

A Legal-Economic History of Resource Use and Nonuse

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I. Introduction

Our relationship with the earth's natural resources has changed over time. For centuries, humans used resources for their own personal and economic interests. They extracted "stock" resources, such as minerals and energy fuels, to become better off economically. "Renewable commodity" goods, such as timber and rangeland and fisheries, were harvested to further economic growth. And "public environmental" goods, such as the air, waters, land, and underground resources, were used as convenient and free locations to dump emissions, effluent, and waste.

Humanity prospered by controlling, depleting, and polluting nature's resources. Welfare was served when forests were turned into farms, wetlands into cities, mountains into mines. Developing countries were deemed successful if their natural landscapes had been transformed from wild lands to utilitarian places where we could live, work, and create individual wealth. It seemed that three types of natural resources – stock, renewable commodity, and public environmental – had one primary purpose: to be used and exploited by one special planetary species, us.¹

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Initially, laws, and particularly the common law of contract and property, encouraged and protected this resource use. The use value of resources was benefitted first by contract law. This law permitted one user to make enforceable, credible marketplace deals with other potential users of resources, particularly stock resources, so that the resource would wind up with the user most willing to pay for it (and who, in theory, would put it to the most efficient use).² Resource use was next furthered by the invention of property law. This law allowed users to own the resource, and to exercise the right to control, develop, and exploit it in order to enhance the owner's selfish interests.³

These "first generation" resource-use laws, prevalent throughout much of the 19th and early 20th centuries, reflected a judgment that endured for multiple centuries: stock and renewable commodity resources should first be owned and then utilized by individuals. These owner-individuals would, in pursuit of selfish interests, transform, extract, use, or exchange them in the relevant market. The working assumption was that laws furthering the operation of the economic market would then ensure that what was best for the individual resource owner would ultimately also be best for the overall society in which that owner lived.⁴

Eventually, however, excessive use depleted stock and renewable commodity resources. Reliance on the economic market as a resource-regulating mechanism had failed, in large part

¹ Mark Sagoff, *Price, Principle, and the Environment* 15 (2004).

² Karl Polanyi, *The Great Transformation: The Political and Economic Origins of Our Time* (1957); Adam Smith, *An Inquiry Into the Nature and Causes of the Wealth of Nations* (1776).

³ David Feeny, *The Development of Property Rights in Land: A Comparative Study*, in *Toward a Political Economy of Development: A Rational Choice Perspective* 272 (Robert Bates ed. 1988); Harold Demsetz, *Toward a Theory of Property Rights*, 57 *Am. Econ. Rev.* 347 (1967).

⁴ Ronald Findlay, *The Roots of Divergence: Western Economic History in Comparative Perspective*, 82 *Am. Econ. Rev.* 158 (1992); Douglas C. North & Robert B. Thomas, *The Rise of the Western World: A New Economic History* (1973).

because owners of private property had little incentive to not use their resource wealth.⁵ Indeed, if they did not use their resources, they were often, by operation of law, deemed to have abandoned or forfeited their rights to their property.⁶ Gradual resource exhaustion and depletion caused lawmakers to adopt another category of “first generation” resource use laws, designed to slow unchecked resource extraction, and create a more sustainable resource base for future generations of resource use.⁷

These conservation laws still had as their primary purpose the long term use of resources, albeit use that was now somewhat regulated to moderate the unchecked exploitation that had threatened the long term viability of both exhaustible and renewable resources. But by the middle of the 20th century, both categories of resource use laws (those encouraging present use and those conserving for future use) had not prevented the depletion of the stock and renewable resource base. Moreover, such use had begun to pollute public environmental goods, such as the air, the water, and the soils. The heretofore dominant “use” component of natural uses was now threatening another facet of resources – the critical “nonuse” component.

Nonuse values prevail when resources are *not* used by humans, and when the resource is left alone in its natural state. Humans in three ways benefit from resources in a nonuse state. First, certain natural resources, especially public environmental goods like air and water, are preconditions to human survival and existence when they are not used as pollution sinks.⁸ Second, undeveloped natural lands and locations have recreational value for those wishing to

⁵ A.V. Kneese and Blair T. Bower, *Environmental Quality Analysis: Theory and Method in the Social Sciences* 1-6 (1972).

⁶ See, e.g., 30 U.S.C. 328, of the 1872 Mining Law, requiring mining claimants on public lands to perform annually \$100 of “assessment work” to maintain a mining claim.

⁷ See, e.g., the Taylor Grazing Act of 1934, 43 U.S.C. §§ 315 et seq., restricting the use of public lands for open grazing purposes, previously opened up for unrestricted use by *Buford v. Houtz*, 133 U.S. 320 (1890).

⁸ When it is un-owned, land is also a public environmental good necessary for humans life.

engage in low-impact play. Also, certain natural objects, like wild lands or wildlife species, have high “existence” value for humans, in that their mere existence in an unused condition is important to us; we place a value on their place in nature, even though we do not intend to consume or own them, as we do stock or renewable commodity resources.⁹ Third, some resources, such as wetlands, rain forests, and estuaries, have economic value for humans in their natural condition because they provide crucial ecological services to humans, that markets fail to price. Unspoiled nature serves as “natural capital,” providing long-term economic benefits that more than offset the short-term disadvantages involved in forgoing human development.¹⁰

Mid-20th century resource depletion and pollution adversely affected these nonuse aspects components of resources. This alarmed humans who had, for eons, been able to personally thrive and economically prosper due to resource nonuse qualities.¹¹ Our response to this threat to nonuse benefits was (once again) to turn towards the law and legal institutions. Throughout the Western world, and especially in the United States, a series of statutes were enacted, and government policies adopted, that were designed to curb resource use not because we wanted to conserve the resource for more future use, but to protect our very human need for resource *nonuse* benefits.¹²

⁹ John K. Krutilla, Conservation Reconsidered, 57 American Economics Review 787 (1967).

¹⁰ See Nature’s Services: Societal Dependence on Natural Ecosystems (Gretchen C. Daily, ed. 1997).

¹¹ Gretchen C. Daily, Susan Alexander, Paul R. Ehrlich, et al., Ecosystem Services: Benefits Supplied to Human Societies by Natural Ecosystems, *Issues in Ecology* 2 (Spring 1997); Graciela Chichilnisky and Geoffrey Heal, Economic Returns From the Biosphere, 391 *Nature* 629 (Feb. 1998).

¹² See, e.g., Richard J. Lazarus, *The Making of Environmental Law* (2004). Some of these statutes were designed to permit and encourage a resource use that did not entail removal, extraction, or development of the land – recreation. See National Park Service Organic Act, 16 U.S.C. § 22; Multiple Use Sustained Act, 16 U.S.C. § 528-531; Federal Lands Policy Management Act, 43 U.S.C. § 1701. However, some recreational uses of lands, especially public lands, produced environmental impacts as harmful as traditional extractive uses. Jan G. Laitos & Rachael B. Reiss, Recreation Wars for our Natural Resources, 34 *Envtl. L.* 1091 (2004); *Southern Utah Wilderness Alliance v. Norton*, 542 U.S. 55 (2004). Other laws were designed to provide aesthetic and health benefits when use-prohibitions were

These second generation legal initiatives served four purposes: (1) to *protect human health* with regard to pollution; (2) to *preserve natural objects* (like wild lands and wildlife) that humans deemed valuable for either recreational or preservationist benefits; (3) to employ non-command structures that instead relied on *market-based approaches* to environmental quality; (4) to *prevent destruction of natural systems* deemed economically important to human welfare (like wetlands). Anti-pollution laws used command-and-control rules to constrain the risks that one person can impose on another during the course of resource use (particularly when public environmental goods were being over-exploited as receptacles for our garbage). Preservation laws protected forests, landscapes, wild lands, and wildlife from resource extraction and development.¹³ Laws that attempted to stimulate private markets to protect the environment were seeking economic efficiency.¹⁴ Proposed laws that focused on restoration of natural capital and ecosystem goods sought to protect the capacity of nature to deliver environmental services to humans.¹⁵

Laws furthering these goals of protection, preservation, efficiency, and restoration were constructed around limiting human “use” intrusions of nature. The assumption behind second generation antipollution laws was that if use was restricted, there would be less human contamination of the necessary “nonuse” qualities of public environmental goods (e.g., a clean and healthful atmosphere). The assumption behind second generation preservation laws was

imposed. See *Hoffman v. Deschutes County*, 240 P.3d 79 (Or. App. 2010) (upholding setback requirements from structures near surface mine operations).

¹³ *Sagoff, supra* note 1 at 12; The Endangered Species Act, 16 U.S.C. § 1531 (b): “to provide a means whereby the ecosystems upon which endangered species...depend may be conserved,”...[and to] provide a program for conservation of such...species.”

¹⁴ David Driesen, *The Economic Dynamics of Environmental Law: Cost Benefit Analysis, Emissions Trading, and Priority Setting*, 31 B.C. Env'tl. Aff. L. Rev. 501 (2004).

¹⁵ Eric S. Higgs, *Nature by Design: People, Natural Processes, Ecological Restoration* (MIT Press 2003).

that use limits would protect natural objects like wild places and living organisms for low-level recreation and existence value. The assumption behind market-based solutions was that these would be more effective and less administratively expensive than command-and-control rules. The assumption behind second generation ecosystem services initiatives was that excessive human use had degraded the ability of natural systems to provide humans with economically essential, but largely under-valued, nature-based goods. These laws and regulations had the effect of constraining and conditioning, and making more expensive and problematic, the use and development of natural resources.

This legal intervention represented an important shift in judgment about the role of law with respect to natural resource development. Previously, first generation contract and property law sought to bring about what was good for the individual, such as the resource owner. First generation conservation statutes similarly sought to temporarily limit short-term resource use to ensure that there could be long-term resource use. But once owner-users so over exploited resources that nonuse values became impaired, second generation laws sought to rein in individual resource use to bring about what was best from the perspective of the larger community.¹⁶

Such laws also shared a common feature: they focused on the harmful effect resource use had on humans, rather than on the resource itself and its surrounding environment. These laws represented, and still represent, an *anthropocentric* perspective. They conceive nature, nature's resources, and the environment, as a mere good which serves to satisfy human needs while possessing no intrinsic value in itself. Most of the statutes and laws that today protect

¹⁶ Leonard Zabler, An Economic-Historical View of Natural Resource Use and Conservation, 38 Economic Geography 190 (1962).

resources from human use still have as their core purposes (1) the protection of human health and safety, (2) the shielding of anthropocentric resource nonuse values – i.e., low impact, recreational play and existence value - from human excesses, (3) the reliance on market-based mechanisms to replace certain traditional regulatory means of protecting human health and welfare and (4) the restoration and valuing of economically important ecological services and natural capital, for current and future generations.¹⁷

For decades, throughout the latter half of the 20th century and beginning of the 21st, resource owners, developers, and users battled these second generation “species chauvinistic” nonuse laws,¹⁸ that viewed virtually all harms to resources and the environment through an anthropocentric rights focus.¹⁹ When these harms seemed to continue, or even escalate,²⁰ attention turned to yet another anthropocentric approach to environmental degradation and natural resources exhaustion. This proposal, still reflecting second generation values, advocated future legal systems that would create “public” rights to environmental quality while continuing to adopt human-centric goals.

¹⁷ See generally Mark T. Brown and Mary Jane Angelo, Valuing Nature 81-109, in *Beyond Environmental Law: Policy Proposals for a Better Environmental Future* (A. Flournoy & D. Driessen eds. 2010); J.B. Ruhl, Valuing Nature’s Services – The Future of Environmental Law?, 13 *Natural Resources & Environment* 359-60 (1998); Klaus Bosselmann, Human Rights and the Environment: Redefining Fundamental Principles, in *Governing for the Environment: Global Problems, Ethics, and Democracy* 118-34 (Brendon Gleeson & Nicholas Lowe eds. 2001).

¹⁸ See, e.g., The National Environmental Policy Act, 42 U.S.C. § 4331 (a): “...the continuing policy of the Federal Government [is] to use all practicable means and measures... in a manner calculated to...maintain conditions under which *man* and nature exist in productive harmony, and fulfill the...requirement of *future generations of Americans*.” [emphasis added].

¹⁹ Gunther Handl, Human Rights and Protection of the Environment: A Mildly “Revisionist” View, in *Human Rights, Sustainable Development and the Environment* 117 (Antonio Trindade ed. 1992).

²⁰ Steve Newman, Nearly the Hottest, *Boulder Daily Camera* 4B (Dec. 24, 2010); Neela Banerjee, Climate Scientists Go Public, *The Denver Post* 5A (Nov.8, 2010); Hagit Affek, What We know About the Climate, *Yale Alumni Magazine* 28 (July/August 2010) (“Anthropogenic climate change is real”); Mark Lynas, *Six Degrees: Our Future on a Hotter Planet* (2007).

Such arguments in favor of extending human rights principles into the environmental realm posited the creation of a right, found in both international and constitutional norms, that could provide a substantive claim for all people to a clean, healthy, and sustainable environment. This kind of legally-acknowledged right could be collectively or individually held, and it would afford humans a priority to environmental nonuse values when resource use demands are being asserted.²¹ The central idea behind such a public right to environmental quality was grounded in part in the same premise that held that certain rights held by individuals, such as liberty from oppression, could be asserted when that right was threatened by government. Similarly when private or government choices adversely affect environmental goods necessary to human survival, then humans should have the right to mount a legal challenge to these destructive actions.²²

Another variety of this kind of human rights approach calls for a recognition of the public's overriding interest in private uses of land and resources. Such a public overlay on private resource choices could take one of two forms: (1) private property could be encumbered with the public's interest in ecological conservation,²³ or (2) government management of natural resources could be conditioned by a new duty to protect those resources consistent with a public trust obligation, where the government would serve as a trustee of nature for present and future generations.²⁴ Either approach would require private and government actions to give formal

²¹ Gunther Handl, Human Rights and the Protection of the Environment, in *Economic, Social and Cultural Rights: A Textbook* (A. Eide, C. Krause, & A. Roseas eds. 2001); Neil A. Popovic, Pursuing Environmental Justice with International Human rights and State Constitutions, 15 *Stanford Envtl. L.J.* 338 (1996).

²² See, e.g., The Rio Declaration, U.N. Doc. A/CONF. 151/26; 31 *I.L.M.* 874 (1992) –

Principle #1 – “Human beings...are entitled to a healthy and productive life in harmony with nature.”

²³ See, e.g., Eric T. Freyfogle, *The Land We Share: Private Property and the Public Good* (2003).

²⁴ Mary Christina Wood, Advancing the Sovereign Trust of Government to Safeguard the Environment for Present and Future Generations (Part I): Ecological Realism and the Need for a Paradigm Shift, 39 *Env't'l L.* 43 (2009).

legal consideration of broader, future, multi-generational ecological values other than near-term private consumptive and extractive use interests.²⁵

The question then, of course, is whether first and second generation laws now in place, or even the addition of a new round of anthropomorphic second generation human rights laws being contemplated, can prevent the environmental catastrophes that seem to characterize the 21st century.²⁶ First generation use-regulating conservation laws simply slowed the inexorable exhaustion of stock and renewable resources. A case can be made that second generation nonuse laws, designed to protect humans from pollution and to preserve natural objects, have not been able to halt, and will not succeed in reversing, a natural planet-wide collapse.²⁷ Criticism has also been leveled at second generation laws ostensibly guided by (1) a desire for economic efficiency, and (2) greater reliance on cost-benefit analysis and market-reliant systems as methods of achieving efficiency goals.²⁸ One can be similarly pessimistic about a new wave of second generation laws that presume unspoiled nature provides long-term economic benefits from ecosystem services that offset the short-term disadvantages involved in forgoing development. Such skepticism is fueled by economists who question whether the economic growth values measured by ecosystem services are correlated to human development and welfare.²⁹ Another proposed second generation law – a substantive human right to a clean

²⁵ Alyson C. Flournoy, The Case For the National Environmental Legacy Act 3-25, in *Beyond Environmental Law* (A. Flournoy & D. Driesen eds. 2010); Richard P. Hiskes, *The Human Right to a Green Future: Environmental Rights and Intergenerational Justice* (Cambridge Univ. Press 2009).

²⁶ Tyler Volk, *CO2 Rising: The World's Greatest Environmental Challenge* (2008).

²⁷ James Gustave Speth, *The Bridge at the End of the World: Capitalism, the Environment, and Crossing From Crisis to Sustainability* (2008).

²⁸ Frank Ackerman & Lisa Heinzerling, *Priceless: On Knowing the Price of Everything and the Value of Nothing* (2004)

²⁹ Nancy E. Bockstael, et al., On Measuring Economic Values for Nature, 34 *Environmental Science and Technology* 1384-89 (2000).

environment – is not in itself capable of determining priorities among competing goals.³⁰ A suggested parallel second generation law – an assertion of a collective right limiting private property choices – has had a mixed record of effectiveness when it has been deployed.³¹

It is the central thesis of this paper that there is another, more fundamental explanation for the inability of past and proposed legal norms and institutions for protect resource nonuse values. Each generation of actual legal response, including each proposed second generation law, has been *anthropocentric*. Each has focused on harmful impacts on individual humans rather than on natural resources themselves. What has been missing in virtually all institutionalized legal responses to resource stress and environmental damage is a perspective that sees resources in nature as a good in their own right, and not just an instrumentality to satisfying human preferences. Such a view would reflect the intrinsic worth of natural resources, not only to humans, but to the survival and continuation of all life on this planet. It would also subsume this assumption: When resources are not over-used, and when they are *left alone by humans*, they provide long-term health to ecosystems, to the earth's biosphere, to biodiversity, and therefore, but only incidentally, to humans.

First and second generation resource management laws assume that the protection of humans should be the central focus. Such a human-centric approach gave birth to first generation laws designed to encourage near-term use, and later conserve resources for future use. Second generation homo-centric laws are a reaction to the consequences of first generation resource – use laws; these laws are meant to protect humans from pollution, preserve natural

³⁰ Michael R. Anderson, Human Rights Approaches to Environmental Protection: An Overview, in Human Rights Approaches to Environmental Protection 22-23 (Alan Boyd & Michael R. Anderson eds. 1996).

³¹ Craig Anthony Arnold & Leigh A. Jewel, Litigation's Bounded Effectiveness and the Real Public Trust Doctrine: The Aftermath of the Mono Lake Case, 14 Hastings W. – N.W.J. Env'tl. L. & Policy 1177 (2008).

objects for human economic, recreational, existence value, and in some ways, grant legal status to ecosystem services. Proposed second generation laws seek to acknowledge environmental human rights, and impose public considerations on private use choices. Such laws would conform to the traditional view, which has always had humans as the prime beneficiaries of use reduction or use prevention schemes. But this approach has not adequately maintained resource nonuse values. As a result, we now face a combination of global climate change, natural systems destruction, species extinctions, and biomass depletion, which could compromise the integrity and survival of the earth's biosphere.³²

What seems needed now is a completely new, third generation response to the age-old problem of resource over-use, which has not only exhausted the resource base, but also impaired resource nonuse values.³³ A paradigm shift is necessary that does not just think about nature and the environment within the existing framework of resource use law, and resource economics, in which the protection of humans and the welfare of people are the primary goals. Instead, one should also reconsider the role of purely environmental rights, where what is legally-recognized is the intrinsic worth of nature and natural resources, irrespective of humans. Specifically, an eco-centric, rather than an anthropocentric, legal right would reflect the value to the entire planet of resource nonuse. Such a third generation legal right, *held by the resource*, would legitimate the resource's power not to be directly used and exploited by humans. This right would be the resource's right of nonuse, a counterweight to the embedded traditional human right of use.

³² Robert Barr, Carbon Output Forecast to Rise, The Denver Post 7B (January 20, 2011); Juliet Eilperin, Study: Extinction Crisis Looms, The Denver Post 13A (Oct. 27, 2010); Jonathan Leake, Fish Stocks Eaten to Extinction by 2050, The London Times 9 (July 11, 2010); Justin Gillis, Is It Global Warming? Probably, Scientists Say, The New York Times 19A (Aug. 15, 2010); Vaclav Smil, The Earth's Biosphere: Evolution, Dynamics, and Change (2003); Noaki Schwartz, 60% in Nation Live in Dirty Air, The Denver Post 6A (Apr.24, 2009); Lindsey Tanner, Pre-Birth Air Pollution May Damage Kids' IQ's, The Denver Post 6A (July 20, 2009).

³³ Ted Nordhaus and Michael Shellenberger, Break Through: Why We Can't Leave Saving the Planet to Environmentalists (2009).

This paper reviews how, over time, laws have been used by people to establish a formal relationship between human needs and the natural resources that comprise the surrounding environment. During each iteration, legal doctrine emerged that was meant to permit people to maximize their own human-centric values and needs with respect to natural resource. Part II will discuss how resource use initially dominated the creation of first generation legal rights, including laws that were eventually adopted to curb resource use in order to conserve natural resources for future use. Part III will review second generation laws that (1) protect the nonuse health benefits that humans experience when public environmental goods are not employed as a pollution sink, (2) preserve natural objects from extractive developmental use to maximize recreational and existence value, (3) seek to carry out regulatory reforms guided by a desire for economic efficiency and market-based approaches to environmental quality, and (4) incorporate into decision making a system that would account for the economic services provided humans when ecosystems are left alone. Part IV will consider an emerging second generation of resource regulating laws, still anthropomorphic, which would benefit humans by (1) recognizing a substantive human right to an unpolluted and non-depleted natural environment, and (2) requiring public ecological values be a check on private resource use decisions.

Part V will argue that all these prior approaches are self-limiting, because they conceive of nature and natural resources as goods that have no inherent value, and instead deserve legal protection only to satisfy human use preferences and nonuse needs. Part V will suggest that an entirely new, third generation perspective may now be in order, which does not simply view looming environmental crises through a traditional human rights focus. A non-anthropocentric right of nonuse, held by the resource, gives legal credibility to the notion that natural resources left in a natural state are a condition to all life on earth, not just human life. With planetary

ecological bankruptcy now a real threat, the creation of an entirely different, ecocentric relationship between law and natural resources, may now be in order.

II. First Generation Laws: Creating Use Interests in Natural Resources

Resource use values have long enjoyed legal legitimacy. Initially, use values were protected by first generation laws acknowledging and providing security to resource user interests. The advent of property law, in particular, established ownership interests that permitted owner-users to resist the advances of competing users, and to exploit the economic use potential of resources. Later, federal and state statutes provided further legal stature to resource owners, while imposing sanctions for failure to use owned commodities. Some of these statutes also authorized government ownership of resources, so that administrative managers could allocate publicly-owned resources to deserving private parties. Common law and constitutional law also rewarded resource use.

The general theme behind these laws was that humans should have a virtually unlimited right to exploit natural resources. These legal assertions of an unfettered right to exploit nature was in keeping with the utilitarian rationale that wealth maximization (through resource use) works as the motor for human welfare production. Such utilitarian rationales consciously subjugated nature in the superficially calculated interest of humanity.³⁴

The legal protection of resource use interests not only provided owner-users with security with respect to rivalrous non-owners, it also, and not surprisingly, encouraged owners to use their resources. And they did. During the Twentieth Century, the world's total urban population

³⁴ Richard Posner, *The Economics of Justice*, 74-76 (1983); Indira H. Carr, *Saving the Environment – Does Utilitarianism Provide a Justification?*, 12 *Legal Studies* 92, 94-101 (1992); Peter A.Y. Gunter, *The Big Thicket*, in *Philosophy and Environmental Crisis* 117-136 (W.T. Blackstone ed. 1974).

grew by 13 fold, and its industrial output increased by roughly 40-fold. The world's population and its industrial base needed natural resources – food, fiber, oil, gas, coal, minerals, water, rangeland, timber. These resources were extracted, developed, depleted, and otherwise used at an unprecedented rate. The resulting accelerated exploitation of natural resources began to exhaust, or make unsustainable, stock and renewable commodity resources.

Nonrenewable stock resources, like minerals and energy fuels, were removed with little concern about the inevitable fact that once exhausted, these resources would be gone forever.³⁵

Renewable commodity resources, such as forests, woodlands, fisheries, water supplies and rangeland, were similarly exploited by humans, often at or above sustainable levels.³⁶

When humans realized that stock and even renewable resources necessary for Twentieth Century human societies were being exhausted, with no easy substitutes available, another variety of first generation laws were enacted. These so-called “conservation laws” were enacted to restrict otherwise unlimited use, in order to perpetuate future use. In other words, we sought to address the first consequence of over-use by adopting laws requiring some conservation of the resource base so that future use was not impaired. Restraint was exercised out of recognition that excessive use could hurt our long term economic interest to over-exploit natural resources.

³⁵ John R. McNeill, Resource Exploitation and Over-Exploitation: A Look at the 20th Century, in *Exploitation and Overexploitation in Societies Past and Present* 52-3 (Brigitta Benzing & Bernard Hermann eds. 2003); Kenneth S. Deffeyes, *Hubbert's Peak: The Impending World Oil Shortage* (2001); Vaclav Smil, *Energies: An Illustrated Guide to the Biosphere and Civilization* (1999).

³⁶ Jeremy B. Jackson, et al., Historical Overfishing and the Recent Collapse of Coastal Ecosystems, 293 *Science* 629 (2001); Sing S. Chew, World Ecological Degradation: Accumulation, Urbanization, and Deforestation, 3000 B.C. – A.D. 2000 (2001); Antonio D'Amato & Sudhir K Chopra, Whales: Their Emerging Right to Life, 85 *Am. J. Int'l L.* 21, 30 (1991). By the Twenty First century, renewable resources were being over-exploited and degraded not only by extractive commodity uses, but also by recreational uses, especially motorized recreation. See Byron Kahr, *The Right to Exclude Meets the Right to Ride: Private Property, Public Recreation, and the Rise of Off-Road Vehicles*, 28 *Stanford Environmental Law Review* 51 (2009).

A. Immediate Use Laws

1. Property Interests Created

For humans to fully exploit the use component of natural resources, it was first necessary to halt the rapid depletion of resources that comes with open access conditions. When resources are unowned, stock resources like minerals are too quickly extracted,³⁷ and renewable commodity resources like timber are removed at a non-sustainable rate.³⁸ Such resource exhaustion leads to the excessive dissipation of resource rents³⁹ and the eventual collapse of resource-dependent economies.⁴⁰ Non-existent or poorly developed property rights also require resource users to incur high costs, first in claiming the resource and then in excluding others from it. The time, effort, and cost of warding off competing users often results in either premature development (i.e., extract the resource before a rival does) or dissipation of net capitalized rents.⁴¹

The obvious solution to these negative consequences of open access conditions was to “privatize” both stock and renewable commodity resources. The ability to establish private property rights over these resources meant that they could be removed and developed only by those users with an ownership interest in them. User-owners could exclude other would-be

³⁷ Edward B. Barbier, *Natural Resources and Economic Development* 130 (2005).

³⁸ James A. Brander & M. Scott Taylor, *Open-Access Renewable Resources: Trade and Trade Policy in a Two-Country Model*, 44 *Journal of International Economics* 181 (1998).

³⁹ Louis Hotte, Ngo Van Long, and Huilan Tian, *International Trade with Endogenous Enforcement of Property Rights*, 62 *Journal of Development Economics* 25 (2000).

⁴⁰ Linda Cordell, *Aftermath of Chaos in the Pueblo Southwest*, in *Environmental Disaster and the Archaeology of Human Response* 179, 189 (Garth Bawden & Richard Martin Reycraft eds. 2000).

⁴¹ Terry L. Anderson and Peter J. Hill, *The Race for Property Rights*, 33 *Journal of Law and Economics* 177 (1990); C. Southey, *The Staples Thesis, Common Property and Homesteading*, 11 *Canadian Journal of Economics* 547, 557 (1978).

users, and enjoy the fruits of the resource's use component.⁴² Applicable property law protected owner-users when non-owner, would-be users sought to invade or assert control over the resource interest. Secure legal rights over natural resources also provided user-owners with incentives for increased investments in resource improvements and productivity.⁴³ In the case of minerals, security of legal title to the resource may have even brought substantial "knowledge" spillovers, which helped to encourage knowledge-based economic growth.⁴⁴

Property law permitted resource users the ability to (1) acquire an ownership interest in resources, (2) assert a right of use and disposition regarding the owned resource, and (3) exclude other claimants who wished to assert a competing use interest.⁴⁵ The right to have a legal property interest in a natural resource grants the owner dominion over it, which in effect removes the privately owned resource from the realm of nature, while transferring its potential utility to the human owner.⁴⁶ The right of use protects the owner's privilege to utilize this ownership interest in the owner's discretion. This utilitarian function of property law has been characterized as one of the most important rights in the bundle of sticks provided by property

⁴² James Willard Hurst, *Law and Conditions of Freedom in the Nineteenth Century United States* 7 (1956).

⁴³ Henning Bohn & Robert T. Deacon, *Ownership Risk, Investment, and the Use of Natural Resources*, 90 *American Economic Review* 526 (2000); Gershon Feder & David Feeny, *Land Tenure and Property Rights: Theory and Implications for Development Policy*, 5 *World Bank Economic Review* 135 (1991).

⁴⁴ Paul A. David & Gavin Wright, *Increasing Returns and the Genesis of American Resource Abundance*, 6 *Industrial and Corporate Change* 203, 240-1 (1997) ("the [American] minerals economy was an integral part of the emerging knowledge-based economy of the twentieth century...").

⁴⁵ 1 William Blackstone, *Commentaries* 138; *United States v. General Motors Corp.*, 323 U.S. 373, 378 (1945); *John R. Sand & Gravel Co. v. United States*, 60 Fed. Cl. 230, 236-7 (2004) (Property is a group of rights, such as the right to process, use, and dispose of it).

⁴⁶ Without private ownership, and dominion over the resource, stock, renewable, and public environmental natural resources remain open to use by everyone, and subject to the "tragedy of open access" – overuse, depletion, and pollution. Daniel H. Cole, *Pollution and Property* 5-7 (2002); Garrett Hardin, *The Tragedy of the Commons*, 162 *Science* 1243 (1968).

ownership.⁴⁷ The right to exclude protects the interest holder and resource user from harm by competing non-owners.⁴⁸ All these elements of property encouraged and legitimated use and exploitation of natural resources. Traditional property law neither promoted resource conservation nor protected resource nonuse benefits from excessive use.

2. Statutory Law Encouraging Use

The advent of property law gave owners the exclusive right to use certain resources, and the ability to prevent competitors from enjoying the same use benefit. This consequence of resource ownership created two classes of users – those who own it and those who do not. For centuries, resource conflicts tended to involve just these two user interests, where one party sought to perfect an exclusive right to resource use, while another party sought to either establish a countervailing ownership interest (permitting them to use it instead), or collaterally attack an ownership right that was not being used. Federal and state statutes helped resolve such conflicts between competing use interests. These laws both defined how users could acquire an ownership interest in natural resources, and established rules allowing owner-users to defeat the claims of non-owner, would-be users. Statutes reflected a generally accepted policy judgment about natural resources: Once they are owned, they should be *used* by the owners. Indeed, failure to use often meant the loss of ownership.

Federal laws allowed private parties to exploit natural resources located on public lands. These statutes created the possibility of ownership interests for the purpose of promoting the

⁴⁷ Trotzer v. Vig, 203 P. 3d 1056 (Wash. App. 2009) (landowner action against neighbor for trespass to timber interest); United States v. Craft, 535 U.S. 274, 283 (2002) (stating that state law “grants a tenant...one of the most essential property rights: the right to use the property....”).

⁴⁸ Nollan v. Cal. Coastal Com’n, 483 U.S. 825, 831 (1987) (“We have repeatedly held that, as to property reserved by its owner for private use, ‘the right to exclude is one of the most essential sticks in the bundle of rights that are commonly characterized as property.’”).

discovery, extraction, development, and use of resources.⁴⁹ Rights were granted to the parties best able to use and exploit resources while, conversely, nonuse was discouraged.⁵⁰ Two classes of conflicts emerged among users: (1) owner-users and competing would-be users who wished to become owners;⁵¹ and (2) owners of two different resource interests, whose different use interests clashed.⁵²

When two resource users in the federal scheme came into conflict, the class that intended to put the property to the most valued use often prevailed.⁵³ As a result, courts tended to favor the active mineral estate over the surface estate, even when use of the mineral estate caused

⁴⁹ General Mining Act of 1872, 30 U.S.C. § 22 (providing for private development and use of the mineral resources on federal lands); Organic Act of 1897, 16 U.S.C. § 472-82 (opening up for private use timber reserves on federal land); National Forest Management Act, 36 U.S.C. § 1600 (opening up timber resource to private harvest and sale); Taylor Grazing Act of 1934 (regulating grazing uses of federal lands), 43 U.S.C. § 315-315r; Multiple Use Sustained Yield Act of 1960, 16 U.S.C. § 528-531 (opening up national forests to the uses of outdoor recreation, timber, watershed and wildlife and fish purposes); Federal Land Policy Management Act, 43 U.S.C. § 1701-84 (directing the BLM to regulate the use of federal lands, including for resource and grazing uses); Reclamation Act, 43 U.S.C. § 373 (providing a mechanism for private parties to exploit the water resources on federal lands); Warren Act, 43 U.S.C. § 485, 523 (allowing the government to enter into private contracts for the impoundment, storage and carriage of water located on federal lands). See generally *United States v. Minard Run Oil Co.*, 1980 U.S. Dist. Ct. Lexis 9570 (W.D. Pa. 1980) (under 1911 Weeks Act, owner of mineral rights had “an unquestionable right” to enter and extract minerals).

⁵⁰ *United States v. Locke*, 471 US 84 (1985) (finding constitutional a provision of FLPMA providing for abandonment and forfeiture of mining claim for failure to comply with mining claim filing requirements).

⁵¹ *Bedroc Ltd. v. United States*, 541 U.S. 176 (2004) (where patentee sought to quiet title to sand and gravel on its property, finding such sand and gravel not “mineral” in nature and therefore not reserved by the United States for purposes of the Pittman Underground Water Act of 1919); *Watt v. Western Nuclear*, 462 U.S. 36 (1983) (where mining company removed gravel from lands patented under the Stock-Raising Homestead Act, finding gravel a “mineral” reserved to the United States); *Rosette, Inc. v. United States*, 277 F. 3d 1222 (10th Cir. 2002) (where landowner sought to quiet title to land’s geothermal resources, finding those resources qualified as “minerals” reserved by the United States under the Stock-Raising Homestead Act).

⁵² *TransWestern Pipeline Co. v. Kerr-McGee Corp.*, 492 F. 2d 878 (10th Cir. 1974) (mineral lessee allowed to cause surface subsidence).

⁵³ See, e.g., *Kinney-Coastal Oil Co. v. Kieffer*, 277 U.S. 488 (1928) (where the surface and mineral estate had been severed, interpreting federal law to require that a homesteaded surface owner yield its residential real estate development to the extent that it interfered with a later acquired oil and gas lease); *Bill Barrett Corp. v. U.S. Dept. of Interior*, 601 F. Supp. 2d 331 (D.D.C. 2009) (coalbed methane gas company denied injunction that would have prevented coal exploration by a different company under federal lease from proceeding).

damage to the surface estate.⁵⁴ However, when the mineral estate was not actually used, the claims of the putative mineral estate owner could be lost.⁵⁵ Similarly, if a user wished to secure a patentable ownership interest in a resource, especially a mineral resource, the critical test was acceptance by the commercial market. In order for the United States to lose its interest in a resource to a private developer, that resource needed to be sufficiently valuable so as to be used and sold in the relevant market.⁵⁶

State statutory law has also provided a mechanism for private property interests in resources to be acquired in state-owned public lands.⁵⁷ Like federal resource statutes, these state laws served to encourage the discovery, use and development of natural resources on state lands.⁵⁸ The policy reflected in these laws was that there was an important public interest in using natural resources.⁵⁹ Indeed, states imposed sanctions when use was delayed, or when certain development standards were not met.⁶⁰ Use was preferred over nonuse. When either the

⁵⁴ See, e.g. *Keystone Bituminous Coal Ass'n v. DeBenedictus*, 480 U.S. 470 (1987) (finding no unconstitutional taking of surface estate under law regulating coal mining); *TransWestern Pipeline Co. v. Kerr-McGee Corp.*, 492 F.2d 878 (10th Cir. 1974) (allowing the mineral lessee to cause surface subsidence without liability).

⁵⁵ *United States v. Begwell*, 961 F.2d 1450 (9th Cir. 1992) (finding the doctrine of pedis possession protected prior claims from subsequent rival claimants only where the claimant actually explores for a valuable mineral diligently and in good faith).

⁵⁶ *United States v. Coleman*, 390 U.S. 599 (1968) (the resource must be extracted and marketed at a profit); *United States v. Etcheverry*, 230 F.2d 193 (10th Cir 1956) (holding that discovery of a valuable mineral is required to perfect the miner's unpatented mining claim under the General Mining Act of 1872); *Ernest K. Lehmann & Assoc. of Montana, Inc. v. Salazar*, 602 F. Supp. 2d 146 (D.D.C. 2009) (finding "discovery" not made where claimant did not establish probable profitability of claims).

⁵⁷ NEB REV STAT § 72-306 (1929) (directing the regulation of mineral substances on state lands); ALASKA STAT. § 44.99.110 (1988) (providing for the mineral policy of the state); N.M. STAT. § 69-10-4 (1978) (directing the private development of mineral resources); 32 PA. STAT 141 (1961) (providing for the development of minerals on state forest land); ARIZ REV STAT. 27-102 (2003) (directing the private development of mineral resources of the state); 7 DEL. C. 6001 (1973) (directing the development of mineral production and mineral products from state lands).

⁵⁸ See, e.g., *Pono v. Molokai Ranch, Ltd.*, 194 P. 3d 1126 (Hawaii 2008) (reviewing state law encouraging that "land resources" be "utilized" for "the needs of the economy.").

⁵⁹ *American Aggregates Corp. v. Highland TWP*, 390 N.W. 2d 192 (Mich. App. 1986).

⁶⁰ TX Natural Resource Code 52.174 (providing for forfeiture of the mineral estate lease interest where there is failure to drill within the prescribed time period).

timing or the intensity of resource use did not fulfill the full potential for exploitation, these laws provided for forfeiture of the interest.⁶¹ Alternatively, state forfeiture laws could be suspended only if doing so served to encourage future mineral production.⁶²

3. The Common Law and Constitutional Law

The common law sets out the conditions of ownership, and constitutional law resolved conflicts that arose between government and potential owner users. The common law of contracts helped ensure that where disputes were between owner-users and non-owner, would-be users, owners would prevail where the non-owner sought to invade or assert control over the resource interest.⁶³ Disputes between owner-users and non-owner, would be users were also resolved with reference to the state-specific common law of property. Property law was inclined toward resource exploitation, and favoring the party whose intention best furthered the use interest. For instance, the Kansas Supreme Court in one case considered a deed granting all coal but reserving “all rights, surface, mineral or otherwise not specifically granted.”⁶⁴ The Court found this deed to have conveyed coal bed methane gas, relying heavily on the fact that the grantee had drilled and obtained production, whereas the grantor had “[n]ever exercised the right

⁶¹ See, e.g., NEB. REV STAT 72-306 (1929) (allowing the Neb. Board of Educational Lands and Funds to demand more rapid development from a lessee, or alternatively lease cancellation, when an unreasonable delay is found between the discovery and development of mineral substances); *Nelson v. State, Dept. of Agriculture*, 242 P. 3d 1259 (Kan. App. 2010) (nonuse of a water right may be considered an abandonment of the right).

⁶² Idaho Code Ann. §42-223(11)(2008) (suspending forfeiture of water rights with a beneficial use related to mining where water right owner has maintained the property and the property has potential for future mineral production).

⁶³ *American Silver Mining Co. v. Coeur D’Arlene Mines Corp.*, 480 P.2d 900 (ID 1971) (contract for exploration work was not abandoned where the contract did not require all levels to be explored and where silver veins were actually discovered in the levels that were explored); *M.J.S. Resources v. Circle G. Coal Co.*, 506 F. Supp. 341 (E.D. Miss. 1980) (coal mining agreement invalid and unenforceable where it did not obligate the mining of coal unless specifically requested to do so, but contained no similar obligation for the opposing party to make such a request).

⁶⁴ *Central Natural Resources v. Davis Operating Co.*, 201 P.3d 680 (Kan. 2009).

to mine and remove coal from any of the tracts... [and] never attempted to explore or produce the natural gas.”⁶⁵ The Court’s message: the law tends to favor use over non-use.

The common law doctrines of adverse possession and prior appropriation of water similarly advocated a “use it or lose it” approach to property and resource ownership. Under the doctrine of adverse possession, the owner must assert an ownership right in the property through use, or risk forfeiting this interest altogether to a competing non-owner, would-be user.⁶⁶ The doctrine of prior appropriation favors the water user that establishes use, and that does not abandon the use.⁶⁷ If there is evidence of non-use, the owner’s water right may be lost, so that the resource may be put to use by some other appropriator.⁶⁸

While common law doctrine favored resource use over nonuse when property owners confronted competing private user interests, the takings clause of the United States constitution recognized the significance of an owner’s right to use and enjoy property when owners confronted government action designed to prevent such use. Takings jurisprudence from the courts established the rule that land use regulations could become unconstitutional takings if they “go too far” by greatly diminishing the economic use value of property rights,⁶⁹ or if they

⁶⁵ Id. at 682-83.

⁶⁶ *Thomas v. Rex A. Wilcox Trust*, 463 N.W.2d 190 (Mich. App. 1990) (oil and gas lease interests capable of adverse possession); *Pickens v. Adams*, 131 N.E.2d 38 (Ill. 1956) (to establish adverse possession, minerals had to actually be removed from the ground or oil and gas actually produced); *Otter Creek Reservoir Co. v. New Escalante Irrigation Co.*, 203 P.3d 1015 (Utah 2009) (applying the doctrine of adverse possession to determine the proper owner of water right).

⁶⁷ See, eg., *In re Clark Fork River Drainage Area*, 833 P.2d 1120 (Mont. 1992) (finding rebuttable presumption of abandonment where nonuse of water right for 23 years was established).

⁶⁸ *Okanogan Wilderness League, Inc. v. Town of Twisp*, 947 P.2d 732 (Wash. 1997) (abandonment of water right where would-be owner failed to use the water right for a continuous, prolonged period of time).

⁶⁹ *Pennsylvania Coal Co. v. Mahon*, 260 U.S. 393 (1922).

“unreasonably interfere” with the owners right to use the owner’s property,⁷⁰ or if they deprive an owner of “all economically beneficial use” of the property.⁷¹ Central to these takings tests is the issue of whether use values remain for resource owners after regulations have been imposed; if few or no remaining uses are available to affected property owners, there is more likelihood that the regulation becomes a taking.⁷² The Takings Clause thereby reinforced the notion that resource use was not just a preferred value under common law and statutory law, but in some cases, also under constitutional law.

B. Future Use Laws: Conservation of Natural Resources

When both market forces and legal doctrine emphasized and encouraged resource use, the inevitable consequence was that stock and renewable commodity resources were indeed used by humans, at escalating rates. At first, it seemed as though there was a never-ending supply of stock resources – if one gold deposit was exhausted, another was discovered. Renewable commodities, like timber and rangeland and water, seemed to be able to replenish themselves, despite increasing exploitation of their use value. Eventually, however, excessive resource use began to inexorably deplete stock resources, and make unsustainable renewable commodity resources.

Initially, what caught the attention of policy makers was the decrease in resources that had the highest *use* potential (i.e., resources, like oil and gas, or timber that seemed to benefit humans economically when they were used in a market setting). Since most laws encouraged

⁷⁰ *Vulcan Materials Co. v. City of Tehuacana*, 369 F. 3d 882 (5th Cir. 2004); *Palm Beach Isles Assoc. v. United States*, 231 F. 3d 1354, 1359 (Fed. Cir. 2000)

⁷¹ *Lingle v. Chevron U.S.A., Inc.*, 544 U.S. 538 (2005); *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 1019 (1992) (“by requiring land to be left substantially in its natural state...to sacrifice all economically beneficial uses...to leave his property economically idle...[is a taking].”).

⁷² *Alabama Dept. of Transportation v. Land Energy, Ltd.*, 886 So. 2d 787 (Ala. 2004); *Friedenburg v. New York Dept. of Environmental Conservation*, 767 N.Y.S. 2d 451 (N.Y. App. 2005).

resource use, a diminution of resources valuable for their use potential required some immediate legal action. Law makers responded to this very real economic threat by adopting legislation designed to regulate and restrict private resource use, even by resource owners. The driving realization behind these first generation laws was that the viability of resources should not be left to the market. Such use-regulating and resource conservation laws were meant to ensure the long-term sustainability of the use component of many economically valuable natural resources.⁷³

An early example of awareness of the exhaustibility of natural resources came in 1920, with the enactment of the Mineral Leasing Act.⁷⁴ Prior to this statute, energy minerals on public lands were being lost to private ownership under the 1872 Mining Law.⁷⁵ The Mineral Leasing Act withdrew oil, gas, coal, and oil shale from the give-away provisions of the 1872 Mining Law, and placed these stock energy resources under a federal leasing system, where their use could be more easily regulated. State well-spacing, pooling, and unitization regulations also sought to conserve underground oil and gas deposits, which otherwise would have been depleted too quickly by competing surface owners.⁷⁶

Law makers next turned their attention to renewable commodity resources, such as timber, rangeland, water, and aquatic life. The Multiple Use Sustained Yield Act of 1960⁷⁷ declared that national forests be administered to produce “sustained yield.”⁷⁸ A sustained yield was a yield that did not exhaust the timber resource. Later, the National Forest Management Act

⁷³ Adrian Parr, *Hijacking Sustainability* (2009).

⁷⁴ 30 U.S.C. §181.

⁷⁵ 30 U.S.C. §22.

⁷⁶ John S. Lowe, *Oil and Gas Law 18-26* (1995).

⁷⁷ 16 U.S.C. §§528-531.

⁷⁸ *Id.* At §529.

of 1976⁷⁹ attempted to slow the harvesting of timber by requiring extensive planning before cutting. Of course, planning does not halt deforestation if the plan both contemplates and provides for timber cutting. The unregulated use of federal rangeland for grazing was addressed by the Taylor Grazing Act of 1934;⁸⁰ this federal statute attempted, with mixed results, to impose controls on what would have become an unsustainable and nonrenewable grassland resource if unchecked overgrazing had continued.⁸¹

The fate of two other over-used renewable commodities – water and aquatic life – was in large part determined, and doomed, by state law and loosely regulated international agreement. The conservation of surface water was thwarted by state “use-it-or-lose-it” prior appropriation rules prevalent in the West,⁸² while groundwater still suffers from an underground “tragedy of the commons” that encourages excessive pumping.⁸³ Over-fishing, especially in the oceans, has proven maddeningly difficult to control. Fish tend to exist in a classic open access setting, out of the reach of normal regulatory systems. International understandings have been largely unenforceable. Curbing the exploitation of fisheries, especially in oceans, will likely require some bottom-up property rights approach among users, secured by international treaty.⁸⁴

III. Second Generation Laws: Protecting Human Nonuse Interests

⁷⁹ 16 U.S.C §§1600-1614.

⁸⁰ 43 U.S.C. §315-315r.

⁸¹ W. Gard, *Frontier Justice* 81-149 (1949).

⁸² See Melinda Kassen, *A Critical Analysis of Colorado’s Water Right Determination and Administration Act of 1969*, 3 U. Denver Water L. Rev. 58 (1999).

⁸³ Robert Glennon, *Water Follies: Groundwater Pumping and the Fate of America’s Fresh Waters* (2002).

⁸⁴ See, e.g., Katrina Miriam Wyman, *From Fur to Fish: Reconsidering the Evolution of Private Property*, 80 N.Y. U. L. Rev. 117 (2005); Carrie A. Tipton, *Protecting Tomorrow’s Harvest: Developing a System of Individual Transferable Quotas to Conserve Ocean Resources*, 14 Va. Env’tl. L. J. 381 (1995). The federal government’s primary response to over-use of animals that inhabit the marine environment was the Marine Mammal Protection Act of 1972, 16 U.S.C. §1361-1407, which sought to maintain the “optimum sustainable population” of seals, whales, porpoises, walrus and other marine mammals.

First generation laws encouraged the use and exploitation of natural resources, for both near-term and future human benefit. Ironically, these laws and the resource exhaustion and contamination they furthered, eventually produced environmental and ecological damage that harmed, or threatened to harm, humans. But the harm was not just to humans; it was also to the “nonuse” component of the natural resources themselves. One feature of this nonuse quality is that humans are benefitted when they leave resources alone. When they do not use resources, but instead leave them in a natural state, the resource’s nonuse component is able to provide humans with clean air and water, and with a naturally sustainable resource base. These nonuse values provide competing benefits that are as important as the economic gains that flow to users when resources are extracted and developed for market advantage. Conversely, when excessive human use destroys or impairs this inherent nonuse dimension of resources, humans bear the cost, when their health, welfare and economic well-being becomes impaired.

First generation laws, even conservation laws, still stimulated resource use. They had little effect on the overexploitation of public environmental goods, like the atmosphere, the water cycle, and the earth’s surface and subsurface. These goods are necessary for human existence. They also serve as “sinks” for the wastes and poisonous emissions from human society; up to a point they have the capacity to absorb, break down, or recycle certain amounts of various pollutants. Overexploitation occurs when pollutants accumulate faster than they can be dissipated. By the mid-Twentieth Century, it was becoming apparent that human use activities had so overloaded these sinks that they could not absorb and retransform these human wastes and emissions sufficiently for a health human livelihood. “Second generation” anti-pollution laws were enacted to protect us from our own pollution, and to restore this vital anthropocentric nonuse role of public environmental goods. Many of these laws were designed to protect

humans from the health hazards of human resource use activities, without making such protection conditional upon utility calculations.⁸⁵

Second-generation anti-pollution laws could not prevent the harm that resource use activities were inflicting on certain natural places, like wild lands, and on natural objects, like wildlife species. These resources have value to humans because they either want to play and recreate in undisturbed forests and landscapes, or enjoy the knowledge that living things still exist in an unused natural state.⁸⁶ When it was realized that some people place a value on resources for future recreational activities that do not consume or exploit the resource, and some people place a value on the mere existence of natural resources simply because they are natural, it became necessary for yet another category of second generation nonuse laws to be enacted. These laws were *preservation* laws; they preserved natural objects like forests, wilderness, wildlife, and historical sites, so that humans could benefit from the nonuse values that emerge when humans are prevented from engaging in resource use practices that affect natural objects.

When the extraordinarily complex system of environmental laws proved more difficult to implement than anticipated, a wave of regulatory reforms were instituted to achieve better economic efficiency. These reforms sought to simulate private markets by creating a capped system of transferable pollution “rights” to protect the environment; at times these reforms also relied on cost-benefit analysis to choose the goals of environmental law.⁸⁷ These second generation laws were designed to make environmental regulations less costly and more efficient,

⁸⁵ Marian Fischer-Kowalski, Modes of Colonizing Nature, in *Exploitation and Overexploitation*, McNeill, *supra* note 35; 42 U.S.C. § 7409(b)(1) (“National ambient air quality standards...shall be...based on such criteria...to protect the public health.”); *Whitman v. American Trucking Ass’n*, 531 U.S. 457 (2001) (cost considerations not permitted when setting national ambient air quality standards).

⁸⁶ See, e.g., E.B. Barbier et al., Economic Value of Biodiversity, in *Global Biodiversity Assessment* 823, 829 (V.H. Hegwood et al. eds 1995); *Krutilla*, *supra* note 1 at 12.

⁸⁷ *Cole*, *supra* note 46 at 45-66.

while mimicking market-based mechanisms as methods of achieving anthropocentric resource nonuse objectives. A final class of second generation laws were premised on the belief that when certain natural resources were not used, they would then provide for humans various “ecosystem services” that benefitted human welfare. A series of legal mandates slowed the destruction of wetlands, estuaries, and other similar resources which perform services that maximize homo-centric welfare when these resources are left alone.

A. Anti-Pollution Laws: Protecting Human Health

Throughout the latter half of the 20th Century, and certainly by the beginning of the 21st Century, there was accumulating evidence of human harm caused by toxic pollution, deforestation, wetlands destruction, over-appropriation and pollution of water, and the loss of fisheries.⁸⁸ Human health seemed threatened by the pollutants that people were breathing and ingesting.⁸⁹ Our ability to experience the ecological and atmosphere-cleaning benefits of forests had been jeopardized by the removal of nearly 90% of the nation’s old growth forest lands.⁹⁰ The collapse of sea fisheries, caused by pollution and over-fishing, portended a loss of wild seafood in the future.⁹¹ The amount of urban land development quadrupled between 1954 and

⁸⁸ Benjamin Toss and Steven Amter, *The Polluters: The Making of our Chemically Altered Environment* (2010); James Gustave Speth, *The Bridge at the End of the World: Capitalism, The Environment, and Crossing From Crisis to Sustainability*, ch. 1 (2008).

⁸⁹ John Wargo, *Creating Environments That Protect Human Health* (2009); General Accountability Office, Doc. No. GAO-06-669, Rep. to Congressional Requestors, *Clean Air Act: EPA Should Improve the Management of its Air Toxics Program 1* (June, 2006); Thomas H. Maugh II, Study: Long-Term Ozone Exposure Boosts Deaths, *The Denver Post* at 4A (Mar. 12, 2009); Lindsey Tanner, Pre-Birth Air Pollution May Damage Kids’ IQs, *The Denver Post* at 6A (July 20, 2009).

⁹⁰ Reed Noss, et al., *Endangered Ecosystems of the United States: A Preliminary Assessment of Loss and Degradation*, app. A, available at <http://biology.usgs.gov/pubs/ecosys.htm>.

⁹¹ Boris Worm et al., Impacts of Biodiversity Loss on Ocean Ecosystem Services, *314 Science* 787 (Nov. 3, 2006); *Leake, supra* note 32.

2000,⁹² bringing about a concomitant reduction of ecosystem services vital to human welfare, wild lands, and native grasslands.⁹³ Species extinction rates accelerated, to the point that by the 21st Century they were 1000 times faster than normal.⁹⁴

These threats to and assaults on life-sustaining and life-enhancing natural resources brought about a realization that there should be a profound paradigm shift towards resources management. Instead of encouraging, or regulating the sustainability of, resource *use*, it was thought that legal regimes should now help individuals to experience the benefits that arise from resource *nonuse*. The first wave of second generation regulations appeared. These second generation laws served a primary anthropocentric purpose: the protection of personal health, especially with regard to pollution.⁹⁵ Second generation antipollution laws, such as the Federal Clean Air Act⁹⁶ and Clean Water Act,⁹⁷ and state environmental protection laws,⁹⁸ were grounded in resource nonuse. The central premise of these second generation laws was (and still is) that when public environmental goods are not used as a garbage dump for our wastes, these resources provide critical health benefits that humans enjoy when they breathe clean air,

⁹² U.S. Envir. Prot. Agency, Doc. No. EPA-231-R-01-002, *Our Built and Natural Environments: A Technical Review of the Interaction Between Land Use, Transportation, and Environmental Quality* 4 (2001).

⁹³ Ross W. Gorte, *Wilderness: Overview and Statistics* (Cong. Research Service, CRS Report for Congress Order Code RL 31447, June 11, 2002); *Noss, supra* note 90.

⁹⁴ E. O. Wilson, *The Diversity of Life* 280 (1992); World Conservation Union (IUCN), *2006 IUCN Red List of Threatened Species, Summary Statistics, Table 1* (2006); *Speth, supra* note 88 at 1; *Eilperin, supra* note 32.

⁹⁵ See, e.g., Juliet Eilperin, *Stricter Chemical Release Law Ok'd*, *The Denver Post* at 9A (March 12, 2009) (companies must provide detailed disclosure of toxic chemicals released into the air).

⁹⁶ 42 U.S.C. §7401 et. seq.

⁹⁷ 33 U.S.C. §1251 et. seq.

⁹⁸ See, e.g., Mississippi Department of Environmental Quality, *MI Code Ann. §49-2-1*; New Mexico Environmental Improvement Act, *N.M.S. § 74-1-2*.

use uncontaminated water, and inhabit land not made toxic by human-created hazardous substances.⁹⁹

1. Federal Environmental Laws

During the later half of the Twentieth century, it became apparent to Federal policy makers that personal health was being adversely affected by pollution of air and water, as well as from the improper disposal of hazardous wastes. Scientific advances led to an awareness of the human health hazards of certain poisonous and toxic pollutants, resulting in the enactment of environmental laws. This new knowledge enabled a science and policy partnership, creating a legal framework that incorporated minimum quality thresholds for life-sustaining public environmental goods and standards for land-based hazardous waste disposal.

Federal environmental laws reflected personal health concerns that followed from the harmful effects from using resources as waste-dumping grounds.¹⁰⁰ Nonuse was advanced based on the degree of the danger to human health when using the air or water as pollution sinks.¹⁰¹ Rather than advocating a complete use bar, the goal of these second generation federal environmental laws was to reduce use intensity to the point necessary to protect the nonuse component of the resource so that human health was furthered. For instance, the Clean Air Act

⁹⁹ Economists label as “indirect use values” the health benefits that follow from not using public environmental goods as pollution dumps.

¹⁰⁰ The Clean Air Act of 1970, 42 U.S.C. § 7401 (providing that “the purposes of this subchapter are... to protect and enhance the quality of the Nation’s air resources so as to promote the public health and welfare and the productive capacity of its population); The Clean Water Act of 1972, 33 USC § 1251(a) (stating that “[t]he objective of this chapter is to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”); Ocean Dumping Act of 1988, 33 U.S.C. § 1401 (finding that “unregulated dumping of material into ocean waters endangers human health, welfare, and amenities...); Resource Conservation and Recovery Act of 1976, 42 U.S.C. § 6901(b) (providing that “[d]isposal of solid waste and hazardous waste in or on the land without careful planning and management can present a danger to human health and the environment.”); Safe Drinking Water Act of 1974, 42 U.S.C. 9611(b) (regulating “contaminants which, in the judgment of the Administrator, may have any adverse effect on the health of persons.”).

¹⁰¹ William T. Blackstone, *Ethics and Ecology in Philosophy and Environmental Crisis* 16-42 (W. Blackstone ed. 1974)

developed limitations on lung-harmful particulate emissions.¹⁰² The Clean Water Act similarly required standards for water based on use limitations allowed for specific pollutants.¹⁰³ These second generation environmental laws also provided minimum health quality thresholds for the disposal of hazardous wastes and their cleanup.¹⁰⁴

The judicial system resolved conflicts between use and nonuse interests that arose regarding the standards imposed by these environmental laws. Such disputes often arose when private industry was unable or unwilling to meet the quality standards required by these laws.¹⁰⁵ Conflicts also arose when citizen groups argued that the standards provided in these second generation laws were inadequate, or were not being properly enforced by the relevant federal agencies.¹⁰⁶ Conflicts were equally likely when private industry interests found these standards too burdensome to meet, and when utilitarian concerns, such as a cost-benefit analysis, seemed an efficient condition precedent to standard-setting.¹⁰⁷

¹⁰² The Clean Air Act of 1970, 42 U.S.C. § 7408 (developing particulate air quality criteria).

¹⁰³ The Clean Water Act of 1972, 33 U.S.C. § 1311 (developing strict effluent limitations for specified toxic pollutants and providing a timeline for achievement of those objectives.).

¹⁰⁴ Resource Conservation and Recovery Act of 1976, 42 U.S.C. § 6901 et seq. (giving the Environmental Protection Agency the authority to control specified hazardous wastes from the “cradle-to-grave.”); the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9601 et seq. (safeguarding human health from the toxic consequences of irresponsible waste disposal).

¹⁰⁵ *U.S. v. Alcoa*, 533 F.3d 278 (5th Cir. 2008) (federal government sued operator of aluminum smelting plant, alleging that owner modified three lignite-fired boilers in violation of the Clean Air Act).

¹⁰⁶ *Center for Biological Diversity v. U.S. Dept. of Interior*, 563 F. 3d 466 (D.C. Cir. 2009) (challenge to Interior Department decision to expand leasing areas within outer continental shelf off coast of Alaska for oil and gas development on grounds that oil spills might harm humans living near coastal shorelines); *National Resource Defense Council v. E.P.A.*, 559 F.3d 561 (D.C. Cir. 2009) (challenging regulation governing an exclusion of emissions data during “exceptional events” under the Clean Air Act); *Southern Utah Wilderness Alliance v. Allred*, 2009 WL 765882 (D.C. App. 2009) (finding BLM’s air quality analysis relied upon to issue leases located near the Arches and Canyon lands National Parks deficient due to a failure to conduct quantitative ozone dispersion modeling required by the National Environmental Policy Act). *Ohio Valley Environmental Coalition v. Hurst*, 604 F. Supp. 2d 860 (S.D.W. Va. 2009) (Clean Water Act violated by discharge of dredged and fill material associated with surface coal mining mountain top removal, since such use threatens water supplies for humans living there).

2. State Environmental Laws

State law followed the example of federal law, which meant that law makers began enacting legislation to reflect the return of nonuse values for otherwise polluted public environmental goods.¹⁰⁸ Second generation state legislation, like that of the federal legislation, focused on the protection of human health, and on the indirect use benefits that occur when humans live in an unpolluted environment. The use of public environmental goods as waste sinks was deemed inconsistent with the nonuse benefits that arise with respect to individual health and welfare when these goods are not exploited by humans. Many states therefore enacted laws declaring pollution abatement a public policy of the state.¹⁰⁹ Some states went so far as to amend their Constitution to provide its citizens with an inalienable right to a clean and healthful environment.¹¹⁰ Most of the legislation was more focused, addressing the quality of the state's air¹¹¹ and water¹¹² resources. Conflicts arose under these statutes when private

¹⁰⁷ *Entergy Corp. v. E.P.A.*, 128 U.S. 1867 (2008) (Clean Water Act authorizes the EPA to compare costs with benefits in determining the “best technology available for minimizing adverse environmental impact” at cooling water intake structures).

¹⁰⁸ This second generation legislation usually encompassed the creation of state environmental protection agencies, charged with abating pollution. See, e.g., Ohio Environmental Protection Act OH R.C. § 3745.011; Oklahoma Conservation district Act, OK St. § 3-1-102; Maine Environmental Protection Board, 38 M.R.S. § 481.

¹⁰⁹ ID I.C. § 39-101, 39-202 (declaring that “it is ...the policy of the state to provide for the protection of the environment and the promotion of personal health and to thereby protect and promote the health, safety and general welfare of the people of this state.”); 7 Del.C. § 6001(a)(1)(5) (stating that “[t]he land, water, underwater and air resources of the State must be protected from pollution in the interest of the health and safety of the public....”); F.S. § 403.021(5) (declaring that “the prevention, abatement, and control of the pollution of the air and waters of this state are affected with a public interest....”); 38 M.R.S. § 341A (directing the state Department of Environmental Protection to “prevent, abate, and control the pollution of the air, water and land and preserve, improve, and prevent diminution of the natural environment of the State.”); 415 IL C 5/2(a) (finding that “environmental damage seriously endangers the public health and welfare....”); AK Rev Stat § 46.03.10(a) (finding it a policy of the state to control water, land and air pollution for the welfare of the people of the state and their overall well-being).

¹¹⁰ See, e.g. MT Const. Art. 2, § 3; HI Const. Art. 11, § 9; PA Const. Art. 1, § 27; MI Const. Art. IV, § 52.

¹¹¹ Indiana Air Pollution Control Act, IN IC § 13-17-1-1; Tennessee Air Quality Act, TN C.A. § 68-201-103; North Dakota Air Pollution Control, ND C.C. § 23-25-01.1; Rhode Island Clean Air Act, R.I. Gen. Laws § 23-23-2; Utah Air Conservation Act, UT C.A. § 19-2-101; Washington Clean Air Act, WA RCWA § 70.94.011.

¹¹² South Dakota Water Pollution Control Act, S.D. CL § 34A-01-01; California Water Quality Control Act, CA WC § 13000.

industry was unable or unwilling to meet the environmental quality standards required by these laws,¹¹³ and where public interest groups believed that such standards were not being properly enforced.¹¹⁴

State common law also enabled courts to protect human health when uses constituted an unreasonable interference with the well-being of humans adversely affected by the use. Often this interference was in the form of an environmental harm to adjacent human dwellings or residences. Relief was sought for such harm to indirect use value (the value of an environment that is not contaminated) under theories of nuisance,¹¹⁵ negligence,¹¹⁶ and trespass.¹¹⁷

B. Resource Nonuse to Preserve Natural Places and Objects

Some second generation laws served to preserve from use pristine places, endangered species, wild rivers, and other natural objects. Second generation statutes preserved *places*, such as national forests,¹¹⁸ landscapes,¹¹⁹ wilderness study areas,¹²⁰ wild lands,¹²¹ wild rivers,¹²² and

¹¹³ See, e.g., *Gray v. County of Madera*, 85 Cal. Rptr. 3d 50 (Cal. Ct App. 2008) (finding mitigation measures related to water at proposed hard rock quarry inadequate to meet California Environmental Quality Act).

¹¹⁴ *Friends and Fishers of Edgartown Great Pond, Inc. v. Department of Environmental Protection* 848 N.E.2d 393 (Mass. 2006) (challenging grant of a groundwater discharge permit for discharge into pond as violating the state Clean Water Act).

¹¹⁵ See e.g., *North Carolina v. Tennessee Valley Authority*, 615 F. 3d 291 (4th Cir. 2010) (state bringing public nuisance action against the Tennessee Valley Authority, seeking injunction halting hazardous emissions from coal-fired power plants); *Ayers v. Township of Jackson*, 493 A. 2d 1314 (NJ 1987) (enjoining landfill operation constituting a nuisance by contaminating municipal water supply).

¹¹⁶ See, e.g. *Anderson v. W.R. Grace & Co.*, 628 F. Supp 1219 (D. Mass. 1986) (allowing negligence suit for physical injuries from disease contracted through ingestion of well water contaminated by operations of chemical manufacturing company).

¹¹⁷ See, e.g. *Bradley v. American Smelting & Refining Co.*, 709 P.2d 782 (Wash. 1985) (finding that invisible particles from copper smelting pass could constitute a trespassory invasion).

¹¹⁸ 43 U.S.C. §1782 (lands subject to the Forest Service's "roadless rule").

¹¹⁹ E.g., *The National Landscape Conservation System within the United States Bureau of Land Management*. See John D. Leshy, *The Babbitt Legacy at the Department of Interior: A Preliminary View*, 31 *Envtl. L.* 199, 219 (2001).

¹²⁰ 43 U.S.C. §1782 (c).

wetlands.¹²³ These laws also preserved *natural objects*, such as bald eagles,¹²⁴ migratory birds,¹²⁵ marine mammals,¹²⁶ and endangered species.¹²⁷ The premise behind second generation laws preserving these places and objects was that people value certain nonused natural resources simply because they are natural, which can only occur when they are not used, destroyed, degraded, or altered by humans. If these natural objects are used, this nonuse natural value is lost and technological advances can never provide substitutes for them.¹²⁸

Some laws combined an interest in furthering both the health and preservationist benefits that followed from not actively using natural resources. At the federal level, the National Environmental Policy Act (NEPA),¹²⁹ required federal agencies to consider, before they acted, whether proposed federal actions might trigger human health concerns, or impair preservation values.¹³⁰ At the state level, some statutes prohibit or limit certain resource use activities if the proposed use will either adversely affect human health or threaten natural objects. For example, Colorado empowered the State Oil and Gas Conservation Commission to promulgate rules for

¹²¹ The Wilderness Act of 1964, 16 U.S.C. §1131. See also The Ombus Public Land Management Act of 2009, S. 22, 111th Cong. (2009) (setting aside over 2 million acres in nine states as protected wilderness).

¹²² The Wild and Scenic Rivers Act of 1968, 16 U.S.C. §1271.

¹²³ 33 U.S.C. §1344.

¹²⁴ 16 U.S.C. §668.

¹²⁵ The Migratory Bird Treaty Act of 1918, 16 U.S.C. §703.

¹²⁶ 16 U.S.C. §1361.

¹²⁷ The Endangered Species Act of 1973, 16 U.S.C. §1531.

¹²⁸ *Krutilla, supra* note 9 at 783.

¹²⁹ 42 U.S.C. §4321.

¹³⁰ 40 C.F.R. §1508.27(b) (2) [does the proposed action affect public health?]; §1508.27 (b) (3) [does the proposed action affect unique characteristics of the geographic area?]; §1508.27 (b) (9) [does the proposal affect endangered or threatened species?]; *Theodore Roosevelt Conservation Partnership v. Salazar*, 605 F.Supp. 2d 263 (D.D.C. 2009) (NEPA challenge to federal government decision to grant gas drilling permits, on the ground that the agency failed to take hard look at air quality effects and impacts on sage grouse).

oil and gas drilling in order to protect (1) public health, and (2) “the environment and wildlife resources.”¹³¹

These preservationist laws reflect twin assumptions about people’s desires. First, we want some places preserved from excessive economic use (i.e., use that extracts resources from natural settings since they are commodities, like minerals) because people would prefer to play there. Some places that are preserved in a nonused state are attractive to many individuals primarily because these locations may then be available for recreational purposes.¹³² Second, many people place value on certain natural objects, like wild lands, archaeological sites, and species, because of their mere existence.¹³³ These individuals want to preserve this “existence” or “option” or “nonuse” value of natural objects not because they want to experience them, or because they want to use or consume them, but because they want them to exist in a state unaffected by humans.¹³⁴

Federal, state, and even constitutional law contain elements implementing or administering a system of nonuse for the sake of natural object preservation. Examples of such federal laws include the Wilderness Act, implementing a system promoting the preservation of

¹³¹ C.R.S. §34-60-102.

¹³² However, some recreational uses, such as motorized recreation, can be just as damaging to nonuse values as resource extractive uses. See *Laitos and Reiss, supra* note 10.

¹³³ *Krutilla, supra* note 9 at 781.

¹³⁴ Moreover, many people are willing to pay to preserve these natural objects, because they believe nature undisturbed is economically worth more than nature domesticated. *Sagoff, supra* note 1 at 37, 137. They may also derive spiritual pleasure from the nonuse of these natural objects. John Copeland Nagle, *The Spiritual Values of Wilderness*, 35 *Envtl. L.* 955 (2005); Sigurd F. Olson, *The Spiritual Need, in Wilderness in a Changing World* 215 (Bruce M. Kilgore ed. 1965).

The value that humans place on an opportunity to enjoy, or benefit from, some activity in the future is called an “option value.” See generally Katherine K. Baker, *Consorting With Forests: Rethinking Our Relationship to Natural Resources and How We should Value Their Loss*, 22 *Ecology L.Q.* 577 (1995). Humans are presumed to place a measurable option value on the future recreational benefits that follow from preventing lands, otherwise available to play in, from being used by extractive industries or renewable commodity purposes.

the wilderness resource.¹³⁵ State law has followed suit with its own regulations, often supplementing or strengthening standards developed by the federal regulations.¹³⁶ Constitutional law promotes nonuse values by upholding police power exercises that restrict property use to the point that little use value remains, but where recreation or existence value is preserved.¹³⁷

1. Federal Preservation Laws

Federal law reflected a growing concern for the preservation of unique places and natural objects.¹³⁸ The preservation of pristine places through this legislation serves dual purposes. First, these laws advance the anthropocentric purpose of safeguarding these lands from extractive and development use, for present and future low impact, non-consumptive recreational use, such as hiking, fishing and camping.¹³⁹ Second, since certain wild lands and landscapes have value in and of themselves, these laws preserve unique natural lands and features for the purpose of promoting their continued existence, irrespective of whether humans actually ever visit these places.¹⁴⁰ For example, the National Landscape Conservation System was explicitly created to

¹³⁵ The Wilderness Act of 1964, 16 U.S.C. § 1131 (providing that the goal of the Act is to “establish a National Wilderness Preservation System for the permanent good of the whole people....”).

¹³⁶ See, e.g., Colorado Natural Areas Act, C.R.S. § 33-33-102 (protecting certain identified areas and other natural features not otherwise protected by federal law for the purpose of their preservation).

¹³⁷ See, e.g., *Palazzolo v. Rhode Island*, 533 U.S. 606 (2001).

¹³⁸ Chad P. Dawson & John C. Hendee, *Wilderness Management: Stewardship and Protection of Resources and Values*, 4th ed (2009).

¹³⁹ National Trails System Act of 1968, 16 U.S.C. § 1241-51 (the stated purpose of which is “to provide for the ever increasing outdoor recreation needs... enjoyment and appreciation of the open-air, outdoor areas and historic resources of the Nation.”); Federal Lands Policy Management Act, 43 U.S.C. § 1701 (finding that one purpose of the act is to “provide for outdoor recreation and human occupancy and use....”); National Parks & Recreation Act of 1978, 16 U.S.C.1(a)-1 (establishing one unified national park system to be “managed for the benefit and inspiration of all the people of the United States”).

¹⁴⁰ Wilderness Act of 1964, 16 U.S.C. § 1131 (securing the benefit of lasting wilderness for the American people); 43 U.S.C. § 1782 (c) (creating “wilderness study areas within Bureau of Land Management property”); Roadless Area Conservation Rule 36 C.F.R. § 294 et seq (providing lasting protection for roadless areas within the National Forest System); Coastal Zone Management Act, 33 U.S.C. § 1451(a)-(c) (providing protection for the coastal zone as a resource “rich in a variety of natural, commercial, recreational, ecological, industrial, and esthetic resources of

protect and restore nationally significant landscapes.¹⁴¹

Also evident in these federal laws is a concern for the preservation of natural objects, such as wildlife and archaeological resources, and even scenic vistas.¹⁴² For instance, the Fish and Wildlife Conservation Act of 1980 promotes the protection of non-game fish and wildlife through the implementation of conservation plans.¹⁴³ The Archaeological Resource Protection Act protects archaeological sites through strict law enforcement regulation, and record-keeping requirements, all for the sake of preserving such sites and their contents.¹⁴⁴ The Wild and Scenic

immediate and potential value to the present and future well-being of the Nation.”); Wild & Scenic Rivers Act of 1968, 16 U.S.C. 1271-1287 (preserving certain selected rivers “in free-flowing condition...for the benefit and enjoyment of present and future generations.”).

¹⁴¹ See The Omnibus Public Land Management Act of 2009, H.R. 146, Section 2002; Salazar Orders Conservation Focus for 27 million Acres of BLM Land Across West, *The Denver Post* 7A (Nov. 16, 2010); Andy Kerr & Mark Salvo, Bureau of Land Management National Conservation Areas: Legitimate Conservation or Satan’s Spawn?, 20 *UCLA J. Env’tl. L. & Policy* 67 (2001); Kristen Wyatt, Obama to Reverse Policy on Fed Land, *Boulder Daily Camera* 1A (Dec. 24, 2010) (Department of Interior to review 220 million acres not under wilderness protection as candidates for “wild lands” designations).

¹⁴² National Wildlife Refuge Administration Act of 1966, 16 U.S.C. § 668dd(2) (providing for the “protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, or waterfowl production areas.”); Kim Murphy, Effort Aims to Block Oil Drilling in Refuge, *Los Angeles Times* A19 (Nov. 20, 2010) (plans to make the Arctic National Wildlife Refuge a National Monument); Archeological Resources Protection Act 16 U.S.C. § 470ee (providing protection from excavation, alternation or defacement of archaeological resources on public or Indian lands....); Marine Mammal Protection Act, 16 U.S.C. § 31 (1972) (finding that “certain species... should not be permitted to diminish below their optimum sustainable level.”); Endangered Species Act of 1973, 16 U.S.C. § 1531 (providing protection for certain species of “esthetic, ecological, educational, historical, recreational, and scientific value to the nation.”); Fish and Wildlife Conservation Act of 1980, 16 U.S.C. § 2901-1911 (finding that “the improved conservation and management of fish and wildlife... will assist in restoring and maintaining fish and wildlife and in assuring a productive and more esthetically pleasing environment for all citizens.”); Refuge Improvement Act of 1997, 16 U.S.C. § 668(a)(2) (declaring a mission of the Refuge System “to administer a national network of lands and waters... for the benefit of present and future generations”); Fish & Game Sanctuary Act 16 U.S.C. § 694 (establishing the Act “for the purpose of providing breeding places for game birds, game animals, and fish on lands and waters in the national forest.”).

The federal Wilderness Act permits humans to hike in wilderness lands, but prevents mountain biking and motorized recreation. 16 U.S.C. § 1133 (c); 36 C.F.R. § 261.18 (2006). However, even hiking has become a resource “use” producing enormous environmental damage. See Jan G. Laitos & Rachael B. Gamble, *The Problem With Wilderness*, 32 *Harvard Env’tl. L. Rev.* 503 (2008).

¹⁴³ Fish and Wildlife Conservation Act of 1980, 16 U.S.C. § 2901-1911 (establishing a conservation program for such resources due to their “ecological, education, esthetic, cultural, recreational, economic, and scientific value of the Nation.”).

¹⁴⁴ Archeological Resources Protection Act 16 U.S.C. § 470ee (providing that “[n]o person may excavate, remove, damage, or otherwise alter or deface any archaeological resources located on public lands or Indian lands....”).

Rivers Act blocks resource use proposals that might either interfere with the scenic qualities of certain rivers, or have a negative visual impact for viewers of these rivers.¹⁴⁵ These laws favor nonuse of certain natural objects, where their intrinsic existence value outweighs the benefits of a use that threatens their natural, non-used, condition.

When conflicts arose from this preservation legislation, they too were resolved by the court system. For instance, judicial disputes between resource use and nonuse interests occurred when the federal government chose to withdraw lands from resource extractive uses for conservation preservation purposes,¹⁴⁶ or attempted to limit recreational use in such areas.¹⁴⁷ There also were judicial conflicts when citizen groups regarded decisions or standards developed by the agency responsible for administering the legislation inconsistent with or inadequate to meet the legislation's nonuse objectives.¹⁴⁸ Such citizen groups were granted standing to sue

¹⁴⁵ 16 U.S.C. § 1271, 1281 (a); *Sierra Club North Star Chapter v. LaHood*, 693 F.Supp. 2d 958 (D. Minn. 2010).

¹⁴⁶ *Mount Royal Joint Venture v. Kempthorne*, 477 F.3d 745 (D.C. Cir. 2006) (upholding withdrawal from mineral location and entry lands that are habitat to wildlife species and that provide potable water in the area); *Wind River Multiple-Use Advocates v. Espy*, 835 F.Supp. 1362 (Wyo. 1993) (finding Forest Service Resource Management Plan not arbitrary and capricious when it halted use activities); *Pathfinder Mines Corp. v. Hodel*, 811 F.2d 1288 (9th Cir. 1986) (BLM decision voiding mining claims within the boundaries of the Grand Canyon National Game Preserve); *Sagebrush Rebellion v. Hodel*, 790 F.2d 760 (9th Cir. 1986) (creation of a "birds of prey" conservation area by the Secretary of the Interior).

¹⁴⁷ *White Tanks Concerned Citizens, Inc. v. Strock*, 563 F. 3d 1033 (9th Cir. 2009) (challenging decision allowing land developers to fill 27 acres of desert washes as violation of NEPA, because citizen group members rode horses there and had "aesthetic interest in preserving undeveloped nature of area"); *Stupak-Thrall v. U.S.*, 89 F.3d 1269 (6th Cir. 1996) (challenging the authority of the Forest Service to ban the use of Crooked Lake by sailboats and houseboats); *Blue Water Network v. Salazar*, 721 F.Supp. 7 (D.D.C. 2010) (challenging Park Service's decision to permit jetskis back into two national parks).

¹⁴⁸ *Alliance for Wild Rockies v. Cottrell*, 622 F. 3d 1045, 1056 (9th Cir. 2010) (public interest in "preserving nature" outweighs the public interest asserted by the Forest Service in approving the logging of a forest – aiding a struggling local economy and preventing job losses); *Meister v. U.S. Dept. of Agriculture*, 623 F. 3d 363 (6th Cir. 2010) (Forest Service had improperly favored "gun hunters and snowmobile users" in national forest over "other persons – for example hikers and birdwatchers – who use the Forests for quiet solitary activities."); *Southern Utah Wilderness Alliance v. Allred*, 2009 WL 765882 (D.D.C. 2009) (challenging BLM issuance of leases near the Arches and Canyonlands National Parks as a violation of the National Environmental Policy Act, National Historic Preservation Act, and the Federal Land Policy and Management Act); *Rock Creek Alliance v. U.S. Fish & Wildlife Service*, 390 F.Supp.2d 993 (Mont. 2005) (challenging issuance of biological opinion allowing construction of copper and silver mine in national forest as violative of Endangered Species Act); *Wilderness Society v. Salazar*, 603 F.Supp. 2d 52 (D.D.C. 2009) (challenging BLM and Fish & Wildlife Service decision to allow oil and gas leasing in national petroleum reserve as a violation of the National Environmental Policy Act and Endangered Species Act); *League of*

these agencies if the primary injury experienced by their members was harm to aesthetic or recreational interests.¹⁴⁹

2. State Preservation Laws

State laws also reflected a growing concern for the preservation of unique places and land features of the state that were not otherwise protected under federal laws. A major focus of these laws was on the preservation of places, either for their intrinsic value,¹⁵⁰ or for the non-consumptive recreational uses the place provided.¹⁵¹ These laws also functioned to protect and preserve nonuse values associated with the state's wildlife resource.¹⁵²

State courts were one forum for nonuse interests to raise the protections afforded by this state legislation when resource use activities seemed threatening.¹⁵³ Often these courts provided

Wilderness Defenders-Blue Mountains Biodiversity Project v. U.S. Forest Service, 549 F.3d 1211 (9th Cir. 2008) (challenging the allowance of commercial logging of 6,281 acres of forest as a violation of the National Environmental Policy Act and the Ochoco National Forest Land Resource and Management Plan); Center for Biological Diversity v. U.S. Fish & Wildlife Service, 450 F.3d 930 (9th Cir. 2005) (challenging failure to designate habitat of endangered stickleback fish species as "critical habitat" under the Endangered Species Act).

¹⁴⁹ Summers v. Earth Island Inst., 129 S. Ct. 1141, 1149 (2009); Animal Welfare Inst. v. Martin, 623 F. 3d 19, 25 (1st Cir. 2010) (a desire to observe an animal species is a legally cognizable interest for purposes of standing); Sierra Club v. Kimbell, 623 F. 3d 549, 557 (8th Cir. 2010) (agency action had diminished opportunities for non-motorized recreation).

¹⁵⁰ New Hampshire Rivers Management and Protection Program, NH Rev Stat § 483:1; Alaska Environmental Conservation Act, AK Rev Stat § 46.03.10(a); California Wildlife, Coastal & Park Land Conservation Act, Cal.Pub.Res.Code § 5901; Kentucky Wild Rivers Act, KRS § 146.220; Tennessee Scenic Rivers Act, TN C.A. § 11-13-101.

¹⁵¹ See, e.g. Colorado Parks and Outdoor Recreation, C.R.S. § 33-10-101 (declaring it a policy of the state that "outdoor recreation areas of this state are to be protected, preserved, enhanced, and managed for the use, benefit, and enjoyment of the people of this state and visitors of this state....").

¹⁵² New Hampshire Healthy Tidal Waters and Shellfish Protection Program, NH Rev. Stat § 487:35; Maryland Endangered Species Act, MD CR § 08.03.08; Mississippi Non-Game & Endangered Species Conservation Act, MS Code Ann. § 49-5-103; South Dakota Environmental Protection Act, S.D. CL § 34A-8-2; New Jersey Endangered and Non-Game Species Conservation Act; N.J.S. § 23:2A-2; California Non-Game, Endangered or Threatened Species Conservation Act, CRS § 33-2-102.

¹⁵³ See, e.g., Environmental Protection and Information Center v. California Department of Forestry and Fire Protection, 187 P.3d (Cal. 2008) (finding state approved logging plan inadequate under California Sustained Yield Plan and California Environmental Quality Act); Center for Biological Diversity, Inc. v. FPL Group, 83 Cal. Rptr. 588 (Cal. App. 2008) (state public trust doctrine protects wildlife from proposed wind turbines because "they are

protection to recreational values, explicitly reasoning that such values were preferred when natural resources like forests were not used for extractive use purposes (like timber harvesting or wood milling), and instead were left alone so humans could play there.¹⁵⁴ Conflicts between use and nonuse interests sometimes may not reach the courtroom; instead they are resolved by local lawmakers. For example, county commissioners turned down a proposal to build a disposal facility for oil and gas drilling waste near the Canyons of the Ancients National Monument, containing the country's greatest concentration of archaeological sites.¹⁵⁵ The community had to choose between furthering use values - local industry interests and economic development – and preserving unique nonuse features of their historic environment, or risk having the court system decide for them.

Local governments have enacted zoning regulations that promote nonuse values by restricting land uses, by requiring exactions as a condition of development, and by encouraging the use of conservation easements. Low-density zoning regulations prohibit intensive development while ensuring the preservation of natural landscapes.¹⁵⁶ Cities, counties and municipalities may also adopt land use ordinances and zoning regulations that require nonuse exactions from potential land users,¹⁵⁷ or that devote lands to an exclusive purpose that prohibits

natural resources of inestimable value to the community”); *Zarock v. Bd. Of Supervisors of Sugarloaf Twp.*, 2008 WL 5101327 (Pa. App.) (zoning law can prohibit mining to protect “natural and historic resources”).

¹⁵⁴ See *Friends of Columbia Gorge Comm. v. Columbia River Gorge*, 238 P. 3d 378 (Or. App. 2010); *Chuckanut Conservancy v. Washington State DNR*, 232 P. 3d 1154 (Wash. App. Div. 1 (2010)).

¹⁵⁵ Nancy Lofholm, *Modern-day Clash Near Ancient Site*, *The Denver Post* 1A (May 24, 2009); Nancy Lofholm, *Montezuma County Turns Down Disposal Site For Drilling Waste*, *The Denver Post* 1B (June 2, 2009). See also Jim Mimiaga, *Mining Past Meets Present*, *The Denver Post* 4B (June 13, 2009) (county commissioners reject plan to mine molybdenum deposit in Colorado, despite owner asking commissioners “to recognize mining as a use by right”).

¹⁵⁶ Note, *New Reactions to Old Growth: Land Use Law Reform in Florida*, 34 *Colum. J. Envtl. L.* 191 (2009).

¹⁵⁷ An exaction is the practice by which local governments require developers to provide public goods, like an easement for viewing a natural object. See, e.g., *Nollan v. California Coastal Comm'n*, 483 U.S. 825 (1987).

use development while mandating nonuse, such as for land preservation or open space purposes.¹⁵⁸ State law may authorize conservation easements, which enable persons or entities to donate lands to government entities or charitable organizations on the condition that the lands stay in their nonused natural state.¹⁵⁹ Such easements ensure the preservation of nonuse values for these lands not only in the present, but into perpetuity.¹⁶⁰ Federal, state and local governments may provide further inducement for conservation easements in the form of tax incentives.¹⁶¹

3. Constitutional Law

A growing trend in state constitutional law is to expressly provide each citizen a right to a clean and healthful environment, necessarily implying that humans have a constitutional right to resource nonuse when conservation and preservation promotes human health and welfare.¹⁶² Federal and state constitutional law further promote nonuse preservation and conservation values by upholding, as against constitutional takings claims, regulations that severely restrict or limit certain resource uses.¹⁶³ State courts have also recognized that significant value still remains in

¹⁵⁸ *In Re Rattee*, 761 A.2d 1076 (N.H. 2000) (affirming denial of an application to construct a home on land subject to an agricultural preservation restriction); *Open Space Regulations*, City of Holly Springs, N.C. Unified Development Ordinance § 7.10.

¹⁵⁹ Anna Vinson, *Re-Allocating the Conservation Landscape: Conservation Easements and Regulation Working in Concert*, 18 *Fordham Env'tl. L. Rev.* 273 (2007).

¹⁶⁰ Nancy A. McLaughlin & W. William Weeks, *In Defense of Conservation Easements: A Response to the End of Perpetuity*, 9 *Wyo. L. Rev.* 1 (2009).

¹⁶¹ See, e.g., 26 C.F.R. § 1.170A-14(a) (providing tax advantages for the contribution of real property interests for conservation purposes); Margaret Jackson, *Ruling Puts Value on Land Contribution*, *The Denver Post* 7B (May 12, 2009) (U.S. Tax Court Overrules IRS determination that conservation easements are worth zero, concluding that such easements can form the basis for charitable-contribution deduction.).

¹⁶² See, e.g. MT Const. Art. 2, § 3; HI Const. Art. 11, § 9; PA Const. Art. 1, § 27; MI Const. Art. IV, § 52.

¹⁶³ See, e.g. *Plmyra Pacific Seafoods v. U.S.*, 561 F.3d 1361 (Fed. Cir. 2009) (upholding regulation prohibiting commercial fishing in wildlife refuge).

land in an undeveloped state, thereby sanctioning state regulation that may completely ban most land use, especially extractive uses, if the ban supports nonuse values.¹⁶⁴

C. Economic Efficiency as the Goal

Another hallmark of second generation laws was the desire to achieve environmental goals in ways that were more economically efficient.¹⁶⁵ Regulatory reforms were adopted that were thought to lower costs, especially the costs incurred by regulated firms seeking to comply with pollution reduction and resource conservation targets. These reforms included (1) market-based mechanisms as methods for achieving regulatory environmental standards, (2) greater reliance on cost-benefit analysis (CBA) to choose environmental goals, and (3) taxation of pollution as an efficient environmental protection instrument.¹⁶⁶ Such approaches were seen as being less costly than traditional command-and-control rules. They were thought also to be inherently efficient, especially when contrasted with the essentially inefficient alternative system of statute + accompanying standard + requirement that firms comply with standard.

Second generation pollution control regulations were imposed as a means of addressing the harmful effects of using “commons resources” such as air, water, and underground as waste sinks. These initial regulatory approaches were usually technology-based command-and-control rules.¹⁶⁷ Economists argued instead that a better system (because it was more efficient) would be

¹⁶⁴ *Kyser v. Kasson Twp.*, 2010 WL 2787954 (Mich. 2010) (state’s long standing judicial doctrine that a zoning ordinance is unreasonable if the person challenging the ordinance can show that there are natural resources on the property capable of being extracted is no longer constitutionally required – mineral extraction is no longer a specially protected land use); *Gove v. Zoning Board of Appeals of Chatham*, 831 NE 2.d 865 (Mass 2005) (upholding a state regulation banning all new residential construction located within a 100 year floodplain).

¹⁶⁵ *Flournoy*, *supra* note 25 at xix; *Cole*, *supra* note 46 at 67.

¹⁶⁶ Richard B. Stewart, *The Future of Environmental Regulation: United States Environmental Regulation: A Failing Paradigm*, 15 *Journal of Law and Commerce* 585, 587 (1996).

¹⁶⁷ *Cole*, *supra* note 46 at 46.

one that allocated limited but transferable private property rights in pollution emissions. The transferability of pollution rights was seen as ensuring that the required reduction in waste discharge would be achieved at the smallest possible aggregate compliance and abatement cost.¹⁶⁸ Transferability helps ensure lower costs by creating markets that efficiently allocate these costs of pollution control among regulated firms. When pollution exchanges occur, regulated firms with the lowest costs of control would theoretically wind up taking on the largest emissions reduction burden.

A prominent example of such a trading system is Title IV of the 1990 Clean Air Act Amendment, which sought to reduce SO₂ emissions, since SO₂ contributed to acid rain.¹⁶⁹ The goal of Title IV was to minimize total costs of achieving the legislatively-ordered reductions in SO₂ emissions, in part by developing a well-functioning emissions market made up of coal-burning power plants issued tradable emissions allowances. Several states are also contemplating the creation of a similar “cap-and-trade” market in greenhouse gases.¹⁷⁰

Although this model has efficiency advantages, it also comes with several endemic problems. Any emissions trading program requires government officials to set limits on the total amount of pollution permitted. If these officials are too timid to set stringent emission limits, then firms need not develop the basic technological changes in operation that will then be necessary to meet such limits. Moreover, for a robust emissions market to develop, the owner of the tradable pollution allowance would need to feel secure in the property right inherent in the

¹⁶⁸ See J. H. Dales, *Pollution, Property and Taxes: An Essay in Policy-Making and Economics* 107 (1968).

¹⁶⁹ 42 U.S.C. § 7651.

¹⁷⁰ Jason Dearen, *California on Verge of Greenhouse Gas Rules*, *Boulder Daily Camera* 6B (Dec. 17, 2010).

allowance.¹⁷¹ Also, a national market cap in overall emissions may overlook the distributional consequences of one geographic sector with lowered emissions being invaded by the emissions of a sector that failed to reduce its pollution.

If market-based mechanisms were deemed preferable to command-and control as methods of achieving environmental goals, CBA was perceived as a more systematic and efficient way to choose these goals. Under the Regulatory Right-to-Know Act of 2001,¹⁷² the Office of Management and Budget must prepare an annual report estimating the total costs and benefits of mayor federal rules imposed by specified federal departments and agencies. Several federal natural resources agencies engaged in a weighing of costs and benefits of alternative policies as a standard statutorily-required decision-making mode.¹⁷³ However, CBA, which was originally sold as a way to rationalize environmental law, too often simply provided cover that permitted regulated firms and those in power who protected them to thwart effective pollution control.¹⁷⁴ The natural resource commons, such as the atmosphere and waters, continued to be used as a pollution sink.

¹⁷¹ See, e.g., *Arkema, Inc. v. E.P.A.*, 618 F. 3d 1 (D.C. Cir. 2010) (challenge to EPA rule honoring only intercompany transfers of baseline allowance for hydrochloro fluorocarbons as being an impermissible retroactive rule impairing vested rights in the allowance).

¹⁷² Pub. L. No. 106-554.

¹⁷³ *Otay Mesa Property L.P. v. U.S. Dept. of Interior*, 714 F. Supp. 73, 87 (D.D.C. 2010) (U.S. Fish and Wildlife Service CBA analysis under the Endangered Species Act); *Sierra Club v. Kimbell*, 623 F. 3d 549, 559 (8th Cir. 2010) (U.S. Forest Service CBA analysis under the National Environmental Policy Act); *Home Builders Ass'n. of Northern California v. U.S. Fish and Wildlife Service*, 616 F.3d 983, 987 (9th Cir. 2010) (Fish and Wildlife Service CBA analysis under the Endangered Species Act).

¹⁷⁴ *Flournoy*, *supra* note 25 at xix; Richard Revesz and Michael A. Livermore, *Retaking Rationality: How Cost-Benefit Analysis Can Better Protect the Environment and Our Health* (2011) (industry groups have captured cost-benefit analysis and used it to further their anti-regulatory ends); Douglas A. Kysar, *Regulating From Nowhere: Environmental Law and the Search for Objectivity* (2010) (climate change is the “poster child for the limitation of [CBA]”). See also Dan Farber, *Taking Responsibility for the Planet*, 89 *Texas L. Rev.* 149 (2010); Daniel H. Cole, “Best Practice” Standards For Regulatory Benefit-Cost Analysis, 23 *Res. in L. & Econ.* 1 (2007).

Similarly, although economists have traditionally supported pollution taxes as an efficient instrument for achieving protection of the nonuse component of air, water, and underground resources,¹⁷⁵ the reality is that reliance on such “economic” instruments as taxes are not necessarily more efficient than command-and-control regulations.¹⁷⁶ Moreover, a tax system would provide a continuous incentive to reduce pollution, but only for a limited class of innovative technologies – those with marginal costs less than the marginal tax rate. Taxes would not be an incentive for firms to develop advanced technologies that would entail significant start-up investments whose marginal costs exceeded the marginal tax rates.¹⁷⁷

D. Legal Protection of Ecosystem Services

A final class of second generation laws force resource users and policy decision makers to account for the benefits of the “ecosystem services” that unused natural resources provide humans when they are not directly used or altered by humans. These services, which maintain air and water quality, suppress floods, enhance habitat, and supply renewable commodity goods, include wetlands, watersheds, riparian habitat, estuaries, floodplains, undisturbed forested lands, and natural grasslands.¹⁷⁸ But resource developers continually threaten, or damage, the nonuse components of ecosystems, thereby depriving humans of the benefits provided by the ecosystem functions.¹⁷⁹ Since “free” ecosystem services are neither explicitly valued by, nor integrated

¹⁷⁵ T.H. Tietenberg, *Economic Instruments for Environmental Protection*, in *Economic Policy Toward the Environment* (Dieter Itelm ed. 1991).

¹⁷⁶ Daniel H. Cole and Peter Z. Grossman, *When is Command-and-Control Efficient? Institutions, Technology, and the Comparative Efficiency of Alternative Regulatory Regimes for Environmental protection*, 1999 *Wisconsin L. Rev.* 887.

¹⁷⁷ *Flournoy, supra* note 25 at 177.

¹⁷⁸ Gretchen C. Daily, *Nature’s Services: Societal Dependence on Natural Ecosystems* (1997).

¹⁷⁹ David Dana, *Natural Preservation and the Race to Develop*, 143 *U. of Penn. L. Rev.* 655 (1995).

into, market economies,¹⁸⁰ some have argued that legal and regulatory frameworks should be modified so that resource use decisions no longer ignore the tremendous nonuse value of natural systems.¹⁸¹

The rationale for ecosystem preservation in an unused, natural condition is not based on traditional justifications for resource nonuse – human health, non-consumptive recreation, or anthropocentric existence value. Rather, the case for ecosystem services is built on human-centric *economic* values. The argument is that undeveloped, unused, and unspoiled nature provides measurable long-term economic benefits to humans; these benefits are thought to offset the short-term disadvantages of forgoing development. The economic basis for laws requiring ecosystem protection is that wild and natural ecosystems supply (for free) services to humans that provide directly for our needs. Since ecosystem services are not fully “captured” in commercial markets or adequately quantified in terms comparable with economic services and manufactured capital, they play little role in policy decisions.¹⁸² Policies therefore should be adopted that require humans to leave nature alone. Indeed, if nature undisturbed is worth more economically than nature domesticated, then laws protecting the nonuse component of nature will help ensure that natural resources can continue to benefit us.¹⁸³

¹⁸⁰ Geoffrey Heal, *Nature and the Marketplace* (2000); Curtis H. Marshall et al., *Crop Freezes and Land Use Change in Florida*, 426 *Nature* 29 (2003).

¹⁸¹ J. B. Ruhl, *Valuing Nature’s Services – The Future of Environmental Law*, 13 *Natural Resources & Environment* 359 (1998); James Salzman and J. B. Ruhl, *Currencies and the Commodification of Environmental Law*, 53 *Stanford L. Rev.* 607 (2000); J.B. Ruhl, Steven E. Kraft & Christopher L. Lant, *The Law and Policy of Ecosystem Services* (2007).

¹⁸² Robert Cozanza, et al., *The Value of the World’s Ecosystem Services and Natural Capital* 387 *Nature* 253-60 (May 15, 1987).

¹⁸³ *Sagoff*, *supra* note 1 at 127-28, 137; *Gretchen Daily*, *supra* note 11, Gretchen Daily et al, *The Value of Nature and the Nature of Value*, 289 *Science* 395 (2000).

Existing regulatory regimes provide a mixed array of ecosystem protections.¹⁸⁴ Ecosystems important for the services they provide humans may be preserved by (1) the National Environmental Policy Act (NEPA),¹⁸⁵ which requires that federal actions that impact sensitive ecosystems be adequately identified;¹⁸⁶ (2) The Endangered Species Act (ESA),¹⁸⁷ which imposes a duty on federal agencies to “insure that any [agency action] is not likely to...result in the destruction or adverse modification of habitat...,”¹⁸⁸ (3) the Federal Lands Policy Management Act (FLPMA),¹⁸⁹ which requires that certain federal lands potentially suitable as wilderness be managed “so as not to impair” their wilderness qualities;¹⁹⁰ and (4) the National Forest Management Act (NFMA),¹⁹¹ that calls for a management plan for each National forest which may, given the appropriate circumstances, prevent surface disturbances that could harm ecosystems.¹⁹² These federal laws do not explicitly target actions that might adversely affect ecosystems, and their focus is usually federal public lands, not state or private holdings.¹⁹³ Nor do they mandate that resource use decisions consider the value to humans if nonuse was preferred, so that otherwise free ecosystem services remain undisturbed.

¹⁸⁴ Michael C. Blum & J.B. Ruhl, Background Principles, takings, and Libertarian Property: A Reply to Professor Huffman, 37 Ecology L. Q. 805, 820 (2010); J.B. Ruhl & James Salzman, The Law and Policy Beginnings of Ecosystem Services, 22 J. Land Use & Envtl. L. 157, 158-61 (2007).

¹⁸⁵ 42 U.S.C. § 4332 (2) (C).

¹⁸⁶ *New Mexico ex rel. Richardson v. BLM*, 565 F. 3d 683, 688-89 (10th Cir. 2009).

¹⁸⁷ 16 U.S.C. § 1536 (a) (2)

¹⁸⁸ *Natural Resources Defense Council v. Houston*, 146 F. 3d 1118 (9th Cir. 1998); *Pacific Coast Federation of Fishermen’s Associations v. Gutierrez*, 606 F. Supp. 2d 1122 (E.D. Cal. 2008) (endangered species protected when river ecosystems restored); *Alliance for the Wild Rockies v. Brad Ford*, 720 F.Supp.2d 1193, 1207 (D. Mont. 2010).

¹⁸⁹ 43 U.S.C. § 1782 (a), (c).

¹⁹⁰ *Utah v. U.S. Dept. of Interior*, 535 F. ed 1184 (10th Cir. 2008).

¹⁹¹ 16 U.S.C. 1604 (a).

¹⁹² *Siskiyov Regional Education Project v. United States Forest Service*, 565 F. 3d 545 (9th Cir. 2009).

¹⁹³ See, e.g., J.B. Ruhl, Ecosystem Services and Federal Public Lands: Start-Up Policy Questions and Research Needs, 20 Duke Envtl. Law and Policy Forum 275 (2010).

Legal protection of ecosystem services seems most pronounced in the case of federal wetlands regulations. The statutory protection for wetlands provided by section 404 of the Clean Water Act¹⁹⁴ and accompanying Army Corps of Engineers Wetlands Regulations¹⁹⁵ require the Corps to determine the nature and effect that any proposed discharge will have on the function of the wetlands’ “aquatic ecosystem....”¹⁹⁶ Reviewing courts have concluded that these rules obligate the Corps to make a best professional judgment about “all ecological functions” that might be impacted by the granting of a Section 404 permit.¹⁹⁷ Federal regulations acknowledge the potential ecosystem service that wetlands perform in reducing greenhouse gases and alleviating water pollution.¹⁹⁸ Academic commentators have also urged that the common law should be enlisted to recognize human interferences with wetlands ecosystem systems as the kind of harms for which nuisance law should provide a remedy.¹⁹⁹

This second generation regulatory framework for managing ecosystem services for its nonuse is grounded in the economic benefits that accrue *to humans* by maintaining certain environmental systems in a natural condition.²⁰⁰ The legal response supporting ecosystem values

¹⁹⁴ 33 U.S.C. § 1344.

¹⁹⁵ 40 C.F.R. § 230.11 (e).

¹⁹⁶ *Ohio Valley Environmental Coalition v. Aracoma Coal*, 556 F. 3d 177, 198 (4th Cir. 2009).

¹⁹⁷ *Id.* at 199; *Butte Environmental vs. U.S. Army Corps of Engineers*, 607 F.3d 570, 574-5 (9th Cir. 2010); *Sierra Club v. Van Antwerp*, 719 F.Supp.2d 58, 66(D.D.C. 2010); *Sierra Club v. Van Antwerp*, 709 F.Supp.2d, 1254, 1269 (S.D. Fla. 2009).

¹⁹⁸ 73 Fed. Reg. 19594, 19673-19676 (2008); USA EPA, Mitigation Banking Factsheet, available at <http://ww.epa.gov/owow/wetlands/facts/fact16.html>; Fred Bosselman, Planning for a Bull Market for Wetlands, 61 *Planning & Environmental Law* 3 (Feb. 2009); J.B. Ruhl, Ecosystem Services and the Clean Water Act: Strategies for Fitting New Science Into Old Law, 40 *Envtl. L.* 1381 (2010).

¹⁹⁹ See J.B. Ruhl, Making Nuisance Ecological, 58 *Case W. Res. L. Rev.* 753 (2008); John Copland Nagle, From Swamp Damage to Wetlands Regulation to Ecological Nuisances to Environmental Ethics, 58 *Case W. Res. L. Rev.* 787 (2008).

²⁰⁰ *Ruhl, Kraft, & Lant, supra* note 181 at 7, 63 (“immense economic benefits accrue to humans by maintaining [ecosystems] under natural flow regime conditions”; “Natural capital resources are capable of providing ...economically valuable services to humans”).

is human-centric, where the preservation values are not for eco-centric or nature-based reasons, but for very human instrumental and economic ones. Those advocating legal recognition of ecosystem services are consistent in their assertion that ecological resources producing such service values, such as forests, riparian habitat and wetlands, “are economically valuable *to humans*.”²⁰¹ Laws designed to protect ecosystem services are linked directly primarily to human well-being, to ensure that humans would be provided with essential services from nature.²⁰²

Any future laws giving special recognition to ecosystem services and natural capital would likely also have an anthropocentric focus. Emphasis would not be on ecological benefits resulting to nature when natural resources are preserved, but to human economic welfare.²⁰³ Second generation laws protecting ecosystem services for human-centric reasons, both present and contemplated, de-emphasize the purely eco-centric functions supplied by natural resources left alone by humans. As such, they inevitably encounter many of the criticisms that have been made of a policy based on the economic value of wild ecosystems.

First, while nature’s services certainly provide benefits to humans, nature also imposes costs and damage to humanity. Such disservices, such as landscape-destroying storms, human-killing viruses, excessive heat or cold, drought, floods and pests, should be subtracted from the positive value associated with nature.²⁰⁴ Second, after one so reduces the economic value of an ecosystem service, one should then not simply measure the net contribution of the service to

²⁰¹ J.B. Ruhl, *Agriculture and Ecosystem Services: Strategies for State and Land Government*, 17 N.Y.U. Environmental L. J. 424, 426 N. 10 (2008) [emphasis added].

²⁰² Barton H. Thompson, Jr., *Ecosystem Services & Natural Capital: Reconceiving Environmental Management*, 17 N.Y. U. Environmental L. J. 460, 461-463 (2008) (environmental policy should be improved to more fully account for the impacts of ecosystem services “on humans”).

²⁰³ See James Salzman, Barton H. Thompson, Jr. & Gretchen C. Daily, *Protecting Ecosystem Services: Science, Economics, and Law*, 20 Stan. Envtl. L. J. 309, 312 (2001); Graciela Chichilnisky & Geoffrey Heal, *Economic Returns from the Biosphere*, 391 Nature 629 (1998).

²⁰⁴ *Sagoff*, *supra* note 1 at 144-45.

human welfare or well-being, because the true worth of a good is not just its value to humanity. Economic value is really a measure of the scarcity of a good (or ecosystem service) relative to demand. However, since nature provides ecosystem services and natural capital for free. These attributes of nature are not scarce relative to effective demand. As a result, the true economic services would be, relative to demand, negligible.²⁰⁵

Third, and finally, although attempts have been made to calculate an economic valuation of ecosystems,²⁰⁶ these values are problematic. Both the United States Supreme Court and the United States Environmental Protection Agency have found it impossible, or “indeterminate,” to place a value on the “non-use [ecosystem] benefits” associated with protecting fish and aquatic systems from cooling water-intake structures in power plants.²⁰⁷ Commentators have also criticized those estimating the economic value of ecosystems services for confusing the “value in use” for such services with their “value in exchange.” While ecosystem services contribute to the former value, which measures overall enhancement of human well-being and contentment, these services have ambiguous connection to the latter, which measure true economic growth (i.e., the total market value of a goods and services produced and consumed).²⁰⁸

An inability to overcome these criticisms may be one reason why there has been a “systematic failure of the legal framework of natural resource decision making to account for

²⁰⁵ *Id.* at 148-49.

²⁰⁶ Robert Costanza, Ralph d’Arge, Rudolf de Groot, et al., *The Value of the World’s Ecosystem Services and Natural Capital*, 387 *Nature* 253-60 (May 15, 1987).

²⁰⁷ *Entergy Corp. v. Riverkeeper, Inc.*, 129 S. ct. 1498, 1509 (2009). See also Mark Sherman, *Court Takes Power Plants’ Side Over Fish*, *The Denver Post* 8A (Apr. 2, 2009) (“Trying to put a dollar figure on fish and aquatic systems gets very difficult and contentious,” said Amy Sinden, a Temple University law professor who wrote a brief in the case for the environmental groups.”). See also Frank Ackerman and Lisa Heinzerling, *Priceless: On Knowing the Price of Everything and the Value of Nothing* (2001).

²⁰⁸ *Sagoff, supra* note 1 at 152. See also Dale D. Goble, *What Are Slugs Good For? Ecosystem Services and the Conservation of Biodiversity*, *J. of Land Use and Envtl. Law* 411, 435-439 (2007).

ecosystem benefits.”²⁰⁹ One should therefore consider other categories of Second Generation laws that are not yet in place, but which have been proposed as yet another example of anthropocentric regulatory and legal reforms that seek to protect resource nonuse values.

IV. Proposed Second Generation Laws: Protecting Human Nonuse Interests by Acknowledging the Public Interests in Natural Resources

Second generation laws – anti-pollution mandates, preservation regimes, market-based approaches, and those protecting ecosystem services – all had two common themes. First, they presumed, consistent with standard welfare economics, that their success or failure should be judged exclusively in terms of their effects on the well-being of humans.²¹⁰ Second, as the world moved into the 21st century, second generation laws proved incapable of halting, or even slowing, our over-powering desire to exploit natural resources, regardless of consequences.²¹¹

In fact, even when the planetary consequences of use and over-use of resources became visible and alarming, too often the institutional reaction was either denial,²¹² or paralysis.²¹³ Commentators and environmental advocates have stepped into this legal hiatus, and have proposed consideration of two types of legal responses that take a different approach than existing laws. One advocates that natural resource nonuse can be brought about by a “human rights” perspective. The other believes that traditional legal norms should reflect public ecological values. Although both are still based on second generation anthropocentric measures,

²⁰⁹ *J.B. Ruhl et al., supra note 181 at 7.*

²¹⁰ *Economic Institutions and Behavioral Economics* (Peter Diamond and Hannu Vartiainen eds. 2007); *Sagoff, supra note 1 at 3-9.*

²¹¹ Carl Safina, *The View From Lazy Point: A natural Year in an Unnatural World* (2010)

²¹² Kari Marie Norgaard, *Living in Denial: Climate Change, Emotional Everyday Life* (2011)

²¹³ *Economic Thought and U.S. Climate Change Policy* (D.M. Driesen ed. 2010)

they at least represent another pragmatic try at limiting the human penchant for using and abusing the planet's remaining supply of natural resources.

A. Legal Recognition of Environmental Human Rights

If one views resource nonuse from a “human rights” perspective, then the harm caused to individuals and communities by resource exploitation and over-use, as well as degradation of resource nonuse values, become threats to an inchoate *right* held by all humans. This is a right to a healthy environment, which is a recasting of human rights guarantees, where this one seeks to ensure that the natural environment does not deteriorate to the point where the human right to life, the right to health, or other human rights, are seriously impaired.²¹⁴ Although such a right to a clean and healthful environment may be present within existing human rights, it is increasingly argued that what needs to be adopted is a new set of human rights relating directly to environmental goods.²¹⁵

A human right to a healthy environment is an emerging international right.²¹⁶ It can sometimes be inferred from explicitly stated international human rights, because the goal of environmental quality and protection from pollution is to enhance the quality and dignity of human life.²¹⁷ Such a right might permit individuals or groups to file legal actions to protect the

²¹⁴ Dinah Shelton, *Environmental Rights*, in *People's Rights* (Philip Alston ed. 2001)

²¹⁵ Symposium, *The Confluence of Human Rights and the Environment*, II *Oregon Rev. Of Int'l L.* 225 (2009), Michael R. Anderson, *Human Rights Approaches to Environmental Protection: An Overview*, in *Human Rights Approaches to Environmental Protection* (A. Boyle & M. Anderson eds. 1996)

²¹⁶ Dinah Shelton, *Human Rights, Environmental Rights, and the Right to Environment*, 28 *Stanford J. Int'l L.* 103, 104 (1991)).

²¹⁷ W. Paul Gormley, *The Legal Obligation of the International Community to Guarantee a Pure and Decent Environment: the Expansion of Human Rights Norms*, 3 *Georgetown Int. Env. L. Nov.* 85, 97, 105 (1990)).

environment or fight against pollution.²¹⁸ The right also typically carries with it the “responsibility to protect and improve the environment for present and future generations.”²¹⁹

Environmental human rights of one kind or another have been adopted in the National Constitution of more than 100 countries, or well as in the constitutions of several states in the United States.²²⁰ These strongly anthropocentric environmental rights can be found in the constitutions of Columbia (“every individual has the right to enjoy a healthy environment”)²²¹ and Chile (“the right to live in an environment free from contamination”).²²² The Indian Supreme Court has found a right to a healthy environment by interweaving constitutional directives on environmental policy with the right to life.²²³ The Philippine Constitution imposes on the “State” an affirmative duty to “protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature.”²²⁴

Despite its growing popularity, human rights approach to a clean and healthful environment has been criticized on several grounds. First and foremost, such a “right” held by humans is deficient because it generally does not address threats to non-human species, and

²¹⁸ Conclusions, Meeting of Experts on Human Rights and the Environment, U.N. High Commissioner for Human Rights 14-15 (Jan. 2002)

²¹⁹ Stockholm Declaration, Principle I, United Nations Conference on the Human Environment (June 16, 1972); Richard P. Hiskes, *The Human Right to a Green Future: Environmental Rights and Intergenerational Justice* (2009)

²²⁰ Gunther Handl, *Human Rights and the Protection of the Environmental* (A. Eide, C. Krause & A. Rosas, eds. 2d ed., 2001); Luis E. Rodriguez-Rivera, *Is the Human Right to Environment Recognized Under International Law? It depends on the Source*, 12 *Colo. J. Int’l Env’t. L. & Policy* 1, 20-37 (2001); Barry E. Hill, Steve Wolfson, & Nicholas Targ, *Human Rights and the Environment: A Synopsis and Some Predictions*, 16 *Geo. Int’l Env’tl. L. Rev.* 359 (2004).

²²¹ 4 *Constitutions of the Countries of the World* 20 [art. 79 of the Columbia Constitution] (Rudiger Wolfrum & Rainer (rote eds. 2005)).

²²² 4 *Constitutions of the Countries of the World* 42 [art. 19(8) of the Constitution of the Republic of Chile] (Albert P. Blaustein & Gisbertlt. Flanz eds. 1991)

²²³ *Charon Lal v. Union of India*, A.I.R. 1990 S.C. 1480, 1509, (1989) (“The right of life and liberty also includes the right to a healthy environment free from hazardous pollutants.”).

²²⁴ *Const.* (1987), Art. II, 16 (Phil.).

natural resources in general. This anthropocentrism inherent in a human rights model to environmental protection necessarily focuses on an environment that is safe only for humans, but not one that is ecologically-balanced and sustainable in the long run.²²⁵ Second, such a human right is not capable of determining priorities, among competing societal goals.²²⁶ Third, implementation of a universal human right could bring about incursions into natural sovereignty, requiring human rights bodies to impose their will on the other nations, a dubious prospect. This reality is why most environmental rights for humans found in constitutions are typically only statements of broad aspirations, but not yet enforceable laws.²²⁷ Finally, an environmental human right would seek to ensure that nature never deteriorates to the point where a human right to life, to health, and to nonuse ecological benefits, would be seriously impaired. Legal acknowledgement of such an enforceable human right to resource nonuse benefits would have a corresponding depressing effect on the right of firms and individuals to *use* resources. If resource nonuse were to be recognized as not just an economic benefit, but also a legal or constitutional right, use interests could find themselves overpowered by those wishing to prevent resource development.²²⁸

²²⁵ Shelton, *supra* note 214; Anderson, *supra* note 215.

²²⁶ Handle, *supra* note 220.

²²⁷ See, e.g., Elaine Kurtenbach, Pelosi, U.S. Delegation Tours China's Financial Hub: Human Rights Take Back Seat to Environment, USA Today 2A (May 26, 2009) (U.S. House Speaker Nancy Pelosi stating: "I will continue to speak out for human rights....Indeed, protecting the environment is a human rights issue."). *But see* Sunburst School District No. 2 v. Texaco, Inc., 165 P. 3d 1079 (Mont. 2007); Montana Environmental Information Center v. Department of Environmental Quality, 988 P. 2d 1236, 1244 (Mont. 1999) (empowering parties to challenge resource use actions in light of Montana's Constitution granting all persons fight to a "clean and healthful environment").

²²⁸ Shelton, *supra* note 214.

B. Legitimizing the Public's Interest in Moderating Private Resource Use and Development

The pervasiveness of first generations laws - those that create private use interests in natural resources -²²⁹ has led to a call to create or expand a countervailing legal doctrine that would permit individuals valuing resource nonuse to curb use and development rights. Three pre-existing legal principals hold some promise to serve this role as a nonuse advocate—the public trust doctrine, the “common good” conception of private property, and the “public interest” inquiry that courts consider when they are asked to issue injunctions halting resource use activities. Each holds the potential to raise the legal stature of the general public’s needs regarding resource nonuse to the point where use decisions might be halted, even use decisions backed by first generation laws.

Public Trust Doctrine—Although the original public trust doctrine focused primarily on navigable waters of a state, and the lands underlying those waters,²³⁰ commentators and some courts have argued that the doctrine should be expanded to include as “trust resources” many property interests in natural resources beyond water.²³¹ The effect of a resource deemed to be a trust resource varies by jurisdiction, ranging from limiting the private right by the public’s *jus publicum* rights,²³² to transforming a fee simple absolute into a defeasible fee, to ensuring that the owner's property was used for truly public purposes,²³³ to imposing a public easement on

²²⁹ See Part II, supra.

²³⁰ See, e.g., Nat'l. Audubon Society v. Supr. Ct. of Alpine County, 658 P. 2d 709 (Lal. 1983).

²³¹ Michael C. Blumm, The Public Trust Doctrine – A Twenty – First Century Concept, 16 West & Northwest J. of Env'tl. L. and Policy 105 (2010); Carol Rose, The Comedy of the Commons: Custom, Commerce, and Inherently Public Property, 53 U. Chi. L. Rev. 711 (1986); Raleigh Ave. Beach Assn. v. Atlantis Beach Club, 879 A. 2d (N.J. 2005).

²³² Marks v. Whitney, 491 P. 2d 374 (Cal. 1971).

²³³ Vermont v. Cent. Vt. Ry., 571 A. 2d 1128 (Vt. 1989),

private property.²³⁴ Whatever the effect though, the public trust doctrine holds the potential to alter resource development and use, based on an acknowledgement of the public's overriding interest in various nonuse qualities of natural resources.²³⁵

Public Obligations of Private Owners – A parallel school of thought has suggested that the entire concept of private property in land and resources should be reexamined, so that instead of focusing on the private *use rights* accompanying ownership, the private owner should also have *public obligations* associated with the right.²³⁶ In other words, ownership of a natural resource might entail public responsibilities, tempering and even checking private use desires if the resource's nonuse potential would otherwise be jeopardized.²³⁷ This radical rethinking of the concept of private property would imprint on resources subject to private ownership an obligation sometimes to not use and exploit land and natural resources, in order to benefit the anthropomorphic interests of the larger human community.

The Public Interest and Injunctive Relief – When environmental advocates seek to enjoin government actions that might adversely affect the survival and health of natural resources, the courts must engage in an exercise involving a balancing of competing public interests. One such interest is often the benefit enjoyed by the public when the resource is used in someone (e.g.,

²³⁴ Nat'l. Home Ass'n. Builders v. New Jersey Dept. of Env'tl. Prot., 64 F. Supp. 2d 354 (D.N.J. 1999).

²³⁵ Michael C. Blumm, The Republic Trust Doctrine and Private Property: The Accommodation Principle, 27 Pace Env'tl. L. Rev. 649 (2010); Mary Christina Wood, Advancing the Sovereign Trust of Government to Safeguard the Environment for Present and Future Generations (Part I) L. Ecological Realisms and the Need for A Paradigm Shift, 39 Env'tl. L. 43 (2009).

²³⁶ Joseph W. Singer, The Ownership and Takings of Property: Castles, Investments and Just Obligations, 30 Harv. La. Rev. 309 (2006); Myrl L. Duncan, Reconceiving the Bundle of Sticks: Land as a Community Based Resource, 32 Env'tl. L. 773 (2002); Gregory S. Alexander & Eduardo M. Penalver, Property and Community (2010).

²³⁷ Eric T. Freyfogel, On Private Property: Finding Common Ground on the Ownership of Land (2007); Eric T. Freyfogel, The Land We Share: Private Property and the Common Good (2003).

employment, job creation, and an invigorated local economy).²³⁸ A countervailing interest is the public's employment when nature is *not* used, when it is preserved and protected from use activities that might injure the resource.²³⁹ Increasingly, courts are taking seriously, and could take even more seriously, the public's interest in the nonuse component of resources in the context of deciding whether injunctive relief should be granted.²⁴⁰

V. Conclusion

The first generation of resource laws emphasized use, so that humans could enjoy the benefits of developing the use potential of the earth's natural resources. The second generation, both adopted and contemplated, focused more on nonuse. But the assumption behind all the second generation laws was the same—humans would benefit if resources were not directly used by humans. Neither first nor second generation laws seem to have protected the earth's resources, which continue to be polluted, depleted, and adversely altered.²⁴¹ This persistent failure to preserve resource nonuse values suggests that an entirely new approach may be necessary. Perhaps a third generation of resource laws is now in order, one where the benefits are not purely anthropocentric, but instead are eco-centric, and where the rights are not held by humans, but by nature.²⁴²

²³⁸ See, e.g., *Alliance for the Wild Rockies v. Cottrell*, 632 F.3d 1127 (9th Cir. 2011).

²³⁹ *The Consolidated Salmonid Cases*, 713 F.Supp.2d 1116 (E.D. Cal. 2010).

²⁴⁰ *The Lands Council v. McNair*, 537 F.3d 981, 1005 (9th Cir. 2005).

²⁴¹ See *Nordhaus and Shellenberger*, *supra* note 33.

²⁴² Susan Emmenegger & Alex Tschentscher, Taking Nature's Right's Seriously: The Long Way to Biocentrism in Environmental Law, 6 *Geo. Int'l Env'tl. L. Rev.* 545 (1994).