Policy Analysis

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Executive Summary

Beginning with the Carter "hit list" and continuing with the fiscal conservatism of the Reagan administration, westerners have been obliged to realize that the days of concrete and steel solutions to water problems are gone. In stressing the West's need to adjust to the new realities of water, Gov. Richard D. Lamm of Colorado described the change that has taken place as follows:

> When I was elected governor in 1974, the West had a well-established water system. . . . Bureau [of Reclamation] officials and local irrigation districts selected reservoir sites and determined water availability. With members of the western congressional delegation, they obtained project authorization and funding. Governors supported proposals, appearing before congressional committees to request new projects, and we participated in dam-completion ceremonies.
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> In 1986, the picture is quite different. The boom in western resources development has fizzled, though tourism remains an economic mainstay. . . . Congress, including members of the western delegation, has to worry about how to cut spending, not which [water] projects to fund. . . . Farmers are trying to stay in business and are recognizing that their water is often worth more than their crops. Policymakers recognize that the natural environment must be protected because it is a major economic asset in the region.[1]

The current political, social, and economic climate is ushering in a whole new era in western water. In the face of efforts to curtail runaway government spending and protect the environment, water institutions must foster the conservation and efficient allocation of existing supplies. They must also take water's growing recreational and environmental value into account. The crucial question is, can the current water institutions meet today's requirements?

In most cases, the answer is no. The current regulation of water allocation is not equipped to promote efficiency and conservation because it evolved during an era when massive federal outlays to fund huge water projects made tradeoffs unnecessary. The objective was to deliver enough water to make the desert "bloom like a rose." Centralized water management, under which supplies are often allocated at highly subsidized prices on the basis of political clout, is a legacy of that era. Water may run uphill to money, but it gushes uphill to politics.

Despite the resulting inefficiency and waste, traditional resource economists continue to identify taxes, regulations, subsidies, and governmental allocation as solutions to today's water problems. More than anything else, that mindset reflects a deep suspicion of the market that precludes its being recognized as a viable alternative.

> In the natural resource field generally, the problem of externalities is widespread, and various organizational arrangements and regulatory measures have been adopted or proposed to cope with it. Laws have been written and established by courts to protect the third parties in water transfers. Special districts have been formed to internalize some of the externalities. The general tendency in institutional development has been to modify market procedures or completely replace them.[2]

A few economists, however, take exception to the idea that centralized planning is the solution to the problems of natural resource allocation in general and water allocation in particular. Anthony Fisher, for instance, has noted,

> 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 judgment, that the government will do any better. Apart from the question of the planner's motivation to behave in the way assumed in our models, to allocate resources efficiently, there is the question of his ability to do so.[3]

Such challenges are based in part on the new resource economics (NRE) paradigm, which provides a clearer understanding of the problems of water allocation.[4] It incorporates elements of the property rights, public choice, and Austrian schools of economics. The property rights approach is to focus on the importance of institutions and incentives. Public choice theorists question whether collective action can increase either efficiency or equity. Austrian economics emphasizes the production of information through the market and the importance of entrepreneurial activities to the market process. The focus of the NRE is on individual decision makers, be they buyers and sellers in the private sector or bureaucrats and politicians in the public sector.

There is a clear distinction between traditional resource economics and the NRE. The traditional approach is to rely on the knowledge of a few experts to direct societal activities. In describing conflicting visions of the role of centralized control in the economy, Thomas Sowell noted,

> Given that explicitly articulated knowledge is special and concentrated, in the unconstrained vision, the best conduct of social activities depends upon the special knowledge of the few being used to guide the actions of the many. . . . Along with this idea has often gone a vision of intellectuals as disinterested advisors.[5]

The NRE does not deny the importance of such expertise, but it stresses that society-enhancing activities are more dependent on knowledge of individual tastes, experiences, and circumstances. Such information does not exist in cohesive, integrated form but is distributed among the members of society. "With knowledge conceived of as both fragmented and widely dispersed, systematic coordination among the many supersedes the special wisdom of the few."[6]

Thus, those who take the NRE approach continually ask how responsibility and authority could be conferred on individuals so as to coordinate their disparate knowledge. In the case of water allocation, there has been an implicit reliance on (some would say a blind faith in) the ability of the few decision makers within a centralized structure to act objectively, omnisciently, and responsibly in pursuit of the public interest. The NRE economists ask whether decentralized markets with well-defined property rights could do better.

Consider how the NRE approach could be applied to water. If property rights in water use were fully defined and transferable, each owner would incur the full costs and benefits of his actions. An owner who ignored the need to allocate water to higher-valued uses would see his personal wealth decrease. Thus, knowledge and incentives would be linked. That is not the case when property rights in water are "owned" by the government. Irrigators may derive benefits from water supplied by public works projects, but they are not at liberty to transfer the water to nonagricultural uses--even when such reallocations would be of higher value. The actions of the "owner"--the agency official who authorizes water use--are not directed by the value of competing uses, as would be the case in a market setting, because he would not gain monetarily from such transfers and in fact could lose discretionary power. Disallowing voluntary trades and restricting water use to irrigation are ways of ensuring that agency control will be maintained.

There are other important differences between market and centralized allocation. Water markets would send supply

and demand signals that would enable managers to conserve water and coordinate its use--precisely the type of information that is conspicuously absent under centralized allocation. Water markets would also allow decentralized knowledge to be brought to bear on water management decisions. As Rodney T. Smith explained, "A farmer can apply his first-hand knowledge of his land, local hydrology, irrigation technology, and relative profitability of alternative crops to decide how much water to apply and which crops to grow on his land."[7] Because they lack such information, public officials are typically forced to use comprehensive plans that are not appropriate under the circumstances.

Water markets cannot exist, however, in the absence of a legal structure that supports private ownership rights. Practitioners of the riparian doctrine, which originated in England and is still being applied in the eastern United States, cannot utilize water markets because property rights in water use are equal for everyone who owns land that adjoins a watercourse and cannot be transferred to others. The riparian doctrine has relatively innocuous effects when water is abundant and tradeoffs are unnecessary, but because it does not permit market reallocation, inefficiency can result when water is scarce.

Because the arid western United States faced scarcity from the beginning, a very different doctrine, the prior appropriation doctrine, evolved there. To support agricultural and mining operations, it was necessary to transport water considerable distances from its source. That could not be accomplished by restricting water use to riparian landowners on an equal basis, so the early California gold miners, in the absence of a formal government, devised their own system for allocating water use. They determined how much water each claimant was entitled to divert by applying the prior appropriation doctrine--"first in time, first in right." Usage rights were well defined and transferable and were enforced by the miners association. A market for trading such rights evolved, and for a time the arid West had in place a legal structure that fostered market allocation of water among competing uses.

That success was short-lived, however; a series of court and administrative decisions led to the centralized restrictions and controls that currently hamper efficiency.[8] It is becoming evident throughout the United States that if the legal impediments to water markets were removed, substantial benefits would result.

The enormous potential of water markets has become particularly evident in central California's San Joaquin Valley, which has 4.5 million acres of irrigated land, and in southern California's burgeoning Metropolitan Water District. Like farmers in other parts of the nation, San Joaquin Valley farmers are suffering because product prices are low. In addition, the quality of the soil in the valley is steadily deteriorating as a result of years of salt buildup and high concentrations of trace elements, such as selenium, in the drainage water. Several years ago high levels of selenium in the irrigation water draining into Kesterson Wildlife Reservoir caused largemouth and striped bass, catfish, and carp to disappear and caused newly hatched waterbirds to develop crippling deformities. The reservoir had been transformed from a fish and wildlife sanctuary into an environmental disaster.[9] Selenium pollution now poses a serious threat to the San Francisco Bay, a critical wildlife and marine life ecocenter.

Solving such problems will require significant investments in water conservation and cleanup; the estimated costs range from $10 an acre-foot for scheduling irrigation and recycling tailwater to $175 an acre-foot for using dripsprinkler systems. None of those investments, however, make economic sense to the region's farmers, who currently pay $5 an acre-foot for irrigation.[10] So where will the money for cleanup come from?

The solution to central California's pollution problems may be a proposed transfer of water from the San Joaquin Valley to southern California. The logic of that choice becomes apparent when one considers southern California's situation. It is a densely developed and highly populated area that is extremely dry and heavily dependent on imported water. The prospects for meeting southern California's growing demands for water were diminished when a readjudication of the Colorado River reduced its share by nearly 500,000 acre-feet a year. Studies of the Metropolitan Water District have forecast significant supply shortages during the 1990s unless new sources can be acquired.[11]

The proposed water transfer would thus benefit both regions. Southern California currently pays $200 an acre-foot for water for urban use and expects to pay as much as $500 an acre-foot for water diverted from rivers into proposed reservoirs. But southern California could continue to pay $200 an acre-foot if it purchased water from San Joaquin farmers--water that they had saved by practicing conservation techniques. The sale of water to southern California at

$200 an acre-foot would mean that the valley's farmers could make a profit even if they invested $175 an acre-foot in drip-sprinkler systems. And they could improve the environment, too, by taking damaged land out of production and eliminating the toxic runoff from agricultural chemicals.[12]

Under current federal policy, however, such transactions are discouraged. The Bureau of Reclamation acts as if it owned the water, and San Joaquin farmers are not empowered to sell their water without its consent. In essence, the bureau has become the water OPEC of the West. It has funded massive projects that supply 35 percent of the West's delivered water and holds contracts that govern the use of the water, most of which is sold to irrigators at heavily subsidized prices. Irrigators in the San Joaquin Valley, for example, pay only about 15 percent of the cost of their delivered water. Conservationists argue that such subsidies have led to a large overinvestment in water storage and delivery, wasteful water management practices, and the overcultivation of farmland.

It is becoming increasingly clear that the bureau's subsidies and ability to veto transfers are standing in the way of efficient water allocation. A 1986 report to the Western Governors' Association concluded that a fundamental change is needed:

Essentially the Bureau must make a transition from an agency whose workload has been constructing large water projects to an agency that assists the West to make better use of the waters the Bureau already provides. It can facilitate this transition by providing support for voluntary transfers of Bureau-provided water.[13]

Change is coming slowly because the bureau has traditionally depended on expensive structural solutions to sustain its substantial budget and its discretionary power. Supporting water transfers would reduce the need for the pork barrel and thus threaten the bureau's potency in western water management.

In all likelihood, major changes will be spearheaded by state legislatures. The same report recommended that western states take

> significant steps towards the encouragement of water use efficiency . . . in terms of meeting in-state demands for water at the least cost, with due regard for community and environmental values in water . . . [and] consider implementing a comprehensive program, going beyond water pricing reform, to encourage conservation and salvage of water through markets.[14]

There are already signs that the states are moving in that direction. The legislatures of New Mexico, Colorado, Utah, and California have made it legal for one person or agency to temporarily transfer surface-water rights to another and reclaim those rights in the future, thus providing additional opportunities for short-term transactions. California's legislature has also taken a step toward encouraging voluntary water conservation by "vesting the senior right to saved water in the user who saves the water. The law enables him to dispose of that water as he wishes, subject to basic transfer legislation."[15]

There are also many indications that water-market solutions are being taken seriously in the policy studies arena. At a 1987 symposium on water policy, for example, one of the country's water experts stated that "regulatory and pricing measures can be contrasted with what promises to be a more effective approach, namely facilitating voluntary market transfers of water"[16] and another that "the nation is approaching limits of what can be achieved by increasing supply. . . . This means introducing market devices into the equation."[17] Market allocation of surface-water use throughout the nation is clearly an idea whose time has come.

Extending the Paradigm

The same insights that have helped to refocus the debate on the efficacy of markets in the allocation of surface-water use can be extended to the more complex task of allocating instream flows and groundwater. America's environmental awakening and a burgeoning demand for recreational facilities, coupled with the declining quality of many streams, have lent new importance to instream flows. The depletion of groundwater supplies in many areas of the West and water contamination due to toxic wastes have raised new concerns about groundwater. Both instream flows and groundwater are thus prime candidates for water markets, and establishing property rights in both would entail problems.

Instream Flows

The management of instream flows was once restricted to the maintenance of flow levels sufficient for navigation and power generation, but today it encompasses the allocation of a broad range of stream uses. Adequate instream flow levels must be maintained to sustain fish and wildlife habitats. In addition, pollution from industrial wastes remains a threat to many inland waters, and maintaining adequate flow levels diffuses pollutants. The demand for recreational opportunities, which also require adequate instream flows, is growing. A U.S. Fish and Wildlife Service study found that the sport-fishing population increased by 27 percent between 1970 and 1980 and predicted that it would reach 100 million by the year 2000.[18] The value of instream flows is clearly rising; the problem is that institutional recognition of that value is difficult to attain. In the absence of property rights in instream flows, anyone attempting to ensure adequate flow levels in our rivers and streams must rely on the political process. Those who have made such efforts have usually collided with agricultural, industrial, and municipal interests, and the results have been less than satisfying for both sides.

Instream flow protection is currently regarded as a responsibility of state agencies, which must balance competing uses. The task is difficult because traditional offstream uses can dewater streams, which in turn can "adversely affect and in some cases destroy valuable in-place commercial and recreational water uses."[19] Understandably, state agencies hesitate to reserve instream flows in cases when such allocations would collide with existing diversion rights in fully appropriated (or nearly so) watersheds. As a water efficiency task force of the Western Governors' Association pointed out,

> States are reluctant to try to use their power to regulate to protect and enhance instream flow values on such streams because to do so may invite litigation. Additionally, where states have the authority to acquire existing water rights and to transfer them to instream flow rights, this authority has not usually been exercised because of budgetary constraints. . . . The gap in protection of instream flows on streams approaching full allocation and the absence of protection of these flows in some states, together with water code provisions that encourage consumptive uses, [leaves] instream flows only partially protected in western states.[20]

Given the political problems with flow-use allocation, it is appropriate to ask whether water markets could resolve them.[21] Some economists assume that property rights in a natural resource such as instream flows cannot be defined and enforced, but the fact is that individuals will undertake to establish property rights when it is in their economic interest to do so. As the value of instream flows rises and the technologies for monitoring water use improve, the likelihood of having instream flow rights will increase. A comparison between instream flows and 19th-century grazing land is illustrative.

> Sophisticated technologies of streamflow monitoring can serve the law of instream flow rights just as the technology of barbed wire served the nineteenth-century law of private rights in grazing land. Defining the parameters of a right to instream flows is no more difficult than defining the parameters of a right to divert water for agriculture or industry.[22]

Cost considerations should include the potential externalities, or third-party effects, of allocating flow use through the market. Critics of proposals to establish instream flow rights argue that if a stream was fully appropriated, transfer restrictions could be imposed on certain holders of diversion rights, one of which, the binding flow constraint, could give rise to further problems.

To gain an understanding of the binding flow constraint, consider the hypothetical stream illustrated in Figure 1. At the head of the relevant portion of the stream, the flow is

Figure 1

The Relationship of Flow-Use Rights for a Fully Appropriated Stream

[Graphic Omitted]

Note: Flows are expressed in cubic feet a second (cfs). 1,000 cubic feet a second (cfs). The stream is fully appropriated; that is, all the owners of land along the stream have well-established rights to divert the flow amounts shown provided that they return the amounts shown. Farmer Adams has a right to divert 250 cfs as long as he returns 50 cfs; Farmer Brown has a right to divert 500 cfs as long as he returns 100 cfs; and so on. But if Farmer Clark wishes to sell his flow- use right to a party upstream, he can only sell his consumption right, 50 cfs. If he was to sell his diversion right, 100 cfs, and all of it was consumed, the downstream flow users' rights would be impaired.

The binding flow constraint becomes operative when an instream flow-use claim of 400 cfs is introduced at point A. If Clark sells his consumption right, 50 cfs, to Adams or Brown, the instream flow at point A will be reduced to 350 cfs and its claimant will cry impairment. The claimant whose rights are enforceable and whose grievance is upheld can capture some of the gains from the transaction between Clark and Adams or Brown. With many instream flow-use claimants, the problems multiply because each claimant can potentially hold up exchanges.

The problems stemming from the binding flow constraint, however, are not unique to instream flows. If Davis and Clark move their consumption rights far enough upstream, Brown's rights will be impaired. But courts in the West have confronted such problems and resolved them by considering priority dates and transfer rights. The binding flow constraint has not deprived the prior appropriation doctrine of its utility.

Furthermore, several factors could mitigate the problems stemming from the binding flow constraint. Claims to instream flows in the upper reaches of a river would create fewer problems because there would be fewer upstream points where diversions could take place. Likewise, claims to instream flows near the mouth of a river would have little impact because they would be subject to upstream parties' consumption rights. Finally, the problems would be mitigated if consumption rights could be transferred without impairing instream flow claimants' rights. For example, suppose that Adams wishes to increase his consumption of water and can purchase a consumption right from either Clark or Brown. If he purchases it from Brown, there will be no impairment. Therefore, if there were many holders of consumption rights between the desired point of consumption and the instream flow claim, there would be little reason to acquire the rights to flows at lower points. That may be why the binding flow constraint has not been a major problem under the prior appropriation doctrine.

A way for instream flow claimants to avoid problems with upstream transfers is to purchase upstream diversions and sell them to parties downstream. As long as no users between the upstream purchase point and the downstream sale point could divert water, the flows between the two points would be enhanced. Of course, such purchases would have a lower value because the purchasers would have to refrain from reselling the water to parties upstream, but that would be the price of preserving instream flows.

Opponents of proposals to establish instream flow rights also argue that it would be too costly to prevent free-riders from enjoying the resulting benefits, which might include scenic value, fishing experiences, and the fruits of improved habitats. The critics point out that nonpayers could reap the existence value--that is, the satisfaction that people can derive from simply knowing that an amenity is there, even if they do not consume or use it. For example, a Bostonian might be happy knowing that the Snake River is free-flowing, even if he has no intention of viewing it or rafting on it.

Of course, all goods have some potential for free-riding, but the free-rider problem has not precluded the private production of goods. For example, the fact that one can enjoy looking at a neighbor's outdoor Christmas lights without having to pay for one's enjoyment of them has not prevented the private sector from producing Christmas lights.[23]

Another response to the argument that water markets would result in less than an optimal amount of investment in instream flows is that in both the market and political processes, certain costs preclude the "ideal" solution. The possibility of free rides does not justify collective action. The important question is, how significant is the free-rider problem under market allocation of instream flows, and is there a tendency for the problem to be eliminated by market forces?

The market process tends to foster solutions to the free- rider problem because free-riders represent opportunities for entrepreneurs who can devise ways of collecting from them. Suppose that a rancher who owns a strip of land along a stream has a tradeoff between grazing cattle there, thus reducing fish habitat production, and forgoing some grazing in

favor of improving fish habitat. Motivated by profit, the rancher will not give up lucrative grazing to produce fishing opportunities if he cannot collect payment for them and exclude nonpayers. For small streams with private riparian land, the cost of such exclusions is relatively low. Hence, riparian landowners have an incentive to improve fish habitats and guarantee adequate instream flows. For large rivers to which access is beyond the domain of a single landowner, more sophisticated contractual arrangements may be needed. As we shall see, such arrangements have evolved in England and Scotland. Environmental entrepreneurs in such organizations as the Nature Conservancy are also playing a role in creating private rights in access to environmental amenities.

A major stumbling block to the private provision of instream flows is the legal precedent for postulating a relationship between diversion and beneficial use. In the early mining camps, an appropriation could be made by any party who was willing to use the water. Gradually, however, judicial and administrative bodies have established diversion as a prerequisite for beneficial use. In the absence of diversion, they have rejected all private appropriation claims. For example, in a 1917 ruling against a claim to the right to appropriate water for a duck habitat, the Utah Supreme Court noted 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. . . . We 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.[24]

A more recent ruling, in Colorado River Water Conservation District v. Rocky Mountain Power Company,[25] also emphasized diversion. The conservation district had sought to establish the right to appropriate instream flows for the propagation of fish, but in 1965 the Colorado Supreme Court found that there was

> no support in the law of this state for the proposition that a minimum flow of water may be "appropriated" in a natural stream for piscatorial purposes without diversion of any portion of the water "appropriated" from the natural course of the stream.[26]

In 1979 an instream flow claim was even denied to a state agency, in Fullerton v. California State Water Resources Control Board,[27] and a nonprofit public-interest corporation, in California Trout. Inc. v. State Water Resources Control Board.[28] The California Supreme Court's argument in both cases was that there was no evidence that there would be a diversion of, or physical control over, the water.

Having been denied the option of private appropriations, states have undertaken to reserve flows by other means. Idaho appropriates flows through its Water Resources Board, which responds to requests from the private sector. The political nature of the board makes it difficult for private conservationists to reserve flows at sites where there is interest in future water development. Washington has attempted to maintain its instream flows by giving its Department of Ecology the power to deny or grant conditional permits for water appropriation. The department bases its decisions on scientific crite- ria, completely ignoring economic criteria. Moreover, the monumental data analysis task of trying to set base flow levels for all the perennial rivers and streams in the state has hindered the department's ability to process appropriation claims; it acted on only 1 of the 26 requests it received in 1980.

Montana maintains instream flows by reserving water through public appropriations. The 1973 Water Use Act "authorizes the United States, the state, and [the state's] political subdivisions to apply for water reservations for existing or future beneficial uses or to maintain minimum flows, levels, or quality of water."[29] Water reservations are placed with the state's Department of Natural Resources and Conservation, as are applications to appropriate water. The system resembles Washington's in that there is little use of economic criteria and not much flexibility once the reservations are made.

Although most states have agencies with the power to claim unappropriated water or reserve water for instream flows, the Colorado Water Conservation Board must apply for rights in unappropriated flows or purchase existing rights; it is forbidden by state law to acquire such rights through eminent domain. The board is required to provide evidence that each of its requests for water would involve a beneficial use. It can purchase rights at market rates, but because state revenues are used for such purchases, decision makers are able to ignore the full opportunity costs of their actions.[30]

To date none of the states have allowed private ownership of instream flows. But notwithstanding the free-rider argument, innovative contractual arrangements can overcome the problems with private provision of public goods, as such private conservation groups as Ducks Unlimited, Trout Unlimited, and the Nature Conservancy have demonstrated. To maintain adequate instream flows, the Nature Conservancy purchased and retired the diversion rights for Boulder Creek in Colorado. (It then had to turn the rights over to the Colorado Water Conservation Board because of the prohibition on private ownership of instream flows.) The Nature Conservancy is also diligently bargaining for instream flow rights to help preserve the endangered humpback chub on the Gunnison River and the squawfish on the Yampa River. In the former case,

> agreement has already been reached with Pittsburgh and Midway Coal Company (P&M) for the donation of a large conditional water right to the Conservancy for instream flow, and a covenant is in effect preventing development of the remaining P&M water rights in the Gunnison Gorge. When the donation is completed, the Conservancy will apply to the state water court for a change in use from commercial to instream flow.[31]

If that right is granted, however, it too will have to be turned over to the Colorado Water Conservation Board under existing laws. If the Nature Conservancy was allowed to hold the right, considerable flexibility in responding to changing requirements could be added to the water allocation process. The Nature Conservancy could more easily change the location of the right through transfers or use it in bargaining for future habitat needs without the political constraints faced by the water board.

As noted above, private instream flow claimants could purchase consumption rights to flows upstream from the minimum flow point and sell them to parties downstream. They could also purchase and release stored upstream water during low flow periods. During a recent drought in Texas, for example, owners of resorts along the Guadalupe River made a joint purchase of water from an upstream authority and agreed to release enough water from an upstream lake to increase the river's instream flow from 20 to 100 cfs.[32] Though in some cases existing market alternatives can help increase instream flows, the current legal institutions do not adequately protect instream flows. For example, it is legal for diverters to withdraw the increased flow from the Guadalupe River.

A major fish kill in the Ruby River in southwestern Montana after dewatering by senior rights holders reduced the instream flow provides another example.[33] The state's Department of Natural Resources and Conservation eventually increased the flow downstream, but that solution will not be permanent, and it has created conflicts. A market for instream flow rights would have improved the situation.

The amount of flow needed to prevent the fish kill was relatively small--150 cfs--and the marginal value of such water, even during a drought, is fairly low. Indeed, while the fish were dying, local irrigators had water standing in their fields. If an organization such as Trout Unlimited had been able to purchase some of the standing water, the farmers would have had a very different incentive. Again, however, the water laws of Montana stood in the way. Likewise, if an individual or an organization had purchased water and left it in the river, junior rights holders whose claims had not been fully met could have diverted the water. But under the current system, would-be instream flow claimants have no way to exercise their demands, and senior diverters have no incentive to leave marginal water in the river.

The evidence suggests that if such legal obstacles were removed, recreational opportunities and habitat protection would be greatly enhanced through private ownership and exchange of instream flow rights. In the Yellowstone River Valley, south of Livingston, Montana, there are spring creeks that offer some of the world's greatest trout fishing. Local, national, and foreign sportsmen try their hand at fly-fishing on those challenging creeks. Yet the private, not the public, sector is providing that highly desirable opportunity--and doing a masterful job of it. Since the creeks begin and end on private property, many of the legal restrictions on private control of fishing access do not apply, and upstream diverters do not exist.

Because they can collect a fee of between $30 and $35 a day from each angler, the private owners have a strong incentive to provide high-quality fishing. Grazing on the stream banks is limited and fishing access is controlled on a

daily basis, so wildlife and land are protected, fish populations are sustained, and the fishermen are able to enjoy uncrowded conditions. In contrast, comparable experiences are becoming harder and harder to find in areas under public control--even elsewhere in Montana, nationally recognized for its blue-ribbon fishing. On a potentially productive state-owned spring creek in Lewistown, for example, "free" access has produced the inevitable crowding and a reduced fish population.

The results have been more encouraging in England and Scotland, where ownership of fishing sites has long been accepted. With the demand for fishing opportunities rising, "there are few landowners . . . who can afford to ignore the commercial aspect of the sporting rights which they own."[34] It has become worthwhile for British landowners 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 fishing access rights.

> 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.[35]

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.[36]

In Grantown-on-Spey, Scotland, as of 1981 a fisherman could

> join the local angling association by paying a weekly fee of 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.[37]

The British experience also suggests that pollution could be reduced if private fishing rights were established in the United States. Liability rules would evolve so that owners of fishing rights could bring suit against an upstream polluter whose effluent damaged their fishing resource. In England, an association of anglers and clubs has carried out the job of monitoring pollution since the 1950s. In fact, Anglers' Cooperative Association officials point out that the organization was protecting the environment 20 years before the general public became concerned and pressured the government to act.

> In all the A.C.A. has handled more than fifteen hundred cases of pollution [and] recovered hundreds of pounds in damages to enable club and riparian owners to restore their fisheries. It has also defeated attempts by various Governments to alter the Common Law in relation topollution, and it has had a profound effect on the attitude of industry, local authorities and politicians and public.[38]

In Great Britain, angling is an accessory right to riparian ownership, and fishing rights can be leased to nonriparian landowners. The recent successes there suggest that the riparian doctrine still has merit as a means of limiting access to streams and protecting fish and wildlife habitats. The British system serves to enhance recreational opportunities because such instream activities as fishing involve real opportunity costs that decision makers are forced to take into account when considering the merits of various water uses.

The possibility of using the British system in the United States and thus increasing the recreational and environmental value of instream flows is being precluded by adherence to the public trust doctrine. That doctrine attenuates landowner rights, obstructs the provision of private instream flow use, and destabilizes the system for appropriating diversion rights, all in the name of public rights held in trust by the government.

Because the premise of the doctrine is that the public, as opposed to the government, possesses rights superior to any private claims, private rights are subjugated to public rights. The people retain sovereignty over public resources and the use of such resources, and therefore the state can neither exercise that sovereignty nor delegate authority to

individuals in the form of property rights.

The rationale for the public trust doctrine initially made sense from an economic perspective. If anyone had been able to claim a right to a one-foot strip of land beneath the Mississippi River, he would have had the power to control commerce on the river. Thus, early courts disallowed such claims in the interest of promoting commerce and navigation and preventing monopolies.

Until 1983 the public trust doctrine was applied almost exclusively to issues involving navigable waterways. But in National Audubon Society v. Superior Court of Alpine County, California was forced to restrict diversions from the Mono Lake watershed on the grounds that the state had a public trust relationship to the environment and wildlife of the lake.[39] The California Supreme Court's decision gave environmentalists and recreationalists a precedent for establishing public rights through the public trust doctrine.

In 1984 two Montana Supreme Court decisions applied the doctrine in a way that has had a significant impact on the conflict between private property rights and governmental power. Montana Coalition for Stream Access v. Curran[40] and Montana Coalition for Stream Access v. Hildreth[41] paved the way for legislation that has opened all the streams in the state to public access. The first decision stated that

> streambed ownership by a private party is irrelevant. If the waters are owned by the state and held in trust for the people by the state, no private party may bar use of those waters by the people. The Constitution and the public trust doctrine do not permit a private party to interfere with the public's right to recreational use of the surface of the state's waters.[42]

Through the two decisions and the subsequent legislation, the state effectively deprived riparian landowners of the right to restrict access to their streams and obscured the criteria for recreational use. A compromise bill passed in 1985 designated 17,000 miles of Montana waters for public access and put the regulation of the property in the hands of the Department of Fish, Wildlife and Parks. Increasing conflicts with recreationalists spurred riparian landowners to ask the Montana Supreme Court to declare the law unconstitutional on the grounds that it took away private property rights without due process of law. In a convoluted decision, however, the Montana Supreme Court failed to address the question of taking and instead tried to further define recreational use. The battle continues to rage; riparian landowners are attempting to regain some of their property rights, and further court actions are expected.

The application of the public trust doctrine enunciated in the Mono Lake decision and extended in the Montana legislation has been creeping into legal findings and laws throughout the West. Instead of being given incentives to cooperate and to create fish and wildlife habitats and recreational facilities, landowners and recreationalists are being pitted against each other in bitter no-win struggles. Equally disturbing, the public trust doctrine is being used to circumvent established property rights in water diversion and thus to preempt the prior appropriation doctrine. The public trust doctrine has a place in cases that involve commerce on navigable waters, but its current application stifles the possibility of using water markets to allocate offstream diversions and does nothing to enhance the prospects for private preservation of instream flows. Instead, the doctrine obscures property rights and hence generates unnecessary conflict.

Groundwater

As with the allocation of instream flows, there has been practically no opportunity for the market to play a role in groundwater allocation in the United States. The NRE paradigm helps explain what has hindered market application and how it could alleviate the two major problems in groundwater allocation: depletion and pollution.

Groundwater use has been increasing steadily for the last 40 years. In the West groundwater accounts for 46 percent of the municipal and 44 percent of the industrial water supplies. Due to the steadily rising demand, extraction exceeds natural recharge in most of the West's groundwater basins. Kenneth Frederick has estimated that in western aquifers withdrawal exceeds resupply by more than 22 million acre-feet each year.[43]

Groundwater depletion is occurring in urban as well as rural parts of the United States. In Tucson, Arizona, the largest American city entirely dependent on groundwater, the water table has fallen by 50 meters since 1960; the water table

beneath Dallas-Fort Worth has fallen by 150 meters. Similar conditions exist in California's San Joaquin Valley, in Houston, Texas, and in Savannah, Georgia.[44]

One of the most dramatic cases of depletion is occurring in the Ogallala aquifer, which stretches from South Dakota to northwest Texas. That enormous subsurface reserve has been tapped for irrigation since 1940. In northern Texas and southwestern Oklahoma, withdrawal exceeds recharge by 22 percent in normal years and by 161 percent in dry years. For the North and South Platte basins, the percentages are 40 and 60 respectively.[45]

Does such groundwater depletion make good economic sense? From an efficiency standpoint, the answer is not necessarily no.[46] "Mining" a basin is appropriate if the future value of the water is expected to be lower than the current value. The real problem in groundwater management is to induce users to optimize the rate of extraction. Optimization occurs when the net marginal value of the water currently being extracted is equal to the net marginal value of the water being left in a basin for future extraction.

A major difficulty in groundwater allocation is that the future value of water left in a basin is not captured solely by individuals who decide to conserve. Water left for the future is a fugitive resource and a common-pool resource; that is, its value can be captured by anyone. Suppose that an individual must decide whether to leave water in a basin in order to offset future shortfalls in precipitation or surface-water availability. Even if he believes that the current consumption value is less than the future insurance value, his incentive to leave water in the basin is reduced by the knowledge that other users can pump the water immediately. As in the case of several children sharing a soda, each individual realizes that anything he leaves behind will be consumed by others. In the absence of secure ownership claims, future value gets zero weight in an individual's calculus.

Groundwater users cannot optimize the rate of extraction unless the rights to water in a basin are clearly defined by water institutions and the courts. Only then can users calculate the current and future value of groundwater supplies accurately. Thus, the first step in solving the problem of depletion is to secure well-defined rights in groundwater use, which in turn will facilitate market transfers.

It was not until the mid-1970s that public attention began to focus on the other major problem in groundwater allocation: pollution. It was discovered that toxic chemicals had seeped through subterranean structures into homes near Niagara Falls, New York, and the chemicals were traced to the now-infamous waste disposal site known as Love Canal. Press reports on the Love Canal incident frightened local residents and created a national chemical pollution scare. That incident, coupled with such subsequent events as the discovery of the evil-looking "valley of the drums" in Kentucky and the dioxin pollution at Times Beach, Missouri, led to public demand for governmental action. Ultimately, the federal government complied; in 1980 it passed the Comprehensive Environmental Response, Compensation, and Liability Act--better known as Superfund.

Superfund, along with related toxic waste legislation, has led to the discovery of a myriad of pollution threats to underground water supplies. They come from point sources, such as abandoned or problem waste disposal sites--which already number over a thousand and continue to proliferate--and leaky underground gasoline storage tanks, and from nonpoint sources, such as pesticides and herbicides used in agriculture. The cleanup costs are projected to be in the tens of billions of dollars.

There is evidence that Superfund has only perpetrated the creation of further problems by lowering the cleanup costs for polluters. The legislative price tag for cleanup increased from $1.6 billion in 1980 to $9 billion in 1986, and with taxpayers footing part of the bill, polluters are spared the full opportunity cost of their acts. For that reason, Fred Smith, a former EPA official, suggested that Superfund and legislation like it are a "hazardous waste of taxpayer money."[47]

The depletion and pollution of groundwater are directly related to the failure of the institutions governing that resource to provide proper incentives and information, without which users are not likely to augment groundwater supplies or reduce the demands placed on them. The problem of excessive drawdown should be addressed through institutional reform. As the use of groundwater increases, close attention must be paid to the structure of property rights if an efficient allocation system is to evolve. And because there are no disincentives to pollution, its abatement must be achieved through effective liability laws. The polluters and the victims must be identifiable, the extent of the damage

must be measurable, and the full cost must be assignable. Those requirements present a particularly thorny problem when it comes to underground water basins to which property rights have never been assigned or to which the rights are deficient in terms of tenure and transferability. The question is, what improvements in the structure of property rights in groundwater would facilitate effective liability protection?

To gain an understanding of the present property rights structure, it is important to realize that the underpinnings of groundwater law are found in English common law. Because very little was known about the hydrology of groundwater, ground-water rights were assigned to the owner of the overlying land. As Frank Trelease, the dean of water law, has pointed out, "It was in the light of this scientific and judicial ignorance that the overlying landowner was given total dominion over his 'property,' that is, a free hand to do as he pleased with water found within his land, without accounting for damage."[48] When groundwater rights either are not assigned or are assigned on the basis of overlying land, the common-pool problems can become quite severe. A rule of capture applies to a migratory resource such as groundwater. Each individual achieves the greatest net benefits by pumping water earlier than the others because the lift costs increase as the level is lowered. The "tragedy of the commons" is that each individual has an incentive to pump water earlier than everyone else, so the supply is depleted rapidly.

Such poorly defined rights were harmless as long as there was little demand for groundwater, but the changes that evolved as the demand grew have not led to efficient groundwater use. For example, owners of overlying land have been granted rights to groundwater on the basis of determinations of "reasonable use." The problem with the rule of reasonable use is that the interpretation of reasonableness has been subject to the whims of judges and administrators, which has made the tenure of rights uncertain. In addition, the equal rights provision has usually been interpreted to mean that water use was restricted to overlying land and could not be transferred elsewhere.

In the West, the application of the appropriation doctrine to groundwater could facilitate transferability, but courts and legislatures have imposed beneficial and preferential use restrictions that interfere with such exchanges. Hence, neither tenure uncertainty and impediments to transfers nor the more prevalent condition of completely open access have produced incentives for groundwater conservation. In fact, the opposite has occurred.

The physical characteristics of groundwater basins and the problems of extraction closely resemble those of oil fields. An oil recovery firm gains access to the resource by drilling wells in the field. Fragmented ownership rights in such wells can result in common-pool problems as numerous firms over- exploit the field.

> Each is motivated to competitively drill and extract oil. . . . Oil is migratory, and property rights to it are assigned only upon extraction. Rapid production by a firm lowers subsurface pressure around its wells, stimulating oil immigration, which increases its share of total output. In the aggregate, these production strategies raise marginal extraction costs and reduce total recovery.[49]

A creative alternative approach to groundwater allocation suggested by Vernon Smith is to issue property deeds for two rights: a share of the total water stock in a basin and a share of the average annual recharge flow of the basin. The maximum initial allocations of each component would be proportional to users' pumping rates during a prior period. For example, in the case of the Tucson Basin in Arizona and the base period 1975, the initial allocations would be a function of the 224,600 acre-feet of water extracted during that year. If an individual had used x(i) acre-feet, his proportion, P(i), would be x(i)/224,600. He would thus be entitled to receive (1) a property deed for a stock right in proportion, P(i), to the Tucson Basin's total water stock, which was approximately 30 million acre-feet in 1975, and (2) a property deed for a flow right in proportion, P(i), to the basin's average annual recharge flow, 74,600 acre-feet.

Basing the initial allocations on prior use, however, could promote water waste, as potential rights holders would race to the pump house.[50] The initial allocations could be based on the proportion of a user's land that overlies an aquifer rather than on prior use.

In order to enforce the rights once they had been defined, metered pumps could be used and periodic readings taken. At the end of each year an adjustment could be made by subtracting a user's share of the total recharge flow from the amount he had used. Stream flows or other sources of recharge could be used to estimate the total recharge flow for a given year. Those who pumped more water than they owned could be fined.

Allowing transfers of property rights in stocks and flows would promote efficiency because users would have an incentive to compare the opportunity costs of various uses. Furthermore, groundwater users would have a greater opportunity to stabilize water levels if they could make exchanges with outside suppliers, which users of surface water in certain states are already permitted to do. They could adjust their stocks and flows by making purchases during dry years and selling temporary shares during wet years. As in the case of surfacewater exchanges, in order to protect buyers and sellers against third-party effects, groundwater exchanges would have to be based on consumption criteria. An additional benefit of the exchange system is that the risk of dry years would be distributed among many producers and consumers. Risk-averse parties would have an incentive to acquire or hold greater shares in groundwater stocks and flows. The water market would thus incorporate a voluntary savings plan that permitted users to guard against water shortages.

But the assignment of property rights in stocks and flows would not necessarily solve all the common-pool problems. A holder of a title to a stock of water could still face high extraction costs imposed by the usage rates of other pumpers. Such third-party effects could be lessened through unitization, a contractual arrangement that evolved in oil recovery to mitigate common-pool problems.[51] Under such an arrangement, all parties would contract to use agreed-upon methods of extraction and delivery and share the costs. Some wells would be shut down and others would remain operational. The latter would be strategically chosen to prevent the cone-of-depression problem, wherein the pumping of a well draws water from adjacent wells. Each party's share of the lift costs would be based on his usage rate. For that reason, unitization might entail higher delivery costs, but it would also foster increased water conservation and thus lower lift costs.

Of course, because unitization would require the cooperation of all the groundwater shareholders, negotiating such agreements would entail higher transaction costs than negotiating two-party contracts. Increases in the value of groundwater and the cost of excessive water withdrawals, however, might well justify proceeding with unitization, at least for small basins. What is important at this stage is to remove, and refrain from creating, legal obstructions to the evolution of such arrangements. That means getting rid of overlying-land restrictions and reasonable-use criteria and choosing a set of rules that would enhance the specificity, enforceability, and transferability of property rights.

Well-defined property rights and unitization could also help overcome liability uncertainty and free-rider problems in cases of groundwater pollution. Property rights in groundwater use would make it easier to assign liability, and the threat of being sued for damages would deter users from allowing effluents to pollute the water supply. Without unitization, each of the owners of land overlying an aquifer would incur only a small amount of the cost resulting from pollution of the aquifer. Each of them would therefore tend to be a free-rider in seeking damages against polluters. But under unitization, all users would share the cost of extracting clean water from an aquifer, so they would be motivated to cooperate in seeking damages.

Moving East

The prior-appropriation institutions of the West have important implications for the East, where the scarcity of unpolluted water has been creating serious problems. The East Coast, which averages about 30 inches of rainfall a year, has undergone three severe droughts in the last 20 years. The one that occurred in 1985 created havoc from Maine to the Carolinas; its effects ranged from salt intrusion in Virginia to severe water shortages in New York and New Jersey. The situation got bad enough for New York City to impose a 21 percent cut on daily residential consumption, limiting it to 1.1 billion gallons, and order businesses to decrease their use of water by 25 percent. It also imposed stiff fines to enforce the cutbacks.[52] Water shortages are a problem with which easterners must continue to deal.

Whereas the East Coast has been plagued by drought, the Great Lakes have had record high-water levels that have caused flooding in Illinois, Michigan, and Indiana and heightened the effects of erosion. The high water has had particularly drastic effects on shoreline communities. Along Chicago's Lake Shore Drive, for example, the already-narrow beaches are becoming narrower by 100 to 200 feet a year, and in Wilmette, a suburb north of Chicago, a popular Langdon Park beach has become largely submerged. The federal government and the town are spending $270,000 in an effort to protect the shoreline. In 1985 a heavy spring rainstorm, combined with rising lake water, damaged many shorefront homes in LaSalle and Luna Pier, Michigan. According to Luna Pier mayor Jerry R. Welton,

the damage amounted to $10 million.[53]

Regulating water levels through diversion is being seriously considered by coastal experts seeking a viable alternative to shoreline reclamation projects expected to cost billions of dollars. But there are major judicial and legislative roadblocks to diversion. The existing diversion of Lake Michigan water into the Chicago River, for example, might be able to relieve the problem of high water if a 1967 U.S. Supreme Court ruling that limits diversions to about two billion gallons a day did not stand in the way.[54] Moreover, an Illinois law, the Level of Lake Michigan Act, prohibits water diverted from the lake from being used outside the state without the prior approval of the other Great Lakes states and the International Joint Commission, which includes both states and Canadian provinces. In addition, Indiana and Ohio have enacted laws that prohibit water diverted from the Great Lakes drainage basin from being used in a state outside the region.[55] Such obstacles must be removed if diversion plans are to be viable.

Even with a more effective Lake Michigan diversion, other projects would still be needed to regulate the water levels in the Great Lakes. Such projects could be funded through water transfers. Water from the Great Lakes could be sold to other communities and the proceeds invested in additional facilities for stabilizing the region's water levels. The eastern states would certainly find Great Lakes water valuable during their droughts. But before that could be accomplished, the laws prohibiting water transfers between regions would have to be removed.

Bucks County, Pennsylvania, provides another example of how water markets could work in the East. For 20 years there have been plans to transport water from the Delaware River to the Limerick nuclear power plant 30 miles away. The water would be pumped into a holding pond, from which it would flow through beautiful Bucks County. Environmentalists object to the transfer on the grounds that its effect on the Delaware River and Perkismen Creek, the delivery channel, cannot be predicted. They also claim that the project is outmoded and unnecessary. Both sides in the debate await a decision from state authorities.

The conflict between environmentalists and energy producers has arisen because property rights in water, both instream and offstream, are unclear. If unambiguous property rights were established and transfers allowed, a market solution to the conflict might evolve. If the diversion of water from the Delaware River proved to have adverse effects and instream flow rights existed, the diverters would have to pay the environmental opportunity cost. In the absence of well-defined, enforceable, and transferable water rights, however, political conflict is inevitable.

Conclusion

Many lessons can be learned from the American West, where property rights in water originated. The first settlers to arrive in the West brought with them eastern laws, including the riparian doctrine, that governed water use. But after the locations that were only a stone's throw away from water had been claimed, the riparian doctrine proved to be too restrictive to serve agricultural, mining, and municipal purposes. It was replaced by a much more efficient allocation system that secured property rights to water in the arid West: the application of the prior appropriation doctrine, "first in time, first in right." With property rights secure and transferable, a market for trading water evolved. For a time westerners were able to allocate water in the most cost-effective manner.

Unfortunately, the turn of the century saw the courts and state legislatures begin to interfere with the assignment of property rights. Some critics contended that water was "a necessity of life" and hence too precious to be subjected to the influence of the market. Traditional economists added fuel to the fire by arguing that monopolies and third-party effects would prevail if water allocation took place in a market setting. Others contended that the property rights system could not support the huge capital investments that would be needed to meet the demand for water in the West and that only massive delivery and storage systems could make the desert "bloom like a rose."

The water projects directed by the Bureau of Reclamation resulted in such engineering marvels as Hoover Dam and Glen Canyon Dam, and it seemed that water scarcity would become a thing of the past. The federal government had the deep pockets, administrators had the bureaucratic savvy, and western farmers had the political clout needed to push for more large water projects. Through the 1970s they were able to do so without much resistance.

But the 1980s are a different story; the demand for limited water supplies, environmental concerns, the federal debt, and the incidence of legal conflicts over water have all increased, and a troubled farm economy has been cursed with

overproduction. Supply-side solutions to water allocation must now take a back seat to demand-side priorities. The Bureau of Reclamation holds claim to 35 percent of the water delivered in the West, which is being supplied at highly subsidized prices. To make matters worse, trade that would transfer water to higher-valued alternatives is being stymied. Neither of those conditions is compatible with conservation or efficient allocation.

In order to reap the advantages of the market, policymakers must find ways to define property rights in water, enforce them, and make them transferable, then guard against doctrines that erode those three elements. The prior appropriation doctrine provides those elements, but the public trust doctrine is eroding them. By limiting the application of the public trust doctrine, by extending the application of the prior appropriation doctrine to instream flows and to areas in the East, where water is becoming more scarce, by unitizing extraction efforts and instituting clearly defined property rights in groundwater basins, and by reducing the impediments to exchange, policymakers could vastly improve the nation's water allocation system. The development of coalitions that could bring about the necessary institutional reforms would be enhanced by the realization that efficient water markets could reduce not only environmental degradation but budget deficits and the role of government.

FOOTNOTES

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[4] See Terry L. Anderson, "The New Resource Economics: Old Ideas and New Applications," American Journal of Agricultural Economics 64 (December 1982).

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[12] Cited in Willey, p. 7.

[13] Driver, p. xi.

[14] Ibid., pp. viii-ix.

[15] Ibid., p. 29.

[16] Richard W. Wahl, "Voluntary Market Transfers of Federally Supplied Water," paper presented at the Congressional Research Service symposium "Evolving Issues in Water Policy: The Aqricultural Connection," Washinqton, February 13, 1987, p. 2.

[17] Kenneth D. Frederick, "The Legacy of Cheap Water," paper presented at the Congressional Research Service symposium "Evolving Issues in Water Policy: The Agricultural Connection," Washington, February 13, 1987, p. 4.

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[19] R. W. Johnson, "Public Trust Protection for Stream Flows and Lake Levels," University of California at Davis Law Review 14 (1980): 256-57.

[20] Driver, pp. 33-34.

[21] For a more technical discussion of the economics of instream flows, see Terry L. Anderson and Ronald N. Johnson, "The Problem of Instream Flows," Economic Inquiry 24 (October 1986).

[22] James Huffman, "Instream Uses: Public and Private Alternatives," in Water Rights: Scarce Resource Allocation. Bureaucracy, and the Environment, ed. Terry L. Anderson (San Francisco: Pacific Institute for Public Policy Research, 1983), p. 275.

[23] Of course, in the absence of perfect information about the positive and negative existence value, it is impossible to determine whether the "optimal" quantity of Christmas lights is being produced. But that does not necessarily imply that the market should be supplanted by government control.

[24] Lake Shore Duck Club v. Lake View Duck Club, 50 Utah 76, 166 p. 309 (1917).

[25] 158 Colo. 331, 406 P. 2d 798 (1965).

[26] 158 Colo. 331, 406 P. 2d 800 (1965).

[27] 90 Cal. App. 3d 590, 153 Cal. Rptr. 518 (1979).

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