
**The Market Process and
Environmental Amenities**

Terry L. Anderson

occasional papers

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Foreword

Conservation and the environment. These words are now on everyone's lips. Everyone is worried about the pace at which industrialised nations chew through resources and the treatment they mete out to the environment. The worry is both genuine and understandable. Few can be blind to the senseless destruction of natural amenities and the rape of natural resources that accompany modern life.

The difficulty now is not in alerting people to the problems but in thinking through how the problems are to be addressed. Here the environmental movement has fallen down badly. Its emphasis has been on advertising the seriousness of the problem rather than on how natural resources can be better managed and natural amenities better provided. The modern view is simply that resource waste and destruction are part and parcel of the market system. The extreme conclusion is that the market system must be overthrown. The moderate conclusion is that the market system must at least be heavily regulated.

Even friends of freedom commonly believe that markets fail when it comes to providing for the environment. They accept that markets and private enterprise are the best means of organising production; but when it comes to the environment, they look to government.

Enter Professor Terry Anderson. For a decade Professor Anderson and his colleagues at the Political Economy Research Center, Montana, have been challenging us to think hard about how to address the multitude of environmental problems of modern concern. In the process Professor Anderson has developed an alternative and exciting framework for addressing environmental problems. This framework is known as the New Resource Economics or, more popularly, as Free Market Environmentalism.

The insights of the New Resource Economics are both deep and penetrating. They apply to the entire range of environmental concerns. And the conclusions reached are invariably the opposite of those reached by modern thinking. The fundamental conclusion is that market processes are not inimical to sound resource and environmental management, and indeed that the power of the market can be harnessed to provide environmental amenities just as surely as it can be harnessed to provide everyday consumer goods.

The challenge is to understand the cause of environmental problems. Very often the cause is not the market as such but the lack

of private property and of the ability to enter contracts. The solution follows the diagnosis: Providing for the environment requires more private property and more opportunities to enter contracts. Instead of being the problem, markets are the solution.

In making the case for free market environmentalism, Professor Anderson is critical of his fellow economists. Their usual approach is to analyse environmental problems against the ideal of a perfect market. Obviously enough, the real world doesn't conform to a perfect market: which leads to the conclusion that government intervention is required. As Professor Anderson points out, this is to assume that governments are perfect. But once it is allowed that governments, like markets, are less than ideal, the economist's usual approach disintegrates. The analysis must go deeper: it must consider the actual behaviour of people in political as well as in private settings. And as Professor Anderson makes plain, there are sound reasons why environmental entrepreneurs are likely to do a better job than bureaucrats and politicians.

The challenge for economists, then, is not to design new regulations and tax systems to direct people to optimal results. The challenge instead is to consider how market processes can be extended to include resources and environmental problems hitherto lying beyond the scope of the market.

There is in fact a challenge in Professor Anderson's work for each of us. Instead of wagging the finger at this or that group and complaining that 'the government should do something', we should be taking responsibility ourselves and considering what we can do to provide for the environment. So Professor Anderson's work is more than just an intellectual challenge: it is a practical one as well. It is also very exciting, as readers of this paper will no doubt discover.

Rodney Hide
Lincoln University

Editorial Note

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About the Author

Terry L Anderson is Professor of Economics at Montana State University and a Senior Associate of the Political Economy Research Center at Bozeman, Montana. In 1988 he was a Fulbright Fellow working with the New Zealand government on the reform of water management laws. He has authored or co-authored five books, including *Water Crisis: Ending the Policy Drought* (1983), and contributed to the Tasman Institute's 1991 publication *Markets, Resources and the Environment*. His article 'Free Market Environmentalism: Rethinking the Way We Think' was published in *CIS Policy Report*, August-September 1988.

The Market Process and Environmental Amenities

Terry L. Anderson

I. INTRODUCTION

No other field of economic inquiry, with the possible exception of industrial organisation, has focused more on market failure and its implications than has natural resource economics. In a leading textbook on the subject, Alan Randall states that:

resource economics ... raises questions about the effectiveness of existing market and institutional structure in allocating resources, in adjudicating among the claims of individuals in the present generation and adjudicating among the claims of present and future generations. (Randall, 1981:42)

In general, resource economists have focused on problems of externalities and public goods. Solutions requiring governmental intervention are then proposed and analysed to determine what taxes, subsidies, and regulations will improve efficiency.

Starting from a perspective of Pareto optimality, most textbooks focus on why such an optimum will not or cannot be achieved through the market process. Charles Howe, for example, uncovers what he believes to be a 'number of reasons why even well informed competitive markets may fail to allocate resources in the socially, most desirable way over time'. His list includes:

- Private markets are likely to overlook the values of environmental services related to stocks of *in situ* resources.
Private interest rates are likely to be higher than appropriate social rates of discount.
- Common access to *in situ* resources may preclude the establishment of markets for these resources.

- Future production cost savings related to carrying stocks of *in situ* resources may be spread among many producers in common pool resources, causing producers to ignore or undervalue such savings.
- Monopoly will generally result in quite a different time pattern of resource use than a competitive market, but this pattern may be closer to the optimum pattern than the competitive one (Howe, 1979:103).

In general, most of the arguments on market failure centre on the divergence of private and social discount rates or private and social costs. Following a Pigovian tradition, economists have tended to see externalities as pervasive cases of market failure calling for governmental intervention. In the textbook that dominated college courses during the 1960s and 1970s, Paul Samuelson states that:

Wherever there are externalities, a strong case can be made for supplanting complete individualism by some kind of group action ... The reader can think of countless ... externalities where economics would suggest some limitations on individual freedom in the interest of all. (Samuelson, 1980:450)

From this perspective, it has been easy to justify governmental intervention in the allocation of almost all natural resources, including land, air, energy, timber, water, and agriculture. Unfortunately, 'the Pigovian analysis contains an implicit bias toward "intervention solutions" for externalities in the form of taxes, subsidies, regulations and prohibitions' because it suggests 'that externalities necessitate "corrective" government action' (Burton, 1978:90).

This approach has recently been criticised and challenged. Stimulated by Ronald Coase's article 'The Problem of Social Cost', economists have begun to incorporate property rights and transaction costs into their analysis of market processes. Particularly in the fields of industrial organisation, public choice, and economic history, this new brand of institutional economics is generating a body of literature that is changing the way we think about government and its role in the market system.

This paper will attempt to help expand the list of such fields to include natural resource economics. A few economists are beginning to recognise the importance of the new institutional economics to the study of natural resources, and the result is an emerging new resource

economics paradigm (see Anderson, 1982). The next section of this paper briefly states the elements of the new paradigm. The third section provides examples of how the new institutional economics can be applied to resource problems. It suggests alternatives to the interventionist solutions derived from the Pigovian analysis, and presents evidence that market processes can provide environmental amenities.

II. THE NEW RESOURCE ECONOMICS

In examining the 'myth of social cost', Steven Cheung concludes that:

The question is ... why public policies exist in the way they do and why they vary in different economic systems. The answer to this question of the economic interpretation of political behaviour requires an understanding of the real-world constraints relative to government decision-making. A recent shift of interest in that direction and a growing recognition of the importance of the analysis of politics, presage a new momentum in the development of economics, particularly in industrial organization, public choice and economic history. (Cheung, 1978:67-8).

These fields place emphasis on the relationships between principals and agents and the effect that transaction costs have on these relationships. As a result, economists are rethinking the concept of monopoly, reconsidering the behaviour of bureaucracies, and asking how and why institutions change over time.

Even more recently, natural resource economists have begun to apply the transaction cost/property rights tool to their analyses. Antony Fisher captures the essence of the change:

We have already abandoned the assumption of a complete set of competitive markets ... but if we now similarly abandon the notion of a perfect planner, it is not clear, in my judgement, that the government will do any better. Apart from the question of the planner's motivation to behave in the way assumed on our models, to allocate resources efficiently, there is the question of the ability to do so. (Fisher, 1981:54)

The new institutional economics approach is giving the kind of rigorous, theoretical, and empirical attention to governmental fail-

ure in natural resource allocation that previous efforts following the Pigovian tradition have given to market failure. Using this approach, it is clear that:

... it is not sufficient to compare the performance of either the market or a non-market mechanism against an 'ideal', 'optimum', or 'theoretical' standard and conclude that it is inappropriate for policy purposes. Market 'failure' in some abstract sense does not mean that a non-market alternative will not also fail in the same or in some other abstract sense. (Castle, 1965:552)

Methodological Individualism

The new resource economics begins with the individual, especially the entrepreneur. Following marginal analysis, entrepreneurs search for situations where marginal benefits exceed marginal costs. As they respond to opportunities, the system moves closer to equilibrium. The question is whether the opportunities they discover and the actions they take will increase wealth for society or simply redistribute it.

The answer to this question depends entirely on transaction costs and the resulting contracts. For entrepreneurs to face the full opportunity costs and reap the full benefits of their actions, there must be explicit or implicit contractual terms for all relevant margins. It is the structure of property rights and the cost of specifying, measuring, and enforcing contractual terms that determine resource allocation.

It is also important to recognise that as the values of resources change and as new technologies are developed, different margins will be specified in contracts. Higher resource rents will induce entrepreneurs to accept the contracting costs that were too high given previous values. Similarly, new technologies can reduce the costs of specifying, measuring, and enforcing contractual terms. Both phenomena were at work in the evolution of property rights in the American west (see Anderson & Hill, 1975), and both are influencing the provision of environmental amenities through the market process.

When property rights are not well-defined, enforced, and transferable, or when transaction costs are high, the entrepreneur has at least two opportunities for increasing his wealth. First, consider the economics of a common pool. Cheung (1970) has shown how entrepreneurs faced with a common pool resource dissipate rents. Because of high transaction costs, certain marginal impacts will not be the basis of contract. Exploiting a resource under these conditions

benefits the individual, but is a negative-sum game for society.

Entrepreneurs also play negative-sum games when they engage in rent-seeking that uses the coercive power of government to increase personal wealth at the expense of others (Anderson & Hill, 1980). In the context of new institutional economics, rent-seeking means that entrepreneurs will engage in efforts to raise transaction costs for their competitors or to redefine property rights in their favour. Both of these actions require governmental action. With so many decisions on natural resource use placed in the hands of State and federal bureaucrats, the rent-seeking game is important for coal company executives as well as environmental leaders. Both types of entrepreneurs recognise that their wealth and that of their principals will be affected by bureaucratic decisions. Hence, interest groups spend large amounts of money and other resources trying to influence these decisions.

Rent-Seeking

While such entrepreneurial efforts explain the demand for rent-seeking, the activities of politicians and bureaucrats explain the supply. Just as entrepreneurs in the marketplace recognise and fill demands for goods and services, politicians and bureaucrats discover opportunities to meet the demands of their constituencies. The constraints on each, however, are very different. With well-specified contracts, private entrepreneurs provide new goods and services only when they expect the benefits from those items to exceed the opportunity cost of resources used in their production. Politicians and bureaucrats who provide goods and services to interest groups, however, do not have to pay the full opportunity cost of expended resources. They can increase their own utility by increasing budgetary discretion, power, and wealth.

There is a principal-agent relationship between politicians and bureaucrats on the one hand and voters on the other. But this is weakened by such things as rational voter ignorance, imperfect information, and special-interest effects, which raise the transaction costs of fully specifying contracts between governmental agents and citizen principals. By explicitly incorporating these costs into our models, we can better understand which situations are likely to result in governmental failure.

Natural resource economists who follow this approach question whether allocation problems can be solved simply by asking governmental decision-makers to equate benefits and costs at the margin. As

Friedrich Hayek states:

The problem is thus in no way solved if we can show that all the facts, if they were known to a single mind ... would uniquely determine the solution; instead we must show how a solution is produced by the interaction of people each of whom possesses only partial knowledge. (Hayek, 1945:530)

From this perspective, the real question is: What are the relevant contractual margins and what values will be placed on them?

The new paradigm is certainly having an impact on natural resource economics and policy, but developing a new theory is not enough. If 'Pigou's contribution to the economic theory of government policy was based on armchair theorizing, rather than empirical investigation' (Burton, 1978:72), it is important that the new resource economics do not fall into the same trap. The property rights and transaction costs constraints that are assumed must be carefully examined to see if they are valid. Empirical investigations must be conducted to ensure that the findings are true. Guidelines for conducting these investigations are provided by Coase's evidence (1974) that lighthouses are not public goods and Cheung's examination (1973) of contracts between beekeepers and orchard owners.

III. FREE MARKET ENVIRONMENTALISM

Those who follow the Pigovian tradition are willing to acknowledge a property rights solution to some problems. But they generally argue that such a solution could not possibly work for water, amenity, and wildlife allocation.

With respect to bodies of land and water, extension of property rights may effectively internalize what would otherwise remain externalities. But the possibilities of protecting the citizen against such common environmental blights as filth, fume, stench, noise, visual distractions, etc. by a market and property rights are too remote to be taken seriously. (Mishan, 1972:62)

But voluntary, contractual solutions to many environmental problems can and do evolve. When they do not, transaction costs can be blamed for the failure. These costs may not simply be those associated with standard market transactions, however; they can be the result of governmental action designed to correct the alleged market

failure. Consider the following examples of how the market provides environmental amenities.

Privatising Instream Flows

There was little need to consider who had the rights to *instream* flows during the years when water rights were forming in the American west (see Anderson, 1983). Since then, however, the demand for *instream* uses has grown to include waste disposal, recreation, and scenery. Industrialisation led to the discharge of effluent into rivers and lakes, and rising incomes and more leisure time led to an increase in aesthetic values.

As *instream* uses began to compete directly with diversion uses, the institutional structure had to be adjusted to account for the new values. Judicial and administrative agencies responded by instituting new rules governing *instream* uses. The rationale is that these uses are a public good; that is, it is difficult (some say impossible) to exclude nonpaying uses, and additional units of the good can be provided at zero marginal costs. To compound the problem, it is argued that an existence value can be associated with *instream* amenities; that is, some people derive satisfaction from simply knowing the amenity is there. A New Yorker may be happy knowing that a free-flowing stream exists in Montana even if he has no intention of ever seeing it. Using these arguments, policy-makers have justified governmental intervention in water allocation. Is the collective action that has been used to provide for *instream* uses necessary, or could markets be allowed to resolve the conflicts between uses?

If we are to be convinced that markets can provide an alternative for allocating *instream* flows, it is reasonable to ask why markets are not more active in this area. James Huffman suggests:

that existing inefficiencies in water allocation result from deficiencies in the private right system rather than alleged market failures. The existing water laws seriously limit private acquisition of *instream* flow rights, so we cannot be sure from experience that the initial public-good assumption is accurate. (Huffman, 1983:268)

In many Western states, the institutional structure precludes the private ownership of *instream* flows. In some cases, the concept of beneficial use — initially developed for agricultural, mining, and domestic uses — does not include *instream* flows. In the early mining

camp, beneficial use was determined by any user who was willing to divert the water. Over time, however, beneficial use has been increasingly determined by judicial and administrative agencies, which have ruled that reserving instream flows for amenity purposes does not constitute a beneficial use.

Beneficial use. The requirement that beneficial use necessitates the diversion of water has produced perverse results. For example, when the Colorado legislature authorised the Colorado River Conservation District to reserve water for instream purposes in any natural streams large enough to support a fish population, the Colorado Supreme Court ruled that there was:

no support in the law of that state for the proposition that a minimum flow of water may be 'appropriate' in a natural stream for piscatorial purposes without diversion of any portion of the water 'appropriate' from the natural course of the stream. (Huffman, 1983:270)

Much earlier, in 1917, a Utah court had ruled on the disputed ownership of instream flows for the purpose of supporting a duck population. The court found that it was:

utterly inconceivable that a valid appropriation of water can be made under the laws of this state, when the beneficial use of which, after the appropriation is made, will belong equally to every human being who seeks to enjoy it ... [W]e are decidedly of the opinion that the beneficial use contemplated in making the appropriation must be one that inures to the exclusive benefit of the appropriator and subject to his domain and control. (*Lake Shore Duck Club v. Lake View Duck Club*, 50 Utah 76, 309, 1917)

The state was unwilling to allow individuals or groups to appropriate rights over the 'public goods'. As long as the maintenance of instream flows does not constitute a beneficial use of water, private appropriators will not be able to define and enforce rights to the flows. Thus, a market cannot develop. Again, this is not a case of market failure, but of governmental or institutional failure.

Also hindering the market allocation is the practice in most states of forcing rights holders to forfeit rights if the water is not used. That is, if water is left in a stream to provide a nice view or fish habitat, the law considers it abandoned and the right is lost. The rationale for this

law was that speculation in water caused valuable resources to remain idle and unproductive, inhibiting economic growth.

Since water held for speculative purposes cannot be distinguished from water held for instream uses, the latter has fallen under the law of abandonment. The law stifles the establishment of instream water rights and discourages what may be a highly valued use. Removing the beneficial use restrictions and the laws of abandonment would eliminate an institutional barrier to the establishment of instream flow rights and the production of amenity values.

Private ownership of streams. The evidence suggests that if legal obstacles to the establishment of instream rights were removed, contracted arrangements for the private provision of instream uses would develop. On small streams, for example, where some legal restrictions do not apply, private owners are gainfully providing fishing. In the Yellowstone River Valley south of Livingston, Mont., several spring creeks begin and end on private property and are wholly appropriated by the landowners. Since access to the stream can be inexpensively monitored, landowners can collect a fee from fishermen. The fee gives owners the incentive to develop spawning beds, prevent siltation, and keep cattle away from streams to protect the bank vegetation and cover. Owners limit the number of fishermen per day so that the value of the experience is not diminished.

A rather different case, but one that produced similar results, occurred in the Gallatin Valley near Bozeman, Mont. A few years ago, a recreational fisherman purchased some land and a stream from a cattle rancher who had allowed his livestock to graze on the stream banks, eliminating vegetation, causing erosion, and reducing the size and number of trout in the stream. The new owner got rid of the cattle and in three years had reclaimed the stream and revived its fishing potential. The owner bears the cost of not using the land for cattle production, but he reaps the benefits of better fishing.

The results of private ownership of fishing rights are being noted in other parts of the world. On the Southwest Miramichi River in Quebec, the owner of a fishing camp described how he turned his leased section into the perfect place for salmon fishing:

I made it perfect by rafting a bulldozer in here ... We cleared away the gravel bar that kept fish from going up the tributary ... dug the hundred-yard long pool and shoved a big-as-a-house boulder in place at the head of it ... With all due respect to Mother Nature, the pool was built by men and machines,

and it seems to be as good now as it was the first year. (Zern, 1982:87)

British experience. The rights to fishing streams in England and Scotland have long encouraged instream uses. The tradition of trout fishing in Great Britain has led some owners to maintain their fisheries even though they have not marketed the fishing rights. As the value of fishing rights has risen with the demand, however, 'there are few landowners ... who can afford to ignore the commercial aspect of the sporting rights which they own' (Southerland, 1968:110). It has become worthwhile to incur the costs of specifying and enforcing contractual arrangements that govern fishing. As a result, many private voluntary associations have been formed to purchase rights to instream flows and to charge fees for fishing.

In the 1960s and 1970s, smaller, privately managed fisheries that offered exclusivity in exchange for higher rod fees began to break out like an aquatic rash around [England]. Now every city and major town ... has first-rate trout fishing within easy reach and at an affordable price. (Clarke, 1979:219)

In Scotland,

virtually every inch of every major river and most minor ones is privately owned or leased, and while trespassing isn't quite as serious a crime as first-degree murder or high treason, it isn't taken lightly ... Many of the stretches, which may be 100 yards of one bank of a river or several miles of both banks, are reserved years in advance, with a long waiting list. (Zern, 1981:120-36).

In Grantown-on-Spey, the angler can

join the local angling association by paying a weekly fee about \$25 and be free to fish any of seven miles of association water. Sometimes, too, hotels and inns own or lease a stretch of river for their guests or make arrangements with the local owner of fishing rights (Zern, 1981:120-36)

When water for instream uses can be privately owned, there is an incentive to manage and improve the fishing habitat. In order to capture a return on the investment, owners must invest in enforcing

their property rights, so the British hire private fish and game managers and invest in capital improvement on their streams.

To maintain their houses as homes, they retained housekeepers. To keep a proper garden and park, they had groundskeepers. Game keepers for stag and grouse. Then, as keepers of the kept, even gatekeepers to further secure things. And eventually, it was for the British to devise the ultimate in the art of maintenance — the riverkeeper. Now, the name itself could easily be misinterpreted — as it has from time to time by our American 'riverkeepers' whom we call 'the Corps of Engineers'. To keep a river from doing what it is supposed to do would be noxious to the British, as it is to many anglers. (Zahner, 1980:16)

The British system illustrates how any country might restructure its institutional arrangements to encourage the private ownership of instream flows. With private ownership, instream flow rights acquire a value that cannot be ignored. Southerland points out there is no doubt

that sporting rights are a desirable amenity ... but it must be remembered that without careful preservation much of the amenity would not exist. The good-natured farmer who allows anyone to shoot over his land, and does nothing to preserve his stocks, will soon find out there is little left to shoot ... [I]f he invests in improving his sporting amenities, he is surely entitled to make what profit he can from his enterprise. That this should result in the rationing of the commodity by prices is no more deplorable than the fact that Dover sole costs more than herring. (Southerland, 1968:113-14).

Reduced pollution. Even pollution can be reduced if individuals are allowed to own water within the confines of a stream's banks. Under these conditions, liability rules can and will evolve. Owners of instream fishing rights, for example, could bring suit against an upstream polluter whose effluent adversely affects their fishing resource. In England, the Anglers' Cooperative Association (ACA) has assumed the job of monitoring pollution.

It has investigated nearly 700 pollution cases since it started and very rarely does it fail to get abatement or damages, as the case requires. The anglers have behind them a simple fact. Every fishery in Britain, except for those in public reservoirs, belongs to some private owner. (Dales, 1968:68)

These efforts have even preserved trout fishing on the Derwent River, which flows through the industrial city of Derby. The ACA prevented the city from dumping sewage into the river and got an injunction against British Electric to stop it from running warm water directly into the river. 'ACA also deals with ... mud running into a stream from a new road grade, or a ditch ... This is actually a good example of a common form of pollution which we [in North America] accept but which is quite unnecessary and not hard to avoid' (Dales, 1968:69).

State laws that prohibit the ownership of water for instream uses inhibit market solutions to use conflicts. If these prohibitions were removed, it is likely that we would move a long way toward reaching private, contracted arrangements for instream uses. The existence of British water institutions, which promote high-quality fishing and give owners an incentive to guard against stream pollution, suggests that markets can play a greater role.

Migratory Fish and Wildlife

Even those who concur with a property rights solution to many natural resource problems often argue that such a solution in some cases would be prohibitively expensive. John Burton concludes that:

fish-farming, for instance, is both technically feasible and commercially viable in some types such as oyster-fishing (and probably also shore-based rearing of expensive fish such as turbot and sole). But the establishment of private rights of fishery in migratory fish seems so far technically infeasible. (Burton, 1978:88)

The fate of whales, sea turtles, buffalo, grizzly bears, and passenger pigeons provides ample ammunition for environmentalists seeking governmental control of wildlife allocation.

As with instream flows, one reason for market failure is the legal restriction on wildlife ownership. An 1896 Supreme Court ruling established the state's proprietary interest in wildlife through the

state ownership doctrine. In light of the near extinction of several furbearing species, state control of wildlife seemed like the only alternative. There are cases, however, where these laws have hindered the establishment of private property rights, and, hence the investment in wildlife preservation. Nonetheless, there is a growing number of examples of markets responding to scarcity conditions in the allocation of this natural resource.

It appears that establishing private rights, even for migratory fish, is technically feasible. In Oregon, companies are investing large amounts of money in breeding salmon in hatcheries and releasing them into the ocean. When the salmon leave the Oregon Aqua Hatchery, they are 'imprinted with a chemical odour which will guide them back to this [release] site when they are ready to spawn' (Nova:8).

Private salmon ranching is not unlike the fishing institutions established by the early coastal Indians. Tribes along the coast and up the Columbia River harvested the fish when they returned to their spawning grounds, limiting the take according to tradition and superstition so there was always a sustainable catch. Resources were not expended in fishing the ocean but were conserved by catching fish as they returned to the rivers.

Common pool salmon. When white men came to the Pacific Northwest, the ocean became a common pool resource to be exploited by commercial and sport fishermen. Efforts have been made to limit the catch in open waters and to increase the salmon population by using public hatcheries, but many resources are still being invested in trying to catch the fish that are available. Large amounts are invested in boats, nets, electronic gear, and labour, even though the fish could be harvested by channelling them directly into the cannery at spawning time. Estimates suggest that total expenditures may exceed the value of the salmon (Higgs, 1982).

Private salmon ranching is a rational alternative. The only piece of equipment required is a concrete fish ladder, and private salmon ranches catch approximately 70 per cent of their released stock. The program is still in its infancy, but it appears to be profitable and is contributing to a growing wild salmon population.

Altruism? No. Timber companies in the south are also recognising the potential for resource management that enhances wildlife. The southern timber industry is dominated by private land-holdings. In the past, forests have been managed primarily for pulpwood, with little attention paid to wildlife habitat. It simply was not worth incurring the transaction costs. As amenity values have risen, however, companies such as the International Paper Company have begun to change. White-

tailed deer, turkeys, rabbits, bob-white quail, mourning doves, and other species are beginning to reap the benefits of new management techniques, and so are International Paper and hunters. Clear-cuts are limited and are made in irregular, narrow patterns to minimise the edge effect. Stream bottoms and natural drainages are left in hard woods to generate food and cover. By increasing phosphorus through legumes, deer body weight and antler size have increased.

All of this comes at some cost to the company, so why do they bother to do it? Part of the reason is improving public relations. But the companies also earn as much as \$US10 per acre in hunting leases. International Paper's 3500-acre Cherokee Game Management Area in east Texas earns \$6 per acre annually. In other States, leases average from 50 cents to \$1 per acre, depending on the quality of the site. *Outdoor Life* editor Richard Starnes concludes that

in the future, timber companies will get involved with leasing lands to hunting clubs, which will then provide timber management of their own. This will give hunters an investment in wildlife helping companies manage their lands. (Starnes, 1982:11).

The number of hunting clubs interested in contracting for land is rapidly increasing. As *Fishing and Hunting News* reports:

Today, as the ranks of hunters grow and the available public lands shrink, more and more savvy sportsmen are turning their attention to the hunting club. What's more, folks have discovered that these preserves are an affordable option to hanging up the gun at the end of the general season. (April 1982:8)

Clubs that support many different bird species can be found from coast to coast and from border to border. The contracts governing the use of private reserves vary with fees charged based on number of birds bagged, number of birds released in the fields, guide services, and annual membership fees.

In these days of posted farmland, shrinking public access, and growing hordes of hunters, a hunting preserve membership is an absolute guarantee that you will have a place to hunt and a place to take junior, and you won't have to spend half of the day looking for a landowner whose permission to hunt may not come readily. The bottom line is better hunting, more shoot-

ing, and a happier end to each excursion. What more can the outdoor sportsman ask for? (*Fishing and Hunting News*, April 1982:8).

Clearly, some sportsmen are beginning to recognise that private contractual arrangements offer an alternative to the public provision of wildlife.

Hunter and landowner as friends. This alternative is especially evident in Texas, where over 85 per cent of the land is privately owned. Deer hunters purchase leases to hunt on private land at fees that range from \$US100 to \$2000 per gun, depending on the quality and quantity of game, and the facilities and services provided by the landowner. The type of lease varies: 71 per cent are deer season leases, 19 per cent are year-round leases, 5 per cent are day leases, and 5 per cent are short-term leases. On a per-acre basis, lease rates range from 25 cents to \$10 annually. Taylor, Beattie and Livengood (1980:2) concluded that 'the net returns from deer leases equal or exceed the annual net returns from livestock operations in many areas of the state'.

Hunter success on leased lands is extremely high relative to public sites. On leased lands, 1.16 deer were killed per hunter in 1978, while on public lands 0.62 deer were killed per hunter (Livengood, 1979:2).

The rancher-landowner is responsible for the wildlife on his place. When the hunter appears, the hunter is charged a fee to hunt on the land ... [T]he cowman participates because he makes money. By the same token, if that cowman posts his land 'no hunting', it costs him money. You just don't see that many acres posted 'no hunting'. (Chambers, 1982:48)

Cooperation between sportsmen and landowners is improved as a result of market contracts that force individuals to take into account costs and benefits. While it is often 'assumed that private property rights cannot be enforced in the case of fisheries, wildlife, and whatever other resources economists have chosen to call "natural" ' (Cheung, 1973:33), it would appear that such assumptions only generate more fables.

Private Land Conservation

Arguments abound in favour of government intervention for conservation in general and for land conservation in particular. They are based on excludability and the divergence of private and social discount rates. 'It is the clear duty of Government, which is the trustee for unborn generations as well as for its present citizens, to watch over, and if need be, by legislative enactment, to defend the exhaustible natural resources from rash and reckless exploitation' (A.C. Pigou, quoted in Milliman, 1962:199).

In the case of land, the call for government action is further buttressed by the claim that market information does not clearly reflect the future value of agricultural production. The National Agricultural Land Survey (NALS) purports to show that more than 3 million acres of agricultural land in the United States is being converted annually to other uses. It has given conservationists the ammunition to press even further their demands for legislation designed to preserve agricultural lands (Baden, 1983). Since the late 1800s, the same arguments have been used to justify governmental ownership of one third of America's land. Everything from national parks to wilderness areas to historic sites supposedly fits into the market failure category. On that basis, vast bureaucratic empires have been built.

Leaving aside the question of whether existing landowners will provide sufficient land preservation and whether the government can do any better (see Baden & Stroup, 1981), let us examine private options for land preservation.

The economics of land conservation are currently undergoing some changes. In the past, much of the activity in land conservation centred on moving land from the private sector into governmental ownership and on classifying public lands into protected status (national parks, wilderness, and primitive areas, monuments, etc.). In the present state of tightening public budgets, money for land acquisition is rapidly drying up and resource development of public land is receiving federal encouragement. Leaving the issue of struggle over public land management aside, the strategies of the land conservation movement are adapting accordingly as they look increasingly to the private sector for support and action. (Rusmore, 1982:87)

The Nature Conservancy. Leading this adaptation on the national level has been The Nature Conservancy,

a national conservation organisation committed to preserving natural diversity by finding and protecting areas that contain the best examples of all components of the natural world. Since 1950, the Conservancy and its members have been involved in the preservation of nearly 2 million acres in 50 states, the Virgin Islands, Canada and the Caribbean. (*The Nature Conservancy News*, 1983:3)

In 1982, the Conservancy held over \$US261 million in assets, nearly \$190 million of which was in natural land areas. At the end of 1982, the Conservancy's portfolio included 689 preserves, a permanent capital fund of \$49.5 million, and 3098 land conservation projects encompassing over 1.9 million acres.

At the local level, land conservation organisations, using primarily volunteer initiatives and private funds, have grown rapidly during the past three decades. In 1950, only 36 conservation organisations existed in the United States. By 1975, there were 173, and by 1982 there were 404 groups representing over 250 000 members. Local conservation organisations in 1982 controlled more than 675 000 acres of valuable resource lands, with over 60 per cent of that total in the New England and Middle Atlantic states, where private ownership is dominant.

Land conservation trusts are generally established with tax-exempt status. Their purpose is to preserve land for its amenity values and to keep it in agricultural uses. Funds are raised by soliciting members, with membership fees levied at a small amount per year, and by soliciting grants from foundations and corporations, sometimes amounting to hundreds of thousands of dollars. With these funds, the land trusts can purchase fee simple title to land or simply purchase conservation easements. In addition, trusts find that, 'given the moral inclination and encouraged by tax incentives, some ... [private] owners are committing their properties to conservation purposes' (Rusmore, 1982:187).

Tax incentives. Tax incentives are very important to the land conservation organisations, since individuals can deduct their contributions as charitable donations. Individuals who give conservation easements to these organisations can also deduct the difference between the value of the land without the easement (the development value) and the value with the easement (the conservation value).

These 'bargain sales are one of the most effective levels the [Nature] Conservancy has to pry loose land it wants' (Wood, 1978:79). It might be argued that conservation contracts between private organisations and existing landowners really are stimulated by government, since such contracts depend heavily on tax incentives. Taking the tax institutions as given, however, the 'business-suited saviors of the nation's vanishing wilds' (Wood, 1978) clearly represent a private response to the provision of amenity values.

Conservation organisations tend to manage lands differently than public bureaucrats. Even land-swapping is not uncommon. For example, when the Nature Conservancy decided that land it had been given in the Virgin Islands was not of prime environmental importance, it exchanged it for land in Wisconsin that could be managed as an integrated watershed for amenity purposes. While land-conservation organisations undoubtedly suffer some of the problems faced by all non-profit organisations, there are some important elements of residual claimancy.

Land trusts are also not opposed to charging user fees of people who obtain benefits from their lands. Since these organisations cannot readily tap public funds, they are continually looking for innovative ways to finance projects. Speaking for the Trustees of Reservations in Massachusetts, Gordon Abbot Jr. states that:

we're also fortunate that user demand enables us to raise 35 per cent of our operating income from admission fees and that these can be adjusted within reason to catch up with inflation. We're great believers in the fairness of users paying their way. (Abbott, 1982:207)

User fees. Fees are charged for everything from parking to concessions to entrance, demonstrating that excluding non-payers from consuming amenity values is possible at a cost. As the amenity values rise, organisations are finding it worthwhile to undertake exclusion costs in an effort to raise funds. These organisations also have an incentive to charge fees because the revenues can be reinvested. This is in sharp contrast to the policies of the National Park Service, which has kept entrance fees in real terms below pre-1920 levels.

There is little doubt that 'the private sector is proving to be a formidable ally' (Rusmore, 1982:187) for the conservation movement. As a leader from the New Jersey Conservation Foundation puts it, 'We have entered an era when we now acknowledge that government

cannot best solve all our problems and that solutions that draw on the private sector will offer greater economic efficiencies and flexibility' (Moore, 1982:213).

With the federal government cutting back on its land acquisition programs, people are turning more to the private sector to provide land-generated amenities. Even though these organisations face an element of the free-rider problem, they have raised significant amounts of money and found ways to overcome the difficulties, at least partially. The groups are unlikely through outright purchase programs to accomplish what the government agencies can, but they 'can significantly contain the threatened damage to . . . critical areas' (Rusmore, 1982:219). Again it is simply not the case that 'protecting the citizen against such common environmental blights as filth, fume, stench noise, visual distractions, etc, by a market and property rights are too remote to be taken seriously' (Mishan, 1972:62).

IV. CONTRACTARIAN DIRECTIONS

Professor Cheung has suggested that the concept of externalities be discarded in favour of a contractarian analysis.

The change in view through the analysis of contracting is not a redundant way of treating the same class of problems, for this change in view leads to different . . . questions. Why do market contracts not exist for certain effects of actions? Because of the absence of exclusive rights, or because transaction costs are prohibitive? Why do exclusive rights not exist for certain actions? Because of legal institutions, or because policing costs are prohibitive? (Cheung, 1970:58)

There is certainly good evidence that the externality approach proposed by Pigou has not taken us very far toward an understanding of natural resource allocation. It has basically provided arguments for governmental intervention. The property rights/transaction cost approach suggested by Cheung, on the other hand, is helping us identify the relevant margins for deciding on natural resource allocation. By looking at the actual market process — i.e. the contracting process — we often find that assumed external effects can be negated through contract. Further, when we ask why contracts do not take externalities into account, we are forced to examine all transaction costs, including governmental restrictions. The three natural resource uses examined in this paper reveal that contracting processes are

working in some cases. In others, it appears that legal restrictions prevent contracting.

The new institutional economics approach suggests two important directions for the study of natural resources. First, more attention must be paid to the nature of existing contracts. In the case of fee hunting, for example, many questions need to be asked about prices, product specifications, length of contract, and provisions for exclusion. Only such an examination can expose the true transaction costs that determine which margins will be important to decision-makers. Natural resource economists are only beginning to turn in this direction.

Second, natural resource economics must develop clearer ways of thinking about the free-rider problem. Environmental groups in general, and land conservation organisations in particular, seem to be overcoming the free-rider problem in a significant way. Again, I suspect, the nature of the contract is important. What economists assume to be free-rider situations may simply be more fables.

As Douglas North suggests, 'strong moral and ethical codes of a society is the cement of social stability which makes an economic system viable' (1981:47). The property rights/transaction cost approach draws our attention to the effect that this 'cement' has on the contracting process. By focusing our attention on the nature of contracts and transaction costs, we will be able to develop a better understanding of the relationship between the market process and environmental amenities.

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Terry L. Anderson

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Terry L. Anderson is a professor of Economics at Montana State university and a Senior Associate of the Political Economy Research Center at Bozeman, Montana. In 1988 he was a Fulbright Fellow working with the New Zealand government on the reform of water management laws. He has authored or co-authored several books and articles on environmental issues.