Where Markets Meet the Environment

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AS FARMLAND WAS ABANDONED, DEER HABITAT INCREASED

WILDLIFE IN THE SUBURBS

By James R. Dunn

Many environmentalists worry that suburban growth is reducing the diversity of wildlife. The Sierra Club's Carl Pope recently wrote that urban sprawl "fragments landscapes—and fragmented landscapes are the biggest threat to America's wildlife heritage" (Pope 1999, 6).

This claim may be true in California, but it is not supported in New York State. I live on abandoned farmland in a suburban area outside Albany that looks like a wildlife refuge.

When our agricultural lands are abandoned because they are no longer competitive, they usually reforest naturally. Subsequently, when these lands near cities become residential areas, people typically plant trees and shrubs, often in places where there have been none before. Deer habitat improves, as does habitat for robins, woodpeckers, chickadees, grouse, finches, hawks, crows, and nut-hatches, as well as squirrels, chipmunks, opossums, raccoons, foxes, and rabbits. My backyard has more than fifty bird species.

When farmlands become suburbs, deer habitat improves enormously, as does habitat for birds such as woodpeckers, chickadees, grouse, and hawks, as well as squirrels, chipmunks, opossums, raccoons, and foxes.

Today, even once-extirpated species like turkey and coyote are abundant enough to be hunted near where I live. Bear, mountain lion, and moose are occasionally spotted. Wildlife in New York State overall is more abundant now than in 1492.

Measuring the quality of wildlife habitats is not easy, but one statistic, the annual harvest of buck deer by hunters, is a good reflection of how well the habitat nurtures deer and also an indicator of the quality of habitat for many birds and other animals.[1] To determine the quality of this habitat, I tabulated buck deer harvests for counties containing or adjacent to major cities across New York State. These are the "suburbanized" counties. I then compared those statistics to average state records.

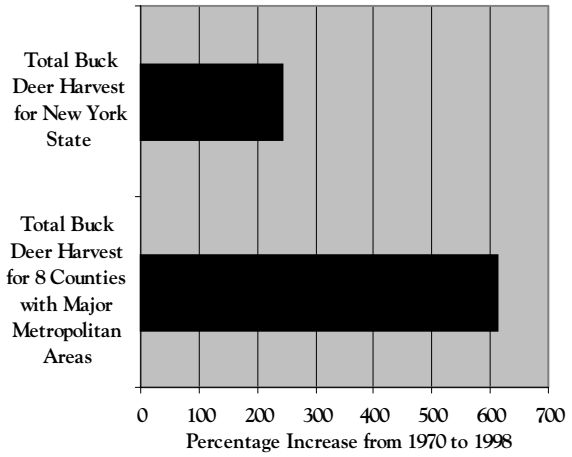
Since 1970, the deer population multiplied 7.1 times (a 610 percent increase) in suburban areas and only 3.4 times (a 240 percent increase) in the state overall (see figure). And for the entire 68-year period from 1930 to 1998, the deer herd increased 44.1 times in suburban areas versus 12.6 times for the state as a whole (Severinghaus and Brown 1956; Stickney 1983; Department of Environmental Conservation 1998). Clearly, areas of maximum suburbanization produce a better habitat for deer than do other areas of the state.[2]

The improvement in deer habitat began with the loss of farmland during the twentieth century, as modern agricultural technology led to greater food production from less land and the prime farming areas shifted westward. It continued as people in the cities became wealthier and began moving out into land that had been previously farmed. The best areas for most wildlife are the places with abundant wood edges—the fragmented landscapes of suburbia. One researcher found this to be the case in California and

even in Finland (Goudie 1990, 100–101).

Nonsuburban New York State is typical of the eastern states in which most of the 209 million acres of America's abandoned farmlands are located. When farming was abandoned, the land typically reverted to natural cover. In New York State, forest cover increased from 25 percent in 1900 (Stanton 1992) to 61 percent in the 1990s, according to the latest New York State Department of Environmental Conservation statistics.

Buck Deer Harvests in New York State



At first, as farms returned to forest, the fragmented landscape, as in surburbia today, was good for wildlife, and deer proliferated. However, as the forests matured, the food available for deer began to drop off. In many areas, once the present-day almost continuous forest was achieved, as in the Adirondacks, wildlife did not fare so well. In the Adirondack wilderness, where much of the forest is over one hundred years old, the deer count is down. In the Adirondacks' Hamilton County, for example, deer harvests were high in the period 1930–1965, but have dropped by 50 percent since then (Severinghaus and Brown 1956; Stickney 1983; Department of Environmental Conservation 1998).

Conditions in the Adirondacks are similar to those of the entire Appalachian chain from Maine through Alabama and Georgia. The almost unbroken forest is beautiful to see and experience, but it is not prime wildlife habitat. Similarly, deer harvests in the heavily forested states of Maine, New Hampshire, and Vermont have been dropping in recent years, due in part to the diminution of prime habitat.

During my years as a geologist in this area, I discovered that many roads on old topographic maps are no longer used. These roads serviced a checkerboard of farms, orchards, and grazing lands during the 1800s and until about 1920. The roads were abandoned when agricultural lands were no longer needed. Thus the trend in this forest area has been toward greater continuity, not toward less, in spite of what critics say about "suburbanization."

The causes of the great changes I have described have much to do with economics and little to do with conservationists. *Audubon* recently published a list of the greatest conservationists of the twentieth century (Graham 1998). The list was what you might expect. No producers of wealth; mostly writers, crusaders, politicians, and bureaucrats—individuals such as Rachel Carson, Paul Ehrlich, Lester Brown; several presidents; and historical figures like John Muir and Gifford Pinchot.

Yet when I look around at my little suburban forest, I realize that none of the people on *Audubon*'s list contributed in any significant way to the conservation miracle that surrounds me. So I want to prepare an alternate list. The great conservationists on my list would include the entrepreneurs and innovators behind Dow Chemical, International Harvester, Monsanto, Caterpillar Tractor, and John Deere. These are the people directly responsible for the almost unbroken forest that extends from Maine's Canadian border down the Appalachians almost to the Gulf of Mexico and, indirectly, for my small forest with its frequent wood edges. By revolutionizing agriculture, they have changed our landscape, giving some of us a chance to walk for hours on end without the interference of civilization and others a chance to mingle with wild animals.

The entrepreneurs and innovators behind Dow Chemical, International Harvester, Monsanto, Caterpillar Tractor, and John Deere are directly responsible for today's forests.

My wife and I enjoy our little forest in what was once an apple orchard. We are grateful for the conditions that have prolonged our lives and made them more comfortable while simultaneously multiplying the trees and the wildlife that surround us.

Notes

1. Carl Pope notes that deer and some other animals have benefited from suburban growth, but he dismisses them as "adaptable and common" species.

2. Although New York State began keeping records in 1927, the records were sketchy before 1930. Hence, I used the interval 1930–1998 in my tabulations.

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THE SECRET PAST OF RESOURCE RECOVERY

Like most people of my generation, I used to believe that recycling began a few decades ago in response to the crisis of energy and environmental degradation (except in the slums of the Third World where it was a means of survival). I had heard of the rag picker, the scavenger at the dump, the handcart junkman, and the old-clothes man of Dickens' era, but I never thought of them as significant economic actors. Little did I know that recycling has always been big business, and that today's "three R's" banner (reduce, reuse, recycle) is actually as old as civilization.

Inventors are compulsive problem-solvers. Innovative technicians are always finding ways to reduce waste or develop new uses for it.

My view of recycling began to change a few years ago through an offshoot of my doctoral dissertation in economic geography. Among other things, economic geographers look at clusters of businesses in places like Silicon Valley, Boston's Route 128 corridor, and Hollywood. Much of their research illustrates how firms can benefit from close proximity to one another through such factors as lowered transportation costs, a mutually reinforcing creative environment, and the communication of tacit knowledge between people dealing face-to-face. For my dissertation I looked at the processes by which knowledge developed in one field is used in another and what role, if any, local conditions play in the transfer.

I decided to talk to individual inventors, and my research strategy led me to shops, factories, bungalows, and apartments in my hometown, Montreal. I met many mechanically inclined people, most of them mavericks who had worked in many different industries. My

research design was validated as I documented numerous cases of interindustry technology transfer.

My interviews showed me that inventors are compulsive problem-solvers. They see problems where the rest of us would be happy with the status quo. In their opinion, a machine can always be improved to do more with fewer resources. As a result of this mindset, they dislike waste. I began documenting ways that innovative individuals had helped reduce waste throughout their lives.

Many of these inventors were part of recycling networks, some of which had managed to escape the attention of tax collectors. I visited backyards and shops that looked like junkyards to me, but whose owners saw them as full of potentially valuable resources.

I had recently become aware of resource recovery. By chance, I had stumbled across urban theorist Jane Jacobs' illuminating discussion of "cities as mines" in her 1969 classic, *The Economy of Cities*. There she pointed out that the best way to deal with waste is not to dispose of it, but to let private enterprises recycle it with a profit. She argued that such an approach would increase true economic abundance.

As my interest in resource recovery grew, I discovered the currently popular way of looking at the economic world and resource recovery known as "industrial ecology." The proponents of industrial ecology draw on an analogy (an imperfect one, as it turns out) with the natural world, in which living organisms consume each other's waste (a true observation) and where nothing is wasted (this is not true—think of coal and oil, formed by decayed vegetation that becomes inert matter, escaping from the ecosystem).

These researchers argue that left to itself, an industrial economy always turns into an unsustainable "extract-and-dump" system. Industrial ecologists want to correct this "market failure" by developing interfirm arrangements that mimic the material and energy cycling of natural ecosystems. That is, they want industrial waste products to become a source of usable material or energy for other industrial processes.

Most industrial ecologists doubt that the free market can achieve such linkages on its own. For example, a pioneer in the field, Robert Ayres (1997, 24), concludes that the only efficient way to turn the waste of one industry into the input of another is through "long-term central planning and coordination authority." Industrial ecology has taken root in the U.S. Environmental Protection Agency's Office of Pollution Prevention and Toxics, and the Clinton White House has called it "the new paradigm" in environmental protection.

Yet the history of resource recovery undermines the assumptions of industrial ecologists. While researching corporate innovation at the Jerome and Dorothy Lemelson Center for the Study of Invention and Innovation (a privately endowed institution affiliated with the Smithsonian), I did a computer search of what the museum had on "waste." Within seconds, I came across a multitude of sources such as the 1862 book *Waste Products and Undeveloped Substances: Or, Hints for Enterprise in Neglected Fields* (Simmonds 1862) and the 1918 volume *The Utilization of Waste Products: A Treatise on the Rational Utilization, Recovery, and Treatment of Waste Products of All Kinds* (Koller 1918), to name just two. I found countless instances of private businesses making a profit out of what were previously waste products.

Most authors who wrote on waste in the last century and at the beginning of this one understood the importance of industrial loops, the supposed bedrock of modern industrial ecology. In his classic *On the Economy of Machinery and Manufactures*, the polymath Charles Babbage (1835, 217) wrote that cheap production of any article was possible partly because of the care taken to prevent raw material waste: "Attention to this circumstance sometimes causes the union of two trades in one factory, which otherwise might have been separated."

Babbage described how horns from livestock were used by many other industries early in the nineteenth century. Some were made into combs and a substitute for lantern glass; others were carved into knife handles and the tops of whips. The processing provided fat for soapmakers, glue to stiffen clothes, and fertilizer for farmers—even toys for children. As Frederick Talbot (1920, 11) wrote in the early twentieth century, waste was "merely raw material in the wrong place."

The economist Alfred Marshall's *Principles of Economics*, published in 1920, also discusses recycling and reuse. In his chapter on industrial location, Marshall wrote: "It is true that an isolated workman often

throws away a number of small things which would have been collected and turned to good account in a factory; but waste of this kind can scarcely occur in a localized manufacture even if it is in the hand of small men. . . ." (Marshall 1986 [1920], 232). As examples of industries that use virtually all their by-products he cited textiles, metallurgy, soda and gas manufacture, mineral oil, and meat packing.

If resource recovery was so prevalent in the past, why do we get the impression that it is something that must be forced today? I think there are two reasons. For one, few academicians and bureaucrats have taken the time to study recycling networks in any depth. The other is the misconception, fostered by regulation, that waste is something dangerous rather than something potentially useful. As industrial ecologist Nicholas Gertler (1995) has written: "To someone imbued with the spirit of the Resource Conservation and Recovery Act (RCRA), an industrial byproduct is a menace to be contained, controlled. It is primarily a threat."

Regulations reflecting this mentality are holding back industrial ecology today. Writing in *Scientific American* in 1995, Robert Frosch noted that once a substance is identified as hazardous, it is so heavily regulated that it can rarely be reused. Frosch notes that the automotive industry, in protecting cars against corrosion, creates a wastewater rich in zinc. In the past, the sludge from this wastewater was sent to a smelter which recovered the zinc. But once the wastewater was designated as hazardous, the regulatory requirements were so stiff that the smelter couldn't take it. Now the zinc ends up in a landfill (Frosch 1995, 181).

While earlier manufacturers didn't have such regulations, they were subject to the common law. They could be sued if they disposed of their waste improperly (as measured by the standard of the day). For example, Chicago meat-packers were sued in 1850 for throwing their byproducts in the Chicago River. After that, they had to transport most of their material far from the city to be buried (Clemen 1923). But because they were free to innovate, they eventually found valuable uses for their byproducts. The same was true for other producers, who had both legal and financial incentives to find productive uses for their wastes. Property rights protection, with freedom to innovate, solved the problem.

Today, most industrial ecologists assume that any industrial economy quickly turns into an unsustainable system where materials and energy are extracted, processed, used, and dumped in a linear flow into, through, and out of the economy. Yet virtually all historical evidence makes clear that this has never been the case. Instead of more central planning, what is needed to achieve the creation of "industrial ecosystems" is to remove the many environmental regulations that prevent the recovery of many by-products. Allowing waste producers to pursue creative solutions to their problems while the common law forces accountability will do more for the environment than centrally planned industrial linkages ever can.

Proponents of industrial ecology tend to think that an industrial economy, left to itself, turns into an unsustainable "extract-and-dump" system.

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Pierre Desrochers, a PERC Fellow this summer, is completing his Ph.D. dissertation in economic geography at the University of Montreal.

PRECAUTION CAN BE A DANGEROUS TOOL

BANNING "BIOFOODS"

By Jonathan H. Adler

In June, European environmental activists dressed as butterflies protested the possible sale of genetically modified crops. A scientific report had suggested that pollen from such corn could harm caterpillars. Friends of the Earth and Defenders of Wildlife have written President Clinton calling for a ban on so-called "killer corn." A broad coalition of environmental groups, including Greenpeace, has proposed an international moratorium on the use of all crops that have been changed by the addition of genes from other species or by the manipulation of DNA. The ban would be lifted when an international "biosafety protocol" is negotiated.

A broad coalition of environmental groups, including Greenpeace, has proposed an international moratorium on the use of all genetically engineered crops.

Calls for tight controls on what some have dubbed "Frankenfoods" are the newest application of the "precautionary principle." This is the idea that we are "better safe than sorry" and thus new technologies should be used only under strict governmental controls (and perhaps even banned) until they are proven safe.

While the precautionary principle may sound reassuring, it differs from the traditional way of dealing with risks in industrialized nations. Normally, people are allowed to develop new products and technologies, but they are responsible for any harm done. This approach has made possible centuries of progress.

The environmental movement is trying to halt this way of dealing with possible dangers. Most international environmental agreements explicitly embrace the precautionary principle, and it increasingly appears in domestic environmental policy discussions. According to the "Wingspread Consensus Statement," a document drafted by several dozen environmental activists and scholars, "When an activity raises threats of harm to human health or environment, precautionary measures should be taken even if some cause and effect relationships are not fully established" (quoted in *Rachel's Environment & Health Weekly* 1998). Thus, Friends of the Earth president Brent Blackwelder recently wrote in the *Chicago Tribune* (3 March 1999) that the U.S. government "should take a precautionary approach to genetic engineering."

Yet the scientific consensus is that genetically modified crops are no more, and no less, dangerous than those developed by less sophisticated cross-breeding or hybridization techniques. The National Academy of Sciences concluded in 1987 that there was "no evidence that unique hazards exist" as a result of genetic techniques (National Academy of Sciences 1987, 6). The National Research Council (1989) concluded that "no conceptual distinction exists between genetic modification of plants and microorganisms by classical methods or by molecular techniques that modify DNA and transfer genes." Britain's leading scientific journal, *Nature* (1999, 639), editorialized earlier this year that there is "as yet no substantial evidence that [genetically modified] foods are inherently more dangerous than conventional foods just because they have been produced using novel techniques."

The problem is not simply that the precautionary principle is being misapplied to relatively safe products but that the precautionary principle poses problems of its own. For one thing, it is a Luddite's dream. If inventors and scientists are uncertain whether they can market new products or processes, they are less likely to develop them in the first place. Progress is stifled.

More broadly, precautionary risk regulation can have the opposite effect of the one intended:

- The Food and Drug Administration applies the precautionary principle in evaluating new drugs. This keeps lifesaving drugs off the market for years. Yet for victims of life-threatening diseases such as cancer, Alzheimer's, and AIDS, few side effects are a greater threat than their own medical condition, which these drugs could address.

- In the early 1990s, Peru cut the chlorination of its water supply, citing, among other things, an EPA report suggesting that chlorination might increase cancer rates. Yet this risk pales in comparison to the risks posed by waterborne disease. The subsequent outbreak of cholera in Peru claimed far more lives than were ever at risk from chlorine-induced cancer (Anderson 1991).

- Ethylene dibromide (EDB) is a powerful fungicide used to prevent the growth of molds on grain and other foods. Molds produce some of the most potent carcinogens found in nature. Yet the EPA banned EDB after it was deemed a potential carcinogen. It is likely that the risk of EDB was less than that posed by aflatoxin, a known carcinogen that is produced by grain mold. Moreover, ethylene dibromide was replaced with fungicides that had to be applied in greater quantities, increasing the risk for exposed workers (Cross 1996, 875–76).

It is likely that the risk of ethylene dibromide, a banned fungicide, was less than the risk posed by aflatoxin, a carcinogen that it helped prevent.

The impact of the precautionary principle can be even broader than these specific results. In the case of genetically engineered crops, excessive precaution may slow down increases in agricultural productivity, improvements in nutritional content of foods, and innovations that reduce the use of pesticides.

It is clear that food production must continue to expand in order to feed the world's expanding population. If agricultural yields are not improved, meeting the increased demand for food as population grows could require putting up to three billion additional hectares (1.2 billion acres) under the plow (Goklany 1999, 120). If yields are static, farmers in the developing world may well have to clear tropical forests and species habitat to satisfy the demand for food.

However, increasing agricultural productivity by as little as 1.4 percent per year over the next sixty years would more than double agricultural output. To realize such gains, genetically modified crops are almost certainly necessary. "We may be able to create the new plant type without biotech," Shaobing Peng of the International Rice Research Institute has commented, "but that is where new opportunities will have to come from in the future" (Mann 1999, 313). Indeed, already yields of pest-resistant corn and cotton are reported to be significantly higher than those of unmodified varieties.

Like any other new technology, genetically modified crops may pose new risks. But they also hold great potential to improve human well-being and enhance environmental protection.

The idea behind the precautionary principle is that it is always better to be safe than sorry. In fact, however, adopting the precautionary principle is likely to make us more sorry than safe.

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GREENER PASTURES

PRIVATE INITIATIVES

By Linda E. Platts

PERPETUAL PRAIRIE

As more and more people move to the country, they are destroying the very thing that they came for—wide open spaces. The once vast grasslands of Texas are succumbing to strip malls and ranchettes. In an effort to reverse this trend, Peter Malin is developing 1,000 acres of farmland outside Fort Worth that will preserve two-thirds of the property as prairie vista.

With the help of an architect, a city planner, and a landscape architect, Malin has devised a plan that will maintain 700 acres as grassland and open space. The homes will ring the perimeter, providing each with a long view of the undeveloped land.

Malin claims that homeowners want to enjoy the landscape and sense of space, but do not want to spend their time tending 20-acre yards. And for the most part, maintaining a healthy prairie ecosystem that has been fenced into small chunks with a different owner in charge of each one is close to impossible.

The preserved open space will not necessarily be pristine prairie. In fact, the plan calls for it to be productive in order to pay the property taxes. It will be up to the residents of the Big Sky development to determine the use. It may be leased as grazing land or used to grow hay or perhaps even a crop of sunflowers. To facilitate its management, Malin has left 50-foot corridors of open space between property lines to accommodate harvesting equipment or grazing herds.

While this may sound like another retreat for the rich, Malin says the lots are selling for about $55,000, which is comparable to a typical building lot elsewhere in Tarrant County. And, there are no deed restrictions dictating the minimum size of the homes.

With 28 lots sold in the first phase, Malin's dream of allowing people to live in wide open spaces without destroying them seems to be well on its way to becoming a reality.

—Chicago Tribune

GROWING COLD

On the island of Hawaii, cold water pumped from 2,000 feet beneath the ocean's surface is creating ideal conditions for agriculture and ocean farming. In 1974, the Natural Energy Laboratory of Hawaii began research into cold water technology. Now that technology is being put to commercial use growing organic vegetables, flowers, clams, and oysters.

The water, which is 43 degrees Fahrenheit, is circulated in pipes close to the roots of the plants. The combination of cool roots and hot Hawaiian sunshine makes delicate roses bloom and creates tasty artichokes and Brussels sprouts. The system also eliminates the need for irrigation as the cold pipes draw moisture from the air creating condensation that waters the gardens.

Two Washington seafood companies are also taking advantage of this unique combination of renewable resources by giving millions of clam and oyster larvae a head start on life. The tiny specks thrive on the constant water temperature and the rich supply of algae from the ocean depths. If raised in the Northwest, they would require expensive artificial light and heated water to maintain the ideal stable temperature. Once they grow to the size of a pencil eraser, they are shipped back to Washington to "set" in Northwest waters.

The use of cold water as a renewable resource is growing, but limited by the need to be close to a source.

—Los Angeles Times

HARVEST OF SAVINGS

An accountant with a Washington State paper mill was the unlikely inspiration for a new process to produce recycled newsprint. Although the engineers said it couldn't be done, Carl Simpson suggested replacing woodchips with office paper and tele-

phone directories in order to provide the fiber content needed for newsprint.

Steilacoom's Abitibi Consolidated is now the only paper mill in the world to use mixed paper to make newsprint, and the recycled component is as high as 100 percent. All of the paper used by Abitibi comes from three surrounding counties where it is collected by two companies, Tacoma Recycling and Rabanco. Managers at these firms are delighted to have a high-volume buyer just 40 miles away instead of in Asia where they had previously shipped their mixed paper.

Abitibi has replaced the 15 to 20 semitruck loads of woodchips it used every day with an equal amount of discarded paper. The quality of newsprint is just as good as that made from woodchips and the price is comparable or even a little cheaper, Simpson says.

Essentially the companies have developed a closed-loop system. The newspaper that shows up on the breakfast table may be made from paper that was tossed out last month; it has just been reprocessed and reprinted with new stories and photographs. Meanwhile, less wood is being used.

—Tacoma News Tribune

BILGE PILL

There seem to be pills for just about everything and one of the latest to come on the market is intended for boats or, more specifically, their bilges. Stagnant water fouled by fuel and oil collects in the bilge, the bottom of the boat, and is commonly pumped overboard where it can have a harmful effect on marine life.

Most people would agree that this is not an environmentally sensitive practice, but nevertheless that is what most boat owners do. Only larger boats (more than 100 feet) usually have holding tanks where bilge oil can be separated and stored for proper disposal.

Mike Harris, who runs a charter fishing operation in Maryland, thought there should be a practical and inexpensive solution to the problem. Together with Athena Environmental Sciences, Inc., they came up with the Bilge Pill, which bears more resemblance to a hockey puck than an aspirin. It is made up of biodegradable detergents, which break down the oil into smaller particles, and emulsifiers, which suspend the oil's chemicals so they don't evaporate or sink.

The pill is placed in a mesh bag and then lowered into the bilge. The motion of the boat causes the pill to slosh about, releasing the agents which begin to break down the oil into tiny particles. These micro-particles can be safely discharged into the water because they are eaten by naturally occurring marine bacteria.

Other bilge-cleaning products are on the market, but they last only about a day and do not break down the oil enough to make it edible for bacteria. The Bilge Pill is designed to last about 60 days and costs $12. Harris and Athena intend to market their product first in their home state of Maryland before moving on to bigger markets. With an estimated 17 million boats under 100 feet long registered nationwide, that makes a mighty big market.

—Baltimore Sun

HOTEL HOGAN

The Navajo Reservation that sprawls across the starkly beautiful landscape of northern Arizona and New Mexico attracts thousands of tourists every year. Yet aside from the trading posts and occasional souvenir stands, few tribal members benefit from this wealth of visitors. Many Navajo families continue to live as their ancestors did, herding sheep on remote sections of the reservation. Recently, however, a few have found a new way to supplement their incomes without disturbing their land or changing their way of life. They have opened their traditional hogans to tourists who are willing to pay well for a bed of sheepskins and a meal of mutton stew.

Many Navajo families keep a hogan, an eight-sided building of logs and mud, for ceremonies and weddings, but actually live in a conventional home nearby. Tourists who are looking for a bit more out of their vacation than the usual motel with a pool and pizza-to-go are enthralled by the idea of spending the night in a hogan with a dirt floor. They are treated to stories told by a Navajo elder under a canopy of stars and rise in the morning to a breakfast of fry bread and cornmeal mush washed down with campfire coffee. To get closer to a way of life they have only read about in *National Geographic*, they pay as much as $100 a night, but with extras such as a horseback ride, guided hike, sweat lodge, or rug-weaving demonstration the bill can easily come to $400.

Although the hogan bed and breakfast business is still small, the tribe's Economic Development Division is encouraging more families to give it a try. This low impact and unobtrusive form of tourism requires little initial investment and provides a huge economic boost to this rural area, which has an unemployment rate of 27 percent.

—Albuquerque Journal

MANAGED HUNTING PROTECTS A SPECIES

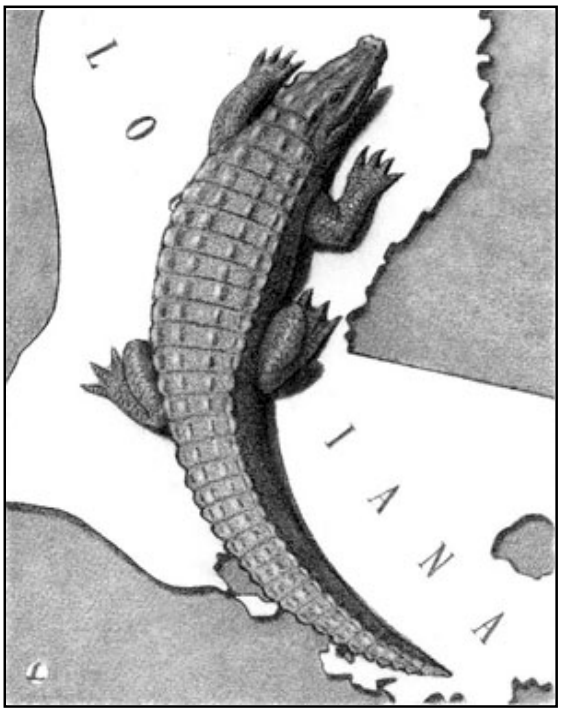
HARVESTING ALLIGATORS

by Robert A. Thomas

Alligators have long been important to Louisianans for their skins (for belts, shoes, boots, luggage, watch bands, etc.), meat (sauce picante, gumbo, sausage, etc.), and, since the advent of nature-based tourism, as a magnet that draws visitors to the swamps. They have played a major role in our culture: We wear them, we eat them, and we are fascinated by watching them.

In the 1960s, alligator populations were declining throughout the state, partly due to habitat loss but mostly due to hunting. The slaughter continued even after alligator hunting was outlawed in Louisiana in 1962 and alligators were officially protected under the 1967 federal Endangered Species Act (the act that preceded today's federal act).

Fortunately, during the 1960s the Louisiana Department of Wildlife and Fisheries quietly laid a foundation for management of alligators based on scientific data about the species. From that foundation, the state of Louisiana developed a management program that allows alligator harvest. The result has been not a decline but, rather, a proliferation of healthy alligator populations. While the species does remain listed under the Endangered Species Act, it is in the category of "threatened due to similarity of appearance" (meaning that alligator hides are so similar to other imperiled species of crocodilians that customs officials would have difficulty differentiating them). Today's Louisiana program illustrates the ability of states to manage protected species and the role that harvesting can play.



During the 1960s, the Louisiana Department of Wildlife and fisheries quietly laid a foundation for management of alligators based on scientific data.

The state's program began with studies by the Department of Wildlife and Fisheries, led by biologists Ted Joanen and Larry McNease at Rockefeller Wildlife Refuge in Cameron Parish, and continues under Greg Linscomb and Noel Kinler. Their studies indicated that the alligator could sustain harvests. The program also reflected the fact that, typically, most of the people who own the alligator marshes make their living trapping and fishing, and they view the alligator as competing for the same resources. These individuals once saw alligator poachers as doing them a favor. Without legal hunting, significant poaching would undoubtedly have continued.

Louisiana had its first legal alligator season in September 1972, after the state petitioned the U.S. government to allow a harvest season in certain areas. The decision evoked opposition, especially from animal-protection and some environmental groups. Opponents thought the program would encourage a year-round underground trade in alligator skins.

That did not happen. Based on the work of Joanen and McNease, the 1970 Louisiana alligator

population was estimated to be 172,080. By 1993, the number had increased to 992,314 (in fact, it reached 1,149,983 the year before). In 1970, 61 percent of the alligators in marshes were on private property (there were no hard data for non-marsh habitats). During the next twenty years, even though public ownership of alligator habitat expanded, the population in private marshes increased to 75 percent of the total.

Contributing to this progress is the reproductive potential of alligators. While at any one time an estimated 5 percent of the population are actively reproductive females, each female generally lays between 30 and 40 eggs. Thus, each nesting season there are more eggs in nests than the total number of alligators in the wild. If one can ensure nesting success, the population is virtually guaranteed to grow.

The state's management plan, based on scientific knowledge of the species, includes the following characteristics:

1. The public season is in September each year. At this time females are typically on nests and thus less subject to harvest than males.

2. Alligators can only be caught on hook and line. Previously, hunters using guns would move from alligator to alligator, choosing the age class and size that would give them maximum money for the skins. This removed many reproductive females from the population. "Poling," the practice of using a long pole with a hook on the end, was outlawed since it is not random and gives the hunter the advantage.

3. Bait can legally be set anywhere, but by far the easiest location for the harvester is in canals and channels. During September, most alligators in canals and channels are male, so most alligators taken are male.

4. Hunters are advised to hang their bait high enough over the water so that only larger alligators can reach it.

5. Harvesters must either own or lease the property where they set their lines. This controls the location of hunting and assures that private landowners will reap some benefits from the hunting.

6. Each year, the state counts alligators parish-by-parish (that is, county-by-county). If population estimates are low, state officials set the harvest low; if high, they set it high. They can, of course, close the season, overall or locally, if the data suggest they should.

7. On the basis of the area a harvester owns or leases and the local alligator population size, each licensed harvester is issued a certain number of tags, each with an identifying number. Each tag represents one alligator that can be harvested.

8. Each year the department issues a unique cutting pattern around certain scales on the side of the head. This pattern is released when harvesters pick up their tags. It allows skin buyers and enforcement agents to easily identify the year in which a skin was harvested. This practice prevents poachers from selecting prime stock during the year and then using legal tags when the season starts.

Louisiana's system works well in theory, but it also works in practice. I have been on several trips to observe the harvest of alligators and have witnessed a number of indications of a well-managed program. For example, Wildlife and Fisheries personnel have met us and known who was allowed to harvest on the marsh. All alligators that we harvested (some 30 or so) have been males, ranging in size from four to 13 feet. When one alligator lost its tag, the department required us to place a new tag on the skin, reducing our harvest by one. And, each time, I have seen plenty of alligators in the harvest area the following spring.

In addition to the annual harvest, the Department of Wildlife and Fisheries encourages alligator farming, in which alligators are hatched and raised in captivity, and alligator ranching, in which eggs are harvested from wild nests and removed to alligator farms. When the young reach four feet in length, 17 percent of ranched alligators must be returned to the site of collection (based on scientific data indicating that natural populations have 17 percent of the young reaching this size). Recently, by the way, there has been controversy over the fate of these alligators. Robert Chabreck of Louisiana State University has stated that most of the released alligators are immediately eaten by adults. The Department of Wildlife and Fisheries disagrees. This topic is being researched. Management will be based on the data.

In sum, the program is working. Alligator populations are very healthy throughout the Gulf Coast in their prime habitats. The only negative is that larger alligators tend to be more easily harvested. So while one generally sees many alligators, fewer animals are ten feet or longer. No one has demonstrated any ecological ramifications of this change in size structure, however,

HARVESTING ALLIGATORS

or any problems stemming from the removal of alligator eggs from the wild via ranching.

Louisiana's alligator harvest is evidence that state management of an endangered species, with harvesting a key element, can preserve the species. Now that the American alligator issue is behind us, let's tackle the more difficult issues.

Further Reading

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Robert A. Thomas holds the Loyola Chair in Environmental Communications and directs the Center for Environmental Communications at Loyola University New Orleans.

ONE SPARK FROM DISASTER

As the road dropped out of the Sierras into the Lake Tahoe basin below, the scenery made an abrupt change from healthy, green forests to dead and dying stands of timber. The congressmen on their way to the June 1997 Presidential Summit on the problems facing the lake and surrounding basin were taken aback by what they saw. Later, during a session on forest health, U.S. Senator Richard Bryan of Nevada exclaimed, "This forest looks like hell!"[1] It appeared as if someone had drawn an imaginary line across the landscape and then nurtured the trees on one side, while destroying those on the other.

After eight years of drought, bark beetles and disease have ravaged dense stands, killing more than 80 percent of the trees.

The Tahoe Basin was once forested with well-spaced Jeffrey and ponderosa pines (WCSHF 1997, 3). Moderate intensity wildfires burned thousands of acres each year, preventing shade-tolerant fir from taking hold in the soils of the basin. In a tragedy of the commons, early settlers and silver miners razed most of the pines. Ensuing years of fire suppression and restricted harvest enabled fire-prone fir to grow in dense stands, replacing the earlier pines. The Forest Service estimates that basin forests are 82 percent denser today than in 1928 (WCSHF 1997, 3). Now, after eight years of drought, bark beetles and disease have ravaged overstocked stands, killing more than 80 percent of the trees (WCSHF 1997, 4).

Lake Tahoe, known as one of the clearest, deepest lakes in the world, is in jeopardy. Forest management practices on surrounding federal lands have put at risk the very qualities they were supposed to preserve: the integrity of the forest and the clarity of the lake below. Environmental regulations have delayed some management actions and restricted timber harvests and forest treatments.

Meanwhile, this tinderbox of dead and dying trees is at grave risk to wildfire that could threaten the basin with even greater erosion and air quality degradation, while destroying homes and vacation getaways sprinkled throughout the forest. The potential for loss of property and life to wildfire is higher than nearly anywhere else in California (WCSHF 1997, 3).

To prevent erosion from wildfire, the Forest Service has estimated that 10,000 acres need to be treated annually—far more than the 200 acres now treated each year. Only through selective thinning and prescribed burn can the risk of conflagration be reduced.

On adjacent lands just above the national forest, the trees remain vigorous and healthy. With a similar history of early forest clearing followed by fire suppression, these stands have escaped the bug infestation because they have been intensively managed to ensure vigor and high productivity.

The Tahoe Basin is not an aberration. It is typical of many federally managed forests in the West. About 39 million acres of national forests are at risk of fire (GAO 1999, 29). While some of our public forests meet high standards for health and vigor, many more are sick and ailing. Often the problem can be traced to obstacles that frustrate managers who are attempting to apply sound science to their management practices. Among them are:

FORESTS:

Do We Get What We Pay For?

Politics. Land management agencies are dependent upon Congress for their budgets. They must respond to political pressures to protect their budgets. Land managers may have to oversee expensive pet projects supported by influential congressional delegations, while other public resources under their care deteriorate for lack of funding. Standard forest management practices such as harvesting, thinning, and prescribed burns may have to be canceled or postponed when constituents complain.

Regulations. During the last thirty years, more than two hundred new regulations have been passed that impede managers from responding promptly to changing forest conditions. The Clean Air Act, the Endangered Species Act, the Federal Land and Management Policy Act, the Multiple Use and Sustained Yield Act, the National Forest Management Act, the National Environmental Policy Act (NEPA), and the Public Range Improvement Act, among others, have the expressed goal of protecting the environment. But in some cases they have the opposite effect. Public comment periods and citizen appeals allowed under NEPA can result in lengthy delays to land management decisions that are critical to forest health.

Short-Term Goals. Federal land managers are required to meet dozens of short-term goals for habitat and stream restoration, road construction and maintenance, timber sales, recreational visits, and more (FS 1998, 3). A manager's annual performance is measured by quantifying these goals. How many miles of roads were constructed? How many million board feet of lumber were sold? Managers meet such goals by dedicating resources to short-term projects. For example, a large cut that produces a high volume of timber at a low cost might be the best way to meet an annual goal.

Lack of Positive Incentives. Federal land managers lack positive incentives to respond to consumer demands. Even today, most recreational users pay trivial or no fees, giving managers little incentive to change management practices. Instead, managers respond first to Congress, which funds their budgets. Fortunately, the recently created fee demonstration program is beginning to change some incentives.

Note

1. Telephone communication with John Hoffman, Vice President of Government Affairs, California Forestry Association, Sacramento, 5 December 1998.

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This excerpt is taken from Forests: Do We Get What We Pay For? *by Holly Lippke Fretwell, a new study published by PERC. Illustrated with color photographs, the 32-page report is available from PERC for $5. An abridged version is available on PERC's Web site (www.perc.org.)*

WHERE RESEARCH AND POLICY MEET

TANGENTS

By Daniel K. Benjamin

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

In May 1981, with the American auto industry mired in recession, Japanese car makers agreed to limit exports of passenger cars to the United States. This "voluntary export restraint" (VER) program, initially supported by the Reagan administration, allowed only 1.68 million Japanese cars into the U.S. each year. The cap was raised to 1.85 million cars in 1984, and to 2.30 million in 1985, before the program was terminated in 1994.

Recent research (Berry, Levinsohn, and Pakes 1999) now gives us a clear picture of the all-too-predictable effects of this restriction on free trade: By limiting the supply of cars from Japan, the export restraints raised the prices of Japanese cars. This increased car sales by U.S. firms, thereby hiking their profits. All of this came chiefly at the expense of American auto consumers, particularly those who bought Japanese cars during this period. Overall, Americans as a whole were made worse off due to the introduction of the export restraints.

The key impacts were felt during 1986–1990. Over this period the restraints (in essence, quotas) caused the prices of Japanese cars sold in the United States to average about $1,200 higher (in 1983 dollars), some 14 percent above what they would have been without the restraints.

The higher prices for Japanese cars caused some consumers to defer purchases altogether and others to switch to American autos. In fact, the negative impact on sales of the Japanese automakers completely offset the profit-enhancing effects of higher prices. Hence, Japanese firms were no better off than if unrestrained trade had prevailed.

Matters were different for American firms, however. The consumers who switched to domestic cars tended to be price-sensitive, so the American makers were able to raise prices by only about 1 percent. But with less Japanese competition, sales of American cars increased sharply at a time when U.S. assembly lines had substantial excess capacity. Hence, during the years 1986–90, profits of U.S. automakers jumped about $2 billion *per year* as a result of the VERs—an increase of better than 8 percent.

> *Due to the restraints, prices of Japanese cars sold in the United States increased about $1,200 (in 1983 dollars), or about 14%.*

The big losers were American car buyers, particularly those who (like me) opted to purchase Japanese vehicles even in the face of their higher prices. Overall, American consumers suffered a loss of some $13 billion, measured in 1983 dollars. After accounting for the higher profits of American automakers, the U.S. economy as a whole thus suffered welfare losses totaling some $3 billion due to the restraints on Japanese car exports.

One surprising finding of Berry et al. is that, contrary to prevailing wisdom, the impact of the VER program was important only during the 1986–90 period. The authors find that the export restraints had essentially no impact on observed prices and quantities from 1981 through 1983, and little impact in 1984 and 1985. Apparently, the 1981–82 recession, combined with high interest rates, depressed auto sales so

much that the restraints initially did not constrain Japanese sales in the United States. Only beginning in 1986 did the program begin to bite, as economic recovery, declining interest rates, and a sharp drop in gasoline prices spurred new car demand.

These results immediately suggest at least two questions. Since the restraints failed to raise Japanese profits, why were the Japanese manufacturers so anxious to agree to them? The authors suggest that the likely alternative to the program was a U.S.-imposed tariff on Japanese cars—which would have cost Japanese makers more than $11 billion over the 1986–90 period.

If this is true, why didn't the Reagan administration simply impose such a tariff? After all, a tariff would have done as much good for American manufacturers and done consumers no more harm, while also raising government revenues. The answer, I suggest, is that such a tariff—which would have amounted to a huge tax hike—would have complicated negotiations over the massive and politically crucial economy-wide tax cuts the administration was proposing at the same time.

One key long-run consequence of the VER program stems from the provision that any Japanese cars produced in the U.S. were excluded from the limits. Beginning with Honda's Marysville, Ohio, plant in 1982, Japanese makers responded to this provision by investing heavily in U.S. production facilities. By 1990, Nissan, Toyota, Mazda, and Mitsubishi had joined Honda in producing substantial numbers of cars in America. That entry, combined with the recession of 1991, was sufficient to eliminate the effects of the restraints after 1990. More importantly, this Japanese auto manufacturing presence in the U.S. has almost surely made it impossible to exclude Japanese cars during future recessions. The scoundrel in me is thus forced to ask: From whom, then, will the American manufacturers seek protection the next time around?

Reference

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Daniel K. Benjamin is a PERC Senior Associate and Professor of Economics at Clemson University. "Tangents" investigates policy implications of recent academic research.

what's new
PERC UPDATE

Private land trusts are proliferating around the nation as ways of preserving environmental values. So why not a federal land trust to manage the Grand Staircase-Escalante National Monument in southern Utah?

In a new *Policy Series* paper, **Terry L. Anderson** and **Holly L. Fretwell** argue that a trust could achieve both environmental and economic goals for this large expanse of land, which has been mired in controversy since it was designated a monument in 1996. Their new paper (PS-16) calculates revenues that the trust could obtain through recreation and commodity production on the monument land.

The concept of a federal trust builds on an earlier idea of a wilderness endowment board proposed by PERC Senior Associate **Richard L. Stroup**. That idea already served as a model for the designation of a trust to manage the Presidio, the former Army base in San Francisco.

Hunting for Habitat: A Practical Guide to State-Landowner Partnerships by **Donald R. Leal** and **J. Bishop Grewell**, will be published by PERC this month. This book explains the programs known as ranching for wildlife (Don't be misled: These partnerships do *not* involve game ranching, but rather management of free-roaming wild animal populations.)

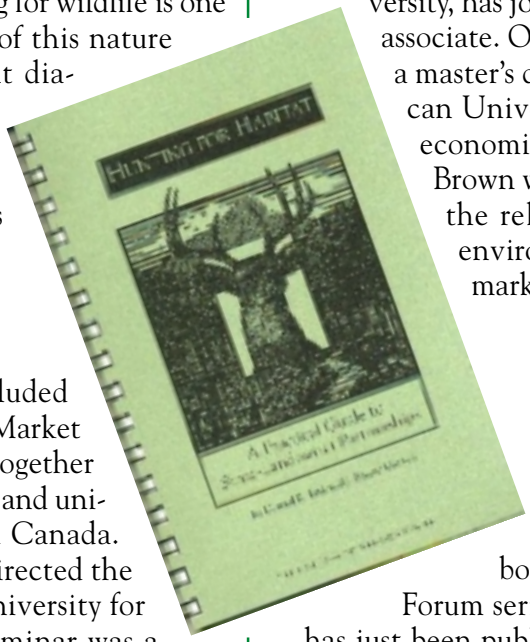
Landowners and state agencies have formed partnerships that give ranchers flexibility in how they manage wildlife on their property. The result is more habitat for wildlife and better hunting. This handbook

for state officials, landowners, and hunters includes a state-by-state review of current programs and advice for starting new ones.

The handbook also addresses the controversies surrounding these programs. Some hunter organizations oppose fee hunting, which is an element of ranching for wildlife.

"I applaud PERC's effort to illuminate these programs, which are tremendously valuable for improving game quality and numbers and non-game habitat as well," says E. Lee Fitzhugh, Ph.D., Extension Wildlife Specialist, University of California at Davis. Kaush Arha, an official of the Wyoming Game & Fish Department, says about *Hunting for Habitat*: "Conservation on private land is the biggest challenge for the wildlife biology profession. Ranching for wildlife is one way of addressing it. Publications of this nature are a healthy contribution to that dialogue."

Hunting for Habitat is available from PERC for $5 per copy. Excerpts can be found on PERC's Web site (www.perc.org).



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Summer events at PERC included our 1999 Student Seminar on Free Market Environmentalism, which brought together twenty-eight students from colleges and universities in the United States and Canada. PERC Senior Associate **P. J. Hill** directed the seminar, held at Montana State University for six days in June. Preceding the seminar was a Young Scholars' seminar, sponsored by Liberty Fund and directed by PERC Senior Associate **Dan Benjamin**. In July, about thirty high school teachers took part in PERC's annual Teacher Institute, directed by **Donald Wentworth**, PERC's Director of Environmental Education.

■

Three PERC Senior Associates who spend most of the year elsewhere were in Bozeman this summer: **P. J. Hill**, **Dan Benjamin**, and **Roger Meiners**. So was **Kim Dennis**, chairman of PERC's board. Board members **Bill Dunn**, **Joe Ignat**, and **Wayne Nordberg** were in town briefly. Former PERC Fellow **Jonathan Adler** gave a luncheon talk in July (see his article on p. 8). **Barun Mitra**, who heads the Liberty Institute in New Delhi, India, visited PERC to learn more about how market approaches can address environmental issues in India. **Tony Dnes**, an economist at the University of Hertfordshire in England, spent some time at PERC to study land trusts and conservation easements with **Dean Lueck**, economist at Montana State University. **Ian Wills** of Monash University in Australia and his wife **Barbara** began a six-month stay. **Andy Morriss** of Case Western Reserve Law School brought his family to Bozeman; he will spend the first semester of the academic year at PERC. **Jay Kommers**, a graduate of Montana State University, was a summer intern at PERC.

■

Matthew Brown, who worked for PERC part-time while a graduate student at Montana State University, has joined PERC full-time as a research associate. Originally from Florida, Brown has a master's degree in economics from American University and a bachelor's degree in economics from Florida State University. Brown will be studying population issues, the relationship between income and environmental quality, and the role of markets in environmental protection.

■

Defending Illusions, a new book by **Allan K. Fitzsimmons**, debunks the myths surrounding ecosystem management. This book, part of the Political Economy Forum series edited by **Terry L. Anderson**, has just been published by Rowman & Littlefield. Fitzsimmons critically examines the science, law, and philosophy underlying ecosystem management, an approach championed as a way of restoring nature's well-being.

He argues that this new policy rests on weak science, erroneous assumptions about the condition of the environment in the United States, and a biocentric world view that sees the earth as an organic whole in which all its parts have the same worth and rights. He also demonstrates that ecosystem management leads to an enormous expansion of federal regulatory controls at the expense of people and of desirable improvements in environmental quality.

The book is available from Rowman & Littlefield (1-800-462-6420). In addition, a "talking points" brochure that identifies the problems of ecosystem management will be published by PERC in September.

letters to the editor

REACTIONS

502 S. 19th Avenue, Suite 211
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To the Editor:

The unstated notion in "Preserving Beaches" by James R. Rinehart and Jeffrey J. Pompe (June 1999) is that only the rich can protect coastal environments and that the majority of the American people should be prohibited from using America's national seashores.

With the median family income in the United States in the $30,000–$40,000 range, the vast majority of Americans cannot afford to live in the types of coastal communities described by the authors. If one were to follow their formula for protecting America's beaches we would restrict access to private landowners while prohibiting "public access." This would create a playground for the rich while turning away most American families from a day at the beach.

In their excellent book *The Commanding Heights*, Daniel Yergin and Joseph Stanislaw note that capitalism will only survive where there is a perception that it is fair. They argue that a market economy "will be evaluated not only by its economic success but by the way in which that success is distributed." I doubt that placing America's seashores under the control of the wealthy would be considered a fair distribution by the majority of the American people. But, hey, if we can't have beaches perhaps Rinehart and Pompe will at least let us have cake.

Richard Clark
Sociology Department, John Carroll University
University Heights, Ohio

Rinehart and Pompe reply:

Richard Clark doesn't challenge our premise that free markets can protect environmental resources in coastal areas. Private communities such as Seabrook Island do an excellent job of protecting beaches without government funding or direction. Preserving beaches is costly and someone has to pay for protecting them. What is fairer than having those who use beaches pay?

Clark's unstated notion is that the government should control access to all resources. Communist countries tried this and caused widespread environmental degradation. Aristotle once said: "What is common to the greatest number gets the least amount of care." Government subsidies and open access have caused much of the development and abuse of coastal areas.

Clark's concern boils down to the fact that incomes are unequal. Those with lower incomes can't buy as much as those with higher incomes. However, the idea that Seabrook is owned primarily by wealthy people is a misconception. Owners include salesmen, clerical workers, and retired college professors. While there are some million-dollar oceanfront homes, there are plenty of more modest homes on the island.

Given the large amount of shoreline already in public ownership there is little chance that any who desire beach access will be denied. In fact, because beaches up to the high tide mark belong to the public, anyone with a boat can obtain access to the beach. Also, eleemosynary organizations provide access. For example, the Episcopal Church runs a camp on Seabrook Island for individuals regardless of income. And those with modest incomes can save their money to rent a condominium in most barrier island communities. (In Seabrook off-season rental prices for a nice duplex have been in the range of $600 per week.)

If there is still too little access for Clark, beach vouchers, similar to food stamps and housing certificates, could be given to the poor. We doubt if most Americans are ready for this, but they are a way to guarantee access regardless of income.

We too have concern for the poor. But a better way to deal with that problem is with policies that equalize employment opportunities and redistribute income. The market system is not perfect, but it provides individuals with the best opportunities to provide for their material well-being and protect valuable resources as well. We can have our cake and eat it, too.

EXCERPT

THE LOOMIS FOREST: A MARKET SOLUTION?

By Matthew Brown

Chaining yourself to a tree in the forest just doesn't work any more. To save forests, environmentalists have found a less confrontational way to achieve their goals. They reach for their checkbooks.

The latest illustration comes from Washington State. The Northwest Ecosystem Alliance has collected $13.1 million to pay to prevent logging of 25,000 acres of Loomis State Forest in north-central Washington. For the first time, private funds will be used to place a government-owned forest in a state conservation trust. While this isn't the same as actually buying the land, the arrangement marks an about-face in the way environmentalists do business.

The Loomis is managed by Washington's Common School Trust, which uses timber sales from the forest to earn money for the state's public schools. Time and again, the Northwest Ecosystem Alliance and other environmental groups have gone to court to block such sales. The new agreement ends the lawsuits and the logging and also provides revenue for the school trust.

The coalition will pay the trust for the current generation of trees and will provide money to purchase an additional tract of land, elsewhere in the state, that is suitable for future logging.

While this new effort is a positive step, it doesn't yet qualify as free market environmentalism. The Loomis agreement uses private funds to move control of the forest from one government agency to another. To make the school trust "whole," the group must buy other land that can be logged. In the end there will be more land in state possession, not less. Removing the forest from active management will also increase the risk of fire that could spread to adjacent land. Responsibility for such management should be part of the agreement.

Even so, the willingness of the environmentalists to come to the table with money instead of rhetoric is a breakthrough.

Matthew Brown is a PERC Research Associate. For more about the Loomis deal, see PERC's Web site (www.perc.org).

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