

June 2008

# Trout in Trouble

## The Impacts of Global Warming on Trout in the Interior West

To read the full issue paper on the impacts of global warming on trout in the West, visit [www.nrdc.org/policy](http://www.nrdc.org/policy).

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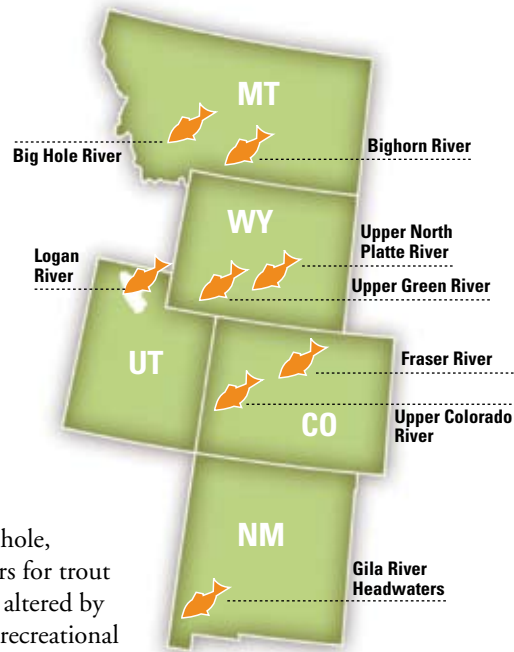
Fly fishing on the Arkansas River in Colorado.

**G**lobal warming is the single greatest threat to the survival of trout in America's interior West. If nothing is done to reduce human-produced greenhouse gas emissions—the primary culprit behind global warming—trout habitat throughout the Rocky Mountain region could be reduced by 50 percent or more by the end of the century.<sup>1</sup> The loss of habitat would bring fewer opportunities for anglers to enjoy sportfishing, resulting in serious economic consequences for those who depend on the fishing, recreation, and tourism industry for their livelihoods. Although we are already seeing declines in trout populations and habitat throughout the West, it is not too late to avoid the most serious impacts of global warming on this important species.



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### Trout and the Impacts of Global Warming in the Interior West



#### Rivers in Focus

These eight treasured rivers are among the many trout fisheries in the West that face serious threats from global warming. For more in-depth stories of these rivers, read the full issue paper at [www.nrdc.org/policy](http://www.nrdc.org/policy).

#### Montana's Big Blackfoot River: A Model for Conservation

With headwaters on the Continental Divide, the Big Blackfoot River in western Montana has long been a vital trout fishery. By the 1980s, however, the Blackfoot was typical of many struggling Western rivers: mining, agricultural, and logging practices had degraded water quality and habitat, reducing the river's ability to sustain healthy trout populations. The result was a decline in the quality of the fishery, and with it a downturn in the angling opportunities the river could provide. In the late 1980s and early 1990s, many who cared about the Blackfoot and its watershed came together and eventually formed an organization called Blackfoot Challenge. Enlisting private citizens, old and new ranchers, federal and state agencies, and conservation groups like the local Trout Unlimited chapter, this partnership has successfully balanced the many interests in the region, and through collaboration and cooperation, brought this great river back from the brink.

The unimpeded impacts of global warming on trout in the interior West will be so sweeping that few populations will go untouched. Rivers like the Upper North Platte, the Green, the upper Colorado, the Fraser, the Provo, the Firehole, and the Gila—hallowed waters for trout anglers—will be dramatically altered by global warming. The famous recreational trout fishery on the Bighorn River in Montana, for example, has struggled in recent years due to drought, declining reservoir levels, record setting high temperatures, and reduced snowpack—all common impacts of global warming. Even tailwater fisheries once thought immune to warming because of their location below immense dams that discharge cold water from far below the surface will be affected.

And the impacts of global warming will reach far beyond the magnificent trout, profoundly affecting economies throughout the region. Trout fishing has become integral to local and state economies in the interior West. In Colorado alone, sport fishing in 2002 had a total economic impact of more than \$800 million and supported nearly 11,000 jobs.<sup>2</sup> In Montana, with its relatively small population of 950,000 people, angling generates nearly \$300 million per year.<sup>3</sup> With each percentage decline in trout populations and stream miles occupied by trout—or reduction in the opportunity to fish due to fishing closures or fire—there could be a corresponding loss in jobs and income for the region.

#### Global Warming Will Cause Serious Damage to Trout Habitat

Native trout have existed in much of the interior West since the Pleistocene Era—the time of the great ice ages. The loss of these trout because of human-caused global warming would be a tremendous loss to the region and a harbinger of future trouble. Trout are viewed by many as an indicator of healthy river ecosystems. Their inability to survive due to environmental conditions could be a glimpse of the challenges that lay ahead for humans in places like the West.

Global warming is already changing the climate and affecting trout populations throughout the West. Through a combination of **diminished snowpacks** feeding cool water to rivers and streams, **higher temperatures** of the air and water, **more frequent and larger wildfires**, and the **proliferation of disease** that can accompany these changes, global warming will transform trout habitat. In some locations where the trout populations are particularly vulnerable, suitable habitat for trout could decline by 70 percent or more over the next 50 to 100 years.<sup>4</sup>



Big Horn River, Montana



Blackfoot River, Montana



Big Hole River, Montana

## More Rapid Warming in the West

2003 to 2007 5-Year Average Temperatures  
Compared to 20<sup>th</sup> Century Averages

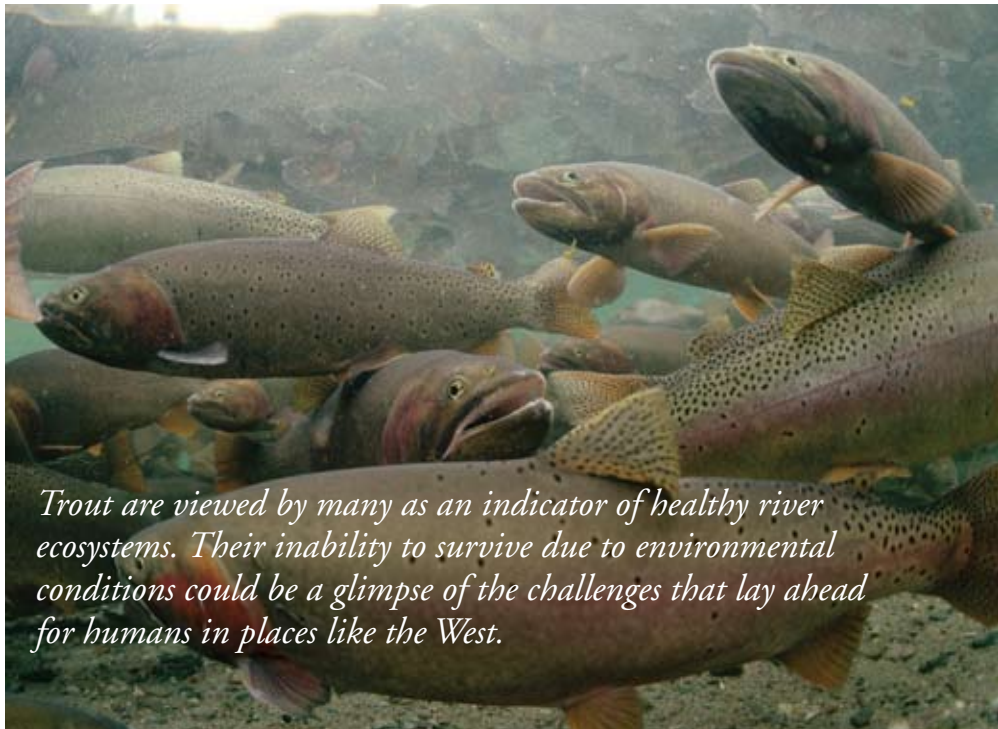
Planet	+1.0°F
Western United States	+1.7°F
Colorado River Basin	+2.2°F
Arizona	+2.2°F
California	+1.1°F
Colorado	+1.9°F
Idaho	+1.8°F
Montana	+2.1°F
Nevada	+1.7°F
New Mexico	+1.3°F
Oregon	+1.4°F
Utah	+2.1°F
Washington	+1.4°F
Wyoming	+2.0°F

## We Can Act Now to Save Trout

It is not too late to avoid the most severe projected impacts of global warming on trout and their habitat. We must act now to reduce our emissions of global warming pollution and adopt other policies that appropriately value healthy rivers, lakes, and streams. For trout to endure in the interior American West, anglers must consider the impacts of global warming, and help lead the effort to save this treasured resource. It is possible to avoid the worst impacts of global warming, but we must act soon.

On the national level, strong federal action to reduce emissions of global warming pollutants at least 80 percent below current levels by the year 2050 is a necessary step to limit warming below dangerous levels, and to give businesses the certainty they need to plan large capital and investment projects. A growing chorus of leaders across the spectrum are calling for immediate action to reduce the lasting and potentially irreversible effects of global warming. In June 2008, a majority of Senators supported moving forward with “America’s Climate Security Act” (S. 3036), also referred to as the Lieberman-Warner bill. In 2009, Congress will consider a variety of new global warming bills. We urge senators from Western states to support a bill that is at least as strong as the bipartisan Lieberman-Warner bill.

In the West, states should adopt their own binding policies to reduce emissions in a similar fashion. This challenge can be met through improvements in building, vehicle, and industrial efficiency; increased investment in renewable energy and low carbon fuel; and deployment of technologies to capture and store carbon emissions.



*Trout are viewed by many as an indicator of healthy river ecosystems. Their inability to survive due to environmental conditions could be a glimpse of the challenges that lay ahead for humans in places like the West.*



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Solving global warming can be done, and it can be done with little or no harm to our economy. A recent study by the respected consulting firm McKinsey & Company made this point, as did a more recent study by the International Monetary Fund. With its abundance of solar, wind, and geothermal

energy potential, the Western United States is uniquely suited to be a major player in a clean energy economy, bringing tremendous economic development to the region, helping to avoid the most dangerous effects of human-caused global warming, and preserving the West we know and love.

## What You Can Do To Combat Global Warming

The choices you make everyday can either contribute to the problem of global warming—or be part of its solution. Planting a tree, buying a fuel-efficient car or truck, driving less, getting an energy audit for your home, and buying efficient appliances and lighting can all save energy and reduce global warming pollution. It is estimated that if every household in the United States replaced one regular light bulb with an energy-saving model, the result would be the same as taking 6.3 million cars off the road. Your choices can also boost demand for more efficient products and send a signal to manufacturers that efficiency matters. Go to [www.nrdc.org/globalwarming/gsteps.asp](http://www.nrdc.org/globalwarming/gsteps.asp) to learn what else you can do to make your own contribution toward reducing global warming.

### To Reduce Demand for Water

You can do your part to conserve water by installing water-saving devices throughout your home. Also consider encouraging the installation of similar devices at your office, school, and house of worship where the water and cost savings could be even greater.

### To Reduce Your Impact on Trout While Fishing

First, and most important, respect fishing closures. Closures are put into place to help trout survive high stream temperatures caused by drought, water use, and high air temperature. Even when stream closures are not in place, there are a few things you should do if fishing when streamflows are low and temperatures warm: fish in the morning hours when temperatures are cooler, limit the length of time you play a fish, use barbless hooks, minimize the fish's exposure to the air, and release the fish as quickly as possible. Alternatively, you can fish high elevation streams and lakes that remain cool in summer.



PHOTO COURTESY OF LANCESCHELVAN.COM

<sup>1</sup> C.J. Keleher and F.J. Rahel, *Thermal Limits to Salmonid Distributions in the Rocky Mountain Region and Potential Habitat Loss Due to Global Warming: A Geographic Information System Approach*, Transactions of the American Fisheries Society, 1996

<sup>2</sup> Colorado Division of Wildlife, *The Economic Impacts of Hunting, Fishing and Wildlife Watching in Colorado*, October 2004

<sup>3</sup> American Sportfishing Association, *Sportfishing in America – An Economic Engine and Conservation Powerhouse*, Alexandria, Virginia, Revised January 2008

<sup>4</sup> F. J. Rahel, et al., *Potential Habitat Loss and Population Fragmentation for Cold Water Fish in the North Platte River Drainage of the Rocky Mountains: Response to Climate Warming*, *Limnology and Oceanography*, Vol. 41, No. 5, July 1996, Anticipated Climate Warming Effects on Bull Trout Habitats and Populations Across the Interior Columbia River Basin, Rieman et al., *Transactions of the American Fisheries Society* 136:1552–1565, 2007

<sup>5</sup> McKinsey & Company, *Reducing U.S. Greenhouse Gas Emissions: How Much at What Cost?*, December 2007, <http://www.mckinsey.com/client-service/ccsi/greenhousegas.asp>.

<sup>6</sup> International Monetary Fund, *April 2008 World Economic Outlook*, chapter entitled "Climate Change and the Global Economy," <http://www.imf.org/external/pubs/ft/weo/2008/01/pdf/c4.pdf>.