



Common Assets

Helen Payne Watt

ASSERTING RIGHTS TO OUR SHARED INHERITANCE



Corporation
For Enterprise
Development

||| REDEFINING PROGRESS ||| |||



REDEFINING PROGRESS

asserts that we have a moral responsibility to address the needs of people and nature as we grow the economy.

RP advocates the development of accurate monetary and non-monetary indicators of how we are really doing, as well as incentive-based policies that will stimulate genuine progress.

REDEFINING PROGRESS

envision progress toward a society of vibrant communities that view economic wealth as a means of improving people's lives and preserving the vitality of nature. Such a society would enable all its people to meet their material needs; operate democratically and transparently; appreciate individual, religious, and cultural differences; broaden access to information, choice, and opportunity; and, all the while, restore and sustain a biologically rich and healthy natural environment.

RP GOALS:

As focused in four program areas with research and policy development components: Expose the fallacy of equating economic growth with progress and advance a healthier conception of progress. Facilitate recognition of nature's limits as essential to true sustainability. Promote pricing systems that incorporate social and environmental costs. Expand recognition and build the value of natural and social common assets.

THE CORPORATION FOR ENTERPRISE DEVELOPMENT

promotes asset-building and economic opportunity strategies, primarily in low-income and distressed communities, by bringing together community practice, public policy, and private markets in new and effective ways.

THE CORPORATION FOR ENTERPRISE DEVELOPMENT

envision widely shared, sustainable economic well being and an inclusive economy where everyone is fully engaged and appropriately rewarded.

CFED GOALS:

As focused in three clusters with policy, research, demonstration, field service and publication components: Create incentives and systems that encourage and assist all Americans to acquire and hold assets. Identify, preserve, and build financial, human, social, and environmental assets, especially in low-income communities. Advocate economic development policies and practices that build a dynamic and inclusive economy.



A Common Assets

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Introduction

Many valuable natural assets existed for millennia without our ever being aware of their usefulness or value.¹

The capacity of the atmosphere to absorb pollution, for example, has only become valuable in recent decades as the limits of this important environmental service have become evident. Many natural assets – once perceived as limitless and for which ownership was, thus, not an issue – have been turned by the advance of technology into increasingly scarce and distressed commodities. The tools for extracting value from these assets have developed more rapidly than the legal and property rights to protect such common resources and their unique, shared status.²

As a result, there are few ownership, governance, or benefit-sharing arrangements in place to manage these assets. Instead, inequitable and unsustainable uses prevail that threaten the health of the assets. One viable response to this crisis – a crisis of global proportions – is to modernize the ancient notion of the commons with a new class of property ownership in the U.S. called common assets.

Common assets represents a new generation of environmental and development policies that treat natural resources and ecosystem services as assets to be protected and managed rather than inventory to be liquidated. The scientific literature suggests that a wide

variety of these resources and services (such as the atmosphere, fresh water, and ocean fisheries) are becoming scarce or stressed through environmental degradation. Further, these assets – the common inheritance of all people – are being appropriated and transformed for their monetary value into private and corporate wealth for a small percentage of the population.

This paper proposes that asserting the common property rights people have to shared resources is crucial to the sustainability of the resources. A new class of ownership is needed in the U.S. in which shared resources-common assets-are owned by all of us and managed in ways that both sustain the assets and ensure equitable sharing of their benefits.

The Sky as a Common Asset

The best example of a common asset – so far – is the sky. The sky is filling with gaseous waste primarily because consumers pay for oil but not for the air that holds its combusted residue. A major flaw of the current market system is that it does not perceive the waste absorption capacity of the air to be scarce. Science has shown – and governments are beginning to recognize – that the sky can only absorb a certain amount of gaseous waste and that its limit may be drawing near. The challenge is to fix the market flaw that blinds consumers to this fact.

Traditionally markets recognize scarcity because property laws allow owners of scarce things to charge others for using them. But there are no property rules or any clear owners for the sky; thus, this resource is subject to what Garrett Hardin calls *the tragedy of the*

1. In this paper, products and services of the environment are associated with the economic idea of a fixed asset.

2. Susan Buck, "The Global Commons" (Island Press, 1998).

commons. One solution to prevent overuse of the atmosphere and its capacity to absorb waste is to create a market for use of the sky, just as there are markets for use of land and of water. To do so, however, requires the creation of new atmospheric property rights. Therein lies both danger and opportunity.

The danger stems from the chance that we are poised to give away our no-longer-spacious sky. Recent agreements on climate change require the U.S. to show demonstrable progress to reducing greenhouse gas emissions by 2001. Current proposals lean towards granting rights to large energy companies based on past emissions. This would be an historic giveaway to corporations. Recent studies estimate the range of values of U.S. carbon absorption capacity from \$30 to \$300 billion per year through the early twenty-first century.³ This valuation reveals a rare opportunity. The next few years could see either a massive transfer of this wealth to energy companies or the emergence of a new class of common ownership in the U.S.

The Corporation for Enterprise Development (CFED) proposes the creation of a trust based upon the underlying asset of the U.S.' share of the carbon absorption capacity of the atmosphere. The Sky Trust provides a modern way for commoners to own *the commons*. As conceived, the trust is a civic institution – neither government nor for-profit – that embodies citizen ownership of the sky, a commonly inherited asset. Revenue from the sale of emissions permits flows into the trust. The beneficiaries of the trust are all U.S. citizens, current and future, on a one citizen, one share basis. Payments are made through an annual tax-free check or direct deposit to a savings account. With a functioning Sky Trust, every American, rich or poor, would have a source of asset-based income.

A Sky Trust is politically viable, in part, because a trust based on a common asset does not take or tax anything that is currently owned. Instead, it creates new property rights for assets that no one now owns and allocates them fairly to all citizens.

3. Peter Barnes
"Pie in the Sky: The Battle
for Atmospheric Scarcity
Rent" (CFED, 2000.)



Economy of Sky

"Chicken Little had it almost right. The sky isn't falling. It's filling.

It can absorb only so much ozone-eating chlorine, acid-brewing sulfur, and heat-trapping carbon dioxide, and these limits are being reached. The problem we will face in the 21st century is not a shortage of fuels. It is a shortage of sky.

In historical terms, the era of free sky is ending. In the future, there will be an economy of sky. Property rights will be established, prices will be charged, and money will change hands. Lots of money."

- P. Barnes, 1998

Why We Need Common Assets

Without property rights, common assets may be subject to *the tragedy of the commons*, a scenario first detailed by Garrett Hardin in 1968. Hardin argues that if a farmer adds a cow to his herd grazing on common land, the benefit he gains is greater than his share of the overall deterioration of the resource that he experiences (e.g. through overgrazing). “But this is the conclusion reached by each and every rational herdsman sharing a commons. Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit – in a world that is limited.”⁴

4. Garrett Hardin, “The Tragedy of the Commons,” *Science*, 162 (1968), 1243-1248.

5. Intergovernmental Panel on Climate Change (IPCC), *Climate Change, 1995, The Science of Climate Change, Summary for Policymakers* (Cambridge: Cambridge University Press, 1996).

6. For example see Herman Daly, “Beyond Growth: The Economics of Sustainable Development” (Beacon Press: Boston, MA, 1996).

7. David Seckler, David Molden, and Randolph Barker, “Water Scarcity in the Twenty-First Century,” *International Water Management Institute*, March 1999.

8. Maude Barlow, “Blue Gold: The Global Water Crisis and the Commodification of the World’s Water Supply,” *International Forum of Globalization*, June 1999.

Consider climate change in the 21st century. Human activities – primarily the burning of fossil fuels and deforestation – are altering the composition of the atmosphere by increasing concentrations of greenhouse gases. In 1995, the scientific and policy communities acknowledged the severity of climate change when the Intergovernmental Panel on Climate Change (IPCC) issued its Second Assessment Report, which concluded that the balance of evidence suggests a “discernible” human influence on global climate. Just this month the IPCC prepares to release a new report which reaches approximately the same conclusions⁵. As long as human activities continue to increase the concentration of greenhouse gases in the global commons, the risk of global climate change increases. In other words, the sky is being used as a dumping ground and the consequences are beginning to be felt. The American economy does not recognize the vital services provided by a functioning atmosphere. Worse, although the sky is becoming more overloaded and more scarce, there are no tools in place to limit or charge for its use.

Many common assets – sky, water, and fisheries – are threatened with similar overuse or depletion. In nearly

all cases, the culprit is an economic system that does not recognize the economic value of these assets or services. It is clear that new tools are needed to connect ecological and economic systems if natural capital is to be sustained for generations to come. Work by ecological economist Herman Daly paves the way for these connections. His contributions on the need for a scale of human activities that fits within the regenerative capacity of the biosphere as well as a fair distribution of property rights within this generation and among future generations are basic assumptions on which the concept of *common assets* is grounded.⁶

Resources characterized by common ownership and impending scarcity are prime candidates for a *common assets* approach. For example, water scarcity is increasingly considered to be the single greatest threat to global food security, human health, and natural ecosystems. A 1999 study by the International Water Management Institute reports that “a quarter of the world’s population, or a third of the population in developing countries, live in regions that will experience severe water scarcity within the first quarter of the next century.”⁷

The Council of Canadians, a citizens’ movement in Canada, is using this impending crisis to promote principles for management of the world’s water supply. The organization argues that “as the water crisis intensifies, governments around the world – under pressure from multinational corporations – are advocating a radical solution: the commodification and mass transport of water.”⁸ To resist this threatened commodification, the Council promotes a new ethic for sharing water and a set of ten guiding principles to achieve sustainability of the resource. Their recent report “Blue Gold: The Global Water Crisis and the Commodification of the World’s Water Supply” is

urgent in its efforts to find a stewardship solution for shared water assets in Canada and world wide.

The problem of sustainability – of achieving an economic system that accurately reflects the true costs and value of our natural capital and ecosystem services – is only one of two important challenges. An equally daunting challenge is avoiding the danger of privatizing common assets in a way that yields inequities in political power, income, and asset ownership.

Just as economic valuations for the carbon absorption capacity of the atmosphere foretell an enormous giveaway, similar valuations are emerging for other common assets. In May 1997 Robert Costanza and others calculated that the value of seventeen ecosystem services is greater than total world GDP as currently defined.⁹ *In other words, nature is worth more than all private and state-owned assets combined.* Even if one disagrees with his results, the scale of the valuation proves that any sort of lottery or giveaway of carbon emissions permits would signal a massive transfer of citizens' common inheritance into the hands of a few private corporations.

The second challenge, then, is one of equity. Now is the time to develop a system of property rights and benefit-sharing arrangements that keep the ownership and benefits of common assets squarely in the hands of the people.

The U.S. has entered an era in which asset ownership is a critical factor for individual and community well-being. The gap between the rich and the poor continues to grow as the ownership of assets that generate wealth becomes increasingly consolidated. In the 1990s the U.S. experienced an increasing polarization in the ownership and control of financial assets.

“Nearly all the increase in total wealth in the past decade has gone to the top one-fifth of the population. The top twenty percent of all households realized almost 99% of the growth in wealth in the 1980s, with nearly 62% of the gains in wealth accruing to the top one percent. These increases in wealth were far greater than increases in income for those at the top.¹⁰” This polarization is significant because asset ownership has implications beyond spending power; ownership directly affects the way families and individuals perceive their future.¹¹

The *common assets* approach is a way to capture the value of natural and social resources for the vast majority of Americans who are asset poor by identifying new tools and policies for sharing wealth associated with such resources. *Common assets* approaches might also generate additional income and increased development options for communities. The approach raises a variety of important questions:

- Is there a way to charge market value for the use of environmental products and services?
- Is there a way to return the benefits of common asset ownership to citizens (for example, through dividends)?
- What are the options for reinvesting in the resource itself or the community that depends on it?

Understanding Common Assets

The terms common and assets are rich with important implications and have been carefully selected.

Common can refer to interests that “belong equally to two or more; shared by all alike; joint.” Common can also pertain to the community as a whole, or the

9. R. Costanza et al., “The Value of the World’s Ecosystem Services and Natural Capital,” *Nature*, 387 (15 May 1997), 253.

10. Edward N. Wolff, “Top Heavy: A Study of the Increased Inequality of Wealth in America” (New York: Twentieth Century Fund, 1995).

11. Michael Sherraden, “Assets and the Poor: A New American Welfare Policy” (Armonk, NY: Sharpe, 1991).

public, as in “the common good.” Thus, the concept raises issues of the broadest public interest. The word also goes back to the notion of the commons and the rights of all persons to use certain lands or water for fishing or grazing livestock. The idea, hence, reflects the rights of all citizens in an economy.

Further, the word common suggests a system in which resources are neither privately nor state-owned; instead resources are common property. Environmental economists also use the terms “free access commons” and “open access problem” to refer to the tragedy of the commons, described previously in this paper.

Finally, what all people clearly have in common are the resources that all inherit across the generations, such as the natural environment and a cultural heritage. This includes everything from architectural riches to wildlife, from the ecosystem functions that keep everyone alive to the social trust and bonds that maintain peace. The notion also implies that every generation inherits an obligation to future generations.

Assets are typically defined as “a useful or valuable quality or thing” or “a valuable item that is owned.” Assets include tangible things (such as cash and inventory) and intangible things (such as trademarks or goodwill). Unfortunately, the U.S. economy is good at valuing only certain intangibles. For example, Microsoft is worth well more on the stock market than the physical building, equipment, and property it owns. Capitalism and its markets very poorly price the people’s common inheritance. And as long as natural resources are not recognized as valuable assets that are owned, they will continue to be abused and depleted.

So, common assets are valuable and enduring natural and social resources shared by a community, for

which there are no private or state owners. The central question of this paper is:

How can our common natural heritage be better valued, sustainably managed, and equitably shared?

We believe that the common assets approach is part of the answer to this question.

Features of Common Assets

The Sky Trust proposal described on pages 2 and 3 presents steps to get from the status quo (where the sky is free and usable by anyone) to a common asset (where users pay and owners – and the resource – benefit). The proposal contains a number of assumptions that appear to be transferable to other natural assets, such as:

- The asset belongs equally to the community of owners.
- Pollution must be limited to what the asset can safely absorb.
- Once limits are set, companies pay for pollution permits.
- The revenue goes into a trust.
- The trust pays equal dividends to all citizens, present and future.

Similar proposals might be developed for solving other common resource problems by applying some of the essential elements of the Sky Trust model. Successful solutions – as identified by leaders in the field of common property – are ones that restrict access to the resource and create incentives to limit its use.¹²

12. Elinor Ostrom, “Revisiting the Commons: Local Lessons, Global Challenges,” *SCIENCE* vol 284 (9 April 1999) pp. 278-282.

Five features of common assets emerge:

Ownership: Common assets are created by appropriating an unowned resource generally believed to be owned by the relevant community and where ownership is needed to secure more sustainable and equitable use patterns. Once a common asset is created, there is no market for ownership rights.

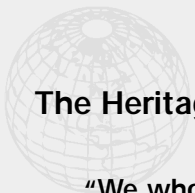
Definition: A common asset has some kind of boundary that can be geographic, ecologic, or determined by the pollutant involved (e.g., a watershed, an airshed, a forest, or a fishery). Use of the asset within the boundary can be limited, either naturally or by political agreement. (This ability to limit users of a resource is known as exclusion.) Common assets can be depleted or degraded by overuse, this attribute is known as subtractability. As this happens, common assets become increasingly scarce and valuable and the value derived is known as scarcity rent.

Valuation: There is a market for usage rights for common assets. Once limits on use are set, values for use of the common assets are determined by private market tools; indirect values are assessed by the community of owners.

Governance: The governance mechanism for common assets is transparent, democratic, and accountable to future as well as present generations.

Benefit Sharing

Ownership of common assets is equalized per household or per capita. The underlying formula is: from all according to their use, to all according to their ownership.



The Heritage of Values

“We who now live are parts of a humanity that has interacted with nature. The things we most prize are not of ourselves. They exist by the grace of the doings and sufferings of the continuous human community in which they are a link. Ours is the responsibility of conserving, transmitting, rectifying and expanding the heritage of values we have received that those who come after us may receive it more solid and secure, more widely accessible and more generously shared than we have received it.”

- J. Dewey *A Common Faith*, 1934

Making Ownership Count

Fundamentally, the concept of common assets is about asserting ownership. Hardin's tragedy of the commons is usually cited for its insight into ecological tragedy. The phrase hints at another tragedy as well, for when commons become economically valuable, the loss of the commons by the commoners generally follows.

The goal of a common assets approach is to claim ownership by the people of valuable common property before rights to it are abrogated to private owners.

Since the days of John Locke, people have viewed protection of property as a primary function of democratic government. The reasoning of Locke, Thomas Jefferson, and others was simple: without property, there can be no independent citizens; without independent citizens, there can be no democracy. However, Jefferson's vision of an America of small property holders has been only partly fulfilled. Today, the richest one percent of Americans own more income-producing assets than the bottom 80 percent combined. This dramatic inequality in asset ownership creates serious social problems. According to

Michael Sherraden, author of *Assets and the Poor*, assets give people security, a stake in society, freedom to think long term, and the capacity to help themselves and their children.¹³ Lack of assets diminishes all these things.

Creating new property rights for common assets deprives no one and, rather, may actually help address the dramatic inequity of asset ownership in America. So far, the sky is the clearest example of a common asset with the revenue generating capacity to impact the problem of inequitable asset ownership in the U.S. Others no doubt will emerge.

Property Rights and Common Ownership

This paper deals with resources that do not have private or public property rights already assigned. In the spectrum of property ownership, the commons are resources that are not owned by individuals, corporations, or the state. Roman law (the basis for American property rights) set out four categories of property rights:

- **Res privatae**, items in the possession of an individual or corporation.
- **Res publicae**, government property, items set aside for public use by the government, such as public buildings, highways, and navigable waterways.
- **Res communes**, property that could not be owned by individuals, property accessible to all but that could never be exclusively acquired by an individual or government.

13. Sherraden, Michael, "Assets and the Poor: A New American Welfare Policy" (Armonk, NY: Sharpe, 1991)

- **Res nullius**, things that have no property rights attached, until they are taken into possession and become *res privatae* or *res publicae*.¹⁴

In this paper, the commons refers to *res communes* and state-owned refers to *res publicae*. As with Roman law, English law divided public property into two classes, one for use by the state and the other as common property available to all citizens. The second kind included “the air, the running water, the sea, the fish, and the wild beasts.”¹⁵ The title of “ownership” of these assets was held by the sovereign, but all such property was common for use by all people.

The ownership question of common property has long been a central problem in economic theory. In economics, the term commons is typically used to describe a property management system that is neither private nor state-owned. In such a system, members (or co-owners) have a right to set policy regarding resource use and to exclude non-members from use. Environmental economists have discussed the tragedy of the commons as the open access problem, or the free access commons. In this situation, there are no defined users or owners; individuals have no clearly enforceable rights or duties regarding resource use. Over-consumption of the resource is likely in this situation.

Each type of system – private ownership, state-owned, and common ownership – has the potential to create a more sustainable future, yet each also has the potential to fail. Private ownership can protect resources unless the owner has incentives to act on short-term costs and benefits. State ownership can conserve resources depending upon the motives and capacities of the government as well as the larger tax, subsidy, and regulatory picture. Common property systems can also manage sustainably, in certain circumstances.

Getting to New Vehicles for Ownership

Many environmental goods in the marketplace are public-type goods, rather than private, in that use does not reflect their true value. Either the values do not include all the social costs (e.g., the price of a car does not include all the environmental damage caused), or there is no price attached to the resource use (e.g., the waste assimilation capacity of the environment). Alternative means of valuing these resources and their consumption must be created and enforced if they are to be managed in a more sustainable fashion.

This is where policy enters the picture:

- What is the appropriate combination of regulation, property rights, and economic incentives to right this situation?
- How can the notions of common assets and common ownership be helpful in reframing policy discussions and directing policy onto a different path?

There has been some attempt to address such questions through the public trust doctrine. The public trust doctrine is based on the belief that various common properties, including rivers, the sea, the shore, and the air, are held in trust by the government for the public’s unimpeded use.¹⁶ Federal and state governments hold lands in trust for the citizens. The public trust is embodied in a number of federal statutes; government obligations in upholding the public trust doctrine include:

- supervising the trust,
- preserving uses protected by trust (consistent with the public interest),

14. Buck, p. 4.

15. *Matthews v. Bay Head Improvement Association*, 95 N.J. 306, 317-18 (NJ 1984).

16. Joseph Sax, “Defending the Environment: A Strategy for Citizen Action,” (1970), 163-64. See also Alison Rieser, “Ecological Preservation as a Public Property Right: An Emerging Doctrine in Search of a Theory,” 15 *Harv. Envtl. L. Rev.* 393 (1991).

- protecting and maintaining public trust property, and
- regulating use of property by devoting trust assets to actual public uses.¹⁷

17. CFED, unpublished memo by Gerald Torres

These property systems and the evolution of the public trust doctrine in the U.S. are rarely neatly applied to the living, changing, moving reality of natural resources. But the case law and legal framework in this country provide a clear foundation for the validity of the peoples' claim to certain assets that are *res communes*.

In the U.S. in general, ownership is categorized along private or public property lines, as if these are the only options. Likewise, private property tends to be reified into something indivisible, so that one either owns or does not own something. Private property could, instead, be thought of as conferring a series of functional and divisible rights. These are already affected by zoning laws, minimum wage statutes, collective bargaining rights, etc. Property is a "packet of permissions." A common assets approach proposes the creation of new property mechanisms and simulated markets that might involve broad-based distribution of revenues as well as reinvestment in stewardship and community development.

Defining Common Assets

Defining a common asset includes: identifying a boundary; identifying key attributes of the asset; and reviewing the history of the asset as a public or common good.

The common asset must have an enforceable boundary to allow owners to limit its use; such a boundary may be tangible (such as the Chesapeake Bay watershed) or intangible (such as the Los Angeles airshed). The boundary requirement distinguishes common assets from common pool resources more generally. Since the common assets approach calls for establishing

ownership, governance, and benefit-sharing policies, having discrete boundaries is necessary.

The table on page 11 identifies and describes the most important attributes when defining a common asset.

In her recent book *The Global Commons*, Susan Buck explains that the two most important attributes of common resources generally are "the difficulty or feasibility of excluding others from the resource (exclusion) and the degree to which one appropriator's use of the resource diminishes the amount of the resource left for others (subtractability)." For private goods, exclusion is easy and subtractability is high. In other words, it is easy to keep others from using my house and, once I own it, no one else can. For public goods, subtractability is low (my use of the national defense

system does not reduce the ability of anyone else to do the same) and exclusion is difficult (anyone can use the safety). The dilemma of the commons is this: exclusion is difficult, and subtractability is high. It is nearly impossible to prevent people from fishing from commonly owned waters and each fisherman's use of the resource diminishes the amount left for others. Yet defining these attributes is essential to crafting a management framework for the asset.

There is a rich literature in economics that considers private and public goods and that deals in depth with the issues of exclusion and subtractability.¹⁸ Yet, to date, this body of literature has remained academic and has little impact on public understanding or public policy. This paper seeks to apply these issues in new way.

18. Buck, p. 4.

Attributes of Common Assets

Attribute Name	Attribute Description
Access to the asset (exclusivity)	Is it easy or difficult for owners to benefit from ownership in the asset? Can access to the asset be limited (e.g., to charge a fee)?
Subtractability	Does use result in depletion of the asset?
Resource type	Is it a moving or a stationary asset?
Physical type	Tangible (material), Intangible (provides services, has cultural value), or Both?
Size of the asset	Finite or infinite; quantitative limits?
Measurability of the asset	Are there data, measurement systems, and research to measure changes in the condition of the asset?
Scale of problem or condition	Global, national, regional, state, local
Carrying capacity of the asset	What storage capacity does the asset have to absorb degradation and depletion before the services and products of the asset are lost? What are the resource flows (especially hidden flows) related to the asset?
Other values	What are the non-economic, non-environmental values ascribed to the asset? Such values include social, cultural, and historic significance

Placing Value on Common Assets

An important step in meeting this challenge is identifying the values that enable people to weigh options in an informed and rational manner and to propose appropriate policy changes.

In his upcoming book *Who Owns The Sky? Our Common Assets and the Future of Capitalism*, Peter Barnes explains that, although people generally have a gut reaction that the buying and selling of the sky is somehow wrong, the best way to save the sky (given the logic of capitalism) is to draw a line and sell a gradually declining amount of sky beneath that line. The problem, he says, is that markets have no appreciation for the intrinsic value of assets like the sky, but markets do determine how resources are used. We need to communicate with markets in a language that they understand that includes property, prices, transactions, and supply-and-demand.

“In the case of the sky, the very incalculability of the sky’s true value is what makes it necessary to create an artificial value – an exchange value – that markets can readily calculate. This artificial value then becomes a proxy for the deeper, incalculable value. It’s not the equivalent of the deeper value, nor an editorial comment on it. It’s simply a proxy – a useful numerical representation. And it’s a much better proxy than the one the market currently uses – namely, zero.”¹⁹

Valuation in this context, then, aims to identify a proxy value of natural goods and services. Valuing the goods and services of the ecosystem is a complicated and daunting undertaking. Gretchen Daily suggests that the task of valuation is more about evaluating trade-offs than it is getting to actual values.

“Valuation involves resolving fundamental philosophical issues (such as the underlying bases for value), the establishment of context, and the defining of objectives and preferences, all of which are inherently subjective. Even after doing this, one is faced with formidable technical difficulties with interpreting information about the world and transforming it into a quantitative measure of value.”²⁰

Monetary Value

Monetary value, whether derived or direct, is the value that markets place on a good or service and is usually (but not necessarily) expressed in money terms. This value depends on many factors, such as: the moral values and preferences of the buyers and sellers; the technologies available to convert into finished goods and services; the distribution of ownership; and the institutional framework within which markets operate – for example, systems for recording and enforcing agreements.

Derived and direct monetary values capture value in real-world markets. If you can directly trade an asset on the market, such as a stand of timber, it has direct monetary value. Derived monetary value is used when there is no way to determine direct monetary value. The value of an uncut forest in terms of not only the

19. Peter Barnes, “Who Owns The Sky? Our Common Assets and the Future of Capitalism,” to be published by Island Press in 2001.

20. Gretchen Daily, ed.: “Nature’s Services: Societal Dependence on Natural Ecosystems” (Island Press: Washington, DC and Covelo, California, 1997) p.7.

timber but also the non-timber products and the ecosystem services it provides can only be assessed through derivative techniques.

When an asset has the potential to create two or more streams of benefits, but we are able to value only one, it is termed the lower bound value. In general, natural assets create streams of benefits for human beings in one of three ways:

- Material inputs to the human economy, such as bananas, timber, or fish.
- Amenity services, such as opportunities for recreation, wildlife observation, scenic views.
- Life-support services (sustaining functions) such as livable climate, breathable air, and assimilation of wastes.

In some cases, the market value of a good may reasonably represent its asset value. For example, commercial quotas to harvest in perpetuity one pound of halibut in Alaska every year are trading for \$6 per pound, so the asset of permanent access to this fishery is worth \$6 per pound. But when only the services or products provided by an asset are traded in markets, the asset value is the capitalized value of the stream of service values. Thus, an asset that generates \$100 of cash flow per year would trade for \$1,000 if the interest rate is 10% and a market for the asset exists. Assets created by society (such as a right to issue government-insured debt or an historic district) also create benefit streams in broadly similar ways. Attempts at valuation must consider both the monetary and non-monetary values of each of these three streams of benefits.

Non-Monetary Value

Non-monetary value refers to value that cannot be captured by price. Some argue that most of nature's services fall or should fall into this category because, by attaching a price, a natural resource becomes immediately vulnerable to market forces. Non-monetary value illustrates the intangibles of our environment - both natural and built - that appeal to people's sense of well-being, to aesthetics, to spirituality, and to the sense that there are aspects of this world over which humans do not or should not have dominion. The concept also includes valuable societal assets that cannot easily be priced, such as freedom of speech, fairness of the legal system, and open, honest government. These values are often expressed in poetry and prose, in photography and on canvas, in rhetoric and in quiet reflection, and in a willingness to protect such assets against threat.

Non-monetary value can be of two types: instrumental value and intrinsic value. Instrumental value means that the asset is of use in bringing about human objectives such as the definition and survival of the community. Intrinsic value describes the inherent integrity of an asset in its own right, quite apart from any human ends or objectives. The purpose of recognizing and naming a common asset's non-monetary value is to set parameters for its use, rather than establish specific quantitative values.

Governing Common Assets

One way to structure common ownership is to delegate it to government. This is not the only way, however, and may not always be the best.

The federal government has mismanaged some of the natural resources entrusted to its care. The experiences of National Forests and Indian Trust Funds present two examples of mismanagement of assets.

Why Not the Federal Government?

The U.S. Forest Service manages 192 million acres in all but a few of the states. For most of the 20th century, the Forest Service focused on timber and mineral production rather than ecosystem conservation. As a result, national forests were scarred by clear cuts, logging roads, stream sedimentation, and mining wastes. Over time, taxpayers have even subsidized this degradation by funding billions of dollars of road building to provide private companies easier access to timber. Most people agree that the purpose of the national forests is to benefit the public, with private use allowed only as it does not interfere with the public's benefit. Yet, critics argue, "the Forest Service's timber program is beneficial chiefly to politicians in Washington, to a small segment of the timber industry, and to the Forest Service's administrators. Taxpayers, small communities, recreationists, the owners of private timberland – and the land itself – all lose.²¹"

Another example of mismanagement involves the Interior and Treasury Departments. For more than a

century the two departments have managed trust funds for hundreds of thousands of Native Americans. The funds were intended to compensate Indians for use of their land; royalties from petroleum, timber, and other resources were to be paid to account holders, many of whom are desperately poor. In 1996, the Native American Rights Fund filed a class action lawsuit alleging that the government had so badly managed the accounts that recipients had lost billions of dollars. The federal judge hearing the case found the evidence "overwhelming" that the government had failed to perform its duties.

The purpose of these examples is to highlight the challenges of designing a truly transparent, accountable, and democratic governance structure for common assets. There may be a role for the federal government, as long as it meets these objectives.

Structures and Instruments Needed

Although rarely thought of in relation to resource conservation, there are a variety of non-governmental structures through which assets can be owned by, or on behalf of, large numbers of people. These include joint stock corporations, mutual funds, pension funds, and trusts of many sorts. One way to structure ownership of common assets that generate revenue is to set up a trust whose beneficiaries are citizens, present and future. Such a trust would privatize the income generated by the natural asset, while retaining undivided common ownership of the asset itself, which is essential for preservation.

Critical questions in designing a trust for this purpose include: Who are the trustees? How are they appointed? How are they held accountable?

21. Perry Knize, "The Mismanagement of the National Forests" The Atlantic Monthly, October 1991.

The key components of any governance structure, whether it is a trust or some other structure, should be transparency and accountability.

Transparency means that citizens should be able to see where every dollar that is generated by the common asset comes from and goes. Shareholders should receive audited annual reports with complete financial information, and additional information should be available at publicly accessible sites like the world wide web.²²

Accountability should be built into the legal structure. Like a joint stock corporation, a trust is a market-based entity that can own and manage assets, charge for use of its assets, and distribute income to individuals. Unlike a corporation, however, a trust can be given to a long-term mission - in this case the preservation of the common asset - which its trustees are legally bound to fulfill. If trustees deviate from the long-term mission, they can be sued.

Tradable carbon emission permits are one property rights tool for natural assets. Permits would be sold to companies that bring fossil fuels into the U.S. economy, each representing the right to emit one ton of carbon into the atmosphere. These permits would be attached to carbon as it leaves the coal mine, oil or gas well, or shipping port. The reason for attaching the permits upstream is that it is much easier to track carbon as it begins to pass through the economy, rather than at the end as it comes out of tail pipes, chimneys, and smokestacks. Companies could buy and sell permits to suit their needs, and would need to own enough permits to cover the amount of carbon they introduce into the economy each year. Revenue from permit sales becomes a stream of benefits and is, eventually, distributed to all citizens.

Another governance tool needed is a vehicle for paying equal dividends to all citizens. In the cases of common assets which can generate significant revenue - such as the carbon absorption capacity of the sky - payments can be made directly to citizens as they are in the Alaska Permanent Fund described in the next section.

22. Peter Barnes, "Who Owns The Sky? Our Common Assets and the Future of Capitalism," to be published by Island Press in 2001.



How a Sky Trust Would Work: A Governance Proposal

The Sky Trust's mission would be to preserve the mix of gases in the sky for future generations. Its trustees would thus be accountable not only to citizens of today, but also to citizens yet unborn.

In practice the trustees would have three responsibilities:

- 1) Issue and monitor carbon emissions permits up to the limit established by Congress,
- 2) Receive market prices for those permits, and
- 3) Distribute the income equally to all shareholders.

In the event of a conflict between the trustee's responsibilities, preservation of the sky takes precedence.

Sharing Benefits of Common Assets

Common assets directly provide benefits – services or goods, for example – to owners. In many cases, owners receive benefits without any payment for them by virtue of being part of a community of owners.

But when a framework is created so that major users of a resource are charged – when polluters are required to purchase emissions permits or broadcasters required to lease a section of the broadcast spectrum – a stream of revenue suddenly appears. Benefit sharing arrangements are essential to ensure that this revenue either returns to the owners, or is reinvested in the asset or the development needs of the community.

Distribution of Revenues

The Alaska Permanent Fund (APF) offers a real-life example of using a trust to establish common assets property rights and distribute revenues. When oil began flowing from Prudhoe Bay in the 1970s, Alaskan voters established the APF, a managed trust for all current and future Alaska residents, separate from the state treasury. The APF receives 25 percent of the state's oil revenue, which it invests in a diversified portfolio of stocks, bonds, and real estate. Income from these investments is divided into two segments. About half is used for schools and highways and the rest is paid in equal dividends to all Alaskans. This year (1999), every citizen received a dividend check for \$1,770; households of four received \$7,080.²³

Another example of an arrangement that distributes commonly owned revenues includes state trust lands, a little known part of American history. Lands held in trust by the states were granted by Congress to most states at the time they joined the Union, beginning with Ohio in 1803 and ending with Alaska in 1959. State trust lands currently total about 135 million acres in 22 states. The land grants were made to support common schools and similar public institutions but the original grants did not clearly establish a perpetual trust. Perpetuity became a component of various school trusts when the “permanent school funds” were established. The first such fund was established in Michigan in 1849, and most states have enacted numerous subsequent provisions for supplementing their funds and for protecting them against either loss or diversion to other uses. The value of the permanent funds in 1996 was over \$27 billion. About \$3 billion of revenue from these funds was distributed to beneficiaries in 1996, and an additional \$1.5 billion was distributed to beneficiaries directly from land management activities.

Cropland and grazing leases, timber harvest, and extraction of minerals (including energy minerals such as oil, gas, coal, and geothermal) generate the bulk of current revenues from state trust lands but the revenue generated by the use of these lands may be much lower than it would be if free markets were to operate. The policies governing these lands are complex and have changed dramatically over time.

Future policy work on management of common assets should build on what has been learned (and often forgotten) from management of the Alaska Permanent Fund and State Trust Lands history.

23. T.A. Badger, “Dividend Sets New Record in Alaska,” The Associated Press, AP-NY09-23-99.

Reinvesting in Resources and Community Development

Revenues generated by common assets could also be used to reinvest in the resources themselves and in community development activities. The Edwards Aquifer Authority (EAA) manages the Edwards Aquifer in Texas and relies on user pumping fees, among other tools, to manage the withdrawal of water from the Aquifer. In years 1996 – 1997, \$2.3 million of the \$5.2 million operating budget for the EAA was provided by pumping fees paid by water users.²⁴ The EAA engages in a variety of activities to improve the condition of the resource including long range regional planning, study of different management strategies, encouraging best management practices that conserve water through a loan program for agricultural water conservation, and an Agricultural Water Conservation Award. EAA also collects data on water levels, streamflows, springflows, rainfall, water quality, and pumpage. Education and media efforts include an extensive informational website (www.e-aquifer.com) and efforts with local newspapers to provide information about and build public awareness of the Edwards Aquifer.

It is especially important to reinvest revenues in non-renewable resources, such as minerals. There is a great deal of research and practice in the area of mineral taxation policy that might inform reinvestment systems for nonrenewable common assets. The economics of mineral exploitation, along with the attendant environmental damage, has encouraged far-sighted policy makers to treat the development of such non-renewable natural resources in a special fashion for specific reasons.²⁵

Resource development is typically a boom-bust process. From coast to coast, the U.S. is littered with the ghost towns of previous eras. The ravages of such development lead many policy makers to believe that tax revenues are needed to pay for today's social costs and to help build a more stable, far-sighted, diversified economy for the future.

Although mineral taxation results in some allocative inefficiencies (in fact, all taxes do), taxes are levied against an industry where supernormal returns are quite common. If done properly, this vast storehouse of wealth can be taxed with minimal impact on production.

Mineral tax revenues could also be used to capitalize trust funds to save mineral wealth for future generations. Mineral trust portfolios typically target some capital into in-state job creation/diversification and recycle other monies back into national capital markets.

Savvy approaches (like the proposed Sky Trust) also seek to avoid tapping these revenues for ordinary government expenditures. In addition to earmarking monies for long-term investment, such revenues have been used for land reclamation (in the wake of strip mining), needed public services and infrastructure (during the growth period) in mining communities, and counter-cyclical funds (for state “rainy day” programs).

The emerging field of common assets should study closely the lessons of this experience in designing its strategies:

- Are special leasing or taxing approaches needed to deal with a particular natural resource industry?
- How is the environmental damage to be contained?
- How is reclamation to be financed?
- How successful have resource trust funds been, in terms of rate of return and economic development?
- Could the common assets and trustee themes of this paper be applied in some new ways to mineral development operations?
- Should coal companies, for example, become “trustees” of the coal that it owns and be directed under the terms of its trust document not to pollute the groundwater from its mining operations?

24. Ronald Kaiser and Laura Phillips, 1998. “Dividing the Waters: Water Marketing as a Conflict Resolution Strategy in the Edwards Aquifer Region.” *Natural Resource Journal*. V. 38 No. 3, Summer Pgs 411 – 444

25. A 1996 account of this industry as a vehicle for economic development can be found in Thomas Michael Power’s “Lost Landscapes and Failed Economies: The Search for A Value of Place.” The book argues that communities should not become overly dependent on this economic engine and that appropriate tax, regulatory, leasing, and investment strategies are needed to address the potential downsides of the industry.

Moving Beyond the Sky: Other Common Assets

The common assets approach might be applied to a host of other commons and public goods. Research should consider:

- fisheries - economic, cultural, subsistence, and biological value of free fish
- aquifers - economic, cultural, subsistence, and biological value of free fresh water
- wetlands - ecosystem services, such as water filtration and habitat protection
- coral reefs - biological and ecosystem services
- mines and minerals - on public lands
- grazing lands and grasslands - on public lands
- forests - on public lands
- wildlife - economic, cultural, subsistence, and biological value of wild life

There may well be an additional category we can call “social” common assets that includes things like:

- the genetic library in living things - the “program” for life on earth

- the broadcast spectrum - the ability of electromagnetic fields to transmit information
- the internet
- historic sites, monuments, and districts

Next we explore three natural common assets (the atmosphere, the Edwards Aquifer, and Alaskan Halibut) and one social common asset (the broadcast spectrum). Each was picked because common ownership claims and impending scarcity make them useful illustrations of the common assets idea. These examples also represent varying levels of common asset ownership: the atmosphere represents global or national ownership, the broadcast spectrum national or regional ownership, the halibut fishery regional ownership, and the Edward’s aquifer local ownership.

Natural Common Assets

The Atmosphere: Who Owns the Sky?

Attributes

The service of the sky most talked about in recent years is its role in regulating the earth’s climate. The atmosphere also currently provides free disposal for greenhouse gases, in the sense that those who emit these gases do not have to pay for disposal. Of course this disposal is not really free, since we and future generations will bear its cost through an altered global climate.

Historically, the atmosphere has been viewed as too vast to be owned or apportioned by people. Thus, no

modern statute or judicial ruling in the U.S. has assigned ownership to the atmosphere. It is important to distinguish between the ability of the public to assert its right to a clean atmosphere and the obligation of the government to promote those interests on the public's behalf. While a legal basis for public ownership of this asset has become more difficult to establish in today's legislative and judicial climate, there is no demonstration that the opposite is true, that is, that the public's interest in the asset has in any way truly diminished. What remains, therefore, is a policy debate over whether the government, as trustee, is capable of adequately representing and upholding the interest held by the public in keeping the atmosphere free from pollutants and in its natural form.

The importance of global climate change and other effects of widespread atmospheric pollution have recently necessitated action at an international level. The United Nations Framework Convention on Climate Change, adopted in May 9, 1992, acknowledges that change in the earth's climate and its adverse effects are a common concern of humankind.²⁶ The Framework Convention asserts a general understanding, as also stated by the Rio Declaration, that the global commons are assets to be protected in the public interest, primarily with respect to human health and future generations.²⁷

If charges (or auctioned tradable permits) for carbon dioxide from energy emissions are imposed in the U.S., a financial cost will result. A wide variety of studies have examined the permit price required to reduce carbon dioxide emissions in the U.S. enough to meet the greenhouse gas target in the Kyoto Protocol (seven percent below the 1990 emissions level). Estimates range from as low as \$23 per metric ton to over \$265 per metric ton of emissions (measured

in tons of carbon). Not all estimates within this wide range are credible, yet even after less-than-credible estimates are removed, significant variation exists. The emissions level required to meet the U.S. target in the Kyoto Protocol is about 1.5 billion tons of carbon, total. If this reduction is obtained entirely by reductions in carbon emissions from energy use, such emissions need to fall to about 1.2 billion tons in 2010. Multiplying by the per ton estimates above, the resulting revenue ranges in the U.S. from \$30 to \$300 billion per year. Revenue will be toward the low end of the range if the cost of adjustment to higher energy prices is small.

Policy Issues

Today, governments at the federal, state, and local levels essentially regulate the atmosphere on behalf of the public, although this function is not explicitly stated in the Clean Air Act or its legislative history. The U.S. Environmental Protection Agency (EPA) has the lead role in implementing the Act, but - as with most common assets - private interests retain a significant number of "management" or "user" rights over the atmosphere, as regulated under the authority of the federal government and the states. Federal and state governments regulate the activities of private interests in order to protect air quality on behalf of the public.

Federal regulation became necessary because of the vast scale of the atmosphere and the need to provide uniform legal standards and remedies for the entire country. While Clean Air Act legislation is highly complex and comprehensive in scope, several basic common law functions are incorporated into the fabric of the Act. For example, the Act assures a prominent role for state and local governments to regulate and implement its objectives, recalling the

26. United Nations Framework Convention on Climate Change, Preamble, available at <http://www.unfccc.org/resource/conv/conv.html>.

27. See, for example, Rio Declaration Principle 1, stating, "Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature."

original police power of the states to regulate common property. The Act itself is based, in part, on a need to remedy conflicts resulting from air pollution crossing state boundaries, in which the health or welfare of citizens of one state are threatened by pollution originating in another.²⁸ Section 116 authorizes state and local governments to continue to enforce their own emission standards and pollution controls (so long as they meet or exceed federal standards).²⁹ The policy objective of the Act “to protect and enhance the quality of the Nation’s air resources so as to protect the public health and welfare [of] its population” also reflects the old doctrine of treating the atmosphere as a common resource belonging to the public.³⁰

28. *Ibid.*

29. Clean Air Act, §116. See also Rodgers, §3.1.

30. Clean Air Act, §101(b)(1).

31. Geographical information is from “The Edwards Aquifer: Conflicts Surrounding Use of a Regional Water Resource;” population information is from <http://www.artesis.eard.swt.edu>.

32. <http://www.artesia.eardc.swt.edu/EndangeredSpecies.html>

33. Richard L. Bowers, Kerry E. Keiser, Tri M. Truong, Daene C. McKinney, and David W. Watkins, Jr., “Chapter 3: Economics and Development,” in “Management of the Edwards Aquifer: A Critical Assessment” (Center for Research in Water Resources, Bureau of Engineering Research, College of Engineering, U.T. Austin. Austin, Texas, 1993).

34. *Ibid.*

Policy makers appear likely to pursue a tradable emissions permit system to limit greenhouse gas emissions. The U.S. will rely on greenhouse gas trading to slow climate change because the Clinton Administration, private industry, many members of Congress, and a number of NGOs support it. In fact, President Clinton’s Climate Change Proposal states, “The President is committed to a market-based emissions trading system, both domestically and internationally, that will harness the power of the market to reduce emissions.”

Whether or not policy makers rely on emissions trading to slow global warming, they have a choice: to give away the rights to pollute the atmosphere or to charge emitters for their greenhouse gas emissions, either through auctioned permits or pollution taxes. What choice they make determines whether the atmosphere is managed as a common asset, such that emitters are charged for their use of the atmosphere, or it is managed for the benefit of the narrow group who would receive free emissions permits.

The Edwards Aquifer: Managing a Common Asset for the Future *Attributes*

The Edwards Aquifer of South Central Texas is the sole source of drinking water for 1.5 million people in parts of 8 counties, including all of San Antonio, the tenth largest city in the nation.³¹ In addition to drinking water, the aquifer provides a wide array of essential services to the surrounding community. The beneficiaries include a sizable agricultural sector, some of the area’s most valuable businesses, and one of the most diverse underwater ecosystems known.³² The Edwards Aquifer has continually been threatened by drought and overuse, forcing the legislature to take action to better protect and preserve it.

Because the demand for aquifer water is expected to increase dramatically in the next 50 years, limiting water use has become a top priority for the Edwards Aquifer community. If, for example, water use is not brought under control, and farmers’ water efficiency remains constant, the increased costs of pumping from lower water levels will cause a 12% decrease in farmers’ profits.³³ Furthermore, the Comal and San Marcos Springs account for approximately 5 to 6% of the economic output and 5% of the employment in Comal and Hays Counties. If these springs were to run dry, up to 90% of the economic activity related to them could be lost.³⁴ The Edwards Aquifer is the driving force behind the agricultural economy and a wide variety of other economic activity that would be devastated if the water were to run out.

The economic power of the Edwards Aquifer is limited by its delicate and vulnerable hydraulics. The Edwards Aquifer is an unconfined aquifer, which means that water can be easily extracted, but that it is vulnerable to pollution. The aquifer’s unconfined

quality also means that it can only be recharged up to a certain amount, generally 640,000 AF/year, before it floods. The extreme variability of rainfall (between 19 and 46 inches in San Antonio) and recharge (200,000 - 2,500,000 AF) between 1987 and 1997 alone only magnifies the need for careful stewardship of the asset. In addition, demand for water from the Edward's Aquifer is expected to double by 2050.

The need for careful stewardship was underscored even more poignantly when low water levels occasionally dried up the Comal and San Marcos springs. This greatly threatened the many species of wildlife that are unique to these springs, as well as the downstream communities that depend upon the springs. In order to prevent an ecological catastrophe, the Sierra Club sued the Secretary of the Interior and the U.S. Fish and Wildlife Service for failure to perform duties under the Endangered Species Act. The Sierra Club's victory paved the way for the creation of the Edward's Aquifer Authority, which is trying to conserve the asset through a tradable water permit system.

The Edwards Aquifer Authority has created an Interim Authorization Permit Process. Permits are leased for \$70-\$100/AF/year.³⁵ While this figure does not necessarily represent the market value over the long term, and likely varies with use, it does provide at least a rough estimate for the value that residents assign to use of water in the area. If we multiply this figure by the average demand for water over the past decade (443,800 AF), the value of the water comes to \$31 to \$44 million/year.

Managed sustainably, a more modest amount of revenue could be generated. The Edwards Aquifer Authority has set 400,000 AF to be a sustainable rate of extraction. It is important to note that, due to wide

variations in rainfall, 400,000 AF still may be too much in some years, and too little in others. Regardless, 400,000 AF is still the most credible estimate of a sustainable rate that is available. Using the lease price of \$70-\$100, a maximum sustainable rate of extraction could generate \$3 to \$4 million of revenue per year. The revenue could then be used to reinvest in the resource and communities, ultimately providing tools for long term sustainable use of the Aquifer. For example, the revenue could be used to develop technology that would allow more efficient use of water and make that technology available to the general public at a low or no cost. This technique is, in fact, the strategy behind the Edwards Aquifer Authority as described below.

Policy Issues

The Edwards Aquifer Authority faces ongoing public scrutiny and controversy surrounding this immensely important resource. The EAA is striving for a balance between the environmentally sensitive nature of the resource and the high demand for water to support the local economy. Governance of this asset evolved over time and as the people and legislature of Texas recognized the need to regulate the Aquifer, it came under state management, ultimately leading to a permit system for water withdrawal under the Edwards Aquifer Authority. The Edwards Aquifer Authority currently has authority over the management and use of the Edwards Aquifer on behalf of the people of Texas, and according to the Texas courts, the aquifer is held in the public commons. The central component of the current governance system is a permit system that allows the purchase, lease, and trade of water rights.

The EAA is harnessing the demand for water by charging money for permits then using that revenue to fund its planning, management, education, and

35. Personal Communication with Geary Schindel, Chief Technical Officer, Edwards Aquifer Authority.

incentive programs. By reorganizing how rights to the Edwards Aquifer are owned, Texas has developed a more efficient and effective system of management for a highly integral and delicate resource. The EAA is still new and continues to face challenges from property and water rights proponents. Yet, the legislature has clearly recognized the public interest in the Aquifer and the need for better management. By taking this common assets approach to ownership of water rights, the EAA has a better chance of distributing the resource more efficiently, more equitably and with greater protection in the long run.

The Halibut Fishery in Alaska:

An Ancient Commons

Attributes

Fisheries have traditionally been viewed as the property of the commons rather than the property of any one individual. Historically, fisheries have been considered part of the public commons until captured. Over fishing, however, spurred policy makers to create regulations and incentives for protection of fishery stocks.

Although fisheries have been treated as a publicly owned resource since 1215, there is widespread dissatisfaction with current management systems. Fisheries are in decline worldwide. In Alaska, before 1995, the halibut harvest was regulated by alterations in the length of the fishing season. In response to increasingly efficient harvesting technology, the fishing season was gradually shrunk from five months in 1970 to two 24 - 48 hour openings by the late 1980s.³⁶ Facing such a narrow window of opportunity, fishermen found themselves forced to harvest even during dangerous weather, and often in heated competition with each other. Subsistence claims by Native Alaskans raise additional challenges that have not been addressed.

Using values from the individual transferable quota (ITQ) system, the value of commercial access to wild halibut in Alaska is estimated to be near \$370 million (61 million pounds of fish each year times \$6 per pound).

There are 625,000 Alaskan residents, or about 260,000 Alaskan households (based on 2.5 person occupancy). The commercial halibut fishery, then, could generate approximately \$140 per household per year if scarcity rents accrued were paid directly to households, equally. A similar valuation attempt shows that selling the ITQs - rather than giving them away - could have generated about \$1,400 per Alaskan household when the ITQ system for commercial halibut fishing was implemented.

Policy Issues

Fishery conservation through government regulation has evolved from virtually no regulation to Federal command-and-control regulation. Recently though, by carving out small bits of rights to fisheries, such as with ITQ programs, government has been able to better protect the resource. Fisheries are still commonly owned in the public trust but their management has become based more and more on allowing selling and trading of rights to exploit the resource. Today, there are a wide array of fishery management tools in use, ranging from regulatory limits to market-based incentives. Community-based management tools have also been particularly effective in some areas.

The Alaskan fisheries are embarking on a new frontier of fishery management through use of innovative Community Development Quota (CDQ) programs that have proven to be an effective tool for management of halibut. The striking feature of the CDQ program is that revenue from use of the resource is reinvested directly into communities in the form of capital, edu-

36. "Flat Out Facts About Halibut", page 1

cation, and technical and financial assistance. Greater long-term environmental stewardship is one of the anticipated outcomes of this program.³⁷

Social Common Assets

Social common assets have historically been known as public goods, an economic concept that has existed for decades and which is becoming more popular and salient as an approach to modern global challenges. Recent work by the United Nations Development Program makes a compelling case for expanding the economic concept of “national public goods” to address the challenges of “global public goods.” They propose that international turmoil today “reveals a serious under provision of global public goods,” such as peace, justice, health, market efficiency, equity, and environmental sustainability. Without these goods, they argue, “human security and development will be elusive.”³⁸

Social assets, defined as common assets that have been built up over time by multiple generations, may require an entirely different framework than the one laid out in this paper for natural common assets. An example of an asset that may in fact be both a natural AND a social asset is the broadcast spectrum.

The Broadcast Spectrum: Rethinking the Rules of the Airwaves Attributes

Since it was first regulated in 1912, the broadcast spectrum has been viewed as an asset to be managed and used in the public interest. Courts and federal officials have traditionally regarded broadcasters as public trustees of the airwaves. While it cannot be specifically said that people “own” the broadcast spectrum, its use must unequivocally further public objectives. The broadcast spectrum was simply not known as an exploitable resource until Guglielmo Marconi’s famous wireless radio transmission first took place in

Pontecchio, Italy in 1895.³⁹ The rapid growth of the broadcasting industry in the United States early in this century led to widespread recognition not only of the spectrum’s great economic importance, but also of its invaluable role in promoting the public interest and upholding the very foundation of American democracy, freedom of expression.

The spectrum is an asset that society created through our development of technology and our need for communication. As the limits of the spectrum were met, the ability to broadcast on it became a scarce and valuable service. The broadcast spectrum is incontrovertibly an inherited asset, not from anyone’s parents, but from the common creation. As none other than Bob Dole stated when he was a senator, “The bottom line is that the spectrum...belongs to every American equally. No more, no less.”

Although the spectrum’s value is partially intangible, some rough estimates can be made that convey an understanding of the broadcast spectrum’s worth. Our estimate for the broadcast spectrum is a lower bound value. We have derived it through summing up Congressional Budget Office estimates of analog⁴⁰ and digital⁴¹ television licenses, a calculation of the value for radio broadcast licenses (using a methodology that is outlined in the National Telecommunications and Information Agency’s report, “U.S. Spectrum Management Policy: Agenda for the Future⁴²”), as well as the revenue from auctions of FCC licenses that have occurred as of November 1999. The broadcast spectrum as it is currently organized would probably trade (once) for \$80 to \$100 billion. That amounts to a financial asset of \$700 to \$900 for every American household if distributed evenly. Investing the revenue raised if the asset were auctioned, again at 10% return on investment, would generate annual revenue of \$8 to \$10 billion in perpetuity, or between \$70 and \$90

37. National Research Council (NRC), “The Community Development Quota Program in Alaska” (National Academy Press: Washington, DC, 1999), p. 215.

38. Inge Kaul, Isabelle Grunberg, Marc A. Stern, “Global Public Goods: International Cooperation in the 21st Century” United Nations Development Programme (Oxford University Press, 1999).

39. See <http://eagle.uccb.ns.ca/marconi/marc1.html>.

40. FCC estimate quoted in Congressional Budget Office, “Where Do We Go From Here? The FCC Auctions and the Future of Radio Spectrum Management,” Chapter 3 (1997). available at <http://www.cbo.gov/>.

41. Ibid.

42. National Telecommunications and Information Agency, “U.S. Spectrum Management Policy: Agenda for the Future,” Chapter 4 (1991).

per American household per year in perpetuity. In addition to communication, the broadcast spectrum is also used for public services including public safety, national defense, international communications and amateur use, as well as various scientific uses. Our valuation does not take into account any of these services. The many values of the broadcast spectrum are good examples of how many types of values common assets can contain.

Another opportunity to generate revenue from this common asset was lost when licenses for digital broadcasting were given away (in the Telecommunications Act of 1996) to those who already owned analog TV licenses. The estimated market value of digital television licenses is around \$12.5 billion.⁴³ At a 10% rate of return this part of the spectrum, alone, would generate more than twice the current, average annual cost of television time for political advertisements for federal office (about \$600 million).

Policy Issues

A market-based model of regulation has been devised to help better allocate private use of the public airwaves. This has put into question the traditional assertion that the broadcast spectrum is held in the public trust. Starting in the late 1970s, emphasis on the role of broadcasters as public trustees diminished while their role as market participants increased.⁴⁴ In light of this trend, emphasis on a private market model might suggest a move towards viewing broadcasters as “owners” of the broadcast spectrum, receiving private property rights allocated through price. In a *common assets* approach, use of the spectrum could be auctioned instead of given away and generate a substantial source of revenue for citizens or for public broadcasting purposes.

Changes brought on with the Telecommunications Act of 1996 appeared on the surface to liberalize broadcast regulation. Some argue that despite these changes, the basic elements of the Communications Act of 1934 remain essentially unchanged and intact with the 1996 Act. Indeed, scarcity continues to be treated as the basis for public interest and trust in the broadcast spectrum. Another critical change in the rules for licensing broadcasters was Congress’s lifting of the prohibition against license auctioning. Congress authorized an “experimental” use of auctions in the Balanced Budget Act of 1997, under which the Commission would be allowed to auction licenses for Personal Communications Service (PCS) frequencies for mobile telephones.⁴⁵ It is yet to be seen how brief experience in market-based licensing may develop into further flexibility for the broadcast industry to operate on the “public’s airwaves.”

While the arguments for market-based regulation often appear to be gaining in strength, political debate has been very vocal on the disservice to the public liberalizing broadcast regulation would cause. While acknowledging the importance of promoting an efficient regulatory and economic framework for the broadcast spectrum, numerous political leaders have viewed liberal broadcast licensing as another form of “corporate welfare,” particularly at a time of budget crisis. Criticism from both sides of the political aisle has pointed to a number of free-market legislative initiatives that ignore the underlying value of the asset to the public at large.⁴⁶ Former Commissioner Ervin S. Duggan, for example, has stated that as a legal matter, “FCC licenses, even those awarded by auction, must never be viewed as outright sales; they are more akin to contracts or leases that revert automatically to the public domain if the terms are broken.⁴⁷” Bipartisan interests held up the Telecommunications

43. Congressional Budget Office, “Where Do We Go From Here? The FCC Auctions and the Future of Radio Spectrum Management,” Summary (1997), available at <http://www.cbo.gov/>.

44. Creech, at 70.

45. Balanced Budget Act of 1997, §3002 amending Section 309(j) of the Communications Act of 1934. See Logan, at 1693.

46. Hazlett, pp. 938-940.

47. Ervin S. Duggan, Spectrum Licensing in the ‘90s: Can We Find A Way?; Remarks before the American Mobile Telecommunications Association SMR Leadership Conference (June 24, 1992), available in 1992 FCC Lexis 3479, p.*8. See also Krystilyn Corbett, Note: The Rise of Private Property Rights in the Broadcast Spectrum, 46 *Duke L. J.* 611, p. 643-644 (December 1996).

Act itself when arguments were raised that High Definition television licenses were another form of “corporate welfare” and a “license giveaway” to broadcasters.

What recent political debate may lead to in terms of capturing the value of the “public commons” in the broadcast spectrum remains to be seen. Whether that value can be directly passed to the public poses yet another level of uncertainty, and may add considerably to the debate. What is clear, however, is that the spectrum is a common asset and existing governance of it does not recognize common ownership.

Wanted: Other Social Common Assets

Peter Barnes, originator of the Sky Trust idea, argues that the focus of a social assets effort should be to identify one or more assets that have significant revenue generating potential. In his unpublished book he proposes “sharing the river of liquidity.” When he considered taking his company Working Assets public, he learned that his business was worth a lot more as a public company than as a private company. The extra value came from the fact that the stock would be liquid, and could be sold. According to his investment banker, liquidity alone would add 30 percent to the value of the stock:

That added value comes not from the company itself, or from its CEO, but from society – from the public stock market and the entire infrastructure of government, financial institutions and media that backs it up. Yet this enormously socially created value is reaped by only two kinds of people: underwriters (who get fees) and private shareholders (who get large capital gains). Indeed it is fair to say that most fortunes in America are made by shareholders who make the magic leap from non-liquid private stock to very liquid public stock.⁴⁸

In sketching out how the value of this social asset might be more broadly shared, Barnes proposes that every time a private company goes public, it pays royalty to the general public for using the wealth creating “river of liquidity.” A giant mutual fund might hold 5 percent of the stock of all publicly traded companies and be owned by every citizen, on a one citizen, one share basis. Shares might be redeemable at age 65 to provide an extra nest egg for retirement. As far fetched as this may sound, it shows how social assets exist and that recognizing them as common assets could “lift all boats.”

In another provocative idea, could the Annapolis Historic District in Maryland be considered a social common asset? Although the District includes primarily private property owners there is a public interest in the preservation of the city, and the value of the historic district adds to the values of private property within its boundary. Historic preservation laws have been consistently upheld as a legitimate means of promoting the public interest in buildings of historic or architectural value. While no laws grant explicit “ownership” rights of historic assets to the public itself, legal precedent provides a strong basis for viewing the protection and preservation of these assets as a legitimate public interest. The federal government implemented broad programs to preserve historic landmarks of national importance with the adoption of the National Historic Preservation Act of 1966.⁴⁹ As stated in the Act:

It shall be the policy of the Federal Government...foster conditions under which our modern society and our prehistoric and historic resources can exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations; [and] administer federally owned, administered, or controlled

48. Peter Barnes, “Who Owns The Sky? Our Common Assets and the Future of Capitalism,” to be published by Island Press in 2001.

49. Public Law 89-665; 16 U.S.C. 470, as amended.

*prehistoric or historic resources in a spirit of stewardship for the inspiration and benefit of present and future generations.*⁵⁰

50. Ibid. §2. The Act also declares that "the preservation of [the Nation's] irreplaceable heritage is in the public interest so that its vital legacy of cultural, educational, esthetic, inspirational, economic, and energy benefits will be maintained and enriched for future generations of Americans."

It remains unclear to what extent the characteristics of natural assets pertain also to social assets. Unlike natural assets, social assets are seldom discovered or appropriated; rather they are created. However, it is sometimes the case that the value of a natural asset is not recognized until a social dimension is added to it. An asset like the broadcast spectrum is of little value as nature delivers it; technological innovations and

social conventions for its use create its instrumental and its monetary derived value. The blurred line between natural and social assets has emerged periodically throughout this project and underscored the need for a deeper comparison of the characteristics of natural and social assets.

Identifying Policy Tools for A Common Assets Approach

The early flurry of environmental lawmaking that created the U.S. Environmental Protection Agency and enacted a variety of command-and-control regulations for cleaning air and water, controlling toxics, recycling solid waste, and so forth, worked.

America's air and water is cleaner. Many forms of pollution have been reduced. Americans are also much more aware of environmental dangers and committed to increased environmental quality.

But it is unlikely that further progress on this path will yield the same gains. Command-and-control regulations do not encourage the industry innovation needed to prevent pollution in the multitude of companies and production processes that characterize the U.S. economy. Regulations also rarely communicate the value of those resources to the citizens. Command-and-control approaches are also more costly to the economy than other market-based mechanisms. New policies, or combinations of policies, are needed.

In *Thinking Ecologically: The Next Generation of Environmental Policies* the authors explain this need:

Many of today's environmental problems are different from those of the last several decades. Ozone layer depletion, climate change, or endocrine disruption are less plainly apparent, more subtle, and more difficult to address than the black skies or orange rivers of the 1960s. Similarly, some of our residential environmental concerns represent unresolved problems of the past - automobile exhaust, agricultural runoff, and the loss of habitat to suburbanization - that cannot be solved by controlling the emissions of the few thousand of the largest factories in America. Instead, we must address the effects of thousands of smaller firms and farms whose releases are individually small but cumulatively large. We must also try to affect the choices of 265 million Americans whose decisions about what to buy, where to live, how much to drive, what to throw away, and where to shop profoundly shape the quality of our environment.⁵¹

Fortunately, environmental protection goals can be achieved in a number of ways, such as:

- an economic incentives approach (using economic instruments such as taxes and charges);
- a regulatory command-and-control approach, buttressed by the precautionary principle; and
- improved property rights systems.

Each approach has its advantages and limitations, a combined approach can be crafted to build on the strengths of each approach. For example, since the environment services are not recognized by markets, regulations will be required to underpin and shape most economic incentive and property right systems.

Elinor Ostrom writes that solutions to common pool resource problems (the tragedy of the commons) are usually most effective at the local and regional level. Primarily because people need to be able to see and feel the costs of resource depletion and the benefits of resource conservation. Social and cultural systems that communicate and respond to this information at the local and regional level are possible, but national and global common assets (such as the atmosphere)

51. Marian Chertow and Daniel Esty, "Thinking Ecologically: The Next Generation of Environmental Policy" (1997), p. 2.



Sky Trust Policy Framework

As described in the opening section of this paper, the Sky trust policy framework has five components;

Cap – establish a maximum usage level, e.g., 1990 carbon emission levels

Auction – sell usage rights for market value, e.g., auctions

Trade – allow trading of usage rights in secondary markets, e.g., tradable emissions systems

Rebate – recognize ownership rights, e.g., annual dividend checks

Trust – governance that is accountable to the people, e.g., the Sky Trust

require more complex management to communicate the same information. Ostrom and her colleagues argue that the challenge ahead is to develop the institutional capacity necessary to manage the commons' biological complexity, especially in the management of resources at the global level.⁵²

The common assets approach calls for a new generation of environment policies and ownership systems that draws from this palette of options. It does not aim to privatize natural resources or to turn all resources into commodities. Instead, it recognizes that economic incentives and property rights are crucial tools for overcoming the challenges of managing and regulating the use of large, complicated, and lucrative commonly owned resources.

52. Ibid.

53. Franz Thomas Litz, "Harnessing Market Forces in Natural Resources Management: Lessons from the Surf Clam Fishery," *Environmental Affairs* 335 (1994) p. 21.

54. Ibid.

Tools for Managing Natural Resources Regulation

Direct command-and-control regulation describes the first generation of environmental policies that were developed. Early versions of the Clean Air Act relied on command-and-control regulation. These, typically include enforceable standards or limits on certain uses of natural resources, usually imposed through non-transferable permits. Examples of standards include emissions standards, performance standards, and ambient environmental quality standards. In some instances government mandates a specific technology to meet the desired standard (e.g., catalytic converters); anyone who implements the technology is considered to be in compliance even if the environmental goals are not met.

Although direct regulation has its limits and problems, it lays the foundation for market-based instruments and is a critical tool for controlling toxic pollutants, further loss of endangered species, and situations where meeting a specific standard in some specific time or place is critical to public health or safety.

Command-and-control government regulation was the first stab at balancing the tragedy of the commons in fisheries. State and federal governments have placed restrictions on the number of fish caught, limited the fishing season, regulated the length of fishing trips, and restricted the type of equipment used.⁵³ In the 1970s, the government began placing restrictions on entry into the fishing industry. Even with regulation, however, fish stocks did not revive. Eventually economists suggested establishing a "system of quasi-property rights in the fishery."⁵⁴ Curiously, although fisheries started out in the public trust, it has required introducing small nuggets of property rights back into the market in order to better protect the resource.

Market-Based Instruments

Market-based instruments encourage appropriate behavior through price signals, not explicit limits or standards.⁵⁵ Market-based instruments rely on a strong underlying regulatory framework, but also provide economic incentives for firms to achieve environmental goals (such as reducing waste, water use and emissions) in their own way. Market-based instruments establish environmental goals and encourage economic innovation and efficiency, benefiting both the environment and the economy in the long run. For example, recent amendments to the Clean Air Act moved from command-and-control to a market-based trading system to provide more flexibility to industry.

A good example of the potential of market-based instruments is a trend in the American west toward leasing of water rights and creation of water markets. Water is generally treated as a public good and therefore water markets have not developed in most places because water is seen as free. In the American west however, with its contentious history of battles for water rights, water markets have emerged as an instrument for bridging the tension between water right owners and environmentalists.

The state of Montana, for example, has an innovative water-leasing program that allows farmers and ranchers to generate income by leasing their water rights to private organizations for fish habitat. The marketplace draws together historic adversaries, such as agriculture and environmental groups, into mutually beneficial relationships where property rights are traded for cash or tax credits. Market agreements seem to be working. In 1997, farmers and ranchers received more than \$10 million for 490,000 AF of agricultural water subsequently used to help protect fish and wildlife.⁵⁶

The Oregon Water Trust acquires water rights through gift, lease, or purchase and commits to keeping water in streams and rivers to protect fish and wildlife habitat. Such programs help people to view water rights in a new way, as a valuable commodity that can be traded in the market place. Though on a large scale some groups warn of the “commodification” of water, in

the American west water markets and this new way of thinking about water rights as property rights have led to new solutions to local and regional environmental problems.

Evidence to date indicates that market mechanisms can be a more economically efficient approach than command-and-control policies. The common assets approach sparks consideration of new kinds of ownership and management systems that are necessary to protect and preserve the quality of our natural environment because it asserts that people are asset owners, not corporations or the government. A common assets approach to management requires that we also examine the implications for equity, ownership, and institutional capacity for these relatively new policy approaches. These three considerations have been inadequately incorporated into market-based approaches to date.

56. Clay Landry with Clint Peck, “Dealing for Water: Western States are Creating Water Markets Without Compromising Prior Appropriation Doctrine,” *Montana Farmer-Stockman*, December 1998.



Market based instruments include⁵⁵:

Pollution charge systems – these assess a fee or tax on the amount of pollution generated, creating an incentive for the firm to reduce pollution.

Tradable permits – these set a limit or target of how much pollution is allowable, then gives away or auctions permits that add up to the total allowable amount. Permit holders can use their amount of “emission rights,” but have an incentive to reduce pollution to even lower levels so that they can sell surplus permits. Secondary markets for the sale of such surplus permits have already emerged in the industries where permits are in use.

Reducing market barriers – to allow markets to emerge, some recent efforts in California make it easier to exchange water rights. Any policy that helps markets to exist or to function better falls into this category.

Eliminating government subsidies – federal subsidies that allow producers to sell resources such as water and timber at below-market rates encourage wasteful and unsustainable practices. Eliminating such subsidies allows market prices to send more accurate messages about the environmental and social costs of certain activities.

Providing public information – allows consumers to make more informed purchasing decisions. An example is the new trend towards certification of sustainably harvested wood.

Community-Based Management

Community-based partnerships among stakeholders may include government, private sector, individuals, or nonprofits that strive to sustainably manage natural or social assets. There is no absolute definition of community-based partnership; rather, such relationships reflect an attempt to resolve resource use issues by bringing together interested parties from the affected community.

In New Jersey, for example, fishermen created a marketing cooperative to improve prices by restricting total catch levels. The cooperative also provided for revenue sharing regardless of individual boat catch to reduce incentives to over fish. Similarly, the Malpai Borderlands Group brought together ranchers and environmentalists to conserve undeveloped lands and maintain working rangelands. The ranchers sought to avoid both environmental regulations and housing developments by providing habitat for endangered species and putting ranchland under conservation easements for payment.

Although it is often true that local communities best understand their own environments, hence are best capable of managing their natural resources in a sustainable way, this is not always the case. Sheer population growth may use up the environment and its available land. New technologies may induce over-use (e.g., the chainsaw in the Amazon forest, the high velocity rifle in hunting, etc.). Community sanctions and persuasion aimed at those who wish to ignore the public good must be strong and constantly exercised. Community-based management examples provide a rich source for tools and experiences that common assets approaches can draw from.

Common Asset Policy Tools

Equity and sustainability are the guiding principles for the common assets approach. Equity is used in the sense that fairness to the least affluent, to all taxpayers, all citizens, and interested parties (for example, existing fishermen, tribes, etc) is a priority. Sustainability, the twin priority, means preservation of the asset. Administrative feasibility (ease of enforcement and flexibility) is also an essential dimension.

The following table summarizes some key considerations associated with some policy tools. The list is not exhaustive but points to policies that will be important tools in a common assets approach.

Degradation of common assets is due, in part, to the fact that they have often been appropriated by private interests; while asset shareholders receive no benefits but suffer from asset degradation. A common critique of market-based mechanisms is that they run the risk of similarly awarding the benefits flowing from these assets to a small group, rather than all shareholders. For example, as noted in the table above, when tradable permit schemes have been most recently implemented, permits have been given away rather than auctioned. Past trading schemes, such as those for fisheries and sulfur dioxide emissions, have awarded permits freely.

In the case of greenhouse gas emissions, if the polluters are not charged for emissions, it will imply that citizens do not have a property right claim to a clean environment. Rather, it will send the message that the atmosphere is owned by polluting firms. Similarly, if rights to fish in common fisheries continue to be given away it will imply that the local community does not have a real claim to the asset.

Key Policy Considerations

Policy Option	Equity Features	Sustainability Features
Pollution Charge Systems	Fairly return revenue to asset owners.	Ensure the charges are high enough to induce changes in behavior that halt the assets overuse or degradation.
Tradable Permits	<p>Maintain public ownership, do not privatize the asset.</p> <p>Compensate shareholders when asset is used by private interests.</p> <p>Avoid the development of pollution “hot spots,” where trading results in a concentration of pollution in one area due to trading.</p> <p>Allocate permits in such a way that avoids allowing private interests to appropriate common assets (e.g., the Sky Trust recommends auctioning permits rather than giving them to private interests).</p> <p>Design allocation of permits to discourage the concentration of rights by a few entities.</p>	Establish maximum levels of use to ensure the asset is not degraded.
Reduce Market Barriers (i.e. allow trading)	Remove barriers to new entries into a system by allowing trading or by not giving away rights to a limited resource to a few interests (e.g., annually giving away the same amount of water rights or emission permits will create a barrier to new utilities or farmers who wish to operate).	Allow trading to discourage the wasteful use of the resource by an entity that may have been granted more access than is needed.
Eliminate Damaging Subsidies	Stop unfair use of taxpayer money to profit private enterprise at the expense of the environment, public health, and government programs (e.g., coal research subsidies).	Eliminate subsidies that encourage the degradation of natural or social common assets.
Provide Positive Incentives	Provide public subsidies and incentives to encourage the provision of social assets such as public education that would be out of reach of low-income people.	<p>Utilize socially beneficial subsidies where appropriate, (e.g. subsidies for public transport).</p> <p>Provide incentives to encourage stewardship of social and natural assets (e.g., property tax reductions in Washington state to landowners who preserve or restore land that benefits public, such as groundwater protection).</p>
Information: Environmental and Social Labeling	Open door for broad assessment of goods, beyond price, to include equity and environment beyond the price (e.g., anti-sweatshop labels for labor practices).	Use policies to encourage improvement beyond minimum sustainability standards, such as ecolabeling of sustainably harvested timber, or socially conscious funds that informs investors of companies labor practices and community impact.

Taking the Next Steps

The essence of common assets is that ownership matters. Environmentalists tackle common resource problems by talking about proper pricing; common property theorists search for appropriate institutions.

The emphasis of our work is that ownership needs to be asserted to solve complex shared resource problems. Common assets are about seeing that nature is not given away, but rather is preserved in trust for all people.

Action

We have to change the way we think and the way we act. The common assets idea will remain only a good idea unless communities can show that the idea translates into a system of policies that improves their ability to manage their common assets.

CFED and Redefining Progress will be exploring the possibility of developing a methodology that communities can use to consider the role of common assets in their area. It would be based on the guidelines introduced in this paper and would provide tools for thinking about valuation, ownership, benefit-sharing arrangements, etc. Projects might demonstrate applications of the common assets idea, such as:

- A project to understand a resource and its value to the community. What is our commons? What is the legacy we leave for the future of our community?

- A project to use the common assets framework to improve stewardship of the asset.
- A project to increase income and wealth in a community through equitable ownership of a common asset.

One example of an application of common assets is the Cayuga Lake in Ithaca, New York. The lake serves as a vital resource within Ithaca's local ecosystem. Located in proximity to Cornell University, the lake has become the potential source for an alternative campus cooling system. The \$55 million Cornell University Lake Source Cooling Project would use lake water to cool campus buildings. The plan has been criticized by residents and Cornell students who claim the cooling project will threaten the ecological vitality of Cayuga Lake.

If Cornell moves ahead with the project, it will not be forced to pay for the use of the water resource or internalize any negative environmental impacts. The common assets framework could be applied here by helping residents and local government ask: Who owns the lake? What is its value? How will the cooling project proposal change the value? Who pays for the services it provides and for any damage to the asset? A common assets methodology could help establish common ownership, value the asset, estimate the effect of Cornell's proposal, and guide residents and local leaders towards a sustainable and equitable solution.

A new area of work by Redefining Progress involves investigating the potential of "agricultural common assets" as a natural resource management strategy. One of these assets involves Napa Valley residents' decision to utilize the ability of the local natural ecosystem to absorb Napa River's periodic floods,

referred to as nonstructural flood control. The environmental and social benefits flowing from this undertaking are clear: endangered species thrive in free-flowing rivers, farmers and Napa residents benefit from reliable flood protection, and residents can enjoy the beauty and use of a free-flowing river.

Interestingly though, it also appears that community efforts to protect themselves from dangerous flooding while maintaining the Napa River may have yielded more social assets than flood control. The process may also have created a social asset of community pride and cohesion born of success in collaboratively creating an experimental and innovative approach to a community issue. RP intends to further explore the potential for the common assets approach to improve natural asset management and to create new social assets.

Research

In 2000, the New America Foundation initiated a collaboration with CFED and Redefining Progress to research and write about common assets. The early exchange of work and ideas will evolve into a working group with a listserv and web page. By the end of the year, the three organizations will jointly host an event to introduce and promote common assets. Each organization also has a specific line of inquiry and project work on common assets.

This paper only skims the surface of many issues that the common assets approach raises. Additional research is needed to address some of the following questions:

- How might a common assets approach change how governmental natural resource agencies manage their resources?

- What are the appropriate mixes of regulatory and other tools for better assets management?

- What is the development agenda for common assets? What current subsidies, regulations, etc. harm common assets?
- Are there other global common assets (like the sky) that deserve protection?
- What are the international implications of U.S.-based common assets projects, such as the Sky Trust?
- How might we better demonstrate the link between long-term economic health and a healthy common assets base?
- How could common assets generate a long-term revenue base for further asset management/conservation?
- How might better common assets management benefit the least well off?
- Which is the most efficient and effective system for distributing dividends from those common assets that generate a stream of revenue?
- What governance structures best protect common assets? Is there a case where the federal government is the best governing body?

Appendix

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A Note from the Author

As this paper evolved, in-depth discussions of some issues (such as the legal basis for asserting common ownership) were streamlined to fit with the overall presentation of the Common Assets approach. The purpose of the following appendices is to share the detailed information that was developed and used as background for this paper but not necessarily included in the final draft. There are a few redundancies between the main body of the paper and these appendices, but the detail and discussion provided here is valuable enough to warrant including the work.

Thanks again to Orestes Anastasia, Brian Dabson, Meredith Lathbury, Ansje Miller, Brian Parkinson, and Gary Wolff for their work on these appendices.

Appendix: I

Valuing Common Assets: Issues of Economic Valuation

By Gary Wolff and Brian Dabson

One of the major challenges we face as we try to halt the degradation of the commons is the need to present a plausible case for taking action. An important step is getting to values which enable us to weigh options in an informed and rational manner. Valuing the goods and the services of the ecosystem is a complicated and daunting undertaking. In *Nature's Services: Societal Dependence on Natural Ecosystems*, Gretchen Daily is clear from the beginning that the task of valuation is more about evaluating tradeoffs than it is getting to actual values.

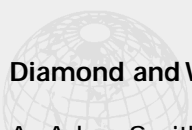
Once explained, the importance of ecosystem value is typically quickly appreciated, but the actual assigning of value to ecosystem services may arouse great suspicion, and for good reason. Valuation involves resolving fundamental philosophical issues (such as the underlying bases for value), the establishment of context, and the defining of objectives and preferences, all of which are inherently subjective. Even after doing this, one is faced with formidable technical difficulties with interpreting information about the world and transforming it into a quantitative measure of value.¹

The purpose of this valuation section is therefore to describe ways to approach the “ballpark” valuation common assets. We describe in this section the three main types of value: direct monetary, derived monetary, and non-monetary.

Monetary Value

Monetary value, whether direct or derived, is the value that markets place on a good or service, and is usually, but not necessarily, expressed in money terms. This value depends on many factors, such as the moral values and preferences of the buyers and sellers, the technologies available to convert into finished goods and services, the distribution of ownership, and the institutional framework within which markets operate – for example, systems for recording and enforcing agreements.

Direct and derived monetary value is the ability to capture value in real world markets. If you can directly trade an asset on the market, such as a stand of timber, it has direct monetary value. Derived monetary value is used when there is no way to determine direct monetary value. The value of an uncut forest in terms of not only the timber but also the non-timber products and the ecosystem services it provides can only be assessed through derivative techniques.



Diamond and Water Paradox

As Adam Smith noted with the diamond and water paradox, value is context-specific. Water is essential to life, but it is inexpensive as long as it is abundant. It sells in the marketplace for very little per unit, but those without the means to purchase it die of thirst. In contrast, diamonds are not essential to life. Although, aside from certain industrial uses, they have little functional value, they are rare and possess aesthetically desirable qualities that command very high prices. Here the market determines that diamonds are more valuable than water.

Direct Value

When markets exist, and trading can occur, direct value is determined most often as exchange value. Attributing value to an asset on the basis of a market exchange has certain limitations but is useful to obtain “ballpark” estimates. Exchange value represents a transaction between a buyer and a seller, where the buyer pays less or as much as he is willing to pay to own a good, and the seller receives more or as much as he needs to relinquish ownership. Obviously, if there is no transaction, it does not mean the good has no value – it may mean that the owner values it very highly, not just in monetary terms but for other reasons, such as emotional attachment or historical significance. Nevertheless, an exchange value can be computed based on transactions for similar goods.

In circumstances where a good is relatively cheap to provide, but where supply is limited for physical or legal reasons, a proportion of the exchange value represents “scarcity rent.” For example, the cost of pumping water from the ground might be quite small, but if there is only one well in town or surface water is polluted, then the market value will exceed the amortized construction costs and the costs of pumping the water. That extra value is the scarcity rent. The examples to illustrate common assets in this paper all have scarcity rents:

- Restricting carbon emissions into the atmosphere through caps and auctions, and regulating the use of the broadcast spectrum create monetary value where not previously recognized.
- Responses to the growing scarcity of water in the San Antonio area and of Pacific halibut off the Alaskan coast are creating new markets.

The prohibition of resource use beyond a certain limit through quotas, caps or other means raises the value of the resources that are available and encourages greater productivity of their use. In the absence of such prohibitions, the limit comes when the well runs dry or the fish are gone.

Derived Value

In the absence of trading, it is possible to derive a measure of monetary value in a number of ways:

- Complementarity – examining the market for goods and services that are complementary to the good to be valued. For instance, valuing the experience of visiting the Grand Canyon can be expressed by how much a person is willing to pay to travel there compared to the amount he is willing to pay for similarly distant places.
- Hedonic Pricing – using variations in the price paid for a bundle of goods in order to estimate the value of specific good within that bundle. This is used to value a view, a location within a school district, or some other amenity by comparing the prices of similar homes with and without these amenities.
- Contingent Valuation – determining the value of good by surveying people’s own estimates. This is usually applied when the continued existence of something is in question, such as the loss of an endangered species or the demolition of a landmark building.
- Alternative Technology – using the cost of an alternative technology to estimate the value of a function performed by the environment. For example, the value of the Chesapeake Bay or the San Francisco Bay as assimilators of organic wastewater can be estimated by applying the cost of installing treatment plants to achieve the same level of water quality.

In some cases, the market value of a good may reasonably represent the asset value. In April 2000 Britain auctioned off five frequencies of the broadcast spectrum for use by cellular phone companies. The auction generated \$30 billion in revenue from competing telecommunications companies, \$27 billion more than expected.²

When an asset has the potential to create two or more streams of benefits, but we are able to value only one, this is termed the “lower bound value.” In general, natural assets create streams of benefits for human beings in one of three ways:

- Material inputs to the human economy, such as bananas, timber, or fish.
- Amenity services, such as opportunities for recreation, wildlife observation, scenic views.
- Life-support services (“sustaining functions”) such as livable climate, breathable air, and assimilation of wastes.

Assets created by society, such as the right to issue government insured debt, or an historic district, also create streams of benefits for human beings in broadly similar ways. Any valuation attempt needs to consider the monetary and non-monetary values of each of these three streams of benefits.

In three of the examples we discuss in this paper – the atmosphere, the Edwards Aquifer, and the Pacific halibut fishery – our estimates of value are lower bounds because we have data on only one or a few of the benefits of those assets. For example, one might argue that the atmosphere is much more valuable than the range of lower bound values in this paper, or even priceless (infinitely valuable), if the value of all services provided by it were summed up. After all, could human life exist on earth without an atmosphere? As the artificial biosphere project in Arizona demonstrated, we are not yet able to create a stable artificial atmosphere. In economic theory, a resource that is essential and unique (i.e., there is no substitute for it) can have infinite value to those who own it.

Summary of Two National and Two Regional Common Asset Values

Common Asset	Estimated Capital Value per Household	Approximate Percent of Median Household Net Worth
Atmosphere	\$2,600 – \$26,000	7% – 70%
Broadcast Spectrum	\$700 – \$900	1.8% – 2.4%
Edwards Aquifer	\$1,500 – \$1,800	4.0% – 4.8%
Pacific Halibut	\$1,400	3.7%

Note: All estimates are lower bounds – that is, conservative estimates.

Our estimate for the broadcast spectrum is also a lower bound but for a different reason. Although the only human use of the spectrum seems to be for communication, we do not have adequate data on all the communication uses of the spectrum in the US. A large amount of the broadcast spectrum is used for public services including public safety, national defense, international communications and amateur use, as well as various scientific uses. We have no values for any of these services. Ten more auctions are slated by the FCC to be held in the future and the information that the FCC provides on them is too scanty to superimpose values of previous auctions on them.

But lower bound value estimates are acceptable for our purpose – to identify which common assets have significant values that society might benefit from managing in other or innovative ways. Any asset with a significant lower bound value will clearly have a larger value in total, if further information were available. The table on page 37 summarizes our estimates of the annual stream of benefits and asset value per household for each of the four assets we examine in detail later in this paper. The table also shows the percentage of median household net worth (\$37,500) in the United States that each asset represents.

The estimated values of these and other common assets may change significantly if their management or the technological, legal, moral, or institutional context change.

Non-Monetary Value

Non-monetary value refers to value that cannot be captured by price. Some argue that most of nature falls or should fall into this category, because, by attaching a price, a natural resource becomes immediately vulnerable to market forces. Non-monetary value illustrates the intangibles of our environment, both natural and built, that appeal to our sense of well-being, to aesthetics, to our spirituality, and to our sense that there are aspects of this world over which humans do not or should not have dominion. The concept also includes societal assets that we value but cannot easily price such as freedom of speech, fairness of the legal system, and open and honest government. These values are often expressed in poetry and prose, in photography and on canvas, in rhetoric and in quiet reflection, and in our willingness to protect such assets against threat.

In such federal statutes as the National Forest Management Act, the National Marine Fisheries Act, and the Endangered Species Act, we as a nation acknowledge a diverse spectrum of value. The Endangered Species Act acknowledges explicitly that “[endangered] species of fish, wildlife, and plants are of aesthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people.” Such services could not be easily replaced, nor could their absence be filled completely by money or any service that money could provide. It is often the irreplaceable quality of nature and the derived stream of benefits that informs the non-monetary value.

Non-monetary value can be two types: instrumental value and intrinsic value. Instrumental value means that the asset is of use in bringing about human objectives such as the creation and survival of the community. Intrinsic value describes the inherent integrity of an asset in its own right, quite apart from any human ends or objectives.

Instrumental Value

The case of the Edwards Aquifer illustrates instrumental value. A variety of basic sustenance, agricultural and commercial uses of the Aquifer allow a direct monetary valuation of the Aquifer to the surrounding region. But the Aquifer has non-monetary values as well. It was recently discovered that excessive use of water in the rural western and urban central counties of the region was inhibiting the flow of springs in the

east. These springs sustained some of the world's most biologically diverse subterranean underwater ecosystem, which contained a variety of wildlife found only at these springs. To protect these species from destruction, the Sierra Club won a federal lawsuit under the Endangered Species Act. In order to avert federal intervention, the Texas legislature decided to take measures to protect the springs by adopting Senate Bill 1477. This law transformed the method of resource management through eliminating the right of free capture and creating the Edwards Aquifer Authority to oversee water use. As Senate Bill 1477 states in its "Findings and Declaration of Policy" section:

The legislature finds that the Edwards Aquifer is a unique and complex hydrological system, with diverse economic and social interests dependent on the aquifer for water supply... To sustain these diverse interests and that natural resource, a special regional management district is required for the effective control of the resource to protect terrestrial and aquatic life, domestic and municipal water supplies, the operation of existing industries, and the economic development of the state.

As it became evident that the Edwards Aquifer's biology and hydrology had instrumental value to the region, the community adapted its management of the resource. The management crisis of the Edwards Aquifer helped to strengthen the voice of downstream interests because the federal ruling forced upstream users to more carefully consider their neighbors' welfare.

Intrinsic Value

Quite apart from the non-monetized instrumental contributions that common assets make to communities, there are non-monetized intrinsic values. Responsible management of a common asset requires an appreciation for its intrinsic value – a value that exists independent of human interest. Although common assets do not themselves possess intrinsic value (being created and defined out of human need), many of them do allow humanity to appreciate the intrinsic value of nature, and of all creation. It is this spiritual regard for nature that must not be forgotten. For, in order to manage it well, one must develop a sensitivity for the larger world that created the possibility for the common asset and, likewise, the commons. Without this heightened sensitivity, communities will be unable to develop the versatility or determination that is required to protect their common assets in the face of inevitable political and ecological challenges. The purpose of recognizing and naming intrinsic values is to set parameters for their use, not to establish specific quantitative values.

1. Daily, Gretchen, ed.: *Nature's Services: Societal Dependence on Natural Ecosystems*, Island Press: Washington, DC and Covelo, California, 1997, p.7.
2. "Britain's Happy Problem: How to Spend \$30 Billion Cell Phone Windfall" T.R. Reid, *Washington Post*, April 25, 2000.

Appendix: II

Current Legal Status of the Atmosphere as a Common Asset

By Orestes Anastasia

Historically, the atmosphere has always been viewed as too vast to be owned or apportioned by people. Thus, no modern statute or judicial ruling in the United States has assigned “ownership” to the atmosphere. In order to understand the current legal status, ownership, and management rights of the atmosphere in the absence of any clear legal authority it is helpful to consider how public rights have evolved through common law and statutory law to address clean air and air pollution.

It is important to distinguish between the ability of the public to assert its right to a clean atmosphere, and the obligation of the government to promote those interests on the public’s behalf. While a legal basis for public “ownership” of the asset has become more difficult to establish in today’s legislative and judicial climate, there in fact is no demonstration that the public’s interest in the asset has in any way truly diminished. What would remain, therefore, is a policy debate over whether the government, as “trustee”, is capable of adequately representing and upholding the interest held by the public in keeping the atmosphere free from pollutants and in its natural form.

Today, governments at the Federal, State, and local levels essentially regulate the atmosphere on behalf of the public, although this is not explicitly stated in the Clean Air Act or its legislative history. The U.S. Environmental Protection Agency has lead role in implementing the Act. As with most common assets, private interests retain a significant number of “management” or “user” rights over the atmosphere, as regulated under the authority of the federal government and the States. Federal and State governments must regulate the activities of private interests in order to protect air quality on behalf of the public.

The importance of global climate change and other effects of widespread atmospheric pollution has recently necessitated action at an international level, and the United States has been an active participant in the process. The United Nations Framework Convention on Climate Change, adopted in May 9, 1992, acknowledges that change in the Earth’s climate and its adverse effects are a common concern of humankind.¹ While the Framework Convention asserts clear objectives in support of mitigating greenhouse gas emissions by developing and developed countries alike, and for reducing vulnerability to the effects of climate change, the instrument itself does not present a solid basis for recognizing the earth’s atmosphere as a common asset per se. Nevertheless, the Framework Convention asserts a general understanding, as also stated the Rio Declaration, that the global commons are assets to be protected in the public interest, primarily with respect to human health and future generations.²

The Atmosphere under Roman Law

One must look as far back as Roman Law to observe any concrete declaration of the legal status of the atmosphere. That legal tradition, later borrowed by the British and ultimately by American common law, maintained that because the atmosphere is too vast, unmanageable, and “unbounded” a resource to be apportioned and owned by individuals, it belongs in the realm of the “public commons.”³ The Romans considered air to be *res communes*, that is, property entirely in the public realm. This excluded government-owned property such as government buildings and furnishings (*res publicae*). As stated in the Institutes of Justinian:

[some] things belong in common to all [persons] by jus naturale, some to a community corporately, some to no one, but most belong to individuals severally, being ascribed to someone on one of various grounds. And indeed by natural law the following belong in common to [all]: air, flowing water, and the sea, and therewith the shores of the sea.⁴

English and American legal traditions have done little to depart from the original legal foundation viewing the atmosphere as a public resource under Roman law. It is because of the “un-ownable” nature of the atmosphere that no legal tradition has emerged to clearly assert any form of ownership, either publicly or privately.

Roman doctrine has some use for shedding light on legal “grey areas” such as common assets. However, in today’s legislative or judicial forums, a more convincing analysis of the “public interest” values of the atmosphere will require turning to more modern legal doctrine as embodied in the common law, and most recently under the Clean Air Act.

Common Law Treatment of the Atmosphere

As will be discussed below, the Clean Air Act has preempted use of common law remedies at the Federal level. Nevertheless, it is helpful to consider common law treatments of air pollution to observe a continued “tradition” of public rights in the atmosphere. While no legal doctrine has emerged to address “ownership” of the atmosphere, there is significant history in addressing conflicts between public and private use of the atmosphere have been connected with direct injury to real property.⁵ This approach has been based primarily on the common law remedy of nuisance. For example, private property owners used “public nuisance” arguments to win lawsuits against nearby polluters for injury to their private property. Such public nuisance actions help demonstrate the common public interest in clean air that competes with “private uses” of the resource. Thus, common law remedies connected to private property (prior to the Clean Air Act) sustained the underlying notion of treating the air a “common” resource.

In *Boomer v. Atlantic Cement Company*,⁶ one of the most significant cases leading to the modern era of environmental protection in the United States, local property owners sued a cement plant “alleging injury to property from dirt, smoke, and vibration emanating from the plant.⁷” On appeal in the New York Court of Appeals, the Atlantic Cement Company argued that an injunction on the plant (to stop the nuisance) should be denied because it would impose far greater costs on the plant owner than the nuisance itself had caused to the property owners. To deny an injunction would overrule the long-established doctrine that an injunction must be granted “where a nuisance has been found and where there has been any substantial damage shown.⁸” Nevertheless, the court found that closing the plant would be too drastic a remedy, and would also affect other public interest values.⁹ The court ultimately decided to grant the injunction, but on the condition

Public and Private Nuisance.

Common law nuisance is the traditional means of recovering for injury to private property. Nuisance is defined as interference with the reasonable use and enjoyment of property, and is generally divided into two categories, public nuisance and private nuisance. The difference is typically based on the nature and extent on the injury, and by the number of persons making a nuisance claim. As stated in a leading nuisance case, *Spur Industries v. Del Webb*, 108 Ariz. 178 (1972), a “private nuisance is one affecting a single individual or a definite small number of persons in the enjoyment of private rights not common to the public, while a public nuisance is one affecting the rights enjoyed by citizens as a part of the public.” Thus, a public nuisance would affect a large number of people or an entire community or neighborhood. *Id.*, at 183.

that the plant owner compensate the property owners for the “total economic loss to their property present and future caused by defendant’s operations.”¹⁰

The Boomer decision was, in part, based on the argument that the nuisance created a “servitude” on the land, for which the defendant must either “purchase” or submit to an injunction.¹¹ Although plaintiffs were not automatically granted an injunction, the Boomer decision confirmed a clear public interest in the use and enjoyment of property free from nuisance caused by local air pollution. In turn, one could argue that property owners possess a right to clean air that is inherent in the fee interest of property ownership. In Boomer, property owners collectively demonstrated a viable public right to be free of injury from the air pollution caused by the cement company. While it is clear that injury was linked directly to specific uses of real property, public interests in the atmosphere were an integral component of the common law remedy that was invoked.

Taking this legal principle further, the argument might be suggested that an “injury” resulting from climate change (caused by excessive carbon dioxide emissions) could in turn create a common law public interest in preserving the atmosphere. Of course, a property owner would have to prove property damage caused by climate change, an impossible task by today’s standards. The plaintiff would also have to identify the defendant(s): Who would be liable for emitting carbon dioxide?

While there may be no clear application of common law nuisance to modern consideration of common assets, historic use of common law public nuisance provides a meaningful starting point for arguing that the public has a legal interest in clean air.

Protecting the Commons under the Clean Air Act

Federal regulation became necessary because of the vast scale of the atmosphere, and the need to provide uniform legal standards and remedies for the entire country. While Clean Air Act legislation has been highly complex and increasingly comprehensive in scope, several basic common law functions were incorporated into the fabric of the Act. For example, the Act continues to assure a prominent role for State and local governments to regulate and implement the objectives of the Act, recalling the original police power of the States to regulate common property. The Act itself was based in part on the need to remedy conflicts resulting from air pollution crossing state boundaries, in which the “health or welfare” of citizens of one state were threatened by pollution originating in another.¹² Section 116 still authorizes State and local governments to continue to enforce their own emission standards and pollution controls (so long as they meet or exceed Federal standards).¹³ The policy objective of the Act “to protect and enhance the quality of the Nation’s air resources so as to protect the public health and welfare [of] its population” also reflects the old doctrine of treating the atmosphere as a common resource belonging to the public.¹⁴

The principles of common law nuisance were partly retained in the original wording of the Act, though specific language has gradually eroded after multiple layers of legislation and amendments.¹⁵ More recently, courts have ruled that the Clean Air Act had actually preempted common law nuisance at both the State and Federal levels.¹⁶

Although specific nuisance remedies are no longer available, the Act incorporates a latent public interest in the atmosphere through a citizen suit provision.¹⁷ Section 304 of the Act provides citizens with the right to commence direct legal action for violations of the Act in the District Courts, against other citizens, the United States, the U.S. Environmental Protection Agency, or “any person [constructing] a . . . major emitting facility” without a required permit.¹⁸ The provision applies to violations of (A) emission standards or limitations or (B) orders issued by the Administrator or a State with respect to such a standard or limitation.¹⁹

While their use is limited, these provisions allow the public to continue to assert its inherent rights to the atmosphere as a “common resource”. Any person can bring a suit, and the federal district courts are empowered to enforce the emission limitation requirements and order civil penalties consistent with the Act.²⁰ The inclusion of citizen suits suggests public “property” interest in clean air, similar in some respects to common law nuisance. By providing a direct means of legal redress to the public, Section 304 appears to enhance the public’s rights to enjoin activities causing air pollution, even beyond the original scope of common law nuisance remedies. Whereas nuisance claims had to be based on a public or private nuisance discretely connected with real property, the Clean Air Act asserts that a violation of air pollution standards alone are enough to establish a litigious claim.

In several recent decisions, courts have ruled that Section 304 does not provide citizens with the unlimited ability to invoke the authority of the Act. In *Steel Company v. Citizens for a Better Environment*,²¹ for example, the Supreme Court held that citizens do not have standing to bring an enforcement suit unless the violation in question is taking place at the time of trial.²² In that decision the Court reasoned that past violations of a regulation do not constitute readdressable injuries and thus do not create a cause of action. Other recent Supreme Court decisions have deferred to the authority of the U.S. Environmental Protection Agency (EPA), and against the claims raised by environmental groups,²³ as demonstrated in the cases of *Train v. Natural Resources Defense Council*²⁴ and *Chevron, U.S.A., Inc. v. Natural Resources Defense Council*.²⁵ Part of the reason for the Court’s deference to the EPA is that the complexity of the Act itself dictates the need to uphold Congress’s intent to delegate regulatory authority.²⁶ The Court’s deference to the EPA creates the risk that, in its execution of regulatory authority, the EPA itself may fail to uphold the public interest in avoiding pollution of the public’s common resource.

1. United Nations Framework Convention on Climate Change, Preamble, located at <http://www.unfccc.org/resource/conv/conv.html>.

2. See, for example, Rio Declaration Principle 1, stating that “Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.”

3. See 2 Hugo Grotius, *De Jure Belli As Pacis* 187, 190 (Francis Kelsey, Trans. 1925) (“...we say that the sea, viewed wither as a whole or in its principle divisions, cannot become subject to private ownership... The extent of the ocean is in fact so great that it suffices for any possible use on the part of all the peoples... The same thing would need to be said about the air...”).

4. Institutes of Justinian, 1.8.2; as quoted in Lee Hargrave, *The Public Trust Doctrine: A Plea for Precision*, 53 *La. L. Rev.* 1535 (May, 1993), note 14. See also Institutes of Justinian, 2.1.1; *Matthews v. Bay Head Improv. Ass’n*, 471 A.2d 355, 360 (N.J. 1984); *Shively v. Bowlby*, 152 US 1; Jan Stevens, *The Public Trust: A Sovereign’s Ancient Prerogative Becomes the People’s Environmental Right*, 14 *University of California, Berkeley* 195, 196-197 (1980).

5. See also William H. Rodgers, *Environmental Law*, 2nd Ed. (1994) (hereinafter Rodgers).

6. 26 N.Y. 2d 219 (1970).

7. *Id.* at 222.

8. *Id.* at 223.

9. *Id.* at 227. Other public interests included, for example, employment of local residents, contribution to the local economy, and production of cement products. *Id.*

10. *Id.* at 225.

11. *Id.* at 228. Citing *United States v. Causby*, 328 U.S. 256, 261, 262, 267 (1946). The court’s approach in deciding *Boomer* borrowed in part from common law trespass. Common law trespass closely resembles many aspects of nuisance, particularly as applied to conflict between private interests and public citizens over air pollution. For example, in *R.L. Renken v. Harvey Aluminum, Inc.*, 226 F. Supp. 169 (D. Or. 1963), settling fluoride emissions

originating from the defendant’s aluminum plant were found to constitute a continuing trespass. See also *United States v. Causby*, 328 U.S. 256 (1946) (where a landowner was found “to own as much space above the ground as he can occupy or use in conjunction with the land”).

12. *Id.*

13. Clean Air Act, §116. See also Rodgers, §3.1.

14. *Id.* at §101(b)(1).

15. Rodgers §3.1.

16. See, for example, *New England Legal Foundation v. Costle*, 666 F.2d 30 (2nd Cir.1981) (holding that the EPA’s approval of the station’s sulfur emissions precluded Appellants from asserting a nuisance complaint), and *United States v. Kin-Buc, Inc.*, 532 F.Supp. 699 (finding that, since Congress has addressed the problem of air pollution in the Clean Air Act, the statute pre-empts plaintiff’s federal common law claim of nuisance).

17. Clean Air Act, §304.

18. *Id.* at §304(a).

19. *Id.* at §304(a)(1).

20. *Id.* at §304(a)(3).

21. 118 S.Ct. 1003, 1018 (1998).

22. *Id.* See also *Friends of the Earth v. Laidlaw Environmental Services, Inc.*, 149 F.3d 303 (4th Cir. 1998).

23. Rodgers, §3.5.

24. *Train v. Natural Resources Defense Council*, 421 U.S. 60 (1975).

25. *Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837 (1984)

26. *Id.* at 848 (stating that the Clean Air Act is “a lengthy, detailed, technical, complex, and comprehensive response to a major social issue”).

Appendix: III

The Edwards Aquifer

By Meredith Lathbury and Brian Parkinson

Description, Background and Valuation

The Edwards Aquifer of South Central Texas provides a wide array of essential services to the surrounding community. These include clean and accessible water for 1.5 million people, a sizable agricultural sector, some of the area's most valuable businesses, and one of the most diverse underwater ecosystems known.¹ The Edwards Aquifer is a common asset because its services, providing clean water for humans and wildlife, are enjoyed by the general public, even though historically individuals have privately owned the land above the aquifer, and rights to the water. The Edwards Aquifer Authority (EAA), the current regulatory authority over the Aquifer, is moving towards market-based management strategies that would provide long-term protection and reinvestment benefits.

The Edwards Aquifer is the sole source of drinking water for 1.5 million people in parts of 8 counties, including all of San Antonio, the tenth largest city in the nation.² The aquifer provides 246,000 AF of irrigation water annually for approximately 83,000 acres in three counties.³ It also supplies the water for a number of important tourist attractions. The various springs that depend upon Edwards Aquifer water themselves offer a wealth of services to the community. Such services include providing sustenance for an extremely diverse wildlife, opportunities for recreational activities, and clean drinking water.⁴ The subterranean aquatic ecosystem of the aquifer is believed to be the most diverse in the world.⁵ At least nine endangered species rely on springflows from the aquifer for survival. These springs also contribute to stream flows of the Guadalupe and San Antonio rivers, supplying surface water for the municipal, industrial, irrigation, and wildlife of both basins in the areas downstream of the springs.⁶ It was a concern for wildlife that first spurred a major push for improved water regulation throughout the Edwards Aquifer area.

Because the demand for aquifer water is expected to increase dramatically in the next 50 years, limiting water use has become a top priority for the Edwards Aquifer community. If, for example, water use is not brought under control, and farmers' water efficiency remains constant, the increased costs of pumping from lower water levels will cause a 12% decrease in farmers' profits.⁷ Furthermore, the Comal and San Marcos Springs account for approximately 5 to 6% of the economic output and 5% of the employment in Comal and Hays Counties. If these springs were to run dry, up to 90% of the economic activity related to them could be lost.⁸ The Edwards Aquifer is the driving force behind the agricultural economy and a wide variety of other economic activity that would be devastated if the water were to run out.

The economic power of the Edwards Aquifer is limited by its delicate and vulnerable nature. The Edwards Aquifer is an unconfined aquifer, which means that water can be easily extracted, but that it is vulnerable to pollution. The aquifer's unconfined quality also means that it can only be recharged up to a certain amount, generally 640,000 AF/year, before it floods. The extreme variability of rainfall (between 19 and 46 inches in San Antonio) and recharge (200,000 - 2,500,000 AF) between 1987 and 1997 alone only reinforces the need for careful stewardship of the asset.

The limited storage capacity of the aquifer, combined with the erratic rainfall patterns of Central Texas, dramatically underscores the need for the inhabitants of the Edwards Aquifer region to maintain a way of life that efficiently uses water. Nevertheless, demand for water is expected to double by 2050. The relentless demand for water combined with the scarcity of the resource has not yielded any significant changes in consumption of the resource.

This need was underscored even more poignantly when low water levels occasionally prevented the Comal and San Marcos springs from flowing. This seemingly benign occurrence greatly threatened the many species of wildlife that are unique to these springs, as well as the downstream communities that depend upon the water for sustenance and livelihood. In order to prevent an ecological catastrophe, the Sierra Club sued the Secretary of the Interior and the U.S. Fish and Wildlife Service for failure to perform duties under the Endangered Species Act and for injunctive relief.

In 1993, the U.S. District Court for the Western District of Texas ordered that spring flows be maintained for the protection of wildlife. Aquifer water levels now must be kept to 90-95% of capacity and water use must be reduced to 400,000 AF/year.⁹ The Texas state legislature created the Edwards Aquifer Authority (EAA), whose purpose is to develop methods to maintain aquifer use at sustainable levels. The EAA is in the midst of establishing a tradable permit system for water. The EAA has also recently adopted the Habitat Conservation Plan. Said to be the largest plan of its kind in the United States, it will address the protection of the species that are now, or may become, listed as endangered at Comal and San Marcos Springs. The demand for protection of endangered species under the Endangered Species Act, and the realization that the State needed to actively manage the Edwards Aquifer led to a series of changes in how the Aquifer is legally owned and protected, described below.

Economic Valuation

Our estimate of the value of the Edwards Aquifer is based on the value of the water in the aquifer for direct use by households and businesses (including farms and ranches). Because our estimate does not include the aesthetic value of swimming in spring-fed pools, or the biological value of the endangered species and other wildlife that depends on the aquifer, our estimate of value is a lower bound estimate.

Although it is tempting to think of the aquifer as a vast underground pool, most of the water is probably located in small pore spaces that are not much bigger than a human finger.¹⁰ An estimated 25-55 million acre-feet (AF) of water is theoretically accessible. But the aquifer cannot be “mined” because doing so would cause surface waters that shelter endangered species and support economic activity to dry up. For example, the Comal and San Marcos Springs account for approximately 5 to 6% of the economic output and 5% of the employment in Comal and Hays Counties. If these springs were to run dry, up to 90% of the economic activity related to them could be lost.¹¹ In addition, if water use is not brought under control, and farmers’ water efficiency remains constant, the increased costs of pumping from lower water levels will cause a 12% decrease in farmers’ profits.¹²

Because the demand for aquifer water is expected to double by the year 2050, limiting water use has become a top priority for the Edwards Aquifer community. But in 1993, the U.S. District Court for the Western District of Texas ordered that spring flows be maintained for the protection of wildlife. Aquifer water levels now must be kept to 90-95% of capacity and water use must be reduced to 400,000 AF/year.¹³

The Texas state legislature created the Edwards Aquifer Authority (EAA) in 1993. Its purpose is to develop methods to maintain aquifer use at sustainable levels. The EAA is in the midst of establishing a tradable permit system for water. Permits under Interim Authorization Permit Process are currently leased between owners for \$70-\$100/AF/year.¹⁴ While this figure does not necessarily represent the market value over the long term, and likely varies with use, it does provide at least a rough estimate for the value that residents assign to current uses of water. If we multiply this figure by the average demand for water over the past decade (443,800 AF), the value of the water comes to \$31 to \$44 million/year. If we multiply by the 400,000 AF/year level that is believed to be sustainable, the value of the water comes to \$28 to \$40 million per year.

As demand for water grows, but supply is limited to 400,000 AF/year, it is reasonable to expect the price of water to rise. How much more might water become worth in the Edwards Aquifer area? The EAA estimates that it would cost between \$466 and \$1305/AF/year to import water. That is, the replacement cost for water is between 5 and 20 times as much as the current water market suggests. Obviously, market prices can rise quite a bit before water from alternative sources will compete, and “cap” the price rise.

Suppose that real prices (that is, adjusted for inflation) quadruple in the next 50 years.¹⁵ Because the real cost of extracting water won't go up if sustainable extraction levels are maintained, this would mean that the owners of the aquifer could pocket between \$84 and \$120 million per year of “scarcity rents” (\$28 million times three and \$40 million times three, respectively). Scarcity rent is the extra that people pay for something as it becomes more scarce, but the price of production does not increase.

In the form of rebates, this amounts to around \$150 to \$180 per year in perpetuity for each household that depends on the aquifer for drinking water. Clearly this asset has very significant value to those who live in this area, even neglecting aesthetic and habitat values.

Current Legal Status, Ownership, and Management Rights

The question of who owns the Edwards Aquifer has a long and colorful chapter in Texas history. When Texas acquired land from Mexico and Spain, thousands of acres of land with titles originating outside of the state became Texas territory.¹⁶ Texas courts upheld the original water rights held on those lands from the time that they became a part of Texas.¹⁷ From the beginning, Texas had to juggle dual property and riparian rights. Underground water was governed by an old common law rule of absolute capture that other states had long since abolished in favor of state control. Texas common law never reached the Edwards Aquifer. It took an act of the legislature to finally bring some public control over this resource.

The Edwards Aquifer has continually been threatened by drought and overuse, forcing the legislature to take action to better protect and preserve the Aquifer. As law evolved over time and as the people and legislature of Texas recognized the need to regulate the Aquifer, the Aquifer came under state management, ultimately leading to a permit system for water withdrawal under the Edwards Aquifer Authority. The Edwards Aquifer Authority currently has authority over the management and use of the Edwards Aquifer on behalf of the people of Texas, and according to the Texas courts, the aquifer is held in the public commons

Legal History

Under common law, water is classified as either surface water (streams, lakes, wetlands, and run-off) or underground water (subterranean streams, aquifers, and groundwater).¹⁸ Even though surface water, groundwater, aquifers, and underground streams are interrelated hydrologically, the law treats surface and underground water differently.¹⁹ It appears that this distinction is based on the fact that surface water was a known, tangible entity that could be defined and identified. Subsurface water, on the other hand, was historically unknown and mysterious.²⁰

The law of water use is classified under two general rights: riparian rights and appropriative rights. A riparian right is the right to make reasonable use of water including the right to access the water, the right to wharf out onto the water, and the right to acquire accreted land.²¹ Appropriative right is the right to make beneficial use of water based on historical use, or “whoever draws first may continue to draw.”²²

Little was known about the movement and location of groundwater in the 1800s. Groundwater was described as “occult,” with unknowable and uncertain qualities.²³ Situations continued to arise forcing the courts to define controlling rights in groundwater. Water found below

the surface of the ground is classified as either groundwater, “those which ooze, seep, or filter through the soil beneath the surface, without a defined channel²⁴” or an underground stream. Groundwater is owned by the overlying landowner. As long as groundwater remains in the ground, the owner can extract the water by pump or excavation. This rule is also known as the “absolute capture” rule. Underground streams are defined as having a channel, a defined stream of water, and an identifiable source of supply.²⁵ Owners of land overlying underground streams cannot draw water to the injury of the “person onto whose land the stream emerged eventually as a spring.²⁶” Riparian rights apply to the underground stream, allowing reasonable use of the water.

Texas adopted the law of riparian rights in surface water in 1840 when it assumed English Common law under the Texas Constitution.²⁷ Texas also recognized water rights established under Spanish and Mexican land grants.²⁸ Over 26 million acres of the 170 million acres in Texas derive from Spanish Crown or Republic of Mexico titles. The Spanish and Mexican roots of these significant land holdings created a dual water rights system. Unclaimed surface waters were owned by the public while riparian rights claimed under Spanish or Mexican title remained intact. Those not already granted water rights by Spanish or Mexican title could purchase water rights by applying to the Board of Water Engineers.²⁹ The Water Rights Adjudication Act was enacted by the Texas Legislature in 1967 to set up an administrative system for recording water rights claims and to establish a licensing and permit system.³⁰ This Act established ownership of surface water in the public trust.³¹ Today, all surface water is regulated by the State.

Texas is the only state to have retained the absolute capture rule for groundwater.³² When Texas adopted the Common Law of England, it also adopted the English “absolute ownership” rule.³³ The owner of the property above the groundwater has an absolute right to withdraw groundwater.³⁴ In the widely cited case, *Houston & TC v. East*,³⁵ the Texas court specifically rejected the reasonable use rule, and upheld the antiquated absolute ownership rule for groundwater.³⁶ The absolute capture rule allows private property owners to withdraw unlimited groundwater from under the property.³⁷

Groundwater is distinct from underground streams, which are governed by the Texas Water Code.³⁸ The state owns ordinary flow, underflow, and tides of every flowing river. In 1949, Texas created Underground Water Conservation Districts to regulate use of underground streams. The Underground Water Districts did not reach the Edwards Aquifer because it did not qualify as an underground stream under the statute.

The Edwards Aquifer Authority

Since the 1970s, Texas legislators knew that the Edwards Aquifer could not sustain the cities of San Antonio and Austin for another twenty years without controls on water use.³⁹ Alarm finally dawned on the Texas legislature in 1984 when a severe drought caused the Edwards Aquifer to drop to its lowest level in decades.⁴⁰ The Texas Legislature was forced to act not only by the conditions created by the drought, but also by the courts due to a series of lawsuits initiated under the federal Endangered Species Act.

The State developed a Special Joint Committee in 1989 to study the problem of low water levels in the Edwards Aquifer. That same year, the Texas legislature enacted a law that created water conservation districts and management of critical areas.⁴¹ Each underground district was required to identify critical areas and develop a comprehensive management plan.⁴² The Edwards Underground Water District (EUWD) was created in 1989, covering the five counties overlying the southern portion of the aquifer.⁴³ The Edwards Underground Water District was not granted authority to regulate withdrawals from the aquifer.⁴⁴

In 1992, the Texas Water Commission (TWC) attempted to regulate withdrawals from the Edwards Aquifer by designating it as an underground river, thereby allowing it to be regulated as surface water. However, the TWC's actions were later overturned by a state district court.⁴⁵

In 1990, attempts to establish control of withdrawal of water from the Edwards Aquifer turned to the Endangered Species Act (ESA).⁴⁶ Rare and endangered species inhabit the surface springs as well as crevices within the Aquifer. Widemouth blindcat (catfish), for example, have been identified as deep as 610 meters below the surface.⁴⁷ Both the fountain darter and Comal Springs riffle beetle (*Heterelmis comalensis*) are also listed as endangered at Comal Springs and San Marcos Springs. Dry periods cause the springs to run low, resulting in a "taking" of endangered species in the Edwards Aquifer.

In *Sierra Club v. Lujan*, the Sierra Club sued the U.S. Fish and Wildlife Service (USFWS) for failure to protect four endangered species under the ESA.⁴⁸ The Sierra Club asserted that these endangered species rely on the Comal and San Marcos Springs, part of the Edwards Aquifer. The trial court ordered the USFWS to designate minimum spring flows and to prepare a plan to prevent future depletion of the springs. The Court also determined the Edwards Aquifer to be an underground stream that could be managed by the Texas Water Commission. Finally, the Court threatened federal intervention if Texas did not establish adequate control over use of the Edwards Aquifer.

The Sierra Club again sued USFWS under the Endangered Species Act in *Sierra Club v. Glickman*, claiming that USDA's subsidies to farmers without establishing agricultural water conservation measures led to overpumping of the Edwards Aquifer, thereby threatening endangered species. The Texas Water Commission estimated that pumping for irrigated agriculture could be reduced by 40,000 to 52,000 acre-feet of water per year through conservation measures.⁴⁹ The trial court held in favor of the Sierra Club and ordered the USDA to develop a land conservation program to protect natural resources, create an intra-agency program to protect the aquifer from pollution, and work with USFWS to develop a plan to protect endangered species.

In 1996, water levels in the Comal and San Marcos Springs fell to low levels, jeopardizing endangered species. The Sierra Club attempted to certify a class of defendants alleging that these defendants, by pumping out the aquifer, were "taking" endangered species under section 9 of the ESA. The trial court denied certification of the defendants as a class action and ordered pumping restrictions based on springflows. The Sierra Club appealed to the U.S. Fifth Circuit Court of Appeals. The Court of Appeals vacated the trial court's mandate with orders that the State of Texas resolve its own matter. In the meantime, the EAA declared a water use emergency and a draft regional plan to reduce pumping was quickly developed. The 1996 Emergency Withdrawal Reduction Plan for the Edwards Aquifer (1996 EWRP) was adopted. This plan established staged reductions of municipal pumping.

Legislative authority over the Edwards Aquifer came at first in 1993 when Senate Bill 1477 was passed by the 73rd Texas Legislature, modifying the unlimited right of absolute capture. Bill 1477 created the Edwards Aquifer Authority to limit water pumping, penalize violators, issue permits, transfer water rights, and institute water quality programs. Existing users were given preference when the Act was initially implemented. If there were any permits left over after existing users staked their claim, then new users were allowed to obtain permits.

Senate Bill 1477 withstood several challenges before the Edwards Aquifer Authority could finally be implemented. The first challenge came under the Voting Rights Act. Under Section 5 of the Voting Rights Act, states with a history of discriminating against minority voters must submit any changes to the law that impact voters or elections to the U.S. Department of Justice for preclearance.⁵⁰ The Mexican American

Legal Defense and Education Fund opposed preclearance of the new law because it replaced the previously elected Underground Water District Board with an appointed Board. The opponents claimed the new law would have hindered the ability of Hispanic voters to be represented on the new EAA Board. In 1995, the 74th Texas Legislature enacted House Bill 3189, amending the Act to allow an elected Board for the EAA.

Implementation of the Edwards Aquifer Act was again delayed due by a challenge launched by the Medina and Uvalde County Underground Water Conservation District. The District sought a declaratory judgment that the law deprived landowners of a vested property right under the Constitution. The Supreme Court of Texas found that the law was not unconstitutional on its face. For the first time, the Texas courts recognized public right and duty to protect the Edwards Aquifer.⁵¹

Conservation of water has always been a paramount concern in Texas, especially in times, like today, of devastating drought. The past droughts of 1910 and 1917 prompted the citizens of this state to approve the Conservation Amendment to the Texas Constitution, which provides that conservation, preservation, and development of the state's natural resources are public rights and duties.

The Edwards Aquifer Authority was yet again challenged under the Texas Private Real Property Rights Preservation Act. In *Living Waters Artesian Springs, Ltd. v. Edwards Aquifer Authority*,⁵² the plaintiff claimed that the rules adopted by the Edwards Aquifer Authority treated some users arbitrarily. The EAA had authority to grant permits for the withdrawal of 484,600 acre-feet of water. Permit applications sought withdrawal of 852,800 acre-feet. The Texas district court found that the Act violated the Texas Private Real Property Rights Preservation Act because an assessment of takings impact was never performed.⁵³ In 1996, the Texas Supreme Court unanimously ruled to overturn the district court's decision, upholding the EAA.

In 1997, the 75th Texas Legislature passed and enacted Senate Bill 1, the Brown-Lewis Water Plan. This statute amended Texas Water Code to require all underground water conservation districts to develop a management plan to be submitted to the Texas Water Development Board by September 1, 1988.⁵⁴ The Edwards Aquifer Management Plan was presented in August 1998. This plan also satisfies the requirement under the EAA Act directing the EAA to develop a long-range comprehensive water resources plan.

Additional protection for the Edwards Aquifer developed through a unique citizen effort in the City of Austin. The citizens of Austin initiated an ordinance by petition to prevent pollution of springs feeding into the Edwards Aquifer under the Save Our Springs Initiative Petition. The goal of this ordinance is to prevent pollution of these springs through restricting impervious surfaces. The Edwards Aquifer, like most water resources, is vulnerable to pollution from urban runoff associated with urban development. Under the Save Our Springs ordinance, development must satisfy impervious surfaces limitations and pollutant loading limitations on suspended solids, lead, cadmium, fecal coliform, fecal streptococci, volatile organic compounds, organic carbon, pesticides, and herbicides. The ordinance also prohibits development within 200 feet of the centerline of major waterways in the Barton Springs watershed

Policy Options

The Edwards Aquifer Authority faces ongoing public scrutiny and controversy surrounding this immensely important resource. The EAA is striving for a balance between the environmentally sensitive nature of the resource and the high demand for water to support the local economy. The Edwards Aquifer Authority is taking a multi-faceted approach to establishing a new management paradigm for the Aquifer.

The central component is a permit system that allows the purchase, lease and trade of water rights. In 1998, this permit system was projected to raise \$5.25 billion in revenue. Most of this revenue (95%) was used to fund the Edwards Aquifer Authority. The EAA is engaging in a variety of activities that are likely to result in better management of the Aquifer. Long range regional planning using a “bottom-up” approach, study of different management strategies, encouraging best management practices that conserve water through a loan program for agricultural water conservation and the A.O. “Odie” Gilliam Agricultural Water Conservation Award are a few of the actions taking place. EAA is also collecting data on water levels, streamflows, springflows, rainfall, water quality, and pumpage. Education and media efforts include an extensive informational website (www.e-aquifer.com) and efforts with local newspapers to provide information about the Edwards Aquifer.

The EAA is harnessing the demand for water by charging money for permits then using that revenue to fund its planning, management, education, and incentive programs. By reorganizing how rights to the Edwards Aquifer are owned, Texas has developed a more efficient and effective system of management for a highly integral and delicate resource. The EAA is still new and continues to face challenges from property and water rights proponents. Yet, the legislature has clearly recognized the public interest in the Aquifer and the desperate need for better management. It appears that Texas’ strong roots in property rights have provided a unique avenue for managing a resource that would probably be highly and tightly regulated in other states.

Such tight regulation would perhaps be beneficial for the resource, yet, by taking this hybrid approach to ownership of water rights, the EAA has a better chance of distributing the resource more efficiently, and with greater protection in the long run

1. <http://www.artesia.eardc.swt.edu/EndangeredSpecies.html>
2. Geographical information is from “The Edwards Aquifer: Conflicts Surrounding Use of a Regional Water Resource,” population information is from <http://www.artesis.eardc.swt.edu>
3. “The Edwards Aquifer: Conflicts Surrounding Use of a Regional Water Resource”
4. <http://www.sosldf.org>
5. <http://artesia.eardc.swt.edu/EndangeredSpecies.html>
6. The Edwards Aquifer: Conflicts Surrounding Use of a Regional Water Resource
7. Management of the Edwards Aquifer: A Critical Assessment, Chapter 3
8. Management of the Edwards Aquifer: A Critical Assessment, Chapter 3
9. <http://www.edwardsaquifer.net/faqs.html>
10. <http://www.edwardsaquifer.net/faqs.html>
11. Management of the Edwards Aquifer: A Critical Assessment, Chapter 3
12. Management of the Edwards Aquifer: A Critical Assessment, Chapter 3
13. <http://www.edwardsaquifer.net/faqs.html>
14. Personal Communication with Geary Schindel, Chief Technical Officer, Edwards Aquifer Authority
15. The price increase required to reduce water demand is usually significant. Economists refer to this type of good as “inelastic.” If a quadrupling of price were to cut demand in half (that is, keep future demand roughly equal to the sustainable level of 400,000 AF/yr), the water demand elasticity in the Edwards Aquifer area would be around 0.17. This is typical of (in fact higher than many) measured water demand elasticities, so the assumption of a quadrupling of price in the next 50 years is reasonable.
16. McClesky, Robert A. Note. Maybe oil and water should mix – at least in Texas law: an analysis of current problems with Texas groundwater law and how established oil and gas law could provide appropriate solutions. 1 Texas Wesleyan Law Review 207 (1994).
17. Id.
18. Robert E. Beck, Ed. Water and Water Rights (1991), §20.
19. Robert E. Beck, Ed. Water and Water Rights (1991), §20.
20. Robert E. Beck, Ed. Water and Water Rights (1991), §20.
21. David Slade, Putting the Public Trust Doctrine to Work. (Coastal States Organization, Inc., 1997).
22. See Beck, *supra* note 3.
23. Id.
24. Clinchfield Coal Corp. v. Compton, 139 S.E. 308, 311 (Va. 1927).
25. See Beck, *supra* note 3.
26. Id.
27. See McClesky, *supra* note 1.
28. Id.
29. Id.
30. Texas Water Code Ann. §11 (Vernon 1988).

31. Texas Water Code Ann. §11.302 (Vernon 1988).
32. Hay. Blind Salamanders... 25 St. Mary's Law Journal 1449 (1994).
33. Texas Revised Civil Statutes, Article 1, (cite?).
34. City of Sherman v. Public Util. Comm'n of Texas, 643 S.W. 2d 681 (1993).
35. 98 Tex. 146 (1904).
36. Id., The ruling of the East case was later codified under the Texas Water Code.
37. 576 S.W. 2d 21.
38. Tex. Water Code Ann., §11.021.
39. See McClesky, *supra* note 1.
40. Id.
41. Tex. Water Code Ann., §52 (Vernon Supp. 1994)
42. Tex. Water Code Ann., §52.160
43. Edwards Aquifer Management Plan (1998).
44. Id.
45. McFadden v. Texas Water Commission, No. 92-05214, slip op. at 2 (DC of Travis County, Tex. 1992).
46. 16 U.S.C.A. §§ 1531 to 1544.
47. Votteler, Todd. The little fish that roared: the Endangered Species Act, state groundwater law, and private property rights collide over the Texas Edwards Aquifer, 28 Env. L. 845 (1998).
48. These species included: the San Marcos Gambusia (*Gambusia georgei*), the Fountain Darter (*Etheostoma fonticola*), the San Marcos Salamander (*Eurycea nana*), Texas Blind Salamander (*Typhlomolge rathbuni*), and Texas wild rice (*Zizania texana*).
49. Id.
50. 42 U.S.C. §1973.
51. Barshop v. Medina County Underground Water Conservation District, 925 S.W. 2d 618.
52. No. 98-02644
53. See Votteler, *supra* note 33.
54. Texas Water Code Chapter 36.

Appendix: IV

Alaska Halibut Fishery

By Meredith Lathbury and Brian Parkinson

Description, Background and Valuation

Although fisheries have been treated as a publicly owned resource since the Magna Carta, strict regulation through harvesting restrictions, for example, has not been shown to be the most effective or efficient means of managing fisheries. By carving out individual rights to the fishery and allowing them to be sold and traded has resulted in a means of reinvesting market energy back into the communities that support the fishery.

The Pacific halibut fishery spans over 2000 miles from the shores of Northern California to the Bering Sea. Archeological evidence suggests that tribes along the North American west coast have fished halibut since ancient times.¹ In the 1890s, the Northern Pacific Railway opened the fishery to American commercial interests. Regulation of the fishery was first proposed in 1914 in order to curtail production, rather than out of conservation concerns. After various studies concluded that the halibut population had declined sharply along the fishery's older banks, however, conservation became an increasingly important consideration.² In response to this pending crisis, the governments of the United States and Canada created the International Pacific Halibut Commission (IPHC) in 1923 to regulate the asset. The agency continues to regulate the Alaskan and Canadian fisheries, while the National Marine Fishery Service's Northwest Regional Office regulates the much smaller³ fishery off the coasts of Washington, Oregon and Northern California.

By far the largest modern use of halibut is commercial. In 1997, for example, the commercial Pacific halibut fishing industry caught approximately 61.3 million lbs. of Halibut off the coast of Alaska, generating \$144 million in revenue and employing over 5000 fishermen.⁴ As of 1995, the Alaskan fisheries switched from a limited entry or open access fishery with short seasons to an individual transferable quota (ITQ) system that lasts for eight months. Under this policy, each fisherman receives a percentage of the annual halibut quota that is based on his catch record. He may catch and market his share from mid-March to mid-November.⁵

Before 1995, the harvest was regulated by alterations in the length of the fishing season. In response to increasingly efficient harvesting technology, the fishing season was gradually shrunk from five month in 1970 to two 24-48 hour openings by the late 1980's.⁶ Facing such a narrow window of opportunity, fishermen found themselves forced to harvest even during dangerous weather, and often in heated competition with each other. The ITQ system still limits the amount of halibut that is collected, but allows fishermen a greater amount of time in which to do the actual harvesting.

The Pacific halibut has also become quite popular for sports fishermen. The amount of halibut that is allocated to this use has grown from 176,000 lbs. in 1976 to over 7 million lbs. in 1995.⁷

A third important use for the Pacific halibut is that of providing sustenance for tens of thousands of native and rural Alaskan residents. As of now, only the much smaller halibut fisheries in Northern California, Oregon and Washington allot a set amount of halibut (272,000 lbs. in 1998) for treaty Indian use.⁸ There is, however, an estimated 55,663 members of Alaska native tribes and other rural residents who have legitimate subsistence needs.⁹ Although they consume an estimated 1.5 million lbs. of halibut each year,¹⁰ there are currently no regulations, or protections for their way of life, aside from fishing gear limitations. In the future, the International Pacific Halibut Commission may also allot a specific quota of fish for these native and/or rural subsistence fishers.

One of the key problems to better regulation of Alaskan subsistence fishing is the on-going conflict between State and Federal officials concerning who should receive such a designation. The Alaskan halibut fishery is overseen by the IPHC, which is a federal entity. Federal regulations distinguish between traditional/native and rural fishers, who may have arrived recently to the area. The state of Alaska rejects any such distinction. When (and if) these disagreements are resolved, changes may occur with respect to Alaskan subsistence fishing rights. Aside from the ongoing challenges to the management of Pacific halibut, there are also new issues on the horizon. In a recent report for the Alaskan Department of Commerce and Economic Development, John Forster forecasts that in the next 15 to 20 years, the supply of farmed halibut will exceed landings from the wild fishery.¹¹ As halibut farming becomes more advanced, new environmental, economic and social issues will arise. Hence, new policies will once again be required in order to continue competent stewardship over this common asset.

Valuation

By far the largest modern use of halibut is commercial. In 1997, for example, the commercial Pacific halibut fishing industry caught approximately 61.3 million lbs. of Halibut off the coast of Alaska, generating \$144 million in revenue and employing over 6000 fishermen.¹² The Pacific halibut has also become quite popular for sports fishermen. The amount of halibut that is allocated to this use has grown from 176,000 lbs. in 1976 to over 7 million lbs. in 1995.¹³

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Halibut probably have value to humans other than as food or fishing recreation. Their sheer existence as an interesting species, or their role in maintaining other marine fisheries, are probably valuable to some people. In addition, our estimate below is for commercial halibut only, not harvest for own use or sport fishing. So once again the estimate we use for discussion purposes in this report is a lower bound on the exchange value of Halibut if all services they deliver to human beings could be accounted for.

Unlike water from the Edwards Aquifer, a reasonably priced economic substitute for wild Halibut (as food) exists. A recent report for the Alaskan Department of Commerce and Economic Development forecasts that in the next 15 to 20 years the supply of farmed halibut will exceed landings from the wild fishery.¹⁷ This means, economically, that the price of wild halibut cannot rise too dramatically even if it becomes scarcer. If halibut farming is sustainable at a competitive price, one could literally harvest the wild halibut fishery to extinction without driving the market price of halibut up (the price of sportfishing would rise dramatically, however, unless fishing for farmed halibut is equally attractive as recreation).

So the scarcity rent from commercial fishing that is captured by owners of the halibut fishery might not increase in the future. Can we estimate what that rent is today? Because over 95% of American Pacific halibut is fished in Alaskan waters, we have estimated the value of this fishery to the 625,000 citizens of Alaska. The current estimate of the Maximum Sustainable Yield (MSY)¹⁸ of the Alaskan halibut fishery is 70 million lbs./year. But the current allowable yield is less than this (around 61 million pounds in 1999). Multiplying by the actual harvest

that is allowed times the average market price over the past few years (\$1.91/lbs.),¹⁹ one obtains an annual exchange value for commercial Alaskan halibut of around \$120 million/year.

Most of this cashflow goes to pay wages, amortize fishing gear, and so on. Is some portion of this a pure scarcity rent that accrues to commercial fishermen? Historically, there was no scarcity rent in this fishery. This is because before 1995 harvest was regulated by alterations in the length of the fishing season. In response to increasingly efficient harvesting technology, the fishing season was gradually shrunk from five months in 1970 to two 24-48 hour openings by the late 1980s.²⁰ Because there was no numerical restriction on the total quantity of halibut caught, there was no formal scarcity rent. This is like the atmosphere, today, for carbon emissions. Because there is no limit on how much one can emit, carbon emissions disposal capacity is not scarce and cannot command a scarcity rent.

As of 1995, the Alaskan fisheries switched from a time-limited entry fishery to an individual transferable quota (ITQ) system. Each fishing quota is referred to as an IFQ (individual fishing quota). Under this policy, each fisherman receives a percentage of the annual halibut quota that is based on his catch record. He may catch and market his share from mid-March to mid-November.²¹ Because a quantity limit on catch now exists, scarcity rent is greater than zero. One brokerage firm that handles trades in halibut IFQs shows recent trades of about \$6.00 for the right to catch one pound of halibut every year, in perpetuity. We use this price to estimate the current scarcity rent, although IFQ asking prices currently vary from \$3.00 to \$9.50 per pound in perpetuity depending on the regulatory area for which they are issued (there are eight in Alaska), and whether the permit is “blocked” or “unblocked.” This latter refers to how many permits may be owned by each fisherman in each regulatory area: no more than two blocked IFQs in each regulatory area can be owned by any single fisherman (or fishing company). This provision is an attempt to prevent monopolization of IFQs.

Since about 61 million pounds of halibut can be harvested each year, the value of commercial access to wild halibut in Alaska is around \$370 million (61 million pounds times \$6 per pound). An asset that is worth \$370 million can earn \$37 million each year if one can invest financial assets at a 10% rate of return. This is the annual scarcity rent that would accrue if annual permits-to-harvest were auctioned each year. For comparison, this is about 1/3 of the current, annual, gross harvest value (\$120 million). Of course this income is not labeled “scarcity rent.” It may show up as higher rates of return on investment in equipment, or in higher wages, or in higher profits, than would occur if permits-to-harvest were auctioned every year.

But regardless of “where” the scarcity rent is hidden we know that it exists. If not, why would commercial fishermen pay for IFQs? They are not merely pieces of paper, and cannot be dismissed as just another cost of business. One does not pay the cost of business unless the business generates a flow of benefits that more than pays back the costs. To justify a purchase price greater than zero dollars, these pieces of paper must command a flow of revenue that rewards those who invest.

There are 625,000 Alaskan residents, or around 260,000 Alaskan households if each household has 2.5 persons in it. So the commercial halibut fishery could generate around \$140 per Alaskan household per year if scarcity rents accrued directly to households, equally. A similar calculation shows that selling the IFQs, rather than giving them away, would have generated about \$1400 per Alaskan household when the ITQ system for commercial halibut fishing was implemented.

Current Legal Status, Ownership, and Management Rights

Fisheries have traditionally been viewed as the property of the commons rather than the property of one individual. In comparison to the other assets being considered in this study, one of the strongest arguments can be made for fisheries as a resource that lies in public ownership. Historically, fisheries were considered part of the public commons until captured. Over fishing spurred policymakers to create regulations and incentives for protection of fishery stocks. Fishery conservation through government regulation has evolved from virtually no regulation to Federal command-and-control regulation. By carving out small bits of rights to fisheries to the industry, government can better protect the resource. Fisheries are still commonly owned in the public trust, but their management has become based more and more on allowing selling and trade of rights to exploit the fishery.

Today, innovative programs such as Individual Transferable Quotas (ITQs) and Community Development Quotas (CDQs) are considered successful models for fishery protection. The Alaskan fisheries are embarking on a new frontier of fishery management through use of an innovative CDQ program. Over time, fisheries came to be managed in the public trust. The establishment of certain limited rights in Alaskan fisheries has proven to be an effective tool for management of halibut.

Legal History of the Alaska Fisheries as a Common Asset

No one owns the wild animals. No one, that is, until an individual animal is captured by a human. The widely cited case of *Pierson v. Post* recounts the concept of *ferae naturae*, which states that wildlife is owned by all until one takes actual possession by capture.²² The *Pierson* precedent has stood unswayed in the common law guidance of fisheries.

Modern rights in fisheries originated in 1215, at the signing of the Magna Carta, marking the establishment of fisheries as *res communes*, or held in the public commons.²³ Preceding the Magna Carta, the king, as owner of all land under water could grant exclusive rights to fisheries. Once the Magna Carta was signed, common ownership of fisheries became the common law of England. This concept was then passed down into American law as individual states adopted English common law during the 1800s.²⁴

Considering the great importance of living resources, it seems logical that they should be owned by all, in the public trust. Fishing has been recognized as a public right for hundreds of years.²⁵ In *Douglas v. Seacoast Products*,²⁶ the Supreme Court sets us straight:

A State does not stand in the same position as the owner of a private game preserve and it is pure fantasy to talk of “owning” wild fish, birds, or animals. Neither the States nor the Federal Government, any more than a hopeful fisherman or hunter, has title to these creatures until they are reduced to possession by skillful capture.

The Court goes on to explain that natural resources are of such high importance to the people of a state that regulation of natural resources can only be limited by the U.S. Constitution. Considering the human compulsion to seek out and take exclusive possession over things so that we may “own” them, it is no surprise that fisheries have experienced the tragedy of the commons. Humans will race to exploit the resource under public choice theory.²⁷ The tragedy of fisheries exploitation required government intervention in order to prevent complete devastation of the resource.

Command-and-control government regulation was the first stab at balancing the tragedy of the commons in fisheries. State and Federal governments have placed restrictions on the number of fish caught, limited the fishing season, regulated the length of fishing trips, and

restricted the type of equipment used.²⁸ In the 1970s, the government began placing restrictions on entry into the fishing industry. Even with heavy handed government regulation, fish stocks did not revive.²⁹ Eventually economists suggested establishing a “system of quasi-property rights in the fishery.³⁰” Curiously, although fisheries started out in the public trust, it has required introducing small nuggets of property rights back into the market in order to better protect the resource.

Historically, fishery regulation has been carried out by the states under the police powers granted in the 10th Amendment to the U.S. Constitution. Individual states have jurisdiction over the “territorial sea,” covering the waters three miles from the shoreline (also known as the “Cannon Shot” rule).

The high seas, beyond three miles from the shoreline, were treated as the true commons, owned by no one (*res nullius*). States were able to exert regulation over the high seas if they could establish that the state had a legitimate interest in regulating, there was a sufficient basis to justify jurisdiction over individual fishers, and the regulation did not violate the U.S. Constitution.³¹

State regulation of the high seas under common law is based on enforcement and conservation. In *Bayside Fish Flour Co. v. Gentry*,³² the U.S. Supreme Court recognized a need for enforcement as a justification for California laws regulating sardine processing. Conservation was found to be a sufficient state interest in the Alaska case of *Hjelle v. Brooks*,³³ where the state regulated king crab in the high seas because the crab cycle began along the shoreline but eventually ended in the deep sea.

The Magnuson Fishery Conservation and Management Act of 1976 was enacted to protect American fisheries from exploitation by foreign fleets and to prevent depletion of fisheries. The Magnuson Act established eight regional management councils that make regulatory decisions about Fishery Conservation Zones (a 197 mile band around US shorelines, beginning 3 miles from the shoreline). The regional councils are made up of representatives from the states in that region, representatives of the fishing industry, and the Regional Director of the National Marine Fishery Service. The Governor of each constituent state nominates council members, and the Secretary of Commerce selects the members.³⁵ The fishery councils have been accused of being controlled almost exclusively by commercial fishermen, resulting in management measures that have not effectively handled over fishing.³⁵

The regional management councils develop regulations, create management plans, and institute conservation measures. The Secretary of Commerce, through the National Marine Fisheries Service (NMFS), has the authority to review and approve or reject management plans proposed by the regional councils.³⁶ There is little incentive for the management councils to develop effective plans because there are no required actions or deadlines.³⁷ Plans are typically approved without consideration paid to whether the conservation goals of the law are met, or whether the plan will be effective.³⁸ NMFS finds itself in a precarious political position because if it does not adopt plans submitted by the regional councils, the integrity or the existence of the Magnuson Act may be threatened by the associated Congressional delegations.³⁹

Alaska claimed fisheries as the public commons in Article 8, §15 of the State Constitution, where it established that there would be no exclusive individual right of fishery. Alaska has regulated fisheries by requiring those engaging in the fisheries business to obtain a license.⁴⁰ Taxes on fish processing and landing are typical of Alaska’s fishery regulation.⁴¹

Alaskan regulations meet Federal laws in the high seas, where Federal law generally takes precedent, but does not completely exclude state regulation. Under *Alaska v. F/V Baranof*,⁴² the Court held that state fishery regulation of the high seas should be permitted when it complements the goals of the Magnuson Act. Dual State and Federal regulation, when conducted with some coordination, provides need additional protection for fisheries.⁴³

The North Pacific Fishery Management Council created under the Magnuson Act manages the Exclusive Economic Zone (EEZ) of the North Pacific, covering the federal waters of the Gulf of Alaska, Bering Sea, and the Arctic Ocean.⁴⁴ Major fisheries falling under the NPFMC include salmon, halibut, crab, and groundfish.⁴⁵ Halibut are also managed by the Pacific Halibut Commission, under the Canada-U.S. Joint International Pacific Halibut Commission established by the Convention for Preservation of Halibut Fishery of the Northern Pacific Ocean and Bering Sea in 1953.⁴⁶ The NPFMC has eleven members, including six Alaskans, three Washingtonians, one Oregonian, a representative of the Native-American tribal community, and the Regional Director of National Marine Fishery Service.

The North Pacific fisheries do not have the all of the same over fishing problems encountered by the other regional councils, although the pollock fishery has suffered from over fishing.⁴⁷ When the NPFMC began regulating in the 1970s, the Council established strong conservation policies based on scientific research.⁴⁸ There was more concern over entry into the market than on the long-term sustainability of the fish stock because the fish stocks were ample.⁴⁹ The NPFMC established a conservative cap on the harvest of groundfish that is still in place today.⁵⁰ The NPFMC has a strong track record for following the advice of the Scientific and Statistical Committee (SSC). The SSC provides technical advice and scientific expertise on issues such as total allowable catch (TAC), and allowable biological catch (ABC).⁵¹ It has only acted against the advice of the SSC twice between 1987 and 1996.⁵²

In 1996, Congress passed the Sustainable Fisheries Act (SFA), amending the Magnuson Act. The SFA requires the management councils to establish definite objectives and measurable criteria to prevent over fishing.⁵³ The Pacific Management Council is now required to include a Native-American tribal representative.⁵⁴ NMFS obtained authority to direct management councils to address and implement measures to prevent over fishing and replenish fish stocks in case of over fishing.⁵⁵ NMFS must also report annually to Congress.⁵⁶ The SFA was not able to rectify every shortcoming of the Magnuson Act, but it did strengthen the ability of NMFS to seek protection and restoration of fisheries. The SFA also included a provision allowing Councils to develop “alternative management programs.” This spurred the development of innovative programs such as Alaska’s CDQ program, described below.

Policy Options

Despite the common ownership of Alaska fisheries, the most effective management scheme turned out to be one where certain rights in the fishery are established and allocated. The Community Development Quota Program was enveloped under the “alternative management programs” that may be developed under the Sustainable Fisheries Act.

The Alaska CDQ program requires 7.5% of the total allowable catch (TAC) of pollock and halibut to be allocated to Bering Sea and Aleutian Island coastal communities.⁵⁷ Eligible communities are those within 50 miles of the Bering Sea that are an Alaska Native Claims Community having residents who conduct 50% of their commercial fishing activity in the Bering Sea, and did not already participate significantly in the pollock industry are eligible for the quota. There are around 60 eligible communities.⁵⁸ This CDQ program has successfully transferred large amounts of capital from Washington and Oregon based fishing companies to Alaskan coastal villages.⁵⁹

The Bristol Bay Economic Development Corporation (BBEDC) represents fourteen villages with a total population of 5,300 people. The BBEDC was allocated 23 percent of the halibut in the western Bering Sea and 30 percent of the halibut in the eastern Bering Sea region. Partnerships were formed with F/V Recovery and F/V Bristol Leader to harvest halibut. Community reinvestment projects provided by the BBEDC include harvest management services for the halibut fisheries and funding for Bristol Bay's fishing infrastructure. BBEDC also made substantial investments in sablefish halibut IFQ shares to supplement investment in the F/V Bristol Leader. The BBEDC established the Alaska Seafood Investment Fund (ASIF). ASIF invests in Alaskan seafood businesses, particularly those fisheries other than sockeye salmon. The BBEDC also invests in research to study and test the feasibility of new fisheries and to develop real time data tracking and catch accounting for the CDQ fishery. Those who have been employed in the seafood industry can upgrade their skills with the help of financial assistance provided by the BBEDC. Member communities can also obtain education through a partnership between the BBEDC and the University of Alaska. The Bristol Bay Permit Brokerage was created to assist Bristol Bay residents in buying, selling and transferring commercial fishing permits. The Brokerage also assists community members in leasing and selling fishing vessels and other financial matters such as taxes, loans and child support.

Under common law, if one entity holds the rights to management and another holds the rights to access and use, the use rights are called usufructuary.⁶⁰ Fishery regulations in Alaska restrict entry into the market through licenses, or CDQ allowances, while the government manages the entire fishery. The CDQ allowances and the fishing licenses are usufructuary rights. So far, the CDQ program has not encountered any legal challenges. The CDQ program benefits Alaskan villages, perhaps in the view of some, to the detriment of large commercial fishers in Washington and Oregon.

It is possible that the CDQ program will be challenged as a violation of the Magnuson Act under the national standards barring discrimination against citizens of other states, requiring programs to be based on conservation over economic efficiency, and requiring programs to minimize costs and avoid duplication. Commercial fishers outside of Alaska raise the question of whether it is fair to favor coastal communities at the expense of those who have historically developed and built up the industry. The lesson apparent from the Alaska fisheries CDQ program is that clearly defined communities, previous management with a quota system, and experience working with corporate entities, were key factors in this program's success.

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| <ul style="list-style-type: none"> 1. Flat Out Facts About Halibut 2. http://www.iphc.washington.edu/halcom/history.htm 3. For example, less than one tenth of one percent of the Pacific halibut commercial catch occurred off the coasts of Washington, Oregon and Northern California. See "The Pacific Halibut Fishery, 1998" by Heather Gilroy: http://www.iphc.washington.edu/hale.../annmeet/1999/bluebook/bluebook.htm 4. Due to the success of conservation measures, the price plummeted in 1998 to \$1.15/lbs. See AP Local Wire March 16, 1999 5. Flat Out Facts About Halibut, page 1 6. Flat Out Facts About Halibut, page 1 7. Flat Out Facts About Halibut, page 3 8. The Pacific Halibut Fishery, 1998, by Heather Gilroy IPHC Bluebook The Pacific Halibut Fishery, 1998, by Heather Gilroy IPHC Bluebook | <ul style="list-style-type: none"> 9. North Pacific Council Report 10. North Pacific Council Report 11. Halibut farming, its development and likely impact on the market for wild Alaska halibut by John Forster. February, 1999. A report prepared for the Alaska Department of Commerce and Economic Development. Division of Trade and Development. 12. Due to the success of conservation measures, the price plummeted in 1998 to \$1.15/lbs. See AP Local Wire March 16, 1999 13. Flat Out Facts About Halibut, top of page 3 14. The Pacific Halibut Fishery, 1998, by Heather Gilroy IPHC Bluebook 15. North Pacific Council Report 16. North Pacific Council Report 17. Halibut farming, its development and likely impact on the market for wild Alaska halibut by John Forster. February, 1999. A report prepared for the Alaska Department of Commerce and Economic Development. Division of Trade and Development. |
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18. The MSY of course changes from year to year, but it is appropriate for the current population base as of 1999 (Our Living Oceans).
19. This is the average price over the past three years, which is also the time span over which the population and catch assessments had been made. Because the commercial price of halibut has fluctuated dramatically over the past three years, it would be most accurate to take their average.
20. Flat Out Facts About Halibut, page 1
21. Flat Out Facts About Halibut, page 1
22. 3 Cal. R. 175 (NY 1805).
23. Britton, Douglas. The Privatization of the American Fishery: Limitations, Recognitions, and the Public Trust. 3 *Ocean and Coastal Law Journal* 217 (1997).
24. Slade, David. 1997. Putting the Public Trust Doctrine to Work, 2nd Ed. 440 pp. Published by Coastal States Organization.
25. *Id.*
26. 431 U.S. 265, 284-5 (1977).
27. Dana, David. Overcoming the Political Tragedy of the Commons: Lessons Learned from Reauthorization of the Magnuson Act. 24 *Ecology Law Quarterly* 833 (1997).
28. Litz, Franz Thomas. Harnessing Market Forces in Natural Resources Management: lessons from the Surf Clam Fishery. 21 *Environmental Affairs* 335 (1994).
29. *Id.*
30. *Id.*
31. State regulations must be sure to comply with the Commerce Clause, Privileges and Immunities, and Supremacy Clause of the U.S. Constitution.
32. 297 U.S. 422
33. 377 F. Supp. 430 (D. Alaska 1974)
34. 16 U.S.C. §1852(b)). Nominees are supposed to be individuals who are knowledgeable regarding fishery management and conservation through occupation or experience (16 U.S.C. §1852(b))
35. See Dana, *supra* note 8.
36. 16 U.S.C. §1853(c)-(d)(1997)
37. *Id.*
38. *Id.*
39. *Id.*
40. Alaska Statutes, §43.75.011
41. Alaska Statutes, §43.75.015, §43.75.77.
42. 677 P.2d. 1245 (Alaska 1984)
43. Winn, John. Alaska v. F/V Baranof: State Regulation Beyond the Territorial Sea After the Magnuson Act. 13 *Environmental Affairs* 281 (1986).
44. 16 U.S.C. §1852(a)(7)
45. Groundfish include cod, sole, flounder and rockfish
46. 5 U.S.T. 5
47. Fluharty, David, Magnuson Fishery Management and Conservation Act Reauthorization and Fishery Management Needs in the North Pacific Region, 9 *Tulane Environmental Law Journal* 301 (1996); on pollock, see NRC *supra* note 25.
48. See NRC, *supra* note 25.
49. *Id.*
50. *Id.*
51. 50 C.F.R. §605.11 (1994)
52. See Fluharty, *supra* note 35.
53. SFA §108
54. SFA §107(b)(3)
55. SFA §109
56. SFA §109
57. See NRC, *supra* note 25.
58. *Id.*
59. Rieser, Alison. Property Rights and Ecosystem Management in U.S. Fisheries: Contracting for the Commons? 24 *Ecology Law Quarterly* 813 (1997).
60. *Id.*

Appendix: V

Current Legal Status of the Broadcast Spectrum as a Common Asset

By Orestes Anastasia

Since it was first regulated in 1912, the broadcast spectrum has been viewed as an asset to be managed and used in the public interest. Indeed, Courts and federal officials have traditionally regarded broadcasters as public trustees of the airwaves. While it cannot be specifically said that the public “owns” the broadcast spectrum, its use must unequivocally further public objectives. Unlike other natural resources,¹ there is no common law tradition describing the legal rights associated with use or ownership of the broadcast frequencies. This is because the broadcast spectrum itself was simply not known as an exploitable resource until Guglielmo Marconi’s famous wireless radio transmission first took place in Pontecchio, Italy in 1895.² The rapid growth of broadcasting industry in the United States early in the Twentieth Century led to widespread recognition not only of the spectrum’s great economic importance, but of its invaluable role in promoting the public interest and upholding the very foundation of American democracy – freedom of expression.

The idea behind “public ownership” of the spectrum is as much a product of the history and politics of broadcast regulation as is the inherent nature of the electromagnetic spectrum itself a vast, yet finite, resource for communication and the transmission of news, information, and entertainment programming. The public interest standard originates from the early history of broadcasting that predated the Radio Act of 1927.³ That Act adopted two interrelated aspects of modern spectrum regulation: both a “scarcity” approach to regulation, and the “public interest” standard. The Radio Act of 1927 and the Communications Act of 1934⁴ together formed the legislative basis for the regulatory framework surrounding broadcasting over much of the century. Even the Telecommunications Act of 1996⁵ changed little of the foundation established back in 1927, where the “public interest” standard to radio regulation was first introduced. The public interest standard has also led to considerable evolution in caselaw addressing First Amendment protections of free speech. Today, the public interest requirement in broadcasting is manifested in three ways: through the regulation of the broadcast industry, through administrative allocation of rights to use broadcast spectrum frequencies, and through regulation of the content of broadcast programming.

Despite a deluge of proposed innovations to broadcast regulation, the 1927 standard remains. Still, recent initiatives to loosen restrictions on broadcasting may have serious implications for the public interest uses of the spectrum. These include a variety of new interpretations and proposed innovations in regulation such as auctioning of frequencies, as well as proposals for market-based approaches to licensing that would grant broadcasters greater “private” property rights over spectrum frequencies.

Today, the Federal Communications Commission (FCC) has supreme authority to regulate the broadcast spectrum. Broadcasters themselves must obtain permits to use the frequencies from the FCC, although this process has increasingly become easier in recent years. In the interest of promoting market-based allocation and distribution of broadcast frequencies, changes in broadcast law have given some flexibility to broadcasters (such as longer permit periods or frequency auctions). Nevertheless, this has not meant that the public protections interest inherent in the spectrum have diminished. Although recent changes relieve private broadcasters of many regulatory constraints, they are still bound by the long-standing tradition of operating their stations in a manner that furthers the “public interest, convenience, or necessity.”

Legal History of the Broadcast Spectrum as a Common Asset

The Radio Act of 1912 and the Challenge of Spectrum Allocation

The Radio Act of 1912⁶ was Congress's first attempt to regulate radio broadcasts and manage the electro-magnetic spectrum. Under that Act, Congress also established the Federal Radio Commission (FRC), the precursor to the modern Federal Communication Commission (later established in 1934). However, the Radio Act of 1912 could not compete with the rapid expansion of broadcast industry that took place in the 1920s.⁷ Indeed, the radio waves soon reached their natural limits even as the Commission was being overwhelmed with requests for new licenses. Ultimately the Commission was utterly incapable of managing the rapid early growth of the broadcast industry and the result was chaos. The Supreme Court recalled the tumultuous history of early radio in the its decision in *National Broadcasting Co. v. United States*:⁸

[In] 1921 the first standard broadcast stations were established. They grew rapidly in number, and by 1923 there were several hundred such stations throughout the country.. The number of stations increased so rapidly ... and the situation became so chaotic, that the Secretary...established a policy of assigning specified frequencies to particular stations.⁹ The entire radio spectrum was divided into numerous bands, each allocated to a particular kind of service... But the problems created by the enormously rapid development of radio were far from solved... [By November 1925] the number of stations multiplied so rapidly, however, [that every] channel in the standard broadcast band was...already occupied by at least one station, and many by several.

From July 1926, to February 23, 1927, when Congress enacted the Radio Act of 1927... almost 200 new stations went on the air. These new stations used any frequencies they desired, regardless of the interference thereby caused to others. Existing stations changed to other frequencies and increased their power and hours of operation at will. The result was confusion and chaos. With everybody on the air, nobody could be heard. The situation became so intolerable that the President in his message of December 7, 1926, appealed to Congress to enact a comprehensive radio law.¹⁰

Despite the need for immediate action, the Secretary of Commerce was powerless to deal with the situation because of a Supreme Court ruling that he could not deny a license to an otherwise legally qualified applicant on the ground that the proposed station would interfere with existing stations.¹¹ A later court decision held that the Secretary also had no power to restrict a station's frequency, power, or hours of operation. Moreover, stations changing frequencies without permission were free to do so under the Radio Act of 1912.¹²

Resource Scarcity and the Public Interest: Spectrum Regulation under the Radio Act of 1927 and the Communications Act of 1934

The "Scarcity" Basis for Government Regulation

The rapid growth in use of the broadcast spectrum and competition over individual bands of the spectrum serves to illustrate its enormous economic value, even in the 1920s and 1930s. The numerous difficulties that emerged in regulating the radio spectrum were combined with basic questions about how government might better ensure that uses of the spectrum could be kept consistent with the overriding public interest. To reign in the free-wheeling broadcast industry, Congress passed the Radio Act of 1927, charging the Department of Commerce with the authority to license specific radio frequencies.

Congress viewed the broadcast spectrum as a scarce resource, one that must be regulated in order to ensure its efficient management and use. By regulating the broadcast spectrum, Congress also underscored the essential role of government to protect the public interest in the resource. Wasteful use of radio frequencies, which were limited and therefore precious, would cause detriment to the public.¹³ Without a regulatory framework in place, the resource would itself cease to consist of clear and usable airwaves. “Regulation of radio was...as vital to its development as traffic control was to the development of the automobile.¹⁴” As later described in *Red Lion Broadcasting Co., Inc v. Federal Communications Commission*:

[Broadcast] frequencies constituted a scarce resource whose use could be regulated and rationalized only by the Government. Without government control, the medium would be of little use because of the cacophony of competing voices, none of which could be clearly and predictably heard. Consequently, the Federal Radio Commission was established to allocate frequencies among competing applicants in a manner responsive to the public “convenience, interest, or necessity.”¹⁵

Today the spectrum is still leased (or temporarily granted) to broadcasters by license, although this does not grant any private interest in any part of the broadcast spectrum.¹⁶

The “Public Interest, Convenience, and Necessity” Standard

A key component of the new licensing authority under the Radio Act of 1927 was the introduction of the requirement that licenses be issued on the basis of “public interest, convenience, and necessity.¹⁷” This and related provisions were incorporated verbatim into the Communications Act of 1934 and still exist today in the Telecommunications Act of 1996.¹⁸ It is this criterion, repeated throughout the statute, which governs the Commission’s power to license and manage the broadcast spectrum.¹⁹

As stated by the Supreme Court, “the avowed aim of the Communications Act of 1934 was to secure the maximum benefits of radio to all the people of the United States.²⁰” Nevertheless, latent ambiguities in the public interest standard has served as the basis for much of the litigation surrounding broadcast law since the 1934 Act.²¹

The Supreme Court faced the issue of the public interest standard head-on in the case of *National Broadcasting Co., Inc. v. United States*,²² where it considered whether the Communications Act of 1934 granted the FCC with the authority to regulate “chain broadcasting,” i.e., broadcasting common programs via a national network. In 1938 the FCC launched an investigation to determine whether special regulations should be applied to radio stations engaged in chain broadcasting.²³ The Commission found that the three major national networks, NBC, CBS, and the Mutual Broadcast Company, constituted over half of the total business of all the stations in the United States, and sought to regulate their practice of chain broadcasting.²⁴ Finding that the FCC acted appropriately under the Communications Act of 1934, the Court reasoned that the interest of the listening public is in “the larger and more effective use of radio.²⁵” The Court found that the licensing function of the Commission is inseparable from the interest of providing the “best practicable service to the community reached” by broadcast.²⁶ The limited “technological” criteria for licensing such as required under the Radio Act of 1912 could no longer satisfy the overriding interests of serving the public. Likewise, two financially and technically qualified station operators would be virtually indistinguishable from the perspective of the regulator. As a result, the only means by which the Commission could exercise its obligations to the public would be by applying the standard of “public interest, convenience, or necessity.²⁷”

Another measure used to uphold the public interest under the Act of 1934 was to deny broadcasters the ability to transfer licenses.²⁸ Although the restrictions on the transfer or exchange of licenses no longer apply under the modern framework of broadcast regulation, the Telecommunications Act of 1996 permits license transfers only where it is consistent with the public interest standard.²⁹

Broadcasters as Public Trustees of the Airwaves

As early as the 1920s, courts interpreted broadcast legislation so broadly that they specifically began to treat licensees as public trustees of the spectrum itself.³⁰ As “public trustees of the airwaves,” broadcasters had “a fiduciary obligation to serve the public through their programming.³¹” Congress had recognized that “[every] licensee who is fortunate in obtaining a license is mandated to operate in the public interest and has assumed the obligation of presenting important public questions fairly and without bias.³²” The Communications Act of 1934 added to these obligations by specifically denying private “ownership” of any property right in the spectrum as a result of the granting of a license.³³

Broadcast licensing has become somewhat less restrictive in modern times. Under the Telecommunications Act of 1996, licenses are now granted for a period of eight years, at which time broadcasters must re-apply to the FCC for a renewal. Likewise, broadcasters are still not required to pay for license rights, although these rights are extremely valuable.³⁴ Nevertheless, Congress continues to assert the fiduciary obligation on broadcasters to act as public trustees of the airwaves, in return for the great economic benefits bestowed upon broadcasters. Congress asserts the same obligation to broadcasters of serving the “public interest, convenience, and necessity” in operating stations and in choosing the programming they air.³⁵ Similarly, both television and radio broadcasters must give candidates for federal office reasonable access to their stations.³⁶ As Chief Justice Burger once wrote when sitting on the D.C. Circuit Court, a “broadcaster seeks and is granted the free and exclusive use of a limited and valuable part of the public domain; when [the broadcaster] accepts that franchise it is burdened by enforceable public obligations... [A] broadcast license is a public trust subject to termination for breach of duty.³⁷

The Public Interest Standard and the First Amendment

The exact role of broadcasters as public fiduciaries has been a frequent issue of debate, particularly with respect to the notion that, under the First Amendment, broadcasters may exercise freedom to choose programming independent of regulation or censorship. The Communications Act of 1934 restricted the government from censoring broadcast programs, although it also obligated the Commission to ensure the content of programming furthered the public interest.³⁸ This apparent conflict is clearly illustrated in Section 326 of the 1934 Act, which states:

Nothing in this Act shall be understood or construed to give the Commission the power of censorship ... and no regulation or condition shall be promulgated or fixed by the Commission which shall interfere with the right of free speech by means of radio communication. No person within the jurisdiction of the United States shall utter any obscene, indecent, or profane language by means of radio communication.³⁹

Denial of a license, however, has not been viewed as a violation of free speech. A different set of regulatory requirements has been imposed on the broadcast spectrum that has not been applied to the printed media, based largely on the scarcity principle. Recalling the NBC decision, without government regulation no electronic speech would be possible. The argument follows that because government regulation itself creates the entire category of broadcast speech, government has unique authority to regulate the speech itself.⁴⁰ As stated in *Red Lion*:

There is nothing in the First Amendment which prevents the Government from requiring a licensee to share his frequency with others and to conduct himself as a proxy or fiduciary. . . . Because of the scarcity of radio frequencies, the Government is permitted to put restraints on licensees in favor of others whose views should be expressed on this unique medium. But the people as a whole retain their interest in free speech by radio and their collective right to have the medium function consistently with the ends and purposes of the First Amendment. It is the right of the viewers and listeners, not the right of the broadcasters, which is paramount.⁴¹

In addition to requiring broadcasters to obtain a license, the government was required to ensure that that information that was broadcast to the public would achieve certain levels of quality that would be appropriate for public consumption.⁴² This combination of public and private control over speech can be characterized as a “limited public forum” under Constitutional jurisprudence. As a result of this legal rationale, the government acts appropriately when it imposes reasonable “content-based” requirements on broadcasters, so long as the restrictions do not discriminate against speech on the basis of its political viewpoint.⁴³

A landmark case dealing with the broadcast of indecent language followed the broadcast of a 12-minute monologue, entitled “Filthy Words”, by the satirical humorist George Carlin. In that case, *FCC v. Pacific Foundation*,⁴⁴ the Court reasoned that the Commission was authorized to restrict the public broadcast of indecent language in any circumstance. The reasoning behind the Court’s decision was again based on the unique nature of broadcast media, in which, unlike printed media, the public could neither anticipate nor “turn off” a program containing indecent language that had already begun.

The role of government is even greater in seeking to uphold the public interest in a “forum analysis”, by seeking to maintain a proper balance between competing interests. Thus, the role of government includes determining whether its “interest in limiting the use of its property to its intended purpose outweighs the interest of those waiting to use the property for other purposes.⁴⁵”

Policy Options: Recent Initiatives in Broadcast Regulation Reform and Their Implications for the Public Interest

As discussed above, clear precedent for the public interest has evolved over the decades since radio broadcasting first began. Nevertheless, a debate has been ongoing between preserving a scarce yet valuable resource through regulation, and allowing the industry to grow with the innovation and efficiency offered by market-based regulatory instruments. The arguments on either side promote public interest values: the former in protecting and preserving spectrum resources, and the latter in expanding the resource itself.

Recent changes brought on with the Telecommunications Act of 1996 appeared on the surface to liberalize broadcast regulation. In general, what the 1996 Act accomplished was the following:

- extending license periods for radio and TV to eight years (from seven and five years, respectively);
- easing renewal of licenses by shifting the burden to the FCC of demonstrating a “pattern of abuse” that would justify non-renewal;
- providing incentives for third parties to challenge license renewals have been reduced;
- relaxing various restrictions on station ownership, particularly in radio markets; and

- mandating the violence-filtering “V-chip” for televisions, and violence-labeling for TV shows.⁴⁶

Some argue that despite these changes, the basic elements of the Communications Act of 1934 remain essentially unchanged and intact with the 1996 Act. Indeed, scarcity continues to be treated as the basis for public interest and trust in the broadcast spectrum. What was stated in *Red Lion* still largely holds true of a resource whose uses are constantly being exploited to their natural limits: “Scarcity is not entirely a thing of the past. Advances in technology [lead] to more efficient utilization of the frequency spectrum, but uses for that spectrum have also grown apace.”⁴⁷

Nevertheless, regulators have recently devised a market-based regulatory system to help better allocate private use of the public airwaves. This has put into question the traditional assertion that the broadcast spectrum is held in the public trust. Starting in the late 1970s, a trend began where the emphasis on the role of broadcasters as public trustees diminished while their role as market participants increased.⁴⁸ In light of this trend, emphasis on a private market model might suggest a move towards viewing broadcasters as “owners” of the broadcast spectrum, receiving private property rights allocated through price. Under such a regime, broadcasters would owe reduced obligations to the public, or possibly none.

Ronald Coase argued that the “chaos” of the 1920s resulted not from lack of government control, but from the fact that property rights were never created in the Broadcast Spectrum.⁴⁹ As Coase explained, the principal reason for government regulation of the broadcast industry was to prevent interference from simultaneous broadcasts on the same frequency. Similarly, the “use of a piece of land simultaneously for growing wheat and as a parking lot would produce similar results.” The creation of a property “right” in the exclusive use of land serves to solve the problem of simultaneous uses.⁵⁰ Under a Coasian market-based model, a broadcaster who values transmission more highly would pay interfering broadcasters to cease broadcasting.⁵¹

Congress made a critical change in the rules for licensing broadcasters when it lifted the prohibition against license auctioning. Congress authorized an “experimental” use of auctions in the Balanced Budget Act of 1997, under which the Commission would be allowed to auction licenses for Personal Communications Service (PCS) frequencies for mobile telephones.⁵² It is yet to be seen how brief experience in market-based licensing may develop into further flexibility for the broadcast industry to operate on the “public’s airwaves.”

Other recent legislative changes may have the appearance of diminishing the public trust model, such as prohibiting the FCC from considering competitors for a license at renewal and by extending license terms. Section 201 today treats broadcasters as holders of rights that can be exchanged with the FCC in market-like transactions. The statute requires the FCC to limit initial eligibility to broadcasters who possess a current license.⁵³

While the arguments for market-based regulation often appear to be gaining strength, political debate has been very vocal on the disservice to the public that more liberal broadcast regulation would cause. While acknowledging the importance of promoting an efficient regulatory and economic framework for the broadcast spectrum, numerous political leaders have viewed less restrictive broadcast licensing as another form of “corporate welfare.” Criticism from both sides of the political aisle has pointed to a number of free-market legislative initiatives that ignore the underlying value of the asset to the public at large.⁵⁴ Former Commissioner Ervin S. Duggan, for example, has stated that as a legal matter, “FCC licenses, even those awarded by auction, must never be viewed as outright sales; they are more akin to contracts or leases that

revert automatically to the public domain if the terms are broken.⁵⁵ The Telecommunications Act itself was held up by bipartisan interests when arguments were raised that High Definition television licenses were another form of “corporate welfare” and a “license give-away” to broadcasters.

What recent political debate may lead to in terms of capturing the value of the “public commons” in the broadcast spectrum remains to be seen. Whether that value can be directly passed to the public poses yet another level of uncertainty, and may add considerably to the debate.

1. Natural resources such as rivers, the sea, and the atmosphere have been treated as publicly owned since Roman Law. See The Institutes of Justinian, 2.1.1.
2. See <http://eagle.uccb.ns.ca/marconi/marc1.html>.
3. Radio Act of 1927, 444 Stat. 1162 (1927).
4. Communications Act of 1934, Pub. L. No. 73-416, 48 Stat. 1064 (1934).
5. Telecommunications Act of 1996, Pub. LA. No. 104-104, 110 Stat. 56 (1996).
6. Radio Act of 1912, 37 Stat. §302, at §303 (1912).
7. Kenneth C. Creech, *Electronic Media Law and Regulation* (1993), at 51.
8. 319 U.S. 190 (1943).
9. Further elaboration of the disintegration of the early attempts to regulate the spectrum is provided in *Red Lion Broadcasting Co., Inc v. FCC*, 395 U.S. 367, footnote 4 (1969), citing *United States v. Zenith Radio Corporation*, 12 F.2d 614 (D.C.N.D. Ill. 1926), and 35 Op. Atty. Gen. 126 (1926).
10. 319 U.S. 190, 210-212.
11. *Hoover v. Intercity Radio Co.*, 52 App. D. C. 339, 286 F. 1003 (1923).
12. *United States v. Zenith Radio Corp.*, 12 F.2d 614 (1926).
13. *National Broadcasting Co., Inc. v. United States*, 319 US at 216 (hereinafter NBC).
14. 319 U.S. at 213 (1943). For example, unregulated automobile traffic would overwhelm the roads with gridlock and leave cars ultimately unusable.
15. *Red Lion Broadcasting Co., Inc v. FCC*, 395 U.S. 375-376 (1969) (hereinafter *Red Lion*) [footnotes omitted].
16. See Murray J. Rossini, Comment, *the Spectrum Scarcity Doctrine: A Constitutional Anachronism*, 39 Sw. L. J. 827, 828 (1985).
17. 47 U.S.C. §303. As currently stated in the United States Code, all powers and duties of the Commission must meet the “public convenience, interest, or necessity.” See, for example, 47 U.S.C. §§214, 307, 309, 310, 315, 336. The phrasing of the standard was lifted directly out of an 1887 Illinois railroad statute and was later adopted in the Federal Transportation Act of 1920. Creech, at 54.
18. Creech, at 53. See also Thomas Hazlett, *Physical Scarcity, Rent Seeking, And The First Amendment*, 97 Colum. L. Rev. 905 (May 1997) (hereinafter Hazlett), at 906.
19. See NBC, 319 U.S. at 215.
20. Id. at 217.
21. Creech, at 53.
22. 319 U.S. 190 (1943).
23. Id. at 194.
24. Id. at 198.
25. Communications Act of 1934, Sec. 303(g).
26. Id. at 475.
27. NBC, 319 U.S. at 215-216 (1943). See also See *FCC v. Pottsville Broadcasting Co.*, 309 U.S. 134, 138.
28. Communications Act of 1934, Sec. 310(b), 48 Stat. at 1085.
29. 47 U.S.C. §336(d).
30. See *Great Lakes Broadcasting v. Federal Radio Comm’n*, 3 F.R.C. Ann. Rep. 32 (1929).
31. *Office of United Church of Christ v. FCC*, 359 F.2d 994, at 1003.
32. *Red Lion*, 395 U.S. at 383, quoting S. Rep. No. 562, 86th Cong., 1st Sess., 8-9 (1959).
33. *FCC v. Sanders Brothers Radio Station*, 309 U.S. 470, at 475 (1940). See Communications Act of 1934, 48 Stat. 1081 (providing licensees with “use of such channels, but not the ownership thereof”). See also NBC, 319 U.S. at 214.
34. See Charles W. Logan, Jr. *Getting beyond Scarcity: A New Paradigm for Assessing the Constitutionality of Broadcast Regulation*, 85 Calif. L. Rev. 1687, at 1688 (December 1997).
35. For example, under the Children’s Television Act of 1990, television stations must air a certain amount of children’s educational programming every week. Likewise, both television and radio broadcasters must give candidates for federal office reasonable access to their stations. 47 U.S.C.A. 309(k)(1)(A). See also, Logan, at 1688.
36. 47 U.S.C.A. 309(k)(1)(A). See Logan, at 1688 (December 1997).
37. *Office of Communication of United Church of Christ v. FCC*, 359 F.2d 994, at 1003 (D.C. Cir. 1966).
38. See Hazlett, at 905.
39. 48 Stat. at 1091.
40. See Hazlett, at 909.
41. *Red Lion*, 395 U.S. at 389-390 (1969). Quoting *FCC v. Sanders Bros. Radio Station*, 309 U.S. 470, 475 (1940).
42. See Creech, 65.
43. Logan, at 1690.

44. 438 U.S. 726 (1978).
45. *Cornelius v. NAACP Legal Defense & Educ. Fund, Inc.*, 473 U.S. 788, 800 (1985). See also Logan, at 1688.
46. See generally Thomas G. Krattenmaker, *The Telecommunications Act of 1996*, 29 Conn. L. Rev. 123 (1996).
47. *Red Lion*, 395 U.S. 396-397(1969)
48. Creech, at 70.
49. Ronald Coase, *The Federal Communications Commission*, 2 J.L. & Econ 1, at 14, 25 (1959). See also Yochai Benkler, *Overcoming Agoraphobia: Building the Commons of the Digitally Networked Environment*, 11 Harv. J. Law & Tec 287 (1998).
50. *Id.* at 25-26 (1959).
51. *Id.* at 26-29.
52. Balanced Budget Act of 1997, P.L. 105-33 (1997), amending Section 309(j) of the Communications Act of 1934. See Logan, at 1693.
53. 110 Stat. 56.
54. Hazlett, at 938-940. As Hazlett summarizes:

After a bipartisan group of Senators ... protested the "corporate welfare" of the "license giveaway" to broadcasters for High Definition television (HDTV) licenses (an FCC proposal that the Act codified), Senator Dole held up passage of the Telecommunications Act in January 1996 until the issue could be resolved.

Other relevant literature includes: Office of U.S. Senator John McCain, Press Release, *McCain-Feingold-Thompson-Kerry Corporate Welfare Amendment Could Save Up to \$60 Billion*, Oct. 24, 1995, at 1,3 (listing broadcasting spectrum sixth on list entitled "Dirty Dozen Corporate Pork Chops" and claiming that the government would raise an additional \$35 billion if it auctioned off all electro- magnetic spectrum rights); Mark Lewyn, "The Great Airwave Robbery", *Wired* (Mar. 1996), at 115; Edmund L. Andrews, "Airwaves Plan Is Called Give-away to Broadcasters," *N.Y. Times* (Oct. 28, 1995), at 9; Ralph Kinney Bennett, "The Great Airwaves Giveaway", *Reader's Digest* (June 1996), at 147; "GOP Giveaway," *Wall St. J.* (Sept. 12, 1995), at A26; Neil Hickey, "What's at Stake in the Spectrum War?," *Colum. Journalism Rev.*, 39 (July/Aug. 1996), at 39.

55. Ervin S. Duggan, "Spectrum Licensing in the '90s: Can We Find A Way?," Remarks before the American Mobile Telecommunications Association SMR Leadership Conference (June 24, 1992), available in 1992 FCC Lexis 3479, at *8. See also Krystilyn Corbett, Note: *The Rise of Private Property Rights in the Broadcast Spectrum*, 46 *duke L. J.* 611, at 643-644 (December 1996).



ABOUT THE AUTHOR:

Helen Payne Watt is a Senior Program Manager at CFED in the Sustainable Economies cluster. Her recent work at CFED includes community projects for environmentally compatible economic development, a major project to revitalize the local planning efforts of the Economic Development Administration, and development finance consulting in Arkansas. Previously she worked at Coastal Enterprises, Inc. a community development corporation in Maine.

ACKNOWLEDGEMENTS:

This paper is the outcome of a collaboration between the Corporation for Enterprise Development and Redefining Progress.

Special thanks to the following people for their research and writing through this paper's many versions.

Orestes Anastasia
Peter Barnes
Paige Brown
Brian Dabson
Joanne Kliejunas
Meredith Lathbury
Ansjie Miller
Trisha Miller
Brian Parkinson
William Schweke
Gary Wolff

And thanks, too, to the following people for their invaluable feedback on the paper:

Robert Friedman
Marc Wetherhorn

We are grateful for funding support from the Wallace Global Fund and the Ford Foundation.





Corporation
For Enterprise
Development

777 N Capitol St NE

Suite 410

Washington DC

20002

Ph:202.408.9788

Fax:202.408.9793

www.cfed.org

||| **REDEFINING PROGRESS** |||||

1 Kearny St

Fourth Floor

San Francisco CA

94108

Ph:415.781.1191

Fax:415.781.1198

www.rprogress.org