



Photo by Greg Kudray, MtNHP

## The Powder River Montana's Last Best?

**O**riginating in the high country of central and northeastern Wyoming, meandering through otherwise dry, inhospitable tracts of southeastern Montana to its confluence with the Yellowstone River near Terry, the Powder River in Montana is one of the last undammed large prairie river systems left in the United States.

In Montana, the landscape through which it flows is nearly the same as when giant herds of buffalo roamed the plains centuries ago. According to a recent report by ecologists with the Montana Natural Heritage Program, no other large river in the eco-region contains the quality and integrity of biological communities and habitats as the Powder River. Its sweeping meanders across the valley bottom, side channels, oxbows, shifting gravel islands and broad connected floodplain provide key habitat for diverse fish and aquatic invertebrate populations, as well as much wildlife outside the scope of the study.

“In spite of their ecological importance, prairie rivers have received relatively little attention compared to cold-water streams in the western part of the state, which support the more popular sport fisheries,” says Dave Stagliano, lead researcher on the MtNHP study. A comprehensive biological survey and quality assessment of the Powder River is critical at this juncture, however, because the river basin in Wyoming and Montana is the target of one of the largest coal bed natural gas developments in the world, with about 12,000 wells in place in 2003, 14,200 in 2005 and as many as 70,000 projected over the next 30 years. Such mining has the potential to severely damage the ecosystem both in the riparian zone and the river itself.

With funding from the federal Bureau of Land Management, Stagliano and biologist Coburn Currier last summer surveyed the middle portion of the Powder River at five sites from

By Caroline Kurtz



Scan courtesy www.southwestdragonflies.net

**(Top) Currier and Stagliano use a fine mesh net to sample aquatic invertebrates in the Powder River, while dog Moe supervises. The brimstone clubtail dragonfly (above) is common in central and western North America but had not been documented in Montana.**

the Wyoming border to Rough Creek, near Broadus. Although by no means comprehensive, the study was very productive, Stagliano says, and some of the biggest discoveries had to do with the smallest and least studied creatures – aquatic insects.

### Intact communities

The researchers turned up three mayfly species of very limited distribution in Montana, as well as a dragonfly new to the state. The brimstone clubtail (*Stylurus intricatus*), a bright yellow-green dragonfly with black stripes, was found at four sampling sites upstream of Broadus in sandy gravel habitat. Although fairly widespread in central and western North America, this species had never before been documented in Montana.

“We’re not sure if there is something special about Montana, or if these clubtails used to occur in Wyoming as well,” Stagliano says. “The upper portion of the Powder has been harder hit by development and dewatering than the Montana portion. Maybe it’s now restricted to Montana, we just don’t know.”

One of the mayflies, *Anepeorus rusticus*, a sand-dwelling species that is ranked G1, meaning it is globally rare due to limited habitat and declining populations, is known only from Montana, Utah and Saskatchewan.



Photo by Dave Stagliano, MHNHP

Two other state-rare mayflies turned up as well: *Homoeoneuria alleni*, a sand-dwelling species, and *Raptoheptagenia cruentata*, a riffle-dweller. (“Since mayflies haven’t achieved the notoriety of dragonflies, they don’t yet have common names,” explains Stagliano.)

Two other rare sand-dwelling mayflies – *Analetris eximia* and *Lachlania saskatchewanensis* – had been found on the Powder River a few years ago by Montana State University researcher Dan Gustafson, but they had not been officially reported.

The discoveries are significant, Stagliano says, because they indicate an intact ecological community. “An intact ecosystem is a fully functioning ecosystem,” he says, “one that has all its components. These insects are components that have been lost in other systems.”

The lower Missouri River, the Big Horn River and the Tongue River all likely supported these mayfly species at one time, Stagliano adds, but lost them as a result of water control.

Dams and irrigation diversions change the normal flow of a river and prevent flooding. Without periodic flooding, a river loses its ability to make the shifting sand/gravel bars that the mayfly larvae rely on. While creatures that can only survive in a specific type of habitat naturally will be less abundant than creatures that can live in a variety of places, it’s almost certain that these sandbar specialists were much more abundant 100 years ago than now. Most likely, the Powder River in Montana has escaped the fate of other prairie rivers thanks to its location – not enough people live near it to require flood control or irrigation.

Overall, Stagliano and Currier found the reach upstream of Rough Creek to be most biologically intact (meaning it supported the largest number of species expected for that type of habitat), with the sites at the Wyoming border and the Dry Creek drainage also ranking high.

Although Montana is proceeding cautiously with coal bed natural gas development in the Powder River watershed, such mining probably is inevitable.

Says Stagliano, “Without careful consideration of consequences, we could jeopardize these specialized species and this ecosystem that we have just realized is the last best prairie river in Montana.”



(Left) A typical sampling site along the middle Powder River.

(Top) The sand-dwelling mayfly *Lachlania saskatchewanensis*, previously only known from the Canadian province, is a component of the Powder River’s intact ecosystem.