

VOLUME 25 | NUMBER 2 | SUMMER 2007 : \$2.50

PERC REPORTS

THE MAGAZINE OF **FREE MARKET ENVIRONMENTALISM**

**Water leasing in Montana
through Trout Unlimited's eyes**

**Trading out of trouble
in the Land Down Under**

**Blue ribbon management
for blue ribbon fisheries**

**Only a market can
clean up the Bay**

BUY THAT FISH A DRINK



FROM THE EDITOR

Growing up in Utah, which ranks among the most arid states, I keenly remember hearing stories about pioneers fighting over scarce water—one of which involved settlers in Utah’s Cache Valley who resorted to throwing rotten vegetables at each other in a dispute over water rights.

My first applied lesson about water scarcity was from my mother; “sprinkler frolicking during the high heat of the day is not allowed as the water will be wasted to evaporation”—a difficult (and devastating) concept for a preschooler. Come to find out, I wasn’t the only one being deprived. Fish, farmers, and buckets of other people, animals, and plants are all thirsty for the elixir of life.

Given the significance of this resource, the summer issue of PERC Reports is devoted to water. In “Buy that fish a drink,” PERC research fellow BRANDON SCARBOROUGH sheds new light on how water wrangles are being solved in some of the fastest-growing and driest states of the union. Trout Unlimited’s STAN BRADSHAW and LAURA ZIEMER take an in-depth look at innovations in water leasing in Montana during the last decade.

Turning to the Land Down Under, JEFF BENNETT with the Australian National University, elaborates on the power of markets to provide resolutions to conflicts arising from water scarcity on the driest inhabited continent.

Program director for the National Fish and Wildlife Foundation, ANDREW PURKEY, discusses the success of the Columbia Basin Water Transactions Program. This is the first and only regional effort of its kind in the United States and has become a model for collaborative, cost-effective water management.

DAVID SCHNARE, environmental scientist and senior fellow at the Thomas Jefferson Institute, tackles pollution in the Chesapeake Bay by declaring that the only viable way to clean up the Bay is through the protection of private property rights and the promotion of markets.

In his column “On Target,” TERRY L. ANDERSON reminds readers that when water is priced correctly people find innovative ways to conserve and trade. Columnist DANIEL K. BENJAMIN, in “Tangents,” elaborates on “The Origins of Beliefs” while “Greener Pastures” contributor LINDA E. PLATTS explores soy oil, geese control tactics, and eco-clothes. “Impressions” should guarantee a smile with its collection of quotes and witticisms about the environment compiled by TIMOTHY M. CRANSTON.

PERC began conceptualizing the possibilities of water markets more than 25 years ago. Today this tool is surpassing early expectations. Through the dedication and devotion of people such as the contributors to this issue, water markets are flourishing. In the words of Fritz Paulus, director of the Oregon Water Trust, “the world is changing landowner-by-landowner, deal-by-deal, stream-by-stream.”

Laura E. Huggins

Laura E. Huggins | EDITOR

PERC REPORTS

THE MAGAZINE OF FREE MARKET ENVIRONMENTALISM

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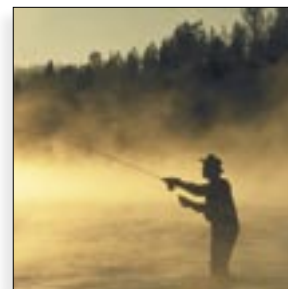
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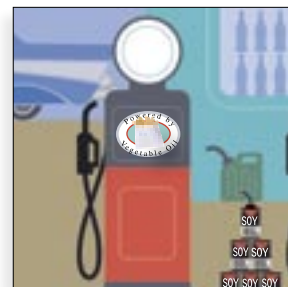
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A tub of soy, finding peace with geese, and the shirt off my back
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OPINIONS

Ideas travel far and fast

I read with interest, as usual, the Spring edition of *PERC Reports*, the one devoted to celebrating the 15 years of Free Market Environmentalism.

I remember the book very well, and not only that, it seems to me that we may have one of the first quotations of the book in an article in Spanish. Together with Alberto Benegas Lynch we both authored an article on environmental issues related to Argentina that was published at the academic journal *Libertas*, Nr. 17, October 1992, Buenos Aires, where there are several mentions and quotations of the book. This is just information for you on how far and fast ideas can go.

—Martin Krause
Professor of Economics
ESEADE Graduate School
Buenos Aires, Argentina

Musings of a loyal reader

I am a loyal reader of *PERC Reports*. The spring 2007 issue got me thinking of my involvement in free market environmentalism during my 35 years as a wildlife biologist. It rang a lot of bells. For about 15 years I have been writing for that splendid lady Carol LaGrasse who heads up the Property Rights Foundation of America (see Nate Dickinson's Common Sense Perspectives at www.prfamerica.org). I recall taking off on a piece by Matt Ridley, "Controlling the British Countryside," from a 2002 issue of *PERC Reports*. Keep up the good work!

—Nathaniel R. Dickinson
Wildlife Biologist and author of
Common Sense Wildlife Management

Climate change figures clarified

Mr. Anderson's articles are always a joy to read, but there was one noticeable error in the spring 2007 "On Target." The article states "Combine this with the estimate from Britain's recent 'Stern Report' that meeting Kyoto targets would cost between 5 and 20 percent of world economic output forever, and you have goals that make no sense."

Stern's 5–20 percent estimate is for the damage due to climate change, not the cost of meeting the Kyoto Protocol. Stern never directly estimates the cost of the Kyoto Protocol. Now, whether Stern's estimates are defensible is another question altogether, and I've written about this in a recent Fraser Forum article. (<http://www.fraserinstitute.ca/admin/books/chapterfiles/Feb07ffSchneider.pdf#>).

—Nicholas Schneider
Policy Analyst
The Fraser Institute

Editor's note: Terry L. Anderson, author of "On Target," stands corrected.

Exciting news from PERC!

The Atlas Economic Research Foundation recently announced that PERC's Enviropreneur Camp (www.enviropreneurs.org) is the first-place winner of the 2007 *Templeton Freedom Award for Social Entrepreneurship*. The multi-faceted awards program, which attracted more than 200 entries from 53 countries, recognizes innovative civil society programs sponsored by independent research institutes around the world. "Economic and political freedom are advancing globally, and men and women focused on ideas, rather than violence, are leading the way," said Atlas President Alejandro Chafuen. "The winners of this year's Templeton Awards demonstrate the breadth of this movement."

A judge for the competition had this to say about the Camp: "PERC's Enviropreneur Camp...seems to be a model of what other organizations should strive to do. The Camp is educational, but it also goes out of its way to introduce a free market perspective into discussions of environmental policy. Consequently students will leave the Camp understanding more about the environment and also more about nongovernmental approaches to what almost everyone today believes should be left up to government."



PERC Enviropreneur Camp Director Bobby McCormick, center, receives the Templeton Freedom Award for Social Entrepreneurship, from Alex Chafuen of Atlas and Stephen Klimczuk of the Templeton Foundation.



Tell me what you think!

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Buy that Fish a Drink

by Brandon Scarborough

Adorning the rotunda of Colorado's state capitol are the words of poet laureate Thomas Hornsby Ferril: "here is a land where life is written in water."



As it was more than a century ago, it is still true today; water is the lifeblood of the American West. It turns barren landscapes into fertile oases of food and fiber, provides flowing paths for migrating fish, and supports complex ecosystems for plants and animals.

The West is changing, however, and its most precious resource is increasingly being used for other purposes—primarily being pulled from streams to support burgeoning urban needs. The dilemma is how to keep water in streams for fish, wildlife, recreation, and even aesthetics, yet still meet growing demands for out-of-stream uses that are helping to enrich local economies and agriculture. As an alternative to costly and inefficient regulations that dictate water allocations between agricultural and environmental uses, voluntary markets of tradable water rights are proving to be an effective and viable solution for governments, local communities, and private groups looking to preserve environmental flows.

Western water law

Water law in the West is based on the prior appropriation doctrine that was developed more than a century ago to address increasing demand for scarce water resources. The doctrine assigns property rights to water based on the principle of “first in time, first in right,” meaning the first to use the water for beneficial use gains the rights to it. Historically, in order to acquire a water right, water had to be diverted from a stream and used in a beneficial way—typically mining, irrigation, or stock watering. Over time, states broadened the definition of beneficial use to include the appropriation of water rights to meet increasing municipal and industrial demands. Unfortunately, after more than a century of appropriations, many streams in the West are now over-appropriated—the amount of water rightfully claimed by water right holders is more than the amount of water in the stream. Competing demands for insufficient water has left some streams severely dewatered, cutting off critical instream flows for fish and other wildlife.

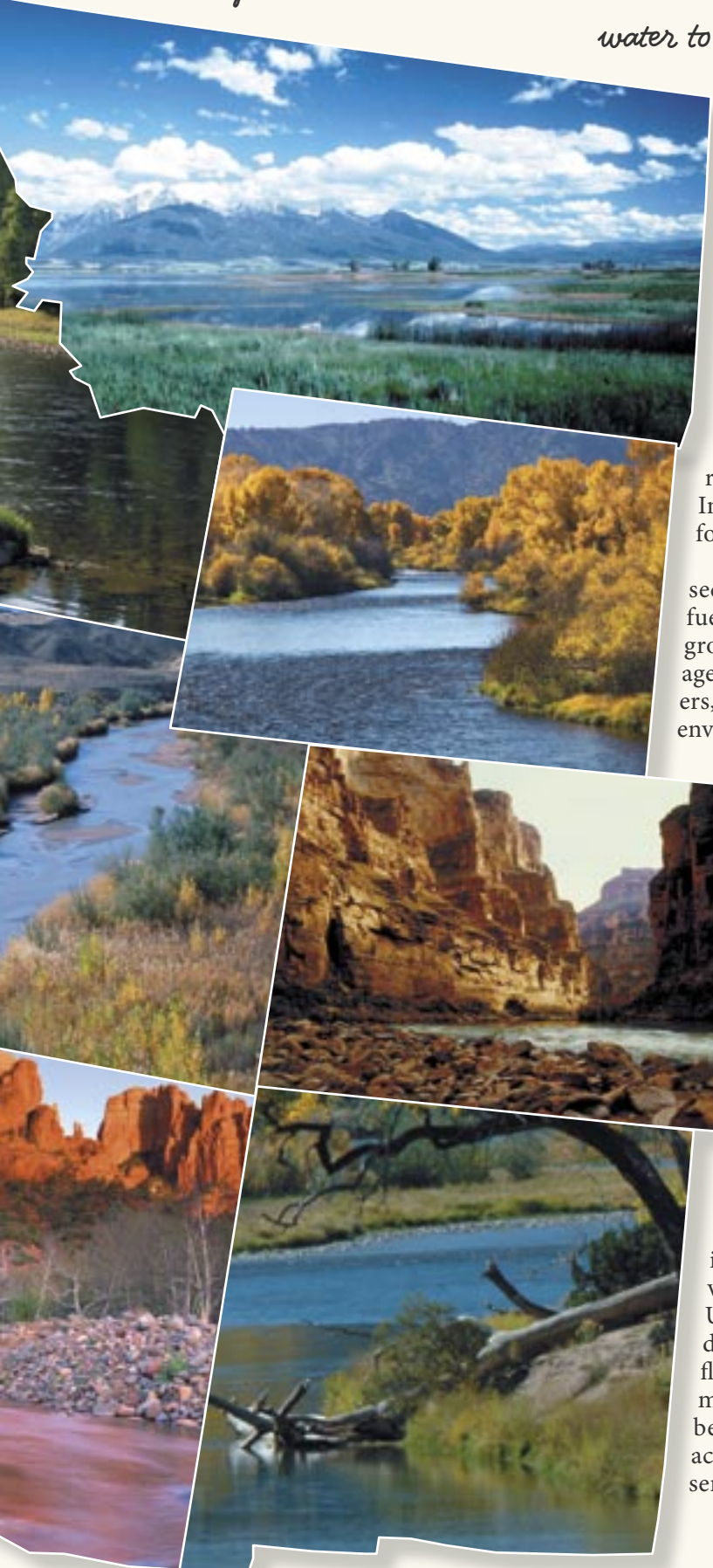
In response to mounting pressure for instream flow protection, some states in the 1960s and 1970s responded with regulatory approaches, such as minimum stream-flow requirements, and imposed conditions on new appropriations. States began adopting legislation that recognized the importance of protecting water for fish and wildlife, and some states even issued new water rights for instream flows. These new water rights, however, were junior to existing rights, and on heavily appropriated streams, they had little or no impact on improving instream flows. As a solution, states began adopting legislation to permit the transfer of existing (more senior) rights through leases, purchases, and donations to be used for instream purposes. The results have been impressive.

Water, water everywhere...

Between 1998 and 2005, approximately \$300 million (see figure 1) was spent in more than a thousand voluntary water right transactions—throughout 10 western



Between 1998 and 2005...government agencies and private conservation groups acquired more than 6 million acre-feet of water to be left instream—enough water to cover an area the size of New Hampshire to a depth of one foot.



states—to restore stream flows for fish, wildlife, and other environmental purposes. Through leases, purchases, and donations, government agencies and private conservation groups acquired more than 6 million acre-feet of water to be left instream—enough water to cover an area the size of New Hampshire to a depth of one foot.

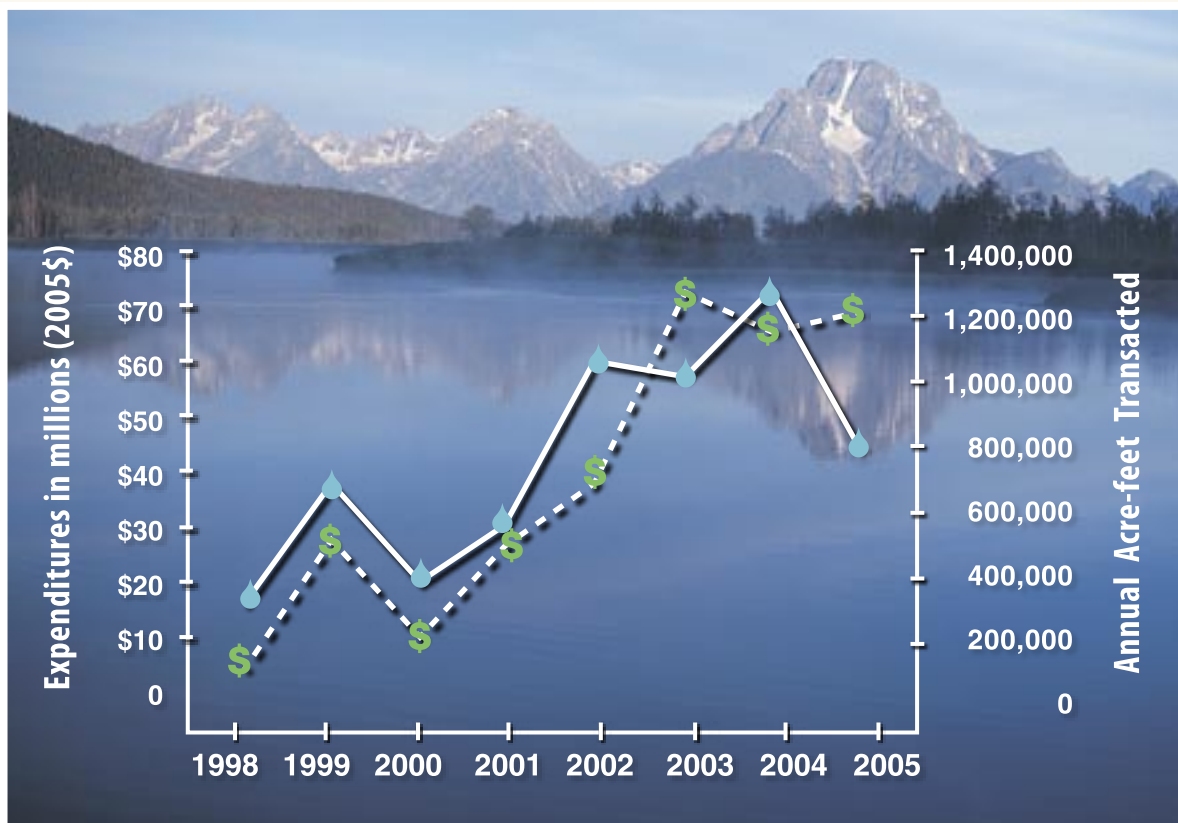
The federal and state governments are by far the largest participants in the market, responsible for nearly 90 percent of all expenditures. The Bureau of Reclamation and various state agencies have been actively acquiring water in California, Idaho, Washington, Oregon, and New Mexico to meet water requirements for endangered species and interstate compacts. In Colorado and Utah, only state agencies have acquired water for instream use.

Changes in legislation and growing interest from the private sector to restore stream flows have motivated the creation and fueled the success of an increasing number of water protection groups. Private groups often work closely with state and federal agencies, irrigation districts, and especially local farmers, ranchers, and other landowners to develop innovative solutions for the environment that are mutually beneficial. In addition to acquiring water, they fund water conservation projects, improve watersheds through restoration efforts, conduct educational programs and scientific research, and assist government agencies in connecting willing water right buyers and sellers.

Founded in 1993, Oregon Water Trust's pioneering efforts to restore stream flows have been an inspiration to others seeking a market solution that balances instream needs for fish and wildlife with the continued use of water for agricultural production and urban communities. Water trusts have since been created in Montana, Washington, and Colorado, all sharing the common goal of restoring instream flows while supporting state policy changes that facilitate the use of water markets. Idaho Rivers United, a river conservation group dedicated to protecting rivers for fish, is currently working to create a water trust in Idaho.

In addition to water trusts, Trout Unlimited has played an important role in efforts to restore stream flows and conserve vital habitat for fisheries in Colorado, Idaho, Montana, and Utah. It also works cooperatively with state policy makers to draft legislation that facilitates water transactions for instream flows. In some states lacking active water markets or legislative means for restoring stream flows, the Nature Conservancy has been instrumental in improving instream flows through land acquisitions. The land is then fallowed and placed under a conservation easement, limiting future consumptive water use.

Figure 1: Acquisitions of water (1998-2005)



Big bang for the buck

Often lacking the funds available to state and federal agencies, private groups have spent comparatively less for instream flows throughout the past decade; however, private expenditures and the number of transactions continue to increase. Private groups spent less but made nearly double the number of transactions of federal and state agencies combined. Moreover, with increasing market activity and funding opportunities, private groups are expected to play a progressively important role in acquiring instream flows.

In Montana alone, there are more than 4,000 miles of streams that are either chronically or periodically dewatered each year. And in the 1990s, nearly every stream in Washington had Chinook, steelhead, or bull trout listed as threatened or endangered under the Endangered Species Act—primarily attributed to low stream flows. Each state in the West has its own story about inadequate stream flows and its impact on local fish, wildlife, and riparian ecosystems.

Federal and state agencies and private groups must decide how the money should be spent and where water should be restored. In practice, state and federal governments spend tens of millions of dollars annually restoring flows on large rivers such as the Columbia, Snake, or Colorado, while private entities generally focus on

smaller streams and tributaries. Both Montana and Washington Water Trusts concentrate their efforts on streams and tributaries where even a small amount of water can have a significant impact. Restoring flows can reconnect critical habitat for the spawning, rearing, and migration of native fish, while maintaining and improving wildlife habitat.

As water markets continue to evolve, however, some private groups are taking on much larger projects. The Lostine River in northeast Oregon, for example, provides critical spawning habitat for coho and spring Chinook salmon. In recent years, low stream flows in late summer and early fall have impeded fish migration and adversely impacted populations, contributing to record low fish counts. In 2005, a cooperative effort between Oregon Water Trust and 115 local ranchers and farmers led to adequate stream flows being maintained to give salmon unimpeded access to spawning grounds high in the Willowa Mountains. More than 800 salmon have since returned to the Lostine to spawn. Landowners were compensated for entering into short-term agreements that ensured adequate water instream throughout the year.

In another landmark project involving the Taneum Canal Company, Columbia Basin Water Transactions Program, Yakima Nation, state and federal agencies, and the Washington Water Trust, winter stream flows have been restored to portions of Taneum Creek and the

Yakima River in central Washington. The partnership is expected to benefit Chinook, steelhead, coho, bull trout, cutthroat, rainbow trout and wintering bald eagles, without affecting agricultural or livestock production.

No two states are alike

Although there are some similarities, no two states are alike in their approach to markets for environmental flows. In Montana, Oregon, and Washington, markets have flourished because of private and public efforts, laws that facilitate the free exchange of water rights, and demand for instream flows. In other states such as New Mexico, Arizona, Nevada, Utah and Wyoming, political, legal, and even social barriers have inhibited markets and thwarted efforts to restore flows for fish and wildlife. The Colorado Water Conservation Board is the only entity permitted to buy, lease, or hold water rights for instream flows and funding for acquisitions has been limited. Transactions for instream flows in Idaho have been limited to short-term leases by state and federal agencies in order to meet Endangered Species Act requirements. Similarly in California, although anyone can acquire water for instream uses, only state and federal agencies are driving the markets. Wyoming remains the only western state that prohibits state or private entities from buying or leasing water for instream uses. Recently introduced legislation, however, could amend some of the existing statutes and ease restrictions on leaving water instream for fish, wildlife, or recreation.

Water marketing for environmental flows has come a long way in the past decade and is gaining momentum. Increasingly states are adopting new legislation and amending the old to strengthen and better define property rights to water, while creating incentives for trade. The success and growing interest in water markets demonstrate that resources can be devoted to environmental goods without the often one-sided effects caused by regulation. As legislative reform occurs, access to markets should improve, allowing broader participation, particularly by private entities. The result will be enhanced stream flows for fish and wildlife habitat while benefiting local landowners and communities throughout the West.



Brandon Scarborough is a research fellow at PERC currently focused on the use of water markets in the West to restore stream flows for wildlife, fish, and other environmental amenities. His other interests include the interactions between natural resources and institutional quality, climate change, and how economic prosperity affects individuals' demands for environmental quality. He can be reached at brandon@perc.org.

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FIGHTIN' OR DRINKIN'

Not surprisingly, global warming is getting the blame for drought conditions in many parts of the American West. For example, in the January 31, 2003, issue of *Science*, researchers from the National Oceanic and Atmospheric Administration (NOAA) reported that recent droughts in the West are caused at least partly by global warming-induced rises in western Pacific and Indian ocean temperatures. Pointing to data between 1950 and 1995 showing that snowpack accumulation in the Cascade Mountains had decreased 50 percent, Seattle Mayor Greg Nickels said, "In a state where salmon, hydroelectric power, and water resources generally depend on snowpack, the claim is a potential blockbuster."

Before jumping on the mayor's bandwagon, however, it is important to note just how careful we must be in making causal inferences based on selected data. The Washington Policy Center reports that Associate State Climatologist Mark Albright saw different trends in the data, casting doubt on the mayor's "blockbuster."

In a memo to scientists at the University of Washington, Albright suggested that there may have been some “cherry picking” with the 1950 to 1995 data. As he put it,

I believe a more accurate statement would be along the lines of 1) The average snowpack in the Cascades has increased over the past 30 years in spite of the steady upward trend in global temperature, or 2) Long term data indicates no significant trend in Cascade Mtns snowpack over the past 90 years, or 3) The snowpack (1997–2007) at Mt. Rainier Paradise has increased 11% since the 1940s.

For his reinterpretation, he was told that he could no longer use the title of Associate State Climatologist.

Such controversies permeate the global warming debate because it has become so politicized. In the case of water supplies in the American West, for example, there is nothing more political than the plumbing system created by the Bureau of Reclamation and Corps of Engineers. As moisture patterns shift, whether due to global warming or other causes, agricultural users may find their irrigation water gone, salmon may be left high and dry, and hydroelectric producers may be called on to replace more fossil fuel production. Making these tradeoffs in the context of the West’s water pork barrel, however, will not be easy.

For this reason, stories such as those in this issue of *PERC Reports* are all the more salient. There is growing consensus that none of the proposed global warming policies, including doing everything proposed in the Kyoto Protocol, will have any meaningful effect on temperature or sea level changes. Moreover, predictions of local impacts of global warming as indicated by the above example are less than precise—making governmental planning problematic.

Assuming that predictions from the global warming models regarding higher temperatures and increased variance in precipitation patterns come to pass and that there is little we can do to reverse the predicted trends, the best alternative is adaptation. For centuries markets and their prices have led demanders and suppliers alike to adapt to food shortages and abundances, to energy crises, and to weather patterns. The same will be true for global warming impacts if we let the invisible hand of the marketplace do its work.

Specifically, in the case of changing water supplies, markets have the potential to encourage adaptation if water rights are clearly defined and transferable. For decades western farmers and ranchers have transferred water rights between one another to accommodate variable stream flows. More recently, growing demands for environmental water uses such as pollution dilution or instream flows for fish and wildlife have been met through willing buyer-willing seller trades. Traditional “use it or lose it” rules are being modified to allow irrigators to transfer their rights, permanently or temporarily, to instream flows. In Idaho, for example, the 2007 legislature unanimously approved the Wood River Legacy Project, which allows ranchers to temporarily dedicate their irrigation water to instream flows without the risk of losing their diversion rights. Between 1998 and 2005,



“whiskey’s for drinkin’
and water’s for fightin’”

approximately 6 million acre-feet of water in the West were restored to instream flows through leasing, permanent transfers, and donations.

Where water prices signal the true scarcity value of water, people find innovative ways to conserve and trade; where prices do not reflect scarcity value, water is wasted and political battles rage. Opening markets to non-traditional environmental uses is a major step toward making prices reflect alternative values. The more that we reform legal institutions to lower the cost of water transfers from one use to another, the more we can adapt to changing demands and supplies regardless of what is causing those changes. With water markets, Mark Twain’s adage that “whiskey’s for drinkin’ and water’s for fightin’” transforms into “water’s for tradin’ leavin’ more time for drinkin’.”

In his “On Target” column, PERC’s executive director TERRY L. ANDERSON confronts issues surrounding free market environmentalism. Anderson can be reached at perc@perc.org.

Water leasing in Montana through Trout Unlimited's eyes



Photo of Randy Mannix courtesy of Trout Unlimited



BY STAN BRADSHAW AND LAURA ZIEMER



Wasson Creek is tiny. If you drive over it on Highway 141 near Helmville, Montana, in the Blackfoot River valley, you likely wouldn't recognize it as a creek, except for the serpentine swath of willows and cottonwoods that mark its course. Its banks are so thick with vegetation that, if you whizzed by at highway speed, you probably wouldn't even notice any water at all.

Despite its humble appearance, Wasson Creek has become a key piece in the effort to restore native trout in this middle reach of the Blackfoot River. Decades of human activity have compromised this fishery, consequently reducing the fish population in the Blackfoot for several miles below its confluence with Nevada Creek. Low flows, high temperatures, and nutrient pollution are some of the challenges facing restoration of Nevada Creek.

Luckily the efforts of landowners on two tributaries of Nevada Creek—Wasson Creek and Spring Creek—mark a promising start on the larger middle Blackfoot restoration effort. Spring Creek has recently been restored from a livestock-damaged, shallow, warm stream to a clean, cold pulse of water running year-round into the lower reaches of Nevada Creek.

But even restored, Spring Creek was not as productive a fishery as it could be.

That's where Wasson Creek comes in. Wasson Creek has taken its share of knocks. The creek has suffered from straightening, irrigation depletions, and grazing. But the reach of this small creek above the irrigation diversion is home to a robust population of pure-strain westslope cutthroat trout. This fish was once the most plentiful and widespread of the cutthroat subspecies in the West, but currently occupies only a quarter of its historic habitat. Native fish in Wasson Creek represent a promising seed source for Spring Creek, Nevada Creek, and eventually the Blackfoot. The problem is that, until recently, irrigation diversions de-watered lower Wasson Creek to the point that cutthroats could not migrate down to the newly restored Spring Creek.

For the past few years, however, the Mannix Brothers Ranch, the primary owner on Wasson Creek, has partnered with Trout Unlimited (TU), the downstream landowners, and several state and federal agencies, on a comprehensive restoration effort. An integral part of that effort was to restore flows in the creek's lower two miles. But the Mannix Brothers Ranch needed irrigation



water from Wasson Creek to provide grass for its cattle.

Working with TU, the ranch came up with a solution that allows them to continue their spring irrigation, while keeping flows in the creek in late summer. It is a water lease—where a portion of the irrigation right is dedicated to instream flows. With funding from the Columbia Basin Water Transactions Program, TU pays the ranch for its lost pasture production from foregoing late-season irrigation and keeping 0.5 cubic feet per second (cfs)—about 224 gallons per minute—flowing in the creek. For Dave and Randy Mannix, it was a question of balance. A water lease with TU gave them the flexibility to restore the stream while maintaining an economically viable agricultural operation.

The results were immediate. In the fall after the first season of the water lease, westslope cutthroat turned up in Spring Creek for the first time in decades. Trout Unlimited and the Mannix Brothers Ranch now have a ten-year water lease to maintain flows in Wasson Creek, helping to bring back the native fish.

Water leasing 101

The Montana water leasing statute allows one to lease agricultural irrigation rights in order to improve stream flows. Water right holders can also convert their water right to instream flows without entering into a lease with anyone, by changing the use of their water right to an instream use with Montana's water permitting agency, the Department of Natural Resources

and Conservation (DNRC). Leases and private conversions can run for up to ten years with a possibility of renewal.

The private water leasing statute includes a number of elements to assure that other water right holders are protected. The applicant for a change to instream flow must identify the length of stream to be protected, and must prove that the rights of other water users will not be adversely affected. In addition, other water right holders are allowed to object to the lease even after the DNRC has approved it, which means that if another water rights holder did not anticipate an adverse effect there is a chance to raise that concern after the water lease is in place.

An instream flow lease takes several years to secure. In most cases, TU first identifies a stream in which low flows are a limiting factor to fish, and looks at how irrigation is affecting the flow. Second, TU must negotiate a water lease with a willing water rights holder. Third, the landowner (with TU's help) applies to the DNRC for the approval of a change to an instream use for all or part of the leased irrigation right. Finally, the DNRC reviews the water right and proposed changes, and either approves or denies the proposed lease.

Leasing lessons learned

Ten years of practical experience has shown that while water leasing can create excellent results for trout habitat, it also has limitations. Changing an existing water right to an instream use won't always deliver water to a stream. Water rights on a

very dry stream can often be complicated, making it nearly impossible to set up a workable system. Just the right combination of seniority of the water right, location of the diversion, the amount of water to be left instream, the condition of the stream itself, and the willing participation of the irrigator all play a part in a successful water lease.

Experience has also shown that water leases are most effective on tributaries, as opposed to mainstem rivers. In many locations in the state, they are quite literally the spawning and rearing factories for wild fish. More than a decade of research on the Blackfoot River, for example, shows that where the tributaries are healthy, the mainstem fish populations are fine; when the tributaries are impaired, the mainstem fish populations are poor.

On most tributary streams, the amount of water necessary to provide good spawning and rearing habitat is relatively small. As a result, a little bit of water in a tributary can go a long way in restoring a fish population, as in our 0.5 cfs story about Wasnon Creek. On the other hand, it has not been cost-effective to pursue a change for a water right on a mainstem river where it is difficult to measure the additional flow, and even harder to determine its contribution to the fishery.

Another restraint on the leasing program is that, unlike conservation easements, water leases are not tax deductible. Making leases tax deductible could help to increase participation, but the leases would have to share some of the characteristics of a conservation easement—permanency and a full property interest—before landowners could receive tax benefits from either the state or federal government.

A final lesson from TU's experience in water leasing is that instream flow changes work best when they are integrated with other habitat restoration. If flows are improved on a stream channel that has been degraded by other activities, the lease may not achieve its intended result. Water leases and changes to instream uses are proving to be most valuable in cooperative watershed efforts where habitat restoration and enhancement are occurring.

On the North Fork of the Blackfoot River, for example, a multi-year, multi-faceted project is underway to restore native trout habitat in the lower 5.6 miles of river. The effort includes screening irrigation ditches, habitat restoration of tributary streams, and water leases to restore flows. In the case of the North Fork, no single water right is sufficient to fully re-water the river. As a result, the watershed group is working with several irrigators to improve stream flows at key times of the summer and fall, while maintaining ongoing agricultural operations. Trout Unlimited has worked on two water leases with irrigators on the North Fork, as well as a rancher on an important North Fork tributary, Rock Creek. The North Fork restoration provides yet another example of where the whole is greater than the sum of its parts, and water leasing is but one of many important pieces.



Portions of this article have appeared in TU publications, "A Buyer's Guide to Montana Water Rights" by Stan Bradshaw, and "Private Water Leasing: A Montana Approach," and are used here with the permission of the authors (pictured above): Laura Ziemer, Director, Montana Water Project—Trout Unlimited, and Stan Bradshaw, Program Attorney, Montana Water Project—Trout Unlimited.

IMPRESSIONS

Compiled by Timothy M. Cranston



EARTH DAY

"Last Sunday was marked by an orgy of celebrations of Earth Day, the worldwide annual event intended 'to spark a revolution against environmental abuse'... [But it is] human ingenuity and technology that not only raise living standards, but also restore environmental amenities. How about a day to celebrate that... Economic Progress Day?"

—John Stossel, Anchor, ABC News 20/20

HOW WRONG CAN A GUY BE?

"The Nazis got 200 German scientists to say that Einstein was wrong, and then somebody asked Einstein, 'How does it feel to have 200 scientists against you?' And he said, 'It takes only one to prove me wrong.'"

—Michael Crichton, in a global warming debate

PERC MOTTO:

"You don't promote the cause by talking only to those who agree with you."

—Dwight Eisenhower

ON MARKETS, INCENTIVES, AND THE ENVIRONMENT:

"It is time for public-land agencies to start running themselves like businesses and stop running themselves like an entity that gives things away to businesses. If we don't keep records, if we don't measure it, we can't improve it."

—Carl Pope, Sierra Club President

"[The market] is a humbler way of going about things than by following the conceited blueprints of politicians, the hubris of monopolistic businessmen, or the arrogance of scientists."

—The *Economist*, an unsigned editorial

"All my constituents love forests. It's just that some love them vertical and some horizontal."

—unnamed elected official

"When we buy wood, we are sending a signal to plant more trees to satisfy demand. If there were no demand for wood, landowners would clear away the forest and grow something else instead."

—Patrick Moore, founding and former member of Greenpeace

A TRANSLATOR'S GUIDE TO ENVIRONMENTAL VOCABULARY

Entries from the (fictitious, as yet) "A Translator's Guide to Environmental Vocabulary," started by Owen McShane and Wallace Kaufman (PERC welcomes readers' entries):

Crude oil: incompletely recycled plant wastes that humans finish recycling as gasoline.

Farmland preservation: cultivation of permanent clearcuts, usually devoted to a few cash crops and preserved in such a way as to remove wildlife habitat.

Old growth forest: collective of trees in which a few large species kill off competitors for energy and form a local solar energy cartel, rationing this vital resource away from lower growing plants and other species of biodiversity.

Solar Energy: radiation from a centrally located nuclear reactor that provides the primary support for all plant life, and that has recently been converted to electricity in extremely small quantities.

ON ENDANGERED SPECIES:

"[After the 1973 Endangered Species Act was passed,] the feds decided that...the spotted owl was being killed off by logging, so (under President Clinton) they cut logging by 80 percent in the Northwest, killing off more than 130,000 jobs. Now it turns out that the science used to justify this war on a whole industry was likely bogus. It appears that what has caused the decline of the spotted owl was not evil hominids or vile technology, but another owl—the larger and meaner barred owl—had been killing and otherwise displacing the wimpy spotted owls.

Biologists are apparently surprised to learn that the fittest survive. The role of the barred owl was suspected in the early 1990s, even as the Clinton enviro-axe fell upon the hapless loggers' heads; but many scientists swept doubts aside, claiming that 'the best science' put the fault on logging. Now that we know they were wrong, will these green activists admit their error and apologize to the hundreds of thousands of victims of their misguided policy? No. They don't give a hoot."

—Gary Jason, in *Liberty* magazine

"There is increasing evidence that at least some landowners are actively managing their land so as to avoid potential

HOW SHOULD SCIENCE INTERACT WITH POLICY MAKING?

"We have to offer up scary scenarios, make simplified, dramatic statements, and make little mention of any doubts we may have. Each of us has to decide what the right balance is between being effective and being honest."

—Stephen Schneider
(leading advocate of the global warming theory)

"In the long run, the replacement of the precise and disciplined language of science by the misleading language of litigation and advocacy may be one of the more important sources of damage to society incurred in the current debate over global warming."

—Dr. Richard S. Lindzen
(leading climate and atmospheric science expert—MIT)

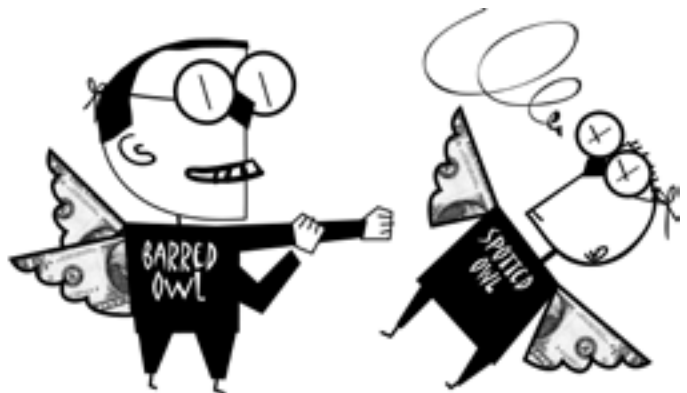
THE KEYNES CHALLENGE:

"When the facts change, I change my mind. What do you do, sir?"

—J.M. Keynes

endangered species problems. Now it is important to recognize that all of these actions are...not the result of malice toward the environment. Rather, they're fairly rational decisions motivated by a desire to avoid potentially significant economic constraints. In short, they're really nothing more than a predictable response to the familiar perverse incentives that sometimes accompany regulatory programs."

—Michael Bean, Environmental Defense





TRADING OUT OF TROUBLE:

IN THE LAND DOWN UNDER

BY JEFF BENNETT

A headline in a recent issue of the *Economist* proclaimed Australia to be as “Dry as a Dead Dingo’s Donger.” Although the current drought is severe, water shortages are not new to Australians.



The aboriginal people evolved complex strategies to cope with droughts and during the 200 years of European settlement, farmers and city-dwellers alike have had to come to terms with a climate characterized by highly variable patterns of rainfall. Despite the best efforts of engineers to develop dams, tunnels, pipes, and channels, water scarcity remains today. Demands for water continue to increase with population growth and with the rise of irrigated agricultural enterprises. Moreover, the relatively recent recognition of the importance of healthy river ecosystems has added to the desire for water in the form of “environmental flows,” the amount of water needed in a flowing body of water to maintain a healthy ecosystem.

Efforts to overcome water scarcity are now being transformed into methods for living with less water. That means making the best possible use of the water that is available. For more than 20 years, important steps have been taken in the Land Down Under to improve resource-use efficiency through the use of water markets.

Prior to 1970, rights to water were allocated by government agencies. Entitlements were assigned to parcels of land and the price charged by the state for water use on these parcels was extremely low. Demands for additional water were met through engineering initiatives with droughts being “handled” using a variety of regulations. This process had three important implications.

First, the allocation of entitlements to water became an important tool for farmers to manipulate the political environment. Farm lobby groups could secure irrigation-based wealth through their capacity to direct votes in rural electorates. Even when the capacity of river systems to supply water for extractive purposes had been exhausted, governments continued to allocate rights to secure political favor.

Second, with next to nothing being charged for water use, farmers had no incentive to conserve the resource. Technical inefficiencies in the application of water abounded. For instance, overhead sprinkler systems were used in the heat of the day ensuring maximum evaporation rates, and delivery systems such as canals and pipes allowed significant “transmission losses” between storages and farms. Negative environmental effects such as irrigation-induced salinity were evident.

Third, with water entitlements tied to land title, the transfer of water to different uses in different locations was heavily restricted. The potential to secure improvements in the returns being offered by water through transfers of entitlements was effectively lost.

The first breakthrough in dealing with these issues came in 1994 when the federal government stepped in to impose water regulatory reform on the states. Title to water was separated from land title. In addition, state agencies were required to develop plans for each river system that involved the setting of environmental flow targets.

These two measures precipitated the development of water markets in Australia. With environmental flows determined, a “cap” was defined for the amount of water available for extractive purposes. Those seeking access to water within the cap could then enter the market to trade. While water leasing has been more voluminous, permanent trades are increasingly prevalent. As a result of these trades, water has shifted around regions and between crops to its highest-valued use. Furthermore, with prices for entitlements reflecting the scarcity of the resource, irrigators have also sought to conserve water through the introduction of high-tech water application techniques such as computer-managed drip irrigation systems.

Despite these innovations, the problem of over-allocated river systems remains. The total amount of entitlements still exceeds supplies in several

IN THE LAND DOWN UNDER

Australia's drought poses a problem for grazing livestock. The author captured this photo of sheep looking for sparse grass on his property.



catchments. While many entitlements have never been activated (so-called “sleeper” and “dozer” licenses), the advent of water trading has encouraged farmers to activate their rights. The impact is that the proportion of an entitlement an irrigator may receive in even a wet year is below 100 percent.

In January 2007, the Prime Minister announced an initiative to spend A\$3 billion (US\$2.4 billion) to buy back entitlements from farmers in the Murray Darling Basin in Southern Australia to overcome the over-allocation problem. The buy-back scheme is targeted to meeting the environmental flow goals for the basin. Ironically, much of the fund may end up being used to buy “dry water,” as it will be the low security sleeper and dozer licenses that are likely to come onto the market first.

Clearly, the policy changes over the past two decades have generated fundamental improvements in the way water is used in Australia. Many issues, however, remain to be resolved.

The level of environmental flows is still defined in rather ad hoc processes driven more by politics than science and economics. Little is known about the environmental responsiveness of most river systems to redirecting water away from current extractive uses to restoring more natural flows. Even less is known about the extent of value that Australians place on the environmental public goods that are provided. The potential for markets to facilitate the allocation and management of environmental flows remains untapped.

Water accounting is still in its infancy. In some situations, water rights are not yet clearly defined or defended. For instance, rules have been implemented that restrict the capture of rainwater in farm storages. Farm forestry ventures, however, do not have to hold entitlements for the water they capture through evapotranspiration (the sum of evaporation and plant transpiration).

In addition, the water reform process in rural Australia has not been mirrored in cities. Efforts to meet growing demands

for water resulting from increasing populations have been politically unpopular because of objections from green lobby groups against new dams in forested catchments. Similarly, price increases to ration demand are politically unpopular, with water being touted as an “essential” and needing to be priced at “affordable” levels. Finally, trade between urban and rural users has been restricted in some jurisdictions thus limiting the potential for arbitrage.

As a result, inefficient water regulations exist in most southeast Australian urban areas, including bans on watering suburban gardens. Local authorities also seek to encourage less-than-cost-effective water savings such as subsidizing the installation of domestic rain water tanks and water-saving shower heads in individual households.

Even in urban contexts, however, some advances are being made. For instance, Adelaide, the capital of South Australia, depends on flows from the Murray Darling Basin for the city’s water supply. Hence, the local water authority has been securing additional entitlements through purchases from dairy farms along the lower Murray River.

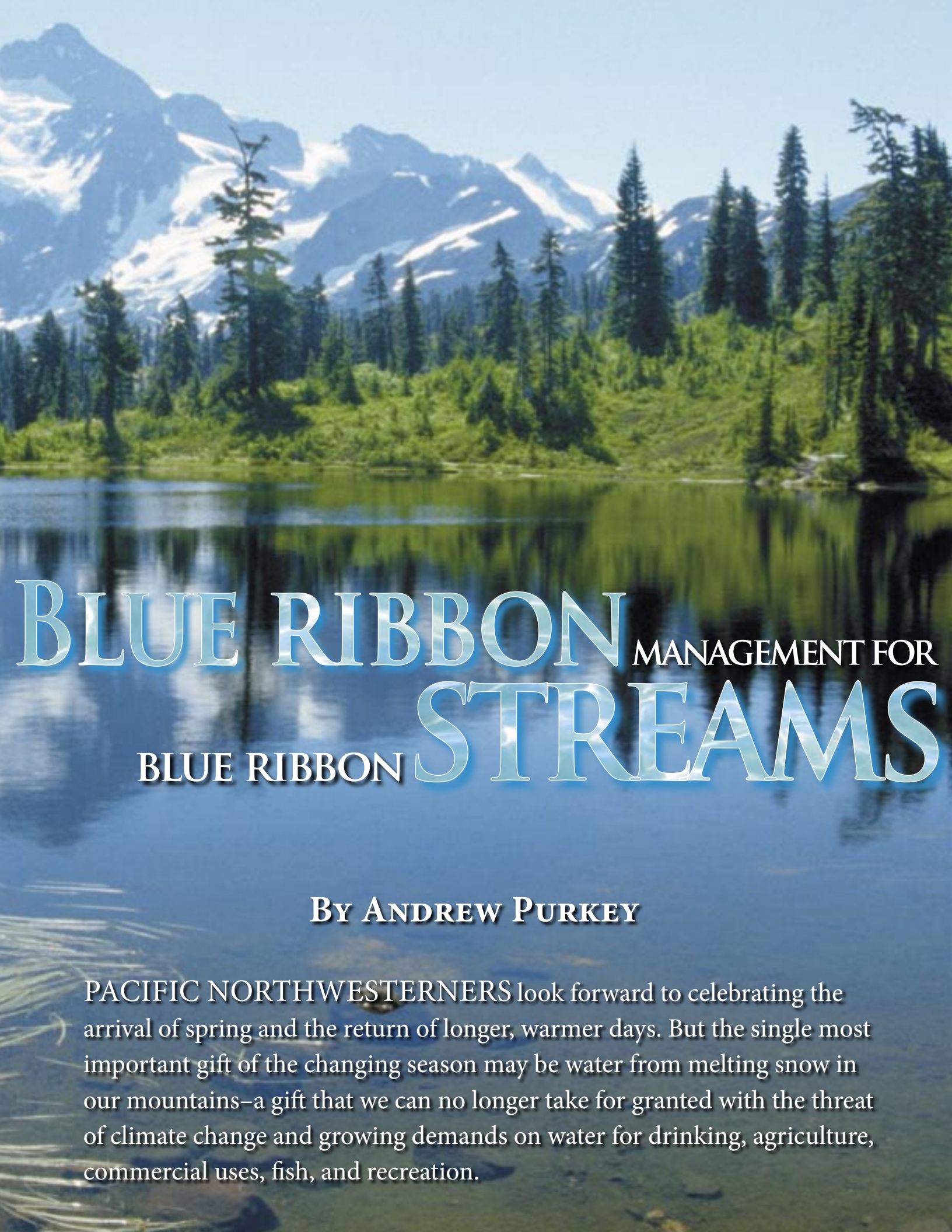
The severity of Australia’s climate when faced with steadily growing water demands for industrial, domestic, and environmental purposes has caused rapid policy evolution. Recognition across the political spectrum of the power of markets to provide some resolution to the conflicts arising from water scarcity has been and will continue to be a key plank in that evolutionary process.

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BLUE RIBBON MANAGEMENT FOR STREAMS

BLUE RIBBON

BY ANDREW PURKEY

PACIFIC NORTHWESTERNERS look forward to celebrating the arrival of spring and the return of longer, warmer days. But the single most important gift of the changing season may be water from melting snow in our mountains—a gift that we can no longer take for granted with the threat of climate change and growing demands on water for drinking, agriculture, commercial uses, fish, and recreation.

FISH BECOME LIKE COMMUTERS

STUCK behind bridges with missing spans

First, the bad news. Scientists report that because of climate change, we cannot count on abundant mountain snowfall to recharge the Northwest's waterways. Here, as in many parts of the West, more precipitation will come as rain, so less snow-melt will be available in summer and early fall when it is most needed. While campers may see their favorite swimming holes turn shallower and warmer, among those most challenged will be our agricultural producers who divert water from streams and rivers to irrigate crops.

With lower flows, how will farmers and ranchers (now using roughly 75 percent of the water diverted in the Northwest) balance competing needs for water in their communities? This has long been a contentious question.

The potential impact on water availability from climate change is but one part of an older and larger problem. In dozens of tributaries to the Columbia River, more water rights have been issued than there is water. Along some sections of streams in late summer, unnaturally low flows and even dry river bottoms have been common for a century or more.

Imperiled salmon, steelhead, and trout have suffered from historic spawning habitats being impaired by these chronic, water-poor conditions. Degraded habitat is one of the most limiting factors in restoring the Northwest's native fish populations. At times, instead of navigating rivers that flow as unbroken ribbons of water, fish become like commuters stuck behind bridges with missing spans.

Now, the good news. Five years ago, the Bonneville Power Administration and the Northwest Power and Conservation Council launched the Columbia Basin Water Transactions Program (CBWTP). Administered by the National Fish and Wildlife Foundation's Western Partnership Office in Portland, the CBWTP uses market incentives to address chronic water problems on a regional scale. The program is the first and only regional effort of its kind in the United States and has become a national, even international, model for collaborative, cost-effective water management.

CBWTP partners include seven nonprofits and four state agencies: in Oregon, the Deschutes River Conservancy (deschutesriver.org), the Oregon Water Trust (owt.org) and the Oregon Water Resources Department (wrд.state.or.us); in Idaho, the Idaho Department of Water Resources (idwr.idaho.gov);

in Montana, Trout Unlimited Montana Water Project (montanatu.org), Montana Water Trust (montanawatertrust.org) and Montana Water Resources Division (dnrc.mt.gov/wrd); and, in Washington, the Walla Walla Watershed Alliance (www.wallawalla.org), Washington Rivers Conservancy (warivers.org), Washington Water Trust (thewatertrust.org), and Washington Department of Ecology (ecy.wa.gov).

The partners negotiate transactions with willing water right holders, compensating them to implement strategies that keep water instream when and where it is needed most for fish. The approaches include water purchase and lease agreements, irrigation efficiency improvements, water-source switching, and water banking. Landowners are responding positively, building trust and finding common ground.

Consider the story of ranchers Pat and Hedy Voigt. Last year, they reached a permanent, voluntary agreement with one of the CBWTP's partners, the Oregon Water Trust. Between July 21 and September 30, up to 6.5 million gallons of water that they would normally divert each day from the Middle Fork of the John Day River and two of its tributaries will stay in the river, enhancing flows for a distance of 70 miles. In exchange, the Voigts now have the resources to improve irrigation efficiencies on their ranch, even as they benefit one of the largest and best remaining populations of wild spring Chinook and summer steelhead in the lower 48 states.

Similar partnerships are succeeding elsewhere in Oregon, including central Oregon, where the Deschutes River Conservancy is working with cities, farmers, and irrigation districts to restore water to the Middle Deschutes and some of its most important tributaries. Last year alone, with help from the CBWTP, water users improved 476 miles of streams and rivers in Oregon, restoring nearly 115,000 gallons per minute of flows.

In Washington, thanks to just one recent transaction between the Department of Ecology, Washington Water Trust, and the Taneum Canal Company (an irrigation district near Ellensburg), more than 18 million gallons of water per day now stays instream rather than being diverted from Taneum Creek during a critical time of the year. As a result, a key section of the creek that has long run low or dry is flowing once again to the Yakima River—providing vital habitat for fish.

In Idaho, the Department of Water Resources signed a



long-term water lease with property owners along Beaver Creek, a tributary of the Salmon River near its headwaters at the southern end of the Sawtooth National Recreation Area. For about half a century, irrigation dewatered the creek on this private parcel, which is surrounded by federal land. Now, enhanced flows have reopened eight miles of spawning and rearing habitat and countless smaller tributaries for steelhead and Chinook.

In Montana, an agreement facilitated by Trout Unlimited's Montana Water Project is permanently providing 10,000 acre-feet of water annually to the Bitterroot River from a state-owned reservoir, resulting in a major boost for a blue ribbon wild fishery that is also home to the imperiled bull trout.

Across the Columbia Basin, forward-looking landowners are creating innovative strategies that improve their bottom lines and build flexibility into ecosystems facing chronic water shortages. The results of this new model are not only benefiting communities right now but also are helping to prepare the Pacific Northwest for the future.



Andrew Purkey is the program director for the National Fish and Wildlife Foundation's Columbia Basin Water Transactions Program. Prior to this, Purkey served as the executive director of the Oregon Water Trust, a nonprofit that acquires existing water rights for conversion to instream water rights. He can be reached at andrew.purkey@nfwf.org.



 Visit www.cbwtp.org for more information



THE ORIGINS OF BELIEFS

CAN BELIEFS about fundamental social institutions, such as the market system, change? If so, what can cause such changes? Even if one replies “yes” to the first question, discerning an answer to the second has been an elusive goal for social scientists. Recent research by Rafael Di Tella, Sebastian Galliani, and Ernesto Schargrotsky (2007) presents compelling evidence that the creation of secure property rights within a society actually changes people’s beliefs, to make them much more favorably disposed to the workings of a free market.

Di Tella et al. study the formation of beliefs in a squatter settlement on the outskirts of Buenos Aires. More than 20 years ago, hundreds of families occupied an area of wasteland that they thought was owned by the state. In fact, the area was comprised of several tracts of land belonging to 13 private owners. Eventually, the state allowed the squatters to stay on the land, offering monetary compensation to the original owners. Many of the owners accepted the offer. The lucky squatters who happened to occupy these tracts received secure, legally defined and protected property rights to the parcels on which they resided. But more than a third of the owners contested the terms of the monetary settlement, and even today the Argentine courts have not resolved this issue. The unlucky squatters on these parcels have never received secure rights to the land they occupy and thus have lived in legal limbo.

As the authors show, the age, education, sex, and other characteristics of the lucky squatters are the same as the unlucky squatters. Moreover, the size and physical properties of the lands occupied by each group of squatters are essentially the same. In effect, then, the authors have happened upon a natural experiment in which different property rights structures were imposed on two otherwise identical groups of individuals. In this study, Di Tella et al. have chosen to answer this question: Does the presence of secure property rights affect the beliefs that individuals hold about the world? The authors find that the answer is unequivocally “yes.” Lucky squatters who received secure property rights to their land report much more positive beliefs about the operation of the market system than do those unlucky squatters whose rights remain insecure.



To reach their conclusion, the authors randomly selected about 40 percent of the 1,100 squatter families and then evaluated their answers to several key survey questions. For example, squatters were asked whether they thought that individual (as opposed to group) action can yield success in life; whether material success is important in determining individual well-being; whether hard work is likely to be rewarded; and whether one can trust other people. Compared to the unlucky squatters, the lucky ones who received secure property rights concluded in the affirmative in each case; they believe individual actions can yield positive outcomes, that material success is important to personal well-being, that hard work is rewarded, and that other people can be trusted.

Di Tella et al. then aggregated the answers to these questions into an index of “market beliefs,” which enabled them to compare the overall attitudes of the two groups of squatters toward the market system. The squatters who received secure property rights are 20 percent more positive toward the market system than are the unlucky squatters. Indeed, the attitudes of the squatters with secure property rights are just as positive toward the market system as the attitudes of much more affluent Argentinians who are much better educated and have much higher incomes.

There is considerable evidence from other research that secure property rights yield improved environmental quality, more efficient resource allocation, and higher wealth. Despite this, many people around the world remain suspicious of market systems and the private property rights essential to their functioning. Such attitudes arguably block the spread of markets, leaving millions of individuals mired in abject poverty. The present study implies that the beliefs held by market skeptics may in fact be subject to change—if the advantages of secure property rights and the operation of free markets can be demonstrated close enough to home.

The importance of this study is that it suggests that changes in attitudes are no accident, and that it may be possible, on a broader scale, to overcome the widespread hostility toward market systems. The aphorism that “seeing is believing” is rarely more applicable, for it appears that the creation of private property rights has the potential to fundamentally change how people perceive the world, and thus, perhaps, the institutions and policies they are willing to adopt. For those who believe that environmental quality, individual choice, and personal freedom are important, this is good news indeed.

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by David Schnare

“Clean Up the Bay”—a familiar slogan among the Chesapeake Bay coastal communities, where significant economic benefits would be realized if the polluted waters were cleaned up to see the full potential of commercial fishing.



Catchphrases like “Clean Up the Bay” often imply that humans caused the problem but government ought to fix it. This orthodoxy distills a complex issue into a simplistic environmental status that becomes the public goal, which, allegedly when it is reached, will resolve the problems—e.g., the Bay will be clean.

Beneath this orthodoxy lie purposes unrelated to the environmental issue, directing the problem and potential responses into narrow paths and limiting the scope and cost-efficiency of alternatives.

In so doing, opportunities may be missed to achieve better environmental quality at a lower cost. This article examines the Chesapeake Bay orthodoxy and offers an alternative means to define and achieve protection and enhancement of this remarkable environmental asset.

Down by the Bay

Once the largest commercial fishery in the United States, the Chesapeake Bay could produce \$3 billion in commercial fishing revenues per year. Now it produces less than \$100 million.¹ Assuming the two states on the Chesapeake Bay shore share equally in the economic benefits, recovering this fishery would double Virginia’s domestic product for agriculture, forestry, fishing, and hunting. For Maryland, it would triple. Regarding their total state domestic products (SDP), recovery of this income would increase Virginia’s SDP by 0.4 percent and Maryland’s by 0.6 percent. These economic benefits justify significant attention to the Bay and a search for cost-effective means to recover the fisheries. But the question remains whether the Chesapeake Bay environmental orthodoxy can produce that recovery. Unfortunately, it hasn’t and it can’t.

The convention begins with the statement that the Bay contains a dead zone—where no fish can live—that can cover up to 40 percent of the Bay and lasts 10 months a year. Having focused on a single ecological phenomenon, the orthodoxy then looks to the source of that problem. It argues that the most important cause of this dead zone stems from the flow of nitrogen into the Bay. Having narrowed the focus of “the problem” to a single chemical, the goal is to reduce nitrogen discharges into the Bay by approximately 35 percent.

Reducing nitrogen discharges is the foundation for solutions, which are dominated by the presumption that all solutions require governmental action, typically in the form of

command-and-control regulations and governmental grants. In this example, environmentalists look to the Clean Water Act as the means to force reduction in nitrogen discharges and as the cornucopia for grants.

When forced to move away from command and control and toward market mechanisms, it is difficult to look beyond a cap and trade approach, which still relies on regulatory mandates but allows the regulated parties to trade between themselves to find less expensive means to meet regulatory standards.

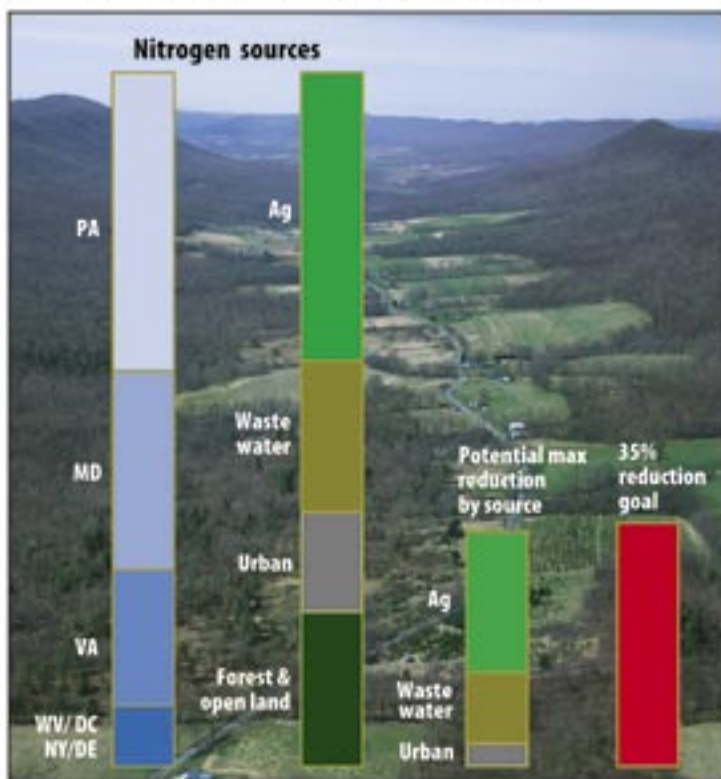
The science, engineering, and economics of the Bay condemn this orthodoxy to failure. A fresh look at the actual determinants to the Bay ecology suggests an alternative approach much more likely to protect and enhance the productivity and aesthetics of the Bay.

Leaving aside for the moment whether the nitrogen reduction goal has merit, the goal itself is beyond the reach of command-and-control or cap-and-trade solutions. Figure 1 documents the antecedents of this failure. To reach the 35 percent reduction goal, it would appear that Pennsylvania, Maryland, and Virginia would need to reduce their nitrogen contributions to the Bay. A closer look at the dead zone, however, shows that this zone is caused by Maryland and Virginia and lies against the Virginia shore. The Bay does not behave like a well-mixed cauldron of ingredients from Pennsylvania, West Virginia, New York, Delaware, and the District of Columbia. Rather, the dead zone results from nutrients discharged into two of the six major river basins within the Chesapeake Bay watershed. Notably, this also excludes half of Virginia and two-thirds of Maryland. Thus, as Figure 1 suggests, the states of Maryland and Virginia do discharge an amount greater than the reduction goal; but taking only the relevant river basins into account, these two basins contribute a nitrogen loading less than the goal. This, alone, impeaches the goal itself.

Another problem with meeting the 35 percent goal stems from the limits of engineering and regulatory proposals. Despite reliance on the Clean Water Act, it does not authorize the federal agencies to regulate pollution caused by agricultural lands, forests, or open lands. Furthermore, the law does not allow the U.S. Environmental Protection Agency (EPA) to mandate application of “tertiary” waste water treatment, which basically turns waste water into drinking water. Though federal and state legislatures have refused to allocate the \$2 billion needed to apply tertiary treatment to the point sources in the Chesapeake Bay watershed, that investment would not solve the problem.

All of the waste water treatment plants in the Bay watershed now have “secondary” treatment to substantially degrade the biological content of the sewage, much of which is derived from human and food waste. To remove additional nitrogen from their discharges, industrial plants must apply the tertiary treatment. Because this process removes only 65 percent of the nutrients, it is of limited use. As shown in the third column in Figure 1, removing only two-thirds of the nutrients from the

Figure-1
Nitrogen Discharges into the Chesapeake Bay



point sources over the Bay’s entire watershed will not be sufficient to meet the goal; significant reduction of nutrient discharge from the agricultural sector is required.

Farms have multiple sources of nutrients, but 55 percent of the nutrient load comes from croplands—primarily from manure and commercial fertilizers applied to the fields. Even under the aggressive regulatory efforts now in play by the EPA and the state environmental departments of Maryland and Virginia, the regulations do not apply to croplands. Moreover, even if farmers could reduce these cropland loadings (and they can using never-till crop management), and even if all the farmers in the entire Bay watershed applied these techniques, it would not be enough to meet the pollution control goal.

Markets to the rescue

Fortunately, vigorous enforcement of private property rights and the marketplace can do what the orthodoxy cannot. Free market environmentalism uses the same science and engineering, but establishes goals directly associated with the market and private property rights. Keeping the environmental concern focused on the dead zone, the free market approach asks who has trespassed on what private property rights.

The \$3 billion worth of commercial fisheries includes private land underlying the rivers flowing into the Bay. Some of these fisheries have traditionally offered valuable oyster, mussel, and shellfish habitat. Although the water itself belongs to the Commonwealth of Virginia or the State of Maryland, the land

on which these mollusks live belongs to private parties. In like measure, the eggs of the shellfish, and indeed of most Bay fish, sit on private lands. A myriad of other private interests accrue in the Bay, all of them harmed by the dead zone.

This nutrient and sediment pollution is a private nuisance that interferes with an individual’s right to enjoy his or her property. The Commonwealth specifically provides relief from such nuisances under Virginia Code, and Maryland has similar protections through the common law. Private actions against polluters in the Potomac and Rappahannock watersheds, for example, would rehabilitate the privately owned fish and mollusk habitat—reducing the dead zone to historical (pre-colonial) levels. The most efficient legal action would be against the point sources—those which should be held liable for their contribution to the nuisance. They would not, however, be required to add tertiary treatment unless other nutrient reduction efforts failed. Rather, they would pay farmers to shift from traditional plowing to never-till crop management. The cost per pound of never-till nitrogen removal is 25 times less costly than tertiary treatment of waste water plants.

A second marketplace will have an important role as well. The bio-fuels market is now moving into a third generation of technology. Companies such as BRI, Inc. offer means to convert manure, and especially chicken litter, directly into ethanol for farmers to use at less than a dollar a gallon—well below other bio-fuel processes.

Only vigorous protection of private property rights and markets can clean up the Bay and, equally important, they can do so regardless of the success or failure of the command-and-control orthodoxy.

NOTE

1. Numbers presented in testimony before the Virginia Joint Committee on Funding Bay Restoration.

This article is based on a paper prepared for the Thomas Jefferson Institute for Public Policy, and delivered at the 2007 Annual Meeting of the Association of Private Enterprise Education.



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Greener Pastures

Compiled by Linda E. Platts

Finding peace with geese



Canada Geese have become a nuisance in many suburban parks or nature areas that feature ponds and lakes. In some areas, the geese have completely taken over and huge deposits of fecal matter make them unusable for family outings, casual strollers, or anyone seeking a friendly moment or two in tune with nature.

Communities have resorted to all sorts of schemes to get rid of the geese, which prompted David Feld, director of GeesePeace (www.geesepeace.org), to seek more humane and rational solutions to the problem. Initially, he was motivated by a problem with geese in his own community.

In an interview with the online magazine *Grist*, Feld explains that migrating Canada Geese were once near extinction and some missteps by wildlife management agencies have led to the current problem. In the past, millions of Canada Geese migrated North in the spring to nest and then headed South in the late fall. Sport and commercial hunters became extremely adept at hunting the migrating flocks. Geese were lured to fields by corn, captured, their feathers clipped so they could not fly, and then set out to swim on ponds. Other geese would see the birds swimming below and, assuming it was a safe haven, join them. Alas, hunters were waiting nearby to collect down feathers and meat from the birds.

The geese grew increasingly scarce. Then in 1965 an intact

flock was discovered in Missouri. Wildlife agents took their eggs, incubating them in many parts of the country thus encouraging them to nest in a wide array of areas. Because migration is a learned behavior, if geese are born in New Jersey or Connecticut, they have no reason to fly off to Canada. They return to the place of their birth to nest and raise their young. The problems that developed as a result of this plan to restore geese to healthy numbers were certainly unforeseen at the time.

The answer, however, is not to blame the geese. Feld along with other community leaders have come up with strategies to deal with the problem. There are several steps to a long-term solution. Volunteers search for nests with eggs and then coat the eggs in corn oil to prevent development. Border collies are kept near ponds and lakes to discourage geese from landing. While certain areas are set aside for returning geese, communities also have exclusion areas patrolled by the dogs that flush the geese out and away from the water. Geese who do have hatchlings are not harassed or disturbed.

Communities that have implemented these strategies report success within a fairly short time, even within a year. Wildlife management is, without doubt, a complex field, but GeesePeace believes the animals should not pay for human errors. So far they have found solutions that are working for both the feathered and the unfeathered.

The shirt off my back

If carbon emissions, chemical spills, and non-point water pollution are weighing heavy on your mind, a new report from Cambridge University has a bit more bad news. That simple, white cotton T-shirt is a problem. Listen up guys! Over the lifetime of the garment, a polyester blouse uses less energy than your T-shirt.

While people have become increasingly environmentally conscious, fluorescent bulbs are lighting homes and offices across the country, and free-range chickens are on the family dinner table, it remains difficult, and sometimes impossible, to buy an item of clothing in a department store and know whether it is a wise environmental choice.

Another factor contributing to the problem is what the *New York Times* calls “fast clothes.” These are clothes that are so cheap—about the price of a sandwich—they can be worn once and discarded, only to be replaced by the next shipment of trendy goodies arriving at Target or Old Navy. Disposable clothes have replaced hand-me-downs and, spurred by lower prices, women’s clothing sales, at least in Britain, rose 21 percent from 2001 to 2005.

The Cambridge University report suggested several innovative ideas, such as a clothing library where people could check out a wardrobe for the month and return it for a different one the next month. If that doesn’t catch on, the report provided a lot of good information on the care and upkeep of clothing, which often can determine whether your dress has a high or low environmental rating.

Clothes made from organic cotton are considered “good” because fewer pesticides are used in production. Non-organic cotton on the other hand uses lots of pesticides and fertilizers so that is not so good. In either case, cotton requires more frequent washing than other fabrics because it picks up odors, and it also requires a higher water temperature for thorough cleaning. For those who tumble dry, the drying period for cotton is also longer than for many synthetic fabrics, so more fuel goes into clothing upkeep. Surprisingly, polyester, which got a bad name during the “polyester pantsuit era,” is in fact easier to clean, faster to dry, and therefore more fuel efficient.

The global textile industry must become eco-conscious, the report concludes. Neither manufacturers or customers know what clothing purchases may degrade the environment, whether it occurs during the harvest of cotton or the manufacture of synthetic fibers. The care and upkeep of the fabrics also need to be more broadly understood.

Eco-clothes are not a thing of the future. They are happening right now and some of the world’s largest and most respected retailers, such as Britain’s Marks & Spencer, believe their customers will adjust their buying habits just as they have already done with other consumer products that claim to be environmentally friendly.



A tub of soy, please

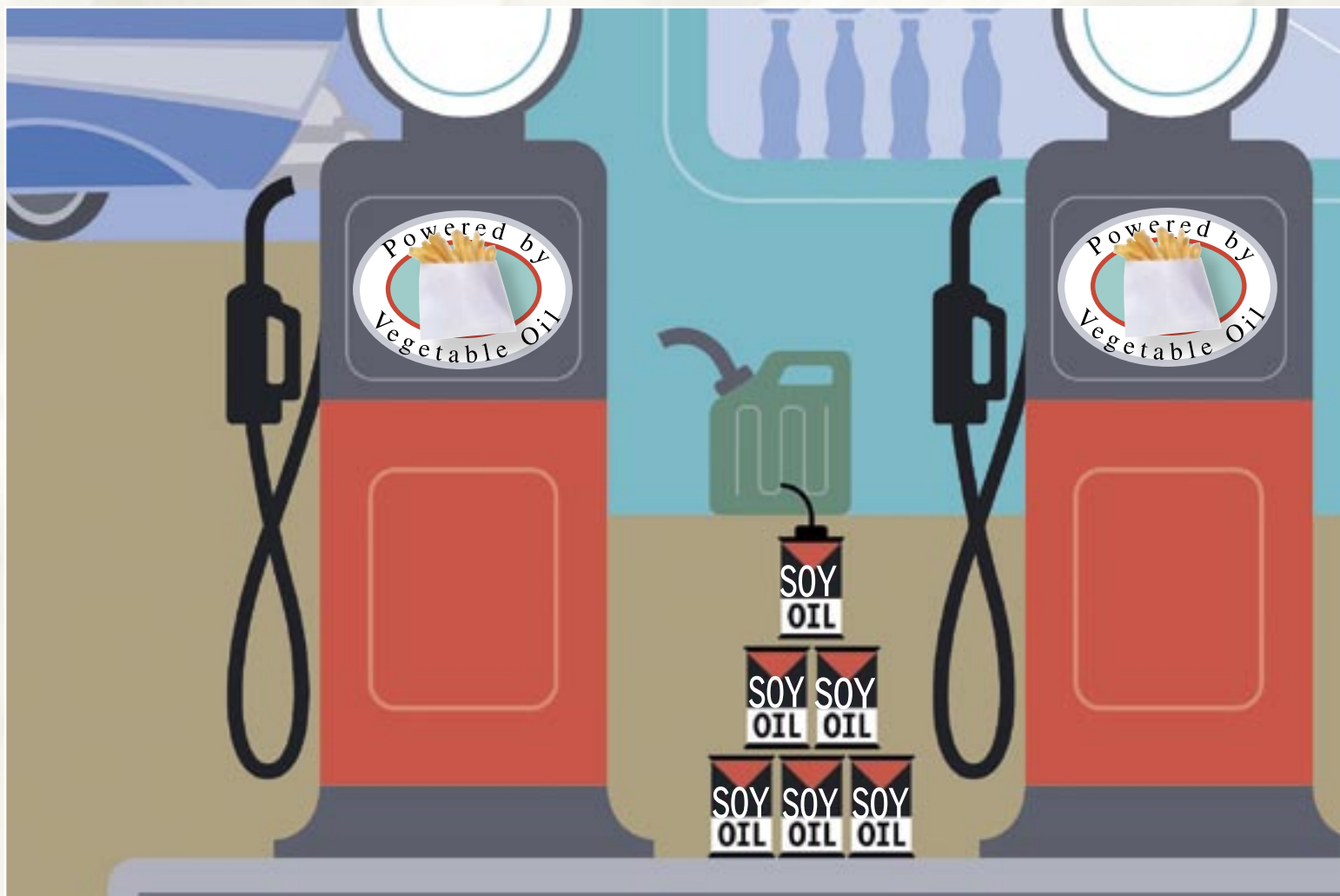
By now, most of us have heard that using vegetable oil to run diesel engine cars is the clean way to drive—reducing carbon emissions. And, we have heard about those handy folks who manage to switch their cars to vegetable power, make friends with the local McDonald's, and soon are buzzing around town with the odor of french fries wafting from their exhaust pipes.

With the ever fluctuating price of petroleum-based fuels, it is an enviable position to be in. But what about those who are not mechanically inclined or don't even know what a car engine looks like?

Some kind folks have taken pity on the rest of the population. Two entrepreneurs joined forces to form Neoteric Biofuels, which does business as PlantDrive (www.plantdrive.com) to provide instructions for converting a diesel engine to a vegetable oil-burning motor. Instructions as well as technical assistance are available online, and PlantDrive products that can make the job easier are also available. The estimated cost for a do-it-yourself conversion is \$700 to \$800.

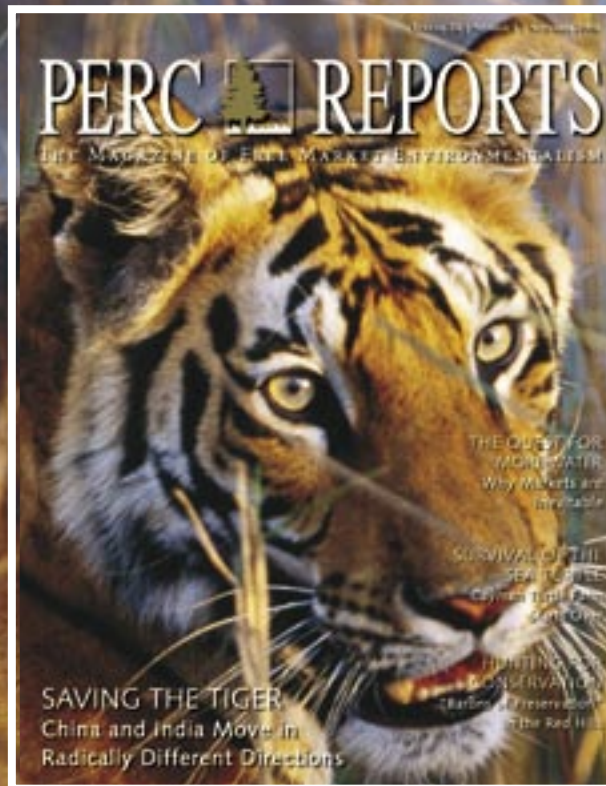
The next step is the vegetable oil. This can be a little time consuming, but not a problem for the truly dedicated or economy minded. Many restaurants are happy to donate their used vegetable oil; otherwise they have to pay to dispose of it. The catch is that it needs filtering before it can be poured into the tank. Filtering systems require two barrels, two pumps, a bag filtration system, and a water separating system, costing about \$300 to \$500.

The *Costco Connection*, a magazine published by the company for its customers, has another solution: it sells 35.6-pound tubs of clean soy oil. Throwing a few of those tubs in the back of the Jetta is probably simpler for many people and better for Costco too. One last piece of good news. According to *Costco Connection*, converted diesel-powered cars can continue to run on regular diesel from the pumps. So don't worry if you are on the road and out of range of your favorite superstore.



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