

This is an essay written for a project on the state of development in U.S. Mountains; the essay expanded to this, rather than the narrower parts for that report, and it is posted here as an informal working paper until it becomes part of a large project in progress. Comments are very welcome. I have deliberately presented an unconventional set of references; please be aware that this topic has a very large law review literature reflecting political science, some economics, case, and constitutional law. The purpose of not reflecting on that is to explore other views, and to depart from the functionalist explanations which pervade social science as the supposedly objective alternative to scriptural approaches based on political theory giants.

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### A Note on Property Rights in the U.S. and Mountains

“At the center of today’s debate, I believe, lies a collective failure on our part to think clearly and intently about the institution, how it works, why it exists, and the many shapes it can take, in terms of landowner rights and responsibilities. Private property differs from the other individual rights that we view as critical in the United States.... It’s a more social, malleable, and indirect kind of right. In operation, it is less an individual right than a tool society uses to promote overall social good. Important truths about this vital arrangement have passed from our collective memory. We need to regain those truths. We need to study private property with greater care and stop treating it as a simple matter. Above all, we need to accept responsibility for the way it works. If private property isn’t working well then it is up to us to make it better.” Eric Freyfogle 2007, On Private Property, xiv.

## Introduction

This short note is intended to make a few arguments about the nature of the property rights system in the U.S. without being comprehensive. Because of the fragile nature of mountains, resource management mistakes can be more important than in less dynamic environments, as the rest of this report shows, so the decisions about use of resources are critical. There are mountains of literature which relate to this, but it may be useful to mention a few issues which are not apparently well considered. The bibliography for this note includes references which may help readers to enter these large literatures, but is also certainly not comprehensive. Readers are cautioned that this note includes opinions and conclusions based in part on some unreported personal experiences in environmental issues since 1977. The difficulty of finding scholarship on some points may confirm their lack of salience and unexamined quality. If we are to conserve the mountain resources and their cultural and spiritual values, we will need to rethink what we mean and what we mean to do.

## **Ideas of Private Property and Modern Analyses**

The basic ideas of private property are given as the creation of net social benefit by harnessing the power of individuals (or supposed substitutes such as firms) to innovate and invest, by establishing security of expectations (most economics introductions discuss this, e.g. Stiglitz 1993). Three sorts of work have addressed the origins and purposes of private property. The political science and political theory developed parallel with the development of the state (government), as an idea of rights related to legitimacy of governments (Freyfogle 2007 covers this very clearly). Later, there were more functionalist economic arguments, and third, there has been a significant change in thinking about what is now often called “governance of resources.

Private property is distinguished in modern resource management from state property, (state meaning any level of government), common property held by a defined group usually organized around resource management and cultural continuity, and “non property” resources which are not effectively claimed by anyone (but may be used and overused, as oceanic fisheries show). The recognition of common property was a significant change in understanding groups, and how resources have been managed for the vast majority of human history (Ostrom et al. 2002 summarize this). The assorted problems with state property relate to problems of state capacity to manage, including lack of local knowledge and craft knowledge, mismanagement for various reasons including corruption (Ascher 1999, Ascher and Healy 1990) and expropriation of resources from user-owners disfavored by those in control of the government.

The analyses arose in part because of the uses of the famous “tragedy of the commons” (Hardin 1968) which is a radically oversimplified view of people who are unable to talk with each other and unable to recognize resource conditions, and respond. Hardin’s weird and unsocialized people destroy the resources they hold in common at any scale regardless of communication and monitoring possibilities, and his answer is to privatize or impose state control. This was a remarkably convenient justification for worldwide state re-allocations of resources, all too often in fragile environments where mismanagement was often far worse under incompetent or worse state management (Ascher 1999). This set of experiences is thoroughly documented in the work by the common property resource management scholars, and was in fact so effectively proven in theory and empirical results that major institutions such as the World Bank changed their rhetoric (see Ostrom et al. 2002, McCay and Acheson Eds. 1987). Recognizing the value of traditional management is not the same as claiming that invading people cannot damage the resource, or that groups are trouble free and can support high growth rates without changing the ecology they inherited. Some remarkably durable places have been managed with strict limits on use, such as the famous Alp described by Netting (1981 and see 1986). It is important that many mountain environments have been subjected to rapid changes in management goals and levels of resource use. The recognition of traditional management as having been effective is also qualified by the recognition of other elements in what can be usefully described as a socio-ecological system.

There are no panaceas, or “one-size-fits all”, “if only they saw the light” single answers, as shown by Ostrom and others, and part of the value of that line of scholarship is in her creation of analytic categories which enable scholars from all over the intellectual map to compare cases using what in other fields would be called a standard thesaurus (Ostrom 2007, 2009). Because this work has added so much clarity to the many discussions in many disciplines, it is the best place to begin. It should be noted that in the U.S. and Canada, traditional Native societies were

in considerable ferment by the time European governmental authority was extended far from the coasts, but there have been assorted changes in land use under different regimes of grazing management (or non-management) and different allocations of authority to limit logging and water resources. Each of those subjects has a large literature, but the point is that these changes in who holds authority, in fact and in theory, have taken place everywhere.

Continuing with the analytic framework, Ostrom (2008) reviewed five kinds of rights to resources, all of which are often accompanied by obligations or responsibilities: (1) right to access to a physical location; (2) right to withdraw some off-take or harvest; (3) right to management – the regulation of uses by others, and to improve or change the system by improvements; (4) right to exclude others from access or withdrawal, and (5) right to alienate (sell, lease, or give away or leave to a designated heir) the rights held. Each of the rights may or may not be transferable.

Ostrom and colleagues named five “positions” which a right-holder may occupy: (A) authorized viewer with access but not authority to harvest or make important changes; (B) authorized user, with right to access and withdrawal, usually carefully described in some norm or formalization; (C) “claimant” with rights of access, withdrawal, and management. This status adds security of expectations of long-term capacity to invest and acquire returns on the improvement; the distinction is in a more individualized claim rather than a group claim. But it is important that this not be thought of as only something individuals can do or have done. (On the contrary, the enormous endowments of resources available to “modern” people were parts of much more long-term oriented systems operated by groups (Wiener 1996, 1995)). (D) Ostrom et al. name the holder of rights to access, withdrawal, management, and long-term security of expectations, a “proprietor”, usually holding substantial obligations to regulate use, investment, and determine access. Finally, (E), they name the holder of all the rights including rights to alienate the resource, an “owner”.

Each kind of use of mountain (or other) resources can be categorized using these distinctions, and considered in terms of the incentives which apply. Unfortunately, there are a few more key points from Ostrom and her collaborators. She and they have identified and applied eight institutional design principles which were discovered from a large range of case studies of successful resource governance. (1): Clearly defined boundaries of a resource system and the authorized group of harvesters are important. Some of the unfortunate problems in mountain resources relate to the lack of adequately appreciated areas affected by headwaters conditions and the transport of pollution from mining and impacts of water-related changes. (2) A proportional equivalence between benefits and costs makes participation cost-effective. Resource degradation often involves externalized costs, which are not only damage to other people’s interests and the environment, but also a subsidy that reduces the cost of the resource, which acts to increase the use of resource and increase the externalized costs. (3) Collective choice arrangements will include most of the individuals affected by harvesting and protection rules. One can apply these ideas to situations such as long-held grazing allotments and permits on public lands, issued by the U.S. Bureau of Land Management and the Forest Service; see also Public Land Law Review Commission (1970). The decisions are supposedly administrative and supposedly flexible, but it is not clear that reductions have been made when appropriate (Clary and Kinney 2002, Steinman et al. 2003, Asner et al. 2004, Pyke and Marty 2005, Marty 2005,

Gordon and Prins 2008, Harrison and Bardgett 2008, Hudak 2007). The resource boundaries are clearly defined by the permit or allotment, and many ranching operations in the U.S. are based on private ownership of land growing hay for winter feeding and public lands grazing which is re-permitted or re-allocated for indefinite periods. The right is very similar to a property right, but the benefits are private, and much of the costs of administration are public, and externalized costs from resource degradation may not be recognized.

The individuals directly affected are fully aware of the importance of the permits or allotments, and these rights are in practice considered a capital asset in the value of the ranch. In conflicts over reduction, the author has heard it argued vehemently and with reason that the owner of a ranch bought those rights along with the ranch and that there was no understanding that they were reducible. This may be quite widespread. Are these rights property rights? Apparently they can be so treated and it may be that different jurisdictions are applying different principles, and it may be that older ideas have changed with the dramatic and very serious Drought of 2002. The point here is that this area of public lands uses by permit is very fuzzy in practice (Coggins and Glicksman 1990, Coggins, Wilkinson and Leshy 2002).

In the mountain case, most of the affected individuals are not involved in the decisions or benefits in resource use, because of the downstream (and down-wind) pollution transport (which can be from lowlands to the mountains, as in the case of acidity from air pollution; Strange et al. 1999, Baron et al. 2004, Wohl 2010). In theory, public interests and diffuse large number individual interests are represented by regulatory agencies, but the counter claim of frequent failure is posed by the efforts to increase meaningful public participation (Wondolleck and Yafee Eds. 2000, Sabatier et al. 2005).

Condition for success (4): monitoring is critical, and the monitors are at least partially accountable to the users and may be the users. Here, particularly in public land situations, this condition may be violated by failure to monitor, financial or political limits on monitoring, lack of accountability for monitoring failures, and regulatory capture (the good old term for agencies which are heavily biased in favor of the industry supposed to be regulated). Skipping ahead, condition (7) is minimal (or better) recognition of rights to organize. In the case of public lands, the collaborative management movement has achieved recognition in some places, but it is often very hard to tell if the results are more than dialogue. This is a substantial topic in planning literature as well as resource management, and important to bear in mind where delay is victory on a practical basis, as in avoided or delayed costs.

Because conflicts arise, condition for success number (5) in the Ostrom set is graduated sanctions, which allow enforcement that is not so harsh as to undercut loyalty and risk preventing enforcement; this is related to the proportionality of costs and benefits condition. In mountain issues, where livelihoods may depend on grazing access, mining, and logging, there are serious issues involving the ability of some small firms and individuals to increase their costs or decrease the level of harvesting because they are competing with producers of similar commodities working in more productive environments (such as grass lower down and in longer growing seasons), and competing with often extremely concentrated oligopsony markets. Beef in the United States is controlled in very large measure by four firms doing 86% of the business (Hendrickson and Heffernan 2007, Heffernan and Hendrickson 2002, Heffernan 1999).

On the other side of the coin, many users of resources are financially very profitable, such as the fossil fuel extraction business (though it too has smaller firms which are often exposed to far more risk than the world's largest corporations). The basic equity claims for the vulnerable may result in rules which benefit the big as well as the small (the symmetric principle to the famous point that the law in all its majesty forbids the rich as well as the poor from sleeping under bridges....Anatole France, 1893). Another complexity in sanctions involves the difficulties of monitoring and evaluation of pollution and ecological degradation even where the owners of the land wish to do so, or where the plaintiffs are able to prove causality.

Condition for success number (6) calls for low-cost local conflict resolution mechanisms. This is certainly part of the collaborative management idea, seeking to resolve conflicts and prevent further conflict, with a process which is more persuasion than litigation, though the relevance of legal proceedings as a last resort is strongly argued by some as a necessary motivation for participation by those whose costs will increase with reduced degradation. The costs of permitting and project authorization for some kinds of activity may foster collaboration processes more than the situations where the problem is continuation of activity, particularly grazing uses; intermediate situations may involve logging where there are new sales. New sales are often argued to be necessary to sustain local livelihoods. The traditional way of life is urged to be worthy of continuation; it is seldom argued that there is a judgment call involved about which traditions should be sustained with public support and at the cost of environmental degradation and which should not. When the private sector terminates millions of good jobs, at enormous human and social costs, we say it is the market in action, but resource-administering agencies are keenly aware of their role in providing resource access for local employment even where local firms are controlled by remote market giants or the large firms own the pulp and paper mills or the beef processing. This is not a trivial problem for mountain people in economic vulnerability.

The virtue of a good analytic framework is clear enough, and the applications to mountain resources could be extended to great length. The purpose of this discussion has been to illustrate how Freyfogle's point about the importance of clarity in property rights applies to the mountain environments (2007).

## **What is missing so far?**

The analysis of private, state, common, and non-property resources may suggest that all interests in the physical world are within those categories, and all interests can be so described. But the idea of state property is a stunted and inadequate version of the public interest, which is not much discussed in the work on conflicts between land owners and would-be owners, or resource users in competition with others. "Safeguarding the public from the poisoning of land, air, and water supplies is one of the most fundamental exercises of government's police power. Yet the containment of hazardous wastes and contaminated site cleanup activities can have dramatic, often draconian effects on private property rights." (Meltz et al. 1999, p 455.) What's missing from this is the concept of a taking of environmental quality by pollution. The law has evolved very much around rights of landowners versus the public, because there is so little consideration of a public property right to environmental quality due to the historical evolution of property

rights as an articulation of divine right and then of support for commerce (Wallerstein 1974, 1980, 1989).

There is also an assumption by most people that there is in fact some kind of public interest, even if they conceive it as being only providing “national defense” (a complicated concept itself), and providing the conditions in which markets can operate. It is basic to that idea of security of expectations that people can expect that property rights will be respected, and further, it is fundamental that one need not spend all of one’s time and efforts dealing with what are called in short-hand terms transactions costs: information, contracting, and policing. These are the terms for finding what one wants and someone who wants what one has to exchange, being able to strike a deal, and being able to expect that it will be performed. The commercial triumph of Europe was the development of trading networks, reasonably reliable information about weights and measures so every trade was not unique, and ways to transfer funds safely, and then get investments from others in business ventures, and ways to reduce fraud and theft and to enforce contracts (one place to start on this is one of the economics treatises, or a big contribution such as North 1990 on development of institutions). But this is about trading in things. If the transactions costs are more than the benefits of the deal, the deal will not be made; the higher the transactions costs, the less dealing.

Consider also how much social structure supports all of the understandings necessary to bring those costs down, and to keep them down by adequate levels of compliance. That takes the discussion into economic anthropology; one might well start with Platteau (1994a, 1994b) for this point. The conditions for the perfect working of markets are ideal conditions which apply reasonably well to some commodities, but are increasingly defeated by lack of competition (where there is market domination by a few firms), and lack of information about markets or products or costs (and one would add about externalities and a more complete view of costs and benefits) (Stiglitz 1993). The conditions in which markets can operate are socially provided, not least because of the need to reduce transactions costs low enough to make commerce with strangers practical. That enables the benefits of innovation and competition to be spread, increasing social well-being. And so far, we are talking about things.

## **Public Interests – Yes, but How?**

How we treat conditions, and in particular public goods which are really the absence of negative externalities in the form of pollution and damage to ecosystem services and values, is problematic. We seem to default, because of Freyfogle’s missing debate, to thing orientation. One concept for the implementation of public interests as a public property right is the public trust doctrine, which has met with various interpretations, and probably a great deal more discussion than implementation or influence beyond the famous Mono Lake case in California, in which a public right to prevent further destruction of a unique natural resource was asserted. Meltz et al. (1999) summarize some of the issues, and Stone (2010) thoroughly reviews them; there may have been more effort put into writing about the public trust than making it meaningful in legislation. Dellapenna (2000, 2003, 2004, 2005) also discusses public interests in water as public goods. The Dellapenna work cited was written before most of the the Australian privatization effort, on which the jury is still out. It is important that while much of Australia’s water in a critical basin was made a commodity in a market, there was also very large investment

in environmental support flows and wetlands (see <http://www.nationalwatermarket.gov.au/>). This may be most fairly characterized as a mixed system seeking the best balance.

The idea of a “public good” in the economics-informed literature is something which has, in the purest form originally described by Samuelson, two essential characteristics. First, the quality of non-rivalry in consumption: one person’s enjoyment of the benefits does not diminish another’s enjoyment; the sunset is an example, or national defense in the simple form of avoiding invasions by other armies (perhaps we can understand that soon as relating to biological invasives). Second, also in the ideal form, is the quality of non-excludability: the good cannot practically be provided to some people but not others, so the problem is that a person would be thought to have no incentive to contribute since she would not be excluded. Therefore, the benefit will not be provided without some social or collective action that overcomes the problem of people not contributing, unless there is the fortunate status of some people wanting the benefit enough to provide it for all (Olson 1971). In most cases, there is less than purity, often because enjoyment of something, however non-rival in consumption, may be affected by congestion, such as crowds at the best place to see the sunset or an art work. The intermediate very broad range of “club goods” are those benefits provided to a group, in which individuals must in economic theory be pushed to contribute, but will do so sufficiently (Cornes and Sandler 1996; Stiglitz 1993; see Bromley Ed. 1995, and Schmid 1987 and 1995). Mountain resources not consumptively used but subject to congestion include most outdoor recreational uses, and the issue is how to cover the costs of providing management such as parking lots, trails, and control of unauthorized destructive uses. This theoretical property rights approach is quite useful for many problems, and is based on a public property idea, or in the case of groups, a modification for the club good. The word “good” is meant to be a benefit, but also shows the relation back to commodities and land.

That whole set of social structures made commerce more successful in many ways than previous forms of domination and extraction (Wallerstein 1974, 1980, 1989), but in the transition to better organization of flows of things, and the transition to governments which supported commerce, there was also recognition of the importance of governments for the fundamental ideas of public well-being. That was hundreds of years of development of political thinking, sometimes said to begin in the English and European traditions with Magna Carta, in which the King acknowledged rights in other high-ranking nobles. One culmination was this: “We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable rights, that among these are life, liberty and the pursuit of happiness. That to secure these rights, governments are instituted among men, deriving their just powers from the consent of the governed.” (Jefferson, 1775, the Declaration of Independence.) This is more than the support of commerce, but it is somewhat undefined.

Another view is that current economic analyses are after the fact and functionalist, in that they explain the workings of these social tools in terms of what they apparently do, but miss important features because of their lack of historic context. At this point we are also looking at the break from the legitimation of government in the European tradition from Divine Right as the basis of ordained monarchy in some form. This is a critical point because what we now call the chain of title – the history of the right of ownership – begins with God, who delegated the spiritual authority to the Church and the political authority at least in part to the King or other

successor to Caesar. The King can in turn assign property rights to at first the nobility, and as the historic shifts in power took place (Wallerstein 1974, 1980, 1989 is perhaps the most wonderfully rich account), title to land could pass to the non-nobles as well. God's dominion over the world includes all possible uses and activities, so the King's scope of rights was limited only by the Church, and the shifts of power back and forth are a huge history. The relevant point is that the U.S. and Canada inherited a common law conception of property as land owned from all the way down to the very sky, and the evolution of ideas includes modifications such as not being able to claim trespass by airplanes. The ownership of land, and then things, was based in principles of a very broad scope of rights of owners.

We are back to property rights: how are those unalienable rights in the Declaration which are not property rights (often called human rights), to be balanced against other rights? One way, achieved after substantial struggles on the balancing (which can be argued to be the main economic action of the end of the 19<sup>th</sup> Century and the first confrontation with monopoly) has been to simply take some things out of commerce (Norgaard 1994). We outlawed slavery, and we do not allow the sale of human organs. And most relevant to mountains, we have established protected areas, starting with the national parks as crown jewels. It is now the struggle over whether species have a right to life which occupies a lot of attention as a symbol of government intrusion on what some people believe to be private property rights (Stone 2010, Meltz et al. 1999). Before a quick look at that, the other side of the common law from England and basic in the U.S. and Canada is the notion that there is a government role and sometimes obligation to defend public well-being beyond facilitating commerce. "Police power" is the legal short-hand for government limiting behavior on behalf of the public in general. This has ranged from regulating a very broad range of acts and objects from sex to nuisances and land uses, and providing schools and usually some level of care for the desperate. This is the guts of politics and the connection to property rights is in the perception of what affects human rights and whether there are non-human rights, and how they relate to property rights, and how present rights relate to those, if any, of future generations (at this point one could cite about a third of the bibliography provided; see especially Norgaard 1994 and Stone 2010).

## **Pollution and Off-Site Impacts**

The result is more or less unconscious specification of property rights that allow not only destruction of the resource owned at a particular moment, but also dangerous presumptions of the right to use property however wished by the owner until some level of proof of injury invokes some sort of response. This treats the problem in the common law tradition of tort law – the seeking of remedy for injuries done, or nuisance, which is essentially a tort (wrong) done to property or the use of property. Those suits are brought by a plaintiff who seeks to prove an injury for which there can be a remedy or an injunction to stop an activity causing injury. Where there is no clear property owner affected, or the owners cannot find the party doing the bad thing, or the owners or injured cannot afford the legal proceedings and proof of injury, and then enforcement of the injunction or remedy, there will be no legal action. There might be political action if there is enough information, and eventually we got there in the 1970s. But for most of the history of the European occupation of North America, mountain areas had no effective plaintiff to bring a case. Note also that these are reactive responses that are based on showing an



injury has been done or there is a very strong showing of an imminent threat. The first major progress from that condition was probably the creation of the National Forests as an assertion of ownership rights by the public which limited activity in order to, originally, protect watersheds from off-site impacts to water users (Coggins and Glicksman 1990; there are many histories of the conservation movement also).

It is generally accepted that one is not allowed to use a privately owned bullet to kill another; but a by-product, waste, or chemical created perhaps for its novelty in the world, or in a large quantity in one place in the world, was in practice presumed innocent and allowed to be dispersed irretrievably into the environment. Historically, active and pro-active regulations without a plaintiff or municipal self-defense were at first applied to food safety, then drugs, and only in the mid 20<sup>th</sup> Century developed into the regulatory framework now in use for some kinds of chemicals and some kinds of situations such as highly toxic sites without owners willing to clean up (Findley and Farber 2000). We employ an expensive regulatory process in which agencies list chemicals as approved or not approved, often depending on their stated uses, such as pesticides. But at the time of writing, it is literally possible to put anything into a natural gas well, without obligation to even disclose what it is, or revealing the expensive knowledge of the geology, in the hydrofracturing process (“fracking”). We are still working with a default setting of “innocent until proven guilty by damage to enough people or resources that it can be proven to have happened” as the general approach. The bias is toward putting the burden of proof of danger on the public and its agencies, which may be strongly associated with the industry involved. The other idea is to require proof of safety before allowing dispersal or a significant risk of dispersal – this is the outline of the struggles over regulation as an assertion of the public interest versus the claims that any limitation is a taking of a property value (Meltz et al. 1999, Freyfogle 2007).

So what about mountains? They are exposed to all the forms of pollution (Strange et al. 1999, Baron et al. 2004, Wohl 2010, other parts of this report), and because of their fragility and dynamic nature, may be more vulnerable to damage. There may be a public interest in this, but if it is left to the state to defend, the results so far are disappointing. In terms of property rights, there was no clearly asserted and enforced general public property right in a clean environment until the 1970s, with a few exceptions. Urban water supplies had political support which enabled some defenses of watersheds in some places, most famously New York City, but this was rare. In the Eastern U.S., common law riparian water allocations enabled some pollution controls where plaintiffs could show that actions were unreasonable, a moving target (Getches 1997, Dellapenna 2003, 2004).

## **Endangered Species Act As Balancing Problem**

Perhaps the leading counter-example of being supposedly willing to put a stop to an activity is invocation of the Endangered Species Act (on which there is a huge literature in the law reviews, political science, and the ecology journals). It is clear, however, from Ostrom’s conditions that this law has not been well administered. Historically, though a good analysis has not come to this author’s knowledge, it seems clear that the law has not been applied with graduated sanctions. On the contrary, it seems that there have usually if not almost always been substantial efforts by affected people and the resource administering agencies to delay application until the

situation is very clearly endangerment. A court may then impose very costly actions, which fall on a few users. The root of this is failure to monitor so that cumulative impacts are observed well enough, and failure to structure the law so that response to cumulative impacts is reasonably pro-active. When cumulative impacts are unobserved or disregarded or both, the result can be quite unfair. It seems to those who are stuck with some kind of regulatory limitation as if they were on a long line to get to the clerk's window to make the same deal those in line ahead of them were making. But as their turn finally came up, the clerk announces that the deals are over. It is even worse, perhaps, that this not only imposes all the costs on a few rather than all of the contributors to the problem – it also provides an unfortunate incentive to accelerate an activity or practice which the farther-sighted expect to be eventually limited. Delay is victory in many cases where costs are postponed; holding money and investing it until forced to apply it to some cost is a financial goal. Banks and insurance companies make their profits from being able to control the use of money, and so do corporations. While there is delay in stopping the bad, the damage often cumulates, and in ecologies, may cross thresholds of stress to systems which “tip” into different stability domains or even radically and effectively irreversibly changed states (Gunderson and Holling 2002).

Socially, the net result of the reasonably perceived and widely lamented unfairness of the Endangered Species Act is that it has aroused some quite legitimate public resentment as well as been the target of absurd politicking. As Ostrom's conditions for success suggest, this has in many understandable ways failed to elicit public support from affected or potentially affected people, and has stimulated a great deal of controversy.

Some progress has been made in resolving the problems of uncertainty over cumulative impacts, in the “No Surprises” policy which resulted in development of the Habitat Conservation Plan approach to implementation of the law, by the Fish and Wildlife Service and National Marine Fisheries Service (U.S.... 1996, 2000). The approach has been described as a contract, and the early efforts were described as contracts between land owners or users and the agencies without significant public information let alone participation. Property rights versus property rights... (Lyons 1999). Later efforts have been considerably more open and inclusive, though Lyons' question of who is being protected remains important. Current review and suggestions for responding to climate change are provided by Taylor and Doremus (2011). They note that there are now about 670 of these plans, ranging from single species small areas to much larger multi-species plans, covering about 47,000,000 acres, but 96% of that land is estimated to be in only 32 regional-scale plans. The essential good news is that does provide more certainty for the humans, but the essential bad news is that the quality of outcomes depends not only on the quality of the information and response in the plan, but also to the plan's effectiveness in changing conditions. In terms of the analysis described above, rather than wait for the lack of graduated sanctions to result in a sudden imposition of limitations, property owners and commercial and local governments and others have made what are effectively deals.

And, it is also very good that these large plans are landscape and larger, and should be taking into account the range of ecosystemic impacts on and off the sites of intense or direct human uses. This is far superior to parcel by parcel determinations (see Sassenrath et al., 2010, Nowak and Schnepf, Eds., 2010 and Schnepf and Cox Eds. 2007). Landscape ecology is a recognized subfield of ecology, with several textbooks and important progress in what we might call off-site

impacts of activities (e.g. Meffe et al. 2002, Bennet 2003, Ecological Applications special section 2005, Vol. 15 No. 6).

And that brings the discussion back to property rights. The rights to use of a resource are presumed to include the right to destroy the resource. The rights to conduct the activities which produced the cumulative impacts that finally cross some threshold into recognition or scarcity that stimulates some action or change, or ecological state changes were granted or presumed without a symmetric property right in the public or the future public to the conditions which are undesirable. The public interest in quality of resources and ecosystems and ecosystem services has been so haltingly, minimally recognized that the big picture is fiscally-crippled catch-up, or even denial (as in the case of climate change and its impacts). The public interest now and in the future just does not shoe-horn well into a landowner sort of property right, or a reactive tort approach. How do you value loss of ecosystem functioning and biodiversity? Some work starts with next best ways to get a given service, such as nitrogen management or water treatment costs, but the issues of valuation for ecological service or damage are non-trivial though there has been considerable effort (Bromley Ed. 1995 is overdue for updating, but still superb). Valuation has been the subject of enormous efforts, perhaps thousands of articles, but it is still a reactive tort-like approach to damage done or an effort to inform choices which are to be made within a commodity framework. The idea of taking things out of the market is still rare. We are not taking the discussion as seriously as we should, and not thinking much about how any valuation in comparative terms relates to the general equilibrium: all prices are relative, and not only relative to current scarcities and demands, but also related to the starting distributions of rights and resources. (This calls for an environmental economics book; Bromley Ed. 1995 covers many topics but there are newer treatments not reviewed by this author.) And in the years of near economic depression and state financial starvation, the highly contested very expensive science-intensive listing processes make sense only as the historic result of politically pushed “innocent until proven guilty” thinking.

## Water

In water, the legal structures governing allocation of water in the United States relied on two ecologically significant wrong ideas. The first was that ground water is not complexly related to surface water; perhaps largely as a matter of administrative convenience and simplicity, evidence of interconnection was not relevant until a remarkably recent time, which varies from state to state (Getches 1997 is a concise introduction to water law). There have been painful adjustments in the form of well regulation where rights to use were presumed, or in a few cases, very serious limitations related to federal law such as the Endangered Species Act (the Edwards Plateau in Texas is a widely discussed case (Eckhardt 2011; and see Western Water Law Review Commission 1998). The second wrong idea was that water allocation should be free of issues of water quality; again, the linkage has been late and minimal. The generalization is that water users holding a water right (Western prior appropriation) or some kind of riparian right or permit (common law in the wetter states) had very limited rights to water quality (Dellapenna 2000, 2003, 2004, 2005 addresses evolution of water laws). No matter how egregious the acid mine drainage or tailings leaking or other pollution, those costs were just imposed on the water users and the environment, and the legacy of unregulated water quality degradation remains highly problematic (see EPA “superfund” CERCLA, Findley and Farber 2000 and EPA websites). The

right to mine, a property right available to take unclaimed public minerals, was not defined to exclude the right to pollute and to leave pollution sources behind, until fairly recently with implementation of the Clean Water Act and its assorted amendments and regulations (Findley and Farber 2000, Coggins and Glicksman 1990).

The Clean Water Act, and the National Pollution Discharge Elimination System required permits for point-source discharges. This was remarkably successful though controversial and expensive to implement. But the non-point source (not coming from a pipe or a pond) pollution remains a tremendous problem. Agriculture is exempt from regulation, and continues to produce water quality degradation and responses which call for financial incentives to stop bad practices. This is a property rights issue. Very useful treatments of the agriculture problem are provided in two books on Managing Agricultural Lands for Environmental Quality (Nowak and Schnepf, Eds., 2010, Schnepf and Cox, Eds., 2007). Freyfogle (2007) offers an extended discussion of re-thinking the balancing between individual and society and environment, and argues that there are problems with presuming that there is a right to pollute and that all responses must be bribery to stop. Another way to consider this is that there are serious failures of rental conservation (Sassenrath et al. 2010, and see many USDA Economic Research Service reports on the Conservation Reserve Program) when markets provide stronger incentives to stop conserving, as we have seen with substantial changing of use of lands in the boom market for corn for the ethanol subsidy (Wallender et al. 2011).

## **Split Estates**

Though there are only a few general points and an enormous number of case-specific situations, split estates must be mentioned in mountain-related property rights discussions. From common law, and partially on the principle of stable expectations, the mineral estate has been dominant over the surface estate, where they are severed. The right to the minerals trumps the right to not have the surface used for mining purposes. On public lands, this has been followed in the case of hard rock mineral claims, and mineral leases, including oil and gas, with a change to require surface owner consent for some strip mining of coal in some cases (Coggins and Glicksman 1990). Generally, it was thought that the minerals were of higher social value, and how that has worked in particular cases has been highly elaborated in the area of regulatory takings (Meltz et al. 1999, Findley and Farber 2000 are guides to large literatures and caselaw). This will seem familiar: the presumptions are that there is a right to use a particular property, and if the government wishes to retrieve that right, it must pay to do so. And, the wish may be motivated by issues of negative externalities, and has been in recent times, but this is late on the scene. More often, historically, it has been an issue of rarely preferring to protect the surface for some other value, as a property value versus property value question.

## **A Root Problem: The Right to Destroy**

It is past time for an explicit discussion of the right to destroy a resource, and the right to externalize impacts on others, and on the long-term. This may be so simple that the concepts are simply implied, in a great deal of the literature, though they were recognized in the early common property resource management literature (Ostrom et al. 2002). They deserve a great deal more attention, especially in fragile environments. There are severe consequences from not

treating the right to destroy as critical for long-term sustainability or even modest conservation. Consider a semi-hypothetical situation. It is one thing to harvest trees sustainably, another thing to overharvest and reduce yields for some period of time pending regeneration at slower rates, and still another to harvest in such a way that qualitatively worse conditions result. A 250 year rotation might be claimed in some national forests for high altitude forests, and it is beyond this little note to go into the legitimacy of such claims without reference to patch sizes, slope, aspect, and also climate change issues. But the logging is often done with heavy equipment, often pushing over and uprooting trees, for harvest or just for access with heavy equipment to the trees wanted. The fragile soils may be not only impacted immediately by new increased exposure to insolation and wind. They may also be impacted by the following seasonal changes in snow capture or blow-off, snow melt timing and speed, and exposure to high intensity rainfall (which is in fact already observed to be an increasing share of total precipitation (Climate Change Science Program 2008, 2008b, 2008c; and see newly posted Intergovernmental Panel on Climate Change Summary Report on Weather and Climate Extremes, 2011). What is the length of time for a soil replacement if one destroys the O and A horizons? The displaced soil becomes sediments which may have impacts on water quality, stream morphology, and the aquatic environment. In high elevations, the question of right to destroy is non-trivial.

Because farmers are presumed to have the right to destroy their land, soil erosion is treated as a public interest which can only be pursued by providing financial incentives for reduction, unless there is some extreme case in which other owners are clearly adversely affected or a stream suffers easily attributable damage. This has a large literature (Nowak and Schnepf, Eds., 2010, Schnepf and Cox Eds. 2007 are entry points to this), and it is a world-wide problem (Pimentel and Pimentel 2008). Mountain farming has the same license to waste as other farming. Future capacity to produce food, feed and fiber would seem to be a quintessential public interest, but it is left to private owners to defend or not.

This is also, clearly, a mis-specification of what rights are assigned in a timber sale, for example, on a national forest (see other parts of this report). Heavy equipment and stream crossings raise a similar issue, which has resulted in regulations on public land permits and leases, though it is hard to judge the extent of enforcement or voluntary compliance. These issues tend to arise in administrative proceedings and litigation in which agencies are criticized, often by industry groups and by environmental groups; that also is a large literature beyond the scope of this note. A wide variety of groups have been variously involved in these issues, with substantial expenses, and there are some positive results in the changes in some places which have resulted from what is loosely referred to as the watershed movement, or more technically, collaborative resource management (Sabatier et al. 2005, Wondolleck and Yaffee 2000).

Wetlands are another hotly-contested resource with a complex history of legislation, regulation, litigation, and judicial involvement. This is treated elsewhere in this report; perhaps inquiry might start with a special issue of the journal *Wetlands* (Nadeau and Liebowitz 2003), and a report on the consequences of changed federal jurisdiction by Environmental Integrity Project (2005). The archetypical problem on the Plains has been the destructive impact of conventional agriculture and soil erosion on prairie potholes and playa lakes important for biodiversity and fly-ways for migratory birds, and waterfowl. These small wetlands get in the way of industrial farming, and have been greatly diminished. In the mountains, fens, and other kinds of wetlands

provide important parts of the mosaic of habitats supporting diversity, and are also important for nutrient capture at altitude (Meffe et al. 2002 and a large literature). And, as noted, the vegetation is often a valuable amenity, visually and for recreational purposes, so they attract development. For grazing purposes, wetlands have often been used for stock watering, with adverse consequences for the ecology (citations above). But, from the perspective of the owner, without being able to use that resource, a much larger area may have far lower value; cattle that have to walk too far gain less. And then there are mosquitoes... The issue is often stability of expectations versus increased understanding and public interest. How much use can and should be limited? Should the owner be paid for the limitation?

## **Regulatory Takings and Givings**

Whatever has been given, however much in ignorance of the nature of the resources or the risks, becomes a property right. Whatever is to be withdrawn must be paid for. We essentially refuse to balance the creation of value by public action as a giving by the public to individuals against the public reducing value, for reasons which may boil down to political unpopularity. There is some recoupment of some givings, if there are property taxes which respond to changes in value, but they are usually set with different considerations. Affecting mountain land in private hands, for instance, the Colorado agricultural land tax rate was set far lower than tax rates on residential land, with disclosures of many cases of rather tiny agricultural use in order to qualify for the tax reduction (following legislative request, Colorado Counties, Inc. investigated this, stimulating legislative reform; see Denver Post 2010-2011, 14 stories by N. Lofholm and C. Osher and two editorials and a guest column).

The recreational and amenity value of mountain lands creates high demand for residential development, (McGranahan 1999), which has resulted in very high growth rates in attractive areas (Knight et al. 1995); “loving it to death” is a common phrase for high development rates next to protected areas and public lands. This development in turn creates additional stress on water and ecological values from increased roading, traffic, perforation and fragmentation of landscapes. This report addresses those issues elsewhere; one recommended starting point might be a special issue on Rural Residential Development in Ecological Applications, 2005, Vol. 15 No. 6 (some citations in bibliography). In urban areas, and sub-urban, being close to open space or water features protected by public action increases the value of real estate, and that is a “giving” of increased value. It is increasingly important as the degree of penetration of formerly lightly-human-used areas increases that there are off-site impacts on ecosystems from development on private property; this is a kind of ecological externality working as a habitat pollution, in effect. There is increasing public interest as there is increasing scarcity, and issues similar to those with the Endangered Species Act arise as thresholds of impact become policy-relevant and ways to address cumulative impacts become more of a concern. Where are the equities, and whose interests should be protected?

The point to consider in mountain development is that there is private capture of value created at social cost, often of management of resources for purposes other than private property development. In all development, there is a giving of public roads, usually many other services including emergency and fire response, and the basic social protection of the property rights. Whether and how to more actively pursue symmetry in givings and takings is an important issue.

One particularly effective result of long-running resource management systems operating in what are usually called, with a sneer, “subsistence” socio-ecological systems, is that they can operate with maximum economic yield from the resources over the long-term. This is not maximum sustained yield in the biological ideal of maximum off-take. Wilson (1987) argued this, showing that the maximum return on effort will often be at lower levels of harvest or off-take, because the system is operated to maximize the well-being of the long-term group, not the short-term, and not with the delusion of mobility of capital. Norgaard (1994) provides a superb treatment of that issue. The maximum economic yield idea was extended a bit in Wiener (1995), arguing that such management, because of the lower harvest levels, provides important resilience for both the humans and the living resources. The humans have enough slack, so to speak, that they can occasionally increase harvest and do so without high expense in effort or technique. The living resources are likely to be well below the point in their reproduction capacity that they also can recover without risk of a system or state change; Gunderson and Holling Eds. (2002) is the essential reference on that idea, though there are dozens of successors and applications; e.g. Chapin et al. Eds. (2009).

## **Moral judgment may look optional but is intellectually unavoidable**

Beyond the scope of this sketch, a review of even a minimal treatment of the issues in economic theory for dealing with these problems shows that although there have been long efforts to avoid normative judgment, they fail. Howarth and Norgaard (1995, and Norgaard 1994) are among many reviews of the problem of intergenerational equity and the problem of a positive discount rate and the long term, noting that some traditional economics solutions to the long term problem have relied on there being equivalence of the social discount rate and the individual discount rate (Hotelling), or mobility of capital such that there is substitutability of resources (Solow), and that these are practically absurd. Schmid (1987, 1995) shows that costs and benefits are a function of the distribution and definition of a set of property rights; before one gets to the problems of working a general equilibrium view, one must first consider that the starting points for even the definition of economic efficiency of transformation are determined by the starting distributions. It is one thing to start with the status quo for a given purpose, but another to insist that it is neither a social choice nor inviolable. We are playing by a set of rules that were chosen, whether or not in the belief that they were divinely given, or necessary for other social purposes (such as democracy; Jacobs 2008). As Freyfogle (2007) eloquently argues, it is time we took this far more seriously than we have. This is too important, in fragile environments especially, to leave it to haggling over political movements which start and end with positions that deny the need to balance the long term, the non-human, and the public with private short-term interests. These balancing questions cannot be resolved by context-specific formal methodologies.

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