TOWARD AN ENERGY ETHIC

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We Americans consume energy conspicuously; yet many of us oppose energy development passionately. This paradox our society cannot long sustain. Within three years, the population of the United States will reach 300 million. By 2050, the population of the planet is likely to exceed 9 billion. Even the most rigorous programs of energy conservation will not cap, let alone reduce, America's or the world's demand for energy.

Opposition to energy development in the United States is fed (perhaps "fueled" would convey the irony better) by a basic set of values about protecting our environment and preserving areas of wilderness. These values, which may be called an environmental ethic and a wilderness ethic, frequently overpower arguments favoring development in our national discourse. But as good as we have become at opposing energy development, we remain largely ignorant of how the choices we make in consuming energy create an inexorable demand for more development. We lack, in short, an energy ethic.

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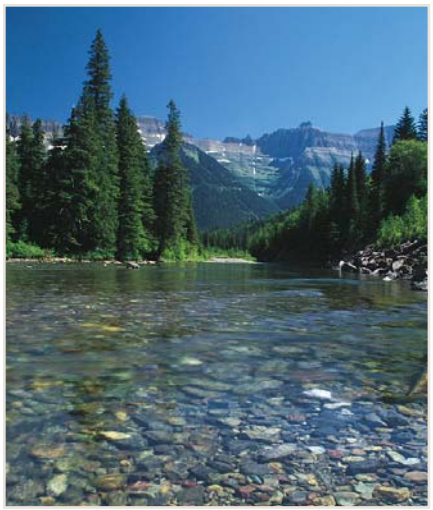
The Environmental Ethic

In the last fifty years, the United States has made extraordinary progress toward an environmental ethic. You might not know this from our newspapers, our leading environmental organizations, and some of our national political figures. From them, we hear multiple messages with a common theme: American industry is at war with the environment, seeking short term profit at the expense of the common good, and contributing heavily to the campaigns of political leaders to secure favorable laws and decisions.



This supposed "war" is being conducted on a far different battlefield than it was a half century ago. Then, writers such as Rachel Carson and Aldo Leopold, calling attention to the dire effects of human activity on the land and the ocean, were novel.[2] Now such writings are commonplace. Then, federal and state laws to regulate the effects of development on the environment were few. Now, at the federal level, our United States Code and our Code of Federal Regulations contain a sweeping legal regime to control the effects of development on air, land, subsurface, and water. Since then we have also

significantly expanded areas to be managed with special sensitivity to their environmental values. The federal government has designated nearly 106.5 million acres - an area larger than the State of California - as wilderness.[3] To this the nation has added uncounted acres of state-created wilderness and the wildlands of national and state parks, wildlife refuges, recreation areas, and "wild and scenic" rivers.

While many would argue that our legal regime has not gone far enough - advocates of the Kyoto Protocol on regulating carbon dioxide emissions come readily to mind - none can plausibly deny that our approach to protecting the environment is far different than it was. Behind that change lies a profound shift in outlook within the American citizenry. We have moved a long way toward embracing what Aldo Leopold called a "land ethic." This ethic recognizes that humans are but one part of a circuit of intricate links among soils, plants, and animals, that humans have the capability to alter those links far faster than nature can, and that those alterations can impair the ability of the circuit to sustain and renew itself - to the detriment of all. This ethic holds that, to keep us from irretrievably damaging the circuit as a whole, humanity must recognize the right of other species to exist and, at least in some places, to exist in their natural state. That this ethic has become imprinted on federal law is indisputable. For example, we saw early recognition of the need to preserve the "natural state" of our wildlands in the Wilderness Act of 1964,[4] the fruit of Leopold's vision and decades of hard work by the Wilderness Society and the Sierra Club.

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While Leopold, resident in Wisconsin, focused his writings on land, lake, and river, his thinking applied fully to what Miss Carson called the seas around us. Taken together, their views comprised a comprehensive ethic of our relationship with our planet, an "environmental ethic." To this ethic the astronauts of the Apollo Program gave powerful emotional force with their spectacular photographs, taken from lunar orbit, of the Earth luminous against the dark vastness of the void beyond.[5]

An Ethic Stunted

In one vital respect, the growth of our environmental ethic has been stunted. We have made little progress in accepting responsibility for the environmental effects of the decisions we make about the energy we consume. This failing is not only personal, but extends to our organizations and our politics. The root of the failing is two parts ignorance and one part indifference.

At the level of personal responsibility, I am as good an example of the failing as anyone. My house is heated and powered by natural gas and electricity. I know that the molecules of gas I burn come mostly from the Gulf of Mexico and Louisiana. Through my work I am more familiar than many with the environmental effects of producing natural gas in that part of the country. However, though I know who sells me the electricity I use, I do not know where or how it is generated. It may be from a hydroelectric turbine on a dammed river, from a nuclear power plant, from a coal fired generator, or from a gas-fired generator. Each month I know what I pay for the electricity I consume, but I do not know who "pays" for the effects of generating the electricity I buy. The same is true of my gasoline. I do not know where the gasoline was refined or the sources of the crude oil entering that refinery. I do know I pay more for pollution control equipment

on the tailpipe of my car, but I do not know who pays for the effects of producing or refining the crude oil I consume. My ignorance of these facts makes the problems seem remote, and their remoteness breeds indifference.

At the organizational and political level, the problem is my problem multiplied two hundred and ninety million fold, but there is one key difference. Personal ignorance breeds indifference; ignorance at the broader levels breeds frustration and finger pointing.

One example suffices to make the point. In 2001 Congress debated whether to reduce our consumption of crude oil by increasing standards setting the minimum average miles per gallon to be obtained by each year's fleet of new motor vehicles.[6] These corporate average fuel economy standards, or CAFE standards, were set by Congress in 1975.[7] The new fleet of cars was to average 27.5 miles per gallon by 1985, a standard that remains unchanged today. Through rulemaking the government set a lower standard for light trucks, which by 2001 had risen only to 20.7 miles per gallon.[8] Over the last twenty years, though, a swelling percentage of the total vehicle fleet has been comprised of pickup trucks, minivans, and sport utility vehicles (SUVs), all classified as light trucks for fuel economy purposes. As a result, total vehicle fuel economy peaked a few years ago.[9] To address this development, the bill before Congress proposed to require the combined fleet of cars and trucks for 2015 to average 35 miles per gallon. Congress delayed consideration of the bill pending a report by a panel of the National Academy of Sciences assessing the trade offs between fuel economy, vehicle weight, and vehicle safety.

The NAS panel's report contained several findings and recommendations. First, it acknowledged that the existing CAFE standards have significantly reduced oil consumption and the emission of greenhouse gases. Oil consumption would have been 2.8 million barrels per day higher if our vehicle fleet had made no progress in efficiency over its 1975 level. Particularly significant was that the CAFE standards had prevented us from "backsliding" to lower levels of fuel economy when the price of crude oil dropped significantly in the mid-1980s.[10]

Second, the report found that these CAFE benefits had come at a cost that was more than economic. Much of the improvement in fuel economy was achieved by building smaller and lighter vehicles. These vehicles, though, fared less well in crashes. In 1993, between 1,300 and 2,600 additional Americans lost their lives as a result. Third, the report found that it was very difficult to predict what social costs and benefits would accrue if the CAFE standards were raised; and the higher the standards, the higher the uncertainty. The report found that a less costly and more flexible option would be to establish a system of "tradable fuel economy credits" and higher fuel taxes.[11]

Congress defeated the proposed increase.[12] Groups advocating the increase pointed to the lobbying of the automakers against the measure as the source of the problem and a cause for shame.[13]

Finger pointing comes easily in Washington, but in this instance it masks a greater failing. Automakers do

not make money by selling fuel inefficient vehicles; they make money by selling vehicles consumers want to buy. If car buyers found heavier, higher, roomier vehicles less attractive, Detroit would make fewer of them. If buyers cherished fuel economy more, then sales of Metros, Insights, and Priuses would skyrocket. Detroit cannot make us buy what we do not want. For a generation advertisements have asked us, "Wouldn't you really rather have a Buick?" Well, judging by sales, apparently not.

At the personal level, then, the fault is not in Detroit for its responsiveness to the market, for businesses are supposed to be responsive to the market. The fault is rather in ourselves that we are fuel-guzzling underlings. At the organizational level, the failing lies with those who advocate the change to higher mileage standards. They simply have been unable to animate enough of us individually to see that the conveniences we enjoy in our sport utility vehicles at twenty miles per gallon are outweighed by vaster social consequences we should not ethically tolerate.[14] The failure is the more embarrassing when we consider that rank and file members of these CAFE proponents are themselves SUV owners. If we cannot persuade our own, how do we persuade others?[15]

Education and the Ethic

The debate over CAFE standards is an emblem of all debates over energy development and environmental protection. The failure of the proponents is a failure to educate the citizenry to understand the full range of consequences and to *feel* that the consequences of the current course are unacceptable. The task of education is difficult enough. Engendering an emotional response sufficient to change behavior is harder still.

Difficult to instill or not, an energy ethic is what we need. The ethic recognizes our obligation to learn the consequences of the decisions we make in producing and consuming energy. It recognizes that we must act on that knowledge, choosing to use energy more efficiently or accepting the consequences of using it less efficiently. It recognizes our obligation to consider the effects of our energy choices on the health of our environment, the vibrancy of our economy, and the security of our citizenry. It acknowledges, for example, that the fate of the Rockies might be linked with the fate of Iraqis. It recognizes our duty, in our public debates, to remember that conserving energy through greater efficiency may be a substitute for producing energy *at a higher rate*, but it is no substitute for *producing* energy. If we don't produce the energy, we can't use it more efficiently. And it recognizes that banning development in one person's backyard will not shrink demand or reduce development, it will simply place development in someone else's backyard. So we cannot shirk difficult choices about where we will seek new sources of energy.

The ethic requires our obligation to learn the consequences of the decisions we make in producing and consuming energy.

The task of instilling this ethic is daunting. We have no image to excite us as the Apollo photographs did. Memories of the gasoline lines of the 1970s have faded. Fourteen years of warfare in and over Iraq have had little effect on our desire to conserve energy or to see more of it produced domestically. A power crisis in California in 2000 and an electrical blackout in the northeast in August 2003 focused our attention, but only briefly.

The task begins with each of us, but it is the work of a generation at the least, just as it took more than a generation for the environmental ethic to progress into

our laws and culture. This means, of course, teaching our next generation. We cannot leave it to our already overburdened teachers, but must find ways to work with our schools to supplement the curriculum. It also means educating our news media. Much of the reporting on issues of energy and the environment is shallow, recounting simply that someone wants to develop energy resources in a given area, while some nearby resident, standing with a spokesperson for some organization, says it will have dire consequences for the environment. Reporters are not alone, however. Some very capable reporters would like to probe these issues more deeply,[16] but face resistance from editors who think their pieces would be unnewsworthy, with newsworthiness being in direct proportion to the degree of scandal or calamity the piece would illuminate. Fixing this problem may take legislation: a No Editor Left Behind Act.

The burden of action falls on the public institutions and private organizations most directly involved in these issues: those who produce and deliver energy and those who seek to protect the environment. The burden falls most heavily on energy producers, because more often than not the failure to educate and persuade is to the detriment of those promoting energy development.[17]

How an energy ethic could change the energy debate will be explored in three cases. The first and most important concerns our efforts to develop a national energy strategy. It uses the debate over oil as its paradigm. The remaining two are matters that have attracted national attention and engaged the emotions of many: developing wind power off the coast of Massachusetts, and developing the energy resources on public lands in Utah considered to have wilderness qualities.

National Energy Strategy: The Debate Over Oil

An Australian professor once told a class of American students about the city of Sydney at the turn of the twentieth century. There the predominant mode of transporting freight and passengers was conveyances drawn by horse. As the population of the city grew, its dependence on horse power grew as well. That dependence required Sydney to pay a heavy environmental cost: horse manure, everywhere on the pavement, always under foot, always in the nostrils. "What saved Sydney," he said, "was the automobile."

The automobile with its internal combustion engine began its career as the "green" technology in our transportation sector, but it has grown blacker with age. Now Sydney and its sister cities around the globe face the challenges of dependence on oil and the emissions of air pollutants from oil refineries and tailpipes. In the face of these challenges rise the new challengers to the internal combustion engine: the hybrid gasoline-electric engine and the fuel cell, both promising more efficient use of gasoline (or other sources of energy) with significant reductions in air pollution.

In this new arena, the Bush Administration and its critics have squared off. The Administration favors promoting greater conservation, developing the fuel cell, and exploring for oil more aggressively. Its critics favor exploring less, developing the fuel cell, and conserving more aggressively.

America's Growing Need

To follow this fight to its finish, one must understand the basics. Crude oil is consumed principally in the transportation sector and the industrial sector, the latter comprised of the manufacturing, agriculture, mining, chemical, and

construction industries. By 2020, the Energy Information Administration (EIA) projects that the nation will consume 25 million barrels per day of oil. Of that, 19 million per day will be consumed in the transportation sector, 5 million per day in the industrial sector.[18] Of the 19 million in transportation, 12 million will be consumed by passenger vehicles.[19]

Greater conservation is essential; but as we have just seen, conservation cannot end the need to find additional supplies of oil. We cannot continue to shirk the hard task of choosing where we will develop and where we will not.

This picture of the national demand for oil assumes no changes in current law, but projects some changes in technology to improve efficiency.

On the supply side, the picture remains discouraging. In 2020, EIA projects that oil produced in and offshore of the lower forty-eight states will have declined to only 4.2 million barrels per day. Alaska will contribute an additional 1.3 million barrels per day for a national total of 5.5 million barrels per day.[20] With domestic demand at 25 million barrels per day and domestic supply at only 5.5 million barrels per day, one can understand the Administration's push for additional domestic production and can see at least the initial appeal of opening the coastal plain of the Arctic National Wildlife Refuge, with its projected 10 billion barrels of oil,[21] to leasing and exploration.[22]

The Administration's critics - most prominently the Natural Resources Defense Council, the Sierra Club, and the Union of Concerned Scientists - fault the Administration for doing too little to stimulate alternatives to the growing demand for oil. The most detailed alternative has been put forth by NRDC, with the aid of UCS.

NRDC's Proposals

NRDC, which has done much in service of an energy ethic through its "Break the Chain" campaign,[23] argues forcefully for a more active government role in promoting the efficient use of crude oil. It argues that America is too dependent on oil from countries whose governments are unstable and whose affection for us is fickle. And whether we are buying from friend or foe, it adds, we are projected to spend a potentially debilitating $160 billion in the year 2020 on imported oil.[24] Our use of oil is also, NRDC reminds us, a threat to the health of our environment, resulting in smog, toxic air pollutants, global warming, and the "constant pressure to drill in pristine wilderness." To cure these ills, it proposes "a comprehensive energy security strategy combining near-term fuel-economy improvements in our cars and trucks with longer-term initiatives to develop the fuels of the future."[25]

NRDC proposes five steps to reduce our demand for oil used to fuel the transportation of passengers. Three of these steps are closely related. First, it would have Congress raise the CAFE standards so that the new fleet in model year 2020 would average 55 miles per gallon. Second, it would have Congress enact tax incentives for buyers of high mileage vehicles, such as those powered by fuel cells or hybrid gasoline-electric engines. Third, it would have Congress set a goal of converting the nation entirely to hydrogen fuel cell passenger vehicles by 2030.[26] Together, these changes would reduce our demand in 2020 by 5.025 million barrels per day.[27]

Fourth, NRDC proposes that Congress should mandate a steady increase in the content of gasoline drawn from renewable forms of energy, such as ethanol. "[B]iomass ethanol made from crop wastes . . . would cut oil consumption in 2020 by almost 400,000 barrels every day." Fifth, NRDC urges Congress adopt a series of measures to encourage "smart growth" in lieu of continued suburban sprawl. These measures would reduce our demand for oil in 2020 by another 590,000 barrels per day.

Taken together, NRDC concludes, these five policies could cut our demand for oil for passenger transport from 12 million barrels per day in 2020 down to about 5.9 million barrels per day.[29]

The Unsolved Dilemma

NRDC's analysis makes as good a case as can be made for aggressive conservation; but as thorough as it is, the analysis leaves the American citizenry with a dilemma the analysis does not discuss. NRDC acknowledges that passenger transport is not the sole source of demand for oil: EIA projects that freight transport and industrial uses will need another 12 million barrels per day by 2020. Even if other measures could reduce the demands of freight and industry by a third, down to 8 million barrels a day, the nation would still require a total of about 14 million barrels per day, even after all the benefits of NRDC's ambitious policies are taken into account.

Again, to meet that demand the nation can expect to supply only 5.5 million barrels per day from American oil wells. We will still be about 8.5 million barrels per day short. Where will that oil come from?

Will we continue to turn to the oil supplies of unstable and unfriendly nations? Will we continue to pay tens of billions of dollars each year even to friendly nations? Will we seek additional oil from existing wells, as the Sierra Club has proposed, through incentives for

more extensive and expensive methods of oil recovery?[30] Will Floridians rethink their opposition to drilling off Florida's Gulf Coast, or Californians their opposition to drilling off California? Will we reexamine our positions on exploring the deserts above the red rock canyons of Utah or the sagebrush habitat of the West? Will we reexamine the line we have drawn in the tundra over ANWR? Greater conservation is essential; but as we have just seen, conservation cannot end the need to find additional supplies of oil. We cannot continue to shirk the hard task of choosing where we will develop and where we will not.

An Argument Not to Be Praised, But Buried

A word of caution is needed, however, before parties to the energy debate put their shoulders to this cumbersome wheel. In recent years, a peculiar argument has crept into the debate. This argument attempts to trivialize a given proposal for energy development as supplying "only" so many days worth of the national energy demand, suggesting that the benefit is so unimportant that even the lightest of environmental concerns is heavy enough to outweigh it.

The most extreme example of this argument has arisen in the debate over ANWR. There opponents of development have argued that ANWR's oil would only meet the nation's demand for six months, suggesting that ANWR's benefits would be gone in the blink of an eye.[31] This kind of argument is incompatible with

an energy ethic, however, for it misleads. What the argument says, when examined, is that if ANWR were the *only* source of America's oil, it would be big enough to meet national needs for six months. Turning that coin on its other side, one could just as fairly ask whether America would be willing to go completely without oil for six months to preserve ANWR from development.

ANWR's ten billion barrels of oil cannot be trivialized. Between 2001 and 2025, all oil wells in the lower 48 states combined are projected to produce 22 billion barrels of oil.[32] The small area of ANWR needed for oil development would itself produce almost half that amount. If this argument against developing ANWR had been applied to oil fields in the lower 48 states, America would produce no oil today. So arguing that we can safely ignore ANWR's oil because it would satisfy only one-half year of American consumption is as imprudent as arguing that we can

safely ignore the views of the NRDC because its 550,000 members represent only half of one day's attendance at National Football League games. The argument, in short, does no credit to the worthy organizations advancing it.

What the Ethic Asks of Energy Policy

In the context of ANWR, the questions an energy ethic demands we answer are whether the coastal plain of ANWR has such special environmental significance that we should not develop it at all, whether development of the area would impair it in the long run and to what extent, and whether we have less sensitive alternatives that can provide the 10 billion barrels we are currently forgoing.

In the broader context of federal energy policy and the continuing role of oil within it, similar but more extensive questions must be addressed, with the answers summarized in a manner the citizenry can grasp without months of individual study. Our government, producers, consumers, manufacturers, and environmental advocacy interests must try again to forge a consensus on the balance of oil consumption and oil development to be sought. The effort required will be no doubt great, and perhaps acrimonious, but all forging requires heat and hammering.

Failing a consensus on the goals, these groups owe their fellow citizens a consensus on the basic facts and realistic projections. How much and how quickly can we safely increase oil-based fuel economy? On what sources of imported oil can we prudently continue to rely? How much additional oil from existing wells could tax incentives coax into production? What are the most promising areas for new supplies of oil from American soil? What would the likely effects be on our environment from developing those areas? These last two questions are especially important for the federal government to consider, because most American oil produced in the future is likely to come from federal land.[33] As to all these questions, the knowledge and skills of the National Academy of Sciences, the National Petroleum Council, and the Energy Information Administration must be called upon again.

In the broadest terms, then, an energy ethic makes demands of us and our energy policy. It demands that we take greater care in how we consume, protect what we and nature cannot replace, produce energy where our wits tell us the resource is the most promising and prolific, and, in those few places where these principles must inevitably collide, work hard to strike the right balance. Such work requires not forgoing consensus, but forging it, not vilifying our fellow citizens, but informing them.

The Power of the Winds of NIMBY in Nantucket Sound

One cannot be surprised that oil development remains so divisive an issue, but one may be fairly surprised that something seemingly as benign as a wind energy project can stimulate opposition of comparable intensity.

Sparking this reaction are two proposals by Cape Wind Associates, LLC, to emplace structures on Horseshoe Shoals, an area in the middle of Nantucket Sound off the coast of the Commonwealth of Massachusetts. The first proposal, for which the Army Corps of Engineers has already granted a permit, is to install a single tower on which the company would gather meteorological data. The second proposal, still under review by several state and federal agencies, is to install 130 "monopile structures," each supporting a wind turbine, and a grid of wiring beneath the seabed to collect the electrical energy created and move it ashore to the existing power transmission grid. At the tip of its blade, the tallest turbine would rise about 400 feet above the surface of the Sound.

Called a "wind farm," the proposed facility would have the capacity to generate up to 420 million watts, or 420 megawatts, of electricity, adequate to supply the electricity needs of the Cape Cod peninsula, at least when the wind is blowing. The selected site offers practical and technical advantages over other potential locations. The area around Horseshoe Shoals is open, free from obstructions to the flow of the wind. It is large enough for the number of turbines proposed. It has only one owner, the United States, with whom Cape Wind Associates would have to deal to obtain the rights to place their monopiles. The area is near existing facilities to transmit the electricity. The area is also substantially sheltered from the pounding force of the waves of the North Atlantic, for it lies protected behind Nantucket Island and Martha's Vineyard.

There are, of course, the usual environmental concerns about placing structures offshore: effects on currents and sediment, on fishing, and on navigation; and possible effects on marine life, including the endangered Right Whale. To these are added a special concern about birds, including protected species of terns and plovers, flying into the turbine blades. All these issues, as well as an assessment of alternate locations for the wind farm, will be addressed in an environmental impact report being jointly prepared by the Corps and the Commonwealth.

But while the wind farm may be protected from the waves on Horseshoe Shoals, its presence there is being buffeted by the wind of a public outcry: "not in my back yard." The greatest single issue on which the public's attention has focused is that citizens along the coast of the Sound will have to look at wind turbines where once mast and sail were all to be seen.[34] To be sure, one cannot hide wind turbines the way oil wells in Los Angeles are hidden within the facades of commercial buildings. So, when not obscured by rain, haze, or fog, the turbines will be in plain view. They will not be close, however, for the nearest of the turbines would be five miles south of the mainland, nine miles northeast of Martha's Vineyard, and thirteen miles northwest of Nantucket Island.

Addressing the Consequences of Consumption

An energy ethic does not direct the outcome for any particular decision citizens or governments must make. But for this project, the ethic weighs against elevating aesthetic concerns. For Massachusetts produces little of the energy it consumes, and its consumption causes effects on the environment far from its borders. Massachusetts' share in the full consequences of its consumption is disproportionately small, a circumstance an energy ethic would compel it to address.

The oil that heats its homes, generates its electricity, and powers its vehicles is produced in the "oil patch" of the southwest, from Alaska's North Slope, and from elsewhere around the planet. The uranium that powers its nuclear plants was quarried far away. The coal that fires its electric generators is mined in Appalachia. The natural gas that heats its homes and generates its electricity comes from the Gulf of Mexico, from Nova Scotia, from the Canadian West, from Trinidad-Tobago, and from Algeria.

Even within the electric generation market alone, imported energy is predominant. This year natural gas will be the primary fuel for 35 percent of the electricity generated in New England, nuclear fuel another 26 percent, coal another 12 percent, oil still another 12 percent, and hydroelectric the bulk of the rest.[35] Cape Wind's project would begin to address the inequity of Massachusetts receiving the benefit of production elsewhere free from production's environmental cost. To that end and to its credit, the Commonwealth enacted a law in 1997 to encourage development of renewable energy resources within the state.[36]

No one in Massachusetts appears to dispute that harnessing wind energy is, in general, a good idea. At the current state of applied technology, electricity generated by wind creates far fewer emissions of air pollutants and greenhouse gases than the coal fired generators at Brayton Point, Massachusetts. The final environmental impact report will likely demonstrate that the environmental benefits of the wind farm are significantly greater than whatever harms it may cause.[37] In this circumstance, one must paraphrase two famous brothers, both renowned sons of Massachusetts. Opponents of the wind farm should ask not "Why in my backyard?" They should ask instead "Why not?"

Oil and Gas in the Wilds of Utah

In the first half of the twentieth century, those who opposed development in wild country often had to resort to arguments founded on economics. Only in the second half of the century did advocates of wilderness succeed more consistently in opposing development on non-economic grounds.[38]

Today, as the popularity of undeveloped lands has increased, it is often possible to carry on the debate on

economics alone. National parks are now big business. The National Parks Conservation Association reports that in 2001 our national park system saw 280 million visitors, who spent an estimated $10.6 billion. A recent

study looked at the 23 national parks within California as "economic engines" in their own right, finding that the $643 million spent by visitors in 2001 sustained 16,866 jobs generating $266 million in wages, salaries, and benefits.[39]

The Call of the Wild

But the preservation of wilderness and its place in American culture no longer requires economic justification. While scores of books have offered dozens of reasons for why this is so, the reasons can be categorized as two: those that are based on the benefits of personally experiencing wilderness and those that are not. In the latter camp are rationales based on the "rights" of nature and the needs of science and history. For example, Roderick Nash has written, echoing Leopold, that "Wilderness was the basic ingredient of American culture. From the raw materials of the physical wilderness, Americans built a civilization."[40] At least some amount of wilderness, as it existed before the Europeans came, must be preserved to allow us to study how ecology influenced our history. Similarly, for the sake of science, we need that amount of wilderness to understand how American civilization altered the ecological balance existing in North America in the year 1492. The same idea is also expressed as needing, before nine billion of us overwhelm the Earth by 2050, to preserve these areas untouched, even unvisited, simply because humanity has no right to trammel the entire planet.

If that were the only kind of reasoning supporting the preservation of wilderness, however, few would be allowed to see the preserved areas. To minimize the risk of alteration, policy would limit access to credentialed scientists and historians. We would sooner let the original Declaration of Independence out on inter-library loan than we would allow mere backcountry campers into the Frank Church Wilderness Area in Idaho.

The needs of science and history do not explain the emotional appeal of wilderness. It is personal experience that fuels the wilderness movement. The reasoning offered from personal experience is as varied as the human personality. Wilderness invites recreation. Wilderness inspires religion, poetry, and art. Wilderness teaches humility. Wilderness is an emotional counter-balance to civilization. Wilderness provides solitude, even psycho-therapy. Wilderness, the Psalmist would say, "restoreth my soul."

For public policy, this is the great divide in the idea of wilderness. When justified by science, history, or for its own sake, "wilderness" in North America requires wilderness in its state before European settlement. Wilderness for personal refuge from modern society does not. We will explore what that distinction portends for an energy ethic.

Utah: Red Rock Canyons and "Green" Natural Gas

Society's interests in affordable energy and environmental protection need not be incompatible, but they usually are portrayed that way. In Utah, the portrayal is particularly vivid. Utah's potential as a source of natural gas has grown significantly with recent discoveries. Under the soil of Utah's high desert plateaus lie heat for millions of homes and oil to fuel the vehicles of city commuters and wilderness advocates alike. But the area is also cloven by canyons whose steep walls reflect vibrant shades of red. Pictograms are found on some of those walls, the art galleries of pre-European peoples.

In 2000, as part of a broader review of the five most promising oil and gas basin in the Rockies, Congress directed the Secretaries of the Interior, of Energy, and of Agriculture to examine restrictions on access to oil and gas resources in eastern and southern Utah. The Departments divided the five basins into study areas. Two included land in Utah: the Uinta/Piceance in

eastern Utah and western Colorado and the Paradox /San Juan in southern Utah, southwestern Colorado, and northwestern New Mexico. Their report was released in January 2003.

Within the Paradox/San Juan area, 10 million acres - 57 percent of the area - are not available for oil and gas leasing. The U.S. Geological Survey estimates that beneath those acres lie 140 million barrels of recoverable oil and 1.2 trillion cubic feet of recoverable natural gas. In the Uinta/Piceance area, 2.7 million acres are unavailable for leasing. USGS estimates these acres contain 14 million barrels of oil and 0.9 trillion cubic feet of natural gas.[41]

Parties to the energy debate may disagree over what these conclusions imply about the correct course for policy. But one point seems undeniable: this is no triumph of energy development over wilderness. The nation cherishes the wild country in Utah (and parts of Colorado and New Mexico) enough to forgo the potential production of 150 million barrels of oil and 2 trillion cubic feet of gas, with a combined current market value of at least $20 billion. Few propose to change the status of these lands, and a change is most unlikely. Wilderness has won that much of the debate on non-economic grounds.

The Legal Landscape of Utah Wilderness

The chief process that brought this result about is the land use planning provisions of the Federal Land Policy and Management Act of 1976, known by its acronym as "Flip-ma."[42] That Act began a fifteen year procedure through which the Department of the Interior studied federally-owned areas, aptly named wilderness study areas, for inclusion within the national wilderness preservation system. At the end of the process, the Department was to report its wilderness recommendations to the President, and the President in turn to the Congress for final action. Pending action by Congress, wilderness study areas are to be managed so as not to impair their wilderness characteristics, with one exception. Some wilderness study areas were created in areas already subject to private rights, including some producing oil and gas fields. FLPMA requires these existing rights be respected.

Through this process the Department studied 3.2 million acres of federal land in Utah, eventually recommending 1.9 million acres as appropriate for designation as wilderness. Wilderness advocates urged a four-fold increase. In 1996, President Clinton, in part responding to the impasse, proclaimed 1.7 million acres in southern Utah to be the "Grand Staircase-Escalante National Monument" to prevent development.[43] Also that year, Interior Secretary Bruce Babbitt undertook to "re-inventory" federal lands in Utah for possible wilderness characteristics. In 1999 Secretary Babbitt determined that an additional 2.6 million acres of federal land would be treated as "wilderness inventory areas," to be managed like wilderness study areas pending final action by Congress.

Congress has followed a state-by-state approach in responding to the President's recommendations for wilderness designation. Bills have been enacted for federal lands in several states, designating certain lands as wilderness and releasing the rest that were studied to their original status as public lands. Utah's lands have been the subject of several competing bills, however. In each Congress since 1989 wilderness proponents have sought enactment of a "Red Rocks Wilderness Act" designating 9.3 million acres in Utah as wilderness, never with success. The process remains at a legislative impasse.

While Congress debates, wilderness proponents continue to press for protection through the Interior Department's land management programs and through the courts. They also have developed recommendations

of their own for administrative designation as wilderness, so-called "citizen-proposed wilderness areas."

These citizen proposals offer us a lesson for an energy ethic. The ethic demands that we protect what nature and man cannot replace. Despite how frequently we hear that our planet is "fragile," nature retains a healing potency. It often can restore and regenerate what humankind has altered. The battlefields of our Civil War offer ready examples. Fields first created by plow and cow, then razed and flattened by cannon shell, minie ball, and infantry boot, have since passed through the stages of plant succession to approach their climax as forests.[44] Time has healed man's initial insult to nature.

If we cannot lead by our actions, if we cannot persuade those near us to think more carefully about the energy choices they make, if we cannot help others to understand the role of energy in our civilization, then policies and politics will fail.

Wilderness Battlefield: Paradise Lost and Regained

It is upon nature's power of regeneration that proponents have based proposals to treat former oil and gas areas in Utah as wilderness. After Secretary Babbitt completed his re-inventorying of potential wilderness lands in Utah, the Utah Wilderness Coalition submitted to the Interior Department a series of proposals for 3.3 million acres of additional wilderness units, areas twice reviewed by the Department and found not to have wilderness characteristics. On December 14, 2001, in support of UWC's proposals, the Southern Utah Wilderness Alliance submitted supplemental information and photographs to the Department. SUWA wished to show that the twenty years since the Department first considered these areas for wilderness "have brought significant changes. Natural processes have significantly diminished the presence of human impacts to the point that they are . . . substantially unnoticeable."[45] Included among SUWA's photographs are pictures showing the regrowth of vegetation on former oil well sites, service roads, and on paths once bulldozed for seismic survey lines. Even the current presence of oil and gas pipelines along the perimeters of the proposed wilderness units do not, SUWA concluded, detract from their "naturalness."

That nature has reclaimed these areas to the satisfaction of wilderness advocates is doubly remarkable. Because these were areas not considered to have wilderness qualities originally, the Department did not require special measures of the operator to limit the initial effects of operations or a special level of reclamation of the sites once operations were completed. Additionally, the revegetation has occurred during a period of drought in eastern Utah.

Today, oil and gas technology is significantly less invasive than it was twenty years ago. Improvements in seismic surveying have permitted operators to reduce the number of wells needed to discover new oil and gas reservoirs. "Horizontal" drilling techniques allow operators to drill numerous wells radiating out from a single wellpad, significantly reducing disturbance to the surface of the land. Oil and gas production occurs compatibly in many of our nation's wildlife refuges, including Alaska's Kenai National Wildlife Refuge and Texas' Aransas National Wildlife Refuge, home to the endangered but recovering whooping crane.[46] It is

possible for oil and gas activities to be conducted with limited current impairment of the characteristics that wilderness proponents cherish.

An energy ethic requires us to open our eyes to the real issue in many places in the West. The issue is not whether we will protect wilderness for all time or accept its permanent impairment by oil and gas development. Instead, the issue is whether this generation will preserve the area as wilderness for its present wants or whether it will currently develop the oil and gas resources in a manner that allows nature to return the area to wilderness for generations to come.

Conclusion

National oil policy, Nantucket Sound, and the Utah desert are merely examples of energy controversies and impasses found throughout our country and throughout our state and federal governments. Most of the impasses are avoidable if the issues behind them are examined in a more comprehensive context. That the impasses are so frequent and so fierce indicates that we have reached a point where energy issues are framed more to serve political ends than to seek solutions. An energy ethic would demand the opposite.

This is not to find fault with our governments, our political parties, or our private organizations; it is to find fault with us. We have not demanded more of our politics and our advocates. Some issues are so central to our well-being that we must expect more of ourselves so that our public and private leaders remain accountable.

Of course, this is much to ask of each of us. As individuals, we seem to live at the mercy of our times. The consequences of our own decisions are dwarfed by those of larger organizations and by the collective force of the decisions of six billion other persons on this planet. Our lives, we think, are fated to flow and ebb with the tide of events.

But what is the course of human events? That course is a consequence, a consequence of countless little decisions. Just as the current state of our environment is the result of, and ruled by, a "tyranny of small decisions" about how we live and use the land and ocean, our national energy policy does not control, but is controlled by, countless individual choices.[47]

This is perhaps as it should be, for we are a self-governing people. But the emphasis in the energy debate, however, has been more on the governing and less on the self. The participants in that debate fault one another for not having a coherent and comprehensive plan for *government* direction. Coherence and comprehensiveness are often politically too dear, however. In the give-and-take of democratic government, coherence and comprehensiveness often must yield to the expedient.

That is why we need an energy ethic. For an ethic is nothing more than a limitation on an individual's or an organization's freedom of action to preserve something of value for the common good. When the nation cannot achieve consensus on its energy policy through its politics, citizens must look to themselves for the solution. If we cannot lead by our own actions, if we cannot persuade those near us to think more carefully about the energy choices they make, if we cannot help others to understand the role of energy in our civilization, then policies and politics will fail.

This is certainly as it should be for a self-governing people. Self-government starts with governing yourself.

Endnotes

[1] The views expressed are the author's alone and are not attributable to Fulbright & Jaworski L.L.P. The author thanks Juanita M. Greenfield and Jennifer A. Rabinowitz for their research for this article.

[2] ALDO LEOPOLD, A SAND COUNTY ALMANAC WITH ESSAYS ON CONSERVATION FROM ROUND RIVER (Oxford Univ. Press 1966); RACHEL CARSON, SILENT SPRING (1962); RACHEL CARSON, THE SEA AROUND US (1951).

[3] *See* http://www.wilderness.net/index.cfm?fuse=NWPS&sec=fastFacts.

[4] As defined in the Wilderness Act, "wilderness" is "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain." 16 U.S.C. § 1131(c) (2000). More specifically, the Act defines wilderness as an area of at least 5,000 acres in which "man's work [is] substantially unnoticeable" and having "outstanding opportunities for solitude or a primitive and unconfined type of recreation." The Act establishes a National Wilderness Preservation System of federal lands to be managed for the American people in such a manner as to preserve the lands' "primeval character and influence, without permanent improvements or human habitation." *Id.*

[5] See, e.g., MARTIN COLLINS & SYLVIA KRAEMER EDS., SPACE: DISCOVERY AND EXPLORATION 43, 281 (1993) (Apollo 8 and Apollo 11 photographs).

[6] *National Energy Policy: Conservation and Energy Efficiency, Hearing Before the House Subcomm. on Energy and Air Quality of the Comm. on Energy and Commerce,* 101st Cong. (2001).

[7] Energy Policy and Conservation Act § 713, 49 U.S.C.S. § 32902 (2003).

[8] See 49 C.F.R. § 533.5 (2002) (original version at 43 Fed. Reg. 12,014 (Mar. 23, 1978); amended by 45 Fed. Reg. 20,878 (Mar. 31, 1980); 47 Fed. Reg. 7250 (Feb. 18, 1982); 47 Fed. Reg. 32,721 (July 29, 1982); 53 Fed. Reg. 11,090 (Apr. 5, 1988); 55 Fed. Reg. 12,497 (Apr. 4, 1990); 56 Fed. Reg. 13,784 (Apr. 4, 1991); 58 Fed. Reg. 18,029 (Apr. 7, 1993); 59 Fed. Reg. 16,323 (Apr. 6, 1994); 61 Fed. Reg. 14,680, 14,682 (Apr. 3, 1996); 61 Fed. Reg. 25,595 (May 22, 1996); 62 Fed. Reg. 15,859, 15,860 (Apr. 3, 1997); 63 Fed. Reg. 16,699, 16,701 (Apr. 6, 1998); 64 Fed. Reg. 16,860, 16,862 (Apr. 7, 1999); 65 Fed. Reg. 17,776, 17,778 (Apr. 5, 2000); 66 Fed. Reg. 17,513, 17,516 (Apr. 2, 2001); 67 Fed. Reg. 16,052, 16,060 (Apr. 4, 2002); 68 Fed. Reg. 16,868, 16,899 (Apr. 7, 2003).

[9] NAT'L RESEARCH COUNCIL OF THE NAT'L ACAD. OF SCIENCES, EFFECTIVENESS AND IMPACT OF CORPORATE AVERAGE FUEL ECONOMY (CAFE) STANDARDS (2001) (hereinafter "NAS Report").

[10] *Id.* at ES-4.

[11] *Id.* at ES-4, ES-7.

[12] 148 CONG. REC. H3462-72 (2002).

[13] *See, e.g.*, DANIEL LASHOF & ROLAND HWANG, NATURAL RES. DEF. COUNCIL, DANGEROUS ADDICTION 2003: BREAKING THE CHAIN OF OIL DEPENDENCE 1 (2003); Jeff Plungis, *Coalition Saves Automakers*, THE DETROIT NEWS, March 14, 2002, at 1B; Press Release, National Resources Defense Council, Senate Fuel Economy Vote Sacrifices National Security to Special Interest Pressure (March 13, 2002), http://www.nrdc.org/media/pressreleases/020313.asp.

[14] For an encouraging counterpoint, see UNION OF CONCERNED SCIENTISTS, BUILDING A BETTER SUV (2003), a recent publication of the Union of Concerned Scientists ("UCS"), a technical but readable explanation of how existing vehicle design and engine technologies could produce a safer and significantly more fuel efficient SUV. The publication examines relative costs, relative fuel efficiencies, total costs to the consumer, and contributions of the vehicles to the emission of air pollutants and greenhouse gases. UCS's challenge now is to communicate this message to consumers. One suggestion would be for the federal government to help, by requiring new car stickers to include this kind of information along with the customary EPA fuel economy numbers. That requirement would not only provide buyers with useful information, but would also help them recognize that these consequences of using their vehicles are factors they *ought* to consider in buying a new car or truck.

[15] Recent trends are not entirely discouraging. On the one hand, the National Highway Transportation and Safety Administration ("NHSTA") recently increased the CAFE standard for light trucks, requiring an average increase to 22.2 miles per gallon for model year 2007. *See* Light Truck Fuel Economy Standards Model Years 2005-2007, 68 Fed. Reg. 16,868, 16,900 (Apr. 7, 2003) (to be codified at 49 C.F.R. pt. 533). This increase seemed too meager to some, who noted that between 2005 and 2010 it would reduce our oil consumption by only 64,000 barrels a day. UNION OF CONCERNED SCIENTISTS, supra note 13, at 7. More worrisome still is the trend toward increased sales of large six passenger trucks, many of which are heavy enough to be exempt from the current CAFE standards. On the other hand, though not required by NHTSA to do so, some automakers - Ford, General Motors, Honda, and Nissan - have already introduced hybrid engine cars and SUVs capable of achieving between thirty-five and seventy miles per gallon. There is reason to hope that consumer choice may itself improve the fuel efficiency of our automotive fleet. Finally, NHTSA has re-opened the CAFE standards for further comment. Reforming the Automobile Fuel Economy Standards Program; Request for Product Plan Information, 68 Fed. Reg. 74,931 (Dec. 29, 2003) (to be codified at 49 C.F.R. pt. 533).

[16] Especially commendable reporting is found in Matthew L. Wald, *Questions About a Hydrogen Economy*, 290 SCIENTIFIC AMERICAN No. 5 66-73 (May 2004). Mr. Wald, a reporter for the *New York Times*, has gone beyond a mere comparison of tailpipe emissions to examine the total emissions associated with producing energy for vehicles and consuming it. Viewed from this perspective, the multiple billions of dollars being invested in research for and development of hydrogen fuel cell vehicles is money spent in pursuit of a questionable strategy.

[17] In the absence of an energy ethic in our culture, President Bush has attempted to address the delays in governmental review of applications for energy projects. Exec. Order No. 13,212, 66 Fed. Reg. 28,357 (May 22, 2001), *amended by* Exec. Order No. 13,286, 68 Fed. Reg. 10,619, 10,622 (Mar. 5, 2003), and by Exec. Order No. 13,302, 68 Fed. Reg. 27,429 (May 20, 2003). The White House has also tried to lead by example in energy efficiency. President Clinton issued a lengthy directive to federal agencies, which occupy over half a million buildings, to consume energy more efficiently "to save taxpayer dollars and reduce emissions that contribute to air pollution and global climate change." Exec. Order No. 13,123, 64 Fed. Reg. 30,851 (June 8, 1999).

[18] ENERGY INFORMATION ADMIN., ANNUAL ENERGY OUTLOOK 2003 80, 84, DOE/EIA-0383 (2003). Additionally, oil remains the dominant source of energy for heating homes in New England. The vulnerability of that source of energy was underscored on January 16, 2004, when Boston's harbor froze over, threatening to block tanker deliveries of fuel oil into Massachusetts.

[19] DAVID DONIGER ET AL., NATURAL RES. DEF. COUNCIL, DANGEROUS ADDICTION: ENDING AMERICA'S OIL DEPENDENCE 4 (2002).

[20] ENERGY INFORMATION ADMIN., *supra* note 16, at 81-82.

[21] Press Release, U.S. Department of the Interior, ANWR Oil Reserves Greater Than Any State (Mar. 12, 2003), http://www.doi.gov/news/030312.htm (last visited Jan. 30, 2004).

[22] The debate over developing the oil and gas resources of the coastal plain of ANWR will be assessed in a subsequent article. That debate is perhaps the premiere example in the United States of the friction between an energy ethic and the contemporary wilderness ethic in its purest form.

[23] The "Break the Chain" campaign combines educating the public to the consequences of our current course of oil use, alerting the public to its options for selecting vehicles with greater fuel economy, and acknowledging that consumers have the responsibility and power to change our current course. Through NRDC's website (www.nrdc.org), it facilitates the efforts of its membership to communicate with relatives, friends, and acquaintances to spread the message.

[24] DONIGER ET AL., *supra* note 17, at vi.

[25] *Id.*

[26] NRDC's documentation does not reveal that the organization considered the full environmental cost of this proposal. *See*, Wald, note 16.

[27] *Id*. at 2-3.

[28] *Id*.

[29] This article accepts NRDC's stated benefits as being made in good faith and having a reasonable basis. Other analyses suggest NRDC is viewing the benefits too optimistically. NAS Report, *supra* note 8, at 3-23, tbls. 3-4 (paths 1-3); ENVIRONMENTAL INFORMATION ADMIN., ANALYSIS OF CORPORATE AVERAGE FUEL ECONOMY (CAFE) STANDARDS FOR LIGHT TRUCKS AND INCREASED ALTERNATIVE FUEL USE at 5-8, SR/OIAF/2002-05 (2002).

[30] SIERRA CLUB, 12 KEY BENCHMARKS FOR ACHIEVING A SOUND ENERGY PLAN (2001) (benchmark 11). This idea is as old as oil conservation policy itself. Since the early 1900s, it has been a tenet of conservation to leave as little oil in a producing reservoir as is economically feasible. The problem is that, using conventional methods of production, somewhere between 50 and 80 percent of the oil originally in place in a reservoir may remain unproduced. One way to force extra oil out is to inject carbon dioxide into the reservoir. Where sources of CO2 are cheap and near, these "CO2 flooding" projects can be profitable without incentives. Projects are underway now in Wyoming, Colorado, Oklahoma, Mississippi, and Texas. *CO2 Floods Taking Hold in Mississippi*, AM. OIL & GAS REP. 115-16 (2003) (stating that the Petroleum Technology Transfer Council estimates that four percent of oil produced in U.S. comes from CO2 flooding projects); W.H. Leach, *CO2 Flooding*, OIL & GAS INVESTOR, Nov. 1, 2003, at 57. But where sources of CO2 are expensive and distant, tax incentives and royalty relief could be needed.

[31] *See*, *e.g.*, NATURAL RES. DEF. COUNCIL, The Arctic National Wildlife Refuge: Drilling in the Refuge vs. Energy Efficiency, at www.nrdc.org/land/wilderness/anwr/anwr3.pdf. Opponents of developing ANWR's oil continue to use an earlier government estimate of 3.2 billion barrels when arguing that ANWR would provide only enough oil to meet the national demand for six months. All projections of how much oil ANWR may contain are based on limited geological and geophysical data, the uncertainties of future oil prices, and the professional interpretations of geologists and geophysicists.

[32] ENERGY INFORMATION ADMIN, supra note 16, at 81.

[33] AM. PETROLEUM INST., ENERGY FOR A PROSPEROUS & SECURE AMERICA, http://api-ec.api.org/filelibrary/ceaccess.pdf (last visited Jan. 29, 2004).

[34] EOEA No. 12643, Cape Wind Project, Certificate of the Massachusetts Secretary of Environmental Affairs on the Environmental Notification Form (April 22, 2002). Opponents note that few buildings in New England are as tall as the turbines. They believe the wind farm would "destroy Nantucket Sound." The following comment is representative: "I think the environment in Nantucket Sound is so beautiful and to turn it into a Coney Island, I just can't believe this is even going to be considered." Transcript of Public Scoping Session, p. 105, U.S. Army Corps of Engineers, New England Division, Wind Farm Proposal Environmental Impact Statement (March 6, 2002).

[35] FEDERAL REGULATORY COMMISSION, STAFF REPORT: NEW ENGLAND NATURAL GAS INFRASTRUCTURE at 12-13, Docket No. PL04-01-000 (2003).

[36] 1997 Mass. Acts. 164. On March 1, 1998, section 20(a)(1) required a mandatory charge per kilowatt-hour for all electricity consumers of the Commonwealth to support the development and promotion of renewable energy projects in accordance with MASS. GEN. LAWS ch. 40J, § 4e (2003). MASS. GEN. LAWS CH 40J § 4e established the Massachusetts Renewable Energy Trust Fund administered by the Massachusetts Technology Park Corporation. Payments from the fund are to be used on renewable energy projects, such as solar photovoltaic and solar thermal electric energy, wind energy, and fuel derived from organic refuse.

[37] The draft report found that counterbalancing the project's minor impacts upon Nantucket Sound's ecology, tourism and property values were the benefits to be realized, including reducing fossil fuel use, pollution and greenhouse emissions, the creation of new jobs, and furthering energy independence. *See http://www.nae.usace.army.mil/projects/ma/ccwf/deis.htm.*

[38] *See* Roderick Nash, WILDERNESS AND THE AMERICAN MIND at chs. 10, 12 (4th ed. 2001), the classic history not of the wilderness movement *per se*, but of the wilderness idea.

[39] NAT'L PARKS CONSERVATION ASS'N, NATIONAL TREASURES AS ECONOMIC ENGINES: THE ECONOMIC IMPACT OF VISITOR SPENDING IN CALIFORNIA'S NATIONAL PARKS 1 (2003).

[40] *See Introduction* to NASH, *supra* note 34.

[41] DEP'TS. OF INTERIOR, AGRICULTURE, AND ENERGY, SCIENTIFIC INVENTORY OF ONSHORE FEDERAL LANDS' OIL AND GAS RESOURCES AND RESERVES AND THE EXTENT AND NATURE OF RESTRICTIONS OR IMPEDIMENTS TO THEIR DEVELOPMENT 3-1, 3-2 (2003).

[42] *See* 43 U.S.C. §§ 1711(a), 1782 (2000).

[43] Proclamation No. 6920, 61 Fed. Reg. 50,221 (Sept. 24, 1996).

[44] *See*, *e.g.*, Michael Godfrey, A SIERRA CLUB NATURALIST'S GUIDE: THE PIEDMONT, at Plate 1 opposite p. 244 (1980).

[45] Letter from Liz Thomas & Ray Bloxham, Southern Utah Wilderness Alliance, to Sally Wisely, Utah State Director, Bureau of Land Management 2 (Dec. 14, 2001) in Southern Utah Wilderness Alliance Supplemental and New Information re: Utah Wilderness Coalition's Lower Bitter Creek Proposed Wilderness Unit.

[46] OFFICE OF FOSSIL ENERGY, U.S. DEP'T OF ENERGY, ENVIRONMENTAL BENEFITS OF ADVANCED OIL AND GAS EXPLORATION AND PRODUCTION TECHNOLOGY (1999).

[47] *See* William E. Odum, *Environmental Degradation and the Tyranny of Small Decisions*, 32 BIOSCIENCE 728 (1982).

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