

# Seeing the Whole River

**Dividing a river into parts, claiming it for economic use and ignoring its natural community, we lose sight of the river itself.**

By James G. Blaine

Rivers around the world no longer run regularly to the sea. The Colorado stopped doing so in 1960, and China's Yellow River runs dry for two thirds of the year. More than half the world's rivers are seriously depleted and polluted. The Ganges is befouled almost from its source, while the Volga annually transports 42 million tons of toxic waste to the Caspian Sea.

Despite all humankind's spectacular engineering feats, over a billion people around the world lack access to safe drinking water—and three times that number suffer from inadequate sanitation. Diarrhea kills an estimated 2.6 million people each year, the majority of them infants and children. Two hundred million people suffer from schistosomiasis, an infection caused by drinking contaminated river water, and more than six million Africans have river blindness.

In place of the multi-faceted relationships people historically had with rivers, we have substituted a single determinant of their value: What can this river do for me? In our drive for economic

growth, we have bent rivers to the human will.

Across the globe there are now more than 50,000 large dams, which collectively have displaced 40 to 80 million people. From Louisiana's Atchafalaya River to China's Yangtze, we continue to impose ever-bigger engineering solutions on natural wonders we do not understand and have ceased to care much about. Nor are we safe from these solutions: In 1975 a dam in China collapsed and as many as 230,000 people died.

Rivers have provided us immeasurable benefits. But we are destroying them, and in doing so, we are imperiling our future. We need to step back from the brink and reconnect with our rivers. We need to understand them, not simply try to control them—to appreciate the whole of a river, not just those parts we find useful, to realize that a river is not merely a channel through which we can push water and waste, but a natural system of which we are a part. We urgently need to awaken to the beauty of our rivers, and to see clearly the forces that threaten them.





*Landscape* (Chao Phraya River, Thailand), watercolor, 7"x10", 2008

Sarah Sutro is a painter and poet. She has recently returned to the United States after living in Thailand and Bangladesh for several years. Like James Blaine's words, her paintings make us consider the river in new ways.



*Bangkok Landscape,*  
watercolor, 7"x11," 2009

## Rivers in History

Streams and rivers provide the essentials of life—water and food. For humans they have done much more. We have used rivers to bathe our bodies, wash our clothes and remove our waste. Rivers have irrigated our farmlands, and carried in their waters the fertile sediments that create and replenish the soil itself. Rivers have made possible the inexpensive and efficient transportation of goods—and thus the social, cultural and intellectual exchanges that have spurred the development of ideas and the spread of knowledge. Harnessing the flow and capturing the power of rivers was the source of the Industrial Revolution and the modern world as we know it.

The earliest civilizations grew on rich alluvial plains that rivers created, and to a great extent rivers defined those early communities. People venerated their rivers as the source of life. Their earliest gods were river gods. But rivers could also be arbitrary forces of destruction, and people were often at their mercy, as floods obliterated their homes, droughts withered their crops, and contaminants poisoned their water. The river brought death as well as life.

Over time, people learned a great deal about stream and river ecosystems by dividing knowledge into distinct disciplines. In recent years, however, despite all we have gained through specialization, we have lost sight of the river itself. To see



it again in its wholeness, we must learn to weave the separate threads of knowledge and experience into a single tapestry, honoring the uniqueness of each thread and understanding how together they constitute the whole river.

Let us look at three threads: science, utility, beauty.

By observing the specific and often microscopic features of a river, scientists have sought to know it directly and tangibly. Particularly over the past 60 years, scientific research has vastly expanded our understanding of rivers and their ecosystems—their hydrology and chemistry, their physical properties and biological communities. Yet perhaps the most profound result of this work has been to demonstrate empirically what people understood intuitively for millennia—that

a stream is a dynamic system whose equilibrium depends on constant change, that it does not flow in a vacuum but is an integral part of the landscape it drains, that what happens throughout a river's watershed determines the health of the stream, and that upstream activities determine downstream health. No part of the river's ecosystem—not even a single organism—can be completely understood except in its relation to everything else.

Human activity is the single greatest threat to the rivers we depend on. To understand the whole river is to account, in full measure, for the manifold benefits that rivers provide humans, and the true costs of doing so. Our dependence on rivers is not going to change. We cannot stop drinking their waters, nor eating the food they provide. We will continue to demand the power they generate, the transportation they make possible and the recreation they support. But we must stop reducing streams and rivers to their utilitarian functions and calculating their value solely in economic terms. It is both an environmental and an economic imperative to restore their place in the natural world so that they can both regenerate themselves and continue to provide their unique array of benefits and resources.

The third dimension of the whole river is the one we have most thoroughly forgotten. That is to honor the river's natural mystery and beauty, which lie beyond the reach of scientific investigation and are too often the victims of economic exploitation. As with science, beauty is rooted in the particular—the play of light on the water, the caddisfly in its tiny case, the murmur of water flowing over stones, the scent of riparian plants in the early spring. It leads us to enjoy the stream directly, as we walk along its banks, raft into its reaches and fish its pools, feeling at these moments the solace of solitude and the paradoxical sense that we are not alone. We learn from these experiences that a stream is not just a collection of resources for us to exploit, but a community of which we are members. Beauty pulls us out of our individual selves and joins us with a world of immeasurable—and infinitesimal—things.

Science. Utility. Beauty. These are the building blocks of a vision of the Whole River. We need science to understand the structure of freshwater ecosystems, how they function in their natural states, and how human activity affects them. We need to be clear about the benefits we derive from streams and rivers and about the costs of these services. And we must reach beyond

scientific data and economic value to allow our rivers to carry us on currents of wonder and connect us to the cosmos.

## The Tragedy of the Commons Revisited

There is no clear and widely accepted set of rules governing the control, use and stewardship of flowing water. In the United States, for example, nobody owns the rivers. Legally, all navigable waterways belong to the public, held in trust by governments for the benefit of all. Yet the nation's history, particularly in the West, reveals endless and frequently violent conflicts over water rights, and all too often the fact that rivers are not owned by anyone means that no one takes responsibility for them. They have become the classic manifestation of what ecologist and author Garrett Hardin called "the tragedy of the commons."

Hardin described two uses of the commons: "a food basket," from which people take things they need, and "a cesspool," into which people put things they don't want. Rivers have long been both. People take what they need from rivers and flush back into them what they do not want. But they do not stop there: They actually take the commons itself—as they remove in ever-increasing quantities the river's water.

Because the evidence of stream and river pollution is often either buried in sediment or exported downstream, and because private water interests have wielded such enormous clout in this country, it has proved difficult for governments to assign responsibility and to enforce remediation. This is not simply a legal matter; it is a testament to ignorance. The misuse of rivers represents a profound misunderstanding of how they work—for they are far more than transport systems for waste. They are homes to communities of tiny organisms that perform the gargantuan work of breaking down and recycling that waste. Rivers, if we treat them with care, will, in fact, clean their own waters, and they will do so free of charge. If we continue to overload them with pollutants, however, we will kill them.

This is particularly true of small streams, which are a river's life blood, the cradle of its biodiversity, and the home of billions of species that are the source of its energy. They are the places where land and water interact most closely and, because they are especially vulnerable to changes in land use, they are the key to a river's health—and to the health of the human settlements that depend



on the river. Yet, these small, often intermittent, streams, which make up 80 percent of most river systems, are the most neglected and least protected parts of the river's ecosystem. And the human victims of that neglect are disproportionately the most vulnerable and least visible members of society.

Because all living things depend on clean fresh water, its distribution must be grounded in equity. Nobody can own the water, just as nobody can own the air; its benefits must flow to all people. While this is a matter of simple justice, implementing it is anything but simple in a world of unending and competing demands for resources. Any distribution system, moreover, must ensure



the health of all living things, for it is neither ethical nor wise—nor, in the end, possible—to appropriate water for human use without regard for the environment that supports us all.

In the 1972 article “Should Trees Have Standing?” Christopher Stone argued that nature is not made up of “objects for man to conquer and use,” but is a subject with legal rights. His thesis was both a call to give nature standing in courts of law and a demand that we transform the relationship between humans and ecosystems from one of domination and exploitation to one of interdependence and community.

In our focus on what rivers can do for us, we

have ceased to consider what we must do for them. In the name of progress, we have auctioned off the commons to those who would most aggressively exploit its resources. We have lost sight of the reality that a river can only belong to all of us when it belongs to none of us.

Just as Aldo Leopold urged 60 years ago that we “think like a mountain,” the time has come to think like a river—to understand that a river and its watershed is a natural community of which each of us is a member, a community that is crucial to our physical survival and to our yearning for transcendence, a community that we must learn to nurture once again so that it will continue to nurture us. **W**

*Water II*, (Phnom Penh, Cambodia), watercolor, 7"x11," 2009

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