

PERC REPORTS

THE MAGAZINE OF FREE MARKET ENVIRONMENTALISM

**WEALTH OF NATURE
SPECIAL ISSUE**

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FROM THE EDITOR

THE WEALTH OF NATURE SPECIAL ISSUE

This issue of *PERC Reports* spotlights “The Wealth of Nature,” a project that PERC has been conducting with the support of the M.J. Murdock Charitable Trust and the Dufresne Foundation.

The term “wealth of nature” has its genesis in the recognition by environmentally concerned economists that affluent eastern Americans are drawn to the West for its scenic beauty and open space. Economists such as Thomas Power and Ray Rasker have highlighted the fact that it is possible to extract wealth from nature not by using natural resources as commodities to make products, but by leaving them alone.

Some have interpreted this fact to mean that the government should set aside even more land. As demand for scenic amenities grow, they argue, wealth will increase.

PERC researchers have questioned this interpretation and over the past two years have studied how the West can best respond to the changing demand for natural resources. In the first article in this issue, Terry L. Anderson, PERC’s executive director, suggests that the best way to obtain the new wealth of nature is to take another look at the Old West and see what it did right—specifically, defining and protecting property rights.

One strand of the “wealth of nature” idea treats natural resources as producers of commodities, but commodities that are “ecosystem services” rather than traditional output such as timber and minerals. Wetlands cleanse water naturally, lakes store water, and wildlife produces food. Economists and others are trying to quantify these kinds of values. In our second article, Tim Fitzgerald examines the role and methodology of “ecosystems valuation.”

These articles are just the beginning of an issue that contains several riffs on the “wealth of nature” idea. Perhaps there is no better way to tap into the changing demand for “nature’s wealth” than to provide homes for people who are willing to pay more where natural beauty is protected. The St. Joe Company in northwest Florida, whose RiverCamps development is on our cover, exemplifies the private response to such demands. Brian Yablonski tells us about it.

Thomas Tanton tackles the distortions of natural wealth that occur with energy subsidies. David McClintick and PERC Julian Simon Fellow Ross Emmett extend the famous decade-long bet between Paul Ehrlich and Julian Simon to a full century, with provocative results. And we have our regular columnists Linda Platts, Dan Benjamin, and Terry Anderson (not to mention a fascinating letter). Welcome to *PERC Reports*!

Jane S. Shaw



From left: Fitzgerald, Tanton, Yablonski, McClintick, and Emmett.



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Cover image:

Canoe on Crooked Creek, courtesy of the St. Joe Company, photographer Ralph Daniel

CAPTURING THE WEALTH OF NATURE

PROPERTY RIGHTS IN THE AMERICAN WEST

By Terry L. Anderson

Today's competition over the West's natural resources can be resolved through either cooperation or conflict. A better understanding of the Old West could tilt the result toward cooperation, illustrated by this painting, Toll Collectors.

Charles M. Russell, Toll Collector, oil on canvas, 1913, Mackay Collection, Montana Historical Society



To economists and policy makers, the term “New West” describes a region that is experiencing increasing demand for amenities from natural resources—demand for more open space, scenic beauty, and relatively untouched landscapes.¹ The “Old West,” in contrast, was based on demand for commodities such as timber, agriculture, and minerals.

The Old West is illustrated by many original state nicknames—Montana the Treasure State, Idaho the Gem State, Wyoming the Cowboy State, Washington the Evergreen State, and California the Golden State. Hardly anyone uses Montana’s original nickname, the Treasure State today. Most call it Big Sky Country.

The transition from demands for mainly commodity treasures to mainly amenity treasures has created a new competition for the West’s natural resources. That competition can be resolved through either cooperation or conflict. A better understanding of the Old West could tilt the result toward cooperation.

THE OLD WEST

Dime store novels, Hollywood westerns, and made-for-television series such as “Into the West” have depicted the Old West as a rapacious frontier where cowboys, miners, loggers, farmers, and railroad tycoons ran roughshod over people and natural resources, with little concern for protecting the environment. Certainly, some of these images are justified. Fist fights did occur and people were shot in barroom brawls (McGrath 1984), and the Indian Wars were a shameful part of western history caused by the standing army created during the Civil War looking for a *raison d’être* (Anderson and McChesney 1994).

Such exciting stories, however, miss the ways in which people on the frontier hammered out the institutions—rules and customs—necessary for peaceful and productive settlement (Anderson and Hill 2004). A few examples will illustrate.

Miners from California to Montana established claims to minerals and water through the rules of the mining camps (Umbeck 1977). Because the six-shooter made nearly everyone equal in the use of force and because each claim had about the same productivity, miners honored first-possession claims as long as they were of equal size. Similarly, the prior appropriation doctrine for water rights, created in the mining camps and agricultural valleys, remains the basis for water law throughout the American West.

On the grazing frontier, cattlemen established property rights to land by posting notice on signs or in local newspapers that they had claimed land. These rights, enforced by the cattlemen's associations, could be traded.

These property institutions provided secure and transferable ownership, which encouraged efficient resource use. As demands changed, people could change uses through voluntary exchange. The prior appropriation doctrine for water, for example, allowed water transfers from one diversion use to another.

DECLINE OF THE OLD WEST

The arrival of formal government, however, changed decision making in the West. Of course, government can and did play a positive role by reducing the costs of defining, enforcing, and trading property rights. For example, once cattlemen established branding as a way of identifying their cattle, they turned to territorial and state governments to register and enforce their brands.

But the farther that decisions are removed from owners and from local constituencies, the more likely interest groups are to find ways to shift the costs to others while capturing the benefits for themselves. When the federal government set aside millions of acres as public lands, they were initially managed at the local level, and management even bordered on privatization because specific individuals or groups were virtual owners. For example, Yellowstone National Park (like other national parks) was de facto owned by a railroad (Anderson and Hill 1996).

Today, however, federal agencies such as the Forest Service,

The farther that decisions are removed from owners and from local constituencies, the more likely interest groups are to find ways to shift the costs to others while capturing the benefits for themselves.

the National Park Service, and the Bureau of Land Management control nearly one-third of the nation's land. On these lands, use is allocated through political and bureaucratic processes.

The history of Yellowstone Park tells the story of this transition. In the late 1860s the Northern Pacific Railroad recognized the value of Yellowstone's unique amenities for potential passenger traffic. But homesteaders were already trying to establish claims to sites such as Mammoth Hot Springs and Old Faithful. Having no way to establish private ownership of the entire area, the Northern Pacific lobbied Congress to set aside Yellowstone as a national park and close it to homesteading. By controlling services such as railroad transportation to Yellowstone and stagecoach travel and services

within the park, the railroad became a virtual owner—with an incentive to preserve Yellowstone's unique features.

After other railroads arrived and the park was opened to automobiles, the National Park Service took over. But during its early years, the National Park Service too acted like an owner, obtaining enough revenue to fully cover its costs and then some.

More recently, the National Park Service has become a political football. Jockeying is rife over issues such as adding wilderness, building campgrounds, allowing snowmobiles, and reintroducing species such as wolves. Each issue represents a competing demand and requires the National Park Service to reallocate the resources under its charge.

The U.S. Forest Service provides a similar story. Initially, the Forest Service had one constituency, loggers. When grazing was added as a commodity on Forest Service lands, there was no significant conflict between the two demands. More clearcuts meant more grass.

Since World War II, however, Forest Service lands have become a recreational playground—and a bureaucratic battleground. Not only do hiking and backpacking conflict with logging, but recreation itself is riddled with dissension as snowmobilers compete with skiers and all-terrain vehicle users compete with wilderness campers, hikers, and backpackers.

In the past, the Bureau of Land Management relied on local grazing districts run by committees of local ranchers. In recent years, amenity demanders have battled to rein in grazing in the interest of increasing wilderness, wildlife, and recreation.

With water, too, bureaucracy overtook private ownership.

By building dams and delivery systems, the federal government supplanted private irrigation development (Anderson and Hill 2004) with massive subsidies to farmers (Rucker and Fishback 1983). As long as the reclamation projects were primarily for irrigation and secondarily for hydro-electric production, conflicts were few. But in recent years pressure to preserve endangered species and other wildlife has increased.

In the Klamath River basin in Oregon,² environmentalists, bolstered by Indian tribes whose treaties give them hunting and fishing rights, demanded that water be left in the river for threatened or endangered fish species. In the spring of 2001, the Bureau of Reclamation shut off water to farmers, instigating a bitter fight that continues during drought years. Who has the right to the water? Farmers who have prior appropriation rights or contracts with the Bureau of Reclamation? Indian tribes who have treaty rights for fishing and hunting? Or environmentalists who claim water for endangered fish?

NEW WEST MEETS OLD WEST

In the past, people could exchange their private property rights to land, water, and minerals to accommodate different values while prompting higher valued uses. In contrast, politics generally substitutes one use for another—in a zero-sum game. Not surprisingly, federal agencies and even some state agencies find themselves locked in political or court battles over virtually every decision they make.

Because privatization is not feasible today, at least we may be able to devolve decision making to levels where the participants have a greater stake in the outcome, as well as have more knowledge about the resources. Here are proposed changes in three areas:

Land

Those who graze cattle on federal lands have relatively secure property rights to their grazing permits (Nelson 1996), although this security has been waning. To accommodate the new demanders—primarily environmentalists who want to reduce livestock grazing—a simple solution is to make existing permits transferable to non-grazers on a willing buyer-willing seller basis. The Grand Canyon Trust and the Conservation Fund have been trying to do this in southern Utah. But federal

In the past, people could exchange their private property rights to land, water, and minerals to accommodate different values. In contrast, politics generally substitutes one use for another—in a zero-sum game.

regulations make such trades difficult, if not impossible.

Devolution could improve timber management, too. A decade ago, PERC Senior Fellow Donald Leal (1995) made side-by-side comparisons of federal and state forest management in Montana. He found that while federal forests on average lost 50 cents on every dollar they spent, state forests made \$2 for every dollar they spent. Moreover, state forests produced more environmental amenities such as clean water and wildlife habitat.

The difference between the two was the management incentives. Federal forest managers obtain most of their funds through congressional appropriations and mostly send their revenues to the federal treasury. State forests are required to earn a profit for the school trust, which is carefully monitored by teachers, administrators, and parents. To earn profits, they will consider recreation, scenery, and other amenity values as assets that may outweigh the value of timber production.

Water

Rather than having agencies and legislators in Washington, D.C., trying to cure the problems of the Klamath, local people could and are addressing them through trading. Throughout the West, allowing environmental interests to lease, purchase, or leave water instream is an important step toward resolving disputes between irrigators and environmentalists.³ Groups such as the Oregon Water Trust, Washington Water Trust, and Montana Water Trust are filling this niche of voluntary, non-confrontational water trades for environmental goals.

Wildlife

Wolves were successfully introduced into Yellowstone National Park because an environmental group, Defenders of Wildlife, decided to compensate livestock owners for losses caused by wolves (Fischer 2001). Defenders raised private funds to establish a fund for compensating livestock owners for livestock killed by wolves. Defenders acted like an owner—taking on liability for predations and bearing a share of the cost of wolf reintroduction.

Leasing or purchasing land for wildlife habitat is another example of how markets can shift uses from traditional commodities to higher-valued amenities. Non-profit groups,

The Old West heritage of property rights offers the best hope for the future of the New West's natural bounty. Evidence comes from the evolving markets for conservation easements, grazing permits, water rights, and hunting habitat.

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clubs, associations, and for-profit firms can and do broker such transactions.

CONCLUSION

In the New West, where political institutions control the allocation of many natural resources, conflict is inevitable. But recognizing existing property rights—whether they be private, as with land, or political, as with grazing permits—and encouraging exchange can link the New West with its Old West heritage. Markets for conservation easements, grazing permits, water rights, and hunting habitat are evolving. State management of land and parks is less contentious and more economically and environmentally sound than federal management. Water markets reduce acrimony and encourage incremental solutions that shift water from traditional uses to recreational and amenity uses. Conservation easements provide open space and other amenities. Private ownership and devolution of governmental control, features of the Old West, offer the best hope for the future of the New West's natural bounty.

NOTES

1. Sometimes the new amenity demands are couched in terms of ecosystems and biodiversity, but regardless of the terms used, they are human demands articulated by human beings.
2. For a discussion of the conflicts over instream and off-stream water uses on the Klamath, see Meiners and Kosnik (2003).
3. For a complete discussion, see Anderson and Snyder (1995) and Landry (1998).

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QUANTIFYING THE WEALTH OF NATURE

CAN ECOSYSTEM VALUATION CREATE MARKETS?

By Tim Fitzgerald

Expanding existing cost-benefit analysis to include the impacts of ecological functions will improve policy analysis. But it is tragically overoptimistic to think that accounting for the economic value of ecosystems will create markets to preserve them.



To many, the terms “ecosystem services” and “ecosystem valuation” sound obscure and complex. But for a growing number of economists, government officials, and financiers, quantifying the benefits of clear-running streams, standing forests, and other natural processes is an idea whose time has come. The *Economist* (2005) recently devoted a cover story to the challenges of “putting a proper value on ecological services.” Last year the World Bank and the National Research Council both issued reports on assessing nature’s services. These efforts followed on the heels of the international Millennium Ecosystem Assessment, which enjoyed international support.

Once the “value of nature” is calculated, it might seem a short step to create markets for ecological functions. In March, the influential banks ABN Amro and Citigroup threw their weight behind efforts to create environmental markets of the sort pioneered by the Katoomba Ecosystem Marketplace.

Don’t bet on such projects just yet. Expanding existing benefit-cost analysis to include the impacts of ecological functions will improve policy analysis. But it is tragically overoptimistic to think that accounting for the economic value of ecosystems will create markets to preserve them.

WHAT ARE ECOSYSTEM SERVICES?

Ecosystem services are the flows that humans capture from natural resources (excluding non-renewables). Timber production benefits humans, and is thus part of a forest’s ecosystem service stream. However, the term also includes those services provided to people if the forest is not harvested, such as watershed regulation or wildlife habitat.

Harvesting some of the timber might change the amount and quality of water that flows through the forest, or the amount and type of wildlife habitat. Ecosystem valuation provides a framework for bringing these potential changes to light and quantifying their impact on humans. Most importantly, it identifies those changes in monetary units so that they can be compared to timber benefits. In other words, ecosystem valuation is an extension of cost-benefit analysis, the traditional means of economic valuation of non-market goods.

The flood plain of Nigeria’s Hadejia river system offers a good example of how ecosystem valuation can improve policy analysis. The first large dam in the watershed was built by the Nigerian government in 1974. Further dams were proposed, most controversially the Kafin Zaki. Its construction would have cut off the source of water recharge for wetlands that provide drinking and irrigation water to downstream households. A simple cost-benefit analysis would consider only the potential irrigation benefits against the cost of pouring concrete.

When the costs and benefits of downstream ecological services were also considered, it became evident that the costs of reduced groundwater to downstream households exceeded the potential (upstream) benefits of the diversion project.¹ Although the future of Kafin Zaki

is unclear, construction halted in 1994 and has yet to resume. From a societal point of view, using ecosystem valuation to consider the impacts on downstream groundwater led to a better decision. As scientific understanding of how ecosystems operate (understanding hydrology in the case of the Hadejia) improves, this process of valuation will improve.

Such progress is in stark contrast to earlier attempts at ecosystem valuation. Robert Costanza et al. (1997) published an article in the prominent journal *Nature* that attempted to estimate the economic value of the natural world. They summed the estimated value of ecosystem services such as erosion control, nutrient cycling, pollination, and waste treatment across a variety of biomes: forests, grassland, and wetlands, for example. The mean value for the entire world was \$33 trillion per year.² This created a stir in the popular media, especially since \$33 trillion exceeded the value of global economic output.

Although aggregate values are impressive and grab headlines, they do not help policy analysis. It was observed at the time that the primary motivation for the paper may have been political rather than economic (Toman 1998). It is marginal values that matter. Recent ecosystem valuation preserves this perspective. Indeed, in Nigeria, it was the additional dam, the Kafin Zaki, that had costs far outweighing benefits.

CAN WE CREATE MARKETS?

The success of ecosystem valuation should not be confused with the potential for markets. Without a defined and defensible property right in the ecosystem service, markets will not work. Thus, the *Economist's* enthusiastic claims that such market protection is imminent should be carefully scrutinized.

To illustrate the potential for markets, the magazine presented a story about the Panama Canal. The canal, now owned by the government of Panama, requires a large amount of fresh water to operate the locks—52 million gallons per ship passage. This water comes from the surrounding mountains.

The availability of this water is threatened. Much of the government-owned land bordering the canal has been cleared of natural vegetation, mostly by logging, slash-and-burn agriculture, and cattle grazing. Without the forest cover, water reaches the canal in periodic floods instead of a steady stream. During periods of drought the number of daily passages has been limited by the lack of fresh water to operate the locks (Dean 2005).

Runoff from the denuded mountainsides also carries unwelcome nutrients and sediment to the canal. As a result, expensive dredging is necessary. Valuing ecosystem services

suggests that a standing forest would enhance human welfare.

Although the Panamanian government owns the canal and surrounding watershed, it is unable or unwilling to reforest the watershed or effectively exclude maverick loggers and others who deforest the mountains. We might expect a private solution to correct this government failure. The *Economist* describes a British firm, ForestRe, that is considering replanting some of the forest in return for payments by the shipping companies, who have a genuine interest in keeping the canal open.

This is a marvelous idea, but unfortunately it won't work. The problem is that the shipping firms would be spending money on trees they do not own and cannot protect. If the government (and owner of the canal) is not going to protect the forest, a better market solution might be for these companies to invest in their own production and distribution networks including travel around Cape Horn. No firm or individual will make an investment without some confidence in a return.

Ecosystem valuation has arrived as a policy analysis tool, as the recent flurry of activity demonstrates. However, jumping to the conclusion that being able to accurately value ecosystems will engender markets for them is premature. Property rights are absolutely necessary to any market, and notably absent from most natural processes.

NOTES

1. This project has been discussed in Acharya and Barbier (2002) and related papers.
2. Pimentel et al. (1997) was a concurrent and similar study that was also received critically by the economics community.
3. The Panamanian government is currently negotiating with the World Bank for reforestation funds.

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DISTORTING THE WEALTH OF NATURE

SUBSIDIES AND FAVORITISM FOR ENERGY

By Thomas Tanton

There are too many forms of subsidies and favoritism to determine accurately which energy sources get the best treatment. But those who argue that their technology should receive more in order to compensate for another technology's subsidies are being disingenuous.



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When Congress debates energy policy every few years, long-simmering battles over subsidies boil over. This year was no different as Congress put the finishing touches on the 2005 energy bill. One issue that consistently rises to the surface is the plea by renewable energy advocates to “level the playing field” with respect to other forms of energy. Other sources, they contend, have been receiving special treatment and they deserve it, too.¹ I have analyzed the history of subsidies and other forms of energy favoritism to evaluate whether any particular energy type is given special or advantageous treatment. As it stands today, there are too many forms of subsidies and favoritism to determine accurately which energy sources get the best treatment, although some interpretations can be made. In any case, those who argue that their technology should receive more in order to compensate for another technology's subsidies are being disingenuous. Congressional subsidies in the latest energy bill will only make matters worse.

In 1999 the Energy Information Administration (1999) published a compilation of then-current federal energy subsidies, including direct dollar amounts, as shown in Table 1 (on page 10). By that calculation, the subsidies to natural gas and renewables received the most support.

These figures are indicative but they are incomplete for several reasons. First, when subsidies are identified this way, comparisons are difficult because each form of energy produces different levels of energy output. Second, the Energy Information Administration has not updated these figures. Third, these figures exclude indirect subsidies.

Table 2 (on page 11) provides a summary that compares the subsidies in a more meaningful way. They have been converted to dollars per million BTUs. New subsidies authorized by the 2005 energy act and indirect subsidies

are also included. The table reveals that when measured on a dollar-per-energy-output basis, renewables are receiving more direct federal subsidies than are petroleum, coal, and nuclear.

Non-monetary government support is difficult to measure and compare. For example, renewable energy advocates consider military expenditures to be a significant subsidy protecting Middle East oil imports, but this argument illustrates a lack of understanding of world oil markets. If U.S. military forces were not in the region, it is unlikely that oil production would be reduced; the revenues would simply go to dictators. And allocating some portion of the military budget as a subsidy to oil would require heroic efforts to attribute costs to a myriad assortment of jointly produced outcomes—including protection against terrorism.

Another example of non-monetary support is the Price-Anderson Act, which protects developers of nuclear power from unlimited liability in the event of accidents; it is correctly characterized as a subsidy. Because there have been no nuclear accidents where Price-Anderson has been invoked, the actual dollar value of this liability limitation is not known. The act has made it possible to obtain financing for nuclear power plants in the past, but the actual dollar value is not calculable. Making such a calculation would require knowing what finance rates and conditions would have been without the act.

Renewable energy receives non-monetary benefits as well. As just one example, the U.S. Bureau of Land Management (BLM) has proposed amending 52 of its land-use plans in nine western states to encourage wind energy development on public lands. It has also released its final programmatic environmental impact statement (PEIS) for wind energy development on BLM-administered lands in the West. The PEIS proposes to speed up the permitting of wind energy in the West. The Federal Energy Regulatory Commission (2005) is amending its interconnection regulations to require public utilities to follow special rules to interconnect wind energy facilities. Wind energy is allowed to behave differently, while other kinds of electricity generation continue to act according to the old rules designed to protect the reliability of the electrical grid.

UPCOMING SUBSIDIES

The Energy Policy Act of 2005 will substantially add to the subsidies. With the

strong support of Sen. Harry Reid (D-NV), the act has revived tax incentives to make geothermal, solar, and wind power more competitive with oil, gas, and coal. The law continues the production tax credit of 1.8 cents per kilowatt-hour to renewable energy development companies. It also allows developers to claim the tax credit when electricity contracts are signed with utilities, a step taken before a plant is built. Under the previous system, owners didn't know whether the tax credit would be in effect when a new plant went online. Reid promoted his plan by saying, "Our dependence on imported oil poses a risk to our national security and our economic well-being" (Young 2005, 4B). But renewable generation of electricity does little to reduce oil imports, since hardly any oil is used to produce electricity.

The energy act includes tax incentives for energy totaling more than \$18 billion over ten years, according to the Joint Committee on Taxation. Assuming that all revenue enhancers, intended to offset some of the tax breaks, are implemented, the total cost will be \$14.055 billion over ten years. The tax incentives include a credit for advanced nuclear facilities that could cost taxpayers as much as \$6 billion; \$2.858 billion in tax breaks for clean coal and clean coke; and \$452 million for public utilities using natural gas.

The act also includes subsidies for not-for-profit utilities that invest in renewable energy and clean coal generation through so-called tax credit bonds. These are municipal utilities and co-ops that already benefit from tax-free status. The proposal places a \$2 billion limit on use of the clean energy bonds, equally divided

TABLE 1: FEDERAL ENERGY SUBSIDIES

RECIPIENT	TYPE OF SUBSIDY				TOTAL
	DIRECT EXPENDITURE	TAX EXPENDITURES		RESEARCH & DEVELOPMENT	
		INCOME	EXCISE		
OIL	0	263	0	49	312
GAS	0	1,048	0	115	1,163
COAL	0	85	0	404	489
COMBINED (OIL, GAS, & COAL)	0	205	0	0	205
NUCLEAR	0	0	0	640	640
RENEWABLES	4	15	725	327	1,071
ELECTRICITY	0	40	0	33	73
TOTAL	4	1,656	725	1,567	3,953

Note: These are the primary energy subsidies on a budget-outlay basis for FY 1999 (in millions of 1999 dollars). Source: EIA (1999).

TABLE 2: FEDERAL SUBSIDIES PER UNIT OF OUTPUT

ENERGY TYPE	DIRECT FEDERAL SUBSIDIES (IN DOLLARS PER MILLION BTUS)	MAJOR INDIRECT FEDERAL SUBSIDIES
COAL	\$0.016	
PETROLEUM	\$0.026	Military
NATURAL GAS	\$0.054	Land-use preference for pipelines on federal lands
NUCLEAR	\$0.084	Price-Anderson liability limitations
RENEWABLES	\$0.162	Renewable portfolio standards in 19 states Interconnection rules relief Accelerated transmission line siting approval Land-use preference on federal lands

Note: To avoid double-counting, electricity is not included.
Source: EIA (1999, 2003).

between renewables and clean coal technologies.

Congress eliminated a proposed national renewable portfolio standard (RPS) that would have required 10 percent of electricity to be generated by renewables, but nineteen states have some form of RPS. Such requirements make consumers pay a higher price for energy than they would otherwise, and the price differential of renewables is often above 2 cents per kilowatt-hour.

The cost to ratepayers of such standards is difficult to quantify, but is surely massive. On a national level, 3,680 billion megawatt-hours of electricity were generated in 2003. Assuming a conservative price premium of 2 cents per kilowatt-hour (not including the already available production tax credit of 1.8 cents per kilowatt-hour for renewables), the standards in those nineteen states cost consumers more than a billion dollars per year. Some proponents have claimed (Union of Concerned Scientists 2005) that the RPS actually reduces consumers' total energy bills, but the assumptions they use are questionable.

STATES HAVE THEIR OWN SUBSIDIES

In addition to RPS standards, many states subsidize renewable energy in other ways. The *Fresno Bee* reports that California farmer Pat Ricchiuti is installing in his fruit packing house what is believed to be the largest "privately" financed solar-energy system in the state (Nax 2005). The \$6.4 million system features 7,730 solar panels on the roof of his 150,000-square-foot facility. Ricchiuti paid \$6.4 million for the system, but after state rebates, his cost was \$3.2 million. With the 50 percent rebate, Ricchiuti will recoup his investment in about eleven years. With no rebate, it would have taken twenty years,

and Ricchiuti said he would not have done the project. California taxpayers would have been better off.

Preferential infrastructure treatment and use of eminent domain are also forms of subsidy. The California Public Utility Commission has pressured Southern California Edison to build a new transmission line in the Tehachapi area east of Los Angeles so that it can tap into proposed wind energy development. The proposed route of the project has run into opposition from a housing developer because the proposed line would run through private property where a school is already planned. Eminent domain has been

considered for taking the property for the transmission line.

Evidence shows that most forms of energy receive some subsidy, and those subsidies show no signs of declining. But if energy technologies are to compete fairly, it's time to start eliminating special treatment in any form. Leveling the playing field by digging deeper holes and building bigger mounds does not lead to fair competition.

NOTE

1. For example, Ronal W. Larson (2005, 22), chair-elect of the American Solar Energy Society and a founder of the Colorado Renewable Energy Society, has observed that the production tax credit for wind energy "is at 1.8 cents only to balance the existing subsidies for conventional sources."

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MARKETING THE WE



ALTH OF NATURE

THE ST. JOE COMPANY IN NORTHWEST FLORIDA

By Brian Yablonski



The kayak slides quietly through the tannic waters of a creek flowing into Western Lake, a rare freshwater coastal dune lake along the shores of the Gulf of Mexico. Up ahead, perched on a cypress snag, a blue heron plays the role of lonely sentinel guarding this piece of wild Florida. As I pass the great bird and take my boat through the water lilies and marsh grasses, there is nothing in sight but an expanse of nature. The quiet causes me to forget that my remote location is actually in the middle of a flourishing beachside resort development. Moreover, access to Western Lake and the kayak itself are amenities provided by one of Florida's largest real estate developers, the St. Joe Company.¹

Like most residents of North Florida, I've followed the high-profile transformation of St. Joe from one of the state's oldest timber and paper companies to a sophisticated real estate development business known for creating places that capture the amenity value of diverse ecosystems. More recently, I became a part of that transformation, signing on with the company as a vice president and a subscriber to the notion that commerce and conservation can co-exist.

The St. Joe story, however, does not begin with the environment. It begins with one of America's oldest business families. In the 1920s, after a falling out with his cousins, Alfred I. duPont left Delaware and his leadership position with the famed gunpowder/chemical company and moved to Florida. Through his brother-in-law and for just a few dollars an acre, duPont amassed substantial holdings across the northwest part of the state—holdings

Courtesy of the St. Joe Company, photographer Ralph Daniel

that would become the forests of our predecessor, the St. Joe Paper Company. While much of the newly-acquired property was already cut-over land that had lost its value after its initial timbering, the tracts also included large portions of snowy-white beaches, marshlands, creeks, rivers and pine forests. Today, with more than 850,000 acres in the region, St. Joe remains Florida's largest private landowner.

In 1997, a strategic decision to reposition the company from a paper maker to a place maker led to the hiring of a new chief executive officer, Peter S. Rummell. At the time, Rummell headed the Walt Disney Development Company, which created the Disney Wilderness Preserve. He had learned his trade from Charles Fraser, an eco-development pioneer known for his mix of preservation and community on South Carolina's Hilton Head Island. Both businessmen recognized early on that people want and will pay a premium for the experience of beaches with unspoiled vistas, paddling blackwater creeks and marshes, and hiking rich forestlands. With these experiences in mind, Rummell set a new course for St. Joe—to capture the value of Northwest Florida's natural amenities and market the ecology of a place roughly 35 times the size of Hilton Head.

PRESERVING NATURAL SYSTEMS

Following the example of Charles Fraser at Sea Pines Plantation, Hilton Head's first master-planned community, St. Joe has aggressively used contractual relations with its home buyers to preserve the natural systems in and around its developments. Protective covenants require that certain areas remain as open space, that structures blend into or are set back from the surrounding environment, or that only native vegetation be used for landscaping. As a result, property owners obtain an assortment of amenities, including trails, wildlife habitats, camping, scenery, and solitude.

For example, one development features a protected 85-acre sand dune ecosystem of sea oats, scrub oaks, and the endangered Choctawhatchee Beach mouse. While these contracts and controls are not required by government regulation, they ensure the compatibility with the natural surroundings that buyers want for the prices they pay to live in these communities. The restrictive covenants not only preserve

I've followed the high-profile transformation of St. Joe from one of the state's oldest timber and paper companies to a sophisticated real estate development business known for creating places that capture the amenity value of diverse ecosystems.

the environment but preserve the value of the residential development itself.

In addition to providing amenities that command high prices, St. Joe recognizes that there is growing demand for property next to or near large conservation areas. Create a conservation area and you create value. In just eight years, as a means of boosting the profitability of their developments, St. Joe has protected more than 160,000 acres near its developments, or 250 square miles, through public and private conservation sales. Bald Point State Park, Torreya State Park, Wakulla Springs State Forest, and the Crooked River tract of Tate's Hell State Forest are all places in Florida created with St. Joe lands. By establishing these preservation buffers, which are scattered across North Florida, St. Joe attracts homebuyers to the land that it develops nearby.

Markets are also encouraging creativity among developers in ways that should ultimately benefit the environment. The shrinking supply of oceanfront property and high demand in the second-home

market together have given St. Joe incentives to introduce prospective purchasers to the traditionally less desirable interior of wild Florida. Now, instead of being drained for progress, as in the past, many marshes are being marketed and preserved as part of this new Florida experience. Once dismissed as worthless Florida swamps, marsh-front properties have been dubbed by the *New York Times* "the new frontier in waterfront," and they now bring up to \$750,000 for a homesite alone (Johnson 2004).

In one of these marsh and woodland preserves, RiverCamps, the homes are Adirondack-style cabins, set back from creeks and marshes by buffers. Visitors are given a checklist of more than 100 species of birds that have been identified at the site. Landscaping is limited to native vegetation such as saw palmettos and pine flat woods. Planned facilities will include an interpretive center, creekside observation decks, and a kayak dock. Two-thirds of the 1,500-acre property has been earmarked for conservation uses.

"NEW RURALISM"

Most recently, St. Joe has advanced a concept called "New Ruralism"—another market-based effort to preserve open space with a less overt but equally powerful message of environmental stewardship. Some of the best preserved and environmentally

managed lands in the South, including North Florida and South Georgia, are the privately owned plantation and farm properties of an older era. Ted Turner's Avalon Plantation in North Florida is a prime example.

Responding to second-home buyers who opt for a similarly more agrarian experience with nature, St. Joe is working to create new farm and ranch communities designed to help people rediscover an intimate connection with rural America. These properties will feature larger home sites, often separated by nature preserves or agricultural land and offering a sense of vastness and privacy. For example, WhiteFence Farms will consist of 5- to 20-acre equestrian-style sites with space for a main farmhouse and other optional buildings such as barns and stables. Pricing is expected to range from \$20,000 to \$75,000 an acre.

Another New Ruralism development, Florida Ranches, is expected to consist of 50- to 150-acre sites located within a 1,000- to 3,000-acre community served by common sporting areas (places where people can train hunting dogs, practice clay shooting, etc.).

Finally, with its large inventory of land, St. Joe is planning with governments on an epic scale. That, too, benefits both the environment and the bottom line. Near Panama City, for example, St. Joe worked with citizens and regulators to map out the future land use of 75,000 acres of St. Joe land. This process provided the company with the necessary governmental approvals to change current land uses for development, while also planning for the preservation of 37,000 acres. Nearby, St. Joe concluded wetland preservation agreements with the U.S. Army Corps of Engineers and the state of Florida on another 31,000 acres. Development will be clustered and natural areas will be contiguous, creating an important "bay to bay" wildlife corridor between West Bay and the Choctawhatchee Bay.

In a state where land-use regulations are increasingly stringent, St. Joe receives greater certainty from government over what it can and can't do on its land. In return, it is earmarking more for preservation. Through this approach, Northwest Florida can avoid the piecemeal development characteristic of many communities further south.

ECHO OF THE PAST

Past is prologue. Nineteenth-century railroad titans,

St. Joe is capturing the value of environmental amenities in its bottom line—enhancing the natural environment and expecting to market the improvements. Profit and protection are not mutually exclusive.

eager for passengers, spurred the creation of our greatest national parks. Today we would say that their intentions were less important than the dramatic outcome. In his book, *Searching for Yellowstone*, environmental historian Paul Schullery aptly sums up the motivations that led to our first national park's founding. "Human nature was not on holiday. The people who created Yellowstone were not exempt from greed, any more than they were immune to wonder. Some cared more for the money, some for the beauty. Some were scoundrels, some may have been saints" (Schullery 1997, 61).

Like those of the creators of Glacier and Yellowstone national parks, St. Joe's profit-driven actions have and will continue to permanently preserve entire awe-inspiring landscapes. If the market is allowed to thrive, the company's success will continue to steer its course toward greater environmental protection. As St. Joe's Rummell explains, "Our value is greatly enhanced not only by what's developed, but also by what's preserved.

Our objective is to create great places that start with Mother Nature's best work. We are working hard to demonstrate that a real estate company can be one of Florida's most important conservationists."²

St. Joe is capturing the value of environmental amenities in its bottom line—enhancing the natural environment and expecting to market the improvements. Like environmental entrepreneurs who went before them, St. Joe's management shows that profit and protection are not mutually exclusive.

NOTES

1. The company's name comes from Port St. Joe, a town in the Florida panhandle located on St. Joseph Bay.
2. Peter S. Rummell, chief executive officer, the St. Joe Company, personal conversation, July 5, 2005.

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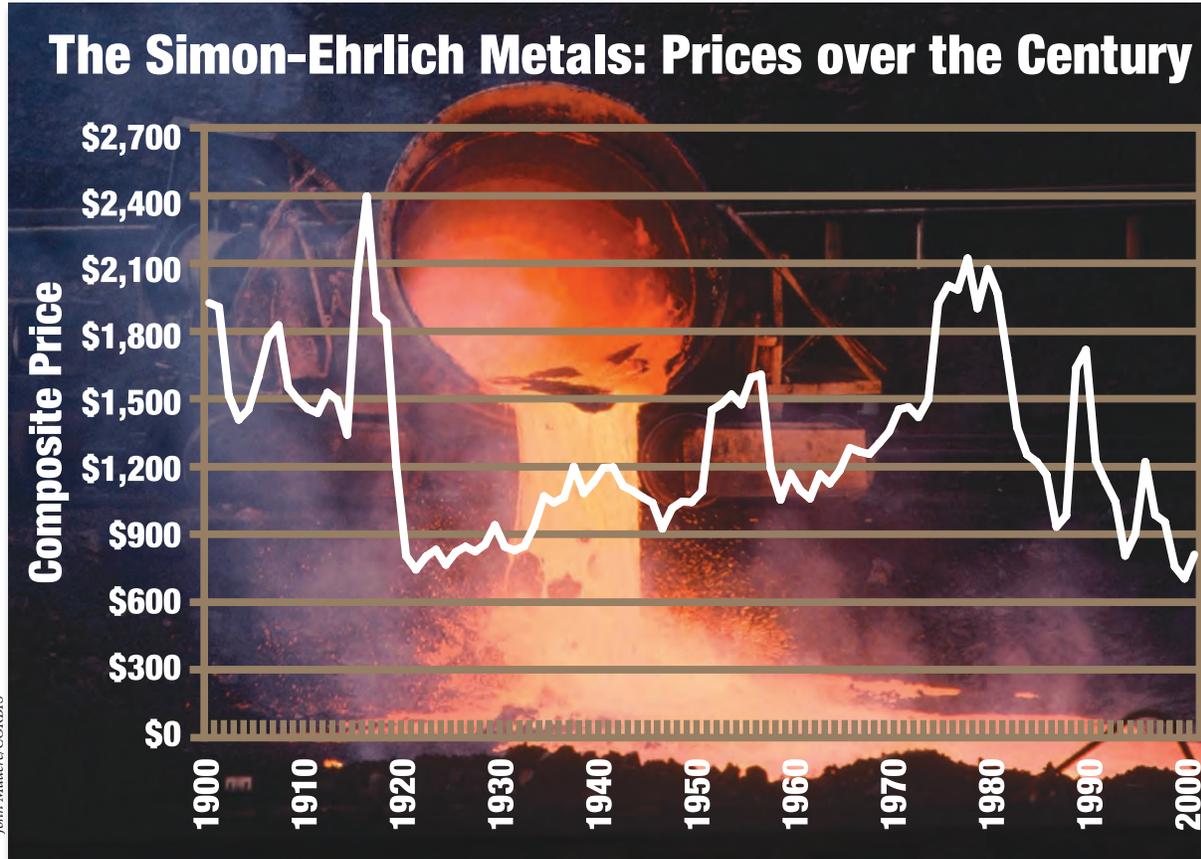
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BETTING ON THE WEALTH OF NATURE

THE SIMON-EHRLICH WAGER

By David McClintick and Ross B. Emmett

Simon's claims can now be put to the test for the entire twentieth century. Despite ups and downs in prices over the course of the past century, a wager in 1900 would have been won in 1999 by the person who predicted a decrease in natural resource prices. (Prices are adjusted for inflation using 1998 as the base year.)



Twenty-five years have passed since Paul Ehrlich and Julian Simon agreed to a wager that would test their competing visions of humanity's future. It is now possible for us to put that wager into perspective. We can decide whether Simon won by mere chance and we can determine what significance the bet has today.

The year 1980 was a time when many people thought that the earth was running out of its precious natural resources. Simon, an economist who died in 1998, contended that human ingenuity would always come up with substitutes if needed. Thus humanity would never run out of key materials. In contrast, Ehrlich, a neo-Malthusian biologist, contended that overpopulation and excessive consumption were already forcing shortages of key materials and that this trend would continue.

Simon and Ehrlich agreed that rising prices would be a sign that raw materials had become scarce. Simon offered to bet that any raw materials selected in one year would be lower in price ten years hence. Convinced that prices would go up over the next decade, Ehrlich and two colleagues responded to Simon's offer.

So, in October 1980 Ehrlich and his colleagues picked five different metals (chrome, copper, nickel, tin, and tungsten), spending \$200 on each metal. The total investment was worth \$1,000 in 1980 prices. If, in October 1990, the value of the five metals at their original 1980 quantities, adjusted for inflation, turned out to be greater than \$1,000, then Ehrlich would win the bet. If the value were less, Simon would win the bet. Whoever lost would be required to send a check to the winner equal to the difference in value.¹

In October 1990, the price of the basket of metals had fallen substantially below its 1980 level. All the metals had experienced a drop in value. Moreover, the drop was so substantial that Simon would have won even if the values hadn't

been adjusted for inflation. Ehrlich and his associates sent Simon a check for \$576.07 (Tierney 1990, 81).

Simon's response to the wager was more humble than that of many of his supporters. Responding to a question from the audience during a debate, for example, he said that he would win "not in every single place, not in every single time span, but on the average" (Myers and Simon 1994, 141). Prices in any short-run period, he recognized, are subject to fluctuations, and he might have lost the bet. Simon's claim was that the human propensity to take advantage of new opportunities and innovate meant that commodities are likely to become less scarce. The general trend of natural resource prices should be downward sloping, even though individual decades might run counter to that trend.

Simon's claims can now be put to the test for the entire twentieth century. The U.S. Geological Survey has standardized the price data for all basic metals during the past century, using 1998 as the base year (Kelly et al. 2005). We examined those data to determine the answers to three questions.

First, would the outcome of the Simon-Ehrlich wager be the same if the bet had been extended to the entire twentieth century? The figure provides the twentieth-century price history of a composite of chrome, copper, nickel, tin, and tungsten. Despite ups and downs over the course of the past century, a wager in 1900 would have been won in 1999 by the person who predicted a decrease in natural resource prices. If someone invested \$200 at 1900 metals' prices in each of these five metals the inflation-adjusted value of the same bundle of metals in 1999 would have been 53 percent lower.² The person who took Simon's position would have won over the entire century.

Second, would Simon have won or lost in other decades? Was he just lucky to have picked the 1980s? The figure shows that the 1980s experienced the second largest drop in prices of the century, so to some extent Simon was lucky. He had said simply that he was more likely to win than to lose in any given decade, and indeed he would have won in only five decades (the 1900s, 1910s, 1940s, 1980s and 1990s). He would have lost by a few dollars in the 1950s, and by more significant amounts in the other four decades. This outcome confirms Simon's suspicion that prices over short spans of time are as likely to rise as to decline, but the overall trend will be downward.

Finally, did some prices fluctuate more than others? Yes. Within the general downward trend of prices over the century, there was plenty of variation. Tungsten and tin were highly volatile during various decades. The price of tungsten doubled in the 1920s, even though other metals finished the decade at about the

same price as they started. Tungsten doubled again in the 1930s, but this time it was joined by a doubling in the price of tin.

In the 1950s, the decade in which Simon would have lost by a few dollars, most of the metals rose in price, with tin leading the way. But tungsten's price dropped by almost a third, almost outweighing the price increase of the other metals. Over the 1960s and 1970s, all the metals increased in price, with tungsten's price doubling over the period and tin's price tripling. These price increases were wiped out in the 1980s and the 1990s. Once again tungsten and tin led the way; their prices in 1999 were about one-sixth of what they were in 1980.

Simon always predicted that in any particular decade prices may move up or down. While he thought he might frequently lose, he was always willing to bet because he thought he would more frequently win. As late as 1996, two years before his death, he said, "I'm only offering to bet; I do not guarantee a rosier future in all respects as a sure thing" (Simon 1996, 36). The price history of the twentieth century provides evidence that he would have won five of the ten decades by large margins, and he would have won a bet over the entire century.

NOTES

1. Simon's offer of the bet is discussed in Simon (1981); Paul Ehrlich indicated his willingness to take the bet in Ehrlich (1981). Ehrlich's account of what happened can be found in Ehrlich and Ehrlich (1996, 100–104); see also Norman Myers' account in Myers and Simon (1994, 99–100). Simon's discussion of the bet's outcome is in Simon (1996).
2. One thousand dollars in 1900 is equal to \$19,297.03 in 1998, our base year. If that sum were divided equally among the five metals, and the portions of each metal were re-valued in 1999 prices, the bundle of metals would be worth \$9,176.34 (in 1998 dollars).

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GREENER PASTURES

Compiled by Linda E. Platts

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OLD BECOMES NEW AGAIN

The latest trend in furniture appears to be environmentally sound, remarkably inventive, and priced considerably higher than the wares at Pier 1. Coat racks made from steel rebar, light fixtures from wooden pallets, and headboards from rusty garden gates are all the rage. This reclaimed-object furniture was once the decor of necessity for struggling college students and newlyweds. Today, however, it is found in stately homes next to the Queen Anne-style table in the foyer.

A gnarled log attached to an old drive shaft provides just the right touch and connection to the past, according to one proud owner of reclaimed-object furniture, and it is reasonably priced for this individual at \$2,300. A popular rocking chair known as the "RE-TIRE" chair has a wooden frame and cleaned, recycled strips of old tires for its seat and back. The selling price is \$1,200 from Metaform studio (www.metaformstudio.com).

Part of the cost stems from the amount of time it takes to locate previously used objects. Time must be spent roaming beaches, garbage dumps, and city streets to find the appropriate castoffs. Other materials come from Asia. Farm implements used during the 1940s and 1950s in Laos, Cambodia, and Thailand are in high demand as are reclaimed floor boards made of teak. In other instances the materials are more readily available. These include sunflower hulls, which are mixed with resin and pressed into tables, or the excess mahogany left over from guitar-making.

One company is actually making money from money. It buys shredded currency from the U.S. Treasury, mixes it in a water-based slurry and presses it into a table selling for \$825. Other designers use newer materials, but just visualize them in a different way. The "Bungee Cord Chair" is woven from the stretchy cords and the "Pipe Dream Sofa" is made from galvanized pipe sold at Home Depot.

Many of these unusual furnishings are available online, and the Furniture Society, a trade group of independent craftsmen, reports that its membership has grown tenfold in less than ten years. Even though the furniture is pricey, the "green" marketing hook draws many people to these unique styles created from ordinary materials.

—Wall Street Journal

SOOT-FREE IN MONTANA

Libby, Montana, a town of about 8,000 residents located in the northwest corner of this giant state, is probably best known for its health

problems related to asbestos. But its troubles don't end there. In this remote and economically depressed area, residents often rely on wood stoves for heat. The result is air pollution that has drawn the attention of the federal government.

Last year, Libby was identified by the U.S. Environmental Protection Agency as not meeting air standards intended to protect against microscopic soot. Frequent air inversions trap smoke from the approximately 1,200 stoves in town, resulting in a variety of respiratory ailments.

With the cost of modern, cleaner-burning stoves ranging between \$1,200 and \$1,800, many Libby residents are unable to replace their older polluting stoves. In this case, the Hearth, Patio and Barbecue Association trade group stepped in and offered to provide 300 new stoves and 200 chimneys to the community for free. With further assistance from the stove industry, the association expects to replace 90 percent of the old stoves within the next two years. It also will pay installation costs. The new stoves create less pollution because they are able to burn so much hotter. Montana Governor Brian Schweitzer intends to be on hand for the kickoff of the Libby stove exchange.

—*Missoulian*

SUPERB WINES FROM GREEN ACRES

In years past, the most prestigious wineries in Napa Valley, Calif., were the most pristine. Not a weed to be seen, just a perfect monoculture—row upon row of meticulously tended grape vines. Today, one of Napa Valley's premier wineries, Shafer Vineyards, is boasting a new look. Its appearance is trashy, chaotic, and unkempt. Growing among the vines are untidy patches of clover, oats, peas, and mustard. And working side by side with the human laborers in the fields are bats, bees, bluebirds, swallows, hawks, owls, kestrels, spiders, ladybugs, and anagrus wasps.

The chemicals once used to kill insects, weeds, and mildew have been replaced and so has much of the standard electrical supply. The bright sunlight that pours down on the fields also floods into the solar panels that Doug Shafer has installed. The solar panels have reduced his monthly power bill from \$3,000 to about \$40.

Shafer freely admits that the changes he instituted at his vineyard did not necessarily stem from his general concern for the environment. He was worried about the future health of his land. Another well-respected vineyard in the region was experiencing a steady decline in the quality of its grapes, a decline that the owner attributed to exhausted soils. Shafer, whose winery was started in 1922, saw this as a warning and began to consider his options.

By planting cover crops such as clover and mustard, Shafer discovered he could choke out the weeds. When the crop cover decomposed, it provided nutrition for the vines. While alive and thriving, the cover crops were natural habitat for the good bugs that prey on bad bugs (or at least bugs bad for growing grape vines). Both sharpshooters and leafhoppers can be devastating to a vineyard, but wasps, ladybugs, and others provide an effective SWAT team, eradicating the invaders. Shafer built a bat house and discovered that bats may have a taste for leafhoppers. The songbirds, who have also been provided with their own housing, eat insect pests, too, although a few of the beneficial bugs get gobbled up in the process. Hawks, owls, and kestrels prey on gophers, mice, and voles, which feed on the young vines. With night-hunting owls in the mix, Shafer has 24-hour protection.

While not all vineyards are rushing to adopt these practices, Shafer is pleased with the results. His Cabernet Sauvignon continues to draw raves at \$150 a bottle, and he feels confident that he has ensured a healthy future for his winery while eliminating the costs of many chemicals and even a great deal of electricity.

—*San Francisco Chronicle*

CARPET SCRAP POWER

Although the idea has been around for a long while, carpet manufacturers in Dalton, Georgia, the "Carpet Capital of the World," think they have finally got it right this time. For years, the industry has sought a way to power its carpet and rug factories with the wasted rejects, overruns, and scraps that are an inevitable by-product of their manufacturing process. According to the Carpet and Rug Institute, 4.7 billion pounds of carpet are dumped in landfills each year, accounting for 1 percent of the nation's total landfill space.

Various attempts to use carpet scraps to generate energy have failed because of problems working with the melted material, failure to meet clean air standards, and finally a serious explosion at one experimental facility. However, the rise in energy costs sent the industry and its engineers back to the drawing boards.

The result is a shiny new \$10 million plant adjoining the Dalton factory that will shred the scraps and convert them into synthetic gas that can be burned much like natural gas. Shaw Industries, which owns the factory and the power plant, expects to save \$2.5 million in fuel oil per year once the plant is in full operation. If the technology works as expected, many other carpet manufacturers will be standing in line for similar power plants.

—*Environmental News Network*

By Daniel K. Benjamin

economist, *n.* a scoundrel whose faulty vision sees things as they really are, not as they ought to be.
—after Ambrose Bierce

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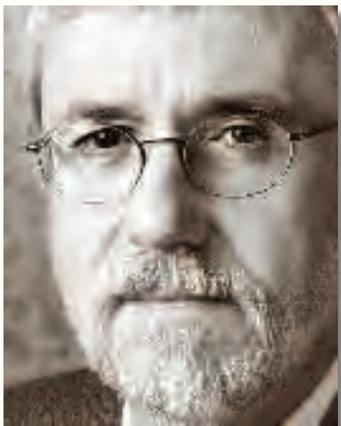
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The Environmental Protection Agency has been regulating air pollution in the United States for more than thirty years. Thus far, we know remarkably little about what benefits we are getting for the \$30-plus billion the nation spends each year on this endeavor. Recent research by Kenneth Chay and Michael Greenstone (2005) has made an important advance in accurately quantifying these benefits.

In their study of total suspended particulates (TSPs), the tiny particles emitted by sources such as internal combustion engines, Chay and Greenstone have found that reductions in air pollution are associated with clear increases in housing prices. Indeed, their estimates imply that during the 1970s alone, mandated reductions in TSPs led to a \$45 billion rise in home prices in counties where pollution was reduced due to federal regulations.

Housing markets are an excellent place to study people’s willingness to pay for environmental amenities. A large body of economic evidence from real estate markets already indicates that people will pay more for homes that have identifiable attributes they want (such as larger lot size or additional bathrooms). In principle, if people value clean air for aesthetic or health reasons, they are likely to pay extra for homes in locales with cleaner air. We thus should be able to identify the value they place on this amenity by observing differences in house prices across areas with differing air quality. But this has proven difficult to do in practice, because of confounding factors that affect both air quality and house prices.

For example, if people move to southern California to take advantage of the mild climate or the excellent surfing, air pollution will rise, but so too will house prices. Thus, even if people dislike dirty air, we may observe people paying more for houses where the air is dirtier.

The great advance made by Chay and Greenstone is that they focus on the very uneven application of the Clean Air Act Amendments of 1970.¹ Under this legislation, if pollution concentrations in a county exceed the federally determined ceiling, then the Environmental Protection Agency (EPA) designates the county as “nonattainment.” Polluters in nonattainment counties face more stringent pollution regulations than do those in attainment counties.

During the 1970s this differential regulatory treatment of counties under the Clean Air Act forced down TSP levels in nonattainment counties relative to attainment counties, and did so independently of other potentially relevant factors. Moreover, because the regulations impinged

The authors estimate that the roughly 10 percent cut in total suspended particulates (TSPs) brought about by the Clean Air Act in nonattainment counties raised house prices in those counties by about 3 percent. This translates into roughly \$45 billion worth of benefits to the people in those locales.

very unevenly across the nation, TSP concentrations also changed unevenly across the nation. These features of the Clean Air Act provide Chay and Greenstone with something very much like a controlled experiment; hence their ability to isolate the effects of TSPs on housing prices.

The authors find that, even after controlling for other factors likely to affect housing prices, such as income, population, and taxes, TSP concentrations have effects on housing prices that are both statistically and economically important. The authors estimate that the roughly 10 percent cut in TSPs brought about by the Clean Air Act in nonattainment counties raised house prices in those counties by about 3 percent. This translates into roughly \$45 billion worth of benefits to the people in those locales.

This rise in housing values is modest, to be sure. Moreover, the authors make no attempt in this study to assess the possible costs of the Clean Air Act. Hence, we do not know whether these air quality improvements have been worth the cost. Nevertheless, this paper joins the authors' prior research (reported in my March 2004 column) as the first convincing assessment of the magnitude of the potential benefits from cleaner air.

Chay and Greenstone also show that the value people place on air quality improvements is lower in counties where air quality is the worst. This result is consistent with a process in which people engage in "self-sorting"; i.e., they choose where they live based partly on environmental amenities, such as clean air. Thus, just as trout fishermen tend to congregate in western Montana, people who are better able to tolerate smog are more likely to live in Los Angeles.

Perhaps the most important feature of this study is its unequivocal demonstration that we can use markets to measure the value of environmental amenities. Many economists have doubted the ability of markets to perform this valuation. Until now this doubt has seemed reasonable, for previous research has had difficulty in establishing a clear link between improved environmental quality and credible measures of the resulting benefits. The present study makes it clear that past failures to establish such a link have been the result of failures on the part of economists, not failures on the part of markets. If the economists get the message and refocus their research efforts accordingly, this is a conclusion that surely bodes well for improved environmental policy in the future.

NOTE

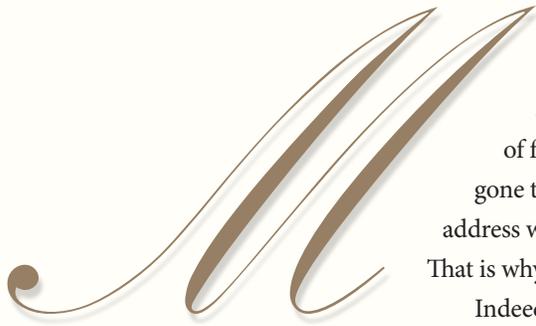
1. These amendments are informally called the Clean Air Act of 1970 because they established the basic framework for federal regulation of air pollution.

REFERENCE

Chay, Kenneth Y., and Michael Greenstone. 2005. Does Air Quality Matter? Evidence from the Housing Market. *Journal of Political Economy* 113(April): 376–424.

LETTER TO THE EDITOR

WHAT PAYING FOR ECOSYSTEM SERVICES MEANS



Mark Sagoff's piece, "The Catskills Parable," (June 2005) recounted the decision of New York City to invest in land management and infrastructure changes in the Catskills and Delaware watersheds rather than build a water treatment plant. Sagoff makes a number of factual corrections that improve the accuracy of the Catskills story (e.g., more funds have gone to land management changes than to fee-simple purchases), but none of his corrections address whether or not the Catskills provides a useful example of a payment for ecosystem services. That is why the story matters in the first place.

Indeed, Sagoff's conclusion fails to understand the most important point. He says that the Catskills parable is being misused as a preservationist argument—"to show that wild or natural ecosystems benefit us more when left alone than when developed economically." But in most cases, services will be better provided by deliberate land management practices. Indeed, an ecosystem services approach is really about influencing land management practices to ensure greater provision of services. Focusing on the Catskills example as a story about leaving nature alone, as Sagoff does, misses the point.

While some environmental advocates may use an ecosystem services argument to assert as a general proposition that roads and development are bad, to claim that this is a central part of an ecosystem services approach mischaracterizes the state of the field. I don't know of anyone active in the ecosystem services arena who would make such an argument. The three basic assertions of an ecosystem services perspective are straightforward: (1) landscapes provide a stream of services, ranging from water quality and pollination to climate stability and soil fertility, whose economic value is enormous; (2) the vast majority of these services are public goods and not exchanged in markets, so landowners have little incentive to provide these positive externalities; and (3) therefore we need to think creatively about creating markets for these services.

A number of insights flow from these basic points. The first is that undeveloped land can be productive, in the sense of producing socially valuable services even if there are no direct market signals that reflect this (e.g., consider the role of wetlands in flood control). The crucial corollary is that provision of ecosystem services through a refuge model as Sagoff implies, i.e., setting aside large areas of land for service provision, may prove both inefficient and impractical. We live in a human-dominated landscape and the key challenge lies in creating markets for what have traditionally been public goods—the positive externalities provided by public and private land management practices such as water purification and flood control.

As support for these assertions, don't simply take my word for it. First, check out the Web site www.ecosystemmarketplace.com. This is the most comprehensive source in the world for examples and analysis of payments for ecosystem services. As you'll see, far more ecosystem service transactions are taking place than one might expect, and most of these do not involve simply setting aside land. You'll also find that the ecosystem services approach shares many similarities with PERC's approach to resource management.

Jane S. Shaw, a senior fellow of PERC and editor of *PERC REPORTS*, welcomes vigorous debate about controversial environmental topics.

Send your letters to her at: *PERC REPORTS*, 2048 Analysis Drive, Suite A, Bozeman, MT 59718 or shaw@perc.org.



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THE NEXT GENERATION OF ENVIRONMENTAL LEADERS

By Terry L. Anderson



Eighteen young conservationists spent the month of June in Bozeman, Montana, attending the Kinship Conservation Institute. At KCI they learned about, discussed, and critiqued free market environmentalism. PERC has teamed up with the Kinship Foundation to produce this unique program for the past five years.

During the month Kinship fellows heard lectures on topics such as property rights, risk analysis, transferable fishing quotas, and conservation easements, as well as fund-raising and marketing. They went to Yellowstone National Park, where Hank Fischer explained his wolf compensation fund. Each participant worked with a PERC mentor on a specific project applying free market approaches—in Russia to save tigers, in Pakistan to save snow leopards, and in the United States to increase instream flows.

During the last two days, the Kinship fellows presented their projects. Nigel Asquith, a native of England with a Ph.D. in tropical ecology from Duke University, asked if he could be the last of the leaders to present his project because he believed his presentation would provide a unifying message for the institute. Nigel's project focused on how to use water marketing to improve water quality in Bolivia's Rio Grande watershed. He proposes that downstream water consumers, such as industrial and municipal users, purchase clean water from upstream farmers, giving the farmers a strong incentive to practice conservation.

I expected Nigel to present his project as the epitome of entrepreneurship. It certainly was that, but his message went beyond his own project. Nigel's unifying theme was his passion for making the ideas of all the Kinship fellows "economically sustainable."

Nigel and his fellow environmental leaders had been given \$1200 at the beginning of KCI to use as they wished. It could have been used for a party, a guest speaker, books, whatever. Instead they chose to establish a "venture capital fund" for conservation projects of the sort they were proposing. To the \$1200, the group pledged another \$600.

Although \$1800 is a drop in the bucket of money necessary to get their projects going, it represents these environmentalists' commitment to free market environmentalism. Moreover, they realized that their approaches were much more cost-effective than typical environmental solutions. Nigel pointed out that large foundations and international environmental groups have purchased land near his Bolivian project to preserve it. But after spending \$10 million, they have no management plan that will ensure economic or environmental sustainability. For a fraction of that amount, Nigel can actually improve water quality and land conservation by clarifying property rights and encouraging trading between willing buyers and willing sellers.

Over its five-year history, the Kinship Conservation Institute has exposed 89 environmentalists to free market environmentalism. Research institutes such as PERC must continue to generate the ideas and information that support free market environmentalism. But only environmental entrepreneurs like Nigel and his colleagues can put these ideas to work and make free market environmentalism truly relevant.

In addition to being PERC's executive director, Terry L. Anderson is a bow-hunter. In this "On Target" column he will be a straight shooter in confronting issues surrounding free market environmentalism.

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PERC REPORTS

Furniture from reclaimed objects, such as this RE-TIRE rocking chair made from recycled car tires, is featured in "Greener Pastures" (p.18).

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