

Interpreting Global Sustainability in National Parks

by

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Rob Elliot Weinberg

Dedication

My thesis is dedicated to those who understand that to grow means not to expand, but to connect: more widely, more profoundly, and more consciously; to free and open academic discourse and research; and to the memory of the fifty species that will disappear on this one day forever from the earth.

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Abbreviations

BLM: Bureau of Land Management

CFC: Crissy Field Center

CIP: Comprehensive Interpretive Plan

DNC: Delaware North Corporation

EIS: Environmental Impact Statement

ESA: Endangered Species Act

GGNPC: Golden Gate National Parks Conservancy (until 2003 known as “Golden Gate National Parks Association”)

GGNRA: Golden Gate National Recreation Area

GMP: General Management Plan

IPCC: Intergovernmental Panel on Climate Change

LRIP: Long Range Interpretive Plan

NEPA: National Environmental Policy Act

NHS: National Historic Site

NHP: National Historic Park

NP: National Park

NPF: National Park Foundation

NPS: National Park Service

NS: National Seashore

PBS: Public Broadcasting System

SUV: Sport Utility Vehicle

UNESCO: United Nations Educational, Scientific and Cultural Organization

US: United States

USGS: United States Geological Survey

YI: Yosemite Institute

Introduction

The visitor's view

In Yosemite in late July, there is no more inspiring place to stand as evening approaches than a cool 3,214 feet above the Valley floor at Glacier Point - about an hour's winding drive, and a welcome escape, from the lodges and food courts of Yosemite Village. After leaving your car in any of several hundred tidily paved parking spaces, beautiful new interpretive signs guide you on a looping walkway past a gift store and restrooms to viewpoints where parents nervously enjoin their children not to climb railings that overlook an unforgiving vertical drop to the Valley floor. Glacier-carved Half Dome presents its world famous granite profile directly before you. Vernal and Nevada Falls unwind their misting ribbons far below, spectacular even at such a distance. The earth seems to open overwhelmingly above and below and beyond; space itself floods out from between the monumental granite shapes to meet your spirit as a tangible force. Despite the heat and crowds and the long drive you are glad you came to Yosemite. Enjoying the experience beside you at the railing, a tattooed Latino man in a tank-top challenges his children to spot a big rock far below in the Merced River where they cooled themselves earlier in the mid-day's 92 degree heat, and visitors converse in several European and Asian languages while they gesture back and forth between a wayside map and the distant granite shapes it says were born of glaciers.

The interpretive signs are world class, bright and pictorial, even sculptural, always at the right place to answer any conceivable English-speaker's question about the cultural and geological history of Glacier Point. Everything about your day in the park - the wayside signs, the swim in river snow melt already warmed by the season, the Visitor Center's spectacular new "Spirit of Yosemite" movie and even its worn lobby exhibits, speak about Change, and especially about the transformative and sustaining powers of ice and water.

Yet nowhere in any signage or videos, not in handouts or waysides, not at the viewpoint below Bridalveil Falls nor in the numerous displays describing ecological transformation over geological time in the Mariposa and Tuolumne and Merced groves of giant Sequoias - nowhere in Yosemite as far as I can tell - can a visitor clearly read what interpretive rangers in the park know all too well: that year by year, spring is coming earlier and earlier in Yosemite. Warm rain, arriving earlier as industrial carbon dioxide warms the earth's atmosphere, reduces snow packs that have until now sustained the Park's world-famous waterfalls and the soothing waters of the Merced, and those of the Tuolumne which San Francisco and its suburbs drink. Not just these rivers, but those of the entire surrounding Sierra Nevada system - whose snow packs provide most of the water on which Californians depend for their agricultural economy, their recreation, and their lives - are changing their flow patterns in ways that are beginning to challenge the ability of water managers to contain and channel them for human use.

Within a few decades the visitor experience of Yosemite's renowned resources may be diminished, with a reduced Merced offering fewer swimming holes for the Latino man's children to enjoy. Visitors may wonder if the mid-1900's photographs in the Valley's Ansel Adams Gallery were retouched in their representations of ancient fat waterfalls now subdued or, more likely than on earlier visits, dried out entirely.

The question

My thesis poses a single question: do US national parks offer an opportunity to enroll their one-quarter billion annual visitors in the stewardship of resources that require preservation and protection from

global impacts that result from the very actions of people like themselves? It examines possibilities and constraints for enrolling them through interpreting global sustainability. It examines the implications of global sustainability for the resources that the National Park Service (NPS) and its partners have pledged to preserve and protect.

Chapter 1, “Sustainability, Globalization, and the National Parks” reveals the need for providing these interpretations by making the case that critical natural and cultural resources are being destroyed at parks and world-wide by the global actions of industrial nations and corporations, encouraged by specific international accords. Chapter 2, “Interpreting Global Sustainability,” highlights work at sites where the NPS and its partners are currently interpreting global sustainability. Chapter 3 examines “Constraints to Interpreting Global Sustainability” in parks by the NPS and its partners, while Chapter 4, “Corporations, Money, and the NPS” focuses on constraints imposed by corporations and money and proposes ways to transform them instead into enablers of interpretations on global sustainability. Chapter 5 examines institutional and emerging factors that provide “Opportunities for Interpreting Global Sustainability” in national parks, now and in the near future. Following the Conclusion, Appendix I, “Guiding Documents,” provides references to existing internal NPS documents and major national legislative acts - some of which are little known to NPS staff – that currently impact interpretations in all parks or could provide direct support for interpreting global sustainability. Appendix II describes the process by which I solicited survey responses and the kinds of responses I received.

What this thesis does not do is offer a critique of the National Park Service as an agency, or focus on any other single challenge it faces such as conservation, education, visitor or employee experience, or choice of partners - though it interrogates each of these insofar as it bears upon my central question of interpreting global sustainability. As an NPS education volunteer and park partner employee over the last six years in San Francisco’s Golden Gate National Recreation Area (GGNRA) who works every day with rangers, it may be all too easy for me to see NPS employees, especially those in interpretation and education, as highly motivated, educated, and experienced public servants now under unprecedented stresses of privatization and personnel reduction. For balance the reader might explore a few well-known critiques of the NPS as listed in the Bibliography, some of which can be read online at the National Parks Services’ web site, nps.gov. One of the most famously acerbic critiques of the NPS can be found in Alston Chase's "Playing God in Yellowstone: The Destruction of America's First National Park." (*Chase*). It appears to be referenced from a couple dozen NPS online publications, but not to be online itself. Also well-known and less critical, but still offering a history of the parks that is sufficiently at odds with the officially sanctioned internal version to provide perspective, is Alfred Runte's "National Parks: The American Experience" (*Runte*), also available online in full text at nps.gov (*National Parks – the American Experience*.)

For my research laboratory I chose two parks for several reasons: I have worked in the GGNRA for five years both as a volunteer and as an employee of both the NPS and a partner, the Golden Gate National Parks Conservancy (until 2003 known as the “Golden Gate National Parks Association); Yosemite NP is within a day’s drive of the GGNRA; and the two provide contrasts between a newer open-access urban park (the GGNRA) and a more “typical” gated destination park (Yosemite NP). In pursuit of my question I interviewed 17 current officials and employees of the GGNRA and Yosemite National Park and their partner organizations live. I also interviewed 90 officials from other national parks across the country via email or letters to provide a cross-section of opinion more representative of the national parks as a whole where resources did not permit me to undertake live interviews. All of them play key roles in teaching the public. Many have fifteen to thirty years of experience within the

parks, and any one of them can provide a reasonably complete picture of the operations and the challenges facing the national parks. I invite you to visit them in their parks. Almost all have the knowledge and incentive to help us – as public citizens – meet the challenges of global sustainability.¹

¹ **How to read this thesis.** Footnotes that expand on concepts discussed in the body are referenced via superscript numbers pointing to the bottom of the current page, while bibliographic references are italicized in parentheses and contain the first one to several words of the corresponding line in the Bibliography section, in MLA style (*Gibaldi*).

Chapter 1: Sustainability, Globalization, and the National Parks

A quarter billion visitors to U.S. national parks could learn that their own life choices determine the sustainability of the global resources on which they and their parks depend. Will they?

People have been using and actively managing even extensive resource areas since the earliest times, particularly through channeling water and wildfire to enhance local availability of plants and game. Early communities that mixed semi-nomadic hunting with restrained and localized mixed-planted agriculture seem to have often sustained low or zero-growth populations for as long as thousands of years with little depletion of local ecosystems while precipitating few extinctions beyond those of the largest land mammal species. Though most of us may prefer our current lifestyle to what we imagine our ancestors experienced, anthropology and archeology show us that human life is possible – and in fact appears to have thrived over much of the planet - without sacrificing long-term sustainability to support its immediate needs. All major sustainability problems today are caused by people – by how we think and organize. This chapter discusses these problems, their impacts on parks, and who in parks is ready to learn about them.

Sustainability

Sustainability may mean many things. My thesis concerns itself with the sustainability of natural systems as resources for humans and as a set of living systems and beings valuable in themselves. It focuses particularly on human caused impacts which might be attenuated by increasing the public's awareness of them.

In recent decades it has become widely known to social and physical scientists that sustainability of human and biological diversity has progressed from a merely academic or political issue to one of survival. In the words of the United Nations Environment Programme, “. . . many areas of the world are on trajectories that will lead them into crisis and . . . little time is left for creating effective responses if deteriorating situations are to be stabilized.” (*Geo*) Because the world is now highly interconnected through the exchange of resources and information, and because we all experience and contribute to industrially generated effects on the global commons, sustainability can be understood most powerfully from within a global context. Our environmental activism – our desire to preserve, protect and steward our resources - is empowered when we learn that our concerns are not simply personal, but are mirrored by people with like concerns in all countries.

Resource sustainability problems today are increasing very rapidly in both their intensity and their interconnectivity. Billions of tons of natural resources are extracted, modified, shipped around the world, and ultimately deposited as enduring and often toxic pollution each year. The gaseous composition of our atmosphere, the essential living organisms of our seas and the composition of our soils are being transformed with accelerating speed by economic enterprises – corporations and the nations with whom they partner – with effects that rapidly reduce the ability of the earth to support people and other living things. Corporate fishing fleets are so powerful that almost any ocean-going fish species that corporations popularize gets depleted beyond economic viability within a few years. Agribusiness is so well organized and financed that the seemingly boundless, sea-size underground aquifers supporting America's Midwestern "bread basket" will be permanently depleted within 30 years or so, leaving one of the modern world's greatest grain production areas without water and unproductive. Animal and plant species are taken to extinction by construction, production of cattle, removal of forests and wetlands, mining operations, and industrial warming of climates far more

quickly than scientists can name and catalog them and so quickly that our era is commonly known as the earth's "sixth great extinction", the most rapid of the six and the only one caused by excessive domination by a single species – humans. Perhaps most disturbing is the simple observation that none of the practices by which we transform the planet's resources into the products we require are sustainable. In the words of "green" businessman Paul Hawken, "If every company on the planet were to adopt the best environmental practices of the 'leading' [most environmentally responsible] companies . . . the world would still be moving toward sure degradation and collapse." (*Ecology of Commerce xiii*)

Nuclear technology, shared around the world and developed simultaneously by the "military-industrial complexes" of a growing set of nations, constantly threatens a Chernobyl-style rapid toxification of extensive inhabited areas, while abandoned nuclear weaponry and materials are dumped in oceans, left to leach into soils, or secretly sold by desperate nations to the highest bidders. Meanwhile the possibility of almost instant massive transformation of human and natural environments remains configured within the aiming mechanisms of tens of thousands of intercontinental nuclear missiles, many of which, like the political forces which own them, are under uncertain control and subject to no real international oversight. Millions of buried land mines lie scattered and uncharted amidst the living, farming, and working areas of the world's poor.

Great bodies of water like the Great Lakes and the San Francisco Bay lose formerly productive fisheries as invasive species escape the poorly monitored ballasts of international cargo vessels, multiply, and destroy local fish species. Fishing weirs which not long ago trapped wild Atlantic salmon driven by ocean currents into the Bay of Fundy have been repurposed as large permanent cages in which tank-bred salmon circle as machines dispense food pellets laced with antibiotics - to protect them from their own excreta - and with artificial coloring to imbue their flesh with a marketably pink color. Most super market and restaurant salmon now comes from such impounds, not from the open ocean which is destructively dredged to extract the smaller fish from which the salmon's feed pellets are produced at a ten-to-one loss of available protein. Agriculture and timber interests struggle against the latest invasions of imported insects. Public health agencies fight disease vectors transporting flu, West Nile Virus, AIDS, and ebola at the speed of commercial airliners from one continent to another, increasingly unable to fight pathogens that have evolved resistance on factory farms where pigs and cows are routinely fed a diet of human antibiotics, rendering them medically useless more quickly than replacements can be developed. The six thousand remaining human languages are being lost – as many as a couple each week – as the capital, military interventions, and values of extractive global enterprises² marginalize human cultures and the traditions, relationships to resources, religions, and social relationships that have sustained their unique outlooks for millennia, pushing millions off the richer agricultural lands now coveted by industrial agriculture for the expensive crops they yield to wealthier diners on distant continents. A full third of the world's amphibians are globally threatened by climate change, habitat loss, species invasions and as yet unidentified processes with no conservation remedies available.³ These include the frogs that consume mosquitoes now carrying deadly imported West Nile virus as far as northern California and which provide the familiar backdrop of sounds that speaks of nature to visitors of national parks.

² "ExxonMobil handed hundreds of millions of dollars to the corrupt regime of [Angolan] President Jose Eduardo dos Santos in the late 1990s, helping to prolong Angola's ruinous civil war - but then the oil business is rarely pretty. They have little choice. If you are running a big oil company, you either deal with the despots or watch your company liquidate itself." (*Fisher*)

³ As reported in a three-year study by 500 scientists from 60 countries (*Stokstad*)

The genes of plants and animals are being intermixed in the laboratories of large corporations and the universities they sponsor to create custom plants optimized for the processes of industrial agriculture. These are marketed by international conglomerates, disseminated through heavily capitalized offerings amid considerable coercion especially in developing countries, planted on millions of acres, and broadcast unlabelled into the world's food supply. Research demonstrating that parts of these novel genes are invading the genomes of ancient wild species thousands of miles from where the genetically modified commercial varieties were originally planted is convincing. However, such research has been disputed by scientists-for-lease hired specifically for that purpose, funded by massive corporate grants to universities aimed at creating a new generation of researchers comfortable with producing "science" at the behest of corporate sponsors who fund whole university divisions and hire their graduates. Researchers who have revealed the accidental drift of laboratory genes have been denied professorships by budget committees in their departments⁴. An estimated 85,000 toxic materials are currently under manufacture while several thousand new ones are released each year - far beyond the ability of government labs to test in isolation, much less in the uncharted combinations by which people, the animals they eat, and other living things actually take them into their bodies. Many will remain in the environment - in the air, soil, oceans, well water, lakes - for millennia, or bioaccumulate upward into the food chains of people and endangered animals. "Remediation" of industrially and militarily toxified soil - in those few situations where money is available to dig it out instead of the less expensive and therefore more prevalent expedient of "capping" it with a coating of cement - consists in hauling it to dumping grounds where it remains indefinitely with its toxic elements largely intact.

Corporate globalization

If there is a free market - an "invisible hand" guiding the commerce that has caused such global disruption of resource systems - it is directed by a highly visible arm: international trade agreements instituted by industrialized nations since the latter days of World War II, embodied now in the World Trade Organization (WTO - formerly GATT, the General Agreement on Trades and Tariffs), the International Monetary Fund (IMF), and the World Bank. These eventually derived from a meeting of the world's leading corporate figures, economists, politicians, and bankers held at Bretton Woods, New Hampshire, in July of 1944 (*Cavanaugh* 18), where it was decided that the way to prevent future wars was to promote global economic development via a centralized global economic system. These organizations and their later expressions in the North America Free Trade Agreement (NAFTA) and the Free Trade Area of the Americas (FTAA) "engineer[ed] a power shift of stunning proportions, moving real economic and political power away from national, state, and local governments and communities toward unprecedented centralization of power for global corporations, bankers, and the global bureaucracies they helped create, at the expense of national sovereignty, community control, democracy, diversity, and the natural world." (18-19) It is a model designed to give precedence, over all else, to unlimited global corporate growth as a "value" superceding any opposing local values and is embodied in specific international accords whose signatories cede sovereignty in many areas, including those designed to support local environments and distinct cultures.⁵

⁴ "A petition signed by 114 professors from four countries calls for a UC Berkeley faculty investigation and a public accounting by the chancellor for denying tenure to an assistant professor . . . Ignacio Chapela . . . [who] believes his tenure denial is linked to his criticism of the university's ties to the biotech industry. . . The petition . . . asks Chancellor Robert Berdahl to explain why he "went against the recommendations of nearly 60 people involved in the tenure process." . . . Chapela and a graduate student published a disputed study in *Nature* saying genetically engineered corn had infiltrated native maize in Mexico." (*Burress*)

⁵ At the time of this writing in October of 2004, the Naga people of India are struggling to protect their culture from the disruption that will result if India succeeds in forcing them to allow vying US, Canadian, German, or French oil

[footnotes continued on next page]

UC Berkeley's professor of environmental history and philosophy Carolyn Merchant has called for an environmental ethic of partnership between men and women, people and nature - even new forms of dialog that provide representation for the "voice" of nature at planning meetings⁶ - as ways to replace court battles, shouting matches, deprecation and hubris with productive discussions and sustainable policies. (*Merchant – Earthcare, 212-223*) This ethic might bridge the dominant and often divisive environmental ethics she has identified, including the "egocentric" ethic that supports resource extraction for the benefit solely of an individual or narrowly defined enterprise; a "homocentric" ethic that treats nature purely as a set of "resources" for disposal as most benefits people, and even an "ecocentric" ethic that recognizes nature's rights yet may place them above the needs of people.

In many ways the Bretton Woods accords were initially an expression of a homocentric ethic. A guiding philosophy of the accords was that poor nations could become elevated to full participants in the world economy if the richer nations lent them money to create local enterprises. However, in general this philosophy failed, leaving weaker nations in such debt to more powerful ones that they were forced to submit to externally mandated "restructuring" – changes in their internal laws, policies, and ways of life – in exchange for being allowed to continue participation in a world economy to which loans had now made them dependent. This has resulted in what some have called a new, if initially unintended, form of colonialism. Despite at least some homocentric intentions, by and large the trade accord signatories and the corporations they sponsor seem to have expressed what Merchant identifies as "an egocentric ethic" where "what is good for the individual, or the corporation acting as an individual, is [considered] good for society as a whole" (*Merchant – Earthcare, 212-223*). We are conditioned to taking this ethic for granted, but like international trade accords themselves, it is not by accident that this ethic seems to have gained such power especially in the United States and industrialized nations. Corporations have worked with considerable deliberation to create a world ethos where they can successfully dominate the global landscape.

Multinational corporations have gone far beyond the use of mere advertising and Congressional lobbying to acquire public "mindshare". They no longer simply sell products, but also commercialization itself and the egocentric ethic as a way of life wherein the names of corporations have replaced those of cultural heroes on the lintels of ballpark entryways, the views from the windows of city buses and trains are often obscured by the advertising panels which cover them, and children receive the approval of parents and peers when they wear corporate labeled clothing that transforms their bodies into walking advertisements. (*Klein*) Shopping malls, unheard of a generation ago, now arguably provide better attended and more persuasive "learning" centers for children than ever more poorly funded public schools, while the average American spends several hours each day in front of television programs so saturated with commercial messages that in recent years, some form of corporate logo often appears continuously superimposed during the duration of a program. Shopping malls feature stores that are continuations of the virtual environments of television so that the experience of being a living, willing participant in a nonstop advertisement is at times nearly seamless.

NPS interpreters may or may not think much about the impact of corporations on the American mindset, but they must constantly work around the results. Just to point out a problem created by a

corporations to begin extracting the 85 million barrels of oil under their land - enough to supply India's own needs for less than a month while, Naga leaders understand, destroying forever the fabric of their culture by moving them off their land and dividing them culturally with offers of temporary personal wealth.

⁶ In Yosemite NP in July 2004, the NPS was allowing controlled burns in seven park areas at once. Despite their clear benefits to the park, none of the fires had been set by the NPS, but all were lightning-initiated. The NPS was thus able to explain to a public annoyed by the smoke that the fires were of "natural" origin. Whether or not the NPS had ever deliberated a partnership with nature, they were successfully applying it with an apparent policy something like: "Let nature start the fires, and we will control them to maintain the ecosystem and park facilities."

corporation - as relevant and essential as such an interpretation might be to providing citizens with a factually informed background enabling them to think critically about the preservation and protection of both local and global resources – can set off concerns or elicit blocking within the minds of people who have been under the tutelage of corporations at home, at school, in theaters and shopping malls for their entire lives. Such interpretations, however, may provide indispensable perspectives valuable in proportion to the difficulty of successfully and appropriately implementing them. Parks provide a temporary escape from commercialization, creating a uniquely safer space for such interpretations. As parks become increasingly privatized, spaces safe for interpreting the real causes of global unsustainability may become more rare.

The National Parks and the problem of global sustainability

"The endangered Kemp's ridley sea turtle recovery program underway here is all about global sustainability, or rather, a 'lack there of'. In some of the interpretive programs I present for visitors I liken the plight of the Kemp's ridley to a human victim of a mob beating. My analogy uses the premise that so many people are involved in the death of an individual during a mob attack it is difficult to determine who the real killer was. The demise of the world's sea turtle populations is similar in that virtually everyone has played a part in their diminishing numbers yet no one individual or group can be held entirely accountable."

- William "Buzz" Botts, Education Coordinator, Padre Island National Seashore

Among the major human-caused global sustainability issues that not only affect and are affected by the world at large (*Impacts*) but that also directly impact resources that NPS visitors desire to see interpreted at parks are global warming, habitat destruction, propagation of invasive species, loss of cultural and biological diversity, reduction of fresh water sources, proliferation of environmental toxins, and the observed and potential effects of modern warfare.

Concerned with forthcoming rises in sea levels as human-caused global warming melts the ice caps, the NPS is working with the United States Geological Survey to develop maps showing which coastal parks are most likely to be impacted along 7,500 miles of at-risk parks shoreline. (*Global Climate, Relative Coastal Vulnerability Assessment*). The NPS points out that at Glacier National Park "Global warming may make a mockery of our attempts in all nature reserves . . . to preserve natural communities and rare, threatened, and endangered native species." (*Biodiversity*) Melting glaciers and rising sea levels affect not only ecosystems - which may not be the insistent concern of most park visitors - but also the famous coral reefs, waterfalls, glaciers, beaches, wetlands, wildlife, giant trees, and even low-lying battlefields and monuments which visitors cross continents and oceans to enjoy in America's national parks.

Global warming is perhaps more usefully characterized as "global climate change," since warming is not the only predicted effect of human transformation of the atmosphere. The United Nations Intergovernmental Panel on Climate Change (*IPCC*) expects more extreme weather events in the future (*Climate Change 2001*). Rangers in Yosemite understand that over time they can expect more of the summer lightning that causes fires during the peak visitor season (*Kline*). One recent climate change model suggests that at some future point "despite enhancement of fire suppression efforts, the number of escaped fires (those exceeding initial containment limits) [will have] increased . . . 125% in the Sierra Nevada." (*Fried*) During my July 2004 visit to the park even necessary controlled burns

caused by lightning produced a number of burdens on staff, visitors, and concession employees.⁷ More uncontrolled fires mean even more difficulties in protecting and preserving parks.

The national and international consensus that global warming requires immediate action has in recent years become overwhelming. In an open letter to US Senators Frist and Daschle of October 1, 2003, one thousand environmental scientists from prominent institutions (including ecologist Dr. Sue A. Perry from Everglades National Park), most of them with doctoral degrees, issued a warning. According to “the consensus opinion of the scientific community . . . Even under mid-range emissions assumptions, the projected [human-caused] warming could cause substantial impacts in different regions of the U.S., including an increased likelihood of heavy and extreme precipitation events, exacerbated drought, and sea level rise.” Internationally, findings of the IPCC may be more worrisome to the park managements than to any other institutions. Among their concerns: “The frequency and magnitude of many extreme climate events increase even with a small temperature increase and will become greater at higher temperatures (high confidence). Extreme events include, for example, floods, soil moisture deficits, tropical and other storms, anomalous temperatures, and fires . . . Increases in extreme events can cause critical design or natural thresholds to be exceeded, beyond which the magnitude of impacts increases rapidly (high confidence).” (*Technical Report*).

People will differ on what they consider scientific fact. For decades after researchers demonstrated the health affects of tobacco, corporate executives sought to keep the issue “controversial” via strong relationships with media and the US Congress. As a result it took medical practitioners and health officials many years before the relationship between 400,000 annual deaths and tobacco consumption could be placed in the “fact” column for many citizens. Rachel Carson encountered similar resistance from the pesticide industry when she began revealing the effects of DDT⁸, and that same industry today is attempting to make controversial the growing scientific evidence of the toxic environmental affects of the ubiquitous pesticide atrozone (*Hermaphrodite*). When a subject of scientific enquiry is thus kept controversial by pragmatic means, it is more difficult to discuss it in a public non-advocacy setting such as a national park to an extent that discussing other global sustainability issues, such as invasive species or habitat fragmentation, is not. Whether it is your child who has taken up smoking, or your glacier or ecosystem that is endangered, effectively alerting the public to the problem can thus present a challenge, one which has been addressed with varying degrees of success by the NPS and its partners as I demonstrate in Chapter 2.

The United Nations Intergovernmental Panel on Climate Change devotes another publication to possibilities for mitigating the effects of global warming (*Climate Change 2001: Mitigation*). My thesis is inspired by a shared belief that if the public learns how their lives and decisions impact the

⁷ When controllable, these fires provide several benefits including renewal of fire-dependent ecosystems and reduction of fuel loads that otherwise threaten safety and property. But fires create problems as well. During my late July 2004 visit to Yosemite employees of concessions told me that smoke from numerous lightning-caused controlled burns had been bothering them greatly for over a week, and one said she was ready to quit her job. Rangers told me that visitors were often disappointed that they could not see the tops of famous cliffs and waterfalls. Mariposa county officials at some points nearly forced the NPS to extinguish fires when smoke particulate matter approached health hazard limits. Controlling the fires was extremely expensive in terms of personnel and aircraft. An Office of Fire Information was set up in the Park’s administrative headquarters, and special temporary signs were installed throughout the park wherever visitors might have concerns about smoke - all engaging scarce personnel resources during the peak visitor season.

⁸ Branch interpretation chief Mary Kline of Yosemite offers DDT as an example of a destructive human-created agent that she feels can be freely interpreted as a “bad idea” in parks today only because its dangers are now so widely accepted by the public. (*Kline*) During the period when pesticide companies were spending millions of public relations dollars to controversialize criticisms of their products as a defense against the research in Rachel Carson’s “Silent Spring”, parks would not have been able to interpret the negative environmental effects of DDT.

global systems on which they and their valued resources depend, their concern will call them to action and they will want to preserve those resources.

However, education may be just as valuable in preventing *overreaction* based on *exaggerated* concerns. Currently, the public appears to be under-informed about global issues, and in fact in the same recent years that scientific consensus has coalesced around the certainty that human-caused global warming is a looming problem, polls show that public concern for it has actually waned considerably ⁹. In Yosemite chief of education Kathy Dimont's experience so far, politicians at large "seem to laugh at it [global warming] - to think it's a 'sky is falling' type of argument." When GGNRA's cultural historian Paul Scolari was involved with the park's Big Lagoon restoration project at Muir Beach, he remembers that when a hydrological designer brought up the gradual rise in sea level due to global warming, the subject was approached "half tongue-in-cheek." So today in Kathy Dimont's Yosemite "we are not teaching anything" about global warming. ¹⁰

Under conceivable circumstances the pendulum could swing back the other way, and a sustainability issue – for example global warming - could become magnified in the public eye, as lurid scenarios of environmental destruction become grist for popular publications sustaining themselves - truthfully or not - by feeding on the public's escalating fears. The first science fiction disaster movie on global warming was released in May of 2004. (*Climate Flick*) Like all disaster movies it probably attained some of its popularity from a public disquiet that – as with the ship wrecks, plane crashes, and virus outbreaks that powered other movies of its genre – something like it might happen.

In August and September of 2004 the San Francisco Chronicle reported in its paper and on its website that recent scientific studies predict at least a tripling of heat-wave days and related deaths in San Francisco (*Hall*) and "extended heat waves in Los Angeles, disrupted ecosystems in the mountains and chaos in California's water-supply system." (*Global Warming Clouds*). National Geographic recently announced its 73-page September article on climate change with the bold cover headline, "GLOBAL WARNING." (*Appenzeller*) Among the possibilities and predictions its scientists extrapolate from currently measured trends: disappearance of the spectacular glaciers in Denali NP (25); displacement of a hundred million people as sea levels rise (28); drastic water shortages in heavily populated deserts including those of the US (31); a worldwide decline in amphibians (34); the disappearance of Antarctic Adelle penguins (39); bleaching and death of many coral reefs (44); the disappearance of sea ice (and with it polar bears) from Hudson Bay by 2070 (51); and an increase in global temperatures of

⁹Gallup poll: "How much do you personally worry about -- The "greenhouse effect" or global warming?"

	1989	1999	2004
	%		
A great deal	35.38	28.18	24.88
A fair amount	27.84	30.68	25.17
Only a little	17.80	23.55	28.66
Not at all	12.12	16.00	20.20

Compiled from the following Gallup Field Dates and Question Numbers, all of which asked the same question as given above: 1989 = 5/4/1989-5/7/1989 qn23g; 1999 = 3/12/1999-3/14/1999 qn31D; 2004 = 3/8/2004-3/11/2004 qn20e (*Gallup*).

¹⁰ Though in fact, during my July 2004 visit to Yosemite I attended a ranger-led hike around Yosemite's Hetch-Hetchy Reservoir. The ranger spoke to us about global warming and its possible impacts on the Tuolumne River, which fills the reservoir and continues on to supply San Francisco with its municipal drinking water. She might or might not have discussed it had I not previously asked her about global warming and interpretations.

2° to 5° Celsius (3.6° to 9° Fahrenheit) within the next hundred years (75). It hints at far more grim possibilities such as severe and permanent changes in climate based on historical changes that they have observed to occur over geological time.

Kathy Dimont has also been busy developing Wawona's Sierra Nevada Research Institute in Yosemite with atmospheric scientists from the University of California whom she characterizes as “frantic.” “They are terrified” over global warming, she reports (*Dimont*). Mary Kline, the park’s chief of non-person interpretation (media, exhibits, and signage) with 23 years experience in 9 national parks, notes that USGS data points and hydroclimatology studies in the park show spring arriving in the park three weeks earlier than in previous times. There is less snow and more rain, which in turn impacts water availability in the Central Valley and San Francisco. Summer rainstorms are more likely, along with more lightning strikes and the fires they cause. Climatological predictions for 2050, she finds “startling.” How will the public, with little background in environmental topics, react once it fully grasps the seriousness of global warming through popular media?

One of the principle predictions of global warming models is an increase in the number and severity of extreme weather events, such as hurricanes, droughts, and floods (*Appenzeller 21, Climate Change 2001: Impacts*). Once the public has global warming on its mind, aided by spectacular media coverage it may take catastrophic but anecdotal weather events as proof that climate change has suddenly arrived in their own neighborhood and now poses serious concerns - concerns which may rise to a level that politicians and corporations might choose to exploit. Ironically, NPS interpreters might then find themselves in a position where any resource interpretations that did *not* include direct admonitions about global sustainability - global warming at least - would be considered by the public to be “controversial” - the reverse of the general situation today in which parks staff often feel that addressing global warming would carry their interpretations uncomfortably into areas of speculation or advocacy. Increasing public concern with global warming may be worthy of consideration by parks currently planning exhibits and waysides that require significant lead-time and that will subsequently remain unchanged in place for many years.

Politicians are currently touting the benefits of a hypothetical “hydrogen economy”, in which hydrogen would replace fossil fuels in automobile engines to reduce urban pollution and slow global warming (*Hydrogen Economy*). Although hydrogen could be extracted from fossil hydrocarbons, it is more likely that it would be produced at centralized facilities that would generate electrical power to rip apart water molecules into the oxygen and hydrogen atoms of which they are composed, imparting to them potential energy. The atoms eventually would be recombined inside automobile engines as an emission of very clean water vapor, in the process releasing heat to power the engine. A hydrogen economy would require massive new investment in generating facilities to rip apart enough water molecules. It would slow global warming only if these new power plants did not burn fossil fuels. Given time and good sense, industrial economies could transition from the current preponderance of oil, coal¹¹, and natural gas generating facilities – all of which contribute massively to global warming – to new renewable sources. Some combination of biomass, wind, and solar powered generation – along with far greater vehicle efficiency and changes in lifestyles - could power our cars through this hydrogen economy. This is every environmental educator’s ideal outcome, to which I hope interpretations for global sustainability in national parks might contribute.

¹¹ According to estimates oil reserves will be sufficient for many decades to come, while coal, which is more toxic and a bigger contributor to green house gases, will remain available for centuries beyond. (*World Energy Reserves*).

On the other hand, if people panic over global warming, Americans might decide to resume development of their problematic nuclear industry to implement this hydrogen economy rapidly, or some other economy based on replacing fossil fuels with new forms of electrically derived vehicular power. Nuclear plants are expensive but they seem to possess the essential qualifications for mainstream American industrial development projects: highly centralized, well connected to big industrial and military suppliers, blessed with a track record for attracting huge governmental subsidies and for receiving favorable treatment by consumer rate regulators, and easy to calculate in terms of output per facility. Historically, America has supported large centralized projects over collective solutions such as wind farms, roof-installed solar systems, and demand reduction. If fears of losing the nation's water and ecosystems due to climate change were to become so fired by pundits and by industries eager to build these facilities that they overcame concerns over nuclear terrorism, the multi-thousand year storage requirements of radioactive byproducts, and the warming of local riparian and tidal areas from plant coolants, the nation might decide to reawaken its hibernating nuclear development programs to produce the vast amounts of electricity needed in turn to produce hydrogen. Such a proliferation of nuclear plants is probably not the outcome that most environmental educators desire. Widely educating the public on global climate change earlier rather than later could help forestall such a misstep or other possible overreactions, and parks enrolled in interpreting global sustainability would thus facilitate pragmatic, proactive rather than reactive attitudes.

By understanding how and why people visit parks both in person and through media outreach, we will be better prepared to consider how these impacts and choices can be interpreted meaningfully for their consideration.

The audience for interpretations in national parks

The NPS itself goes to some effort to understand its audience in aggregate, and attempts to count the number of people who visit its parks each year. But what can be counted as a visit? Yosemite NP's visitors pass through discrete gateways, as do those visiting the GGNRA's Alcatraz island and its Muir Woods reserve. But the vast majority of visits to many parks, including those to the geographically complex and diffuse 75,000 acre urban GGNRA, can only be estimated by counting the number of people driving past fixed locations in the park. Howard Levitt, chief of interpretation for the GGNRA, puts the number of visitors in the park at about 20 million per year, but the number who have contact with staff at perhaps 3.5 to 5 million. George Su, the park's media specialist, states that his NPS website received 3.3 million hits, that he produced and distributed 325,000 publications, and that some tens of thousands of people looked into or became volunteers there last year.

Webmasters like to measure activity on their sites by the number of pages that have been browsed by "visitors." But it is difficult to assess the educational impact of a page being displayed on a computer during a browsing session. Web page visits are often extremely brief and probably impact the visitor little compared to face-to-face live interpretations by staff at parks.

The NPS maintains a vast and relatively open website with links to all of its parks, to studies and entire books, and even to many of its own internal documents such as Director's Orders and management plans. Many people may assume that whatever page they browse on the nps.gov internet domain must reflect NPS perspectives, but this may be only partially true. In this thesis I have assumed that NPS content on its park-specific websites reflects the interpretations visitors will experience when they actually visit those parks. The nps.gov web publishes many documents apparently more as discussion points than as representatives of NPS perspectives. Still, by placing a document on nps.gov, the NPS invests it with some degree of institutional acceptance and at least a presumption of relevancy, and I have assumed this when quoting pages of the NPS website.

How many people learn something in national parks? I know of no estimate of how many people read interpretive signs in parks, nor of how many are repeating their visits with such regularity that they have ceased learning anything new in parks with which they have become familiar. Mary Kline, division chief for non-person interpretation (media and exhibits) at Yosemite, philosophically estimates the number of learners there at somewhere between the few hundred who are surveyed in the park each year and its total attendance of 4 million! More realistically, in fiscal year 2003, 53,700 people received (and supposedly read from) Yosemite publications; 1,675 attended programs; 7,000 local urban youth were visited by traveling outreach vans; and in all personal contacts were made in some form with 1.8 million people.

Various NPS spokespeople provide numbers like 250 million or 400 million annual visits to NPS sites which include national parks, recreation areas, preserves, seashores, lakeshores, rivers, parkways, trails, monuments, memorials, cemeteries, battlefields, historic sites, and historical parks, plus affiliated areas and other designations. (*Designation*) Some individuals believe that visitors to parks are intent mostly on recreation; others, that visitors chose National Parks as vacation destinations because the programs, historical and natural features, museums and interpretations within them offer educational experiences unavailable at other vacation destinations. Certainly many private and public schools visit parks for experiences that are expressly educational.

Parks provide extensive outreach into surrounding urban communities. Hundreds of buses of public school children are brought into both Yosemite and the GGNRA each year for anything from loosely structured outdoor romps to highly structured and curriculum-focused park "classroom" experiences. Christy Rocca, director of GGNRA's Crissy Field Center, puts the number of visitors to the building at 54,000 per year - most of whom probably engage in some form of learning. The nonprofit Yosemite Institute provides structured outdoor science learning experiences to 13,500 school children at Yosemite (and several times that if you include their work at other national parks) each year. Responses from other national parks indicate that both informal and structured learning experiences occur there in similar proportions.

NPS educators also refer to a sort of outreach ripple effect which can be incidental or designed into a program. One way the NPS actualizes its policy of encouraging "non-traditional" park users - non-white and lower income communities - to visit Yosemite is to bring urban youth from Fresno, Mariposa and other local communities into the park on classroom excursions, then to give them free passes granting their entire families a return visit to the park free of the \$20 entry fee. When Yosemite's education chief Kathy Dimont succeeds in convincing one child from a traditionally large clan-based Hmong family in Fresno that the park is there for her enjoyment and stewardship, the child in turn may encourage her family and others in the community to experience the park. Dimont sees an exponential educational outreach that is much greater than immediate numbers might indicate. She has encouraged young people to serve as interns in the park, and over a number of years some have become the first individuals in their families to attend college via participation in park-based programs. When she encourages migrant labor classrooms to attend parks and learn lessons of stewardship, others in their communities are affected for the first time.

NPS staff in general exhibit a passion to infect the public with their message of preserving and protecting national resources in parks, and they sometimes reach out in creative ways. About ten years ago Corky Mayo, NPS chief of interpretation, helped set up a Junior Ranger program that urban kids could read about on the back of their cereal boxes. Thousands of kids each sent in a box top to one of ten major national parks to initiate a pen-pal relationship with NPS staff there. Rangers wrote each kid back, and a few of those correspondences continue today.

In the GGNRA and Yosemite no first-time visitor would be able to drive, walk, cycle, or sail far without reading information signs or maps which unavoidably provide messages of historical and

natural conservation, beginning with the naming of features considered significant by the interpretive staff who develop them: "Old Fort Chapel"; "Redwoods Loop Trail"; "Toxic Soil Removal Site" and so forth.

Perhaps it would be safest to say that significant educational contacts between visitors and the staff and exhibits at NPS sites occur tens to hundreds of millions of times each year, and that the depth and transformative affect of these contacts varies from casual to deep.¹²

My thesis assumes that millions of national park visitors can receive messages about the need to act for global sustainability, and that they are in a position to take political and economic action. If NPS efforts to include new communities are successful, it might seem that the proportion of the higher income white demographic with its propensity toward high participation in the political process and representation on corporate boards may be reduced by the inclusion of people with less ability to affect the social changes needed to reverse the destruction of global resources. On the other hand, there may simply be more people of all levels of influence in the parks. The NPS diversity outreach is premised on the idea that communities of color will wield an increasing proportion of the political and economic power needed to sustain parks in the United States in coming decades. If so, educating the new communities about global sustainability will be one key factor in keeping ecosystems, agriculture, and lifestyle-enhancing levels of economic activity functioning, as well as key natural and even cultural features of national parks.¹³

An interesting aspect of the new urban communities is that they often bring with them into the parks less exposure to traditional conservation and environmental values than traditional park visitors. This means that they will bring fresh minds into the process of developing interpretations, presenting NPS educators and park partners with opportunities to rethink the meanings of parks and environmentalism along with the educational methods and messages by which they are addressed¹⁴. The perspectives of the new communities are urban, and they may be well disposed to help shape the requisite new relationship between people and parks as growing urban areas embrace ever more closely the boundaries of formerly "isolated" parks.

¹² Very little research appears to have been undertaken on the extent to which a park visit creates new learning in visitors; this might be remedied by adding a few questions to the survey deployed yearly by the NPS to assess visitor responses on other issues, and would yield information of use to park interpretive staff.

¹³ According to Curt Gaul, Supervisory Park Ranger at Colonial National Historical Park in Virginia, Congress allocated \$3 million at Jamestown to stabilize sections of the island's shoreline against erosion due to rising ocean levels. Interpretations at the park do not currently link this rise to global warming which must be at least some part of its cause. Robert K. Sutton, Superintendent of Manassas National Battlefield Park in Virginia, maintains the historical appearance of the park's 5,000 acres through techniques that also sustain the local wetlands and provide refuge for migratory birds as well as local song birds that were historically present but are now nearly extinct in the area. Many parks fight to maintain historical parcels that are threatened by commercial development, noise pollution, acid rain, and many other artifacts of the global economy.

¹⁴ Yosemite Institute Director of Education Moose Mutlow in Yosemite and interpretive ranger Cidney Webster in the GGNRA both report on limited attempts to accommodate the camping needs of Hispanic and Hmong families – both of whom prefer extended family campouts that required enlarged group campsites. Sequoia NP, unlike Yosemite, has accommodate their needs. Neither park has apparently responded to Hmong and Pacific Islander requests to harvest edible fern shoots and other plants within the parks, even though the harvesting for personal consumption by the general public of other natural resources such as fish and berries has long been allowed in many national parks.

Conclusion

By raising opaque walls of abundance around their own communities, the world's most powerful people have blinded themselves to the resource impacts which in the process they have created, endangering the unseen people of their own future and of other communities – human and otherwise – which are already deeply affected beyond their view. Collectively as corporations and governments, acting from a highly promoted ethic of grasping magnified by powerful international accords, they irreversibly transform complex living systems into short-lived monocultures, and human communities into labor resources, throughout the world. Their natural resource transformations, in particular, have powerful impacts on the sustainability of important resources in national parks. How have parks provided interpretations informing their visitors of the source and nature of the globalized impacts that reduce their own and their parks' sustainability?

Chapter 2: Interpreting Global Sustainability

A rich cross-section of alert citizens enter the gates of national parks ready to learn from the extensive and popular educational facilities and the living contexts which the NPS and its partners have developed and preserved over decades. NPS and partner staff have always addressed this audience's potential for helping preserve park resources through interpretive development. Many parks now recognize that "interpreting the resource" is most engaging to the public and helpful in protecting local resources when it explicitly demonstrates the connection between local and global sustainability. They have developed their interpretive practices and exhibits accordingly, even at sites whose initial enabling legislation requires them to interpret primarily historical resources.

Through a variety of traditional and innovative methods these parks address a wide range of global sustainability problems including national over-consumption and the forms of multinational commerce and militarism that encourage it; threats to native communities, biodiversity, and whole ecosystems; global warming and the shrinkage of glaciers and wetlands; disappearance of ancient forests; accumulation of human toxins in air, water, and soil especially in unequal distributions that affect environmental justice; destruction of sea life through coral bleaching and oil spills; and alternatives leading to sustainability including an ethic of addressing nature as life rather than as a set of resources. They provide successful and flexible models for interpreting global sustainability that can be replicated at other sites. At the same time, other parks have overlooked obvious possibilities for interpreting global sustainability, often due to staff resourcing priorities or shortages.

Interpretations by the NPS

Presenting facts on global sustainability at Jefferson National Expansion Memorial in St. Louis, Missouri reveals how the park's enabling legislation supports interpretations of local resources that help to contextualize the problem of global warming. Elixia Kunz's banners interpret them with explicit, succinct and non-technical language: "The Greenhouse Effect, or global warming, is the build-up of gases trapping a certain kind of heat (or infrared radiation) near the Earth's surface."
(*Kunz*)

She and her educators have overcome what other parks accept as barriers to interpreting global sustainability (see Chapter 3) through several techniques. First, they use a temporary exhibit – in this case four 16 foot by 11-½ foot banners – perhaps chosen because it offers the benefits of temporary exhibits that I describe in Chapter 5. Second, following the admonitions of most NPS interpreters who responded to my surveys, they provide statements of well established fact, rather than opinions.

A "fact" need not be some exact and self-evident number. In ecosystem science, a fact is often represented by a range of probabilities based on established science. For example, some may quibble with the range of global daily species extinctions given on one of Kunz's banner - "from 5 to 50" – and say it is low compared to the 75 per day theorized by prominent ecologist E. O. Wilson, a featured presenter at the NPS's Discovery 2000 national conference (*E.O. Wilson*). But all who study global sustainability and conservation recognize that species do disappear every day; that for important reasons the number can never be established with precision; and that the number is probably within a range such as Kunz has provided. By staying with facts Kunz's team also follows another NPS interpretive principle commonly mentioned by my correspondents when she adds: "No one is told what to do. The items are there to provoke thought so people can make their own informed decisions."

Her banner topics are exceptional in that they explicitly interpret global sustainability and/or the sustainability impacts of the United States, and demonstrate the range of topics that she feels are appropriate to interpret in a national park: acid rain, tree planting as a means of reducing carbon dioxide buildup, wind power as a renewable energy source, the 2.7 billion pounds of pesticides introduced by the US into the environment each year; the fact that an acre of timber disappears in the US each second, that "Global population growth occurs at 1.7% per year, while the world's cars multiply by almost 5% yearly," that the globe adds 93 million more people each year, that "Over half of the world's wetlands have been lost in the past century" and that "The United States has 5% of the Earth's population and consumes nearly 30% of the world's economic output." Stating specific ways that the United States creates problems is apparently not seen as an infringement on the visitor's prerogative to form her own opinion. The banners also steer clear of politics by listing well known *actions* of the United States rather than its *policies*.

The interpretive exhibits at Jefferson also suggest that showing Americans ways to improve the actions of the country they are proud of may be an acceptable alternative to simply suggesting that they as isolated individuals should change their habits to increase sustainability¹⁵. Most interpretations at parks seem to take the more timid approach of either suggesting that visitors act individually rather than collectively as a nation, or simply make no suggestions at all on the theory that good interpretations should describe resource problems but not possible responses to them. Given the constant feedback that interpreters receive, it is likely that the differences in approach may stem from the differences between audiences from park to park, but several of my respondents claimed that decisions by the local park superintendent made a big difference in how interpretations were formed.

Interpreting problems provides the opportunity to highlight individuals and institutions that provide positive solutions. In the context of each set of environmental problems, these same banners specifically call out cultural and environmental protections provided by national parks – protection of sacred Indian sites at Chaco Culture National Historical Park, the re-meandering of the Kissimmee River and the creation of detoxifying marshes at Everglades NP, and the protection of ancient trees in Sequoia NP.

Jefferson, like many other historical NPs, has determined that the history of America's people is intimately tied to the history of America's environment, and that changes observed in one help explain and provide context for changes to the other. As Elisa Kunz puts it, "This park is basically historical. By infusing a connection with the natural environment, it can bring a more complete view of the 19th century continental exploration."

With similar logic, Bent's Old Fort National Historic Site in La Junta, Colorado interprets the relationship between cultural exchanges among the many diverse cultures along the border between the US and Mexico on the one hand, and changes to ecosystems which are at once both local and transnational on the other. Staff interpret the major impact of the fur trade and Santa Fe trade during the first half of the 19th century on the native environment and native peoples since "Bent's Old Fort . . . was involved with international industries and early examples of multi-national commerce, which today continue to transform the lives of human beings around the world." (*Wallner*) Their website describes a 19th century "expanding trade empire" (*Bent's Old Fort*), language very similar to that used by analysts of today's US multinational corporatism. However, if Bent's is like other parks, staff

¹⁵ "In the US, the Keep America Beautiful campaign (KAB) is industry's most organized proponent of the belief that individual irresponsibility is at the root of pollution. About 200 companies . . . fund KAB to the tune of \$2 million a year . . . KAB's message to consumers is that *they* are responsible . . . and that they must solve this problem by changing their habits." (*Stauber* 132)

probably find it more appropriate to interpret impacts to cultures and ecosystems that occurred in the past than they do to provide intellectual and emotional links to similar impacts on local resources by corporate empires today.

Yellowstone NP's Long Range Interpretive Plan lists as one of its primary interpretive themes "Natural Resource Preservation" whereby "The Greater Yellowstone Ecosystem preserves a world-renowned biological reserve with a gene pool that includes rare and endangered species. Yellowstone preserves biological processes and ecosystems as well as living things and their surroundings. Threats to resources are not limited by park boundaries. For example, migratory species require healthy habitats and protection as far away as Central America and the Arctic tundra; exotic species from around the world have invaded the park and now compete with native species; global warming could alter climate and shift habitats." (*Yellowstone Long Range*)

The park's "Resources & Issues Handbook" reminds visitors that there are "few places remaining on Earth where we can not only preserve but study such ecological completeness." It argues for management of a large ecosystem extending beyond park boundaries and into Canada "to ensure the long-term survival of wildlife in the Northern Rockies from the Greater Yellowstone Ecosystem to the Yukon Highlands—a distance of 1,900 miles." (*Yellowstone Resources* 34) Also, "Yellowstone is an active participant in the Western Working Group of Partners in Flight, an international effort to protect migrant land birds in the Americas, because more than 100 bird species spend the winter in Mexico and Central America. There, they are threatened by loss of habitat, pesticide use, and increasing human development and pressure." (111) It argues that "As global biodiversity declines, national parks and other preserves become increasingly important as sources of genetic diversity for scientific study as well as products that may benefit humanity." (139) Going far beyond traditional local interpretation, in October of 2003 Yellowstone hosted its Seventh Biennial Conference on the Greater Yellowstone Ecosystem "to generate, in non-technical language, a publicly oriented discussion of issues that draw together national parks in the Greater Yellowstone and East Africa" and "consider the interdependence of both nature-society relations and natural and cultural history in local and global contexts." (*Seventh Biennial Conference*)

Warm water sea coasts are particularly susceptible to global impacts on their ecosystems, and parks located on them raise public understanding of their fragility through appropriate interpretations. Gary Bremen interprets coral bleaching in Florida's Biscayne NP by explaining that ocean warming is often its cause, then letting visitors figure out the connection to global warming themselves – which, he says, they usually do. This illustrates that the flexibility of live interpreters to adjust to particular audiences gives them far greater ability to lead people to understandings than "canned" media like waysides and even well developed multimedia, which have no awareness of whom they are addressing.

Cherry Payne's staff interprets a broad range of global sustainability effects that locally impact the Everglades and Dry Tortugas National Parks - invasive exotics, fisheries, boat groundings, the 40% of world shipping that passes the park and the transcontinental migration of critical bird populations that nest in it. A new theme of their current GMP is that "The Dry Tortugas is a fragile ecosystem that is influenced by global, regional, and local activities."

Currently, despite the importance of global effects to the park's fragile and globally dependent natural resources, interpretations with an explicit global perspective await implementation of their just-completed Comprehensive Interpretive Plan for Dry Tortugas. Interpretations have focused regionally rather than globally in part to increase awareness of Everglade's critical dependence on the upstream development and/or restoration which impacts the availability of water to sustain the wetlands which constitute the park – effects that depend on local understanding and policies. Yet Everglade NP's designation as a Wetland of International Importance, a World Biosphere Reserve, and a World

Heritage Site – each of which must have required a great deal of effort to obtain – provide an ample prelude to reinforcing and adding interest to local understandings by interpreting global ones.

Scientists studying global warming at Hawai`i Volcanoes National Park collaborated with the Public Broadcasting Service to produce a highly accessible mini-documentary to inform the public about the impacts of global warming on beautiful native birds. Hopefully, many thousands of people viewed it as a news segment on PBS and are viewing it today on PBS’s website. (*Online News Hour*) This demonstrates that park sites can literally “broadcast” an interpretation of global sustainability given appropriate partners and circumstances. At the same time, I find it notable that the segment is not shown to visitors on the island, where its messages would have great impact and appropriately interpret the local park resources. According to Mardie Lane, several scientific teams on the island not only research sustainability of the fragile ecosystem and many endangered species but also interpret to the public, including the U.S. Geological Survey Biological Resources Division, the U.S. Forest Service, and scientists from Stanford University.

Gulf Islands National Seashore in Mississippi and Florida encourages visitors and local residents to help protect migratory species which include monarch butterflies, sea turtles, and birds including Least terns, snowy plovers, and black skimmers. By placing seasonal barriers and other physical restrictions on activities in the park that might disrupt nesting, they provide the public with very tangible reference to species fragility. Interpreters discuss conditions in Mexico that affect butterfly wintering grounds. But, their emphasis is on simple acts of avoiding nesting areas, and it is not clear if they relate the sensitivity of nesting grounds there to extinctions caused by the loss of vast habits throughout the world, or to the political and economic factors that drive those losses.

One National Seashore hosts symposia that inform the public about the impacts of global warming on sea level rise near salt marshes. Reducing personal consumption of energy is suggested as a way to mitigate those losses. (*attribution withheld*).

Enabling legislation for Alaska’s Klondike Gold Rush NHP asks it to preserve historical structures and trails, but in addition Sandy Snell and her team follow their new General Management plan under which they will begin to interpret the great diversity of natural communities within the Skagway and Taiya river valleys and how these have affected human use over time. Part of their new work will be to interpret globally-related sustainability issues like the melting of glaciers – whose resultant sediment deposition has raised the level of the Dyea historic town site area by several feet over the last century – and particulate releases from cruise ships and tourist trains which have caused dramatic changes to vegetation in this most diverse area of southeast Alaska.

Timothy Manns and his interpreters at Ross Lake National Recreation Area, North Cascades National Park and Lake Chelan National Recreation Area in Washington draw visitors’ attention to the effects of global climate change on the combined parks’ 316 glaciers and the importance of glaciers to the water requirements of salmon, people, and other species. They discuss lake habitat contamination from air pollution caused by human activities upwind and draw some connections between these impacts and the lifestyles of visitors, but apparently not to the historical role of state citizens in granting and revoking the charters of corporations according to whether or not they serve local interests.

At South Carolina’s Congaree National Park, Fran Rametta and the interpretive staff provide guided programs about the declines of migratory and herpetological species, and conduct census programs that involve the public in butterfly protection – all of which are discussed within a global context. “Visitors are informed that loss of habitat and pollutants are contributing towards species decline,” she states.

Lia Vella and the other interpreters at Oregon’s John Day Fossil Beds NM address climate change over geological time as a basic narrative of the park, and tell visitors that “climate and life are

intrinsically linked and ever changing.” As far as modern climatology, “It’s up to the individual park rangers to choose whether or not to make a connection to the impact of human activity on ecosystems.”

An exhibit at Muir Woods NM in the GGNRA with its famous giant redwood trees provides one of the clearest fixed interpretations of global sustainability that I observed or heard about. A boardwalk circle intercepts the path of all of the park's 4 million annual visitors shortly after entering the park, and displays small live plantings of different redwood trees native to several continents. In the middle of the exhibit a large wayside reads: "It is probable that today human activity plays a role in the current rapid progress of global warming. Scientists estimate that a three to four degree increase in global temperature could eliminate the cool, moist coastal zone in California. What, then, might the future hold for Coast Redwoods?" According to Mia Monroe, a primary purpose of the exhibit is to acknowledge to the park's many foreign visitors the significance of their own home countries, and to encourage them to carry the ecological messages of the park to their own homes. The exhibit also resonates with the interpretation of an important event in the park's history on May 19, 1945 when delegates to the signing of the United Nations charter came to visit the park. The wayside commemorating that event features a 1955 quote from UN Secretary-General Dag Hammarskjöld: "Persons who love nature find a common basis for understanding people of other countries, since the love of nature is universal among men of all nations." The park's website provides a spiritual "global connection" when it quotes its patron philosopher John Muir: "When we try to pick out anything by itself, we find it hitched to everything else in the universe." Taken together the park's interpretations integrate the ecology of fascinating local resources, global sustainability, and world peace. According to Mia, Muir Woods may also be the one site in the GGNRA where ecological destruction by a corporation may be part of interpretive conversations with visitors: the continuing destruction of old growth redwood forests in Humboldt County, California in an accelerated and often illegal manner by the Maxxam Lumber Company. (*Maxxam*)

Kenilworth Park and Aquatic Gardens in Washington DC “is the only National Park Service site devoted to the propagation and display of aquatic plants” (*Kenilworth*). According to Kate Bucco, “As a wetland park, and with the global destruction of wetland, we can’t not include this topic.” (*Bucco*)

One NP in the mountains interprets air quality and its connection to distant source pollution, water quality and its relationship to acid rain, forest health impacts of air quality, acid deposition, and the introduction of exotic pests, and impacts on biological diversity due to global changes. These are brought to the public through publications, ranger-led programs, electronic media, and citizen science projects that engage all ages, including middle and high-school students who participate in service learning projects. (*attribution withheld*).

Interpretations by park partners

Non-profit organizations that develop environmental education programs locate themselves in or near parks to take advantage of natural and staff resources that can assist them in their mission. I am particularly familiar with the programs at Crissy Field Center in the GGNRA where I have worked for several years. Live animal demonstrations often provide the context for successful and popular discussions of global sustainability, like the family-oriented presentations on bats which feature them live while the presenter explains their value and habitat protection requirements worldwide. An evening presentation and discussion of genetically modified organisms mass produced by the Monsanto corporation, along with the problems caused by their global distribution, attracted a large audience of activist-oriented individuals. The 2004 Goldman Environmental Prize winner discussed her Louisiana community's fight against nearby toxic releases by the Shell corporation's chemical refinery. A program on healthy food and agriculture discussed the sector's contribution to global

warming and pesticides, and how organic alternatives could offer better health for people and environments. Popular movies with global environmental themes were presented in a topical series.

Crissy Field Center is unique in combining staff from both the NPS and a cooperating organization in its operations, so its programs may bear a bit more of an “official” NPS imprimatur than those of NPS partner sites which typically operate much more independently. I have not significantly researched other GGNRA partners.

From browsing their website (*Welcome*), the Gulf of the Farallones Marine Sanctuary Association in the GGNRA does provide a curriculum on oil spills and mentions the large number of ships that transit the bay, but it is not clear that it critiques global shipping for delivering invasive salt water organisms, the dangers posed by transiting nuclear submarines, or any of the direct human impacts of the shipping industry in filling the bay and creating asthmatic levels of truck diesel pollution for children near shipping ports. If they mention the 47,800 barrels of radioactive waste near the Farallones or the policies that brought them there, it was not immediately clear from a scan of their website. Perhaps, like the NPS, they tend to reserve discussion of such controversial topics to person-to-person programs. Among the three organizations which provide by far the largest individual contributions to Gulf of the Farallones (*FY2003 Annual Report*) is the National Parks Foundation (*Proud Partners*) – which, as I discuss more fully in Chapter 4, is a conduit for corporate contributions from Ford – who is totally dependent on the oil tankers that cruise through the Sanctuary – and Time-Warner, the global media giant whose income is derived from selling whatever sails by on container ships. The point is not that Gulf of the Farallones Marine Sanctuary is corrupt but that park partners, like the NPS itself, may experience major constraints in interpreting the actual sources of impacts that effect the resources they want to protect through education. Some NPS staff feel that partners are freer than the NPS to interpret political and corporate effects, but as I indicate later in Chapter 4, even they are likely to experience real constraints in what they can present even to an open audience.

Slide Ranch in the GGNRA (*Slide Ranch*) is frequently mentioned by local NPS staff as a partner in education who uses a hands-on organic farming environment to educate around global sustainability. According to the mission statement on their website, “Every bite of food connects us to the soil, sun, water, and air, and to the people who work to feed us. Slide Ranch teaches respect and responsibility for sustaining these connections.” Volunteering their “provides a chance to spend meditative, relaxing time with plants and the earth.” All participants “are encouraged to consider their interdependence with other living creatures, and their role and responsibilities as humans.” A sweat lodge and fire circle are available for group use. In many ways they offer a bodily and spiritual experience of connection to the earth itself, in which essential resources are experienced and enjoyed in context rather than commoditized and de-localized. The contrast they create to the corporate-generated world just outside their facility is huge and deliberate, and it is likely that by generating the message on such a sensory level it is deeply received – whether or not they explicitly inform visitors that much of the world’s people still live close to the earth in this way but are being pushed into unsustainable sweatshop manufacturing by corporate globalization.

Missed opportunities for interpretations

By taking advantage of specific situations for interpreting global sustainability, these sites provide clear contrasts with sites where such situations are not actualized. I have identified three circumstances which seem to prevail where this interpretive opportunity is neglected: a disconnect between resources and sustainability impacts; a disconnect between scientists and interpreters; and a shortage of trained interpretive personnel.

While many parks – even historical ones – draw relationships between local events and larger sustainability issues, in others a disconnect exists between local resources and global (and even local)

sustainability. Many either simply have not progressed to the development of sustainability interpretations or prefer not to allocate their resources in that effort. Whiskeytown National Recreation Area's ecologist Jennifer Gibson is familiar with the parks "astounding biodiversity," the impacts of diminishing water quality and availability, and the park's importance to migratory birds and threatened species – yet the park provides very little interpretation on them so far. Its enabling legislature is forty years old, and reflects old-style interpretations of the NPS mission, in this case enjoining the park to conserve "scenic, scientific, historic and other values contributing to public enjoyment of such lands and waters . . ." Whiskeytown does not seem to have moved as far forward as Yosemite and other parks which have "recognized that whenever a park is charged with protecting scenery it's a factor of the age in which the park was set aside, and that it should include all the things that that park would be set aside for now." (*Kline*)

Minuteman Missile NHS in South Dakota is required by its enabling legislation to "interpret the historic role . . . as a key component of America's strategic commitment to preserve world peace." (*Herberger*) Such a mission could be the start of a larger interpretation of why an increasing number of nations maintain nuclear weapons systems and what the potential affects of their use is to human culture and ecosystems; what happens to discarded nuclear material; and other global implications of nuclear weapons. The narrow focus and recent establishment (1999) of this park's enabling legislation suggest that interpretations on the global sustainability of nuclear armaments will not be forthcoming in the park any time soon. Similar constraints to providing extensive interpretations on sensitive topics are discussed elsewhere in Chapter 3.

Missed opportunities for interpreting global climate change at Yosemite were dramatized in the Introduction. Glacier Point hosts a particularly apt site for such an interpretation – its beautiful open rock-walled "Geology Hut" overlooking vistas of Yosemite Valley and its river and waterfalls. The Hut interprets the Valley as change: "Anchored in granite, the scene before you appears permanent, fixed as a photograph. Yet landscapes, like time, are in constant flux." It asks visitors to look beyond what they can see before them – beyond the immediate resource – and to understand it over time. The Hut exhibit could interpret discoveries of the ongoing park-wide hydrological studies and Sierra-wide scientific research programs that report changes that are affecting tangible aspects of the resource visitors experience from this view point – those caused by human-induced global climate change.

A second major limitation of the NPS for interpreting global sustainability is the disconnect between science and interpretation. Where scientists may focus almost exclusively on broad ecological implications – of climate change, for example – NPS interpretive staff engage the public by focusing on "interpreting the resource" – the most obvious historical and scenic elements that are sought by visitors. Powerful scientific studies at parks are sometimes little interpreted to park visitors, though some parks encourage their scientific personnel to present findings to staff, the public, and interns¹⁶.

Scientists - especially those performing research at national parks - who want to expose their findings to an audience beyond academic circles and directly affect the opinions of the public should describe and model impacts not only on ecosystems, which are little known to visitors, but also on famous scenery - for example, the glaciers of parks like Glacier, Kenai Fjords, Klondike Gold Rush Historical, North Cascades, and Olympic NPs whose reduction can be readily interpreted to visitors, and the waterfalls of Yosemite whose scenic fullness is a constant concern for visitors and concessionaires and is being affected by climate change.

¹⁶ Kathy Dimont will try to convince the new environmental scientists who are hired for her Sierra Nevada Research Institute at Yosemite NP to schedule presentations to her youth interns as part of their regular work.

Thirdly the NPS lacks interpretive rangers. Park visitors expect to meet rangers and hear their talks. Although multimedia like Yosemite's "Spirit of Yosemite" movie provide emotionally powerful educational experiences, as "one size fits all" interpretations they, like websites and waysides, do not engage visitors as flexibly as one-on-one interactions with knowledgeable staff who are trained in interpreting for the public. In Muir Woods, waysides are specifically designed as take-off points for flexible interactions between interpretive staff and visitors. For each wayside, a comprehensive set of interpretations has been developed over time and collected in a binder whose contents are taught to regular and interning staff. Interpreters are then able to engage visitors of diverse ages and backgrounds with informed responses chosen extemporaneously from a variety of well considered perspectives. A visitor who comes to the park to stare at magnificent trees may take home an understanding of ecosystem sustainability because a ranger knew how to take her from her initial interest to a broader understanding of the resource – including some of the political and corporate issues involved – and how she can help preserve and protect it.

Rangers quickly develop new interpretations to suit opportunities as they emerge, and work constantly with partners, schools, and new communities on a local level and with each other on a national level to produce effective and authentic educational experiences. Laying off interpretive staff and funding fewer trainee interns may be the surest ways to reduce the ability of parks to provide transformative learning experiences for visitors in all areas, especially understandings of global sustainability which they will need to protect the resources of parks as well as the rest of the world. Transmitting these understandings requires sensitive conversational approaches that cannot be delivered via fixed media.

Conclusion

Of the parks that responded to my survey, a small but increasing¹⁷ number, especially those dedicated to protecting resources sensitive to ecological disturbance, expand and contextualize local interpretations of environmental sustainability by providing visitors with linkages to global factors. Of those, fewer still - perhaps only Jefferson National Expansion Memorial - meaningfully interpret current collective impacts of the United States, while among the slightly greater number who do suggest that visitors might reevaluate their own impacts, most suggest that citizens might act as individuals rather than collectively or nationally. Perhaps surprisingly, some parks established for historical preservation and recreation have become major interpreters of at least local natural resource sustainability.

Many clear opportunities for increasing public awareness of global conservation and impacts to help in the protection of park resources have not yet been seized. Scientists in parks often fail to communicate their findings about sustainability to the public in ways they can grasp (with notable exceptions), while critical person-to-person interpretations are becoming less available as ranger staff is reduced. But beyond the neglect of a few clearly outstanding opportunities and connections, why is it that throughout the national park system, global interpretations on sustainability appear so limited and constrained? This is the question which I next address.

¹⁷ "Increasing" because several replied that they are planning and/or have obtained significant funding for new interpretative programs and exhibits that discuss global sustainability.

Chapter 3: Constraints to Interpreting Global Sustainability

Argue for your limitations, and sure enough, they're yours.
- author Richard Bach

The over 400 national park sites in the United States receive, in aggregate, roughly the equivalent of one visit per US citizen per year. The public - as individuals, collectivized interests, legislative bodies, and corporations – all have vested interests in affecting the sensibilities of this enormous audience. NPS and partner staff must work within the powerful constraints imposed by these stakeholders and by their own historical mandates, physical circumstances, and economic realities as they attempt to preserve resources amidst changing scientific understandings and political climates.

The NPS is a Federal agency

"All agencies of the Federal Government shall recognize the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment."

- a section of the US National Environmental Policy Act of 1969 (NEPA) of which, to my knowledge, NPS interpreters are never made aware.

What the public learns about their world while visiting an NPS site is constrained and shaped by the agency's status as a Federal agency. Though the agency's Washington DC, Harper's Ferry, and regional headquarters actually have limited control over how NPS facilities are used by the public¹⁸ and how interpretations are shaped at individual parks, they can and do influence them.

In June and July of 2004, US media carried numerous stories describing the large relative cutbacks in funding for the NPS and its field staff (*LA Times*). In my interviews I investigated the simultaneous media claim that NPS site officials were "gagged" on the subject of budgetary reductions and received a mixed but somewhat consistent response. Site officials may speak of specifics - for example, Mary Kline, a senior administrator¹⁹ at Yosemite, can tell me openly that the park's staff of government-paid seasonal rangers was reduced to one for the current summer. The Chief of Interpretation at Everglades²⁰ can tell me that staff reductions have cut her winter interpretive services from 120 to 20. But both are probably prohibited from discussing NPS budgeting in general, and, according to other NPS site officials, would put their jobs at risk if they should do so. NPS budgets are publicly available on their

¹⁸ Throughout the 75,000 acres of the GGNRA, the frequently posted NPS restriction against walking dogs off-leash is, from my observations, routinely ignored and essentially unenforceable even in areas posted for the presence of endangered species. Congress has frequently added additional park sites for the NPS to manage, without providing resources and staff for managing the public in them (*Ridenour*).

¹⁹ Mary Kline is currently branch chief of interpretation for non-personal services (exhibits, waysides, internet, etc) at Yosemite NP, and was formerly Branch Chief of Interpretation for personal services managing a staff of 28 interpretive rangers. She has served the NPS for 23 years.

²⁰ Cherry Payne, Chief of Interpretation & Visitor Services, Everglades & Dry Tortugas National Parks

website (*Justification*), but staff are not allowed to engage the public with general discussions of their impacts or sufficiency.

Kline says this restriction represents an application of a general NPS interpretive principle: present clear facts, not supposition or advocacy. Still, other interpretations engage visitors in forming intellectual connections to events in their parks, to consider the whys and wherefores of human actions, so to some extent the NPS budget stands out as a specifically taboo subject. Several senior people at NPS and partnering non-profit conservation organizations have informed me privately that the current Presidential administration (Bush, 2001 - 2004) is exceptionally inclined to fire or transfer outspoken NPS officials who might publicly examine policy issues. Some parks staff would only discuss such straight-forward facts as staff reduction counts and percentage reductions in retirement benefits anonymously, for fear of negative consequences.

However, neither the current nor past presidential administrations appear to make any effort to affect the public interpretation of most topics within parks. And in general, even the NPS's own administration in Washington, DC, its several regional headquarters, and its interpretive center in Harpers' Ferry seem to have quite limited impact on what or how topics are interpreted at sites. Park site officials usually agree that their interpretations are based on the mission of the NPS, the Congressional enabling legislation of their particular site, the work of local staff in consultation with external professional experts and local community members, and only to a much lesser degree, initiatives that are handed down from Washington. And those initiatives are often developed in response to the concerns of local site interpretation staff.

I'm personally aware of limitations on ones' ability to simply present what seems factual and relevant when educating the public within a national park. For several years I have maintained an interactive message board exhibit at the joint NPS/non-profit Crissy Field Center where I work in the GGNRA. It is my responsibility to periodically post an article of environmental interest in a highly visible area where visitors are asked to respond on written cards. Because I listen to scientists who say that the world's resources are being rapidly reduced to a level which will not sustain either humans or other living beings, I often present not only articles immediately relevant to our own park's survival but also those that highlight the national and global scale at which such local problems as ours aggregate, and at which they need to be addressed. Sometimes I post articles from major media that reference the roles of the entities who have effects at that scale – governments and corporations – and which often examine specific policy choices and actions. Once or twice a year one of the articles has to be removed from the exhibit during a visit by a national official or corporate grantor in order to avoid offending an important friend or sidetracking the development of important conversations during the visit. I've also found that if the topics I post too directly criticize the actions of an elected administration, the reactions from the public sometimes spin out into a referendum on an elected official rather than a discussion of the critical environmental policy which the article is intended to address.

Similarly, NPS interpreters sometimes tip-toe around controversial topics to avoid overwhelming, with political debate, any opportunities to educate.

Crissy Field Center is a new experiment within the parks - a direct collaboration between the NPS and a cooperating association, the Golden Gate National Parks Conservancy. Our on-site staff consists of both Conservancy employees (of whom I am one) and uniformed NPS interpretive rangers. The message board and some of our programs - especially those developed by youth from underserved communities - test the envelope of what most NPS sites would consider appropriate for visitor

messages.²¹ In my experience, the Center is generally able to post newspaper articles that fairly consider the impacts of specific governmental policies, or even criticize them outright while providing counterpoint in support. Our interactive exhibit may be a fairly unique and new context within the NPS to interpret the major affecters of global environmental outcomes amongst which certainly are the United States, specific presidential administrations, and corporations.

Nationalism versus self criticism

The US, as the world's one remaining economic and military superpower, bears great responsibility for the reduction of global sustainability caused by its huge support of industrialism and consumerism. It is impossible to fully interpret global sustainability without in some way referencing impacts of the US, its multinational corporations, its citizens, and its international trade and domestic policies. When I asked several interviewees if NPS interpreters are free to criticize US actions, all responded that they are largely restricted from doing so. Many respondents defended a non-critical approach in general on the theory that education works best when it does not point a finger of blame, but instead provides facts and allows the public to form its own conclusions. However, it is also the case that the NPS is so much in the public eye that it must not only avoid placing blame, but sometimes avoid presenting facts simply because they might incur controversial reactions, even if they would provide a more comprehensive and thought-provoking interpretation.

Major wars, and nuclear war especially, represent perhaps the greatest of all threats to global sustainability. Warfare exacerbates those destructive tendencies of industrial nations which prevail even under the pressure of simple economic competition: short-term goal setting, purely pragmatic understanding of living things and even people as "resources," and in general, re-active decision making based on fear rather than on a broad, inclusive, and sustaining pro-active vision. A senior NPS official at a memorial site suggested to me that "'peace' is ultimately a critical element of any conservation effort and issues involving the sustainability of global resources. Even a victor in a war may fail to implement conservation as they prepare for and hold onto what was won." (*attribution withheld*) Scenarios of global nuclear war, even when devised by the most pragmatic thinkers, appear so beyond the realm of our experience that they may seem as fiction. But among those envisioned are a "nuclear winter" in which so much of the world's forested areas burn that the constant smoke erases summer for a season, causing global extinctions on a massive scale and destroying agriculture in a world whose peoples are too decimated to address the new problems. The NPS's historic military sites *should* provide an opportunity to interpret the relationship of warfare to global sustainability along with the critical role that the United States plays in the global conflict and geopolitics that impact it.

The Congressional enabling legislation for Superintendent Herberger's Minuteman NHP asks him to interpret America's use of nuclear defenses to preserve peace in the context of the Cold War, yet he points out that "global sustainability is not yet on our radar screen." The Nike Missile Site in the GGNRA has been wonderfully restored over the years by the painstaking work of volunteers, many of whom originally manned the defensive installation near San Francisco when it operated during the Cold War. The historic technology of the installation is fascinating to visitors who learn of nuclear tipped intercept missiles that were to be guided by mechanical computers engaging far less computational power than today's average wrist watch. Because those volunteers interpret mostly this gear, to some people it seems like an opportunity foregone to engage the park public with the

²¹ The NPS sees currently underserved communities and especially their youth are the future of the parks. If a propensity to criticize "business as usual" is a hallmark of the new communities, the next decade may see parks becoming more activist unless privatization overcomes them.

meanings of war and nuclear conflict and proliferation, including their devastating potential impacts on the global sustainability of cultures, their resources, and other living things.

Why are seemingly ideal opportunities to critically interpret US nuclear arsenals and the importance of maintaining peaceful international relations generally foregone at the loss of many excellent opportunities to understand major potential impacts on local and global sustainability? Part of the reason is nationalism and the way it has been expressed by Americans through their parks.

Parks, war memorials, battlefields, peace parks, monuments, historical sites, recreation areas, scenic rivers, and trail systems are established from time to time by the United States Congress (or by the President in the case of monuments) and placed under the management of the NPS as repositories for Americans' collective identity: America as internationally unique scenic splendor, as the home of indigenous peoples past and current, as the remembrance of sons and daughters who died, as collections of unique living things, as places to play under the protection of the national flag. This can be read explicitly in the 68-year-old mission statement of the NPS, in the enabling legislation of each site, and in independent histories written about the discussions which surrounded the establishment of NPS sites. (*Runte, Dilsaver*)

Although Americans visit national parks in large part to learn about their nation's history and living systems, they also desire – and sometimes demand – to be inspired about its contributions to the world. Public interest groups such as veterans' organizations and historical societies organize themselves as politically effective watchdogs over park interpretations. They encourage parks and their partners to portray a nation - including its military in which they have served and the corporations for which they work – as having positive impacts on the world. Can the NPS, this keeper of the American consciousness, also interpret the misdeeds of the nation, its military, and its corporations, or even factually represent at all American deeds whose discussion might lead to controversy? I see three conditions under which nationalistic sensibilities act to constrain the interpretation of global impacts: a lack of historical distancing, distrust or dismissal of “foreign” nations, and perceptions of geographic isolation.

Events that reflect negatively on the American character can be and are interpreted in appropriate detail at parks if they are historically distant, while events that occurred within the living memory of a significant constituency tend to be whitewashed. The contrast between the interpretability of historically remote versus more recent events is nowhere more apparent, and perhaps nowhere more consequential in determining public awareness of potential sustainability impacts, than in the interpretation of warfare. Nineteenth century massacres of Indian peoples live in a past sufficiently remote (at least from a non-Indian perspective) that they can be reported in detail, including a precise count of bodies and ethnicities and the names of official and uniformed American perpetrators, on a number of NPS websites without apparently drowning officials in angry deluges of emails and phone calls.²² But the US bombings of Hiroshima and Nagasaki occurred during the living memories of US veterans. One can find NPS sites that do enumerate the people killed by US atomic bombs in Japan, but also ones using sanitized references such as "The crew of the Enola Gay [which dropped an atomic bomb on Hiroshima] proved that an atomic bomb could be used under combat conditions" on a page

22 For example, at NPS's *A History of American Indians in California (A History)* "Bloody Island derives its name from the Clear Lake [California] Massacre of 1850 in which Captain Nathaniel Lyon, accompanied by soldiers and local White volunteers, invaded the island and killed 60 of the 400 Indians who had taken refuge there. Another 75 Indians were killed on the Russian River nearby. The soldiers killed a total of 135 Indians, while two White men were wounded. The Indians fled to the island in an attempt to save themselves after five Indians had killed two White men."

(*Wendover*) which omits any mention that people were killed by it. Looking again at the distant past, an NPS site that interprets the European and American slave trade states that "Overall, at least twelve million Africans . . . were kidnapped, sold into slavery in Africa and shipped to the Americas from 1450 to 1850 . . . Perhaps one-third of all kidnapped Africans perished before being forced onboard a slave vessel, and perhaps another third died on the voyage across the Atlantic." If this page were as sanitized as the Hiroshima interpretation it might simply state that Africans were given passage to America and began working here. Most people would feel that the salient aspects of the Middle Passage were being ignored – woefully – and one could say the same of the *Enola Gay* web page.

Neither the Indian nor the Hiroshima nor the slavery interpretations trespass beyond the facts to pass moral judgment on the perpetrators, but the interpretations of Indian massacres and slavery provide more complete historical statements – allowed to be told more completely perhaps, as interpretive staff have suggested to me, because a) they occurred in the distant past and b) the extent of the misdeeds are widely acknowledged by now. In 2004 there are no significant remaining defenders of Indian suppression or slavery as an institution around to deny or bemoan interpretive details, but there are many who defend the atomic bombings - which occurred during the living memory of many Americans - as beneficial acts which saved the lives of both Americans and Japanese.

It may be argued that African Americans and American Indians form active NPS constituencies whose influence may have been more decisive in assuring rounded historical interpretations than the mere fact of historical distancing. However, despite a significant constituency within the United States that strongly desires to daylight a more complete story of the atomic bombings, it has had little effect in producing more complete interpretations. In the controversy surrounding the installation of the *Enola Gay* exhibit at the Smithsonian Institute's National Air and Space Museum, the defenders of interpreting the effects of its bombs simply lost out to those who objected. After working with historians and veterans groups for years to develop a historically accurate interpretation of the effects of airplanes on warfare, Museum Director Martin Harwitt resigned when veterans' groups lined up 81 Congress people to force him out after he attempted to construct an informative exhibit on the impact of the *Enola Gay*'s successful mission to drop atomic bombs on Japanese cities. (*Former Smithsonian*) Veteran's of WWII, large numbers of whom are still among the living, censor historical interpretations in ways that long dead US veterans of the Civil War or of Indian wars do not.

According to Minuteman National Historic Park's web site which interprets the Cold War, "The devastation caused on 6 August 1945 at Hiroshima and 9 August 1945 at Nagasaki led the world to fear an atomic war." (*Minuteman*) Since the fear engendered by the bombings in Japan is thus seen as critical to interpreting the Cold War, some mention of the thousands of deaths in Japanese cities and that they were not simply "caused" but were - like Indian massacres and African slavery of long ago - engineered by historically specific decisions and actors, would have provided additional depth and context, and told us why those events led Americans to fear a global nuclear war. It would also have stirred uncomfortable controversy among those who, still living, participated in those bombings and in the wider context of WWII itself.

Most discussions of Hiroshima on NPS websites mention it almost in passing from the perspective of living US veterans as a mission that is usually characterized, without discussion, as having directly resulted in the end of hostilities between the US and Japan, an assumption that is disputed by historians²³ but appreciated by Americans. Often no mention is made of casualties in the city, despite

²³ The argument that dropping the atomic bombs on Japan ended the war is based on the assumption that the war would not have ended as quickly or as favorably to the United States without it. Some of the best known

[footnotes continued on next page]

their enormity and their importance in determining critical modes of confrontation and decisions made in the Cold War decades following, and contrary to NPS official guidelines for interpreting the historical event.²⁴

The NPS web makes available a contrasting article from the Desert Research Institute in Las Vegas. It concerns itself with a structure dubbed the "Japanese Village" built in the Nevada nuclear testing grounds to enable an international study of radiation effects. The article does not avoid a body count: "The death toll has been estimated at more than 200,000 between the two cities. Additional deaths within five years added another 130,000, with many more victims suffering long-term radiation effects." It goes so far as to point out that "The tragic loss of life and long-term health effects suffered by the survivors of the Hiroshima and Nagasaki bombings are perhaps the main reason that an all-out nuclear exchange never occurred during the Cold War." This provides a clear, emotionally and intellectually tangible link between the Hiroshima and Nagasaki "missions" on the one hand and the reluctance of governments to initiate nuclear exchanges during the Cold War on the other - a link that is much less explicit in the Minuteman NHP's attempt to interpret the Cold War.

GGNRA regional education chief Mia Monroe has more than considered how meaningful interpretations might engage a wider public at the Nike anti-nuclear missile site. Already she trains NPS interpretive interns to guide visitors beyond discussions of payloads and trajectories and to help them reflect on what it really would have meant to "save" the US from a Soviet attack with a nuclear intercept missile so designed that it would most likely have also destroyed San Francisco in the attempt.

A second effect preventing full interpretation of national impacts on sustainability is the American distrust or dismissal of "foreign" nations. Moose Mutlow believes that American children come to his environmental education classes in Yosemite with inordinate fears toward people who hold viewpoints different from those of their own families and communities. Compared to young people from other countries whom he has taught, "They've generally been conditioned to be frightened," he says.²⁵ Field staff from another park report that "a few local residents have opposed our inclusion of global references, because they believe that the United Nations is involved in a conspiracy to take over private land under the guise of International Biosphere Parks." (*attribution withheld*)

deconstructions of this assumption have been presented by Gar Alperovitz. Some of his arguments plus pointers to many related historical documents can be found at <http://www.doug-long.com>.

²⁴ NPS Guidelines for Evaluating and Documenting Historical Aviation Properties (*Guidelines*) suggest the following information for this date in aviation history: "1945 On August 6, at 8:15 A.M. (Japanese time) an American B-29, the Enola Gay, dropped an atomic bomb on the Japanese city and military base of Hiroshima. The bomb, with an explosive force of 20,000 tons of TNT, destroyed over four square miles of the city and killed or injured over 160,000 people. Three days later, an atomic bomb was dropped on the Japanese city and naval base of Nagasaki. On August 14th, the Japanese accepted the Allies terms of surrender." This seems more objective than local interpretations that appear at some NPS military historical web sites because unlike those, it does not gratuitously assume a causal connection between the bombs and the end of the war, and it specifically enumerates the staggering death toll.

²⁵ Moose has "worked in a lot of countries - I worked in So. Africa at the end of apartheid. I've seen full-on revolution. I've never been in an environment where the fear around speaking the truth has ever been so profound as it is right now [July 2004] in the United States because it's termed unpatriotic. . . The strength of images that young people come in with [from family experiences] of good and bad and right and wrong - I've never seen them so defined and so unwilling to move. We have seventh and eighth graders from one environment from Northern California - rural background - predominantly white - they'll kind of want to let it [environmentalism] go by, understandably. Then you'll get this liberal, private, affluent day school that'll come with a completely different agenda. Then you'll get this L.A. group that comes up with a totally different agenda. Now I see more camps because people are fearful. They've generally been conditioned to be frightened." (*Mutlow*)

The United States is one of the few industrialized nations which has generally refused to become signatory to international accords such as those on climate change, use of land mines, and enforcement of human rights actions against military personnel in world courts. The government has often withheld membership dues to the United Nations, and Congressional leaders express their disgust whenever that body criticizes a United States action. The current Presidential administration (Bush 2001-2004) has greatly restricted participation in international conservation efforts notably by the NPS. Distrust of the intentions of the world beyond the United States seems strong enough to encourage resistance to actions that suggest alliance or cooperation with other nations, especially if they do not provide a clear and immediate benefit to the United States and enhance or at least support its presumed status of preeminence.

Interestingly, this distrust has had little effect on the development of truly powerful international accords as represented by the World Trade Organization, the World Bank, and NAFTA, in large part because the United States has been successful in convincing citizens that these bodies protect its interests over those of other nations. However, in some cases major investments by foreign governments in US interests may be concealed or downplayed by United States corporations with which they cooperate through advertising and via ownership of major media outlets, to prevent domestic concern. So in effect, US citizens are told that humanitarian and environmental accords with other nations will limit their freedom, while economic accords will promote them. This mindset increases the difficulty of interpreting the negative global environmental impacts of corporations and the difficulty of suggesting the possible benefits of international cooperation in the solution of environmental problems.

Geographic isolation of their nation, real or perceived, is a third effect that may make Americans less amenable to considering their environments in a global context. Europeans established an American identity as they gradually broke from their European sponsors in the 17th and 18th centuries. Eventually a new nation spread to occupy an Atlantic to Pacific section of the North American continent embracing 3,618,770 square miles (*Water Science*), several major mountain ranges, and biomes ranging from desert to tundra, grasslands to rainforests (*North American*). The very size of the United States and its ocean boundaries have often allowed a false sense of isolation which has been breached only by extreme events like the attacks on Pearl Harbor or the World Trade Center, by the responses of its economic system to world conditions, and, occasionally, by concerns over global environmental impacts like the atmospheric dispersion of debris from above-ground atomic testing and the Chernobyl nuclear power plant explosion, and dust storms crossing from the overgrazed steppes of Asia to America's west coast. While conservationists in smaller European nations easily understand that biological resources cross borders, Americans have tended to believe that their conservation issues could be contained within the political boundaries of their continent-sized nation, especially in the historical period before large-scale industrial emissions made cross-border affects evident to more American environmentalists.

National parks located at national boundaries where visitors are aware of their connections to other nations tend more to interpret conservation from an international perspective. Boundary parks whose interpretations of global sustainability I discussed in Chapter 2 include Bent's Old Fort HNS near the border with Mexico; Biscayne NP, Everglade NP and Dry Tortugas NP in South Florida; Gulf Islands NS in South Florida and coastal Mississippi; Hawai'i Volcanoes NP in the middle of the Pacific; Ross Lake NRA and Yellowstone NP near the Canadian border.

While well-conceived interpretations can and do move visitors to consider the responsibilities they bear as members of a nation for impacts and threats to global sustainability, current park constituencies concerned with defending their past actions, along with a prevailing sense of political and geographical isolation, discourage interpreters from providing visitors with well-rounded and

essential interpretations on the impacts of America, its military, and its corporations on global sustainability.

The “advocacy line”

“Interpreters are responsible for presenting factual information to visitors based on current scientific research and are not allowed to present their own opinions or the opinions of other groups.” (*Helmich*)

A visitor to a national park does not expect to be harangued or proselytized, especially by rangers. She expects to receive interesting stories and information about the park and its resources, but not to be told how to vote or what size car to drive, even if such choices might affect global warming.

According to Cherry Payne of Everglades NP, “as a federal public service agency, we are not advocates for any one position . . . our job is to talk about issues and concerns that challenge parks, and to present the facts - but, visitors make their own choices as to whether or not they want to engage in advocacy activities” (*Payne*). But in pursuit of the mission in Rocky Mountain NP, “Sometimes action is suggested (more efficient cars, fuel reduction in our forests, etc), but again not in a confrontational manner. Personal opinion of the interpreter is never appropriate.” (*Frederick*)

Still, NPS staff must somehow express their basic mission to preserve and protect their historical and natural resources, and their extended mission to welcome both old and new communities to parks. In many ways they are active advocates, emphasizing as part of their programs and waysides the fragility and needs of the plants, animals, ecosystems, skies, rivers, historical buildings, battlefields, and even pollution-affected neighborhoods within and sometimes beyond the boundaries of their parks. If a ranger were asked whether he thought it better to destroy the park’s resources or to preserve them, he would seldom tell a visitor that both choices are valid – unless a bill were pending in Congress to destroy park resources, in which case he would be required to refrain from taking a position. I believe it is possible that if a large corporation used its resources successfully to convince the public that destroying park resources was their civic and moral duty (to create industrial parks for jobs, create housing, etc.), then protecting and preserving the park resources would be withdrawn behind the “advocacy line” and, like the deaths of children from the atomic bombings of Japan, become too controversial to interpret.

One way that sustainability can be interpreted in parks without crossing the advocacy line has been suggested by the GGNRA’s Mia Monroe. The voice of John Muir is historically and environmentally central to her Muir Woods NP interpretive program. By interpreting his life of advocacy and inscribing his quotes on waysides, environmental advocacy is represented to visitors without requiring rangers themselves to assume the position of advocates.

NPS officials pointed out to me that the NPS chooses which organizations may hold leases to buildings on its sites. It can and does at times choose leaseholders who advocate global sustainability. As I point out elsewhere, however, NPS staff may have an exaggerated view of how unrestricted these non-profit organizations are in interpreting global sustainability, since many rely to a large extent on funding from large corporations that cultivate a public conditioned to overlook their disregard for the sustainability of the earth’s resources and human communities.

Many of my survey respondents expressed the belief that drawing the line against advocacy tightly enough to remove conclusions of any kind from interpretations enables visitors to learn in the best way possible - by drawing their own conclusions. But few respondents offered actual incidents of visitors doing so. Sometimes educators referred to an “aha” moment: a self-realized epiphany, an experience of learning that is exceptional and impactful because it appears to oneself *from* oneself, rather than

being imposed from outside. When I visited San Mateo County's wonderfully conceived Coyote Point Museum, I watched a small family traversing ramps which switch-backed in such a way that they were led from lively displays describing individual California ecosystems, to panels explaining how humans impact them. The father held his little girl's hand as he read to his wife from one panel, "Did you know it says here that the United States with less than 6 percent of the world's population uses nearly 30% of the world's resources and produces about one-half of the world's pollution?" It sounded like an "aha" moment to me, derived I believe from his sense of the credibility of the Museum's presentations, an *external* source of authority. Even though the dots had been connected for him, I believe he still experienced it as a personal revelation.

Controversy and interpretation

Controversy over issues can threaten to overwhelm the email boxes and telephones of already pressed NPS interpretive and management staff. They can and do receive hate messages when they control wildlife to the disapproval of animal rights' advocates or fail to interpret military memorials to the liking of veterans. Staff approach controversial topics in many ways, but always with some caution and with a "soft" approach emphasizing facts already widely accepted by the general public and de-emphasizing or even proscribing "personal opinion" – which may sometimes refer to accurate information which happens to be disputed by some interest, like the scientific consensus that much of global warming is caused by humans. As a result, their interpretations are subject to manipulation by political organizations that succeed in creating controversies over issues in the public mind.

A very senior officer of a major NPS partner privately puts it this way: "As with many federal agencies, the NPS is very cautious about an arena that could be considered politically loaded in any way. It will go at [interpreting the impacts of US policies and corporations] obliquely. At the Grand Canyon, you can hear about air quality problems caused by power plants. I guess that's why there are conservation associations that take on the advocacy and activist role." However, even an "independent" partner such as the Yosemite Institute has significant dependence on Congressional and corporate funding. Four years ago according to education director Moose Mutlow, Yosemite National Institutes received a \$1.8 million Federal appropriation. Critical support was provided by "Slate Gordon, a conservative right wing rural power based Senator from Washington." Mutlow is certain that such grants do not affect the Institute's programming content - and in fact he points to Gordon's support as a positive indication that the Institute reaches diverse constituencies - but from the outside, it is hard to imagine that such grants and the political affiliations of their grantors have no constraining effect. The effects of money on interpretations are further addressed in Chapter 4.

Sites readily interpret regional and global effects of water pollution and invasive species even when they cannot be directly observed, and even though their real impacts for the most part cannot be quantified. There are no significant economic or political vested interests who are harmed by acknowledging these impacts, therefore there is no argument – no controversy is generated over these impacts - and they are widely interpreted in parks. On the other hand, although the general process of global warming has for years been understood by the national and international scientific communities as a certainty, "free market" advocates aided by corporate-sponsored "think tanks" and political champions of industry have challenged it because they believe action to remediate it would threaten the short-term economic priorities that maintain corporate competitiveness. They have transformed the scientific fact of global warming into a controversy, and this has made it more difficult for parks to interpret.

The scientific community may bear some responsibility for allowing controversy over global sustainability. It has tended to define "facts" as those observations which can be repeatably demonstrated under controlled laboratory conditions. On large scales such as the planetary ecosystem, the most certain of occurrences can never be explained in the same precise way, so the scientific

explanations of events on a global scale may be perceived by the public as hesitant. It is up to scientists to educate the public - to use terminology that conveys the same level of factuality to large-scale observations made outside of laboratories as to those made under controlled conditions – to reduce the burden of controversy on interpreters and educators.

“Interpret the resource”

Park visitors expect to learn about what they see within the park, so interpretations are designed to connect them to the objects and processes before them. It makes little sense to talk about Nike missiles to visitors standing beneath a giant Sequoia in Yosemite’s Mariposa Glade. Rangers and park partners repeatedly emphasized to me that they must “interpret the resource.”

When GGNRA educator Roxy Farwell²⁶ works with communities to develop programs about the geological formations at the Marin Headlands and not about something else it is because "the resources are here. They are NP resources and have been designated as nationally significant. You don't change the resources and make them invisible and ignore some to meet educational standards [of local schools]. They are here. We can't change the park story. We can't change the story of the resource, that's self-evident, that's there."

But even local resources have extension beyond the physical and temporal borders of the park. In parks such as Yosemite and the GGNRA’s Muir Woods, many wayside signs extend the visitor’s frame of reference from the immediate present to one spanning thousands of years. A visitor can touch a tree that has stood there, she is told, long before the founding of the United States. The spectacular granite cliffs of Yosemite, visitors learn, were created by glaciers long before even the first people came to the valley. These unusual and tangible experiences of trans-political timescales may expand visitors perspectives beyond the usual boundaries by which they experience natural systems, even though they are based on the local resource.

Similarly, most parks that preserve natural resources provide geological and biome-based interpretations that contextualize local resources trans-nationally, though seldom explicitly. That is, they speak of natural processes that operate universally. However, it appears quite rare for waysides to suggest that human actions produce effects on these scales that influence global sustainability, or even specifically to mention that the ecosystem processes they interpret – for example plant succession - occur throughout the world just as they do in the local park.

Enabling legislation

National parks are created not by the NPS, but by Congressional legislation (except for monuments, which are created by Presidential decree). According to almost every one of my respondents, a park's enabling legislation is second only to the mission of the NPS itself in shaping interpretations within the park. While rangers say that they interpret resources which are "inherent" or "found within" the park, it is the enabling legislation that indicates which are the salient ones. When Roxy Farwell speaks about "the resource" in the GGNRA it is true that it may be "self-evident", but she also indicates that Congress has made some selections when they "designated [certain resources] as nationally significant" in drafting the park's enabling legislation, which therefore effectively directs visitors to those aspects of the park not only through influencing its choice of interpretations, but through developing physical access – roads, turnouts, and so on.

²⁶ Roxy Farwell, education specialist for the Marin Headlands in the GGNRA

Yet, for a park's interpretations to remain relevant enough to elicit the intellectual and emotional responses by which all interpretive staff seek to connect people to parks, even its enabling legislation needs to be brought up to date occasionally. Parks are not solely about scenery and its preservation today as they were when Yosemite was set aside from private ownership in 1876, or even later in 1916 when a Congressional Organic Act gave birth to the National Park Service. A famously quoted portion of the Act enjoins the agency that its "purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."²⁷ It also stipulates that the Director of the NPS shall receive a salary of \$4,500. When the Act was written, no-one had heard of ecosystems or of \$500,000 condominiums. Parks do some translating of the Act today, asking what conservation means to the public today, and what a \$4,500 salary is in today's dollars. Few of the parks' natural resource staff today are asked to prioritize the preservation of scenery over that of the ecosystems – if only local ones – in which functioning communities of plants and animals are preserved. Moreover, in the words of the current director of the NPS, "the NPS functions in a complex global environment unforeseen by the framers of the 1916 NPS Organic Act." (*Director's Order #13a*)

During my July 2004 visit to Yosemite, the vistas in the valley were greatly reduced by the smoke from natural fires that park officials allowed to burn, not only to keep the park safe from future catastrophic fires that would result if fuel were allowed to accumulate, but also to preserve plant communities that required the fires in order to propagate. The visitor's enjoyment of scenery - apparently the top priority of the 1916 Act and arguably so in the establishment of earlier parks (*Ridenour*) - was certainly being sacrificed in favor of long term ecological benefits. Visitor access today is commonly restricted in many national parks to protect natural resources, if not to the extent that conservationists would prefer. For example, on Alcatraz Island in the GGNRA visitors are prohibited from a large area of the island from February to October during bird mating season. In some parks light and loud sounds are seasonally reduced to avoid harassing mating pairs.

In designing interpretations for Yosemite, Mary Kline must deal with the park's outdated enabling legislation. Written in the 1890's, it identifies recreation and scenic enjoyment as Yosemite's chief reasons for existing.²⁸ According to Kline, the priorities of today's Yosemite differ from those stated in its enabling legislation. "This park has unique Sierra Nevada ecosystem components which are elevated somewhat [in our park's mission of protecting and preserving resources] because so few of them are left - such as the riparian water way along the Merced, and higher alpine lakes. There just aren't that many that are protected anymore." Yet, the park's enabling legislation says nothing about ecosystems. Speaking for the NPS generally she says that "We recognized that whenever a park is charged with protecting scenery it's a factor of the age in which the park was set aside, and that it should include all the things that that park would be set aside for now. So we take a current ecological and historical and cultural look at it and say, 'These are the things that make it significant in addition to the scenery.' And these things contribute to the scenery." De facto revision of enabling legislation is

²⁷ In fact Mia Monroe of the GGNRA may be only a bit ahead of other NPS interpreters in seeing the Act itself through more modern eyes when she observes that it does not confine "future generations" to people alone – it may certainly refer to future generations of animals and plants as well, who should thus be allowed to enjoy the parks in perpetuity.

²⁸ "Three separate legislative acts form the enabling statutes for the current Yosemite National Park. On June 30, 1864, Congress granted to the State of California the Yosemite Valley and Mariposa Grove of Big Trees to 'be held for public use, resort, and recreation.' On October 1, 1890, Congress set aside Yosemite National Park as a 'forest reservation' to preserve the 'curiosities' and 'wonders' in their natural condition." (*Merced River Plan*)

not unique to Yosemite, since Kline has observed a similar process in others of the 9 national parks she has worked in.

Parks are still largely concerned with connecting visitors - millions, in the case of Yosemite - to resources that need to be protected, often ironically in the form of tourism that impacts those very resources. But the age when parks were strictly about scenery has long been supplanted by one focusing on ecosystems that is highly interpreted throughout Yosemite, even in its 1960's-vintage Visitor Center exhibits²⁹. Mary Kline's planned revitalization of these exhibits so that they interpret the effects of global warming on the park's waterfalls and Mia Monroe's cautionary wayside in the GGNRA's popular Muir Woods site tying survival of giant trees to human-caused global climate change hopefully herald a new phase of interpretation in which global factors will be understood to be as critical to protecting and preserving natural and cultural resources as regional and local ones.

Enabling legislation for Jefferson National Expansion Memorial requires it to interpret America's westward movement³⁰. Elisa Kunz, the park's director of education, interprets the environmental impacts that accompanied it. "As a park, our goal was to have people engage in a different look at the westward expansion movement. This park is basically historical. By infusing a connection with the natural environment, it can bring a more complete view of the 19th century continental exploration." And certainly, major changes in ecosystems are historical artifacts – so much so that in recent decades environmental history has distinguished itself as a major academic field. The wall-size eco-banners Kunz has developed interpret the dramatic impacts of western expansion on "Air," "Water," "Land," and "People," and emphasize the increasing environmental impacts as the United States has continued its expansion - now in terms of economic and political power - beyond the boundaries of the continent and across the world. "The world loses between 3 and 50 species a day," reads the text of one; "The United States has 5% of the Earth's population and consumes nearly 30% of the world's economic output," reads another.

Chuck Sayon of American Memorial Park in the Northern Marian Islands explains a strong motivational force for extending interpretations at least to the margins of the park's enabling legislation. "Being a national park, we take every opportunity (internally) to vie for funding in other disciplines outside the main purpose of the park. These pots of funds are competed for." So he has "stretched" his mandate to interpret WW2 with interpretations of ecosystems and habitat preservation in the park's wetlands.

In accordance with its new General Management plan, Klondike Gold Rush NHP will extend its interpretation from the themes of its original enabling legislation – historic structures and trails of the Gold Rush – to interpreting the great biodiversity of the area. (*Snell-Dobert*).

Enabling legislation that is both recent and designed to encourage subjective patriotic outlooks may create a formidable barrier to complete interpretations – of global sustainability or any other issue. The 1999 enabling legislature of Minuteman Missile NHS in part requires it "to interpret the historical role on the Minuteman II missile defense system as a key component of America's strategic commitment to preserve world peace." The park itself is a recently converted Air Force base. It is hard to imagine that

²⁹ The dated lobby exhibits in Yosemite's main Visitor Center make no reference to global warming but do discuss human-caused reductions of the wildlife that visitors experience and ongoing efforts to restore local ecosystems.

³⁰ Congressional House Resolution 6549 of May 17, 1954 calls for the construction "upon the Jefferson National Expansion Memorial National Historic Site" of "an appropriate national memorial to those persons who made possible the territorial expansion of the United States . . . the great explorers . . . the hardy hunters, trappers, frontiersmen, pioneers, and others who contributed to such expansion." (83 P.L. 361; 83 Cong. Ch. 204; 68 Stat. 98) Staff at Jefferson interpret the resource impacts concomitant with this continental movement.

the global human and ecosystem implications of nuclear weapons and materials will be interpreted there any time soon, since they require a multidimensional examination of the rationale for the development, continued deployment, and effects of prior use of nuclear weapons by the United States – whose motivations are actually complex and extend beyond a simple desire for peace.

Obsolescence

In my Introduction, I dramatically decried the lack of any wayside interpretations on global warming at Yosemite's Glacier Point. Yet in reality Yosemite interpreters, like their education chief Kathy Dimont, do not entirely dismiss global warming. Yosemite, like other parks, is engaged in the process of finding ways to provide relevant interpretations of global sustainability.

When I attended a ranger-led tour of Yosemite's Hetch-Hetchy reservoir, a striking evening hike under a rising moon took us across a precipitous dam, through a rock-carved tunnel, and part way around the source of San Francisco's drinking water. The reservoir is an important venue for interpreting the history of the park and of the nation's conservation movement, since it was here that John Muir led the nation's conservationists in a great battle over preserving a beautiful mountain valley, only to have it removed from Yosemite National Park and drowned to create the reservoir. Ranger Adrianna Hirtler took her audience beyond the historical context to the natural, and provided visitors with a well-informed discussion of the observed and expected effects of global warming on reducing the snow-fed flows into the Tuolumne, the reservoir, and down to the taps of San Franciscans.

One of the several great advantages of human interpreters over exhibits is that they can adapt very quickly to new information (some other advantages are discussed in Chapter 5). The lead time for creating new fixed exhibits is commonly five years or more³¹ and since they are durably built, the information in an exhibit even at mid-life can be ten to twenty years old.

Twenty years ago, the science on global climate change was considerably less established and prominent than it is today. It is just too new to have been incorporated into existing waysides, or into the lobby exhibits at the Yosemite Visitors' Center that Mary Kline is preparing to update.

Public disinterest

Visitors come to parks for a variety of reasons, but interpreters must accomplish their work knowing that enjoyment of recreation, and fascination with historical events and scenic wonders, are far more common impulses than a desire to be told how one's choices impact the environment.

³¹ According to Howard Levitt, chief of interpretation and education in the GGNRA, exhibits can be produced in a few months. But, exigencies seem to slow development of waysides in many parks. Thus in the neighboring Presidio, Howard's team designed new wayside kiosks, but eight years passed until the new Presidio Trust had established itself as the management of the converted military base there and ultimately produced the waysides. Mark Herberger, Superintendent of Minuteman Missile National Historic Site describes a multi-year scenario which is echoed by many of my respondents: "In National Park Service planning, the "broad" picture of resource conservation activities and visitor services is outlined through a General Management Plan (GMP). We are in the final year of drafting our final GMP. Specific management documents tier off of the GMP, including what is called a Comprehensive Interpretive Plan. The CIP outlines a multi-year program of visitor interpretive services and more specific year-by-year tasks. The plans highlight significance statements, interpretive themes, and visitor experience goals. Currently, the multi-year part of the CIP (called a Long Range Interpretive Plan) is being drafted. The LRIP may call for waysides, for example, at a specific site in order to facilitate interpretation and to meet interpretive goals." (*Herberger*)

The island and former prison of Alcatraz in the GGNRA is a potentially rich site for interpreting the migratory and mating behaviors of the many bird species that nest there. In its better funded days the NPS paid a full-time natural resource ranger to manage a popular volunteer bird monitoring program there that produced important scientific data. But, few of the island's 1.5 million annual visitors join rangers for the nature walks they offer; by far the majority want to view relics of the prisoners – Al Capone, the Bird Man of Alcatraz, the escapers – made famous by Hollywood movies. There is no longer a natural resource ranger stationed on the island.

Many interpreters find that visitors are not particularly interested in the conservation topics that they would like to present. So interpreters frequently use a “by-the-way” technique. Larry Frederick finds that most hard-hitting resource issue topics “have limited appeal to general park audiences” at his Rocky Mountain NP. “So rather than [providing] a wildland fire walk we talk about wildland fire on a wildflower walk, which will be well attended.” In presentations featuring popular topics, they introduce global sustainability themes like ozone increases, global retreat, exotic plant control, wolf reintroduction, and forest health, “by-the-way.” Like interpreters in most parks, they gauge the receptiveness of the group and/or individual they are addressing to determine and present the appropriate material so that a program becomes in part a conversation with visitors. Frederick speaks for many of my respondents in stating that “It depends on the topic, the sensitivity, the potential controversy, the targeted audience, and many other factors on how topics might be addressed and/or interpreted.”

Belief that interpretations of global sustainability are already in place

Many educators and interpreters point out to me that they interpret sustainability via issues and in ways that *could* be applicable anywhere else, or everywhere else, in the world. In fact, many argue, it is best to just paint the dots and let visitors connect them – that is, let them extrapolate from the local to the global by themselves. Interpreters may tell visitors that the ecosystem before them is suffering from the impacts of local development (loss of water, incursions of people and pets, introduction of invasive species, toxic runoff, heat generation, loss of wildlife refuge for reproduction, etc) and then allow them to draw for themselves the conclusion that ecosystems around the world must be similarly under threat from development.

However, it may not be the case that park visitors have sufficient background to extrapolate correct conclusions from such throttled-back interpretations. In fact, a magnificent park may inadvertently project a satisfying aura of permanence and elicit a comforting feeling that nature is doing quite well after all, everywhere apparently. Engaging communities in the preservation of a locally endangered species may instill a conviction that volunteer work can solve sustainability problems, belying the grim reality that a vastly greater number of species are being driven to “the death of birth” each day by forces beyond anyone’s control with no solution currently imaginable. Jim MacDonald, education specialist for Muir Woods in the GGNRA with its magnificent stands of millennia-old trees, points out that visitors are often very surprised to learn that similar ancient trees are currently being cut down by loggers not just all over the world, but within an easy drive’s distance of Muir Woods itself. Few visitors, he has discovered, in fact know anything whatsoever about ecosystems.

It can be argued that letting visitors “connect the dots” to derive their own world views may be just as valuable as explicitly global interpretations in moving a person toward a conviction of the need to attend to global sustainability. However, if staff do not see a visitor making these connections from the local interpretations they provide to the global ones they also consider important, they have no way to know whether he ever arrives at those connections.

Conclusion

On occasion there may be no more than a single beleaguered ranger in the GGNRA's Muir Woods to greet a day's share of the year's 4 million visitors. She will voice the park's interpretive themes of world peace and the ecological sustainability of ancient and threatened forests to an unknown cross-section of national and international visitors, and is expected to keep her words within the anticipated political and philosophical comfort level of all 4 million. Parks require across-the-board support from a nation of citizens with diverse and media-informed perspectives, and must offer a low common denominator of potential controversy even when it requires avoiding plain statements of facts that have not only been well established within the historical and scientific communities but are also crucial to a deep appreciation of interpretive subject matter. Powerful interest groups erode the sharp edges of interpretations, sometimes leaving them dull and uninformative. Visitors currently accept or fail entirely to comprehend the global sustainability impacts that are integral to their own daily political and economic landscapes and are driven by their choices – but to get through the day or the year park staff often need to tell visitors what they want to hear, rather than what they need to know about global sustainability if they are to help sustain park and world resources in the long term.

Chapter 4: Corporations, Money, and the NPS

No interpretation of global sustainability can be comprehensive without accounting for the role of corporations and nations, especially the United States, in transforming, redistributing, and reducing the future availability of critical resources. Yet my research indicates that these very institutions reduce the ability of NPS and partner staff to provide relevant and necessary interpretations in ways that are subtle, pervasive, and unmanaged. One may judge the overall impacts of corporations and the US to be good, bad, or indifferent, and chose to advocate a position towards them one way or another. But that their impacts have major transformative effects on global sustainability is seldom questioned; to acknowledge this is neither in itself controversial nor does it represent an advocacy position. Corporations are here to stay, and the NPS needs to address them in new ways if it is to continue to provide real interpretations of global sustainability.

Arrowheads, flat-hats and corporate logos

Around 3 to 4% of all the liquid which enters the bodies of humans on this planet comes to them via the Coca-Cola Company.³² On a planet where fresh water is increasingly scarce³³, where does Coke get all the water that they flavor, bottle, and ship?

According to their website, "The Coca-Cola Company is part of the fabric of life in each of the communities [in the 200 countries] we serve throughout the world. It operates as a local business partner, providing quality in the marketplace, enhancing the workplace, preserving the environment and strengthening the community." (2003 Summary Annual Report (2))

But on August 19, 2004, D.S. Mathur, Coca-Cola India's V-P for technical operations in New Delhi, resigned amid an ongoing controversy at their bottling plant in Plachimada, in Palakkad, India (*Coke's tech V-P quits*). India officials in that region shut down a Coke plant - even at the cost of many lost jobs - after sit-ins by local farmers protested that the plant was critically lowering their water table and that the waste sludge from Coke's bottle cleaning operation was contaminating what remained. The controversy is international and charged with claims and counter-claims by environmental groups, business organizations, and politicians.

³² According to Coca-Cola: "Worldwide unit case volume for the year increased 4 percent to 19.4 billion cases, led by 5 percent growth in international operations and 2 percent growth in North America." (*Coca-Cola Earnings*) "Unit Case: Unit of measurement equal to 192 U.S. fluid ounces of finished beverage (24 servings)." (2003 Summary Annual Report (1)) So, 19.4 billion times 192 ounces yields 3.7 trillion ounces of Coke products sold and presumably consumed per year, or around 620 ounces per year for each of the planet's 6 billion people on average. That's about 1.7 ounces per day for each of us. US dieticians try to convince Americans to drink 8 8-ounce cups of water a day. Assuming this represents a high standard, perhaps the "average" human drinks 6 cups per day - 48 ounces. So, Coke products represent 1.7/48 or about 3.5% of the average daily intake. Many sources quote Paul Hawken's citation of a boast by a Coca-Cola official that they provide 10% of the world's total liquid intake, but I'm unable to find any numbers to support the official's claim. Coca-Cola has every intent of expanding its manufacture and shipping of beverages worldwide - as long as it can keep finding more water for sale in politically welcoming regions of the world.

³³ According to H. E. Jan Kavan, President of the 57th Session of the United Nations General Assembly, 1.2 billion people lack access to safe drinking water and 2.4 billion people lack proper sanitation because of shortage of adequate supplies of water while water related diseases kill 3 million people each year, most infant mortality is linked to water related infections, and "riverine ecosystems are endangered virtually everywhere by non-sustainable development and misuse of limited freshwater resources." (*World Environment*)

In Yosemite NP's village of Wawona, the most recent five years of education chief Kathy Dimont's 34 years in the NPS have been spent not only building the Sierra Nevada Research Institute, but also finding ways to bring local communities together with her park. Several sources confided to me that while Congressional budgeting for the NPs has remained fairly level, the cost of living for employees and non-salary expenses have greatly increased throughout the NPS, resulting in staff and program reductions in many parks. The staff who used to help Dimont manage the 300 busloads of school children she brings into Yosemite each year has been gradually cut from four down to zero. Lacking local staff, she decided instead to make creative use of a \$100,000 private grant and "bought two big Dodge vans, got them painted with wild animals [and the NPS logo], and filled them full of environmental education materials." (*Dimont*) She gave them to the Discovery Center in nearby Fresno, who drives them to area schools every evening to teach kids about the environment.

The \$100,000 for Dimont's vans came from the Coca-Cola Company.

In Yosemite, this summer the NPS budgeted the whole park for only 1 seasonal ranger to deal with the year's biggest influx of the park's 4 million annual visitors. (*Dimont, Kline*). At Everglades NP, "In the last couple of years, our capacity to present personal interpretive services has diminished from about 120/week in the winter season to 20-30/week. This is due to reduced staffing levels." (*Payne*) The GGNRA has seen cuts in its maintenance staff (all of whom, in 2004, face the prospect of layoff through privatization); and sources tell me that a 20% reduction in NPS staffing for the GGNRA was announced in May of 2004. Staff from several parks tell me that the morale of their park is at its lowest point in years or decades due to these and **similar reductions.**

Because of her ability to reach young people from underserved communities - to educate them in becoming stewards of the parks and of their own urban streets, to put them on track to be the first ones in their families ever to attend a university - Dimont's job during these last five years has been the most satisfying in her life. The money from Coke for the vans was received uncritically and thankfully, as corporate money usually seems to be by all NPS personnel and their partnering organizations.

I asked several of my interviewees if receiving grant money from corporations and non-profits had changed the content of programs, and the answer was almost universally "No." Dimont's response is typical: "The NPS won't accept a grant if you have to put the Coca-Cola logo next to the Park logo. But I would do it in a heartbeat for the kind of money they give us. I would wear a Coke tee-shirt with my flat hat. They are generous and really require nothing of me." For corporations, exposure in national parks clothes them in universally favorable associations - wildlife, trees, leisure, safety, campfires, family. Like most corporations who provide grants in Yosemite and the GGNRA, Coke's sole requirement was for a modest amount of publicity - in Dimont's case an initial photo-op with kids and rangers at the van. Some nonprofit corporations may be more likely to require their grantees to perform a simple assessment of some kind to ascertain that learning has taken place. In the GGNRA, Toyota funded their National Park Labs in creating several environmental programs for local schools, without impacting content at all (*Fonfa, Levitt*).

However, private grant money may affect whether a program comes into existence in the first place. Yosemite is one of several national parks that benefit from a Federal "fee demonstration" program under which they receive most of the income from "recreation fees" (80% of the \$20 per car park admissions, in the case of Yosemite) and are allowed to use it within the park. (*Recreational Fee*) Interpretive division chief Mary Kline has to compete with other NPS departments in Yosemite for use of this money, and if she can find matching funds, it increases the chances that her project will gain approval. "Within this park we have to apply for it [fee demonstration money] because there are so many of us who want to use it. So how you succeed in getting the money might be either how well you can tie to partnerships, or tie to a national initiative in some way. Where someone is going to pay

