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

BY

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Modern environmental law has proved a colossal failure, despite the good intentions and the hard work of many citizens, lawyers, and government officials. Notwithstanding the most extensive and complex set of legal mandates the world has ever known, government is driving runaway greenhouse gas emissions and resource depletion. Agencies use the discretion in their statutes to allow continuing damage to the atmosphere and other natural resources. At a time when society faces catastrophic climate heating and ecological collapse, leading thinkers should be setting their sights on a transformational environmental law principle. This Article is the first of two companion Articles that identify the public trust doctrine as the most fundamental legal mechanism available to ensure governmental protection of natural resources necessary for public welfare and survival. At the core of the doctrine is the principle that every sovereign government holds vital natural resources in "trust" for the public—i.e., present and future generations of citizen beneficiaries. This Article proposes a paradigm shift away from the current system of natural resource management, a system driven by political discretion, to one that is infused with public trust principles and policies across all branches of government and at all jurisdictional levels.

Section II of this Article explains the necessity for an emergency response to arrest the hemorrhage of natural systems and stabilize climate by bringing down atmospheric concentrations of greenhouse gas pollution. Section III explains the dysfunction of modern environmental law and the role of agencies in promoting natural damage. Section IV explores the depth of legal change needed to secure the resources essential to future survival and

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prosperity. Section V explains the role of government as trustee of natural resources. Section VI describes states and foreign nations as cotenant trustees with respect to shared or transitory resources. Part II of this work presents the trust framework as it relates to the modern regime of statutory and administrative law.

I. INTRODUCTION

The ecological crisis of today is largely a result of government's failure to protect natural resources on behalf of its citizens. Under the system of environmental statutory laws enacted in the United States over the past three decades, agencies at every jurisdictional level have gained nearly unlimited authority to manage natural resources and allow their destruction by private interests through permit systems. Although environmental statutes were designed to protect natural resources, most agencies have used permit provisions to allow continual destruction of natural resources. Though permits often contain mitigation conditions, the overall cumulative effect of agency-permitted damage pursuant to statutory authority is staggering. Nearly every natural resource—including the atmosphere, water, air, wetlands, wildlife, fisheries, soils, marine systems,

grasslands, and forests—is seriously degraded, and many are at the brink of collapse.[1] Without a fundamental paradigm shift in the way government manages the environment, government will continue to impoverish natural capital until society will no longer be able to sustain itself.

This paper draws upon the public trust doctrine as the most compelling beacon for a fundamental and rapid paradigm shift towards sustainability.[2] Deriving from the common law of property, the public trust doctrine is the original legal mechanism to ensure that government safeguards natural resources necessary for public welfare and survival. At the core of the doctrine is the antecedent principle that every sovereign government holds vital natural resources in "trust" for the public—present and future generations of citizen beneficiaries.[3] A trust is a basic type of ownership whereby one manages property for the benefit of another. An ancient yet enduring legal principle, it underlies modern environmental statutory law.[4] The doctrine invokes the sovereign's property powers and obligations, distinct from the police powers of a state.[5] In the United States, the doctrine is

1 *See infra* Sections II.A–B.

2 For sources and materials on the public trust doctrine, see JAN G. LAITOS, SANDRA B. ZELLMER, MARY C. WOOD & DANIEL H. COLE, NATURAL RESOURCES LAW 622–54 (2006). For discussion of the public trust doctrine, see Harrison Dunning, *The Public Trust: A Fundamental Doctrine of American Property Law*, 19 ENVTL. L. 515 (1989); Allen Kanner, *The Public Trust Doctrine*, Parens Patriae, *and the Attorney General as the Guardian of the State's Natural Resources*, 16 DUKE ENVTL. L. & POL'Y F. 57 (2005); Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471, 558–66 (1970).

3 Geer v. Connecticut, 161 U.S. 519, 525–29 (1896) (detailing ancient and English common law principles of sovereign trust ownership of air, water, sea, shores, and wildlife); Ill. Cent. R.R. Co. v. Illinois (*Illinois Central*), 146 U.S. 387, 455 (1892); *see also* Charles F. Wilkinson, *The Public Trust Doctrine in Public Land Law*, 14 U.C. DAVIS L. REV. 269, 315 (1980) ("The public trust doctrine is rooted in the precept that some resources are so central to the well-being of the community that they must be protected by distinctive, judge-made principles."); Ctr. for Biological Diversity v. FPL Group, Inc., 166 Cal. App. 4th 1349, 1360 n.12 (Cal. Ct. App. 2008) ("[C]ertain interests are so particularly the gifts of nature's bounty that they ought to be reserved for the whole of the populace." (quoting Sax, *supra* note 2, at 484)). For a compelling presentation of the theoretical and legal structure for protecting future generations, see Burns H. Weston, *Climate Change and Intergenerational Justice: Foundational Reflections*, 9 VT. J. ENVTL. L. 375 (2008), *available at* http://www.vjel.org/journal/pdf/VJEL10067.pdf.

4 *See* National Environmental Policy Act of 1969, 42 U.S.C. § 4331(b)(1) (2000) (declaring a national duty to "fulfill the responsibilities of each generation as trustee of the environment for succeeding generations"). Federal pollution laws also designate sovereigns (federal, tribal, and state governments) as trustees of natural resources for purposes of collecting natural resource damages. *See* Mary Christina Wood, *The Tribal Property Right to Wildlife Capital (Part II): Asserting a Sovereign Servitude to Protect Habitat of Imperiled Species*, 25 VT. L. REV. 355, 443 (2001). The public trust is also expressed in many state constitutions. *See, e.g.*, HAW. CONST. art. XI, § 1; PA. CONST. art. I, § 27; R.I. CONST. art. I, § 17. *See generally* Robin Kundis Craig, *A Comparative Guide to the Eastern Public Trust Doctrine: Classifications of States, Property Rights, and State Summaries*, 16 PENN ST. ENVTL. L. REV. 1 (2007), *available at* http://ssrn.com/abstract=1008161.

5 *See* LAITOS, ZELLMER, WOOD & COLE, *supra* note 2, at 623 ("Because the public trust doctrine emanates from property ownership on behalf of the public, the duties and powers to preserve the trust are distinct from the states' legislative police powers."); Gerald Torres, *Who Owns the Sky?*, 19 PACE ENVTL. L. REV. 515, 525 (2001–2002) (distinguishing sovereign's police power and property interests in the context of air pollution); *Ctr. for Biological Diversity*, 166 Cal. App. 4th at 1364–66 (distinguishing police power and public trust, noting the latter is not "superfluous" to statutes).

evident in hundreds of judicial decisions, including landmark United States Supreme Court opinions.[6]

Section II of this Article explains the ecological crisis and the need for an emergency response to arrest the hemorrhage of natural systems and stabilize the global climate by bringing down atmospheric concentrations of greenhouse gas pollution. Section III seeks to explain the dysfunction of modern environmental law. Section IV explores the depth of legal change needed to secure the resources essential to future survival and prosperity. Section V explains the role of government as trustee of natural resources. Section VI delineates the role of states and foreign nations as cotenant trustees vis-à-vis one another with respect to shared or transitory resources. A companion Article, Part II, explores the application of trust principles within the modern administrative framework. It discusses the substantive and procedural duties of governmental trustees of natural assets and presents the interface between public trust obligations and statutory law.

II. THE END IN SIGHT

The need for a profound and enduring societal paradigm shift towards natural resources management is now quite obvious. Society is exhausting life-sustaining natural resources at a pace that threatens the lives, comfort, and economic prosperity of individuals—not just future generations, but those living on Earth today.[7] Many "collapse" books illuminate the trajectory towards disaster.[8] In his book, *The Bridge At the Edge of the World*, James Gustave Speth, the Dean of the School of Forestry and Environmental Studies at Yale University, inventories accumulating evidence of natural collapse from deforestation, destruction of wetlands, toxic pollution, over-appropriation of water, disappearance of coral reefs, and extinction of species.[9] He surmises that societies now face environmental threats of unprecedented magnitude and scope, a future comprised of "catastrophes, breakdowns, and collapses."[10] As he puts it: "[W]e're headed toward a ruined planet."[11] The drivers of collapse are society's impoverishment of natural systems and resources, and climate crisis.[12]

6 *See* Kanner, *supra* note 2, at 71–72; Torres, *supra* note 5, at 521; Sax, *supra* note 2, at 489.

7 *See* discussion *infra* notes 34, 36 and accompanying text.

8 This genre of literature was first identified in JAMES GUSTAVE SPETH, THE BRIDGE AT THE EDGE OF THE WORLD: CAPITALISM, THE ENVIRONMENT, AND CROSSING FROM CRISIS TO SUSTAINABILITY 5 (2008). For a sampling of literature, see LESTER R. BROWN, PLAN B 3.0: MOBILIZING TO SAVE CIVILIZATION (2008); JAMES LOVELOCK, THE REVENGE OF GAIA: WHY THE EARTH IS FIGHTING BACK—AND HOW WE CAN STILL SAVE HUMANITY (2006); MARK LYNAS, SIX DEGREES: OUR FUTURE ON A HOTTER PLANET (American ed. 2008) (2007); and DAVID SPRATT & PHILIP SUTTON, CLIMATE CODE RED: THE CASE FOR EMERGENCY ACTION (2008).

9 SPETH, *supra* note 8, at 1–2.

10 *Id.* at 8.

11 *Id.* at 237.

12 Of course, both are linked to overpopulation, excessive consumption, industrial-style capitalism, and other broad factors.

A. Ecological Bankruptcy

Just a few statistics speak volumes as to the loss of life and ecosystems on the planet. In this country alone, at least 9000 species are at risk of extinction.[13] Nearly 40% of fish species in North American streams, rivers, and lakes are in jeopardy, representing a 92% increase since 1989.[14] Fish advisories for toxic contamination are in effect for 24% of all rivers, 35% of all lakes, and 71% of all coastal estuaries, as well as 100% of the Great Lakes.[15] The United States has destroyed over 53% of its wetlands[16] and 90% of its old growth forests.[17] California has lost 99% of its native grassland.[18] The amount of urban land development quadrupled between 1954 and 1997.[19] According to the United States Environmental Protection Agency (EPA), 95% of all Americans now have an increased risk of lung cancer, just from breathing toxins in outdoor air.[20] Babies in the United States are being born polluted, the blood of some hosting a cocktail of toxins even before they take their first breath of life.[21]

On the global level, approximately half of the world's original forest is gone, and another 30% is degraded or fragmented.[22] There are now 200 "dead zones" in the world's oceans, covering tens of thousands of square miles.[23] Due to high levels of

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13 *See* COUNCIL ON ENVTL. QUALITY, ENVIRONMENTAL QUALITY: 21ST ANNUAL REPORT 137 (1990) ("The problem is national in scope, with every region of the country reporting losses of native species . . . . More than species are being lost. Whole plant and animal communities—integrated, resilient systems—are threatened.").

14 Howard L. Jelks et al., *Conservation Status of Imperiled North American Freshwater and Diadromous Fishes*, 33 FISHERIES 372, 372 (2008), *available at* http://www.fisheries.org/afs/docs/fisheries/fisheries_3308.pdf.

15 *See* Mary Christina Wood, *EPA's Protection of Tribal Harvests: Braiding the Agency's Mission*, 34 ECOLOGY L.Q. 175, 190 (2007), *available at* http://www.law.uoregon.edu/faculty/mwood/docs/epas.pdf.

16 William B. Meyer, *Present Land Use and Land Cover in the USA*, *in* CONSEQUENCES: THE NATURE AND IMPLICATIONS OF ENVIRONMENTAL CHANGE, 24–33 (1995), *reprinted in* LAITOS, ZELLMER, WOOD & COLE, *supra* note 2, at 730; *see also* REED F. NOSS ET AL., ENDANGERED ECOSYSTEMS OF THE UNITED STATES: A PRELIMINARY ASSESSMENT OF LOSS AND DEGRADATION app. A (1995), http://biology.usgs.gov/pubs/ecosys.htm (last visited Nov. 25, 2008).

17 NOSS ET AL., *supra* note 16.

18 *Id.*

19 U.S. ENVTL. PROT. AGENCY, DOC. NO. EPA-231-R-01-002, OUR BUILT AND NATURAL ENVIRONMENTS: A TECHNICAL REVIEW OF THE INTERACTIONS BETWEEN LAND USE, TRANSPORTATION, AND ENVIRONMENTAL QUALITY 4 (2001), *available at* http://www.smartgrowth.org/pdf/built.pdf. The amount of developed acreage during that time period grew from 18.6 million acres to about 74.0 million acres in the contiguous 48 states. *Id.*

20 GOV'T ACCOUNTABILITY OFFICE, DOC. NO. GAO-06-669, REP. TO CONG. REQUESTERS, CLEAN AIR ACT: EPA SHOULD IMPROVE THE MANAGEMENT OF ITS AIR TOXICS PROGRAM 1 (2006), *available at* http://www.gao.gov/new.items/d06669.pdf.

21 *See* Douglas Fischer, *Womb Fails to Shield Babies from Pollution*, OAKLAND TRIBUNE, July 15, 2005, http://www.insidebayarea.com/search/ci_2864589?IADID (last visited Jan. 25, 2009). The Oakland Tribune published a multipart series dealing with the chemical contamination of human beings in modern society.

22 THE WORLDWATCH INSTITUTE, VITAL SIGNS 2002, at 104 (2002).

23 *See* John Heilprin, *U.N.: Number of Ocean "Dead Zones" Rise*, BOSTON GLOBE, Oct. 19, 2006, http://www.boston.com/news/science/articles/2006/10/19/un_number_of_ocean_dead_zones_rise/ (last visited Jan. 25, 2009) (stating that dead zones are as far-flung as Finland, Ghana, China, Britain, Greece, Peru, Portugal, Uruguay, the western Indian Ocean, and the Gulf of Mexico). For more information on the rapid expansion of "dead zones," see Anne Minard, *"Dead Zones" Multiplying Fast, Coastal Water Study Says*, NATIONAL GEOGRAPHIC NEWS, Aug. 14, 2008, http://news.nationalgeographic.com/

carbon absorbed in marine waters, the oceans are becoming acidic—corrosive enough to dissolve the shells of sea creatures—posing "potentially catastrophic consequences for marine life."[24] Nearly one-third of the sea fisheries have already collapsed, with the rate of decline freefalling towards complete loss of wild seafood just four decades from now.[25] The International Union for Conservation of Nature (IUCN) has found that globally 21% of all mammals, 30% of all amphibians, and 12% of all bird species are threatened.[26] The planet "has not seen such a spasm of extinction in sixty-five million years, since the dinosaurs disappeared."[27] Overall, the Earth's natural ecosystems have declined by 33% during the last thirty years according to a comprehensive report issued in 2000 by the World Wildlife Fund (WWF).[28]

B. Climate Emergency

Climate crisis now looms over all other environmental threats as a deadly emergency that is leagues beyond anything Humanity has ever faced.[29] In June 2007, a team of leading climate scientists warned that Earth is in "imminent peril"

news/2008/08/080814-dead-zones.html (last visited Jan. 25, 2009) (dead zones are now "the key stressor on marine ecosystems" and "rank with overfishing, habitat loss, and harmful algal blooms as global environmental problems").

[24] Roger Highfield, *Oceans Turning Acidic Decades Earlier*, LONDON TELEGRAPH, May 22, 2008, http://www.telegraph.co.uk/scienceandtechnology/science/sciencenews/3342688/Oceans-turning-acidic-decades-earlier.html (last visited Jan. 25, 2009); Press Release, Or. State Univ., *New Study Finds Increasing Acidification of Pacific Ocean's Continental Shelf* (May 22, 2008), *available at* http://oregonstate.edu/dept/ncs/newsarch/2008/May08/acid.html ("The water that will upwell off the coast in future years already is making its undersea trek toward us, with ever-increasing levels of carbon dioxide and acidity.").

[25] Boris Worm et al., *Impacts of Biodiversity Loss on Ocean Ecosystem Services*, 314 SCI. 787, 790 (2006) (projecting "the global collapse of all taxa currently fished by the mid–21st century" based on current trend); Richard Black, *"Only 50 Years Left" for Sea Fish*, BBC NEWS ON-LINE, Nov. 2, 2006, http://news.bbc.co.uk/2/hi/science/nature/6108414.stm (last visited Jan. 25, 2009) ("There will be virtually nothing left to fish from the seas by the middle of the century if current trends continue . . . ." (paraphrasing study)).

[26] IUCN, 2008 IUCN RED LIST OF THREATENED SPECIES tbl.1 (2008), *available at* http://www.iucnredlist.org/documents/2008RL_stats_table_1_v1223294385.pdf. E.O. Wilson, the renowned Harvard biologist, estimates that the world is losing 27,000 species per year (three per hour). E.O. WILSON, THE DIVERSITY OF LIFE 280 (W.W. Norton & Co. 1993) (1992).

[27] SPETH, *supra* note 8, at 1 (noting extinction rates are now 1000 times faster than normal).

[28] WWF, LIVING PLANET REPORT 2000, at 1 (Jonathan Loh ed., 2000), *available at* http://assets.panda.org/downloads/lpr2000.pdf. The WWF examines ecosystems on a global scale and presents trends in species loss. The 2000 report concludes, "the ecological pressure of humanity on the Earth has increased by about 50 per cent over the same [thirty-year] period." *Id.* The WWF presents indices to measure changes in species abundance over time in three separate categories: forest species, freshwater species, and marine species. Its 2000 report presents a dramatic decline in all three categories over the 1970–1999 period: forest species (-12%), freshwater species (-50%), and marine species (-35%). *Id.* at 2. Similarly, the Millennium Ecosystem Assessment of 2005, conducted by over 1300 experts from 95 countries, concludes: "Approximately 60% (15 out of 24) of the ecosystem services evaluated in this assessment (including 70% of regulating and cultural services) are being degraded or used unsustainably. . . . Ecosystem services that have been degraded over the past 50 years include capture fisheries, water supply, waste treatment and detoxification, water purification, natural hazard protection, regulation of air quality, regulation of regional and local climate, regulation of erosion, spiritual fulfillment, and aesthetic enjoyment." MILLENNIUM ECOSYSTEM ASSESSMENT, ECOSYSTEMS AND HUMAN WELL-BEING: SYNTHESIS viii, 6 (2005), *available at* http://www.millenniumassessment.org/documents/document.356.aspx.pdf.

[29] *See* SPRATT & SUTTON, *supra* note 8 (summarizing science).

from carbon emissions that cause global heating.[30] Runaway heating threatens to melt the polar ice sheets and those on Greenland, kill the coral reefs, and turn the Amazon forest into savannah.[31] It would bring floods, hurricanes, killer heat waves, fires, disease, crop losses, food shortages, droughts, and could cause extinctions of 50% or more of the world's species.[32] In the words of a leading scientist, our continued carbon pollution will cause a "transformed planet."[33]

Climate heating is a life and death matter for citizens worldwide, as it impacts the resources humans need for basic survival. Analysts warn that climate change will force massive human refugee migrations and pose an unending threat to world security.[34] Legal institutions that collapse under such stress will no longer provide stability, and many predict that a hotter world would trigger the breakdown of civilization as we know it.[35] If these scenarios come to pass, it could mean death for millions or even billions of Earth's citizens.[36] As Speth concludes: "[If we] keep doing exactly what we are doing today, with no growth

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30 James Hansen et al., *Climate Change and Trace Gases*, 365 PHIL. TRANSACTIONS ROYAL SOC'Y A: MATHEMATICAL, PHYSICAL AND ENGINEERING SCIENCES 1925, 1949 (2007), *available at* http://www.planetwork.net/climate/Hansen2007.pdf; *see also* Steve Connor, *The Earth Today Stands in Imminent Peril*, THE INDEPENDENT, June 19, 2007, http://environment.independent.co.uk/climate_change/article2675747.ece (last visited Jan. 25, 2009).

31 *See* SPRATT & SUTTON, *supra* note 8, at 87–88, 90.

32 Geoffrey Lean, *A World Dying, But Can We Unite to Save It?*, THE INDEPENDENT, Nov. 18, 2007, http://www.independent.co.uk/environment/climate-change/a-world-dying-but-can-we-unite-to-save-it-400847.html (last visited Jan.25, 2009).

33 Jim Hansen, *The Threat to the Planet*, N.Y. REV., July 13, 2006, at 12.

34 KURT M. CAMPBELL ET AL., THE AGE OF CONSEQUENCES: THE FOREIGN POLICY AND NATIONAL SECURITY IMPLICATIONS OF GLOBAL CLIMATE CHANGE 10 (Sharon Burke et al. eds., 2007); *see also* LYNAS, *supra* note 8, at 180–81; SPETH, *supra* note 8, at 25, 236–37; SPRATT & SUTTON, *supra* note 8, at 61–62; Ross Gelbspan, *Two Paths for the Planet*, AM. PROSPECT, July–Aug. 2007, at 45. One report estimates that as many as one billion people—one sixth of the Earth's population—could lose their homes by 2050 due to steadily rising temperatures. *See* Nigel Morris, *Climate Change Could Force One Billion from Their Homes by 2050*, THE INDEPENDENT, Apr. 29, 2008, http://www.independent.co.uk/environment/climate-change/climate-change-could-force-1-billion-from-their-homes-by-2050-817223.html (last visited Jan. 25, 2009).

35 Ross Gelbspan, *Beyond the Point of No Return*, GRIST, Dec. 11, 2007, http://gristmill.grist.org/story/2007/12/10/165845/92 (last visited Jan. 25, 2009); CAMPBELL ET AL., *supra* note 34, at 7, 105 (describing the scenario of a 2.6 C° average increase in global temperature by 2040: "[M]assive nonlinear events in the global environment give rise to massive nonlinear societal events. . . . [N]ations around the world will be overwhelmed by the scale of change. . . . The social consequences range from increased religious fervor to outright chaos"); LOVELOCK, *supra* note 8, at 65; SPRATT & SUTTON, *supra* note 8, at 250.

36 One notable scientist, James Lovelock, predicts that by century's end, only 500 million people out of the present population of 6.6 billion will survive on Earth, "with most of the survivors living in the far latitudes—Canada, Iceland, Scandinavia, the Arctic Basin . . . ." Jeff Goodell, *The Prophet of Climate Change: James Lovelock*, ROLLING STONE, Oct. 17, 2007, http://www.rollingstone.com/politics/story/16956300/ (last visited Jan. 25, 2009). Slowly, political leaders are recognizing the gravity of human life at stake in climate crisis. The mayor of New York recently told a United Nations conference: "Terrorists kill people. Weapons of mass destruction have the potential to kill an enormous numbers of people . . . global warming long term has the potential to kill everybody." Benny Avni, *Mayor Compares Threat of Global Warming to Terrorism*, THE SUN, Feb. 12, 2008, http://www.nysun.com/article/71103 (last visited Jan. 25, 2009).

in the human population or the world economy . . . the world in the latter part of this century won't be fit to live in."[37]

The world has only a narrow window of time to begin reversing global emissions of carbon before the planet passes a "tipping point."[38] At such point, dangerous feedback loops will unravel the planet's climate system—despite any subsequent carbon reductions achieved by Humanity.[39] Under its aimless present course of "Business As Usual" (BAU), Humanity continues to emit carbon dioxide at an average increase of 2%–3% each year.[40] Carbon pollution can persist in the atmosphere for hundreds, or even thousands, of years. Due to carbon in the atmosphere from past releases, the Earth is already experiencing intense "feedbacks" that exacerbate the planet's heating.[41] For example, vast areas of

[37] *See* SPETH, *supra* note 8, at x; Mark Lynas, *Why We Must Ration the Future*, NEW STATESMAN, Oct. 23, 2006, http://www.newstatesman.com/200610230015 (last visited Jan. 24, 2009) ("[I]f we go on emitting greenhouse gases at anything like the current rate, most of the surface of the globe will be rendered uninhabitable within the lifetimes of most readers of this article.").

[38] *See* FRED PEARCE, WITH SPEED AND VIOLENCE: WHY SCIENTISTS FEAR TIPPING POINTS IN CLIMATE CHANGE 238–39 (2007). The tipping point concept has been recognized by the Ninth Circuit Court of Appeals in a recent climate case. *See* Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 508 F.3d 508, 523 (9th Cir. 2008) **("**Several studies also show that climate change may be non-linear, meaning that there are positive feedback mechanisms that may push global warming past a dangerous threshold (the 'tipping point').").

[39] *See Dangerous Human-Made Interference with Climate: Hearing on "Dangerous Global Warming" Before the U.S. House of Representatives Select Committee on Energy Independence and Global Warming*, 110th Cong. 5 (2007), *available at* http://globalwarming.house.gov/tools/assets/files/0292.pdf [hereinafter *Hansen Testimony*] (testimony of James E. Hansen, Dir., NASA Goddard Institute for Space Studies) ("In the past few years it has become clear that the Earth is close to dangerous climate change, to tipping points of the system with the potential for irreversible deleterious effects."); STERN REVIEW, THE ECONOMICS OF CLIMATE CHANGE 298 (2006), *available at* http://www.hm-treasury.gov.uk/stern_review_report.htm (follow "Chapter 13 Defining a goal for climate change policy" hyperlink) ("Recent scientific developments have placed more emphasis on the dangers of amplifying feedbacks of global temperature increases and the risks of crossing irreversible tipping points . . . ."); UNITED NATIONS FOUNDATION-SIGMA XI SCIENTIFIC EXPERT GROUP ON CLIMATE CHANGE, CONFRONTING CLIMATE CHANGE: AVOIDING THE UNMANAGEABLE AND MANAGING THE UNAVOIDABLE, at xi (2007), *available at* http://www.globalproblems-globalsolutions-files.org/unf_website/PDF/climate%20_change_avoid_unmanagable_manage_unavoidable.pdf (discussing climate "tipping point"); Hansen et al., *supra* note 30, at 1925, 1949 (discussing positive feedback loops); James Hansen et al., *Dangerous Human-Made Interference With Climate: A GISS Model Study*, 7 ATMOS. CHEM. PHYS. 2287, 2306 (2007) [hereinafter Hansen et al., *Dangerous Human-Made Interference*], *available at* http://www.atmos-chem-phys.net/7/2287/2007/acp-7-2287-2007.pdf (discussing tipping point: "[W]e must be close to such a point, but we may not have passed it yet."); Hansen, *supra* note 33, at 14 ("[B]ecause of the global warming already bound to take place as a result of the continuing long-term effects of greenhouse gases and the energy systems now in use . . . it will soon be impossible to avoid climate change with far-ranging undesirable consequences. We have reached a critical tipping point."). While the term "tipping point" is often used, in actuality there are many dangerous feedback loops, each representing a destabilizing tipping point. For discussion of the many tipping points, see PEARCE, *supra*, note 38.

[40] *See* Hansen et al., *supra* note 30, at 1938; Hansen, *supra* note 33, at 13; Geoffrey Lean, *Global Warming 'Is Three Times Faster Than Worst Predictions,'* THE INDEPENDENT, June 3, 2007, http://www.independent.co.uk/environment/climate-change/global-warming-is-three-times-faster-than-worst-predictions-451529.html (last visited Jan. 25, 2009) (reporting on study performed by the U.S. National Academy of Sciences showing that carbon dioxide emissions have been increasing over the last eight years at the rate of about 3% per year, as opposed to 1.1% per year during the 1990s).

[41] *See* PEARCE, *supra* note 38, at 235–36; David Archer, *Fate of Fossil Fuel CO2 in Geologic Time*, 110 J. GEOPHYSICAL RES. 1, 6 (2005) (discussing lifetime of atmospheric CO_2 and concluding that "17–

permafrost are melting, in turn causing releases of carbon and methane.[42] Natural "sinks," such as oceans and forests that historically have absorbed carbon, are turning into sources of carbon.[43] Another feedback concerns what scientists term the "albedo flip." When ice melts and turns to water, it causes further heating, because water absorbs heat and ice reflects heat;[44] thus, melting begets more melting. Last summer, Arctic melting greatly accelerated, causing scientists to warn that the Arctic Ocean could have no summer ice by 2012—about thirty years earlier than the predictions made even a year earlier.[45] All of these indicators have caused leading climate scientists to warn, "[r]ecent greenhouse gas (GHG) emissions place the Earth *perilously close to dramatic climate change that could run out of our control*, with great dangers for humans and other creatures."[46]

Time is short. While just a year ago scientists believed the "tipping point" would be triggered at 450 parts per million of carbon in the atmosphere, some now believe the tipping point is below 350 parts per million.[47] Present levels are at 387

33% of the fossil fuel carbon will still reside in the atmosphere at 1 [thousand years]" and anticipating that 7% will remain at 100,000 years); Hansen et al., *Dangerous Human-Made Interference*, *supra* note 39, at 2305–06 (discussing feedbacks).

42 Permafrost is believed to contain more than a third of all carbon stored in soils globally. *See* Joseph Romm, *The Permafrost Won't Be Perma For Long*, GRIST, May 23, 2008, http://gristmill.grist.org/story/2008/5/23/93829/4280 (last visited Jan. 24, 2009). Global warming is causing the top layer of permafrost to melt in Arctic Alaska and Siberia at an alarming rate. *Id.* For example, a frozen peat bog in western Siberia the size of France and Germany combined is becoming a mass of shallow lakes—some almost a mile wide—due to regional warming of three degrees Celsius over the past 40 years. *Id.* This bog is estimated to contain 70 billion tons of methane, which if it escapes directly into the atmosphere, has "20 times the heat trapping power of carbon dioxide." *Id.*; *see also Greenhouse Gases, Carbon Dioxide and Methane, Rise Sharply in 2007*, SCI. DAILY, Apr. 24, 2008, http://www.sciencedaily.com/releases/2008/04/080423181652.htm (last visited Jan. 25, 2009). In 2007, "global levels of carbon dioxide . . . [increased by] 19 million tons. Additionally, methane rose by 27 million tons after nearly a decade with little or no increase." *Id*. However, "[i]t's too soon to tell whether [this] spike in emissions includes the start of [a methane release from thawing Arctic permafrost]." *Id.*; *see also Global Warming Time-Bomb Trapped in Arctic Soil: Study*, TERRA DAILY, Aug. 24, 2008, http://www.terradaily.com/2007/080824170027.p937t12p.html (last visited Jan. 25, 2009) (reporting recent study finding that stocks of organic carbon, which are "currently held in check only by the cold," are 60% higher than previously thought and could have a "significant impact on Earth's climate" if released from thawed Arctic soils).

43 *See* Hansen et al., *Dangerous Human-Made Interference*, *supra* note 39, at 2306 ("The ability of the ocean to absorb human made CO2 decreases as the emissions increase. . . . [T]here is a possibility that the terrestrial biosphere could even become a source of CO2 . . . and even a potential that large amounts of methane could be released from undersea methane hydrates, or from thawing permafrost."); *First-Ever State of the Carbon Cycle Report Finds Troubling Imbalance*, TERRA DAILY, Nov. 16, 2007, http://www.terradaily.com/reports/First_Ever_State_Of_The_Carbon_Cycle_Report_Finds_Troubling_Imbalance_999.html (last visited Jan. 25, 2009) ("Carbon 'sinks' such as growing forests may remove up to half [of the two billion tons of carbon released by North American sources], but these current sinks may turn into new sources as climate changes."); Deborah Zabarenko, *Wetlands Could Unleash "Carbon Bomb,"* REUTERS UK, July 20, 2008, http://uk.reuters.com/article/oilRpt/idUKN1745905120080720 (last visited Jan. 24, 2009) ("The world's wetlands, threatened by development, dehydration and climate change, could release a planet-warming 'carbon bomb' if they are destroyed.").

44 *See* Connor, *supra* note 30.

45 *Scientists: 'Arctic is screaming,' Global Warming May Have Passed Tipping Point*, FOXNEWS.COM, Dec. 12, 2007, http://www.foxnews.com/story/0,2933,316501,00.html (last visited Jan. 25, 2009).

46 Hansen et al., *supra* note 30, at 1925 (emphasis added).

47 James Hansen, Makiko Sato, Pushker Kharecha, David Beerling, Valerie Masson-Delmotte, Mark Pagani, Maureen Raymo, Dana L. Royer & James C. Zachos, *Target Atmospheric CO2: Where*

parts per million and climbing at an unprecedented pace.[48] Analysts are repeatedly warning in the clearest terms possible that the Earth is now in a danger zone—**a state of planetary emergency**[49]—and that, if Humanity follows BAU for even another few years, it will lock in future catastrophic global heating.[50] The head of the United Nation's climate panel recently told the world: "What we do in the next two to three years will determine our future. This is the defining moment."[51]

Should Humanity Aim?, 2 OPEN ATMOSPHERIC SCI. J. 217, 217 (2008), *available at* http://www.benthamopen.org/pages/content.php?TOASCJ/2008/00000002/00000001/217TOASCJ.SGM; *see also* Bill McKibben, *Remember This: 350 Parts Per Million*, WASH. POST, Dec. 28, 2007, http://www.washingtonpost.com/wp-dyn/content/article/2007/12/27/AR2007122701942.html (last visited Jan. 25, 2009). Hansen points out that a lower target of 300–350 parts per million is needed to restore Arctic sea ice. *See* Hansen et al., *supra*, at 226. Author Philip Sutton emphasizes the urgency for meeting such an ice-restoration target:

> There are good grounds for believing that the Arctic sea ice could be entirely absent from the Arctic Ocean in summers as early as 2013. This will cause a jump in temperatures in the Arctic and sub-Arctic that will commit the Greenland ice sheet to full melting, eventually causing a 7m sea rise that will most likely set off the melting of most of the permafrost causing, over time, the release of perhaps 12 times the amount of CO2 that has been injected into the atmosphere through the burning of fossil fuels up to now.
>
> The knock-on environmental impacts from this permafrost melting could conceivably cause, over time, the deaths of vast numbers of people (over decades), the collapse of human civilisation and the extinction of more than half the species on the planet.

Philip Sutton, A Strategy Paper for the Australian Climate Summit 2009, at 1 (Jan. 21, 2009), *available at* http://www.green-innovations.asn.au/Climate-summit-strategy-paper.pdf (unpublished manuscript, on file with Environmental Law).

48 *See* David Adam, *World Carbon Dioxide Levels Highest for 650,000 Years, Says US Report*, GUARDIAN, May 13, 2008, http://www.guardian.co.uk/environment/2008/may/13/carbonemissions.climatechange (last visited Jan. 25, 2009).

49 *See* SPRATT & SUTTON, *supra* note 8, at 222–33; BROWN, *supra* note 8, at 5 ("We are in a race between tipping points in the earth's natural systems and those in the world's political systems."); SPETH, *supra* note 8, at 27 (according to Jim Hansen, NASA scientist, "[t]he crystallizing scientific story reveals an imminent planetary emergency. We are at a planetary tipping point.").

50 *See Hansen Testimony*, *supra* note 39 ("[I]gnoring the climate problem at this time, for even another decade, would serve to lock in future catastrophic climatic change and impacts that will unfold during the remainder of this century and beyond . . . ."); James Hansen, *Why We Can't Wait*, THE NATION, May 7, 2007, at 13 ("If we do follow that [BAU] path, even for another ten years, it guarantees that we will have dramatic climate changes that produce what I would call a different planet . . . ."); Jim Hansen, *Climate Change: On the Edge*, THE INDEPENDENT, Feb. 17, 2006, http://environment.independent.co.uk/article345926.ece (last visited Jan. 24, 2009) ("How long have we got? We have to stabilize emissions of carbon dioxide within a decade, or temperatures will warm by more than one degree. That will be warmer than it has been for half a million years, and many things could become unstoppable."); *Warming Expert: Only Decade Left to Act in Time*, MSNBC.COM, Sept. 14, 2006, http://www.msnbc.msn.com/id/14834318 (last visited Jan. 25, 2009).) (describing a "10-year window of opportunity to take decisive action on global warming and avert catastrophe"). A disturbing United Nations IPCC report indicates that the planet has already reached the danger point of atmospheric carbon dioxide equivalent concentrations, indicating that a decade is far too long to achieve significant greenhouse gas reduction. *See* Gregory M. Lamb, *A Key Threshold Crossed*, CHRISTIAN SCI. MONITOR, Oct. 11, 2007, at 11 (quoting climate scientist Tim Flannery: '"[A]lso we have really seen an unexpected acceleration in the rate of accumulation of CO2 itself, and that's been beyond the limits of projection . . . beyond the worst-case scenario. We are already at great risk of dangerous climate change—that's what the new figures say . . . . It's not next year, or next decade; it's now."').

51 Elizabeth Rosenthal, *U.N. Chief Seeks More Climate Change Leadership*, N.Y. TIMES, Nov. 18, 2007, http://www.nytimes.com/2007/11/18/science/earth/18climatenew.html (last visited Jan. 25, 2009).

Climate analysts call for a global mobilization surpassing the scale of WWII to cut carbon emissions worldwide.[52]

C. Realism

These circumstances create the imperative to halt natural resources destruction immediately, across the board, for two basic reasons. First, doing so is the only means of avoiding the climate tipping point. Scientists make clear that we need to take immediate measures to draw down carbon pollution from currently dangerous levels.[53] This not only means steep pollution reduction from obvious sources such as coal-fired plants and cars, but also measures to preserve and enhance natural sinks such as forests,[54] wetlands, soils and oceans that can absorb carbon.[55] In policy terms, this means a halt to much extractive old growth logging, wetland destruction, virgin land development, and industrial farming that damages soils.

Second, it is vital to protect the natural resources we still have in order to adapt to the irrevocable climate heating already underway—and thereby maximize human survival. Due to the persistence of carbon in the atmosphere, the world is projected to heat approximately 2 degrees Celsius further.[56] This is known as the heating "in the pipeline."[57] Projected effects from such irrevocable heating include increased storm intensity, sea level rise, 20%–30% species loss, forest die-offs, drought, fire, crop loss, and a myriad of other consequences.[58] Society now has to look at all of its natural infrastructure in a different light, because many systems will fail, and natural

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52 *See* SPRATT & SUTTON, *supra* note 8, at 223; BROWN, *supra* note 8, at 20; LOVELOCK, *supra* note 8, at 153.

53 Hansen et al., *supra* note 47, at 217 ("If humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted, paleoclimate evidence and ongoing climate change suggest that CO_2 will need to be reduced from its current 385 ppm to at most 350 ppm . . . . If the present overshoot of this target CO_2 is not brief, there is a possibility of seeding irreversible catastrophic effects.").

54 For discussion of the importance of natural forests as carbon sinks and the danger of carbon releases through deforestation, see *Scientists Warn Forest Clearing More Harmful than Thought*, AGENCE FRANCE-PRESSE, Aug. 5, 2008, http://afp.google.com/article/ALeqM5got-Y-VKudluUk-uj72SFKoo2VJw (last visited Jan. 25, 2009). ("From a scientific perspective, green carbon accounting and protection of the natural forests in all nations should become part of a comprehensive approach to solving the climate change problem.").

55 Hansen et al., *supra* note 47, at 217 ("An initial 350 ppm CO_2 target may be achievable by phasing out coal use except where CO_2 is captured and adopting agricultural and forestry practices that sequester carbon.").

56 *Id.* at 221 (irrevocable heating "in the pipeline" will bring temperature increase from pre-Industrial levels to about 2 degrees Celsius).

57 *Id.*

58 *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT 31–33, 48–53 (2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf; Cahal Milmo, *"Too Late to Avoid Global Warming," Say Scientists*, THE INDEPENDENT, Sept. 19, 2007, http://www.independent.co.uk/environment/climate-change/too-late-to-avoid-global-warming-say-scientists-402800.html (last visited Jan. 25, 2009). (stating that the United Nations projects an irrevocable "two degrees centigrade" rise in global temperatures which will put up to 30% of plant and animal species at risk of extinction); Press Release, Univ. Cal. Berkeley, Dying Frogs Sign of a Biodiversity Crisis (Aug. 12, 2008), *available at* http://berkeley.edu/news/media/releases/2008/08/12_extinction.shtml (quoting David Wake, a professor of integrative biology at U.C. Berkeley, as stating that "[t]here's no question that we are in a mass extinction spasm right now").

resources will become ever more scarce. Society simply will not have all of the forests, the water, the species, and the productive soils that Humanity inherited from past generations. In the new world of climate heating, all remaining natural assets carry a premium for human survival and welfare.

D. The Inevitability of Transformational Change

This much can be said with a high degree of confidence: the legal, economic, and social paradigms that give structure to our industrial society are fast approaching expiration. As Speth and others explain, the current Business As Usual path is programmed to lead to a collapse of civilization because disasters and the political unrest they create will stress governments beyond their limits.[59] With the fall of legal institutions will come the rapid demise of the paradigms that buttressed them. Those who advocate policies perpetuating the status quo must come to terms with an earth-rattling truth: the status quo is a transient illusion.

If, on the other hand, society forges a new, sustainable trajectory, then it will retire Business As Usual out of choice and invoke new, sensible, life-sustaining paradigms for the world ahead. Indeed, that is the course of action urgently advocated by leading climate scientists and policy thinkers.[60] Speth concludes: "[W]e now approach the fork ahead. . . . Beyond the fork, down either path, is the end of the world as we have known it. One path beyond the fork continues us on our current trajectory . . . the abyss. . . . But there is the other path, and it leads to a bridge across the abyss."[61] One of the foundations of such a bridge is a revolutionary legal approach assuring natural resources protection and restoration.

III. THE FAILED PARADIGM OF ENVIRONMENTAL LAW

Government's current management of natural resources grew around a system of environmental law created three decades ago. In the 1970s, Congress passed a host of statutes, such as the Clean Water Act,[62] the Clean Air Act,[63] the National Environmental Policy Act (NEPA),[64] and many others, all with the goal of protecting the environment.[65] In addition, the fifty states and local governments have developed their own sets of environmental laws. Collectively, these many laws have mushroomed into hundreds of thousands of pages of federal, state, and local statutes and regulations that have proliferated across the legal landscape in a disjointed and complex set of mandates.

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59 *See supra* note 34 and accompanying text (discussing impacts to world security from climate change). *See generally* BROWN, *supra* note 8; ROSS GELBSPAN, BOILING POINT (2004); SPETH, *supra* note 8 (all discussing the numerous threats that climate change poses).

60 *See generally* BROWN, *supra* note 8; SPETH, *supra* note 8; SPRATT & SUTTON, *supra* note 8; Hansen, *supra* note 33; Gelbspan, *supra* note 35 (all calling for a paradigm shift to achieve a sustainable future).

61 SPETH, *supra* note 8, at 236–37; *see also* Gelbspan, *supra* note 35 (stating that humanity is at a crossroads, with one path leading to a peaceful future, and the other leading to chaos and destruction).

62 Federal Water Pollution Control Act, 33 U.S.C. §§ 1251–1387 (2000).

63 42 U.S.C. §§ 7401–7671q (2000).

64 National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321–4370e (2000).

65 *See* Mary Christina Wood, *Nature's Trust: Reclaiming an Environmental Discourse*, 25 VA. ENVTL. L.J. 243, 252 (2007) (citing statutes).

It is fair to characterize modern natural resources management as an ongoing experiment in administrative law—and if environmental health is any measure, a failed experiment at that. The administrative state burgeoned in a manner and on a scale that was unprecedented. Modern statutes parceled out natural resources between multiple jurisdictional levels to the federal, state, and local agencies, spawning "a huge and impenetrable regulatory and management apparatus."[66] Environmental issues came to be resolved according to complex and often incomprehensible technical criteria created by the agencies. This pattern was replicated in many other nations that borrowed legal approaches from the United States.[67] The accumulated power in these agencies has stretched the seams of democracy, letting loose a host of ramifications that must be understood if the United States, and indeed the world, is to tackle the modern, urgent problems facing Humanity.

The modern environmental administrative state is geared almost entirely to the legalization of natural resource damage. In nearly every statutory scheme, the implementing agency has the authority—or discretion—to permit the very pollution or land destruction that the statutes were designed to prevent. Rather than using their delegated authority to protect crucial resources, nearly all agencies use their statutes as tools to affirmatively sanction destruction of resources by private interests. For example, two-thirds of the greenhouse gas pollution emitted in this country is pursuant to government-issued permits.[68] The regulatory systems were never intended to subvert the goals of environmental statutes, but the majority of agencies spend nearly all of their resources to permit, rather than prohibit, environmental destruction.[69] Permits usually have mitigating conditions that lessen

66 SPETH, *supra* note 8, at 83; *see also* Wood, *supra* note 65, at 252.

67 *See, e.g.*, DAVID R. BOYD, UNNATURAL LAW: RETHINKING CANADIAN ENVIRONMENTAL LAW AND POLICY 275 (2003) ("Despite American environmental law and policy's resounding failure to solve environmental problems, Canada continues to emulate the United States. . . . Like American laws, Canadian environmental laws are becoming far more complicated."); Christine J. Lee, Comment, *"Pollute First, Control Later" No More: Combating Environmental Degradation in China Through an Approach Based in Public Interest Litigation and Public Participation*, 17 PAC. RIM L. & POL'Y J. 795, 802 (2008) (discussing China's environmental legal framework as based on United States laws).

68 Laura H. Kosloff & Mark C. Trexler, *Consideration of Climate Change in Facility Permitting*, *in* GLOBAL CLIMATE CHANGE 259, 259 (Michael B. Gerrard ed., 2007).

69 For example, for discussions of decision making under the Endangered Species Act (ESA), see Oliver A. Houck, *The Endangered Species Act and Its Implementation by the U.S. Departments of Interior and Commerce*, 64 U. COLO. L. REV. 277, 317 (1993) ("[T]he number of projects actually arrested by the ESA is nearly nonexistent.") and Daniel J. Rohlf, *Jeopardy Under The Endangered Species Act: Playing A Game Protected Species Can't Win*, 41 WASHBURN L.J. 114, 151 n.153 (2001). For a discussion of EPA rulemaking, see David Schoenbrod, *The EPA's Faustian Bargain*, REG., Fall 2006, at 36, *available at* http://www.cato.org/pubs/regulation/regv29n3/v29n3-5.pdf. For an account of the United States Army Corps of Engineers's permitting record under section 404 of the Clean Water Act, see LAITOS, ZELLMER, WOOD & COLE, *supra* note 2, at 815 (noting that less than 0.2% of permits are denied). For a discussion in the context of the EPA water quality program, see generally Wood, *supra* note 15, at 183. The problem is not limited to the United States. As the former Executive Director of the United Nations Environment Program noted:

> The field of law has, in many ways, been the poor relation in the world-wide effort to deliver a cleaner, healthier and ultimately fairer world. We have over 500 international and regional agreements, treaties and deals covering everything from the protection of the ozone layer to the conservation of the oceans and seas. Almost all, if not all, countries have national environmental

the damage, but the cumulative effect is one of mounting resource loss.[70] While it is true that some agencies are loyal guardians of the public's natural assets, they seem to be the exception rather than the rule. The overarching bureaucratic mindset permeating most agencies is that permits are there to be granted.[71] Speth concludes:

> Unfortunately, there is now proof that today's environmentalism doesn't work well enough. A great experiment has been conducted. The evidence is in. Current approaches have been tried for almost four decades. And look what has happened. We have won many victories, but we are losing the planet. It is important to ask why.[72]

Within the realm of environmental law, several negative factors converge to create system-wide dysfunction. First, the administrative structure is now so huge, with so many overlapping jurisdictions, that individual agencies are not taking leadership or responsibility for protecting natural resources in their entirety. There is little sense of the "big picture" as agencies tunnel down into their specific statutory authorities. Operating within regulatory silos, agencies allow incremental

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> laws too. But unless these are complied with, unless they are enforced, then they are little more than symbols, tokens, paper tigers. This is an issue affecting billions of people who are effectively being denied their rights and one of not only national but regional and global concern.

Climate Justice, Climate Justice: Enforcing Climate Change Law, http://www.climatelaw.org (last visited Jan. 25, 2009) (quoting Klaus Töpfer, Executive Director of the U.N. Environment Program on the adoption of the Judges' Johannesburg Principles on the Role of Law and Sustainable Development).

70 *See* SPETH, *supra* note 8, at 84 ("[T]here is the regulatory slippage problem—the problem of the slip twixt cup and lip—inherent in today's policy reform approaches. What if a regulation covered 80 percent of the problem, and 80 percent of those regulated tried to comply, and 80 percent of that effort was successful? Oops, 0.8 X 0.8 X 0.8: EPA just missed 50 percent of the problem. And the problem is growing, driven as we have seen by economic expansion.").

71 *See generally* ROBERT F. KENNEDY JR., CRIMES AGAINST NATURE 32–33 (2004) (stating federal agencies in the George W. Bush Administration "have given quick permit approvals and doled out waivers that exempt campaign contributors and polluters from rules or regulations"). Examining EPA's 30-year implementation of the Clean Water Act, Professor Michael Blumm observes:

> EPA has never been very interested in pursuing a broad interpretation of the Clean Water Act (CWA) that would construe some of the statute's ambiguities to fit the scope of the nation's water pollution problem. Often, when the goal of a comprehensive approach to clean water conflicted with administrative convenience or political wisdom, EPA compromised that goal. . . .
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> [C]ompromises came under Republican as well as Democratic administrations, so crass politics does not help to explain the results. Instead, it seems more likely that the explanation lies in a maturing bureaucracy more interested in self-preservation than in championing the environmental goals established in the authorizing legislation. . . .
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> . . . .
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> The upshot is that after thirty years the nation's water pollution control effort is half-baked.

Michael C. Blumm, *Roads Not Taken: EPA v. Clean Water*, 33 ENVTL. L. 79, 80–81, 111 (2003). *See also* SPETH, *supra* note 8, at 78 (quoting political scientist Richard Andrews: "Even after more than three decades of the modern 'environmental era,' [U.S. environmental policies] have only selectively, modestly, and temporarily held back the larger national and global forces of human population growth, landscape transformation, natural resource use, and waste generation . . . .").

72 *See* SPETH, *supra* note 8, at 78; *see also* KENNEDY, *supra* note 71, at 75 (discussing conclusions from an assessment of pollution law conducted by Resources for the Future: "'[T]he fragmented system is seriously broken . . . . [T]he problems cannot be fixed by . . . efforts to tinker at the margins.'").

damage that accumulates over time. They rarely focus on the aggregate affect of their actions.[73]

Second, agencies have created a regulatory complexity that is mind-boggling.[74] Most of the thousands of pages of highly technical regulations are geared to the task of evaluating permits and various pollution situations. Rather than "just saying no" to permit requests, agencies reach to ludicrous heights in a technical excursion to avoid drawing a prohibitive line against damage.[75] Complexity seems to compound upon itself as the agencies confront collapsed ecosystems resulting from their programs of legalized destruction. New rules are crafted to address collapse, but often the new ones are hardly more effective than the old ones.[76] The complexity that grows from multiple levels and layers of rules—legal baklava, so to speak—carries several perils for environmental policy. It distracts agencies from seeing the macro picture of resource health. It operates as a brick wall to public involvement and press attention. And, it drains bureaucratic energy needed for the crucial task of restoring badly damaged natural systems.

Third, within this context, agencies regularly confront and succumb to political pressure to issue permits and sanction other harmful actions.[77] In some

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[73] Professor Dale Goble calls this the "tragedy of fragmentation":

> [B]oundaries produce fragmentation, and fragmentation, in turn, fosters myopic decisions; these small decisions, however, eventually aggregate to produce a large decision that is never directly made. Although the Tragedy of the Commons is far better known, it is the Tragedy of Fragmentation that poses a far greater risk to biodiversity.

Dale D. Goble, *The Property Clause:* As if *Biodiversity Mattered*, 75 U. COLO. L. REV. 1195, 1196 (2004).

[74] *See* SPETH, *supra* note 8, at 83–84 ("Environmental regulations today are quite literally beyond comprehension.").

[75] *See* Wood, *supra* note 15, at 181–82, 185, 196–98 (examining water quality standards).

[76] The Columbia River Basin salmon recovery effort is an example of enormous regulatory effort spanning nearly three decades with little return for the salmon, which are still near extinction. *See* Mary Christina Wood, *Reclaiming Natural Rivers: The Endangered Species Act as Applied to Endangered River Ecosystems*, 40 ARIZ. L. REV. 197, 221–24 (1998).

[77] *See* SPETH, *supra* note 8, at 85 (citing, in addition, Washington Post writer William Greider: "The regulatory state has become a deeply flawed governing mess. . . . Many of the enforcement agencies are securely captured by the industries they regulate . . . ."). Occasionally, agency politicization takes the form of censorship. For an in-depth look at the political censorship of agency scientists during the George W. Bush Administration, see generally SETH SHULMAN, UNDERMINING SCIENCE: SUPPRESSION AND DISTORTION IN THE BUSH ADMINISTRATION (2006) and MARK BOWEN, CENSORING SCIENCE: INSIDE THE POLITICAL ATTACK ON DR. JAMES HANSEN AND THE TRUTH OF GLOBAL WARMING (2007).

There is a considerable body of investigative reporting on inappropriate politicization within particular agencies. For EPA, see Christopher Lee, *Scientists Report Political Interference*, WASH. POST, Apr. 24, 2008, http://www.washingtonpost.com/wp-dyn/content/article/2008/04/23/AR2008042303074.html (last visited Jan. 25, 2009) (showing poll reporting that more than half of the scientists at EPA "witnessed political interference in scientific decisions at the agency during the past five years"); GOV'T ACCOUNTABILITY OFFICE, GAO-08-128, TOXIC CHEMICAL RELEASES: EPA ACTIONS COULD REDUCE ENVIRONMENTAL INFORMATION AVAILABLE TO MANY COMMUNITIES (2007), *available at* http://www.gao.gov/new.items/d08128.pdf (toxic substances reporting); KENNEDY, *supra* note 71, at 90–91 (providing detailed accounts of political pressure faced by EPA officials and reporting a 2003 survey of EPA's Region 8 that found "widespread demoralization caused by the political pressure to please industry" and that one-third of the employees surveyed feared retaliation for carrying out their duties); Jody Freeman & Adrian Vermeule, Massachusetts v. EPA*: From Politics to Expertise*, 2007 SUP. CT. REV. 51, 54–61 (2008) (compiling accusations of politicized decision making by EPA surrounding global warming regulation within the context of the Clean Air Act); Schoenbrod, *supra* note

agencies, political decision making has become an entrenched part of agency culture.[78] This legal infection seems to be a direct result of the discretion conveyed to agencies in the permit provisions of the statutes.[79] The deep pocket of discretion has become a magnet for undue political influence.[80] Such pressure comes not only from the permit applicants, but also supervisors and outside political interests, including senators and congressmen.[81] Mark Hertsgaard observes:

> In theory, governments are supposed to police corporate greed, channeling it . . . away from the corner-cutting that threatens public health and safety. But regulation is an iffy thing. Corporations are constantly pressuring governments to relax environmental regulations if not eliminate them altogether. This pressure is often supplemented by bribery—most commonly, the legal bribery known as campaign contributions . . . .[82]

Internal political drivers are rarely exposed, because every permit decision carries a technical façade. Agencies have become experts at masking their decisions in scientific terms. Inappropriate influences are easily hidden behind an

69, at 39 ("The EPA was supposed to insulate environmental rules from politics. But it did not; it insulated the politicians from responsibility."); H. Joseph Herbert, *EPA Scientists Complain about Political Pressure*, FOXNEWS.COM, Apr. 23, 2008, http://www.foxnews.com/wires/2008Apr23/0,4670,EPAScientists,00.html (last visited Jan. 25, 2009); Richard Simon, *Did EPA Cave to White House?*, L.A. TIMES, May 20, 2008, at 11.

For the U.S. Fish and Wildlife Service, see, for example, Ivan J. Lieben, Comment, *Political Influences on USFWS Listing Decisions Under the ESA: Time to Rethink Priorities*, 27 ENVTL. L. 1323 (1997); Press Release, Comm. On Natural Res., U.S. House of Representatives, GAO Investigation Uncovers Political Meddling by Four Top Interior Officials (May 21, 2008), *available at* http://resourcescommittee.house.gov/index.php?option=com_content&task=view&id=387&Itemid=27 ('"A disconcerting picture has emerged of officials working at the highest levels of the Interior Department continuing to tamper with the endangered species program, trumping science with politics. The practice is pervasive . . . ."' (quoting U.S. Rep. Nick J. Rahall (D-WV), Chairman of the House Natural Resources Committee)).

For NASA, see Andrew Revkin, *NASA Office is Criticized on Climate Reports*, N.Y. TIMES, June 3, 2008, http://www.nytimes.com/2008/06/03/science/earth/03nasa.html?ex=1213156800&en=0da313cab8e4d9e0&ei=5070&emc=eta1 (last visited Jan. 25, 2009) (describing a NASA Inspector General report finding that the NASA public affairs office suppressed information provided by scientists and that "the NASA Headquarters Office of Public Affairs managed the topic of climate change in a manner that reduced, marginalized or mischaracterized climate change science made available to the general public").

[78] Some courts have identified the U.S. Forest Service as an extreme example. *See* Sierra Club v. Thomas, 105 F.3d 248, 251 (6th Cir. 1997), *rev'd on other grounds sub nom.* Ohio Forestry Ass'n v. Sierra Club, 523 U.S. 726 (1998) ("[R]ather than being a neutral process which determines how the national forests can best meet the needs of the American people, forest planning, as practiced by the Forest Service, is a political process replete with opportunities for the intrusion of bias and abuse."); Sierra Club v. Espy, 822 F. Supp. 356, 370 (E.D. Tex. 1993), *rev'd*, 38 F.3d 792 (5th Cir. 1994) (noting "statutory violations by excessively self-aggrandized, run-amok executive agencies" in the context of Forest Service management).

[79] *See* Wood, *supra* note 65, at 243–45.

[80] *See* Oliver A. Houck, *On the Law of Biodiversity and Ecosystem Management*, 81 MINN. L. REV. 869, 928–29 (1997) (noting the "contorting influence on agency life of economic interests and politics" and the role of discretion).

[81] *See* SPETH, *supra* note 8, at 85 ('"Many of the enforcement agencies are securely captured by the industries they regulate, others are blocked from effective action.'" (quoting William Greider)).

[82] SPETH, *supra* note 8, at 83 (quoting MARK HERTSGAARD, EARTH ODYSSEY: AROUND THE WORLD IN SEARCH OF OUR ENVIRONMENTAL FUTURE 273 (1999)).

impenetrable shield of technical and regulatory complexity.[83] The modern environmental groups—watchdogs for the public—rarely penetrate the political dynamics, instead organizing their activism around the myth that the agencies operate in good faith.[84] These dynamics undermine the entire premise of administrative law, which assumes that agencies are neutral and objective agents of the public, constituted to carry out statutory objectives without regard to internal or external political agendas. The systemic politicization of agencies represents one of the most consequential breakdowns in administrative law.

Fourth, the public has become disenfranchised within this system of environmental law. While NEPA and other statutes provide for ample public notice and comment in order to promote environmental democracy, these protections often amount to a sham when examined against the modern constraints under which most citizens operate. A standard environmental analysis contains acronyms, technical findings, and conclusions that are unduly complex and incomprehensible to the average citizen.[85] Most individuals also lack the time or expertise to fully engage in the comment process.[86] The barrage of development and permit proposals at any given time overwhelms the ability of even informed citizens to respond to each worthy one. Often when citizens do take the time to respond, their comments are dismissed by the agencies as NIMBY (Not In My Backyard) complaints, or as expressing positions unrelated to the technical basis of the decision.[87] While professional environmental organizations are able to contribute comments in some proceedings, they cannot possibly hold sway against the administrative hurricane of destructive actions assaulting our natural systems.

Fifth, the judiciary has lost its potency as a third branch of government operating in the environmental realm. This is primarily due to the tendency of courts to invoke the administrative deference doctrine, which allows them to give undue

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83 *See* Wendy E. Wagner, *The Science Charade in Toxic Risk Regulation*, 95 COLUM. L. REV. 1613, 1653 (1995) ("Public officials faced with resolving . . . conflicting demands [of economic goals and public health] thus must resort to the science charade out of sheer political necessity."); Wood, *supra* note 65, at 256 (concluding that the "impenetrable complexity of environmental law" impairs those who realize environmental laws are not working from fighting for a new set of values); Wood, *supra* note 15, at 194–95 (discussing how complex statutes with "impenetrable terminology" have given water quality regulations a technical façade that prevents "clear images of the failed system" from being on the "political radar").

84 As Speth and others have pointed out, the entire environmental public interest movement has been built around the "belief in the good intention of these agencies as the norm . . . ." SPETH, *supra* note 8, at 70, 79 (paraphrasing and quoting the conclusion of Mark Dowie in LOSING GROUND: AMERICAN ENVIRONMENTALISM AT THE CLOSE OF THE TWENTIETH CENTURY, at xiii (1995), that the national environmental organizations "crafted an agenda and pursued a strategy based on the civil authority and good faith of the federal government. Therein . . . lies the inherent weakness and vulnerability of the environmental movement. Civil authority and good faith regarding the environment have proven to be chimeras in Washington.").

85 *See* Wood, *supra* note 15, at 194–95; Wood, *supra* note 65, at 256–57; SPETH, *supra* note 8, at 84. Many agencies use euphemisms to greenwash the consequences of their proposed actions from the general public. *See* Oliver A. Houck, *Damage Control: A Field Guide to Important Euphemisms in Environmental Law*, 15 TUL. ENVTL. L.J. 129 (2001).

86 *See* SPETH, *supra* note 8, at 83–84.

87 *See, e.g.*, Terry R. Bossert, *Environmental Justice: The Permit Applicant's Perspective*, 18 TEMP. ENVTL. L. & TECH. J. 135, 141–42 (1999–2000) ("Agencies, like DEP, have looked at public notice and public involvement very mechanistically and very rigidly.").

weight to agency decisions.[88] At the heart of the deference principle is an abiding faith in nonbiased administrative expertise, and a corresponding perception that courts are no match in the scientific and technical realm.[89] Assuming that expert agencies are neutral decision makers, judges accord agency decisions, particularly technical ones, a presumption of validity.[90] In contrast to the nonadministrative realm of trial practice, where expert opinions are routinely examined for inherent bias,[91] the deference doctrine precludes courts from examining political motivations or conflicts of interest that may have inappropriately shaped the agencies' scientific conclusions.[92] Yet, as noted, such decisions are often infected with political influence and bias. The problem is endemic, which suggests that the basic premise of the deference doctrine is unfounded.

Compounding the deference problem is the lack of a sufficient remedy in many cases. When a court does find an administrative decision insufficient, it normally remands the case back to the agency, a remedy that simply returns the matter to the same flawed political process that produced the litigation in the first place.[93] The impaired judicial role has upset the constitutional balance of power across the realm of natural resources management.[94] With Congress deadlocked

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[88] *See, e.g.*, Marsh v. Or. Natural Res. Council, 490 U.S. 360, 378 (1989) ("When specialists express conflicting views, an agency must have discretion to rely on the reasonable opinions of its own qualified experts even if, as an original matter, a court might find contrary views more persuasive.").

[89] *See, e.g.*, Mt. Graham Red Squirrel v. Espy, 986 F.2d 1568, 1576 (9th Cir. 1993) (noting judgments as to adequacy of squirrel monitoring program "require technical expertise that courts do not possess"); RONALD A. CASS ET AL., ADMINISTRATIVE LAW: CASES AND MATERIALS 216–17 (2d ed. 1994).

> The proliferation of administrative agencies emerging from the New Deal reflected a faith that modern social and economic problems required an expert's attention. Those who rationalized the New Deal's regulatory initiatives regarded expertise and specialization as the particular strengths of the administrative process. That expertise was not shared by judges, since it springs only from that continuity of interest, that ability and desire to devote fifty-two weeks a year, year after year, to a particular problem. . . . [A] month of experience will be worth a year of hearings.

Id. (citations omitted) (internal quotations omitted).

[90] *See, e.g.*, *Marsh*, 490 U.S. at 378; Baltimore Gas and Elec. Co. v. Natural Res. Def. Council, 462 U.S. 87, 103 (1983) ("When examining [an agency's] scientific determination, as opposed to simple findings of fact, a reviewing court must generally be at its most deferential."); The Lands Council v. McNair, 537 F.3d 981, 993 (9th Cir. 2008) (stating court should be "most deferential" when the agency is "making predictions, within its [area of] special expertise, at the frontiers of science" (citations omitted)); *Mt. Graham Red Squirrel*, 986 F.2d at 1571 ("Deference to an agency's technical expertise and experience is particularly warranted with respect to questions involving . . . scientific matters." (citation omitted)).

[91] *See generally* Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993) (addressing validity and admissibility of expert testimony).

[92] *See* Wood, *supra* note 76, at 255–68.

[93] The Columbia River litigation involving salmon listed under the Endangered Species Act represents such a legal revolving door. For analysis, see Mary Christina Wood, *Restoring the Abundant Trust: Tribal Litigation in Pacific Northwest Salmon Recovery*, 36 Envtl. L. Rep News & Analysis (Envtl. Law. Inst.) 10,163 (2006), *available at* https://www.law.uoregon.edu/faculty/mwood/docs/abundanttrust.pdf.

[94] Only a few courts have inquired deeply into the effect of judicial deference on the constitutional system of checks and balances:

> While it is generally accepted that federal agencies are entitled to a presumption of good faith and regularity in arriving at their decisions, that presumption is not irrebuttable. *We would be abdicating our Constitutional role were we simply to rubber stamp this complex agency decision*

over environmental policy and the judiciary hindered by the deference doctrine, something close to an administrative tyranny now presides over Nature.

IV. DEPTHS OF CHANGE

The severity and pervasiveness of administrative dysfunction means that there is no simple fix to the problem. All solutions will entail fresh dilemmas, complexities, and tradeoffs. But that reality cannot distract from the urgent task of envisioning a different paradigm. Speth rightly argues that we need a "fresh conceptualization . . . a new way of thinking . . . and [proposals for] transformative change."[95] While institutions are often resistant to change, making prospects for reform seem impossible, it must be remembered that the status quo—Business As Usual—is driving the world's societies into collapse.[96] The reality underlying any transformative proposal is that change of a dramatic sort is inevitable no matter what path society chooses. If society is to salvage a future with any measure of comfort and security, it must reverse course, in albeit *radical fashion*, to halt the destruction of remaining natural resources, and urgently pour energy into restoring damaged ecosystems. The challenge, then, is immediately reorienting the entire administrative system on the federal, state, and local levels, towards that end.

Of course, envisioning very different systems under such a time crunch is, to say the least, daunting. Perhaps Alex Steffen, author of *A Changing World*, states it best: "We find ourselves facing two futures, one unthinkable and the other currently unimaginable."[97] Many proffered solutions merely tinker around the edges of the same Business As Usual that is driving the planet to catastrophe. Steffen observes:

> The magnitude of the crises we face, the speed with which they are unfolding . . . mean that the solutions we need to embrace are not going to be the same *sort of solutions* we're used to thinking of now. . . . Faced with the need to reinvent the material basis of our civilization, we argue paper or plastic.
>
> [We need to go] way out beyond what the conventional wisdom thinks is possible. . . . Our idea of what's normal, or even what's possible, will not outlast the next decade.[98]

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rather than ensuring that such decision is in accord with clear congressional mandates. It is our role to see that important legislative purposes are not lost or misdirected in the vast hallways of the federal bureaucracy.

Sierra Club v. Thomas, 105 F.3d 248, 250 (6th Cir. 1997) (emphasis added), *rev'd on other grounds sub nom*. Ohio Forestry Ass'n v. Sierra Club, 523 U.S. 726 (1998); *see also* Sierra Club v. Espy, 822 F. Supp. 356, 359–70 (E.D. Tex. 1993), *rev'd*, 38 F.3d 792 (1994).

95 SPETH, *supra* note 8, at xiv.

96 Even apart from population surge and economic growth, current trajectories lead to a terrifying end—a world that "won't be fit to live in" by the latter half of this century. SPETH, *supra* note 8, at x; *see also supra* note 36 and accompanying text.

97 Alex Steffen, Worldchanging.com, http://www.worldchanging.com/bios/alex.html (last visited Jan. 25, 2009).

98 Alex Steffen, *The Real Green Heretics*, WORLDCHANGING, May 28, 2008, http://www.worldchanging.com/archives/008064.html (last visited Jan. 24, 2009).

While prominent commentators in the economic arena increasingly question the wisdom of industrial capitalism and propose alternative economic models such as natural capitalism,[99] the legal realm lacks such innovative thinking. Many of the current environmental lawsuits are premised on the same statutes that delivered the ecological crisis in the first place.[100] Such cases are essential to addressing individual causes of harm,[101] but they are in no way geared to transforming the legal landscape. Even if all cases are successful, they are only capable of effectuating change around the edges of a legal system that is in high failure mode. It must be remembered that bureaucratic machines legalize colossal environmental damage on a *daily* basis.

Naturally, many political analysts will contend that prospects for fundamental change are not politically viable. Lawyers are especially conservative in their outlook, wary of innovative approaches out of fear that cautious judges eschew approaches that are out of the ordinary.[102] Speth confronts these reactions on a broader scale:

> If [deeper] proposals [seem] impractical, or politically naive, . . . [or] radical or far-fetched today, then I say wait until tomorrow . . . .
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> . . . .
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> . . . In general, the world of practical affairs does not truly appreciate how much negative change is coming at us, nor how fast . . . [W]e must look beyond the world of practical affairs to . . . [proposals for] transformative change.[103]

Developing necessary solutions first requires an analysis of where the institutional decay lies. Using discretionary authority to serve private and corporate interests was the governing hallmark of several agency heads within the George W.

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99 *See* PAUL HAWKEN, AMORY LOVINS & L. HUNTER LOVINS, NATURAL CAPITALISM: CREATING THE NEXT INDUSTRIAL REVOLUTION; *see generally* SPETH, *supra* note 8; PETER BARNES, CAPITALISM 3.0: A GUIDE TO RECLAIMING THE COMMONS (2007).

100 *See, e.g.*, Massachusetts v. EPA, 549 U.S. 497 (2007) (Clean Air Act litigation); Ctr. for Biological Diversity v. Kempthorne, No. C 08-1339 CW, 2008 WL 1902703, at *1 (N.D. Cal. Oct. 10, 2008) (Endangered Species Act litigation**)**. Some of the novel litigation strategies include ones based in nuisance and conspiracy theory. *See, e.g.*, Connecticut v. Am. Elec. Power Co., 406 F. Supp. 2d 265, 267 (S.D.N.Y. 2005) (public nuisance theory); California v. Gen. Motors Corp., No. C06-05755 MJJ, 2007 WL 2726871, at *1 (N.D. Cal. Sept. 17, 2007) (same). *See also* Felicity Barringer, *Flooded Villages File Suit, Citing Corporate Link to Climate Change*, N.Y. TIMES, Feb. 27, 2008, at A16 (public nuisance theory).

101 *See, e.g.*, Friends of the Chattahoochee, Inc. v. Couch, No. 2008CV146398, slip op. at 1, 9 (Ga. Super. Ct. June 30, 2008), *available at* http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Filings%|20By%20Appeal%20Number/DE418399FC9A175C852574AD0054ADBC/$File/Ex.%2016%20of...39.pdf (invalidating air permit for coal-fired plant on basis that it failed to include carbon dioxide).

102 *See, e.g.*, Lauren K. Robel, *Grass Roots Procedure: Local Advisory Groups and the Civil Justice Reform Act of 1990*, 59 BROOK L. REV. 879, 902 (1993) (noting the results of a survey indicating that "lawyers are conservative in their approach to civil justice issues"); Richard W. Painter, *Irrationality and Cognitive Bias at a Closing in Arthur Solmssen's* The Comfort Letter, 69 FORDHAM L. REV. 1111, 1129 (2000) ("[L]awyers often overstate legal risk when they advise clients. In addition to risk aversion in the gains frame, rational incentives, social norms, and other cognitive biases further push lawyers toward being more conservative and unwilling to take risks.").

103 SPETH, *supra* note 8, at xiii–xiv.

Bush Administration.[104] It is fair to ask whether our administrative system inherently lends itself to corrupt inclinations. In this regard, the source of administrative rot seems to lie in the way in which discretion is used, or abused. Yet, obliterating discretion altogether seems dangerous medicine for the environmental crisis at hand. Agencies hold tremendous resources, authority, and expertise, all of which is needed in the urgent effort to restore Nature into balance. Agencies cannot operate without a measure of discretion, particularly when innovation is needed to address new and unpredictable situations.

Given these assumptions, the task is to locate a reservoir of legal *obligation* to steer discretion in a way that effectuates government's true purpose—protecting the interests of the citizenry. Agency discretion must be redirected in a way that protects, rather than destroys, natural resources that citizens rely on for survival, economy, and prosperity. Such redirection is the type of transformational change that would harness the full spectrum of governmental authority on behalf of the people. While at first glance this redirection seems politically naive because of the corporate hold on many parts of the agencies, a reorientation of this nature may gain strength and momentum by drawing upon the deeply held philosophical assumptions invigorating American democracy. Striking a broad public chord may transform, in Speth's words, "the politically impossible" into the "politically inevitable."[105] And on a more dismal note, climate crisis positions the world for such a transformation because it disrupts all sorts of political and economic expectations and upsets citizens' sense of personal security.[106]

Nevertheless, defining a firm source of legal obligation to protect resources is not a simple task. If it were, environmental groups would have used it already with widespread success. The sustainability movement of the 1990s was an example of a promising idea, but one that seemed to lack obligatory force, perhaps because it was framed more as a political choice than an inherent obligation.[107] The tension is this: transformative change requires radical movement away from the status quo, yet the legal system is built around precedent, the most recent of which squarely supports the status quo. Transformative change is well-suited to entrepreneurial and business contexts, but the legal system is premised on slow, methodical, incremental change.

The Nature's Trust paradigm developed in this Article suggests an approach to governmental management of natural resources that is protective and obligatory

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104 *See* KENNEDY, *supra* note 71 (discussing the tactics used by "Bush's dream team" to promote "polluter projects" at the expense of environmental programs). The effect of close industry ties appears to be unprecedented as manifested in the politicization of agency decision making. *See* Freeman & Vermeule, *supra* note 77, at 55 ("[T]he accounts circulating about the [George W.] Bush administration . . . were of a different scope and scale than in the past: the administration had been altering scientific reports, silencing its own experts, and suppressing scientific information that was politically inconvenient. And this was being done so systematically, critics said, as to leave no doubt that it was authorized by the White House.").

105 SPETH, *supra* note 8, at xv (quoting Milton Friedman).

106 Yet, initiatives involving solar and wind energy and zero-waste products provide much hope for a new economy and energy security. *See generally* JAY INSLEE & BRACKEN HENDRICKS, APOLLO'S FIRE: IGNITING AMERICA'S CLEAN ENERGY ECONOMY (2008).

107 *See generally* Linda Geggie & Jacinda Fairholm, *Times They Are a' Changin'; A New Wave of Youth Activism Promises a Broader Approach to Social Change*, ALTERNATIVES J., Summer 1998, http://findarticles.com/p/articles/mi_hb6685/is_/ai_n28707202 (last visited Jan. 25, 2009).

in nature—transformative when compared against today's practices—yet grounded in precedent. The trust approach is rooted in ancient principles that have endured in Western society since, literally, Roman times.[108] These principles have been buried under layers and layers of statutory and regulatory law, but they remain determinative, vibrant, and available for courts, legislatures, agencies, and citizens to draw on. They call for a return to basic principles—a paradigm shift from political discretion to fiduciary obligation in the management of natural resources.

Of course, even assuming these principles are the right ones to lead a transformation, merely illuminating them does not automatically turn on a light switch across all of government. Lawyers, judges, agency officials, legislators, and citizens must all work hard and with great speed to bring these principles to bear in the operation of various legal institutions. Efficiencies should flow from the effort, because the trust principle represents a cohesive, encompassing, and holistic approach to the legal regime governing modern natural resources management.

For a legal shift to endure, it must be part of an overall cultural and economic transformation encompassing all facets of society. While the law is at best a clumsy institution to effectuate massive change, it should at least not impede necessary change across the other sectors. At a time when visionaries are urging ideas like "zero energy, zero emissions, zero waste, closed loops, . . . and green infrastructure"—concepts that have potential to become the "operating principles of our entire society"[109]—the current environmental regulation perpetuates a system of legalized pollution. We cannot, on one hand, envision a society organized around these civilization-saving concepts while, on the other hand, we continue to allow massive pollution under environmental law.

Society may not move in the direction it urgently needs to unless the legal paradigm shift dovetails with culturally and spiritually rooted human values. Somewhere along the way, environmental law became detached from a deeply shared ethic reflecting the sanctity of human survival, local economic security, and natural abundance.[110] As such, it has failed to inspire broad environmental

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108 Charles F. Wilkinson, *The Headwaters of the Public Trust: Some Thoughts on the Source and Scope of the Traditional Doctrine*, 19 ENVTL. L. 425, 429 (1989).

109 Alex Steffen, *The Real Green Heretics*, WORLDCHANGING.COM, May 28, 2008, http://www.worldchanging.com/archives/008064.html (last visited Jan. 24, 2009).

110 *See* Wood, *supra* note 65. For example, pollution laws place governmental officials in the morbid position of deciding how much death from toxic exposure is appropriate.

> To illustrate how detached environmental law is from any human value system today, consider the way in which EPA looks at human exposure to toxins. With every pollution scenario, EPA tries to draw a line at how much pollution will impose an unacceptable risk to society. In decision after decision, it allows toxic pollution that carries a certain probability of causing cancer cases. Those probabilities range from one in a million (10^{-6}) to one in 10,000 (10^{-4}). And everyone knows this is a shell game—the real body burden of toxic chemicals is far greater because we all get assaulted on a daily basis with a number of chemicals, each of which carries a risk factor. EPA spends a huge amount of our money in its struggle to determine whether to allow a risk of 10^{-4} or 10^{-6}, but let us face it, there is no value difference between the two unless you want to count coffins. It does not take a toxicology Ph.D. to figure out that the toxins EPA permits are contributing to soaring cancer rates in our communities. . . . Yet EPA continues to allow more and more toxic pollution into our airs and waters, telling us it is fine to cause cancer to a modeled number of people. This sniper-style of regulation is never questioned. There is no discussion of whether the human sacrifice implicit in these numbers is justified by any social

protection.[111] Trust principles, however, tap the deep inclination of human beings to secure natural abundance for children and society at large. They also harmonize with many religious and spiritual understandings that view humans as stewards of the earth.[112] A trust approach dovetails with visionary economic proposals based on principles of natural capitalism that have potential to jump-start a sagging economy with green jobs.[113] Finally, trust principles reconcile private property rights with natural resource protection.[114] While no one legal approach is a panacea for the broad ills facing society today, the trust approach may carry the most potential to reinforce promising visions for a sustainable future.

V. NATURE'S TRUST

All government authority in this country derives from the people. Such delegated authority could be summarized by analogizing to two sides of a coin. One side consists of the police power, which encompasses legislative authority and obligation to protect public health and welfare.[115] Statutory law is a product of such police power. The other side consists of the property-based obligations of the sovereign. The people, through their representative sovereign, have an interest in the ecosystem encompassed within the particular jurisdiction.[116] The public trust

> good resulting from the particular industry and its products. EPA's approach makes it a participant in a discretionary chain of death.

Id. at 255–56 (citations omitted).

111 *See* MICHAEL SHELLENBERGER & TED NORDHAUS, THE DEATH OF ENVIRONMENTALISM: GLOBAL WARMING POLITICS IN A POST-ENVIRONMENTAL WORLD 6–8 (2004), *available at* http://www.thebreakthrough.org/images/Death_of_Environmentalism.pdf ("Today environmentalism is just another special interest."); SPETH, *supra* note 8, at 69 (noting that "today's environmentalism . . . is more comfortable proposing innovative policy solutions than framing inspirational messages").

112 Leaders of the world's major religions have declared a spiritual duty to protect Nature. *See* Carrie McGourty, *Prayer to End Climate Change*, ABC WORLD NEWS, Sept. 7, 2007, http://abcnews.go.com/WN/GlobalWarming/Story?id=3572327&page=1 (last visited Jan. 25, 2009).

113 *See* ROBERT POLLIN ET AL., GREEN RECOVERY: A PROGRAM TO CREATE GOOD JOBS AND START BUILDING A LOW-CARBON ECONOMY (2008), *available at* http://www.americanprogress.org/issues/2008/09/pdf/green_recovery.pdf; Keith Schneider, *Majoring in Renewable Energy*, N.Y. TIMES, Mar. 26, 2008, http://www.nytimes.com/2008/03/26/business/businessspecial2/26degree.html?ex=1364270400&en=7d2f042c3f84400f&ei=5124&partner=permalink&exprod=permalink (last visited Jan. 25, 2009); THOMAS L. FRIEDMAN, HOT, FLAT, AND CROWDED: WHY WE NEED A GREEN REVOLUTION—AND HOW IT CAN RENEW AMERICA (2008).

114 *See* Mary Christina Wood, *Advancing the Sovereign Trust of Government to Safeguard the Environment for Present and Future Generations (Part II): Instilling a Fiduciary Obligation in Governance*, 39 ENVTL. L. 91, 117-26 (2009).

115 *See* Sligh v. Kirkwood, 237 U.S. 52, 58–59 (1915) (discussing the broad protective scope of the police power).

116 Georgia v. Tenn. Copper Co., 206 U.S. 230, 237 (1907) ("[T]he state has an interest independent of and behind the titles of its citizens, in all the earth and air within its domain. It has the last word as to whether its mountains shall be stripped of their forests and its inhabitants shall breathe pure air."). Several courts have distinguished between the police power and trust authority in the natural resources law context. *See* Kleppe v. New Mexico, 426 U.S. 529, 541, 545 (1976) (noting separately the "police power" and the "[s]tate's traditional trustee powers over wild animals"); Maryland v. Amerada Hess Corp., 350 F. Supp. 1060, 1066–67 (D. Md. 1972) (distinguishing between trustee ownership and police power as a basis for recovering damages for polluted water caused by oil spill); State v. Fertterer, 841 P.2d 467, 470–71 (Mont. 1992) (observing "regulatory

represents a central dimension of the sovereign property interest. It simply means that the public owns in common certain property interests in natural resources and land within the territory, and that the government is the people's designated trustee with the obligation to protect such property on behalf of the citizens.[117]

While the public trust concept has been firmly expressed in the courts, it has not substantially evolved beyond its initial characterization by Professor Joseph Sax, who wrote a seminal article three decades ago.[118] The trust concept has remained underdeveloped in at least six respects. First, it has primarily evolved within the courts, having less of a presence in the other two branches of government.[119] Second, it has been applied primarily to state government.[120] Third, it has been interpreted as applicable to primarily water and wildlife resources rather than the full span of natural resources.[121] Fourth, it has never been infused into the statutory and regulatory structure that now dominates the field of natural resources law.[122] Fifth, it has not been invoked to define transboundary responsibilities for common resources (like the oceans and atmosphere) in which many states or nations have interests.[123] And sixth, it has not been linked to other important societal realms, such as the economic and moral realms.[124]

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power was derived from the states' 'title ownership' in the game, and also from the states' police power"); State v. Bartee, 894 S.W.2d 34, 43 (Tex. Ct. App. 1994); 35A AM. JUR. 2D *Fish and Game* § 1 (2001); *see also* Thomas A. Campbell, *The Public Trust, What's it Worth?*, 34 NAT. RESOURCES J. 73, 78 (1994) ("State authority over natural resources originated not as a function of state police power, but on the basis of 'proprietary' right . . . ."). Commentators have found the distinction critical in wildlife law, because only a property-based theory brings to bear trust principles governing the sovereign's action. *See* Deborah G. Musiker, Tom France & Lisa A. Hallenbeck, *The Public Trust and* Parens Patriae *Doctrines: Protecting Wildlife in Uncertain Political Times*, 16 PUB. LAND L. REV. 87, 92 (1995). The modern Supreme Court also recognizes the distinction between police powers and trustee powers over wildlife.

117 *See infra* note 125–26 and accompanying text; *see also Illinois Central*, 146 U.S. 387, 452–56 (1892) ("The State can no more abdicate its trust over property in which the whole people are interested . . . than it can abdicate its police powers in the administration of government and the preservation of peace . . . .").

118 *See* Sax, *supra* note 2, at 486–87.

119 *See* Kanner, *supra* note 2, at 66–75 (discussing development of doctrine as a process of the common law); James P. Power, Note, *Reinvigorating Natural Resource Damage Actions Through the Public Trust Doctrine*, 4 N.Y.U. ENVTL. L.J. 418 (1995) (discussing the common law development of the doctrine and its novel statutory application through natural resource damage actions under the Comprehensive Environmental Response, Compensation, and Liability Act).

120 *See* Power, *supra* note 119, at 420; Paul C. Tico, Kristen M. Fletcher & Tara Jänosh, *Will an Expanded Public Trust Doctrine Lead to Better Coastal Management?*, 14TH BIENNIAL COASTAL ZONE CONF. PROC. (2005), *available at* http://www.csc.noaa.gov/cz/2005/CZ05_Proceedings_CD/pdf%20files/TiccoPublic.pdf.

121 *See infra* notes 193–197 and accompanying text; *see also* Kanner, *supra* note 2, at 72–75 (explaining expansion of doctrine from its roots in submerged land to its modern application to public lands providing wildlife habitat).

122 *See supra* notes 66–73 and accompanying text.

123 *See* URBAN HARBORS INST., UNIV. OF MASS. BOSTON, PUBLIC TRUST DOCTRINE AND PUBLIC ACCESS IN NEW JERSEY 1 (2003), *available at* http://www.uhi.umb.edu/pdf_files/public_access_in_nj.pdf ("Traditionally, the physical jurisdiction of public trust lands includes all lands below the mean high tide line and out to 3 nautical miles offshore."); Torres, *supra* note 5, at 533 (observing that the public trust doctrine, properly understood, could provide the necessary legal cornerstone for legislative action to protect a public interest in the sky).

124 *But cf.* GELBSPAN, *supra* note 59, at 162–63 (explaining how a Sky Trust for all Americans could result in dividend payments for all citizens); Katherine Monk, *Water, the New Oil, Takes Center Stage*,

Drawing from the fundamental purpose underlying the public trust, this Article maps out an encompassing trust limitation on the powers of government—a limitation that characterizes government's duty in natural resources management as holistic, organic, and obligatory. These "back to the future" trust concepts resonate with visionary economic approaches and grounded moral values. They also carry potential for an organized framework of sovereign responsibility, from the local to the global realm. This Article refers to this full fiduciary paradigm as Nature's Trust.

A. Government as Trustee of Public Assets for Present and Future Generations

A trust bifurcates the property interest between the legal owner and the beneficial owner.[125] The beneficiaries hold the beneficial title to all assets in the trust. The trustee holds legal title, encumbered with the responsibility to manage the trust strictly for the beneficiaries.[126] This construct imposes a responsibility on government, as the trustee, to protect the assets (also called the res, or corpus) in the interests of the beneficiary class.[127] In the case of the public trust, the beneficiaries are the citizens, both present and future generations.[128] In a landmark

THE GAZETTE, May 12, 2008, http://www.canada.com/montrealgazette/news/arts/story.html?id=becacb77-8096-4c54-afd6-b4fd15ccb5a2 (last visited Jan. 25, 2008) (noting assertion by Canadian water policy analyst Maude Barlow that efforts by companies like Coca-Cola and PepsiCo to make water a commodity seem immoral because water belongs to all people).

125 GEORGE T. BOGERT, TRUSTS § 1 (6th ed. 1987) ("A trust is a fiduciary relationship in which one person is the holder of the title to property subject to an equitable obligation to keep or use the property for the benefit of another.").

126 GEORGE G. BOGERT & GEORGE T. BOGERT, THE LAW OF TRUSTS AND TRUSTEES § 582, at 346 (rev. 2nd ed. 1980) ("The trustee has a duty to protect the trust property against damage or destruction. He is obligated to the beneficiary to do all acts necessary for the preservation of the trust res which would be performed by a reasonably prudent man employing his own like property for purposes similar to those of the trust."); RESTATEMENT (SECOND) OF TRUSTS § 176 (1959) ("The trustee is under a duty to the beneficiary to use reasonable care and skill to preserve the trust property.").

127 *See, e.g.*, Ohio v. City of Bowling Green, 313 N.E.2d 409, 411 (Ohio 1974) ("[W]here the state is deemed to be the trustee of property for the benefit of the public it has the obligation to bring suit . . . to protect the corpus of the trust property . . . ."); Ivanhoe Irrigation Dist. v. All Parties and Persons, 306 P.2d 824, 840 (Cal. 1957) ("The state as an entity is the holder of the legal title as trustee for the benefit of the people of the state . . . ."); United States v. White Mountain Apache Tribe, 537 U.S. 465, 475 (2003) (recognizing that the fundamental common law duty of a trustee is to maintain trust assets); Fort Mojave Indian Tribe v. United States, 23 Cl. Ct. 417, 426 (Cl. Ct. 1991) (finding federal trust duty to protect Indian water rights because "the title to plaintiffs' water rights constitutes the trust property, or the res, which the government, as trustee, has a duty to preserve").

128 *See, e.g.*, Ariz. Ctr. for Law in the Pub. Interest v. Hassell, 837 P.2d 158, 169 (Ariz. Ct. App. 1991) ("The beneficiaries of the public trust are not just present generations but those to come."); Ridenour v. Furness, 504 N.E.2d 336, 340 (Ind. Ct. App. 1987) ("Title to wild game and fish is in the state in its sovereign capacity as the trustee of all the citizens in common."); State of Md., Dep't of Natural Res. v. Amerada Hess Corp., 350 F. Supp. 1060, 1067 (D. Md. 1972); Shepard v. State, 897 P.2d 33, 40 (Alaska 1995). For commentary, see Torres, *supra* note 5, at 527 ("[T]he people always hold beneficial title."); Peter H. Sand, *Sovereignty Bounded: Public Trusteeship for Common Pool Resources*, 4 GLOBAL ENVTL. POLITICS 47, 55 (2004) (defining beneficiaries, on the global level, as "future humanity").

trust opinion, *Geer v. Connecticut*,[129] the Supreme Court said "the ownership is that of the people in their united sovereignty."[130]

The public trust is perpetual, designed by courts to secure the natural resources needed by both present and future generations. The concern for future citizens is the *raison d'etre* for the trust. As the Supreme Court said in *Geer*: "[I]t is the duty of the legislature to enact such laws as will best preserve the subject of the trust, and secure its beneficial use in the future to the people of the state."[131]

The core of the doctrine requires trust management for public benefit rather than private exploit. As the *Geer* Court stated: "[T]he power or control lodged in the State, resulting from this common ownership, is to be exercised, like all other powers of government, as a trust for the benefit of the people, and not as a prerogative for the advantage of the government, as distinct from the people, or for the benefit of private individuals as distinguished from the public good."[132] The lodestar public trust opinion is *Illinois Central Railroad Co. v. Illinois* (*Illinois Central*),[133] where the Supreme Court announced that the shoreline of Lake Michigan was held in public trust by the State of Illinois and could not be transferred out of public ownership to a private railroad corporation.[134] In broad language encompassing the public's fundamental right to natural resources, the Court stated:

> [T]he decisions are numerous which declare that such property is held by the state, by virtue of its sovereignty, in trust for the public. The ownership of the navigable waters of the harbor, and of the lands under them, is a *subject of public concern to the whole people of the state*. The trust with which they are held, therefore, is governmental, and cannot be alienated . . . .[135]

The trust therefore serves as a fundamental limitation on government's assertion of power to allow natural damage. While the current environmental laws

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129 161 U.S. 519 (1896).

130 *Id.* at 529; *see also* Gilbert v. Dep't of Fish and Game, Bd. of Fisheries, 803 P.2d 391, 399 (Alaska 1990) ("[M]igrating schools of fish, while in inland waters, are the property of the state, held in trust for the benefit of all the people of the state, and the obligation and authority to equitably and wisely regulate the harvest is that of the state." (citation omitted)). For discussion of the sovereign wildlife trust established by *Geer* and other cases, see Mary Christina Wood, *The Tribal Property Right to Wildlife Capital (Part I): Applying Principles of Sovereignty to Protect Imperiled Wildlife Populations*, 37 IDAHO L. REV. 1, 52–86 (2000). While *Geer* was later overruled for its treatment of commerce clause issues, the underlying trust basis of the decision holds force today. *See id.* at 60–64 nn.276–95.

131 *Geer*, 161 U.S. at 534.

132 *Id.* at 529. *See also* Lake Mich. Fed'n v. U.S. Army Corps of Eng'rs, 742 F. Supp. 441, 445 (D. Ill. 1990) ("[T]he public trust is violated when the primary purpose of a legislative grant is to benefit a private interest.").

133 146 U.S. 387 (1892).

134 For discussion of the *Illinois Central* holding, see Sax, *supra* note 2, at 489–91. For extensive background on the circumstances giving rise to the case, see Joseph D. Kearney & Thomas W. Merrill, *The Origins of the American Public Trust Doctrine: What Really Happened in* Illinois Central, 71 U. CHI. L. REV. 799 (2004). For discussion of the constitutional basis for the holding in *Illinois Central*, see Douglas L. Grant, *Underpinnings of the Public Trust Doctrine: Lessons from* Illinois Central Railroad, 33 ARIZ. ST. L.J. 849 (2001).

135 *Illinois Central*, 146 U.S. at 455 (emphasis added) (noting, however, that parcels can be alienated "when parcels can be disposed of without detriment to the public interest in the lands and waters remaining").

give agencies control over natural systems and authority to allocate rights to private parties to pollute and destroy resources, the trust serves as a fundamental check on this authority. Simply stated, government trustees, who serve at the will of the public, may not allocate rights to destroy what the people legitimately own for themselves and for their posterity.

B. The Trust as an Inalienable Attribute of Sovereignty Derived from the People

The public trust obligation is the oldest expression of environmental law, dating back to Justinian times and Roman law.[136] Trust-like stewardship concepts have been central to indigenous governance back to time immemorial.[137] The public trust is manifest in the legal systems of many nations throughout the world. Professor Charles Wilkinson has traced the doctrine to the ancient societies of Europe, Asia, Africa, Moslem Countries, and Native America.[138]

The public trust is most appropriately viewed as a fundamental, organic attribute of sovereignty itself.[139] As one federal district court said in applying the doctrine to both the federal and state governments: "The trust is of such a nature that it can be held only by the sovereign, and can only be destroyed by the destruction of the sovereign."[140] As the Phillippine Supreme Court explained when applying the trust to halt logging of ancient forest:

> Needless to say, every generation has a responsibility to the next to preserve that rhythm and harmony for the full enjoyment of a balanced and healthful ecology. . . .
>
> . . . .
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> . . . [T]he right to a balanced ecology . . . belongs to a different category of rights [than civil and political rights] altogether for it concerns nothing less than self-preservation and self-perpetuation . . . the advancement of which may even be said to predate all governments and constitutions.

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136 Wilkinson, *supra* note 108, at 428–29.

137 Native nations have traditionally managed natural resources to ensure their availability in the same abundance for beneficiaries in distant generations. *See* Marcus Colchester, *Self-Determination or Environmental Determinism for Indigenous Peoples in Tropical Forest Conservation*, 14 CONSERVATION BIOLOGY 1365, 1365 (2000).

138 Wilkinson, *supra* note 108, at 429.

139 *See Geer*, 161 U.S. 519, 525–28 (1896) (referring to the trust over wildlife as an "attribute of government" and tracing its historical manifestation "through all vicissitudes of government"); State v. Bartee, 894 S.W.2d 34, 41 (Tex. App. 1994) ("attribute of government"); Rogers v. State, 491 So. 2d 987, 990 (Ala. Ct. App. 1985) (noting "[a]ll property rights in ferae naturae were in the sovereign" (internal quotation marks omitted) (quoting Cook v. State, 74 P.2d 198, 201–02 (1937))); United States v. 1.58 Acres of Land, 523 F. Supp. 120, 122–23 (D. Mass. 1981) (tracing historical origins of the public trust doctrine and noting that the trust was applicable to all forms of government in developed western civilization); Gary D. Meyers, *Variation on a Theme: Expanding the Public Trust Doctrine to Include Protection of Wildlife*, 19 ENVTL. L. 723, 729 (1989) ("The ownership of wildlife, like water, historically has been treated as an aspect of sovereignty."); Campbell, *supra* note 116, at 79 (noting government ownership of wildlife was "viewed as a fundamental attribute of state sovereignty").

140 *1.58 Acres of Land*, 523 F. Supp. at 124.

> As a matter of fact, these basic rights need not even be written in the Constitution for they are assumed to exist from the inception of humankind. If they are now explicitly mentioned . . . it is because of the well-founded fear of its framers that unless the right to a balanced and healthful ecology and to health are mandated as state policies by the Constitution itself . . . the day would not be too far when all else would be lost not only for the present generation, but also for those to come—generations which stand to inherit nothing but parched earth incapable of sustaining life.[141]

The natural interest of humankind in "self-preservation and self-perpetuation"[142] suggests a doctrinal foundation redolent of natural law[143]—indeed one of the first public trust cases in this country referred to the "law of nature" as one of the many bases, along with civil law and the common law of England, of the doctrine.[144] The abiding and unyielding self-interest of the people in their own survival, and that of their children, forms an inherent constraint on any government that gains its authority from the people. Because the people have a direct stake in the future, through their own life spans and those of the children born to their generation, the citizens' present beneficial interest inherently encompasses future concerns. And because generations are continually born, the trust beneficiary class is never subject to severance. The role of natural resources in realizing the

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141 Oposa v. Factoran, G.R. No. 101083 (S.C. July 30, 1993) (Phil.), *reprinted in* LAITOS, ZELLMER, WOOD & COLE, *supra* note 2, at 443–44.

142 *Id.* at 444 (citing petitioner's briefs).

143 The petitioners in *Oposa*—children and their parents—characterized their right to self-preservation and perpetuation as "the highest law of humankind—the natural law." *Id.* at 443. For discussion of a natural law basis for the public trust, see generally George P. Smith II & Michael W. Sweeney, *The Public Trust Doctrine and Natural Law: Emanations Within a Penumbra*, 33 B.C. ENVTL. AFF. L. REV. 307 (2006).

144 *See* Arnold v. Mundy, 6 N.J.L. 1, 11 (N.J. 1821) (linking sovereign trust ownership of navigable waters and water resources for the people to "the law of nature, which is the only true foundation of all the social rights" as well as to civil law and the common law of England). A state legislature "cannot, consistently with the principles of the law of nature and the constitution of a well-ordered society, make a direct and absolute grant of the waters of the state, divesting all the citizens of their common right." *Illinois Central*, 146 U.S. 387, 456 (1892). The approach has a rich basis in the political history of the United States. Thomas Jefferson asserted as a basic principle of natural law that one generation is not at liberty to encumber a subsequent generation with natural debt. In a letter to John Taylor, he wrote: "[E]very generation coming equally, by the laws of the Creator of the world, to the free possession of the earth He made for their subsistence, unincumbered [sic] by their predecessors, who, like them, were but tenants for life." Letter from Thomas Jefferson to John Taylor (May 28, 1816), *in* SOCIAL AND POLITICAL PHILOSOPHY: READINGS FROM PLATO TO GANDHI 251, 252 (John Somerville & Ronald E. Santoni eds., 1963). The point was further developed in a letter to James Madison written in 1789:

> I set out on this ground which I suppose to be self evident, "*that the earth belongs in usufruct to the living;*" that the dead have neither powers nor rights over it. The portion occupied by any individual ceases to be his when himself ceases to be, and reverts to the society. . . . Then no man can by *natural right* oblige the lands he occupied . . . to the paiment [sic] of debts contracted by him. For if he could, he might during his own life, eat up the usufruct of the lands for several generations to come, and then the lands would belong to the dead, and not to the living, which would be reverse of our principle. . . . [T]he present generation of men . . . have the same rights over the soil on which they were produced, as the preceding generations had. They derive these rights not from their predecessors, but from nature.

Letter from Thomas Jefferson to James Madison (Sept. 6, 1789), *in* SOCIAL AND POLITICAL PHILOSOPHY: READINGS FROM PLATO TO GANDHI, *supra* at 261–63.

perpetual human self-interest does not diminish over time, because the fabric of ecology is as vital to each future generation as it was to each past generation, though the modes of resource utilization may change over time. From this it can be surmised that any government deriving its authority from the people never gains delegated authority to manage resources in a way that jeopardizes present or future generations or diminishes the people's use of resources that have public benefit. The trust attribute of sovereignty, then, is fundamentally one of limitation, not power, organically comprised as a central principle of governance itself.[145] In the United States, this principle has been an enduring hallmark of natural resources jurisprudence since the beginning of the country.[146]

The essence of the doctrine, formulated to protect human survival and prosperity, explains why it is found in so many varying legal systems. As Professor Charles Wilkinson has put it: "The real headwaters of the public trust doctrine . . . arise in rivulets from all reaches of the basin that holds the societies of the world."[147] In this country, the doctrine has manifested in litigation primarily at the state level.[148] But public trust theory applies with equal force to the federal government, which also gains its power from the people.[149]

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145 *See* Dunning, *supra* note 2, at 516. By viewing the public trust doctrine as an implicit state right, "[w]hat [courts] may be saying . . . is that the public trust doctrine . . . springs from a fundamental notion of how government is to operate with regard to common heritage natural resources." *Id.* at 523. *See also Ctr. for Biological Diversity*, 166 Cal. App. 4th 1349, 1362 n.14 (Cal. Ct. App. 2008) (noting sovereign trust duty "'owing to the people'" (citation omitted)).

146 *See supra* note 117 and accompanying text (discussing *Illinois Central*). While some commentators have lamented what they view as vague origins of the doctrine, there has been another notable occasion in which the United States Supreme Court has fashioned a trust doctrine from a power imbalance that would threaten principles of democracy. In federal Indian law, the Court created a trust construct to hold the federal government to a duty of protection towards tribes to temper its exercise of plenary power over tribes. The federal Indian trust doctrine is entirely of common law origin and has no expression in the Constitution, yet it has endured for two centuries of jurisprudence and is considered the "cornerstone" of federal Indian law. *See* Dep't of the Interior v. Klamath Water Users Protective Ass'n, 532 U.S. 1, 11 (2001) ("The fiduciary relationship has been described as 'one of the primary cornerstones of Indian law,' and has been compared to one existing under a common law trust, with the United States as trustee, the Indian tribes or individuals as beneficiaries, and the property and natural resources managed by the United States as the trust corpus."). For discussion see COHEN'S HANDBOOK OF FEDERAL INDIAN LAW § 5.01, at 392 (Nell Jessup Newton ed., 2005) and Mary Christina Wood, *Indian Land and the Promise of Native Sovereignty: The Trust Doctrine Revisited*, 1994 UTAH L. REV. 1471 (1994). By analogy, in the private context, courts create constructive trusts to compensate for fraud or inequity. BOGERT, *supra* note 125, § 77, at 286. The public trust and the Indian trust are both judicially-created constructive trusts on the sovereign level.

147 Wilkinson, *supra* note 108, at 431.

148 *See* Grant, *supra* note 134, at 850–51 (discussing application of *Illinois Central* by numerous state courts).

149 *See* Complaint of Steuart Transp. Co., 495 F. Supp. 38, 40 (E.D. Va. 1980) (applying doctrine to federal government); *1.58 Acres of Land*, 523 F. Supp. 120, 124 (D. Mass. 1981) (same); ZYGMUNT J.B. PLATER ET AL., ENVIRONMENTAL LAW AND POLICY: NATURE, LAW, AND SOCIETY 1103 (Erwin Chemerinsky et al., eds., 3rd ed. 2004) ("In several cases, courts have asserted that the federal government is equally accountable and restricted under the terms of the public trust doctrine. . . . [Since] the federal government is a creature of the states by delegation through the Act of Union and the federal Constitution . . . the federal government is therefore exercising delegated powers . . . [and] cannot have greater rights and fewer limitations than the entities that created it."); Grant, *supra* note 134, at 877 (locating the constitutional basis for the doctrine in the reserved power principle and concluding, "there

C. The Constitutional Framework of Trust Responsibility

It is both possible and compelling to construe the public trust doctrine as carrying the weight and supremacy of a constitutional principle. As Charles Wilkinson once summarized the legal framework in the United States: "[T]he most principled analysis leads to the conclusion that the public trust has minimum requirements set by the [federal] Constitution."[150] Casting the doctrine as a constitutional principle not only satisfies the natural inclination of lawyers and judges to have positive law grounding for a potent legal rule, but more importantly, it elevates the principle to a position of supremacy over legislative enactments where the situation warrants it. Constitutional law prevails over statutes, but common law must recede in the face of statutory conflict.[151]

While many scholars have located the trust doctrine in the equal footing doctrine, which grants new states public trust ownership over their streambeds,[152] the more compelling analysis is one set forth by Professor Douglas Grant drawing upon the basic premise of legislative power as expressly conveyed in the Constitution. In his careful analysis of the *Illinois Central* opinion, Professor Grant ties Justice Field's holding and rationale to the reserved power doctrine, a constitutional doctrine that was particularly prominent in Contracts Clause cases at the time.[153] In an early body of jurisprudence geared toward defining basic duties of government, the Supreme Court made clear that "essential sovereign powers are implicitly reserved to the legislature in perpetuity, and are inalienable such that they could 'neither be abdicated nor bargained away . . . even by express grant.'"[154] Any one legislature could not take acts to compromise a future legislature's ability to exercise sovereignty on behalf of the people. As the Supreme Court stated in *Newton v. Commissioners*,[155] a case that created a foundation for Justice Field's opinion in *Illinois Central*:

> Every succeeding legislature possesses the same jurisdiction and power with respect to them as its predecessors. . . . All occupy, in this respect, a footing of perfect equality.

is no reason why the reserved powers doctrine, with its inalienability principle, should not apply at the federal level as well as the state level").

150 Wilkinson, *supra* note 136, at 464. Some courts appear to assume the trust is constitutional. *See, e.g.*, *Ctr. for Biological Diversity*, 166 Cal. App. 4th at 1366–67 n.16 (citing Cohen, *The Constitution, the Public Trust Doctrine, and the Environment*, 1970 UTAH L. REV. 388, 392 ("The failure to carry out the obligations of the trust amounts to a breach of constitutionally protected rights which no court can permit.")).

151 This is known as the doctrine of preemption. *See* City of Milwaukee v. Illinois, 451 U.S. 304, 312–14 (1981).

152 *See generally* Dunning, *supra* note 2, at 524 (discussing basis of equal footing doctrine); Grant, *supra* note 134, at 852–53 (discussing commentary).

153 The Contract Clause provides: "No State shall . . . pass any . . . [l]aw impairing the [o]bligation of [c]ontracts." U.S. CONST. art. I, § 10.

154 Grant, *supra* note 134, at 856 (citing Atl. Coast Line R.R. Co. v. City of Goldsboro, 232 U.S. 548, 558 (1914)). Professor Grant cites case law stating "'the reservation of essential attributes of sovereign power is . . . read into [a legislature's] contracts as a postulate of the legal order,'" allowing the legislature immunity from violating the Contract Clause when it repudiates contracts that would alienate essential sovereign powers. *Id.* at 856–57 (citing Home Bldg. & Loan Ass'n v. Blaisdell, 290 U.S. 398, 435 (1934)).

155 100 U.S. 548 (1879).

> This must necessarily be so in the nature of things. It is vital to the public welfare that each one should be able at all times to do whatever the varying circumstances and present exigencies touching the subject involved may require.[156]

Because of their crucial public character, Justice Field determined that submerged lands—a "subject of concern to the whole people"[157]—were clothed with sovereign interests. Professor Grant points to a New York case relied upon by Justice Field that described the navigable rivers as "natural highways, and any obstruction to the common right, or exclusive appropriation of their use, is injurious to commerce, and if permitted at the will of the sovereign, would be very likely to end in materially crippling, if not destroying, it."[158] The lakebed at issue in *Illinois Central*, along with other navigable waterways, thus served such paramount public interests that the Supreme Court classified them as reserved assets of the people's sovereignty that could not be conveyed away by any one legislature.[159]

Courts have made clear that the police power is an inherent attribute of sovereignty that cannot be abridged or surrendered by any legislature, and that, as an inherent attribute, it needs no express constitutional validation.[160] The *Illinois Central* Court swept the public trust into the same class of sovereign attributes when it declared:

> The state can no more abdicate its trust over property in which the whole people are interested . . . than it can abdicate its police powers in the administration of government and the preservation of the peace. . . . Every legislature must, at the time of its existence, exercise the power of the state in the execution of the trust devolved upon it. [161]

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156 *Id.* at 559. For more discussion of *Newton*, see Grant, *supra* note 134, at 857.

157 *Illinois Central*, 146 U.S. 387, 455 (1892).

158 People v. N.Y. & Staten Island Ferry Co., 68 N.Y. 71, 77 (N.Y. 1877); Grant, *supra* note 134, at 866; *Illinois Central*, 146 U.S. at 458.

159 *Illinois Central*, 146 U.S. at 459–60.

160 *See* City of New Orleans v. Bd. of Comm'rs of Orleans Levee Dist., 640 So. 2d 237, 249 (La. 1994) ("The principle of constitutional law that a state cannot surrender, abdicate, or abridge its police power has been recognized without exception by the state and federal courts. Because the police power is inherent in the sovereignty of each state, that power is not dependent for its existence or inalienability upon the written constitution or the positive law."); Reesman v. State, 445 P.2d 1004, 1007 (Wash. 1968) ("[The] police power is an attribute of sovereignty, an essential element of the power to govern, and a function that cannot be surrendered. It exists without express declaration, and the only limitation upon it is that it must reasonably tend to correct some evil or promote some interest of the state, and not violate any direct or positive mandate of the constitution." (quoting Shea v. Olson, 53 P.2d 615, 619 (Wash. 1936)); State *ex. rel.* City of Minot v. Gronna, 59 N.W.2d 514, 531–32 (N.D. 1953) ("The police power is an attribute of sovereignty inherent in the states of the American union, and exists without any reservation in the constitution, being founded on the duty of the state to protect its citizens and provide for the safety and good order of society. The constitution supposes the pre-existence of the police power, and must be construed with reference to that fact." (citation omitted) (internal quotations omitted)); Hickenbottom v. McCain, 181 S.W.2d 226, 229 (Ark. 1944), *cert. denied*, 323 U.S. 777 (1944) ("The police power which resides in the State as a sovereign, exists without express constitutional grant, and may be used in any manner not prohibited."); Borden v. La. State Bd. of Educ., 123 So. 655, 661 (La. 1929) ("In fact, the Constitution presupposes the existence of the police power and is to be construed with reference to that fact.").

161 *Illinois Central*, 146 U.S. at 453, 460.

While the public trust doctrine may also have a separate constitutional foundation in the Statehood Clause,[162] locating its basis in the constitutional principle of reserved powers, as Professor Grant has done, highlights the governmental duty to future generations. This view of the trust constraint is reinforced by the Constitution's preamble which expresses the Framers' intention to create a more perfect union to "secure the blessings of liberty to ourselves and our *Posterity*."[163] The language underscores an ongoing duty, engrained in government itself as part of its constituted purpose, to govern for the endurance of the nation, for the benefit of future generations as well as present ones. The duty forms the essential rationale of the reserved powers doctrine.

Building upon this analysis of the *Illinois Central* opinion, Professor Grant points out that the public trust doctrine finds explicit constitutional underpinning in the express conveyance of legislative power on both the state and federal levels. By allocating power to legislatures for specific terms, these constitutional provisions limit the temporal influence one legislature can have and thereby "preven[t] one legislature from impairing essential powers of a later legislature."[164] Applying this to the public trust doctrine, a grant of lands or other resources vital to sovereign functioning would improperly extend the dominion of one legislature into the future—aggrandizing the legislative power beyond its inherent constitutional limitations as reflected in the reserved powers doctrine. In Justice Field's words, "[a] grant of all the lands under the navigable waters of a State has never been adjudged to be within the *legislative power* . . . ."[165]

In addition to this constitutional interpretation, which supports an organic, inherent trust limitation on the federal and state governments and their agencies, many states have constitutional provisions declaring natural assets to be held in public trust or common ownership.[166] Such provisions provide an additional basis for finding a constitutional underpinning of the public trust doctrine. Those states that currently do not have such provisions could amend their constitutions to make the trust duty explicit.

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162 U.S. CONST. art. IV, § 3, cl. 1.

163 *Id.* pmbl. (emphasis added). The full Preamble to the Constitution reads:

> We the People of the United States, in Order to form a more perfect Union, establish Justice, insure domestic Tranquility, provide for the common defense, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the United States of America.

Id. Posterity refers to future generations, or descendants. WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 1772 (Philip Babcock Gore ed., 16th ed. 1971).

164 Grant, *supra* note 134, at 872.

165 *Illinois Central*, 146 U.S. at 453 (emphasis added). Professor Grant notes that "[a]lthough Field did not cite the Illinois constitutional provision on legislative power, his use of a phrase that also appears in the constitution is not necessarily a coincidence." Grant, *supra* note 134, at 874.

166 *See* Matthew Thor Kirsch, *Upholding the Public Trust in State Constitutions*, 46 DUKE L.J. 1169, 1178–86 (1997); *supra* note 4 (discussing state constitutions).

D. The Trust as Applied to Each Branch of Government

While the public trust doctrine blankets all three branches, it manifests itself differently according to the unique constitutional role of each branch.[167] The legislature is the trustee of the assets[168] in its role as primary governing branch of the sovereign. The executive branch is by nature an "agent" of the legislature. Thus, on both the federal and state level, agencies are agents of the trustee,[169] encumbered with the duty to carry out sovereign trust obligations.[170] While modern agency officials rarely think of themselves as "trustees," in practice they have the most direct role in managing the trust because legislatures lack the capacity to engage in the details of environmental management.

The judicial branch remains the ultimate guardian of the trust. As craftsmen of the common law, judges define the contours of this obligation. While modern natural resources law primarily focuses on statutes and regulations, it must be remembered that American courts have defined basic sovereign obligations towards natural resources through common law for two centuries. Decisions pertaining to the public trust obligation, the Indian trust obligation, treaty rights, water rights, wildlife law, the federal navigational servitude, private property takings, and public nuisance make up a rich and extensive body of natural resources law developed within the judicial branch.[171]

Although common law generally yields to statutory expression, the public trust arena harbors a judicial "veto" of extraordinary scope, unparalleled in other areas of the law.[172] Legislative acts inconsistent with the trust are subject to judicial invalidation.[173] As one federal court said: "The very purpose of the public trust doctrine is to police the legislature's disposition of public lands."[174] The judicial

167 In delineating the role of the three branches, it is instructive to look to another trust doctrine, the Indian trust doctrine, which imposes a fiduciary obligation on government to protect the interests of native nations. Courts have defined the duty over the course of two centuries. For analysis, see Wood, *supra* note 146, at 1472; Mary Christina Wood, *Protecting the Attributes of Native Sovereignty: A New Trust Paradigm For Federal Actions Affecting Tribal Lands and Resources*, 1995 UTAH L. REV. 109, 224–25 (1995).

168 *See Geer*, 161 U.S. 519, 533–34 (1896).

169 It is commonly accepted in the realm of trust law that the trustee may retain agents to carry out the details of management, but the agents are held to the same fiduciary responsibilities as the trustee. RESTATEMENT (THIRD) OF TRUSTS § 80(2) cmt.g (2007).

170 *See, e.g.*, *Ctr. for Biological Diversity*, 166 Cal. App. 4th 1349, 1365–66 (Cal. Ct. App. 2008) (discussing public trust obligations of "public agencies"). In the Indian law context, which also features a prominent common law trust doctrine, courts have made clear that every federal agency is encumbered with the trust obligation to protect Indian interests. *See* Wood, *supra* note 146, at 1559.

171 The common law pertaining to sovereign ownership and "sovereign servitudes" is assembled in LAITOS, ZELLMER, WOOD & COLE, *supra* note 2, at 310–72.

172 *See id.* at 634–44; Dunning, *supra* note 2, at 515–25.

173 *See, e.g.*, Lake Mich. Fed'n v. U.S. Army Corps of Eng'rs, 742 F. Supp. 441, 446 (D. Ill. 1990). For discussion, see Dunning, *supra* note 2, at 515–25, and Grant, *supra* note 134, at 849–50.

174 *Lake Mich. Fed'n*, 742 F. Supp. at 446. Courts have noted that the judicial check against politicized agency decision making is also important in the context of statutory law. *See* Sierra Club v. Epsy, 822 F. Supp. 356, 370 (E.D. Tex. 1993) ("When a federal court fails to prevent and correct statutory violations by excessively self-aggrandized, run-amok executive agencies, Congress' (and the people's) purposes are frustrated, and, more generally, the rule of law itself is subverted. Judicial refusals to enjoin such violations abdicate, for one thing, the courts' affirmative role in the constitution's system of checks and balances."), *rev'd on other grounds*, 38 F.3d 792 (5th Cir. 1994). *See also* Sierra

veto springs from the inherent, constitutional trust limitation embedded in legislative sovereignty.[175] No government can disclaim its fiduciary obligation to protect crucial natural resources; in the words of the Supreme Court, abridging the trust "has never been adjudged to be within the legislative power."[176] Whereas deference is due to standard legislative determinations of the public interest, deference cannot allow a legislature to overstep the inherent trust limitations on sovereignty. Thus, in overriding a legislative grant of submerged lands to a private railroad corporation, the *Illinois Central* Court explained that the state legislature never had the power to grant the land in the first place: "The control of the state for the purposes of the trust can never be lost . . . ."[177]

At the heart of the judicial veto is an institutional suspicion towards legislative actions that cause permanent impairment of the corpus of natural resources needed for public welfare and survival. As an Arizona court explained: "The check and balance of judicial review provides a level of protection against improvident dissipation of an irreplaceable res."[178] Underpinning these decisions rests a recognition that the legislature remains an enduring institution with fiduciary duties towards generations that come into being as time goes on. Yet, each legislative body temporarily comprises a particular set of individuals who may relent to pressure from powerful political constituencies to purloin the public corpus of crucial resources. Any one set of legislators should not wield power to cause lasting damage that handicaps future legislatures and generations. In the words of the *Illinois Central* Court:

> The position advanced by the railroad company . . . *would place every harbor in the country at the mercy of a majority of the legislature of the state in which the harbor is situated.* . . . The legislature could not give away nor sell the discretion of its successors in respect to matters, the government of which, from the very nature of things, must vary with varying circumstances. The legislation which may be needed one day for the harbor may be different from the legislation that may be required at another day. Every legislature must, at the time of its existence, exercise the power of the state in the execution of the trust devolved upon it.[179]

Construed as a principle embedded in the Constitution, the judicial authority for a public trust veto is apparent: constitutional doctrine overrides statutory law. Many courts, however, stay their hand, instead using their authority more as a judicial check on the other branches. Reflecting a tradition of comity to the other branches, these cases express deference to the legislative process and, if they find trust violations, they may simply remand the case for further proceedings by the

Club v. Thomas, 105 F.3d 248, 252 (6th Cir. 1997) ("The public nature of the planning process and the public's right to appeal timber sales were intended by Congress to be a check on the Forest Service's power and discretion. Judicial review of planning decisions is intended to be a further check.").

175 For discussion, see *supra* Section V.C.

176 *Illinois Central*, 146 U.S. 387, 453 (1892).

177 *Id.* The Court, however, created an exception for "parcels as are used in promoting the interests of the public therein, or can be disposed of without any substantial impairment of the public interest in the lands and waters remaining . . . ." *Id.*

178 Ariz. Ctr. for Law in the Pub. Interest v. Hassell, 837 P.2d 158, 169 (Ariz. Ct. App. 1991).

179 *Illinois Central*, 146 U.S. at 455, 460 (emphasis added).

legislature or agency.[180] As Professor Joseph Sax observes: "In the ideal world, legislatures are the most representative and responsive public agencies; and to the extent that judicial intervention moves legislatures toward that ideal, the citizenry is well served."[181]

Professor Grant provides a reasonable approach for distinguishing the instances that call for a judicial veto rather than a deferential remand. A remand is appropriate, he argues, "[w]here a legislative [or] administrative grant of a trust resource causes harm that is fully reparable reasonably quickly."[182] But where the harm is "irreparable or not reparable within a reasonable time," he contends, a judicial veto is warranted.[183] The approach is well grounded in trust law's prohibition against waste. While a trustee may allow an asset to be utilized, she or he may not allow destruction or permanent impairments of corporeal hereditaments that beneficiaries are entitled to in the future.[184]

The judicial veto can play a crucial role in the present climate crisis as legislative recalcitrance pushes the nation, and indeed the world, closer to climate thresholds that threaten the future of human life and civilization on the planet. The irrevocable damage associated with the climate "tipping points" is unprecedented, and far beyond the ability of any future legislature to mitigate or repair. Granting away present rights to pollute the atmospheric asset will handicap future legislatures in virtually every realm they face, including health care, the economy, property protection, homeland security, child welfare, food security, and disaster preparedness. There is little doubt that this ecological emergency would best be addressed by responsible, swift, legislative and executive action. But the executive and legislative branches presently sit idle, politically handcuffed by powerful industrial interests. Because of the permits issued directly under environmental laws, the carbon load in the atmosphere is increasing on a daily basis. As arbiters of justice and ultimate guardians of the trust, the courts may call upon the judicial veto to force carbon reduction as a society-saving mechanism to avert devastating and irrevocable natural losses to "our Posterity."[185]

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180 *See, e.g.*, Kootenai Envtl. Alliance, Inc. v. Panhandle Yacht Club, Inc., 671 P.2d 1085 (Idaho 1983) (discussing the history and origins of the public trust doctrine including judicial deference to legislative action).

181 Sax, *supra* note 2, at 559.

182 Grant, *supra* note 134, at 879.

183 *Id.* at 880. Professor Grant ties this distinction directly to the reserved power doctrine:

> When the environmental harm is likely to be objectionable to a future legislature but not reparable by it within a reasonable time, there is a sense in which the future legislature's police power discretion over the resource will have been destroyed by the earlier legislature's grant if that grant is allowed to stand. It would not be a great stretch for a court to extend the principle against alienation of the police power to this situation.

Id.

184 *See infra* note 232 and accompanying text; Wood, *supra* 114, at 94 n.5.

185 For a detailed analysis of how courts could invoke the public trust doctrine to force carbon reduction at all levels of government, see Mary C. Wood, *Atmospheric Trust Litigation*, *in* ADJUDICATING CLIMATE CHANGE: SUB-NATIONAL, NATIONAL AND SUPRA-NATIONAL APPROACHES (William C.G. Burns & Hari M. Osofsky, eds., forthcoming 2009) (manuscript at 21), *available at* https://www.law.uoregon.edu/faculty/mwood/docs/atlpaper.pdf. As explained in that Chapter, courts may intervene to stabilize the situation without invading the prerogatives of the political branches. *Id.* (manuscript at 20). Such intervention carries high stakes. Scientists from around the world have warned

E. Common Law in a Changing World

In light of the climate decision-making vacuum left by the political branches, it is worthy of note that one of the great strengths of the common law has always been its ability to adapt to emerging societal needs. As the Oregon Supreme Court stated long ago:

> The very essence of the common law is flexibility and adaptability. . . . If the common law should become . . . crystallized . . . , it would cease to be the common law of history, and would be an inelastic and arbitrary code. It is one of the established principles of the common law, which has been carried along with its growth, that precedents must yield to the reason of different or modified conditions.[186]

Courts have emphasized that the public trust doctrine, as a creature of common law, is subject to flexible interpretation according to new and varying circumstances. As the California Supreme Court said: "In administering the trust the state is not burdened with an outmoded classification favoring one mode of utilization over another."[187] The New Jersey Supreme Court has observed: "[W]e perceive the public trust doctrine not to be 'fixed or static,' but one to be 'molded and extended to meet changing conditions and needs of the public it was created to benefit.'"[188] In the face of climate crisis, which presents an urgency to which the political branches have not responded, the common law's adaptability to new situations may prove crucial.

F. The People's Ecological Res

The natural resources subject to the public trust doctrine make up the "res" of the people's trust. These are the quantifiable assets in which the citizens hold a property interest, as carried out in trust form through their government officials for the benefit of present and future citizen beneficiaries.[189] While the courts have traditionally focused on water and wildlife resources in applying the public trust, the new climate-altered world demands a far more encompassing definition of the public's natural res.

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that, absent rapid political or legal action to curb carbon pollution, Humanity may have to resort to extremely risky geo-engineering measures on a planetary scale (like seeding artificial clouds over the oceans, or dumping massive amounts of iron into the oceans to stimulate plankton growth) in order to slow catastrophic global heating. *See* David Adam, *Extreme and Risky Action the Only Way to Tackle Global Warming, Say Scientists*, GUARDIAN, Sept. 1, 2008, http://www.guardian.co.uk/environment/2008/sep/01/climatechange.scienceofclimatechange2 (last visited Jan. 25, 2009) (reporting on scientific papers published by Britain's Royal Society).

186 *In re* Hood River, 227 P. 1065, 1086–87 (Or. 1924).

187 Marks v. Whitney, 491 P.2d 374, 380 (Cal. 1971).

188 Matthews v. Bay Head Improvement Ass'n, 471 A.2d 355, 365 (N. J. 1984) (citation omitted); *see also* Kanner, *supra* note 2, at 72 ("United States judges have broadened the geographic protections and widened the range of activities under the public trust.").

189 *See* Wood, *supra* note 185 (manuscript at 5).

1. The Essential Trust Purpose

In defining the scope of the trust endowment, courts have looked to the needs of the public as the primary guiding factor. The most illuminating opinion in this regard is *Illinois Central*, involving a conveyance of a portion of the Lake Michigan shoreline. It should be remembered that at the time of the case, lakebeds served a vital function in supporting fishing, navigation and commerce. In determining that the lakebed was part of the people's sovereign trust and could not be granted away to private interests, the Court repeatedly underscored the public's interest. Describing the lakebed as "the whole property in which the public was interested," it reasoned:

> [I]t is a title different in character from that which the state holds in lands intended for sale. . . . It is a title held in trust for the people of the State that they may enjoy the navigation of the waters, carry on commerce over them, and have liberty of fishing therein freed from the obstruction or interference of private parties. . . . A grant of all the lands under the navigable waters of a State has never been adjudged to be within the legislative power. . . . So with trusts connected with public property, *or property of a special character*, like lands under navigable waters, they cannot be placed entirely beyond the direction and control of the state. . . .
>
> . . . .
>
> . . . The ownership of the navigable waters of the harbor and of the lands under them *is a subject of public concern to the whole people of the State*. The trust with which they are held, therefore, is governmental and cannot be alienated, except . . . when parcels can be disposed of without detriment to the public interest in the lands and waters remaining.
>
> This follows necessarily from the *public character of the property*, being held by the whole people for purposes in which the *whole people are interested*.[190]

The Court's approach could be captured as the "public concern" test. As Professor Charles Wilkinson explains, the focus on public concern lies at the core of legal interpretation generally:

> The public trust doctrine is rooted in the precept that some resources are so central to the well-being of the community that they must be protected by distinctive, judge-made principles. This is an accepted process in our law: Anglo-American jurisprudence is rife with judicially developed doctrines that reflect the deeply held convictions of our society. In natural resources law generally, the unique qualities of some resources have impelled courts to apply the public trust doctrine as a flexible, loosely connected set of rules that allow maximum public utilization.[191]

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[190] *Illinois Central*, 146 U.S. 387, 452–56 (1892) (emphasis added); *see also id.* at 455 ("It would not be listened to that the control and management of the harbor of that great city—*a subject of concern to the whole people of the state*—should thus be placed elsewhere than in the State itself." (emphasis added)).

[191] Wilkinson, *supra* note 3, at 315.

2. Society's Changing Needs

Obviously, the interests protected by the trust at the time of *Illinois Central*—fishing, commerce, and navigation—are certainly not the only interests requiring protection in today's world. The people's interest in preserving a stable atmosphere, in protecting water sources, protecting natural flood barriers, and in maintaining species habitat and food sources now rank centerfold in the scheme of public interests. The question is whether the public trust doctrine, which represents a fundamental limit on the damage government can allow to natural resources, is elastic enough to protect the core public interests that are now at stake.

The assets constituting the res of the public trust have been expanded by courts to meet society's changing needs.[192] The original cases focused on submersible lands, tidelands, and wildlife as trust assets.[193] Over time, the doctrine reached new geographic areas including water, wetlands, dry sand beaches, and non-navigable waterways.[194] The doctrine has also pushed beyond the original societal interests of fishing, navigation, and commerce to protect modern concerns such as biodiversity, wildlife habitat, aesthetics, and recreation.[195] Courts have justified such expansion as being well within the function of common law to adapt to emerging societal needs.[196] Nevertheless, the facts of public trust cases are most often tied to aquatic or wildlife resources.[197]

It is reasonable to conclude that the doctrine is not tethered to those classes of resources. While the early cases linked back to the state's ownership interest in submersible lands, an ownership that is constitutionally rooted in the equal footing doctrine, the scope of the public trust readily moved outside those bounds to address important public interests in water, groundwater, wetlands, wildlife, and even dry sand areas.[198] The *Illinois Central* case implied that traditional public trust resources, such as navigable waters and soils under them, were part of a broader category of property imbued with the public trust:

> The state can no more abdicate its trust over property in which the whole people are interested, *like navigable waters and soils under them*, so as to leave them entirely under the use and control of private parties, . . . than it can abdicate its police powers in the administration of government and the preservation of the peace.[199]

Guided by the essential public purposes approach taken by the Supreme Court in *Illinois Central* and other public trust cases, it is only logical that the public trust should protect the atmosphere and all other natural resources that are vital to the

192 *See supra* notes 186–188 and accompanying text.

193 *See Illinois Central*, 146 U.S. at 453.

194 *See, e.g.*, Nat'l Audubon Soc'y v. Superior Ct. of Alpine County, 658 P.2d 709, 719 (Cal. 1983) (non-navigable tributaries); Baxley v. State, 958 P.2d 422, 434 (Alaska 1998) (wildlife); Matthews v. Bay Head Improvement Ass'n, 471 A.2d 355, 358 (N. J. 1984) (dry sand area); Robinson v. Ariyoshi, 658 P.2d 287, 310 (Haw. 1982) (groundwater); Just v. Marinette County, 201 N.W.2d 761,769 (Wis. 1972) (wetlands).

195 *Matthews*, 471 A.2d at 363; *Nat'l Audubon Soc'y*, 658 P.2d at 719–22.

196 *See, e.g.*, *Matthews*, 471 A.2d at 365.

197 *See generally* cases compiled in LAITOS, ZELLMER, WOOD & COLE, *supra* note 2, at 622–54.

198 *See supra* note 194 and accompanying text.

199 *Illinois Central*, 146 U.S. 387, 453 (1892) (emphasis added).

people and society at large.[200] No one could seriously argue that the air is not a resource of "special character" that serves purposes "in which the whole people are interested."[201] Atmospheric health is essential to all facets of civilization and human survival. The Roman origins of the public trust doctrine classified air—along with water, wildlife and the sea—as "res communes."[202] The *Geer v. Connecticut* decision relied on this ancient Roman classification of "res communes" in holding that the public trust doctrine incorporates wildlife.[203] Courts today continue to trace the public trust doctrine to Roman origins, citing air in the group of assets that are "common to mankind."[204] Numerous state court decisions, constitutions, and codes have recognized air as part of the res of the public's trust.[205]

3. Statutes as a Reflection of Public Concern

One approach to defining the scope of the res is by looking to the expansive set of natural resources that are subject to statutory law. While statutory law is not the final word in defining the scope of the trust res, nevertheless, it reflects a breadth of public interest in natural resources—and illuminates the "public

200 *See* Sax, *supra* note 2, at 556 (arguing that the public trust doctrine should not be limited to streambeds but should apply "in a wide range of situations in which diffuse public interests need protection against tightly organized groups with clear and immediate goals").

201 *Illinois Central*, 146 U.S. at 453, 454. Commentators have recognized that air is a logical trust asset. *See* Torres, *supra* note 5, at 522–24; Grant, *supra* note 134, at 878 (arguing that the public trust doctrine should encompass "natural resources that historically have been enjoyed by the people in common and are of continuing public concern—of which the air is a prime candidate"); WILLIAM H. ROGERS, JR., ENVIRONMENTAL LAW: AIR AND WATER, § 2.20, at 161 (1986) ("It is eminently clear now that trust properties not only can, but must, be administered to protect birdlife and to prevent air and water pollution . . . .").

202 *See Geer*, 161 U.S. 519, 525 (1896) ("These things are those which the jurisconsults called *res communes*. . . . [T]he air, the water which runs in the rivers, the sea and its shores . . . [and] wild animals." (internal quotations omitted)); Torres, *supra* note 5, at 529–30 ("The evolution of the public trust doctrine is complex, but it is essentially rooted in Roman law and from those laws through the various commentators on Roman law. . . . If a resource were excluded from private ownership because by its nature it could only be used in common, it was called res communes. . . . The principal of res communes was expressed in the English common law and in 19th century American law as jus publicum. . . . The beneficial interest in any res communes is held by the people in common.").

203 *See Geer*, 161 U.S at 522 (quoting Pothier treatise on property: '"Among other subdivisions [in property] things were classified by the Roman law into public and common. The latter embraced animals *ferae naturae*, which, having no owner, were considered as belonging in common to all the citizens of the state."').

204 Raleigh Ave. Beach Ass'n. v. Atlantis Beach Club, Inc., 879 A.2d 112, 119 (N.J. 2005); *Matthews*, 471 A.2d 355, 360 (N.J. 1984).

205 *See, e.g.*, Her Majesty v. City of Detroit, 874 F.2d 332, 337 (6th Cir. 1989) (citing Michigan act that codifies public trust to include "air, water, and other natural resources"); HAW. CONST. art. XI, § 1 (stating, "All public natural resources are held in trust by the State for the benefit of the people," and "the State and its political subdivisions shall conserve and protect Hawaii's . . . natural resources, including land, water, air, minerals and energy resources"); LA. CONST. art. IX, § 1 ("[N]atural resources of the state, including air and water . . . shall be protected . . . ."); R.I. CONST. art. I, § 16 (noting duty of legislature to protect air, interpreted as codification of Rhode Island's public trust doctrine in State *ex rel.* Town of Westerly v. Bradley, 877 A.2d 601, 606 (R.I. 2005)); Nat'l Audubon Soc'y v. Superior Court of Alpine County, 658 P.2d 709, 720 (Cal. 1983) (describing "purity of the air" protected by the public trust); *c.f.* PA. CONST. art. I, § 27 (declaring public trust duty to conserve natural resources, and expressing citizens' right to clean air).

concern" that lies at the core of the judicial approach in determining the res. Many resources are accorded public trust protection through statutory law. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)[206] provides natural resource damages to sovereign trustees of "land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources . . . ."[207]Across the full realm of environmental law on the federal, state, and local level, the assemblage of natural resources in which the public has a demonstrable interest spans nearly to the entire scope of ecology. The police power is now regularly exerted on behalf of the public interest in forests, wetlands, grasslands, water, air, streambeds, ocean areas, riparian areas, fish, wildlife, insects, plants, minerals, and soils.[208] The expanding scope of police power is not hard to explain. Untrammeled growth in the wake of the Industrial Revolution has demolished ecosystems. While a century ago the law was not concerned with species extinctions, biodiversity loss, toxic pollution, and climate crisis, these problems now rank at the center of contemporary challenges.

Perhaps the time has arrived to forthrightly align the geographical scope of the public's trust with the scope of government's sovereign police power in natural resources law.[209] While a seemingly logical step, it has drawn some critics who are concerned about the impact on private property rights.[210] Since the public trust recognizes a common property interest belonging to the people, the intrusive potential of the doctrine into private property rights expands as the doctrinal

206 Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9601–9675 (2000).

207 *Id.* § 9601(16) (definition of natural resources); *see also id.* § 9607(f)(1) (natural resources liability).

208 *See* Federal Water Pollution Control Act, 33 U.S.C. §§ 1251–1387 (2000) (the Clean Water Act); Endangered Species Act of 1973, 16 U.S.C. §§ 1531–1544 (2006); Resource Conservation and Recovery Act of 1976, 42 U.S.C. §§ 6901–6992k (2000) (amending Solid Waste Disposal Act, Publ. L. No. 89-272, 79 Stat. 992 (1965)); Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9601–9675 (2000); National Forest Management Act of 1976, 16 U.S.C. §§ 472a, 521b, 1600, 1611–1614 (2006) (amending forest and Rangeland Renewable Resources Planning Act of 1974, Pub. L. No. 93-378, 88 stat. 476 (1974)); Taylor Grazing Act, 43 U.S.C. §§ 315–315o-1 (2000); Federal Land Policy and Management Act of 1976, 43 U.S.C. §§ 1701–1785 (2000); Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. §§ 1801–1891d (2006) (incorporating the Essential Fish Habitat Act); CAL. PUB. RES. CODE §§ 10330–10344 (West 2007) (Rangeland, Grazing Land and Grassland Protection Act). In a recent California public trust case, the court looked to statutory recognition to accord wildlife public trust protection. *See* Ctr. for Biological Diversity v. FPL Group, Inc., 166 Cal. App. 4th 1349, 1366 (Cal. Ct. App. 2008).

209 In the area of federal Indian law, the Supreme Court has said the federal trust obligation, also a doctrine of common law, imposes a duty of protection when the federal government "takes on or has control or supervision over tribal monies or properties." United States v. Mitchell, 463 U.S. 206, 225 (1983). The approach provides an interesting application to environmental law, where statutes have vested government with complete management authority over many categories of natural resources. While not the same as federal management of Indian lands, nevertheless, the degree of control vested in government through statutes is enormous. The duty implicit in the trust doctrine provides a check on otherwise nearly unrestrained discretion to allow damage to regulated resources.

210 *See* James L. Huffman, *Speaking of Inconvenient Truths: A History of the Public Trust Doctrine*, 18 DUKE ENVTL. L. & POL'Y F. 1 (2007), *available at* www.law.duke.edu/shell/cite.pl?18+Duke+Envtl.+L.+&+Pol'y+F.+1+pdf.

footprint expands.[211] The broader the set of assets protected under the trust doctrine, the more circumstances in which the doctrine applies.

If one were to approach this legal terrain as a surveyor would, that point would be true. However, the relationship between the public trust and private property rights is not so much a matter of survey lines, but rather the proper accommodation between the private property owners' use of the property and the people's interest. This accommodation has already been fleshed out, albeit not in any simple or satisfactory fashion, in regulatory takings cases that arise from the assertion of sovereign police power.[212] The impact of public limitations on private property is not something that arises exclusively in the public trust realm but rather across the full terrain of the police power. Private property ownership is a legal right, a founding principle of this nation, and a crucial element of American liberty. Allowing that ownership to flourish while protecting the interests of society (and safeguarding private property as an institution within society) is a matter not decided by bounding the geographical scope of the public interest—for society has an interest in all of its natural resources—but rather by identifying the appropriate uses of such private property to ensure that they are consistent with the people's interest in safeguarding the natural infrastructure necessary for society to endure. The matter is taken up in greater depth in Part II, the companion piece to this Article.[213]

4. A Holistic Approach

Perhaps the main failing of natural resources law is that it has never fully comported with ecological reality. The laws have addressed environmental problems by compartmentalizing resources into separate categories, according each separate legal treatment. Conservation biology teaches us to recognize the full ecology of Nature and the interrelationships between all elements.[214] A trust approach that cherry-picks specific assets for protection and ignores the reality of interrelationships is likely to perpetuate the failings of natural resources law. In the real world, groundwater is connected to surface water, migratory birds are dependent on water areas and forests, forests are vital to the carbon cycle, and the entire workings of Nature operate together as a system.

Recognizing this, it is difficult to find any resource that can be summarily excised from public trust treatment. The soils, never a subject of past public trust cases, now seem indispensable, because they provide valuable carbon sinks and are

211 *See generally* discussion in *id.* at 96–99. Professor Huffman makes the point that, "if the jus publicum is just a Latin term for the public interest, the scope of the public trust is limitless and the constitutional protections of property rights are a nullity." *Id.* at 99. This Article does not suggest that the public trust reach to the full set of interests that could be conceivably be defined as "public interests." It simply asserts that the geographic, ecological reach of the doctrine need not be confined to navigable waters, wildlife, and other categories that dominated the thinking of 19th century jurists. Since the broad range of ecology is vital to modern civilization, a matter that has been recognized in the modern exercise of police power, courts should take a holistic approach to defining the geographic reach of the public trust rather than premise its further legal construction on seemingly artificial categories.

212 *See, e.g.*, Lucas v. S.C. Coastal Council, 505 U.S. 1003 (1992).

213 Wood, *supra* note 114, at 117–26.

214 *See* Reed F. Noss, *Some Principles of Conservation Biology, as They Apply to Environmental Law*, 69 CHI.-KENT L. REV. 893, 904–07 (1994).

also necessary for local food supplies.[215] The wetlands and coastal areas are essential for storm barriers.[216] The forests are crucial carbon sinks.[217] The bees are vital components of agriculture.[218] If, indeed, the body of public trust law is designed to protect society and assure the natural infrastructure necessary for the citizens' survival and prosperity, it can no longer be built around artificial categories.[219] A holistic approach would recognize the people's interests in all resources sustaining ecological balance—i.e., all natural resources.[220] The weight of the trust interest in any particular parcel depends on the parcel's contribution of natural capital to the ecosystem. That contribution, of course, will change over time as ecosystems change in response to climate and as resources become ever scarcer to society.[221]

VI. THE ROLE OF SOVEREIGNS AS COTENANT TRUSTEES OVER SHARED ASSETS

A. The Sovereign Cotenancy

Some assets, like oceans, air, some rivers, and many types of wildlife, are transboundary in nature, crossing several jurisdictions. An inherent limitation of statutory law is its confinement to jurisdictional boundaries. A notable strength of the trust doctrine's property framework is that it creates logical rights to shared assets that are not confined within any one jurisdictional border. It is well

215 R. Lal, *Soil Carbon Sequestration Impacts on Global Climate Change and Food Security*, 304 SCI. 1623, 1625–26 (2004).

216 For a discussion on the value of wetlands as storm and hurricane barriers, see Joe Palca, *In a Strategic Reversal, Dutch Embrace Floods*, NPR, Jan. 22, 2008, http://www.npr.org/templates/story/story.php?storyId=18229027 (last visited Jan. 25, 2009); Anna Vigran, *With Climate Change Comes Floods*, NPR, Jan. 25, 2009, http://www.npr.org/templates/story/story.php?storyId=18022014 (last visited Jan. 24, 2009).

217 *See* PEARCE, *supra* note 38, at 63.

218 Brit Amos, *Death of the Bees: GMO Crops and the Decline of Bee Colonies in North America*, GLOBAL RESEARCH, Mar. 25, 2008, http://www.globalresearch.ca/index.php?context=va&aid=8436 (last visited Jan. 25, 2009).

219 As the First Circuit Court of Appeals has said in the context of natural resource damages to public trust assets:

> In recent times, mankind has become increasingly aware that the planet's resources are finite and that portions of the land and sea which at first glance seem useless, like salt marshes, barrier reefs, and other coastal areas, often contribute in subtle but critical ways to an environment capable of supporting both human life and the other forms of life on which we all depend.

Puerto Rico v. SS Zoe Colocotroni, 628 F.2d 652, 674 (1st Cir. 1980).

220 The nation of Ecuador is pioneering trust-like holistic protection for Nature through a constitutional amendment that accords Nature the "right to exist, persist, maintain and regenerate its vital cycles, structure, functions and its processes in evolution." *See* Andrew C. Revkin, Dot Earth, *Ecuador Constitution Grants Rights to Nature*, N.Y. TIMES, http://dotearth.blogs.nytimes.com/2008/09/29/ecuador-constitution-grants-nature-rights/ (Sept. 29, 2008, 08:34 EST) (citing the Ecuadorian Constitution).

221 A good many dry sand beaches, for example, will be inundated as sea levels rise. Many species of wildlife that are thriving today will be struggling to survive in the future. Some forests will burn and become grassland. Some water supplies will dry up. *See generally* NAT'L SCI. AND TECH. COUNCIL, COMM. ON ENV'T AND NATURAL RES., SCIENTIFIC ASSESSMENT OF THE EFFECTS OF GLOBAL CHANGE ON THE UNITED STATES 8–17 (2008), *available at* http://www.climatescience.gov/Library/scientific-assessment/Scientific-AssessmentFINAL.pdf.

established that, with respect to transboundary trust assets, all sovereigns with jurisdiction over the natural territory of the asset have legitimate property claims to the resource.[222] States that share a waterway, for example, have correlative rights to the water.[223] Similarly, states and tribes have coexisting property rights to share in the harvest of fish passing through their borders.[224]

Such shared interests are best described as a sovereign cotenancy. A cotenancy is "a tenancy under more than one distinct title, but with unity of possession."[225] The Ninth Circuit Court of Appeals has invoked the cotenancy model to describe shared sovereign rights to migrating salmon.[226]

Within the United States, layered sovereign interests in natural resources arise from the constitutional configuration of states and the federal government. Where the federal government has a national interest in the resource, it is a cotrustee along with the states.[227] The concurrence of federal and state trust interests is reflected in statutory provisions that provide natural resource damages to both sovereign trustees.[228] As one court has made clear in the context of streambed ownership, the federal government and states are held to identical trust obligations, but must carry them out in accordance with their unique constitutional roles:

> This formulation recognizes the division of sovereignty between the state and federal governments . . . . [T]hose aspects of the public interest . . . that relate to the commerce and other powers delegated to the federal government are administered

222 *See* Idaho *ex rel.* Evans v. Oregon, 462 U.S. 1017, 1031 n.1 (1983) (O'Connor, J., dissenting) (noting "recognition by the international community that each sovereign whose territory temporarily shelters [migratory] wildlife has a legitimate and protectible interest in that wildlife").

223 *See, e.g.*, Arizona v. California, 373 U.S. 546, 601 (1963).

224 *See* Washington v. Wash. State Commercial Passenger Fishing Vessel Ass'n, 443 U.S. 658, 676–79 (1979); Minnesota v. Mille Lacs Band of Chippewa Indians, 526 U.S. 172, 208 (1999).

225 20 AM. JUR. 2D *Cotenancy and Joint Ownership* § 1 (2005). A cotenancy typically implies each party's right to full possession of the asset. JOSEPH WILLIAM SINGER, PROPERTY LAW: RULES, POLICIES, AND PRACTICES 708–11 (2d ed. 1997).

226 Puget Sound Gillnetters Ass'n v. U.S. Dist. Court (*Gillnetters*), 573 F.2d 1123, 1126 (9th Cir. 1978) ("We held that [the treaty] established something analogous to a cotenancy, with the tribes as one cotenant and all citizens of the Territory (and later of the state) as the other."); *id.* at 1128 n.3 ("The primary point is that the state and the tribes stand in similar positions as holders of quasi-sovereign rights in the fishery . . . ."); United States v. Washington, 520 F.2d 685, 685–90 (9th Cir. 1975) (applying cotenancy construct, by analogy, to Indian fishing rights). Of course, a cotenancy framework for sovereign management of natural resources differs in significant ways from a private cotenancy in land among individuals. For example, a sovereign cotenancy in natural resources may not be capable of partitioning. *See Gillnetters*, 573 F.2d at 1134–35 (Kennedy, J., concurring). Nevertheless, the basic cotenancy construct is instructive in the sovereign context. *See id.* at 1128 n.3 (stating, in the treaty fisheries context: "We refer to the cotenancy analogy only because it is helpful in explaining the rights of the parties, not because all the rights and incidents of a common law cotenancy necessarily follow. . . . Obviously, not all the rules of cotenancy in land can apply to an interest of the nature of a profit.").

227 For an extensive discussion of these cotrustee interests, see *1.58 Acres of Land*, 523 F. Supp. 120, 124 (D. Mass. 1981) (discussing tidelands: "Since the trust impressed upon this property is governmental and administered jointly by the state and federal governments by virtue of their sovereignty, neither sovereign may alienate this land free and clear of the public trust."); *see also* Wood, *supra* note 130, at 79 (describing concurrent federal, state, and tribal trust interests in wildlife).

228 *See, e.g.*, Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. § 9607(f) (2000).

> by Congress in its capacity as trustee of the *jus publicum*, while those aspects of the public interest in this property that relate to nonpreempted subjects reserved to local regulation by the states are administered by state legislatures in their capacity as co-trustee of the *jus publicum*.[229]

B. The Cotenant's Duty Not to Waste the Asset

Cotenants have duties toward the asset and towards one another.[230] One tenant cannot appropriate the property of the other tenant by destroying the property to which both are equally entitled. They stand in a fiduciary relationship towards one another and share the obligation not to waste the common asset.[231] Waste is the impairment of property so as to destroy permanently its value to the detriment of the cotenants.[232] Whether applied to a shared fishery, a transboundary waterway, or the Earth's atmosphere, the prohibition against waste is an important footing in the foundation of organized society.

United States case law clearly prioritizes the duty to prevent waste over the economic ambition of individual sovereigns.[233] The Ninth Circuit declared the sovereign cotenant duty in a treaty fishing dispute between states and tribes:

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[229] *1.58 Acres of Land*, 523 F. Supp. at 123. Recently, in *Massachusetts v. EPA*, the Supreme Court echoed this division of authority with respect to the air:

> When a State enters the Union, it surrenders certain sovereign prerogatives. Massachusetts cannot invade Rhode Island to force reductions in greenhouse gas emissions, it cannot negotiate an emissions treaty with China or India, and in some circumstances, the exercise of its police powers to reduce in-state motor-vehicle emissions might well be pre-empted. . . . These sovereign prerogatives are now lodged in the Federal Government.

127 S. Ct. 1438, 1454 (2007).

[230] The Constitutional Law Foundation provides the following story, called *Taking Turns*, to demonstrate the elementary nature of the duties:

> Once upon a time, there was a small, neighborhood playground. The playground contained only one swing. . . . One day, a boy named Jimmy, who had signed up for the swing, . . . decided to stand up . . . and to jump up and down. . . . [A]fter a few minutes of this game, the swing set began to shake violently. The structure could not endure Jimmy's abuse much longer.
>
> The grandmother . . . explained to Jimmy . . . "It is never your swing—or anyone else's; it is only your turn on the swing. Other children have a right to play on the swing after you are done. So even though you are free to play on the swing, . . . you are not free to break it.

CONSTITUTIONAL LAW FOUNDATION, THE STEWARDSHIP DOCTRINE: INTERGENERATIONAL JUSTICE IN THE UNITED STATES CONSTITUTION, http://www.conlaw.org/Intergenerational-Intro.htm (last visited Jan. 25, 2009).

[231] *See Washington*, 520 F.2d at 685; *infra* note 235 and accompanying text.

[232] EARL P. HOPKINS, HANDBOOK ON THE LAW OF REAL PROPERTY § 214, at 342 (1896); WILLIAM F. WALSH, 2 COMMENTARIES ON THE LAW OF REAL PROPERTY § 131, at 69, 72 (1947); 76 AM. JUR. 2D *Trusts* §§ 331, 404 (2005) ("[T]he trustee must make the trust property productive, and must not suffer the estate to waste or diminish, or fall out of repair."). Waste is "a spoil or destruction in . . . corporeal hereditaments, to the [detriment of the one who has a] remainder or reversion." Lytle v. Payette-Or. Slope Irrigation Dist., 152 P.2d 934, 939 (Or. 1944); *see also Washington*, 520 F.2d at 685.

[233] In one landmark treaty fishing dispute between tribes and states, the United States Supreme Court declared: "Rights can be controlled by the need to conserve a species; and the time may come when the life of a steelhead is so precarious in a particular stream that all fishing should be banned until the species regains assurance of survival." Wash. Game Dep't v. Puyallup Tribe, 414 U.S. 44, 49 (1973).

> Cotenants stand in a fiduciary relationship one to the other. Each has the right to full enjoyment of the property, but must use it as a reasonable property owner. A cotenant is liable for waste if he destroys the property or abuses it so as to permanently impair its value . . . . By analogy, neither the treaty Indians nor the state on behalf of its citizens may permit the subject matter of these treaties to be destroyed.[234]

In addition to the duty against waste, a corollary duty requires each tenant to pay his share of the expenses proportionate to his interest in the property.[235] These principles form a conceptual framework for assigning ecological responsibility to sovereigns sharing a natural resource. They have potentially forceful bearing in the international context, because they imply an organic obligation incumbent on each government that shares in the natural asset.

C. The Global Atmospheric Trust

Extrapolating from classic principles of sovereign trust law, the atmosphere can be characterized as a global asset belonging to all nations on Earth. The trust construct positions all such nations as sovereign cotenant trustees of this shared atmosphere.[236] In addition to a fiduciary obligation owed to their own citizens to protect the atmosphere, all nations have duties to prevent waste arising from their cotenancy relationship with one another.[237] Citizens and courts are positioned to define these duties by tying them directly to scientific prescriptions for carbon reduction.[238] This approach is quite opposite from the diplomatic stance taken by the United States in the climate arena—namely, that carbon reduction is a political choice.[239]

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234 *Washington*, 520 F.2d at 685.

235 *See, e.g.*, Willmon v. Koyer, 143 P. 694, 696 (Cal. 1914) ("In proportion to their interests all tenants in common are in duty bound to pay taxes . . . ."); *id.* ("The rule is that when one tenant in common has paid a debt or obligation for the benefit of the joint property, or has discharged a lien or assessment imposed upon it as a common burden, he is entitled as a matter or right to have his cotenant, who has received the benefit of it, refund to him his proportionate share of the amount paid."); Garber v. Whittaker, 174 A. 34, 37 (Del. Super. Ct. 1934) ("Tenants in common of the legal title to land are ordinarily entitled to the use, benefit and possession of such land, including their just and proper shares of the rents and profits therefrom."); *see also* WILLIAM B. STOEBUCK & DALE A. WHITMAN, THE LAW OF PROPERTY 205 (3d ed. 2000) (stating that where a cotenant derives income from a use of land that permanently reduces its value the cotenant must account to the other cotenants); White v. Smyth, 214 S.W.2d 967, 978 (Tex. 1948) ("When it is claimed that a cotenant in possession of . . . property has become liable to his cotenants for profits accruing from his productive operations, the usual mode of settling the account is to charge him with all his receipts and credit him with all his expenses, thereby ascertaining the net profits available for distribution [among cotenants]." (quoting 14 AM. JUR. § 38) (internal quotations omitted)).

236 *See* Sand, *supra* note 128, at 51–54 (discussing concept of global trusteeship for common resources that are vital to humanity). For an analysis applying the trust to the analogous global oceans resource, see Gail Osherenko, *New Discourses on Ocean Governance: Understanding Property Rights and the Public Trust*, 21 J. ENVTL. L. & LITIG. 317, 327–28 (2006). *See also* EDITH BROWN WEISS, IN FAIRNESS TO FUTURE GENERATIONS (1989).

237 *See* discussion *supra* notes 231–32 and accompanying text.

238 Wood, *supra* note 185 (manuscript at 1–2).

239 For example, the United States did not ratify the Kyoto Protocol. *See* PUBLIC AFFAIRS SECTION, U.S. EMBASSY, VIENNA, AUSTRIA, FACT SHEET: UNITED STATES POLICY ON THE KYOTO PROTOCOL

VII. CONCLUSION

Society's industrial base has demolished natural systems across the planet. The trajectory of anthropogenic change points to a lineup of horrors—overpopulation, resource depletion, peak oil, toxic pollution, dead oceans, species extinctions, planetary heating, and unrelenting natural disaster.[240] These new conditions of Nature present immense challenges for the law. Transformational legal change is inevitable, either because society will choose a sustainable path, or because the present legal institutions will collapse from economic and social disintegration following ecological chaos. Scientists warn that Humanity now stands at the crossroads of its future.[241] Society must undertake dramatic carbon reduction in short order to avert catastrophic climate thresholds.[242] Moreover, government must protect the remaining natural infrastructure to maximize human adaptation in face of a radically different natural world brought on by accelerating planetary heating that is now unavoidable.

The catastrophic threats facing society defy established statutory and doctrinal approaches in the field of environmental and natural resources law. The modern legal regime is an outgrowth of statutes passed in the 1970s. While the environmental statutes had laudable goals, they vested agencies with a vast amount of discretion that now lies at the heart of administrative dysfunction.[243] The discretion invites intense political pressure from private, singular interests to issue permits for pollution, development, and resource extraction.[244] Administrative decisions often take place on a playing field dominated by agency lobbyists for moneyed interests. Agency capture contravenes the primary assumption underlying administrative authority—that agencies are neutral decision makers—yet courts exacerbate the problem by giving reflexive deference to agency determinations even when such decisions are the product of inappropriate influence.[245] Ignoring the realities of Nature, government actors at all levels continue to authorize ecological devastation under the authority of environmental law. As such, the law itself has become a major engine of ecological ruin. This Article has argued that only an encompassing vision of sovereign obligation carries hope of turning governmental conduct away from disastrous outcomes.

This Article presents a new framework, Nature's Trust, that draws upon the public trust doctrine to present a fundamental paradigm shift in natural resources and environmental law. A companion Article, Part II, applies the framework in more specific detail to the three branches of government. The trust doctrine, lodged in Supreme Court case law, characterizes government as a trustee of crucial natural resources, vested with a duty to protect such assets for present and future generations of citizens, who are the beneficiaries of the trust.[246] The public trust

(2001) ("On March 29, 2001, the Bush Administration withdrew the United States from the 1997 Kyoto Protocol on Climate Change.").

240 *See supra* Section II.B.

241 *See supra* Section II.B.

242 *See supra* Section II.C.

243 *See supra* Section III.

244 *See supra* notes 77–84 and accompanying text.

245 *See supra* notes 89–94 and accompanying text.

246 *See supra* Section V.A.

doctrine is the common law's original legal mechanism to ensure that government safeguards natural resources necessary for public welfare and survival.[247] The doctrine is deeply lodged within Supreme Court case law and has constitutional overtones.[248] Nature's Trust advances this ancient public trust doctrine into the modern administrative age by identifying the trust as a fundamental attribute of sovereignty, engrained in the legislative authority conveyed by the people. This Article explained the trust as an organic, inherent limitation on the powers of government, applicable to all legislatures and natural resource agencies. The Nature's Trust paradigm challenges agency discretion by invoking the public trust doctrine as an abiding obligation to protect the environment. The Nature's Trust approach characterizes government's duty in natural resources management as obligatory, holistic, and organic to sovereignty itself.

While the public trust doctrine has traditionally protected only water-based resources, this Article has argued that Nature's Trust should protect the full "ecological res," including the atmosphere, air, soils, and forests—all of which carry as much importance as water resources to human survival and civilization. Failure to recognize these natural resources as assets in the trust simply perpetuates a misguided assumption underlying much of environmental law today—that natural assets are capable of severance and partition. In arguing for a holistic approach to the scope of protected assets, the discussion aims to align environmental legal doctrine with the ecological realities of Nature.

This Article concluded by presenting a property-based framework to deal with cross-border, shared sovereign resources.[249] Because statutes have no reach beyond jurisdictional borders, there is a broad failure to allocate conservation responsibilities among sovereigns. This void allows polluting sovereigns to escape responsibility for their actions, as exemplified in the current global climate crisis. The discussion exhibited the trust framework as an archetype of mutual sovereign responsibility by describing sovereigns as cotenant trustees of shared assets.[250] The doctrine of waste, deeply rooted in property law, demands consistent obligations of resource protection across borders.[251] This doctrine has long served as a principled approach for assessing responsibility towards natural resources shared among multiple interests. This Article has argued that the trust model presents a viable framework for international responsibility towards common resources, including Earth's imperiled atmosphere.[252] Moreover, as a paradigm that transcends cultures and national borders, Nature's Trust is available to citizens worldwide in their struggle to hold governments accountable for protecting a vanishing global natural heritage.

247 *See supra* Section V.B.
248 *See supra* Section V.C.
249 *See supra* Section VI.
250 *See supra* Section VI.A.
251 *See supra* Section VI.B.
252 *See supra* Section VI.C.