosystem in the West (even larger when combined with substantial contiguous wild country in Canada). The next 40 miles flow at the border of Glacier National Park and the Great Bear Wilderness in a thin corridor—shared with Highway 2 and the Great Northern Railroad—that separates the two protected



North Fork Flathead River

zones. The river's final eight miles mark the boundary of the park on one side, with private land and national forest on the other.

The Middle Fork Flathead offers extraordinary wilderness values from highcountry of the Northern Rockies, through rugged canyons, flowered meadows, and dark forests to low-elevation riparian habitat, thick with willows and cottonwoods. The Middle Fork supports grizzly bears, mountain goats, bald eagles, native westslope cutthroat trout, bull trout, and a host of other wildlife. The upper river is among the wildest sizable rivers in the West and is comparable in many ways to the Selway of Idaho, though it does not have the native anadromous salmon and steelhead (and never did owing to waterfalls on the Pend Oreille River, downstream). The Middle Fork Flathead is one of few rivers on the Rockies that flows for more than 100 miles with no dams

The river offers the unusual opportunity for especially remote river trips by packing or flying into Schaefer Meadows and floating for 25 miles to Highway 2, with the option of then going another 40 road-accessible miles to the confluence of the Middle and North Fork and even beyond, to Flathead Lake. A river-front trail also makes the upper Middle Fork a premier route for backpacking.

The entire length is designated in the National Wild and Scenic Rivers system—the fourth-longest river designated from source to mouth. With national park, wilderness, and wild and scenic designations, this river is protected from land development and logging more than almost any other stream in the West, though its lower 40-mile highway and railroad corridor has associated traffic, noise, riprap, and cut-and-fill.

All the Middle Fork tributaries offer excellent wild river qualities, and many support bull trout. A few of the major tributary creeks are Bowl, Clack, Morrison, Nyack, Schafer, and Strawberry.

Flathead River, North Fork and tributaries

Flowing through a semi-wild region at the border of Glacier National Park, the North Fork Flathead has exceptional natural assets, though a paved and then gravel road runs the whole way up

its valley. The river supports cutthroat and bull trout in an excellent riparian corridor with cottonwoods, gravel bars, and largely undeveloped shorelines.

After rising in Canada, the North Fork flows for 58 miles to the South Fork confluence, where the main stem Flathead begins. The east side of the river, in Glacier National Park, is wild, and while a gravel road runs up the west side, it is usually set-back from the river and seldom visible from the water.

The North Fork offers fine habitat for grizzly bears, moose, mountain lions, otters, bald eagles, cutthroat trout, Dolly Varden, and bull trout. It's an excellent canoeing stream, with many Class II and one Class III rapids, and is one of the West's finest streams for semi-wild overnight float trips with easy road access. The water of the North Fork is famously clear and tinted blue-green with its colorful tinge of glacial runoff from the peaks of the Livingston Range in Glacier National Park. This clarity, however, has deteriorated in recent decades owing to road cuts as the highway up the west side of the valley has been upgraded. Coal mining upstream in Canada, along with oil and gas exploration and drilling, pose serious threats with international complications that could potentially involve the International Joint Commission.

Most tributaries are in good condition and remain undeveloped, but west-side streams in Flathead National Forest could be threatened by gas drilling and logging. State-owned lands lie along Cyclone and Coal Creeks, and some private lands can be found along Trail, Moose, and Hay Creeks.

The entire U.S. portion of the river is in the National Wild and Scenic Rivers system. About 90 percent of the frontage is public land, but important private parcels remain in the corridor. Some of these have been built-on in recent years, and some could be further developed.

Flathead River, South Fork and tributaries

Although a 30-mile-long reservoir impounds the South Fork Flathead in its lower reaches, the 60 miles of river upstream include



Flathead River

superb wilderness and the finest remaining habitat for bull trout in Montana, according to the Pacific Rivers Council

The headwaters of the South Fork begin with Danaher and Youngs Creeks—each flows about 25 miles through the Bob Marshall Wilderness before the South Fork begins at the confluence of the two streams. The South Fork then runs for 60 miles to the backwater of the sizeable Hungry Horse Dam. All but the final 10 miles of this are wild, with only trail access, and most of this is in a designated wilderness area.

The unroaded basin is a stronghold of grizzly bears, westslope cutthroat trout, and other wildlife, and is considered the only sizable, secure habitat of bull trout in Montana. The South Fork's entire length offers excellent wilderness backpacking, and 27 miles of the river above the reservoir are sometimes floated by boaters who pack-in their gear for this exceptional wilderness trip.

Magnificent tributaries to the South Fork include the Spotted



Flathead River

Bear River, which flows 32 miles, beginning in the Bob Marshall wilderness and joining seven miles above the reservoir. The 24-mile-long White River flows right through the heart of the wilderness—a stream that’s guarded for miles by high peaks on both sides of a high-elevation valley like no other sizeable waterway in the Rockies. These and other tributaries can be reached by paralleling trails—some of the premier riverfront wilderness backpacking in America.

All of the South Fork above Hungry Horse Reservoir is designated in the National Wild and Scenic Rivers system. The entire upper basin is public land, and most of it is designated as wilderness.

Yellowstone River

The 678-mile-long Yellowstone is often regarded as the longest undammed river in the U.S. outside Alaska. That’s not quite true. Although there are no storage dams on its entire length, six low diversion dams are built across the river—four of them significant barriers to fish migration and canoeists. Nevertheless, the river has many exceptional qualities: pristine headwaters in Yellowstone

National Park, good water quality throughout its length, a largely-intact riparian corridor with cottonwood forests that continue off-and-on for literally hundreds of miles, and an excellent assemblage of native fishes unlike any other in the West. With its qualities, size, and range of habitat—from high elevation to low—the Yellowstone might well be regarded as the premier river of Montana.

The upper 100 miles of the Yellowstone lie in Wyoming, where the wilderness river flows into Yellowstone Lake. Below there it winds through Hayden Valley—one of the most outstanding areas in the country to see large wildlife including bison, moose, grizzly bears, and wolves. The river crashes over the tallest high-volume waterfall in America—308 feet compared to Niagara’s 160—and through the turbulent, impassable wilds of the Grand Canyon of the Yellowstone. All this is in Yellowstone National Park. Below there, the river drops through the rapids of Yankee Jim Canyon to Montana’s Paradise Valley—an idyllic ranching scene with steep slopes of the Absaroka Range rising to the east and the Gallatin Range to the west. Once threatened by the proposed Allenspur Dam and its 31-mile-long reservoir, this section was spared by an outpouring of opposition. Unfortunately it is now undergoing massive vacation-home development and troublesome related effects of extensive riprapping along the river’s banks. Below Paradise Valley and the town of Livingston, the Yellowstone breaks out of the mountains and crosses a foothills transition zone before entering the Great Plains. Below Big Timber, the Yellowstone flows another 500 miles across the Plains before joining the Missouri River, just beyond the Montana state line in North Dakota.

All in all, the Yellowstone spans a substantial geography of both the Rocky Mountains and the Great Plains and is—along with the Salmon River of Idaho—one of the two longest essentially free-flowing and natural rivers in the West. In its epic trek, the river incorporates the exquisite wildness and wildlife habitat of protected headwaters in the national park, excellent trout fishing, stunning scenery, and habitat for charismatic wildlife. Many of these qualities extend downstream to Livingston. Below there, the Yellowstone features the longest nearly free-flowing reach of river in the Great Plains. Long stretches of riparian habitat remain reasonably

intact and support beavers, whistling swans, bald eagles, sandhill cranes, white pelicans, and much waterfowl. For roughly 225 miles, between Billings and Glendive, the north side of the river—with no major paralleling roads (Interstate 94 parallels the south side)—includes extensive mileage of undeveloped shoreline where the river's interface with the Great Plains is relatively uncompromised. However, many miles are also heavily encroached upon, and riparian habitat has been greatly reduced by nearly continuous ranching and hay farming.

The Yellowstone hosts an exceptional assemblage of 45 species of native fishes, including rare and ancient paddlefish, a freshwater cod called burbot, and shovelnose sturgeon—a large fish weighing up to 140 pounds. The imperiled paddlefish migrate in the lower river but are stopped by Glendive Dam. While some tributaries, such as the Powder, retain some of their natural values and native fish, many have been severely degraded by withdrawals, and energy developments to the south, in Wyoming, are now causing pollution of the Powder and Tongue Rivers. This could reach the Yellowstone.

Although many prairie rivers have been severely compromised by withdrawals that have depleted flows for more than a century, the Yellowstone's riparian habitat and native fishery remain in reasonably good condition, in large part owing to a path-breaking river protection policy adopted by the Montana Board of Natural Resources and Conservation in 1978. When threats of large withdrawals and dams appeared to be imminent owing to proposed and on-going coal and energy development in the eastern part of the state, the Board reserved large portions of the natural flows of the Yellowstone for its flora, fauna, and ecological health. Nationwide, this state policy stands as perhaps the most significant for reserving flows in a large river to protect its ecosystem. However, a complimentary program for protecting the riparian habitat through easements, acquisition, or other arrangements along the river has never been launched.

From Paradise Valley down, most of the Yellowstone's frontage is privately owned. Protection of such a large river is a daunting task, but much could be done to safeguard the finest remaining riparian tracts. Especially valuable tracts include the least-developed



Yellowstone River

shorelines where roads and agriculture do not directly encroach, islands covered with cottonwoods and other native plants, the mouths of tributaries, and frontage along reaches of particular importance for endangered fish. With the Flathead River's natural reaches being largely protected (except for parts of the North Fork), the Yellowstone might be regarded as the premier opportunity for land-based river conservation in Montana.

MONTANA'S "B" RIVERS

Blackfoot River, North Fork

The North Fork of the Blackfoot flows south from its headwaters in the Scapegoat Wilderness, which adjoins the Bob Marshall Wilderness, making this the southernmost extent of the greater Glacier National Park/Northern Rockies ecosystem of protected federal land. (This complex encompasses the Flathead basin to the north and includes the upper Sun, Dearborn, and other basins to

the east.)

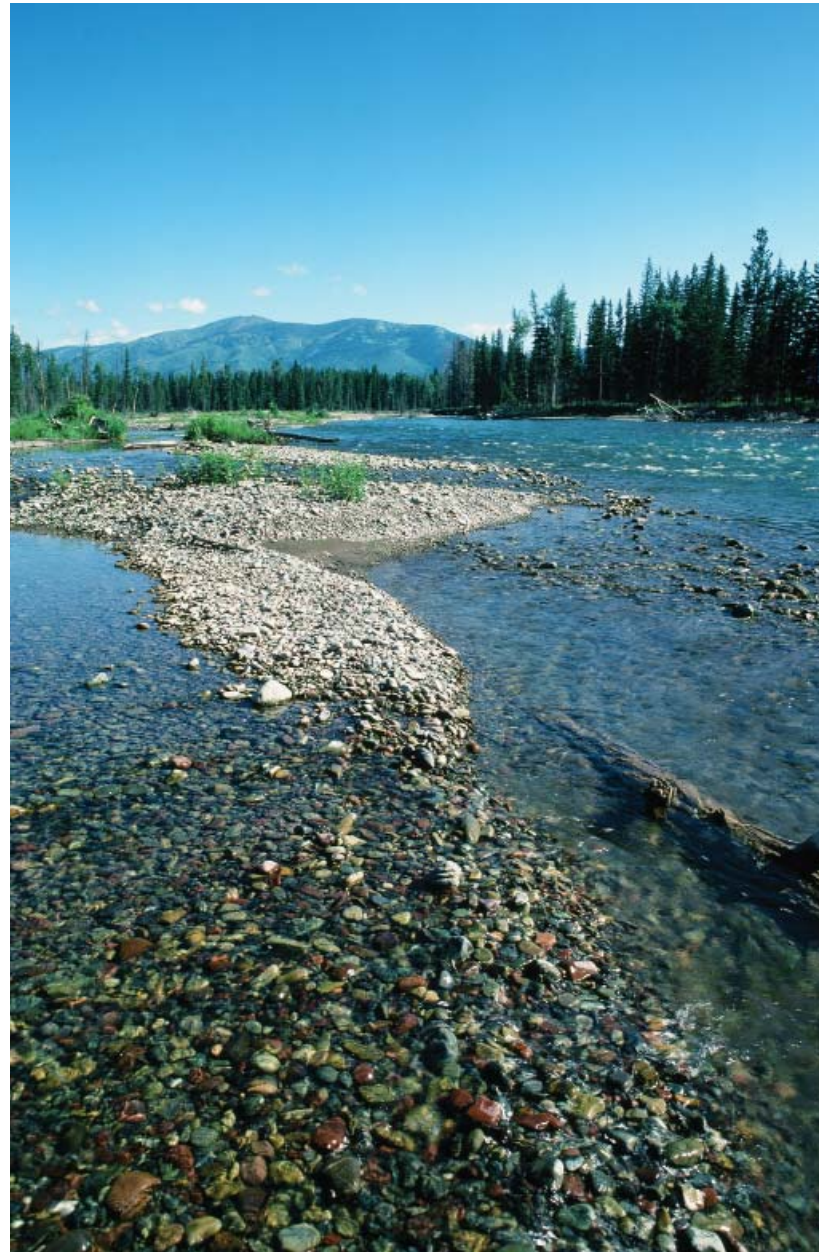
The 35-mile-long North Fork flows south from pristine wilderness headwaters including Cabin Creek, Dry Creek, and Lake Creek. Trails follow along these streams and the North Fork for its upper 19 miles. The lower 16 miles have road access, and much of the river frontage is in private ownership, mostly by the timber industry.

The North Fork joins the main stem Blackfoot 20 miles west of Lincoln, or about halfway through the river's 100-mile course. Popular among anglers and boaters, the main stem has been degraded by past mining, but it has also been the subject of reclamation efforts and a pioneering program of easement acquisition for recreation and riverfront protection begun in the 1960s. The Blackfoot became an early model of easement success for the Nature Conservancy in the 1970s and remains the target of innovative conservation efforts through an organization called Blackfoot Challenge. The river will also benefit by plans to remove Mill Town Dam, which impounds both the Clark Fork and lower Blackfoot, and also Mike Horse Dam on the upper Blackfoot.

With additional protection of the lower North Fork's river corridor, the vast wildlands of the Flathead/upper Sun/upper Dearborn basins would be linked with the improving river corridor of the Blackfoot. Adding to this wildland complex, Monture Creek is another excellent stream, immediately west of the North Fork Blackfoot and flowing south from headwaters bordering the Bob Marshall Wilderness.

Little Missouri River

Though its significance to Montana may seem minor, the Little Missouri passes through the far southeastern corner of the state on its 560-mile, tortuously winding journey to the Missouri River. With no storage dams and only minor diversion structures, this is the eighth-longest essentially undammed river on the Great Plains, and it's longer than any reach of undammed river in the rest of the West. With hundreds of miles of cottonwood and willow-lined shores, including highlights such as a stunning passage through Theodore Roosevelt National Park, the Little Missouri may be the finest river



North Fork Blackfoot River

TINA PALMER

remaining on the entire Great Plains.

The Little Missouri rises in Wyoming, where its intermittent headwaters flow northeast into Montana. For 130 sinuously looping miles the tiny river drifts through rolling dry reaches of Montana's short-grass prairie. From there it flows through the northwest corner of South Dakota and then for hundreds of miles north and east across North Dakota, finally ending at its confluence with the Missouri River in the backwaters of behemoth Garrison Dam. In addition to its short but stunning segments through two divisions of Theodore Roosevelt National Park, the river winds for roughly 200 continuous miles through the Little Missouri National Grassland. This area is almost entirely grazed by cattle, but the land is publicly owned and intended to be a model of good range management.

The nation's second-largest semi-free-ranging buffalo herd lives along the Little Missouri in the national park (the park is fenced), and the abundance of wildlife here, including deer, elk, raptors, beavers, badgers, foxes, and much more, is probably the best approximation of the richness that once existed throughout the Great Plains.

The price of land may be cheaper in this region of the Plains than anywhere else in America, which could present a unusual opportunity for large-scale protection of a riparian corridor. This could possibly be combined with model management by willing private landowners and with improved riparian protection of the river's corridor through the national grassland. The national significance of this best-remaining remnant of the Great Plains, and perhaps its finest river, warrants examination for large-scale, ecosystem protection.

Rock Creek (tributary to lower Clark Fork)

Rock Creek is the only river flowing north from a rugged complex of southern Montana mountain ranges that has no major roads, developments, or diversions. It is one of only three basins identified by the Interior Columbia Basin Ecosystem Management Project as having "high aquatic integrity." (The Middle and South Forks of the Flathead are the other two).

The sizable stream gathers its waters on East Pintlar Peak in the Anaconda-Pintlar Wilderness (due west of Butte) and flows north, paralleled by a trail for 4 miles. From there, for roughly 45 miles to the creek's mouth at the Clark Fork River (20 miles upstream from Missoula), the stream is followed by unimproved or lightly-used roads. (Montana has many "Rock" Creeks, including two smaller ones that enter the Clark Fork farther downstream.)

The stream supports bull trout and a popular sport fishery. It is considered one of the state's top streams for biological integrity by the Department of Environmental Quality, and is one of the larger streams on that premier list of mostly small waterways. Non-native sport fish, unfortunately, have largely taken over the lower river and are likely spreading upstream.

Rock Creek's watershed may be strategically important to three of the finest wild terrestrial ecosystems in the West. It lies directly between the Glacier/Northern Rockies wilderness complex to the north, the Selway/Salmon/central Idaho complex to the southwest, and the Greater Yellowstone ecosystem to the southeast. The undeveloped, semi-wild, and lightly-roaded landscape of the Rock Creek basin appears to be the finest "bridge" between these three areas of extraordinary importance to wildlife and nature in the Rockies.

Most of the Rock Creek basin lies within the Deer Lodge and Lolo National Forests, though many private parcels front the river, and mines have been active in the past. Most of these parcels are limited to thin strips of land along the stream. Some Burlington-Northern, state, and BLM lands are also found near the creek. Unlike many other unprotected rivers where large amounts of private land are found, this small, undeveloped gem of southern Montana may include opportunities for an ambitious program of land conservation to effectively protect a whole river corridor—one whose location may be important to areas of enormous consequence in the ecology of the West.

Yaak River

Draining a mostly forested and undeveloped basin in far



Lower Yaak River

TIM PALMER

northwestern Montana, the Yaak supports bull trout in its lower reaches and native redband cutthroat trout upstream.

With some of its headwater tributaries beginning in Canada, the main stem of the Yaak flows for 45 miles from its East and North Forks confluence southwestward to its mouth on the Kootenai River. Highway 508 follows the river for its entire length, logging roads probe most of the tributaries, and two or three paralleling roads occupy the valley in its upper reaches and along its East Fork. Yet some of the rain-rich basin remains unlogged, and a sense of wildness similar to what is found in northern Idaho and in the rainy Northwest prevails. The native fishery has survived and could possibly recover with restoration of logging and mining sites. A river integrity study sponsored by American Wildlands found this to be one of the better rivers in the state, and the Nationwide Rivers Inventory identified good recreational qualities here.

MONTANA'S "C" RIVERS

Dearborn River

The Dearborn is perhaps the finest river flowing from the spectacular Rocky Mountain Front—the escarpment on the east face of the Rockies that extends from the Canadian border southward for 130 miles. Upper reaches flow from the Scapegoat Wilderness and plunge down to the Plains. The river has no dams as it winds through the rolling hills of the far-western Great Plains to its confluence with the Missouri River.

For most of its uppermost 20 miles the river drops through a wilderness that is secluded behind the first great ridgeline of the Northern Rockies. Downstream from the Lewis and Clark National Forest boundary, the Dearborn runs for 60 miles through private land in the Rocky Mountain foothills and across high, rolling prairie terrain to the Missouri River. Limestone cliffs include the stark 500-foot-rise of cliffs on Scapegoat Mountain. The river has good sport fishing for introduced rainbow trout and some cutthroat, though it is not known for native fish. River otters, which are uncommon in much of Montana, are seen here. The lower 45 miles of the river make a fine



Dearborn River

river trip for intermediate or advanced paddlers, though the season is short and landowners have aggressively discouraged boating in the past.

Other rivers of the Rocky Mountain Front include the Saint Mary in the far north followed by the Milk, Cutbank, Two Medicine, Birch Creek, Teton, and Sun. All these streams have more intrusions in the form of diversions, dams, oil and gas wells, and roads. The Dearborn has escaped some of these problems but does have diversions in its 60-mile foothills/prairie reach. Like the Dearborn, the Sun River, immediately to the north, has exquisite wilderness headwaters that connect with the greater Glacier/Northern Rockies wildlands, but the massive Gibson Dam blocks the Sun River's flow even before it leaves the mountains.

Flathead River, lower

The lower Flathead, below Kerr Dam, is a large river flowing for about 80 miles with clean, clear water and very little development.

All but the lower five miles flow through the Flathead Indian Reservation. The water flowing from Flathead Lake is incredibly clear, and remains clean for its entire route through dry prairie, low mountains, and canyon terrain. Unlike the situation at many other dams, the temperature of the lower river is little affected by Kerr Dam. At its mouth, the Flathead's flow roughly doubles the size of the Clark Fork, making it and ultimately the Pend Oreille (the same river renamed below Pend Oreille Lake) the second-largest river of the Rockies.

For about 30 miles the Flathead has no roads or development along its shores—extremely rare for a river of this size anywhere. Buffalo Rapids—a major, high-volume, Class IV rapid—lies within this remote reach. For the river's remaining mileage, a road and railroad parallel its path, but virtually no development is found. The lower river is not noted for native fish species; 17 non-native fishes throughout the basin have been proliferating and are well-represented in the lower river.

In part because it flows through the Indian Reservation, this significant river is little-known by non-Indian people; it appears on none of the lists that were examined for this survey. However, owing to its size, clarity, and lack of development, there may be tremendous potential to restore the river to excellent conditions.

Gallatin River

Tumbling out of Yellowstone National Park, the Gallatin River offers excellent sport fishing, whitewater boating, and an important wildlife corridor as it flows through scenic valleys and canyons toward the three-forked confluence where it converges with the Madison and Jefferson to form the Missouri.

The main stem—sometimes called the West Gallatin River—rises at Gallatin Lake in Yellowstone National Park. The upper 10 miles flow through meadows and past mountainsides reachable only by trail. Then the river drops into the Gallatin Canyon—a 50-mile-long descent with both riffles and big rapids. Here the river separates the Madison Range, immediately west of the river, and the Gallatin Range, just to the east. Below the mouth of the canyon (about 12

miles southwest of Bozeman), the river winds quickly with a steady gradient through gravel bars, willow thickets, and fine cottonwood stands for another 60 miles to its mouth, which marks the start of the Missouri River.

Though it still has some native westslope cutthroat trout, the Gallatin is prized for its sport fishery and is regarded as a “blue ribbon” trout stream. The Gallatin Canyon is one of Montana’s most popular whitewater rivers for rafting, kayaking, and expert canoeing. The canyon is a crucial wildlife corridor in the Greater Yellowstone Ecosystem, especially for the park’s large elk herds that descend into the valley for shelter in winter. Grizzly bears frequent the canyon and the upper river basin. Owing to its excellent water quality, the Gallatin is currently being considered as Montana’s only candidate for “Outstanding Resource Water” status, a designation that would govern effluent standards from new developments, including those at the Big Sky Resort, just west of the river.

The Gallatin is one of a group of revered rivers that form the Missouri headwaters after flowing across a 100-mile wide expanse of southwestern Montana and drawing from six subranges of the Rockies. The upper Gallatin is highlighted here for its lack of development and ranching, for the importance of its wildlife corridor to Yellowstone, and for its recreational and scenic value. The other rivers, however, also have significant qualities. Immediately to the west, the Madison is legendary among trout anglers for its trophy rainbow and brown trout fishing and it widely considered the most popular sport fishery in the state. It is dammed at its headwaters and then flows through a more open, ranchland valley before being dammed again for hydropower above the rugged whitewater of Bear Trap Canyon. Moving west from there, the Ruby is a small, unsung river with scenic mountain headwaters and a lower reach that is dammed as it flows into ranchland before converging with the Beaverhead. The Beaverhead is a popular trout stream with lower reaches that wind through ranchlands and willow thickets. Interstate 15 and a railroad parallel its middle section and part of its tributary, the Red Rocks River. This little stream notably forms the farthest-reaching source of the Missouri; counting Red Rocks as its upstream extension, the Missouri is the longest river in America,



Gallatin River

flowing for 2,540 miles from its source to its mouth at the Mississippi. Westernmost of this Missouri headwaters group, the circuitous Big Hole flows for 150 miles through arid ranchland and supports the only population of fluvial Arctic grayling in the lower 48 states—these grayling live entirely in rivers and not in lakes. The Big Hole, however, has egregious problems with diversions, which in some years reduce the river to a series of isolated pools. State agencies have been trying to ameliorate the flow problem through voluntary agreements with ranchers. The small but significant North Fork of the Big Hole contributes needed cold water to the main stem. The combined Big Hole and Beaverhead join to form the Jefferson—another good trout-fishing river that winds through ranchland and riparian thickets to its confluence with the Madison and Gallatin.

Kootenai River

The Kootenai is the second-largest river in Montana (exceeded in volume only by the lower Clark Fork after it is joined by the Flathead) and is one of few big-volume, forested rivers in the interior West.

The Kootenai's clear waters still harbor a small, non-reproducing population of the rare white sturgeon—the largest freshwater fish in North America, which once inhabited all the big rivers of the Northwest but now are found in only a very few.

The Kootenai can well be regarded as a branch of the Columbia itself; the river actually begins 90 miles north and 30 miles east of the Columbia's headwaters in Canada and flows south from fabulous glacial valleys while the Columbia, in somewhat of a mirror image, flows north before turning toward Washington state.

With substantial volume where it enters the U.S., the Kootenai is flooded for 90 miles by Libby Dam. But from there downstream, the river runs for about 84 miles across far northern Montana and Idaho before reentering British Columbia, where it is again dammed. The Kootenai's total length in both countries is 480 miles.

The riffing and rapid river flows with clear water through a forested valley with a highway on one side and a railroad on the other, so its route is certainly not natural, yet owing to the river's size and to the screening forest, the big waterway retains a sense of wildness and power through much of its route. Above Troy, it roars over Kootenai Falls, the highest-volume waterfall in the West that's unaffected by dams or major diversions (Lower Yellowstone Falls has less volume; Shoshone and Twin Falls on the Snake are entirely diverted much of the time). Rapids below Kootenai Falls quickly ease into a gentle current that takes the river into Idaho, where the flow slows to a nearly imperceptible drift and meanders toward the backwaters of massive Kootenay Reservoir in Canada.

White sturgeon, which once grew to be sixteen feet long, still live in the Kootenai in Montana. Libby Dam, however, has drastically reduced the fish's habitat and dramatically altered the flows of the river for hydropower, in the process destroying the flow regime that is essential for sturgeon reproduction. Efforts are being made to alter the hydropower release schedule to mimic natural conditions of the river in order to help the sturgeon and other threatened native fish, including whitefish and a freshwater burbot on the verge of extinction owing to temperature alterations caused by Libby Dam. The river also has the only native rainbow trout (redband) in Montana. All the others—extremely popular among anglers—have



Kootenai River

been introduced. These fish have now made the Kootenai a trophy rainbow trout fishery without the high-end recreational profile attached to other “blue ribbon” trout streams such as the Madison and Yellowstone.

Many ospreys nest along the river, and the Kootenai is one of few rivers in Montana where black bears are often seen along the water, especially in spring.

The ownership of the shorelines is a mix of private land, including the towns of Libby and Troy, and national forest. Pressures for land development in this remote area are not as strong as they are along many of Montana's other desirable rivers, so further open space protection may be possible. If the efforts to reinstate semi-natural flows are pursued and timber management is reformed in this logging-industry-driven corner of the state, the Kootenai's unusual and even extraordinary qualities might be protected and partially restored.

Madison River

One of the most famous fly-fishing rivers in America, the Madison

is an extremely productive river for trout.

The Madison begins in Yellowstone National Park in Wyoming and then in Montana immediately runs into the reservoir behind Hebgen Dam. Quake Lake lies just 4 miles below, formed by an earthquake-induced landslide in 1959. After 4 miles of heavy rapids formed by the landslide, the river enters a broad sagebrush valley and runs for 57-miles with swift, riffing current, through braided, willow-lined channels in a reach renowned for trout fishing. This section ends in Ennis Lake, just downstream from the town of Ennis. Madison Dam forms this reservoir, releasing warm water from the shallow, silt-filled reservoir. A deep whitewater canyon called Bear Trap follows for 16 miles. In another 20 miles, the braided, cottonwood-lined river reaches its confluence with the Jefferson, and immediately after that with the Gallatin River at Three Forks, where the Missouri River begins.

The Madison is world-renowned as a fly-fishing river for non-native but wild, reproducing rainbow and brown trout. Tens of thousands of anglers fish here every year; this is among the most popular fishing rivers in the West.

Marias River

Though it is greatly affected by a dam, the lower Marias River has one of the most beautiful river corridors of the Great Plains, and its lower reach supports a host of wildlife along its mostly-wild journey to the Missouri River.

Far upstream from this section, the river actually begins with its tributary, the Two Medicine River, at one of the more spectacular road-accessible locations in the Northern Rockies—Two Medicine Lake in the southern reaches of Glacier National Park. Below the lake, and below Lower Two Medicine Lake, which was raised by a dam, the Two Medicine River descends rapidly to the Great Plains where it winds across undeveloped terrain of the Blackfoot Indian Reservation. North Badger Creek, with fine cutthroat trout habitat at its headwaters, joins from the south, and where Cut Bank Creek joins from a cluttered field of oil wells to the north, the 210-mile-long Marias River begins. Passing through rangeland and diminished by



Lower Madison River

diversions, the muddy river winds across the northern plains to Tiber Dam. Below Tiber lies the excellent lower reach of the river discussed here.

The lower Marias meanders across a wide, sandstone-canyon floor with groves of large plains cottonwoods. A put-and-take trout fishery is stocked below the dam. The river is not known for native fish, though some might survive in lower reaches near the Missouri. Wildlife here, however, is outstanding, with plentiful beavers, coyotes, waterfowl, and eagles. The river runs for about 80 miles, the entire route like a small, intimate version of the famed White Cliffs section of the Missouri itself, and ideal for canoeing. Some of the shorelines are owned by BLM but much of the land is privately owned. A land protection program here along with flow releases from Tiber Dam to encourage regeneration of the cottonwood forest could ensure that the lower Marias would remain and improve as one of the great streams of the Plains.

Missouri River

A list of Montana rivers would hardly be complete without the



Marias River

longest remaining dam-free section of the Missouri, which is free-flowing for about 200 miles east of Great Falls. With its source in Montana, the entire Missouri is America's longest river—counting its headwater reaches in the Jefferson-Beaverhead-Red Rocks River system, it is 2,540 miles long.

Already a mature river where it forms at the convergence of three substantial tributaries in the aptly named town of Three Forks, the Missouri's first 20-mile-reach offers fine trout-fishing. After this brief free-flowing upper section, the river is obstructed by a diversion dam, by Canyon Ferry Dam and its large reservoir, and by two other dams in quick succession. Just downstream from the city of Great Falls, Great Falls of the Missouri—once a hugely spectacular cataract—is now largely obscured by a hydroelectric dam. After four more dams in the 12-mile reach below Great Falls, the Missouri's longest dam-free section begins below Morony Dam and continues for about 200 miles to the backwaters of Fort Peck Dam, east of Highway 191.

This reach hosts 49 species of fish—native and introduced—including one of only six remaining populations of the rare paddlefish.

These fish grow to 140 pounds and survive only in deep, turbid waters of large, undammed lengths of the Missouri, Yellowstone, and Mississippi. Even more rare, about 50 pallid sturgeon still survive in this section of the Missouri. Plains cottonwoods shade in groves along the riverfront, though their health and extent are greatly reduced owing to the effects of heavy cattle grazing and to alterations in flow and diminished floods from the dams upstream. Good riparian habitat remains at the mouths of Arrow Creek, the Judith River, and Cow Creek. The undeveloped corridor offers fine wildlife habitat for pronghorn, beavers, mule deer, elk, golden eagles, white pelicans, and waterfowl. In the "White Cliffs" section, limestone bluffs rise 200 feet above the water.

The 149-mile Class I paddle from Fort Benton to Highway 191 is a classic in the West, in part owing to its history as the route of Lewis and Clark and frontier fur trappers. With gentle current but heavy winds and muddy water, this section is boated by more than 3,000 people per year, typically running trips of three to ten days. This section was the subject of one of the prototype river studies that led to the National Wild and Scenic Rivers system, and the 149-mile reach was later designated by Congress in 1976.

The riverfront is mainly private rangeland for the upper 36 miles to Fort Benton and for the next 60 miles to Kipps Rapids, below Coal Banks Landing. Downstream from there the river frontage is mostly BLM land mixed with many parcels of private and state-owned land.

Another, disjunct, free-flowing section of the Missouri lies downstream, below Fort Peck Dam, and runs for 125 miles across far eastern Montana. This section flows through rough "breaks" in the plains incised by ravines and offers important habitat for waterfowl, raptors, and whooping cranes. While the upstream dam causes massive effects on water temperature, turbidity, and fish habitat, those effects are largely ameliorated after about 60 miles, and native prairie fish return. Though Highway 2 is nearby, this remote and runner-up reach of the Missouri offers the feeling of quiet isolation, sees little recreational use, and is one of the finer rivers on the Plains.

Poplar River, West Fork

This extremely remote, small river is among the most biologically

intact streams remaining in the Great Plains in Montana.

The West Fork begins in Saskatchewan and enters Montana north of the settlement of Opheim. It flows southeast for about 100 tightly meandering miles to the main stem Poplar River, which then flows another 100 miles to its confluence with the Missouri River at Poplar, in the Fort Peck Indian Reservation.

The West Fork is ranked among the top prairie rivers in the state for biological integrity in a comprehensive study by the Montana Department of Environmental Quality. Plains cottonwoods grow along the stream for much of its length. The middle-third of the river includes large amounts of state-owned land, and the bottom-third flows through the Fort Peck Indian Reservation, as does all the remaining 100 miles of the main stem. The West Fork Poplar would rank among the finest streams flowing through Indian lands in Montana and the West.

Powder River

This small river is among the ten longest essentially dam-free streams on the Great Plains (the second-longest in Montana, next to the lower Yellowstone). It has very little development, and still supports 19 species of native fish, including the rare shovelnose sturgeon. This is one of the longer Great Plains rivers that remains relatively intact as an ecosystem.

With its extensive mileage roughly split between the high, dry plains of Wyoming and Montana, the Powder runs for roughly 400 miles with no major dams. Owing to its salinity, the river is not diverted for agriculture. Little-traveled roads parallel both shores for much of the length, however, these are usually set back on bluffs above the river. The flow meanders within a narrow valley constantly alternating with banks and floodplains covered with cottonwoods or pasture. Incredibly remote, the river is seldom even visited by people other than local ranchers. Coal bed methane development in Wyoming poses a serious pollution threat to this stream, as it has to the Tongue River, just to the west.

In spite of the low, warm, turbid, and even saline flows, much

of the native life of this river has survived. To some extent, these demanding conditions have always been present in the river, and the fauna is well adapted, though stresses have greatly increased with diversions, grazing, cutting of cottonwoods, and now energy development upstream.

Still surviving are 25 species of fish including 19 native ones—one of the finest such assemblages on the Plains. The rare and large shovelnose sturgeon still lives in the lower river. Five species of globally rare sand-dwelling mayflies have been found here, as well as the sturgeon chub—a small fish on the state's species of special concern list. The Montana Natural Heritage Program's survey of aquatic biological integrity ranks the Powder and several of its tributaries as the largest concentration of relatively intact watersheds on the Plains.

Threats to the river are considered high because of coal bed methane development in Wyoming—the subject of an ongoing lawsuit between the two states. Much of the sprawling watershed is public land managed by BLM, however, most of this is in a checkerboard pattern, and most is in the rugged “breaks” or ravines incised within the dry terrain. Nearly all the riverfront is private property, making watershed-scale protection more difficult than along the somewhat-similar Little Missouri, which lies to the east and flows through an extensive national grassland in North Dakota. See also the Power River in the Wyoming section of this report.

Smith River

With a geography unlike any other Montana river, the Smith flows through the isolated mountains of the central state, cutting a deep limestone canyon with only minor road access.

Headwaters rise in the Castle Mountains and meander through a wet valley bottom of irrigated ranchland for nearly 50 tightly curving miles to the entrance of a canyon between the Big Belt Mountains to the west and the Little Belt Mountains to the east. With riffles and small rapids, the river winds through the canyon for about 65 miles, and then flows for 20 miles through ranchland to the Missouri River not far upstream from Great Falls.



TIM PALMER

Powder River

Unique in its geology and geography, the small river penetrates isolated, uplifted mountain ranges that are outliers of the main body of the Rockies, all surrounded by high prairie. With clear water cutting into a deep limestone canyon, the stream is popular for fishing and floating through its class I and II rapids. The Smith offers one of few multi-day, semi-wilderness float trips possible in Montana with road access at either end. Deer, elk, and otters live along the river, and anglers flock here for introduced rainbow and brown trout, though the Smith still supports some native cutthroat as well.

The upper and lower portions of the river are entirely privately owned. The middle, canyon section lies within Lewis and Clark National Forest but includes a substantial scattering of private parcels and large tracts, some of which are being developed.

Stillwater River and West Fork Stillwater (Yellowstone tributary)

The pristine upper reach of this river flows for many miles through wilderness and is perhaps the finest stream draining the spectacular Beartooth and Absaroka Ranges to the north of Yellowstone National Park.

The main stem begins just northwest of Cook City and flows for 28 miles through the heart of the Absaroka-Beartooth Wilderness. A trail follows the river the entire way, making this one of the finer river/wilderness/trail routes in the Rockies. Downstream from the wilderness boundary, the Stillwater soon leaves Custer National Forest and then riffles for 50 miles through private ranch land before reaching its mouth at the Yellowstone River. Low diversion dams through this section shunt water out of the river for irrigation.

Beginning in the river's uppermost miles--just north of the Fisher mine complex--the river passes through spectacular mountain terrain of metamorphic and granitic bedrock. This wilderness area offers some of the finest grizzly bear habitat in the lower 48 states. A long trail along the Stillwater offers excellent riverfront backpacking through a large wilderness, and the river's sport fishery for trout is

well known. From the end of the road to the mouth of the river, the Stillwater's nearly continuous gradient and lively rapids also offer a demanding whitewater run for kayakers.

The West Fork of the Stillwater follows a similar route, though there are no mines near its headwaters and it flows for only 17 miles through the wilderness area before leaving the national forest and entering ranchland. Then it flows for another 12 miles with roads and diversions to its confluence with the main fork Stillwater.

While the upper ends of these streams are entirely in wilderness, the lower portions, with significant mileage to the Yellowstone River, flow entirely through ranchland. Though private, this is only lightly developed. The rivers are known for sport fishing but not for native fish.

Several other rivers drain this spectacular region of Montana and are quite similar to the Stillwater, with comparable values. The Boulder River lies west of the Stillwater, and is an excellent stream but has less mileage in the wilderness area and more that is affected by roads, and diversions. The 30-mile-long West Boulder has 12 miles that are reached only by trail, and sustains some cutthroat trout. Rosebud Creek and its forks lie to the east of the Stillwater. Here, West Rosebud Creek is dammed for hydropower six miles upstream from the national forest boundary. East Rosebud Creek flows for 14 utterly spectacular miles from a chain of wilderness lakes to the national forest boundary. Finally, West Rock Creek and Lake Fork Rock Creek flow from even higher glacial country of the incomparable granite Beartooth Plateau, but they have far less wild mileage before encountering roads, private land, and development in the Red Lodge area. All of these streams have stunning headwater scenery and wildness, with habitat for grizzly bears and other wildlife, and with sport fishing for introduced trout. All, however, lack complete biological or hydrologic continuity downstream, where they encounter diversions and encroachments on their floodplains. ■

Conclusion

Using sixteen lists of rivers compiled by other organizations or by agencies, plus several interviews with experts familiar with the biology of Montana’s rivers, we have listed 133 rivers with notable natural qualities and then selected 17 of these as exceptional. We sorted these into an “A” category of five rivers plus 19 Flathead River tributaries, a “B” list of four rivers, and a “C” list of 12.

The natural qualities of the Flathead and the Yellowstone overshadow the rest of Montana’s rivers estate. In both large river systems, scale alone means that each stream and its tributaries can be regarded as a cluster in its own right. Moreover, in both cases, the opportunity for restoration to a level of unmatched quality is extraordinary among all the rivers of the West. Beyond these two stellar rivers, a number of other distinctive sets of streams might be considered for their cumulative regional value. In this survey, we have highlighted only the best river in each of these areas, but other streams, appearing on our master table and sometimes mentioned in the text, are nearly comparable in value, and together create sets of streams whose combined ecosystem values are notable.

Flathead River System

The Flathead River system is outstanding nationwide in its degree of wildness and presence of species that indicate ecological health, including bull trout and grizzly bears. The Flathead’s three forks, plus virtually all their dozens of tributaries, constitute one of the most distinct groups of contiguous top-quality streams in the country. With the exception of the North Fork Flathead and the dammed portion of the South Fork, these basins are almost entirely protected.



Madison River

Yellowstone River System

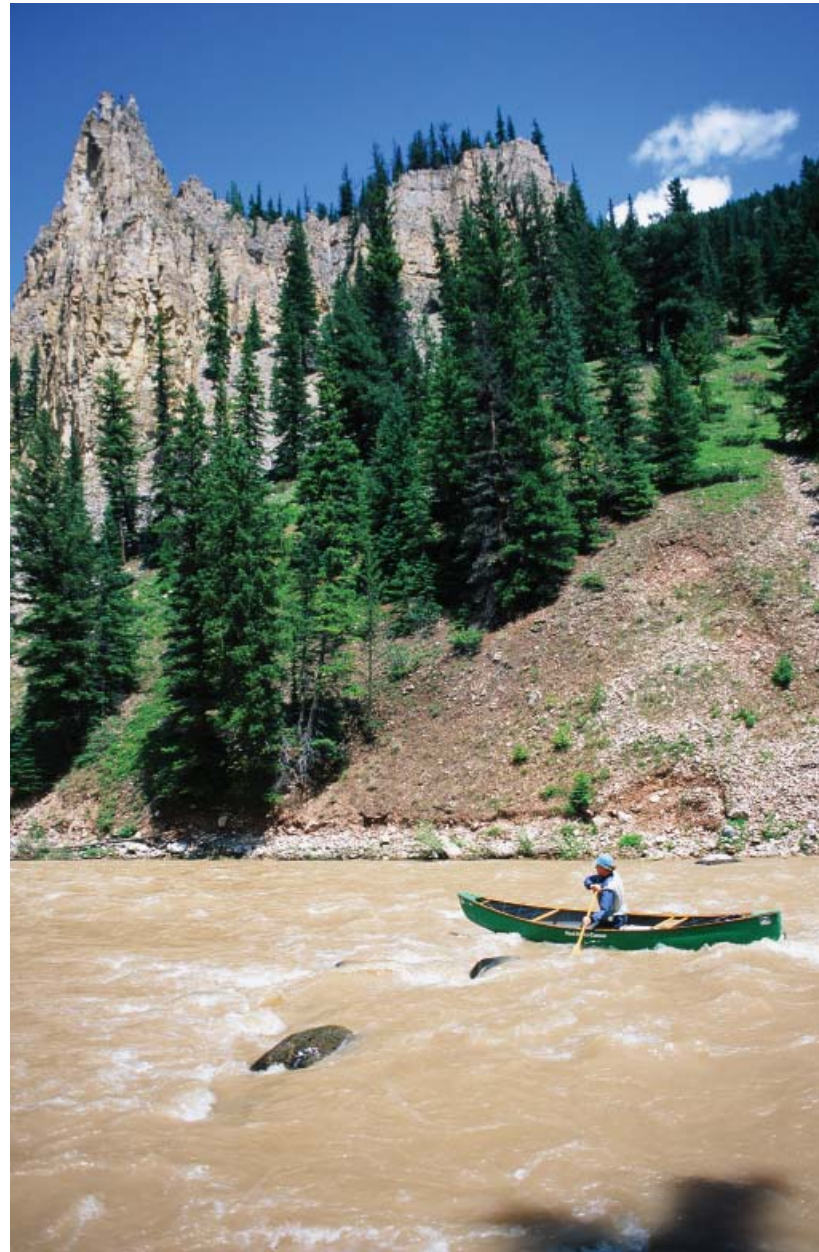
The 678-mile length of the Yellowstone might—all by itself—be regarded as the state’s second great river region. Without even thinking about its tributaries, the sheer length of this waterway makes it significant when considering protection and restoration opportunities of an enormous landscape. Though it lacks wildness except in its stunning Wyoming headwaters, the Yellowstone is truly remarkable in its length of essentially free-flowing mileage, its assemblage of native fishes including rare species such as the paddlefish, its nearly continuous riparian corridor, its protected large volume of flow, and its range of habitat from high to low elevation.

Rocky Mountain Front rivers

Streams of the Rocky Mountain Front form a third river cluster. While only the Dearborn is highlighted in this report as the best of the suite, other rivers of the Front include the Two Medicine, which rises in the spectacular wilds of Glacier National Park and flows dam-free across the Blackfoot Indian Reservation and then picks up Badger Creek, which has likewise flowed from pristine high country. South of those basins, the Teton River similarly comes from high mountains and flows across the western plains for many miles without major dams, though it is seriously depleted by diversions. The Sun River is the next stream to the south, and has exquisite, wild, high-country mileage but unfortunately encounters Gibson Dam before the waterway even leaves the mountains. The Dearborn is the southernmost of this group. The upper reaches of all these streams are part of the wild Glacier/Northern Rockies ecosystem. All could be protected for additional mileage as they start across the plains, and all could conceivably be part of a larger strategy to reconnect the wildness of the Northern Rockies with the once-abundant nature of the Great Plains—especially in the Plains' westernmost, highest-elevation, fifty-mile-wide swath from the base of the mountains to the north-south corridor of Interstate 15.

Missouri Headwaters rivers

The fourth river cluster is the Missouri headwaters, led by the Gallatin, which is highlighted in this survey, and includes the Madison, Ruby, Beaverhead, Wise, Big Hole, and Jefferson. These begin in the ranges of southwestern Montana and then flow for many sinuous, riffling miles through ranchland with riverfront willows and cottonwoods. The Jefferson has a particularly fine corridor of cottonwoods. Several of these streams are popular trout-fishing rivers. Their lower reaches—particularly those located to the east—tend to face heavy land-development pressures in the greater Bozeman area. Some, such as the Big Hole and Jefferson, have inherited difficult problems resulting from diversions.



Gallatin River

Absaroka-Beartooth rivers

The fifth group of high-quality rivers includes the Yellowstone River tributaries that flow northward from the rugged bulwark of the wild Absaroka and Beartooth Mountains. Headwaters of the adjacent Boulder River, Stillwater River, Rosebud Creek (not to be confused with Rosebud Creek on the Plains), and Ruby Creek all flow from high wilderness mountains that stand just north of Yellowstone National Park—forming a virtual northern extension of wildlands that totals half the size of the park itself. While this survey focuses on the Stillwater, the other three rivers are quite similar in many respects. The integrity of all streams are important to the Yellowstone Ecosystem, and all could be better connected biologically through their free-flowing but diverted mileage and their riparian corridors, which extend the whole way to the Yellowstone River and its remarkable aquatic ecosystem.

Great Plains rivers

Finally, though not contiguous, a number of streams constitute a group of the best remaining examples of rivers flowing through the Great Plains. This survey has selected the Yellowstone, Little Missouri, Missouri, Marias, Powder, and West Fork Poplar Rivers as the best from this expansive, 370- by 260-mile semi-arid region. These streams are widely scattered across the state. Other Great Plains streams appearing on our listing of valuable waterways include the Missouri below Fort Peck Dam with its substantial 125-mile length of free-flowing current—the second-longest undammed reach on the entire Missouri. Smaller streams with relatively intact habitat include the small Black Canyon Creek in the Bighorn National Recreation Area, the likewise diminutive Beauvais Creek, flowing through the Crow Indian Reservation, the dam-controlled tail-race fishery of the lower Bighorn River, and portions of the Judith River, which still have some fine cottonwood floodplains in central Montana. ■

Sources for the Montana Survey

Montana Rivers were evaluated using the following sources. Please see Appendix 1 for criteria.

1. Existing Inventories Of High-Quality Rivers

- National Wild and Scenic Rivers
- National Wild and Scenic Study Rivers
- National Wild and Scenic Study Rivers
- State-designated wild and scenic rivers
- Nationwide Rivers Inventory (National Wild and Scenic Rivers Act)
- U.S. Forest Service rivers recommended for protection
- Bureau of Land Management rivers recommended for protection
- Bureau of Outdoor Recreation, Western U.S. Water Plan
- Columbia Interior Basin Ecosystem Management Plan

2. Interviews with biologists and local experts

- David Feldman, Montana Department of Environmental Quality, biological integrity analyst
- Don Skaar, Montana Fish, Wildlife, and Parks Commission, chief of the state fisheries management bureau
- Dave Stagliano, Montana Natural Heritage Program and the University of Montana, formerly with The Nature Conservancy, aquatic ecologist
- Scott Bosse, Greater Yellowstone Coalition, fisheries biologist

3. American Wildlands. This list includes the highest-ranking rivers in A River Integrity Assessment for Western Montana. The study, conducted by biologists at the University of Montana, considered connectivity of natural river features, native/exotic fish assemblages, floodplain conditions, and headwaters conditions.

4. Montana Department of Environmental Quality. From this agency's Reference Stream list (2005), which considered only the state's smaller streams, we included waterways identified as "pristine" as well as some of the relatively larger streams that had high quality rankings based on biological criteria.

5. Montana Fish, Wildlife, and Parks Commission, outstanding trout waters. This 1988 list of top fishing rivers includes streams with introduced fish, such as rainbow and brown trout, and incorporates the well-known "blue ribbon" trout waters that the state first designated in the 1970s.

6. Montana Fish, Wildlife, and Parks Commission, outstanding recreation rivers. Though recreation is not the most important criterion for the Western Rivers Survey, we include this 1988 list because recreation is usually dependent on high quality waters.

7. The Montana Nature Conservancy, informal list. This list of top rivers was taken from an interview with Jamie Williams (2007), Montana state director of TNC and an avid rivers enthusiast.

8. Natural Heritage Program, high biodiversity streams. The Montana Natural Heritage Program

is based at MT State University (previously with the Nature Conservancy). This list of streams with high biodiversity is taken from the report, Freshwater Measures for the Northern Great Plains Steppe Ecoregion of Montana. By David M. Stagliano, Dec. 2006.

Appendix 1: Assessing the Quality of Rivers

To assess the qualities of rivers, the WRC survey used two sets of criteria. The first set were minimum requirements to be considered for a base-list of the best natural rivers. The second set addressed quality indicators—the specific values that indicated which rivers were the very best.

MINIMUM CRITERIA

Five minimum criteria were considered:

1. Free-flowing current. Free-flowing reaches of rivers are those that remain with their currents, riverbeds, shorelines, valleys, and canyons unblocked by dams. These reaches continue to benefit from floods' scouring and replenishment, they lack dams as barriers to fish migration, and they are more likely to retain ecological functions. Dams are so ubiquitous throughout the West that in many states only limited free-flowing reaches of rivers remain.

2. Reasonably natural flow regime. Natural flow regimes permit the full complement of native flora and fauna to thrive. Reaches that are de-watered or heavily diverted usually lack much of their native fish and wildlife and were not included in this survey, though rivers with minor diversions were considered. The more-natural the flow regime, the better.

3. Good water quality. High water quality is a foundation for much of the life in rivers. Heavily polluted reaches were not considered.

4. Non-urbanized shorelines. Most urban riverfronts no longer have intact corridors of riparian plant life; rather they are encased by impervious surfaces that contribute to extreme flow fluctuations and tend to aggravate problems of sedimentation and pollution. Conversely, undeveloped and undisturbed shorelines with their green band of riparian vegetation provide shade, temper flow and temperature, filter sediments, and offer habitat for wildlife. For this reason, urban rivers—though extremely important to society—were not included in this survey of the best natural streams. But occasional small towns and rural development did not bar a river from inclusion.

5. Outstanding natural features. One or more of these should be present. These include superlative scenic, geologic, hydrologic, fish, and wildlife qualities. (Historic and cultural values were excluded because they are an indicator of human activity and do not necessarily represent natural values.)

QUALITY CRITERIA

Beyond the minimum requirements (which yielded a very long list of rivers), the following four quality criteria were used to determine which rivers best retain their natural values:

1. Biological health. In keeping with the strategic plan of the WRC, this was the most important criterion. The best rivers should have intact and functioning ecosystems, with most of the native fish and wildlife species present. This survey identified rivers with exceptional biological diversity, healthy fisheries, and natural riparian corridors.

To date, no uniform or comprehensive evaluation of the biologically healthiest rivers has ever been compiled for the West, though the Environmental Protection Agency is currently working on this goal, and some states have inventoried at least small (wadeable) streams for biological integrity. Even at state or regional levels, there is little information that indicates cumulative biological values of all rivers. To make determinations in this regard, the survey consulted with biologists working for state fish and wildlife departments, state natural heritage programs, and federal agencies including the U.S. Geological Survey, Fish and Wildlife Service, and Forest Service. We also consulted some of the Nature Conservancy's ongoing ecoregion planning programs. These local experts often provided the best judgments available regarding biological values.

In evaluating rivers' biological health, the survey considered high value fisheries as ranked by state agencies and the American Fisheries Society, valuable fisheries listed by the organization Trout Unlimited, inventories of riparian conditions, and other biological data. Rivers with intact native assemblages of fish were favored over rivers where introduced species, such as pike, brown trout, and rainbow trout have become dominant (even though these fish may be popular with many anglers).

Wildlife and plantlife are also important indicators for biological health. The survey considered keystone species such as cottonwoods, healthy populations of rare species otherwise in danger throughout much of their ranges, and other fauna and flora of special interest. Federal and state endangered and threatened species and species of special concern were also considered.

2. Wilderness and roadless areas. Rivers with the least development generally rank highest in natural quality. For this reason, the survey noted rivers flowing through designated wilderness, through roadless areas, and through publicly owned land. For some states, the survey consulted comprehensive proposals for wildland protection that identified large blocks of undeveloped and roadless terrain. For some states (generally those lacking other lists indicative of wilderness), we conducted our own survey of roadless conditions by consulting with DeLorme atlases.

3. Recreation suitability. Though not necessarily an indicator of natural quality, river-based recreation often depends on high natural values. Thus the survey includes recreation as an additional and related category of interest and consideration. Three river-based recreation activities that depend on natural qualities were noted: fishing, river running, and backpacking.

4. Length. Though short rivers or river segments may have great natural values, rivers and tributaries with long free-flowing reaches provide the greatest range of interconnected aquatic habitat. Connectivity is especially important for migratory fishes that depend on a range of habitat conditions for different phases of their life history. In some cases, connectivity is also important for the transfer of nutrients within river systems and from oceans to rivers. For these reasons, the survey considered longer free-flowing reaches better and focused on rivers 25-miles or more in length but did not necessarily exclude short streams.

Threats to the qualities of a river were not considered criteria for selection. This is not a list of the "most endangered" rivers. The survey, however, does note some threats to specific rivers. Consideration of these problems may be important in conservation strategies that will follow.

In addition to these specific criteria, the survey set out to include rivers that represented the full diversity of the West's biology and terrain. Recognizing the importance of biological and natural diversity, we included at least one river from each ecoregion, based on vegetation and shown on the U.S. Forest Service's map, Ecoregions of North America.

RATING THE RIVERS

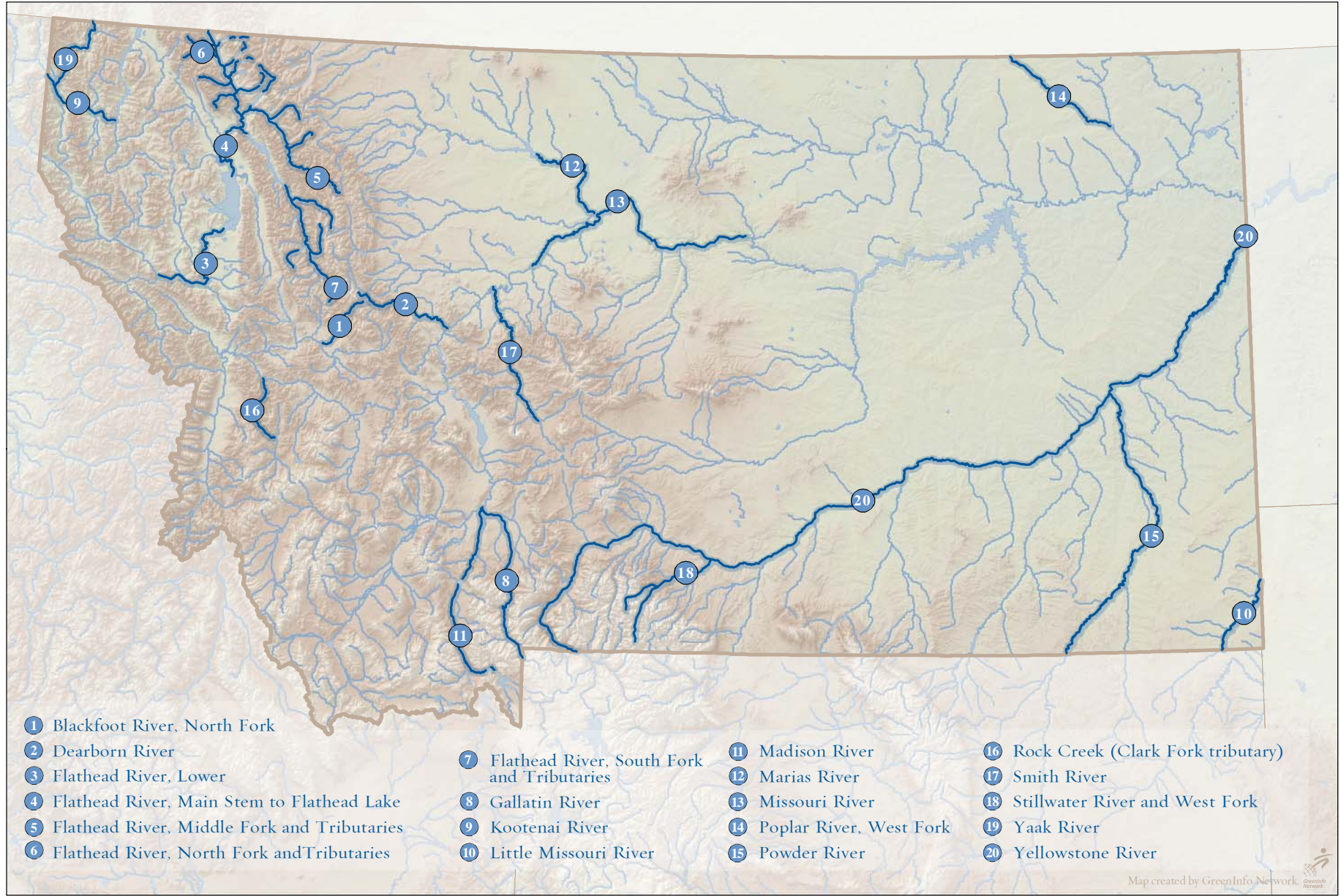
To analyze these criteria for rivers West-wide, data were obtained and tabulated for hundreds of rivers on a state-by-state basis. The resulting state-by-state tables became the integral foundation for evaluating and ranking waterways for the WRC survey. Each table lists a large number of high-quality rivers considered for the survey (100-300 for each state), the sources that have identified the river for its exemplary natural qualities, the types of qualities that are recognized, and the ecoregion that the river flows through.

Sources consulted include the National Wild and Scenic Rivers system, National Wild and Scenic study rivers, state-designated wild and scenic rivers, the Nationwide Rivers Inventory conducted by the National Park Service, rivers recommended for protection by the U.S. Forest Service and Bureau of Land Management, and streams identified in other regional planning efforts, such as the Columbia Interior Basin Ecosystem Management Plan. Additional sources were used for specific states, ranging from articles in the American Fisheries Society journal to state lists of the best water quality, top fisheries, and other natural features. Of comparable importance, the survey consulted on-the-ground experts from natural resource agencies and western universities to supplement and corroborate information about the biological values of the rivers.

The tables also list the final rankings given to streams on the basis of comparative analysis. In these rankings, A represents the most valuable natural rivers. B applies to rivers of very high value but that might occur in the same region as an A river and that have somewhat less quality or significance. C rivers lack the superlative qualities of A and B rivers or represent the second- or third-highest ranking stream in their particular region, or they have valuable qualities but also one or more significant problems.

In the main body of this report, state-by-state chapters include narrative sections that begin with an overview of the state's river system, one-page profiles of each A-, B, and C-listed river, and a description of notable river "regions" where clusters of high-quality streams are found. In this regard, advantages can be gained by protecting identifiable clusters of streams in order to safeguard continuous aquatic habitat, to conserve landscape-scale wildlife habitat in adjoining basins, and to minimize "edge" effects that can damage rivers even when the source of degradation might be distant.

Montana's Great Rivers: List



 Great Rivers of Montana

 Other Rivers and Streams