

River Voices



Using Economics as a River Conservation Tool

by Stephen O. Andersen, J. Glenn Eugster, and Rolf Diamant

River lovers, true believers in the value of free-flowing rivers, typically do not need or want an economic assessment to justify why they believe their rivers are worth saving. To them rivers are priceless. The accounting matters, however, to competing interests and public decision-makers. Having economic information about the values of your river will make you a more credible player at the table. A good way to begin is to identify the values of your river and to learn about approaches and strategies other river conservationists have used successfully.

The demands we place on our rivers to generate power, supply water, assimilate wastes, irrigate crops, and assist transportation are steadily increasing. Scientists, economists, ecological planners, resource managers, and government officials are becoming more aware of the values and functions that natural environments provide free of charge. Recognition of the worth of these natural systems is proving to be an important factor in many decisions about the future of our rivers and watersheds.

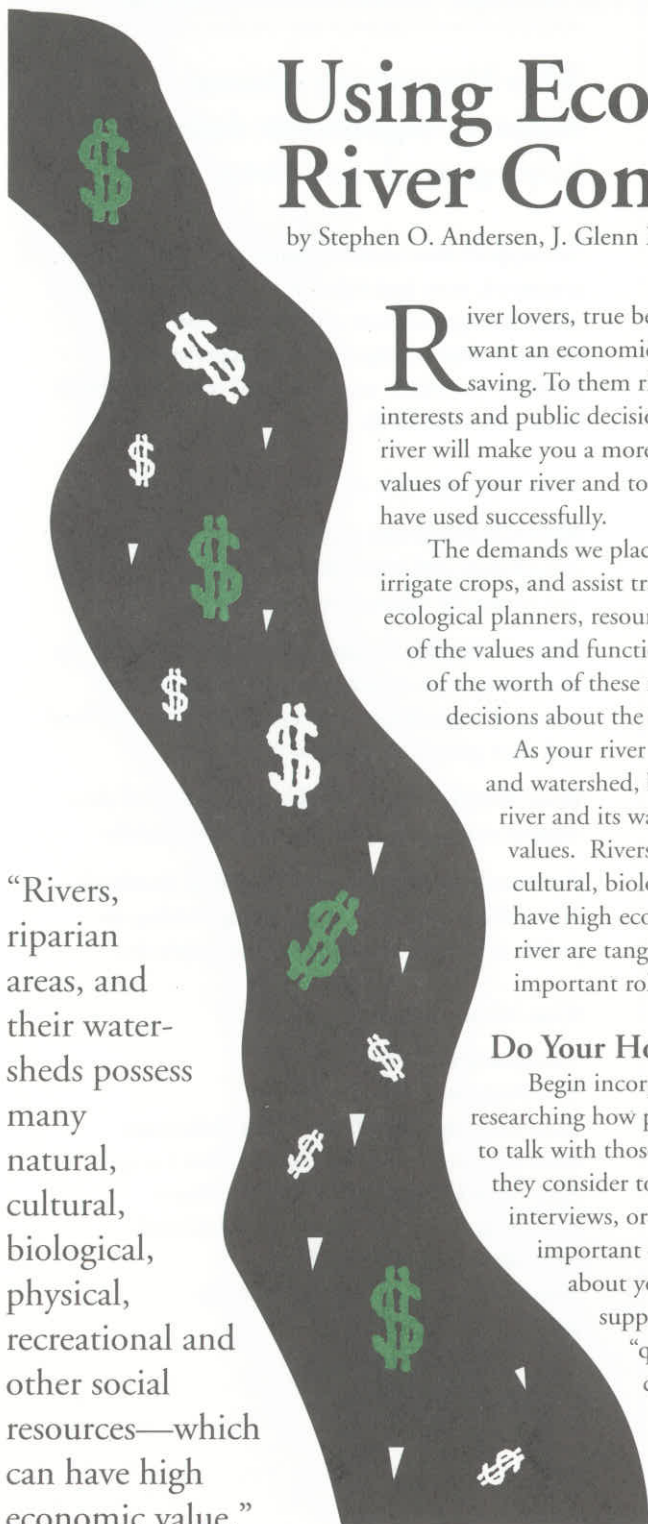
As your river group chooses strategies for protecting and restoring your river and watershed, be mindful that rivers have value to the economy. Think of your river and its watershed in terms of its environmental, community, and economic values. Rivers, riparian areas, and their watersheds possess many natural, cultural, biological, physical, recreational and other social resources—which can have high economic value (see chart on page 5). Some of the values of your river are tangible, others are intangible, but both types of values can play an important role in river management decisions.

Do Your Homework

Begin incorporating economics into your river conservation efforts by researching how people historically and currently appreciate your river. Take time to talk with those who use, own property along, and govern the river about what they consider to be the existing values of the watershed. Public meetings, interviews, or surveys may reveal a variety of special river qualities which are important to people. Not only will you learn about what people value most about your river, it's also a good way to build awareness and broad support. Although some of the information you collect may be of a "quality of life" nature—not suitable for economic calculations—it could be invaluable when considered by decision-makers. The information you collect about how people view your river and watershed will help you organize an overall river protection strategy and economic analysis, if you choose to do one.

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River Voices is a forum for information exchange among grassroots, state and regional river groups across the country. River Network welcomes your comments and suggestions.

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River Network is a national nonprofit organization dedicated to helping people save rivers.

We support river conservationists in America at the grassroots, state and regional levels; help them build effective organizations; and through the **River Network Partnership** link them together in a national movement to protect and restore America's rivers and watersheds.

River Network runs the following four programs:

River Clearinghouse provides river activists with information and referrals on technical river resource and nonprofit organizational issues;

River Leadership Program develops new leadership and strengthens existing state and regional river advocacy organizations, and provides a link for local and state groups on national legislation;

River Wealth Program builds the capacity of river organizations to support themselves financially;

Riverlands Conservancy brings critical riverlands into public ownership, thereby empowering the public to oversee management and protection.

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From the President

These are trying times for river and watershed protection. In Congress and many state legislatures, we are experiencing a "Reign of Error"—pardon the expression—in which the environmental values we hold most dear are under attack.

This places a heavy burden on us, as river advocates, to answer the question "why?" Why river protection? Why clean water? Why floodplain zoning? Why instream flow?

Part of our burden of proof is to express the "why" in terms of dollars. This is a way of communicating with voters and decision-makers who may not share our philosophical commitment to rivers. You and I know that rivers are priceless, but we can't let this prevent us from placing a monetary value on a river system and the free work that it does for society. Free work such as:

- water filtration
- aquifer recharge
- recreation
- flood containment
- enhancement of real estate values
- habitat for fish and wildlife
- open space for urban populations—and so on.

The other side of the coin (so to speak) is the monetary cost of the engineered systems that become necessary once the river system becomes degraded. The value of watershed health in the Catskills, for example, can be measured by the cost of a filtration system for New York City drinking water.

When I worked on the Rio Chama campaign in New Mexico, we had two things going for us in the area of economics. First, a positive value: boating on the Rio Chama was a source of income in a very poor part of the state. Second, the negative: no one was willing to pay for the water that the Corps of Engineers wanted to store at Abiquiu Dam. The City of Albuquerque wanted the storage, but not if it would cost them anything.

Your river has an economic value to the community, whether real or potential. The question is, how to collect and present the facts? River Network is here to connect you with experts who can help you do just that. A few of them have written the articles in this issue of *River Voices*. Many others are available through DORIS, our listing of volunteer experts. Give Rita Haberman a call, at 1-800-423-6747, and she'll put you in touch with an expert (preferably in your region) who can help you make the case for your river. Another good source of help, of course, is the staff of the Rivers, Trails & Conservation Assistance program of the National Park Service in their regional and field offices.

I'm happy to report that 192 organizations have now signed on as Partners of River Network. This is better than we expected in the first year of the program. I'm also happy to announce that our Eastern Office in Vienna, Virginia, is now in full swing, staffed by Kevin Coyle and Pat Munoz.

We're here to serve. Tell us how we can help!

Sincerely,



Phillip Wallin
President



© photo by Linda Klewer

A Special Thanks

River Network would like to thank the National Park Service's Rivers, Trails & Conservation Assistance (RTCA) program for its technical and financial assistance in producing this issue of *River Voices*. River Network and RTCA will work cooperatively on future *River Voices* and the 1996 *River Conservation Directory*.

At the request of citizen groups and public agencies, RTCA helps communities protect rivers, trails, and greenways based on the principle of partnerships, not federal regulation or acquisition.

To learn more about RTCA assistance and projects in your area, contact the RTCA office in Washington, D.C. at (202) 343-3780. 🐟

Using Economics as a River Conservation Tool continued from cover

If your river possesses some "significant" values, you have an opportunity to build a broad base of support for your river. Your economic information can also build on these significant values or river and watershed indicators that illustrate uniqueness, environmental health, and recreation use over time. Placing a river in a regional or national perspective may also be helpful. Although every stream is worth protecting, some river areas have been recognized as being of regional, state or greater significance because their natural, cultural, recreational, or other values are unique. Compare your river to other rivers by reviewing existing river assessments, canoe or whitewater guides, natural heritage inventories, conservation and development plans, and interviews with credible experts.

Five Common Approaches

A few impressive statistics, some appealing anecdotes, and generally positive public sentiments about your river may be enough to win some support for river conservation, but more likely you'll need a stronger case. An in-depth, credible, river-specific economic analysis may be necessary to convince skeptical decision-makers. The economic analyses (used in numerous successful river campaigns throughout the last few decades) can be categorized into five different approaches: river recreation economics, project evaluation economics, natural watersheds for sustainable futures, land development economics, and water and power pricing economics.

River Recreation Economics

River recreation economics quantifies the value of recreational, scenic and other tangible benefits of rivers which can then be compared to the calculated benefits of river development. Recreational benefits are often more important to local communities than jobs from river construction

projects or local use of river products such as electricity or irrigation water. Calculated recreational values are widely accepted by economists, government agencies, and business interests. One example of a successful campaign that has used river recreation economics is a study of the Poudre River in Colorado which attempted to establish the comparative worth of different types of activities and how the activities were affected by the amount of river flow.

Typically, these calculations are based on revealing a "willingness-to-pay" for river recreation and on the value of spending to local businesses. A variety of methodologies can be used to determine river values. Four frequently used techniques include: contingent valuation, travel cost, hedonic pricing, and economic impact analysis (see chart of four methods on page 6).



Bicyclists enjoying the greenway along the South Platte River in Denver.

Project Evaluation Economics

Project evaluation economics is another approach used to determine whether the perceived benefits of river development could be more cost effectively met with other alternatives. An example of project evaluation economics used to save a river was spearheaded by Dr. Charles Wharton, of Georgia State University, who successfully challenged a channelization

project proposed by the U.S. Army Corps of Engineers on the Alcovy River. Wharton calculated the economic benefit of the values and functions of the wetland-dominated watershed in terms of water quality and quantity, research, recreation, and biological productivity in his classic report "A Southern River Swamp..."

Rivers Unlimited in Ohio has also used project evaluation economics to stop numerous channelization projects by closely examining assumptions behind alleged project benefits (see sidebar on page 7).

Natural Watersheds for Sustainable Futures

Natural watersheds for sustainable futures is another approach to using economics to support river conservation. A growing awareness of the interdependence between the river environment and the economy of its surrounding area reinforces the need to view development activity alternatives within a framework that protects the natural values while meeting legitimate public needs. This type of sustainable development, incorporating "sustain-a-river" practices, can decrease impacts on natural resources by stimulating more innovative approaches to water resource management. The state of West Virginia's concerted effort in the late 1980s to diversify its economy from resource extraction to tourism and recreation is a prime example of sustainable development (see page 11).

The U.S. Environmental Protection Agency, in cooperation with the President's Council on Sustainable Development, has compiled research that illustrates how recently developed methods of natural resource accounting can be used with conventional economic accounts as a tool to facilitate sustainable watershed management. The Upper Mississippi watershed from Minnesota to Missouri has been assessed for its natural and economic accounts (i.e. fish, timber, topsoil, etc.).

What are the values of healthy natural river systems? How many of the following might be reasons to conserve your river?

- ☛ Perhaps most important, rivers are the habitat and life-corridors for **wildlife**, the matrix for biological diversity. River corridors that run from the mountains to the lowlands to the sea connect many ecosystems and populations. In contrast to an "island" preserve dedicated to one species, a river corridor contains a rich and varied pool of interacting life forms.
- ☛ Rivers carry **nutrients** that sustain our wetlands, estuaries and ocean shallows, the beginning link in the food chain. This function is severely impaired by dams, which bury nutrients under reservoirs.
- ☛ Rivers are a free delivery system for **fresh waters** to support human settlements, agriculture and industry, but only to the extent that we protect the quality of those waters.
- ☛ Rivers recharge the vast underground **aquifers** that our cities and farms depend upon.
- ☛ They are the home for **fisheries**, resident and anadromous, commercial and sport, that support many local economies. Dams and diversions and dredging have severely depleted those fisheries.
- ☛ Rivers provide the free capital of **top-soil** in their floodplains, replenishing the fertility of our farmlands.
- ☛ They absorb the energy of **floods** in their meanders and marshes and floodplains when allowed to flow freely.
- ☛ They provide free **recreation** that brings millions closer to nature, through floating or fishing or swimming or hiking.
- ☛ Rivers provide easy **access to wilderness** for those who cannot carry a 40-pound pack.
- ☛ They provide our cities with **greenways** that are often the best chance for urban open space.
- ☛ Rivers have carved out the breathtaking **beauty** of canyons, valleys, waterfalls, cataracts—the glory of our continent.

Beyond these intrinsic values, there are symbolic values that make rivers special for millions of people:

- ☛ Rivers **define the landscape** for most of our population: the three rivers of Pittsburgh, the Cuyahoga of Cleveland, the Potomac of Washington, the Hudson of New York, and innumerable settled valleys.
- ☛ Rivers are the "canary in the coal mine," an **index of watershed quality** and early warning of environmental problems.
- ☛ As such, rivers are a **rallying point for environmental concerns** throughout the watershed: forest management, mining practices, roads and highways, water supply and conservation, toxic wastes, industrial pollution, farming practices, urban growth and land-use planning. A group can deal with all these issues by protecting the quality of a river.
- ☛ Rivers are also a rallying point for **local control** in the face of pressures by outside economic interests for water storage, navigation, hydropower and so on.

- ☛ Rivers were the **historic pathways** for exploration and settlement, and they remain embodied in our song and literature: Old Man River, the wide Missouri, the Mississippi of Mark Twain, the Hudson of Fenimore Cooper, Hemingway's Big Two-Hearted.
- ☛ Rivers symbolize **permanence**, carving their path from the mountains to the sea over the millennia. They contrast with the 100-year lives of dams, the salting-up of irrigated land, the boom and bust of mining and logging.
- ☛ Rivers embody the **free work** that nature does for humankind in all the ways above, in contrast to the expensive and fallible systems that engineers construct.
- ☛ Most important but most difficult to talk about is the **spiritual** quality of rivers. As Ken Olson writes: "Rivers are refuges for the soul, places of spiritual refreshment, where the natural flow and play of running water plainly mirrors the movement of life itself."

Is it any wonder, then, that citizen groups are springing up in valleys across the land to protect "their" rivers and watersheds?

Land Use Displacement Economics

The land use displacement economics approach assesses the impact of river development on existing land use and associated economic activity (not necessarily related to direct river recreational benefits). River development can accelerate a long-term change in land ownership and income resulting in the destabilizing loss of economic benefits to local communities. In the case of the Wildcat National Wild and Scenic River in the skiing resort community of Jackson, New Hampshire, river conservation efforts gathered considerable momentum after studies showed that new condominiums being built on the floodplain by out-of-town developers would cause a decline of locally owned and operated inns and bed and breakfasts that are a traditional economic mainstay of the town.

Increased property values and increased marketability for property located near rivers (and other open space) is another well documented economic benefit of rivers (see page 21).

Water and Power Pricing Economics

Water and power pricing economics can be used to challenge the assumptions that taxpayer-subsidized projects actually cover the direct costs of river destruction. For example, river water diversions for more irrigation can increase production of crops which are in excess supply and thus increase the taxpayer cost of price support programs. The Environmental Defense Fund's studies of California irrigation illustrate this point. Another issue that involves water pricing is watershed management to protect drinking water supplies. The Oregon Natural Resources Council is spreading the word that tax dollars spent to clean water fouled by logging, mining, manufacturing or agriculture are an obvious, if indirect, public subsidy to those industries (see page 14).

Major Types of Natural Resource Economic Valuation Techniques



Methodology	Definition	Use of Market Data
Contingent Valuation Method	<p>Goal: To determine monetary value that individuals place on a change in the level or quality of the resource;</p> <p>Approach: Use of surveys of actual resource users or random sampling of the general public;</p> <p>Uniqueness: Only technique that attempts to measure non-use attributes like option, existence, and bequest values; does not use market data;</p> <p>Example: To value the existence value of native salmon or other threatened or endangered species for which anglers and non-anglers alike may value.</p>	No
Travel Cost Method	<p>Goal: To estimate the monetary value of a site at its given condition by users of that site;</p> <p>Approach: Use of reported expenditures on trips or single or multiple recreational sites;</p> <p>Example: To estimate the value of a particular state park based on travel expenditures of visitors to that park.</p>	Yes
Hedonic Price Method	<p>Goal: To infer the value of particular aspects of a market good using a surrogate market;</p> <p>Approach: Use of actual price and market data for a certain market good such as housing;</p> <p>Uniqueness: Attempts to show the portion of value placed on specific characteristics that are not explicitly priced in the market;</p> <p>Example: To infer the value of an environmental asset (e.g. open space, clean air) by analyzing the relationship between housing prices and the availability of that asset.</p>	Yes
Economic Impact Analysis	<p>Goal: To estimate effects of changes in the flow of goods and services in an economy;</p> <p>Approach: Modeling of changes in the flow of often highly valued goods and services;</p> <p>Uniqueness: Attempts to estimate the value of resource conservation;</p> <p>Example: To estimate the economic impact of fisheries protection on a given region.</p>	Yes (but data is often highly aggregated)

Source: *Fishing for Values* by National Wildlife Federation, 1995 (see page 21 for more info)

Keys to Success

Economic analysis is most credible and useful when it is:

- Reflective of the full range of beneficial public and private uses, values and functions of the river or watershed. Economic values you promote must be relevant and understandable to the people of the basin and indicate the importance of the river to the environment, the community, and the economy. River indicator data, such as numbers of river users, jobs created, fish caught, dollars spent, or small businesses started are all relevant.

- Undertaken by independent researchers without biases or apparent conflicts of interest. Good choices include National Park Service, state agency, and academic experts. Don't overlook the possibility of studies commissioned by state divisions of tourism, chambers of commerce or riverside cities.

- Presented by respected and articulate individuals after peer review and preferably after responding to criticisms by proponents of river development. Make special efforts to educate river protection advocates—no analysis is effective if its proponents doubt its objectivity.

- Picked up by the media. Publicity will help to institutionalize an appreciation for the natural-based economic values rivers provide (refer to *River*

Voices Fall 1994, "Media Matters").

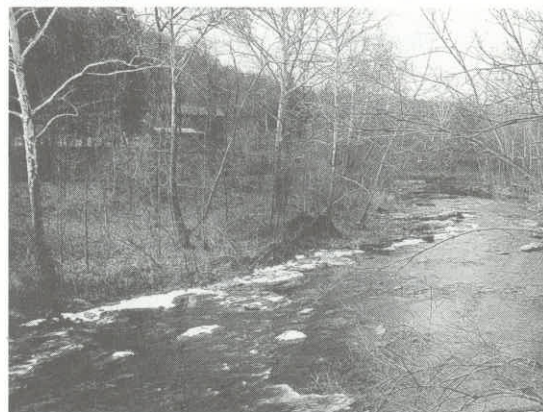
- Heard by policy-makers who have been trained to appreciate the objectiveness of the calculations and who are confident that economic calculations are useful tools. Make the effort, if necessary, to bring decision-makers up to speed.

- Endorsed and reinforced by local business interests. Solicit support from motel, restaurant, and retail store owners who can verify that they have seen the advantage of recreational river use. River conservation also frequently provides an economic advantage to riverside property owners. Getting their endorsement is essential.

- Presented in a context unencumbered by conflicting user groups (boaters, hunters, fishers, picnickers, private property owners, etc.)

Natural rivers, riparian areas, and their watersheds are economic resources worthy of stewardship by all levels of government and the private sector. The tangible and intangible qualities contribute to our environment, communities, and economies. Local river interests need to continue to describe, estimate, and advocate the importance of natural rivers so that their use can be carefully planned and managed. Such recognition and conservation will help to ensure that these assets are available to meet current and future needs. ➤

Photo: Tim Palmer



Increased property values of land near rivers is well documented.

Stephen O. Andersen played a key role in protecting the Penobscot River in Maine, co-authored the "River Valuation Bibliography" and is now deputy director for stratospheric ozone protection for the U.S. EPA.

J. Glenn Eugster helped found the National Park Service's Rivers, Trails and Conservation Assistance program and currently works for the U.S. EPA's Chesapeake Bay Program.

Rolf Diamont previously directed the National Park Service's Wild and Scenic Rivers program in New England and is superintendent of the Frederick Law Olmsted National Historic Site. Together Eugster and Diamont co-authored Citizens Guide to River Conservation.

Question Project Assumptions: Mill Creek, Ohio

Defeating a U.S. Army Corps of Engineers' project on Mill Creek just came down to a hard look into the assumptions of the project. In 1959, Cincinnati's Mill Creek overflowed causing \$2 million in damage. As a result the Corps proposed a \$30 million flood control channelization project—17 miles long through eight floodplain communities including Cincinnati. The alleged annual flood damage prevention benefits

were more than \$18 million. Construction began in 1981. By 1991, \$110 million had been spent, work was only 41% complete and project costs had risen to \$340 million.

Rivers Unlimited analyzed the flood records from government agencies and found a pre-construction 1979 flood came to the same creek levels as the 1959 flood but didn't even make the news and flood damage claims came to only \$57,000.

A closer examination of the Corps' assumptions revealed that the claimed annual benefits were based on predicted structures to

be built in the protected floodplain and what would happen to them if the channelization project were not built. The \$18 million annual benefit would be correct, according to one wag, if the buildings were high rise complexes with their ground floors below sea level, noting that Cincinnati is about 650 feet above sea level! Coming at a time of budget cutbacks, these revelations helped convince the Corps to "walk away" from the project. ➤

Mike Fremont of Rivers Unlimited provided this information.

Putting River Economics Data to Work

by David Brown

The task of convincing the public and decision-makers that your river has economic values is a marketing challenge that deserves a comprehensive strategy. Sometimes the debate boils down to society's value comparison of two or more competing uses. Even if the economic impacts of the river in its natural state are not comparable to the dollar value of electric power, those impacts can make a significant contribution to your arguments when added to the other values that the natural resource provides. Capturing those valuable attributes and fashioning them into a simple, repeatable message is the key to winning the public relations portion of your strategy.

Do you need a formal economic study?

If your group decides that economic data could be helpful, one of the first questions you'll need to address is "do you need a formal economic study?" Several questions should be answered before launching into a formal economic study:

- Are the results likely to satisfy the needs of your strategy?
- What are the geographic boundaries of the study and do they mesh with your political goals?
- Can you afford a study that adequately measures all visitors' impacts or a significant portion of them?
- Is the researcher credible politically?
- Are there less expensive ways to establish estimates of economic impacts or more politically potent ways to demonstrate them than through a formal study?

Developing economic data to fit your strategy

The use of economic data must be part of a comprehensive strategy to obtain a specific goal. The overall strategy can include remedies arrived at through legal or political action, or direct negotiation with the competitor for the resource. So it is important to know who will be making the key decisions and what kind of data will be appreciated in those decisions. If the data is to be used in a public relations campaign, the presentation need not be technical. However, if it is required as part of a specific administrative proceedings, you'll need to follow the requirements carefully. The study may need to measure economic value and not economic impacts, an important distinction.

Economic impact information studies measure how much people are spending for travel, services, food, clothing, and the like.

Economic value studies measure demand for the resource in terms of willingness-to-pay or other indicators of demand for the resource. Economic impacts are easier to use in public relations because they relate to actual behavior (as opposed to theoretical behavior) most people understand, like paying for gas, food, lodging and recreation services.

Establishing measurement boundaries

Thought needs to be given to where the economic impacts occur before launching into a study. This issue is especially important where impacts are spread between states or other political boundaries. For example,

if you need a decision by the governor of South Carolina and your study reveals that most of the economic benefits are in Georgia, you may shoot yourself in the foot with your study.

To the extent possible, try to ensure that the boundaries of your study (those in which the economic impacts are measured) conform to your political goals. Measuring total economic impacts of river use, for example, doesn't automatically mean that it occurs in the state or vicinity of the river. Boundaries in which the economic impacts occur are necessary to develop multipliers of direct impacts. The boundary for this measure may be a state or a collection of counties around the resource. Multipliers are used to depict the turnover of dollars in the economy. In a study done by the Corps of Engineers on the Gauley River, the multiplier for the aggregate of counties (boundaries of the economic impacts) was 2.27. The multiplier varies according to the type of economy in which the impacts occur.

Is your researcher credible politically?

If you are using the results from your research in a public relations campaign or to achieve a political solution, it helps to have a politically credible source for the data. The more potent the source the better. If you're trying to change the plans of a federal agency for example, the data developed by another federal or state agency can be very helpful. Perhaps the best example of this was on the Gauley River in 1984, when the Corps' own study revealed significant economic benefits for recreation. Having another environ-

...IT IS IMPORTANT TO KNOW WHO WILL BE MAKING THE KEY DECISIONS AND WHAT KIND OF DATA WILL BE APPRECIATED IN THOSE DECISIONS.

mental group sponsor or collect that data would not have made as big a splash. It was hard for the Corps to deny its own research.

Valuable economic data need not be expensive

Sometimes it is more important to have a credible source for reasonable economic data than an expensive study. In the effort to preserve flows for recreation on the Ocoee River in Tennessee, the State Department of Tourist Development agreed to help by constructing an estimate of direct impacts using U.S. Travel Data Center estimates of daily spending for a similar type of tourism. A state official called area motels, service stations and restaurants to confirm that river visitors provided a significant level of business. Travel expenditures for each visit to the river were established from the Data Center's averages. To achieve an estimate of total direct impacts, the estimated spending per visit was multiplied by Tennessee Valley Authority's own use data.

On the Payette River in Idaho, river advocates simply asked businesses up and down the road along the river to write letters about the importance of the river to their business. Operators of service stations, restaurants and other business who benefited from the visits for fishing, boating, and other uses of the waterway wrote positive letters of support. Another approach to this method might be to encourage businesses to write letters describing how many jobs at each establishment depend in some way on the river.

Benefit transfer is another way to gain economic data without using a formal study. For example, using average daily expenditures from studies of similar rivers in a region, you may be able to estimate the economic impacts

of an unstudied river by plugging in use data. Again, it is important to have the data organized by a credible source.

In 1993 America Outdoors worked with the U.S. Forest Service to develop economic data for five recreation rivers across the country. The economic impact data is reasonably accurate, but the number of actual jobs created by outfitted use of rivers, for example, exceeded the number indicated by the study in some cases. This problem may have occurred because the entire state was used as the boundary for determining impacts, and refinement of employment data in a local economy may not be possible from such a large perspective. So even sophisticated studies can miss the mark on some points.

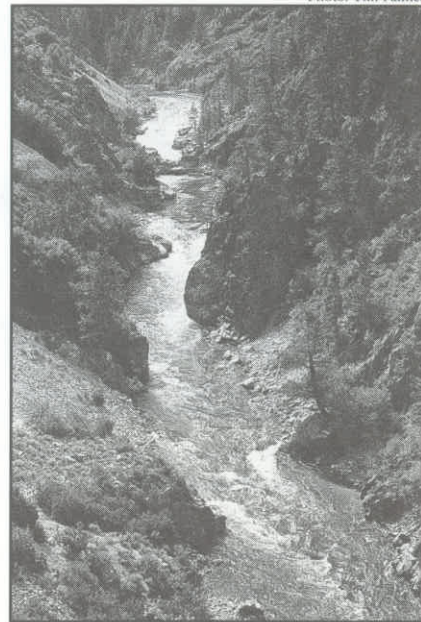
Using economic data to gain political support

The Ocoee River study done by the State of Tennessee Department of Tourist Development was very powerful because it implied that the state supported the Ocoee River Council (ORC) and the state was a credible source. There was no cost to ORC either. It helped gain formal support from chambers of commerce, conservative politicians, Rotarians and tourism boards. ORC asked civic organizations and business groups to pass resolutions in support of the river using the economic impacts of the state study in the language of formal resolutions presented to their boards.

The resolution was then offered by a respected member of the body, not the advocates. We picked a group that was a "sure win" and then moved on to others by asking that they add their support to the "chamber of commerce."

"Whereas, a study by the State of Tennessee Department of Tourist Development revealed that the total direct impacts of recreation on the

Photo: Tim Palmer



Payette River advocates recruited nearby businesses to write letters of support documenting the river's importance.

Ocoee contributes \$3 million to the area economy; and whereas, the Board of Directors of the Chamber of Commerce (etc.) unanimously supported a resolution to preserve recreation on the Ocoee River..." and so forth.

With local support, these resolutions were taken to newspaper editors in request for favorable editorials. Even the Tennessee legislature passed a resolution supporting recreation on the Ocoee. The passage of these resolutions made great press in local papers, and the economic impacts were repeated in news stories. Soon our message of the economic benefit of the river was accepted as fact. It helped us gain needed momentum.

So, as the costs of the Ocoee water project rose and the value of the power diminished, keeping water in the river began to look like a better deal. The public can easily grasp economic ►



The Potomac River is a valuable urban recreational resource for the Washington, D.C. metropolitan area.

impact data because they understand things like paying for gas, food, lodging and recreation services. And it helps to have a service station or motel owner nodding in your favor when you're at a civic club meeting presenting a pie chart depicting how much money river users spend in the area. While the economic impact data was not the key factor in winning, it helped us build needed political support.

Tips and pitfalls in developing economic studies:

- Monitor the study design to ensure that it matches the resource and users. The researcher may be great technically, but if he or she leaves out significant potential sources of impacts, your study will be incomplete. Although it may not be necessary or possible to study all user groups because of budget considerations, it is essential to ensure that the study adequately measure significant economic benefits.

- Some economic comparisons miss the point. When the economic impacts of recreational use of a local river are compared to the overall state economy, it always seems insignificant.

What is lost in this comparison is the value of the river to the local economy. The trade-off is that the economic impacts are likely to be spread over a wide area if extensive travel is required to visit the river. It may be worthwhile to measure the total economic activity and also describe the impacts in a local economy if measure-

ments can be made in that way. Impacts in the local area are significant if the number of employees is significant and they spend their money locally.

- Don't overlook values that are not described in economic impact studies. For example if the river is used by the state to symbolize the quality of life of the state or region that value will not be detected in economic comparisons or impact data. We all recognize that relaxation and recreation is key to good health. Forty percent of the traveling public wants a vacation on the water near a lake, river or seashore, according to a recent Roper Starch study commissioned by the American Recreation Coalition. The availability of recreation resources often figure significantly in the "livability" indices which receive attention in the media and even in the selection of business locations. Use information like this to augment your value arguments.

- Include satisfaction ratings. With a few added questions you can determine the level of support for a resource by asking people about their satisfaction with the experience and

whether or not they plan to return. High satisfaction ratings help show demand for the resource and its value to the quality of life of the area.

- Don't overstate your economic impacts. Sometimes the data can be too good. If your study grossly overstates the impacts, don't use it. Outlandish information will discredit your effort.

- Be aware of the potential unintended consequences. Tourists from outside an area are notoriously easy marks for taxation. Economic studies boasting of millions in revenue may encourage taxation by a local government, especially if that government can isolate a group of businesses. Outfitters on the Ocoee River are subject to a 10% county tax, for example, although that tax did not result from an economic study. But repeating a rosy financial picture of the river industry may lead to resentment and taxation if the river is in a poor area and local citizens don't see it benefiting them.

In Summary

Economic studies can be extremely helpful, but they must be part of a larger strategy to save your river. There are numerous options for sources of information and degrees of specificity.

Careful consideration of design options is necessary to maximize the usefulness of the economic information collected. Like all creative modeling techniques, using economic information takes insight, perseverance and time to consider the alternatives. 🐟

David Brown is the executive director of America Outdoors, a professional association of outfitters. Brown led the efforts to ensure recreational flows in the Ocoee and Gauley Rivers.

Rivers are Magnets for Tourism

West Virginia's economic salvation lies with the popularity of its rivers

by Roger Harrison

Rivers are to West Virginia what snow is to Alaska, the fabric of life, poignantly noted one writer on a recent trip to the state. The statement serves as a testament to the wealth of water in West Virginia and its inescapable ties to the people. And that wealth of water, particularly whitewater, is quickly becoming West Virginia's newest economic salvation.

Last year, more than 200,000 people flocked to West Virginia to enjoy some of America's best whitewater on five of the state's commercially regulated whitewater rivers—the New, Gauley, Cheat, Tygart and Shenandoah Rivers. On the New and Gauley rivers, both federally protected rivers, whitewater rafting has increased by nearly 45% since 1990 signaling that West Virginia is quickly becoming a destination for outdoor recreation. Home to more than 29,000 miles of rivers and streams, these waterways are a tourist magnet for West Virginia and subsequently are a large part of West Virginia's second largest industry—tourism.

The Poorest Rich State

In West Virginia unemployment is chronically high and the per capita income is one of the lowest in the nation. Ironically, West Virginia's poverty coexists with some of the richest energy and hardwood resources in the lower 48 states. West Virginia Tax Commission Chairman E.A. Bennett foresaw the crux of the state's problems more than 100 years ago. In a report to the governor in 1884, Bennett wrote:

"The wealth of this State is immense...the question is, whether this vast wealth shall belong to persons who live here and who are permanently identified with the future of West Virginia, or whether it shall pass into the hands of persons who do not live here and who care nothing for our State

except to pocket the treasures which lie buried in our hills?"

The same concern is felt by many West Virginians today as 72% of West Virginia's land base is owned by absentee landowners, many of whom are major natural resource extraction companies.

Manufacturing is still West Virginia's largest industry. In fact more coal was mined in West Virginia last year than at any time in the state's history. Unfortunately, automation has resulted in fewer jobs in the coal fields.

In 1988 Governor Gaston Caperton understood the need to diversify West Virginia's stagnant economy and capitalized on the state's greatest asset—it's natural beauty. Caperton's administration has been largely responsible for the dramatic growth in the state's tourism industry.

Today, tourism, much of it river-based, is the fastest growing industry in West Virginia. In spite of a downward tourism trend in neighboring states and all across the country, West Virginia tourism revenues have continued to rise since 1989. Tourism contributes more than \$2.5 billion to the state's economy each year, including almost \$120 million in state tax revenues.

The Rivers State

West Virginia's rivers, particularly the New and the Gauley, provide proof positive that river conservation may be one of the cornerstones to support a new structure of economic opportunity for West Virginia—one that builds on the importance of ecological integrity and recreational pursuits.

In recognizing the value of recreation and tourism to West Virginia, the West Virginia Rivers Coalition is the lead advocate for National Wild and Scenic Rivers designation for 12 streams within the Monongahela National Forest.



River recreation on the Gauley generates \$35 million annually for the local economy.

These streams are considered the "crown jewels" of rivers in the Mid-Atlantic region and collectively could provide significant economic certainty to local forest communities that have historically relied on timbering and coal revenues.

River stewardship will enhance West Virginia's reputation as a place of superlative beauty and community where people want to live and work. Healthy rivers attract healthy businesses. Corporate executives increasingly cite "quality of life" (including scenic beauty and recreational opportunity) as a major factor in corporate relocation decisions.

River conservation has little future in West Virginia unless economic opportunities are developed that can help sustain both the rivers and the local communities. The West Virginia Rivers Coalition believes that a sound river protection program oriented to economic growth is possible east of the Mississippi, where 65% of Americans live, work, and recreate. If development of a river conservation movement consistent with economic growth is successful in the heart of Appalachia, it surely will be recognized as a model for river protection elsewhere. 🐟

Roger Harrison is the executive director of West Virginia Rivers Coalition.

How to Assess the Economic Benefits and Impacts of fisheries in your river

by Tony Fedler

Northwest recreational salmon fishing jobs decline by 43% over a 6-year period!

Northwest workers lose \$500 million in wages from recreational salmon fishing declines! These and similar headlines have been conspicuously absent from media reports as salmon, steelhead, trout, and a host of marine fish stocks have declined to historic lows around the country. While we have seen similar information from the commercial fishing, timber and agricultural industries and other river resource users, why has there been a noticeable absence of economic information on the river-dependent recreation industry? In many communities, fishing, hiking, river floating, wind surfing, boating and other activities provide vital economic activity throughout the year.

Resource managers and politicians have been giving increasing consideration to the economic effects of their decisions and policies. Further, users of public resources such as water and timber have effectively used economic arguments for decades to gain increased timber cuts, water for irrigation, and justify the construction of yet another

dam. The general absence of economic information on the river recreation side has left river and fisheries conservation advocates without a full set of tools to work with.

Recent fisheries issues such as the precipitous decline of Pacific Northwest salmon and steelhead stocks, particularly in the Columbia River basin, and numerous hydropower facility relicensing projects across the country, have stimulated economic analyses which have brought these other river benefits to the forefront.

With credible economic analyses in hand, some fisheries advocates are having success at capturing the attention of decision-makers. Other river and fisheries advocates have yet to utilize this potentially powerful river conservation tool.

What are Economic Benefits and Impacts

Understanding some basic economics terminology is essential. Economic benefits related to fisheries and other recreational uses of rivers can be considered within two basic frameworks.

The first, **economic impact**, is an assessment of the effects of using the resource both on levels of economic activity and on equity considerations (who benefits, who pays). This requires identifying monetary expenditures associated with the use of the resource and tracing the impact of these expenditures as they ripple through the economy. Economic impact answers the question, "What is the economic activity generated by the use of the resource itself?"

The second framework, economic efficiency, looks at "**total economic value**" and includes both use and non-use values. This framework generally examines an individual's "willingness-

to-pay" for use of the resource, over and above what they are currently paying (expenditures), or for having the resource available for use in the future. Techniques for estimating these benefits include contingent valuation and travel cost models (see page 6).

Estimating Economic Impacts of Recreational Fisheries

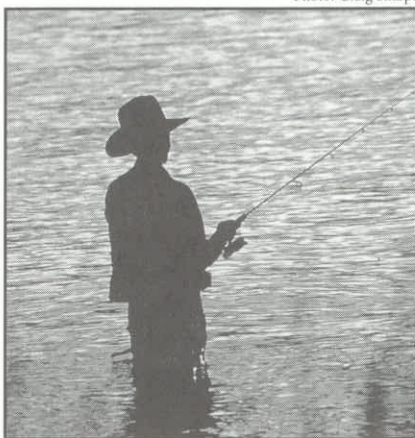
Expenditures by recreational anglers measure the value of fisheries resources to local, state, and national economies. Changes in regional economic output, income, and employment associated with changes in expenditures by recreational anglers do not measure the benefits of a recreational fishery. Instead, they represent accounting measures of transactions and income payments which give an indication of the economic activity generated in a local area or region that is related to fishing. Expenditures represent costs to the angler, not benefits. They do not measure the loss of value to the angler that would result should fishing opportunities be diminished or eliminated, or the gain in value resulting from expanded or new fishing opportunities.

Recreational anglers purchase things such as tackle boxes, boats, rods and reels, and numerous other items for their fishing activity. Angler surveys can be used to estimate the amount of expenditures made by anglers and also ascertain where those expenditures were made so they can be assigned the proper location (local, state or national level). Once angler expenditures are measured, then economic impacts can be calculated.

Types of Economic Impacts

There are basically three types of economic impacts: 1) **Direct impacts**,

Photo: Craig Sharpe



Fishing makes up a significant proportion of the tourism industry in Montana.

which are the initial purchases made by anglers; 2) **Indirect impacts**, which are the purchases made by businesses to produce the goods or services demanded by anglers; and 3) **Induced impacts**, which are purchases of goods and services by households receiving wages from businesses producing direct or indirect goods and services. The purchase of a fishing rod provides a good example of a direct impact. The associated indirect impact would include the purchases by the rod manufacturer of graphite, paint, guides, reel seats, and other items. Further indirect impacts might include the purchase of pigments by the paint supplier and aluminum by the guide supplier. Induced impacts would include all purchases by households with the wages paid to employees of the retailer, and rod, paint, graphite, guide, pigment and aluminum manufacturers in the proportion they contributed to the final product.

Total economic impact is the summation of these three levels of impact. The total economic impact divided by the direct impact is called the **multiplier** and reflects the number of times the initial expenditure circulated through the regional economy. The economic effect of any activity may seem infinite as initial expenditures are spent and respent by suppliers and households. However, there are several limiting factors. Expenditures are only impacts on a specific region if they take place in that region.

In the case of the fishing rod, the suppliers of paint, graphite, and aluminum are probably not located in the same region as the rod manufacturer. Households, which are the source of the induced impacts, save part of their wages and have part

withheld in taxes. Also, businesses do not spend a dollar in inputs for every dollar they take in. These and other reductions provide a finite limit to the effects of the initial expenditure.

Five Study Steps

In conducting an economic impact study, there are five general steps that need to be followed:

- 1) define the scope of the study, such as salmon fishing in the Columbia River or all fishing on Eagle Creek;
- 2) collect expenditure data from anglers through on-site interviews or mail surveys;
- 3) categorize expenditure data by type;
- 4) determine the amount of the expenditures that were made within the impact study region; and
- 5) use the regional expenditure data in conjunction with an economic input-output model, containing appropriate regional multipliers, to estimate the total economic impact within the region.

Obtaining the requisite expenditures data for analysis is often the most difficult part of conducting an impact study. Most organizations do not have the resources, either human or financial, to collect original data to meet their study needs. Further, once data is in hand, finding and using an input-output model can be equally daunting.

Don't let these obstacles sway your decision toward not pursuing an economic impact study. There are several sources of data on angler expenditure and input-output models to overcome these hurdles. First, state fisheries programs often conduct surveys on individual rivers and streams. These are generally conducted on an a-periodic basis or

when the need arises. Encouragement from the angling community and local business organizations can often move this type of research up on the priority list. Second, the "National Survey of Fishing, Hunting and Wildlife Associated Recreation" conducted every five years by the U.S. Fish and Wildlife Service has extensive expenditure information on freshwater and saltwater fishing for each state. While this information is not collected by water body or species, it can be very useful under some circumstances. Another alternative is academic institutions which are involved in recreational fishing research. Fisheries, economics and parks and recreation departments are good places to begin looking.

The U.S. Forest Service has developed extensive input-output models as part of their planning process. IMPLAN was developed to assess the impacts of various harvest levels on local economies. The model works quite well for recreational activities as well. The American Sportfishing Association has developed a series of state-level input-output models for its assessment of impacts using the U.S. Fish and Wildlife Service's national survey data. These models can be adapted for local rivers and river systems but are limited by the availability of local multipliers. County-level multipliers often exist and can be substituted into these models to better reflect local conditions.

Contact the American Sportfishing Association (ASA) for more assistance and guidance in assessing the economic impact of fisheries. ASA can be reached at 1033 North Fairfax Street, Alexandria, VA 22314. 🐟

Tony Fedler, Ph.D. is the director of economics at the American Sportfishing Association.

Bull Run: A Case Study in Foresight...and Mismanagement

by Regna Merritt

“How does protecting your municipal watershed save you money? ... Tax dollars spent to clean water fouled by logging, mining, manufacturing or agriculture are an obvious, if indirect, public subsidy to those industries. The waters in Oregon’s rivers and streams belong to the public. Why should we all pay to clean what certain industries foul?” *Wild Oregon*, Oregon Natural Resources Council’s newsletter

Over a century ago, visionary Oregonians began protecting more than 140,000 acres in the then-pristine Bull Run and Little Sandy watersheds in order to provide reliable, inexpensive and pure water for future Portland residents. Why? Because their in-town sources had become polluted.

The first Portlanders drew their water from wells. By the mid 1850s, these had become polluted and unreliable, as flows were diminished after trees in the area were cut and houses built.

Next, the surface waters of Caruthers Creek, Balch Creek and the Willamette River were tapped to quench the thirst of the growing city. But with increasing human activity, both within Portland and in upstream communities, pollutants concentrated in the reduced summer flows.

The Bull Run Vision 1884-1950

By 1884, citizens staged protests, complaining about their tainted water. The Portland Water Board decided that making Willamette River water fit for human consumption was too expensive. Fortunately, clean, abundant, cheap water could be gravity fed to the city from an uninhabited forest 35 miles away.

Scouts traveled three days to reach the Bull Run, Gordon Creek and Little Sandy watersheds, according to a Portland Water Bureau publication. At that time, these areas were rugged wilderness impossible for a horse and difficult for a human to traverse. Standing and fallen timber so obstructed hillsides that in many places progress could only be made by wading waist deep in the frigid streams. But this complex forest produced waters as pure and clean as any they had ever seen.

City leaders of that era knew permanent protection of this watershed from settlers, grazing and timber interests was essential. In 1885, the Chairman of the Portland Water Committee warned:

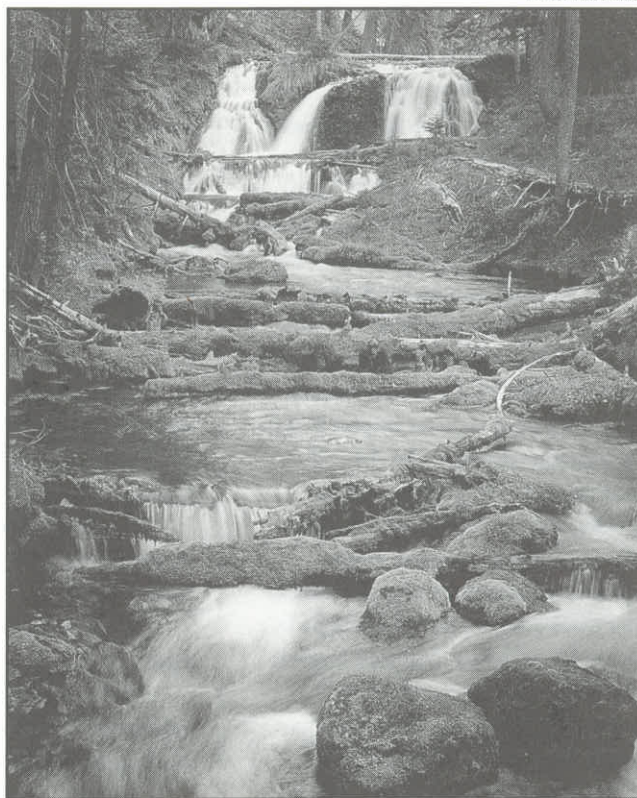


Photo: Tim Palmer

Intact watershed forests are essential for properly filtering drinking water.

“If [Bull Run’s] forests are burned by the owners of sheep or cattle, or removed by lumber companies, the snow will go off in sudden freshets with the first warm weather, the springs will go dry long before the summer is over and the water system which cost the people of Portland \$3 million will be greatly impaired if not rendered useless by a few individuals for the sake of a few thousand dollars worth of sheep, cattle, and lumber.”

In 1892, city leaders prevailed upon President Harrison to create the Bull Run Reserve, where entry or settlement was restricted. Drinking water first flowed from the Bull Run to Portland in 1895. By 1904, President Roosevelt had signed the Bull Run Trespass Act, which forbade entry into the forest except to protect the forest and the water supply. The task of managing the watershed was given to the newly formed Forest Service, which today oversees it as part of the Mt. Hood National Forest.

Risky Business 1950-1995

Portland’s municipal watershed remained largely intact until illegal logging by the Forest Service violated the reserve

in the 1950s. Various actions reduced the size of the reserve to just under 100,000 acres, including a 1977 law that shrunk the reserve by some 10,000 acres; legalized logging in both watersheds; and excluded some of the Little Sandy, a potential future water supply, from the new "Bull Run Watershed Management Unit."

The Forest Service built hundreds of miles of logging roads and cleared more than one-quarter of the Bull Run basin. Of course, logging and road building have never improved water quality and quantity, but introduced other risks as well. Most of the fires reported in the Bull Run since 1958 have resulted from logging operations. In addition, the artificial forest "edges" along clearcut boundaries were susceptible to wind, and thousands of acres of trees blew down in 1983. After that, salvage logging proceeded, and the Little Sandy watershed was given over to timber production. Protection efforts led to a temporary moratorium on logging Bull Run in 1994.

Consequences

What has come from opening Portland's watershed to logging? Summer stream temperatures in the Little Sandy violate state standards for drinking water many days each summer. Silt displaces water in our reservoirs, threatening the quantity and quality of Portland's water. Although the city's reservoirs should hold 17 billion gallons, they now store about 10 billion gallons of usable water because of the sediments settling behind the dams.

Given the metropolitan area's rapidly expanding population, the region's increasing tendency toward drought, and the loss of some of Portland's wells due to industrial contamination, protecting the Bull Run watershed is critical to the future of about one-quarter of the state's residents. We cannot afford to take further risks with this water supply.

Anticipating dramatic growth, regional water suppliers are facing the same choice that city leaders faced in the 1880s. After rejecting the Willamette River as a drinking water source a century ago, should Portland return to it now with its

"...if sediments from logging in Portland's Bull Run Watershed degrade water quality, city residents may have to pay more than \$200 million for a filtration plant."

Wild Oregon, Oregon Natural Resources Council's newsletter

Safe Drinking Water

Passage of the 1986 Amendments to the federal Safe Drinking Water Act indicated a renewal of national concern for drinking water quality. In addition to requiring improvements in treatment, disinfection, and compliance monitoring, the U.S. EPA's Surface Water Treatment Rule places an increased emphasis on source protection for unfiltered surface water systems whose managers wish to avoid filtration. Watershed protection programs using source protection techniques—such as buffer zones, land acquisition, reservoir-use restrictions, best management practices and others—can play a significant role in maintaining or enhancing water quality and in providing cost-effective options to the use of advanced water treatment methods.

Source: *Effective Watershed Management of Surface Water Supplies*, American Water Works Association, 1991.

Superfund sites, heavy metal pollutants, dioxins from pulp mills, and one-eyed fish with skeletal deformities?

Or, should we filter Columbia River water, replete with agricultural herbicides and pesticides, sewage effluent and radioactive waste from Hanford Nuclear Reservation?

Or is it time for us to honor and reclaim our Bull Run legacy, to protect our forested watershed as our ancestors intended? Their conservative and prudent approach is still the least costly and most beneficial. And shall we take steps to limit our growth, and live within our "ecological budget" by using water more efficiently? If so, future generations, as well as fish and wildlife, will benefit from the pure, inexpensive waters of these bountiful watersheds.

Many Oregon cities face a similar choice of either conserving their existing forested municipal watershed or paying the high costs of filtering tainted waters. ◀

In 1995 ONRC will work to strengthen and pass the Bull Run and Little Sandy Watershed Protection Act, calling for both aggressive water conservation and a permanent ban on logging.

Regna Merritt is the Clean Drinking Water program leader for Oregon Natural Resources Council. For more information contact ONRC, 522 SW 5th Avenue, #1050, Portland, OR 97204. Reprinted with permission from ONRC.

Hard-earned Lesson from the Midwest Floods

Floodplain open space makes economic sense

by Kate Hanson and Ursula Lemanski

The price tag for disaster assistance to Midwesterners after the Great Flood of 1993 was astronomical¹:

- \$4.2 billion in direct federal expenditures,
- \$1.3 billion in payments from federal insurance programs,
- more than \$621 million in federal loans to individuals, businesses and communities.

The severity of the 1993 floods led taxpayers, lawmakers and the many federal, state and local agencies that provide flood protection and disaster relief to ask a similar question: How can we afford to repeatedly pay to rebuild in places that flood over and over again?

In response, the federal government made a major shift in public policy. For the first time, a significant share of disaster funding was made available to local governments to "buy out" damaged structures and remove them from floodplains. Now, close to two years after the devastating floods, a number of Midwest communities are looking forward to the conversion of these buyout areas to public open space.

Few people who pursue the option to be bought out and move from the floodplain are motivated by desire for appropriate land use. They just want to put their lives together after a flood and avoid having to go through the ordeal again. However, a year or more into a buyout project, when negotiations with individual property owners are nearing completion, attention shifts toward the future of the buyout properties. Adjacent landowners have concerns about cleanup and use of the buyout area, and the community as a whole doesn't want it to become an eyesore. People begin to consider the possible benefits of open space.

This has been the case in Iowa, where, as of early March 1995, more than \$19 million had been obligated by the State Emergency Management Division to purchase flood-damaged homes. Staff of the National Park Service Rivers, Trails & Conservation Assistance Program (NPS) are working with three towns that have requested NPS help to develop and start implementing local open space plans for flood buyouts.

One of the three towns, Cherokee, has Iowa's largest residential buyout: 187 properties in a 67-acre area along the Little Sioux River.² The Little Sioux went out of its banks five times in Cherokee between April and July 1993. It had

¹All figures are from *Sharing the Challenge: Floodplain Management into the 21st Century* (June 1994).

²While 187 properties are in the "buyout area" that has been approved by FEMA and the Iowa Emergency Management Division, individual property owners decide whether they will participate in the buyout.

Photo: National Park Service



Buyout property on the floodplain of Lincoln County, Missouri.

also flooded in 1963, 1965, 1969, 1983, 1984, 1987 and 1990.

Cherokee has been working for a number of years to protect and restore floodplain open space. The city has put in place and enforced strong floodplain ordinances. It also has identified the floodplain corridor as a greenbelt and encouraged private donation of land within the corridor. When the disaster declaration was made in 1993 and hazard mitigation funding became available, Cherokee was quick to act on the opportunity to further floodplain management goals through property buyouts.

For Cherokee, as for other Midwest towns, putting together a buyout project has proved to be an arduous undertaking—one requiring extensive public education, communication with individual property owners, and coordination among an array of federal and state agencies.

NPS is helping Cherokee make its way through the open space planning aspect of their buyout project. Rivers, Trails and Conservation Assistance staff have worked with city officials to form a local Greenspaces Advisory Committee, which is sponsoring a workshop to get people's ideas on how to use the buyout area as open space. NPS will help the Advisory Committee and the city review the ideas, compile an open space plan representative of what the community wants, and identify potential funding sources to implement the plan.

Nevada and Audubon, Iowa, other towns that NPS is assisting, have similar open space planning efforts underway for buyout areas.

Like Cherokee, Nevada has strong floodplain ordinances. There is little development along Indian Creek, which runs through town. In a strategic planning effort several years ago, Nevada identified community objectives which included

BY FOCUSING LOCAL ATTENTION ON POSITIVE LONG-TERM USES OF THEIR BUYOUT AREAS AS OPEN SPACE...MIDWEST COMMUNITIES STAND TO REALIZE BENEFITS... RECREATION AND CONSERVATION EDUCATION, RESTORING HABITAT, REDUCING SOIL EROSION, AND IMPROVING WATER QUALITY.

development of a multipurpose trail system. When 13 property owners along one portion of Indian Creek showed interest in a flood buyout, the Parks Board recognized the opportunity to put a key trail segment in place.

NPS is helping Nevada develop a comprehensive open space plan for the Indian Creek corridor, including the buyout area. Along with trail development, residents are interested in wetland and prairie restoration and environmental education. The Parks Board is exploring opportunities to extend the open space corridor through easements with private landowners and, possibly, purchase of additional property. There is potential for a 60 to 70-acre trail/greenway system within the city limits, most of it in the floodplain.

Audubon residents are working on a plan for an 11-acre buyout area along Bluegrass Creek that will include wetland or prairie restoration for an outdoor classroom, as well as trails, a picnic area, and an athletic practice field.

They are also enthusiastic about the potential to link their buyout area with a nearby rail line that is being abandoned. The line, which extends 30 miles south to Atlantic, Iowa, is being considered for a segment of the transcontinental American Discovery Trail. Open space planning for the buyout has led residents to start working with the county conservation department, trail proponents in Atlantic, and statewide trail groups.

By focusing local attention on positive long-term uses of their buyout areas as open space, Cherokee, Nevada, Audubon and other Midwest communities stand to realize benefits much more far-reaching than flood damage reduction. They will be providing opportunities for recreation and conservation education, restoring habitat, reducing soil erosion, and improving water quality. Studies indicate they can also expect economic benefits beyond reduced costs of future floods. For example:

Increased property values: A study of property values near greenbelts in Boulder, Colorado, noted that housing prices declined an average of \$4.20 for each foot of distance from a greenbelt up to 3,200 feet. In one neighborhood, this figure was \$10.20 for each foot. (Correll, Lillydahl, and Singell, 1978). The same study revealed that the aggregate property value for one neighborhood was approximately \$5.4 million greater than if there had been no greenbelt.

Reduced cost of municipal services: A South Portland, Maine, study of development costs indicated that residential development cost \$1.30 in directly attributable services for every \$1 of revenue from property taxes (Ryan, 1990).

Expenditures for recreation: More than one-fourth of the total national wildlife-related recreation expenditures, \$55.7 billion in 1985, was related to bird watching and wildlife photography (U.S. Fish and Wildlife Service, 1988).

Local leaders know that buyout open space can be a tremendous asset to their community, one that can enhance their city's livability, attract residents and businesses, and foster community pride. ➤

Kate Hanson and Ursula Lemanski are NPS RTCA staff assisting Iowa communities with open space planning for flood buyout projects.

Hazard Mitigation

Removing structures from floodplains is possible through the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program, which helps fund measures that will reduce or eliminate damages from future floods.

FEMA is quick to point out that participation in the hazard mitigation program is entirely voluntary. But the increased availability of this type of assistance, along with other post-flood policy, legislative and regulatory changes, has led close to 10,000 residents of nine Midwest states to decide that it's in their best interest to move out of the floodplain.

Amendments to the Stafford Act (legislation providing for federal disaster assistance) are among the most notable changes:

- * The federal share of hazard mitigation grants was increased from 50 to 75%, giving communities more incentive to pursue buyouts and other forms of mitigation.

- * A stipulation was added mandating that land acquired through buyouts must be used for open space, recreation or wetland management—in perpetuity. This will help prevent redevelopment in buyout areas.

Recent reforms of the National Flood Insurance Program also support hazard mitigation:

- * A new \$20 million-a-year National Flood Mitigation Fund has been created that will provide mitigation grants to state and local governments on a cost-share basis (75% federal, 25% match) allowing states to encourage and help support ongoing flood hazard mitigation projects.

- * State and local governments can no longer waive a requirement to purchase flood insurance as a condition of receiving federal disaster assistance.

These incentives encourage the types of floodplain land uses that will result in less damage from future floods and give public policy some teeth. They also help lower the cost to taxpayers when the next flood comes, as it surely will. ➤

Balancing Power Generation with other River Values

Lessons from the Deerfield Hydro Relicensing

by Jane Peirce

In the fall of 1994, a historic gathering took place in Shelburne Falls, Massachusetts. Nineteen non-governmental organizations and state agencies met by the side of the Deerfield River to ratify a negotiated Offer of Settlement with New England Power Company (NEPCO). The landmark settlement protects the Deerfield River watershed in western Massachusetts and southern Vermont through the relicensing process for NEPCO's Deerfield River Hydropower Project.

The agreement, representing hundreds of meetings and thousands of hours of work on the part of resource agencies, regional planning commissions, recreationists, environmental groups, and other intervenors as well as the utility itself, is the first of its kind in the Northeast and only the second in the United States.

The settlement offer seeks to balance the competing needs of all the interest groups on the river and is considered to be a model for resolution of dam relicensing issues and future relicensing processes. The estimated dollar value of the Settlement is approximately \$27 million over 40 years, and it's a price that NEPCO is apparently happy to pay.

The Deerfield River—one of America's hardest working rivers—originates in Vermont, flows south into Massachusetts, and finally joins the Connecticut River in Greenfield. In 67 miles, the river provides habitat for native and stocked trout as well as the red-bellied dace and short-nose sturgeon, and is also the site for an aggressive Atlantic salmon restoration program. Sections of the river provide some of the finest whitewater in the Northeast, while other parts are perfect for a lazy tube-float or a leisurely swim.

In that same short distance, the Deerfield River serves 10 hydropower developments. Eight are for the New England Power Company; collectively, they are known as the Deerfield River Project. The Project includes 15 generating units which produce 85 MW of capacity and 290,000 megawatt-hours of hydroelectricity annually. In late 1991, the NEPCO filed a new license application with the Federal Energy Regulatory Commission (FERC), for relicensing of the eight NEPCO facilities of the Deerfield River Project.

How the Relicensing Occurred

The process leading up to the relicensing process actually started in 1987, when several things happened in a short amount of time. While the power company made its plans for preparing the applications, the various stakeholders along the Deerfield, spurred by the formation of the Deerfield River Watershed Association, began to realize that the relicensing process would provide a golden opportunity to change the terms of the license to enhance and protect all the interests along the river.

At the same time, by chance, NEPCO needed to do maintenance work on its No. 5 dam in Monroe Bridge. This resulted in six weeks of raging whitewater in a section of river that had been a dryway for 40 years. Ecstatic whitewater boaters flocked to the 3.5 mile-long dryway to enjoy Class IV whitewater runs that are unparalleled in southern New England.

Meanwhile, local planners and environmental groups had formed a task force to develop a Comprehensive Management Plan for the Deerfield. This plan would be a guidance docu-

ment that would establish the resources and values of the Deerfield Basin, define issues and set goals, and provide baseline data for future scoping and licensing. Recreational boaters, having gotten a taste of what the future could be if instream flows were to be reestablished in the dryway, also joined the task force along with fishers, local businesses, and public officials to develop a truly comprehensive plan that represented all the interests along the River. Power company officials joined the task force which soon formalized itself as the Deerfield River Compact. When Massachusetts formally adopted the Comprehensive Management Plan, the Deerfield River Compact assumed responsibility for overseeing and implementing the plan.

The Federal Electric Consumer Protection Act in 1986 changed the licensing process by requiring that dam operators give equal consideration to recreational and biological issues as well as power generation. FERC could be expected to issue a license that included their version of the terms and conditions that would, in their estimation, satisfy those criteria. The intervenors in the relicensing process, which included diverse interests such as environmental groups and recreational users, realized that a united front presented to the FERC relicensors would be much more likely to result in an agreement that would satisfy everyone. NEPCO agreed, and thus began the series of negotiating sessions that would finally result in the Offer of Settlement.

The agreement commits NEPCO to enhance recreation, fisheries, and conservation along the Deerfield in return for the support of the signatories to the agreement in its efforts to gain a 40-year renewal of its license to operate its Deerfield River Project.

Parties to the agreement include, among others, the Deerfield River Compact, Deerfield River Watershed Association, Appalachian Mountain Club, New England FLOW, Trout Unlimited, American Whitewater Affiliation, American Rivers, National Park Service and other federal and state resource agencies as well as the utility.

What Was Won

Terms of the agreement include provisions for minimum flows and reservoir management to protect aquatic habitat, the installation and operation of recreational facilities and assured public access to NEPCO lands for recreational purposes, prearranged releases of water at two dams for whitewater recreation, fish passages, wildlife management, and the creation of an enhancement fund for future conservation and educational projects.

The estimated value of the settlement agreement is \$27 million, most of which is in the cost of lost income from foregone power generation, incurred when water is used instead for instream flow or reservoir management. A summary of the cost breakdown reads as follows:

- \$22 million - Reservoir Management restrictions and fisheries flows
- \$3.3 million - Fish passage and flow control facilities
- \$1.9 million - Whitewater boating flows
- \$1.3 million - Recreational facilities
- \$100,000 - Enhancement fund
- \$193,000 - Wildlife management

It's important to recognize that the value of the settlement does **not** include secondary economic impacts of the enhanced instream flows (i.e. the impacts of healthier fisheries, the expenditures of river recreationists, etc.).

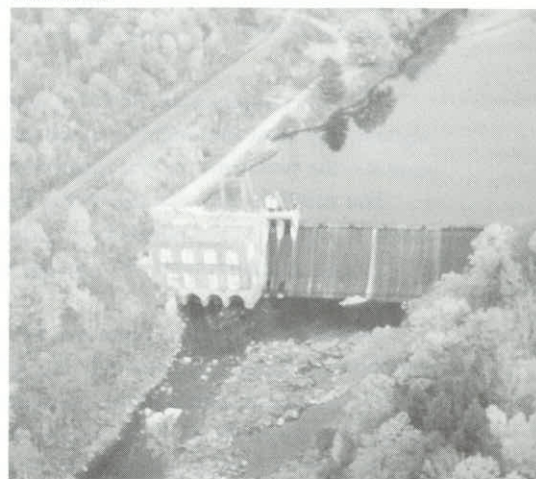
"The negotiated settlement will allow NEPCO to generate enough power to sustain the economic viability of the hydropower operation while vastly improving the condition of the resource it relies on for the energy source."

Also adding significant value to the settlement are the conservation easements and public access provisions on approximately 18,350 acres of NEPCO land in Vermont and Massachusetts that have not been appraised and are not included. Although a dollar value is not available, by some estimates it could very well double the \$27 million package.

By its own admission, NEPCO's former policy was to use every drop of water for energy generation; but the company realizes that philosophy is no longer consistent with public policy, nor is it responsible use of the resource. The negotiated settlement will allow NEPCO to generate enough power to sustain the economic viability of the hydropower operation while vastly improving the condition of the resource it relies on for the energy source.

By presenting FERC with an already agreed-upon set of conditions for relicensing, all parties to the settlement are hoping that issuance of a new license will be expedited. From the utility's point of view, a new license with negotiated terms will be more efficient and economical than a long-drawn-out process with uncertain outcome. From the intervenors' point of view, speedy

Photo: NEPCO



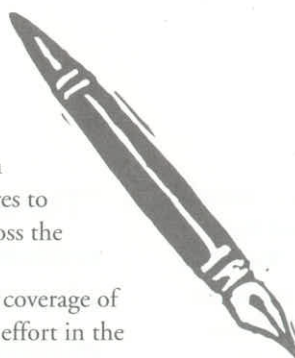
The No. 2 dam and powerhouse on the Deerfield River.

relicensing means that the negotiated terms will be in effect sooner rather than later, and that's better for fish, wildlife, and all the other stakeholders.

Finally, from all points of view, the agreement is consistent with good stewardship. "The successful conclusion of this landmark agreement underscores New England Power's commitment to providing electric power in an environmentally responsible manner," says John W. Rowe, president and CEO of New England Electric System. "This benefits fish, wildlife, recreational users and the entire Deerfield watershed for decades to come." The Deerfield River Offer of Settlement demonstrates the ability of diverse interests to come together to negotiate balanced, environmentally responsible agreements to protect valuable natural resources while still enabling energy production from our rivers. 🐟

Jane Peirce is the natural resource planner for Franklin County, Massachusetts and staff of the Deerfield River Compact.

Letters to the Editor



Elwha River Restoration

Congratulations on your excellent winter 1995 issue focusing on dam decommissioning and removal opportunities. It was among the best features to date on the subject, providing a diverse sample of dam removal efforts across the nation.

We were disappointed, however, with the depth and accuracy of your coverage of arguably the most thoroughly studied, analyzed and documented removal effort in the nation—the two dams on Washington state's Elwha River.

You correctly note that the Elwha dam removal effort has received significant attention in the national press. Yet your publication unfortunately repeated some of the inaccuracies and misperceptions much of that news coverage has contained, particularly in relation to the funding and costs of dam removal.

Removal of the Elwha dams was mandated by Congress in the 1992 Elwha River Ecosystem and Fisheries Restoration Act (P.L. 102-495). Implementing the Elwha Act remains a top priority for environmental organizations, commercial and recreational fishing groups, Native American tribes, U.S. Department of the Interior and the dam owners.

As your lead article pointed out, recent changes in the national political climate and a new fiscal conservatism in Congress pose serious challenges for implementing dam removal efforts nationwide, including those on the Elwha. We disagree, however, that these changes have made securing funding for Elwha removal "unlikely."

Nearly everyone, including key members of Congress, continues to recognize the need for implementing a comprehensive solution to the long-running Elwha controversy. Friends of the Earth is leading a broad coalition of groups working to demonstrate that Elwha dam removal is not only a wise investment, but also the least-cost solution. Failure to fund dam removal would only lead to another round of protracted, expensive litigation—the kind that the 1992 Elwha Act was designed to settle.

Regarding the total costs of removing these dams, opponents to restoring the river often claim a price tag of \$307 million or more, and you quote that incorrect figure at one point on page 9. Please note that the actual cost estimate for Elwha restoration is much lower, between \$147-\$203 million. This figure includes dam removal, sediment management, fish restoration, water quality protections, and other related activities authorized by the Elwha Act.

In addition, in order to insure funding support for moving forward with implementing the Elwha Act, dam removal advocates are also exploring ways to further reduce these total costs—with promising results. Preliminary investigations by the National Park Service, Bureau of Reclamation and the Lower Elwha S'Klallam Tribe indicate that alternative methods of sediment management can reduce the total Elwha project costs significantly to below \$147 million.

These types of cost savings will be crucial as Congress works to come up with a revised funding package for the Elwha—one which addresses new fiscal constraints without compromising the central goal of restoring the river and its salmon runs.

We hope that in a future edition of *River Voices* you can share with your readers a more detailed analysis of the biological, engineering, legal and political factors behind the effort to remove the two antiquated dams blocking the Elwha River. In the meantime, people interested in more information can contact the Friends of the Earth's Northwest Office (206-633-1661).

Shawn Cantrell, Rivers Project Director
Friends of the Earth

Jeff Bohman, River Restoration Coordinator
Lower Elwha S'Klallam Tribe

Editor's Note: River Voices did correctly print the \$147-203 million estimate to dismantle the Elwha dam in the lead article, but incorrectly printed the \$307 million in "Hydroelectric Relicensing."

About this Column

This issue of *River Voices* kicks off our "Letters to the Editor" column.

We welcome your comments and letters and encourage you to share information and ideas about your experiences in saving rivers.

Letters
(continued)



**Clyde River, VT
Relicensing
Dam Removal
Corrections and Update
from winter 1995 RV**

Mona M. Janopaul, Conservation Counsel to Trout Unlimited (TU), reports that TU initiated the movement for the dam and powerhouse removal in 1989 and convinced the Vermont Agency of Natural Resources to join TU in the effort. TU is seeking removal of both the dam and the powerhouse to ensure that there is sufficient water in the river for Atlantic salmon restoration.

In February 1995, the Federal Energy Regulatory Commission (FERC) issued a draft Environmental Impact Statement recommending the removal of the No. 11 dam and no repowering of the No. 11 powerhouse. This is the first time that FERC has recommended "decommissioning" an existing power generating facility, making the Clyde River an even more important, precedent-setting case.

For more information on efforts to save the Clyde, contact Ms. Janopaul at TU at (703) 522-0200. ❖

References and Resources

Updated 1995 Edition
Economic Impacts of Protecting Rivers, Trails and Greenway Corridors by National Park Service's Rivers, Trails and Conservation Assistance Program (NPS RTCA). A valuable resource book to help citizen activists, local planners, and park and recreation administrators understand and communicate the economic benefits of their projects. A compendium of the most recent information from across the country. To receive a FREE copy and other NPS RTCA assistance and referrals to offices in your region, contact NPS, Recreation Resources Assistance Division, P.O. Box 37127, Washington, DC 20013, (202) 343-3780.

Fishing for Values: A Primer for River Protection Activists in the Use of Contingent Valuation as an Economic Tool for Measuring Anadromous Sport Fisheries by Kari Dolan and Patrick Field, National Wildlife Federation/River Watch Network, forthcoming 1995. Although emphasis is on anadromous fish, it is an excellent reference for any river advocate interested in economics. NWF, NE Resource Center, 58 State Street, Montpelier, VT 05602, (802) 229-0650.

River Valuation Bibliography: A Practitioner's Guide to River Valuation Literature by Chiara Dolcino and Stephen O. Andersen. College of the Atlantic, Bar Harbor, ME, 1986. Copies available from River Network.

Annotated Bibliography of Economic Literature on Instream Flows by Aaron J. Douglas, Biological Report 88(39), September 1988. U.S. Fish and Wildlife Service, Research and Development, Washington, DC 20240.

"The Economics of Clean Water," a chapter from *The Clean Water Act 20*

Years Later by Robert Adler, Jessica Landman and Diane Cameron, Island Press, 1993.

Natural Resource Accounting and Sustainable Watershed Management by Dennis M. King, Curtis Bohlen and Pierre Crosson. February 1995. Prepared for President's Council on Sustainable Development, University of Maryland, Center for Environmental and Estuarine Studies, Chesapeake Biological Laboratory, Solomons, MD 20688.

How to Conduct an Economic Impact Analysis. American Sportfishing Association, 1033 North Fairfax Street, Suite 200, Alexandria, VA 22314, (703) 519-9691. Other publications and assistance are also available from ASA.

Economic Benefits of Land Protection by Land Trust Alliance. A collection of statistics, arguments and examples to use in making the case for land conservation. LTA, 1319 F Street, Suite 501, Washington, DC 20014, (202) 638-4725.

Economics of Protected Areas: A New Look at Benefits and Costs by John A. Dixon and Paul B. Sherman, Island Press, 1990.

Jobs and the Environment: The Myth of a National Trade-Off by E.B. Goodstein for Economic Policy Institute, 1730 Rhode Island Avenue, NW, Suite 200, Washington, DC 20036. EPI also produces numerous other helpful publications on current, pressing economic issues.

Journal of Environmental Economics and Management, a publication of the Association of Environmental and Resource Economists, 1616 P Street, NW, Room 507, Washington, DC 20036.

Contact River Network for more references and referrals on river economics. ❖

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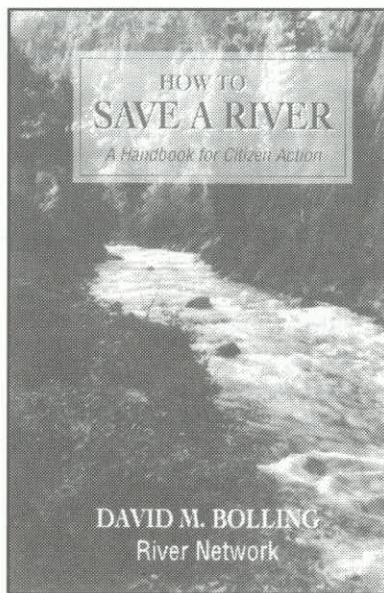
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