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ESSAY: DAM(N) HOW TIMES HAVE CHANGED...

BY PETER M. LAVIGNE*

INTRODUCTION

Dams and rivers, rivers and dams. Dams hold a special place in our culture and imagination, a hold so powerful that a four cent U.S. postage stamp issued in 1960 contained the caption "Conservation" and pictured a dam as the image of conservation.¹ Dams represent man's (in the strictest sense of gender) triumph over the human-created evils of both the dust bowl and the Great Depression of the 1930s.

Over the past seventy years, dams and their impact on the surrounding environment have come to define many elements of the physical and cultural landscape in the United States: the nature and purpose of rivers, America's positive attitude, cheap power sources, and the ultimate expression of Manifest Destiny.²

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¹ See *Postage Stamps of the United State First Issued in 1960*, available at <http://www.1847usa.com/identify/1950s/1960.htm> (last visited Mar. 1, 2005).

² See *POWER AND THE LAND* (Kino Int'l Corp. 1994) for the insightful narration of two of the documentaries from the classic 1936 and 1937 Roosevelt administration. The two films, entitled *The Plow that Broke the Plain* and *The River*, were directed by Pare Lorentz and combined with two other films in this collection to "provide an accurate, eloquent record of the people and the land of the United States during the 1930s." *Id.*

Dams have turned the arid deserts of the West into dazzling electrical cities, water-wanton agricultural plots, and high desert grazing ranges. The United States, specifically the Bureau of Reclamation and the Army Corps of Engineers ("ACE"), even provide engineering expertise and modern technology for large dams all over the globe.³ Currently, China, India, Turkey, Chile, Argentina, and a number of other countries are utilizing American models of large dams, canals, and irrigation systems in their own river basins. However, the public debate in the United States reluctantly and belatedly faces long-ignored sedimentation and maintenance costs, failed flood control measures, and other ecological devastations of three centuries of dam building.

I. DAM TABOOS

When Rita Haberman, the River Network's River Clearinghouse Program Director, penned an article for a 1995 River Voices newsletter entitled *Dam Fights of the 1990s: Removals*,⁴ some career dam "fighters" called the article wildly optimistic. Charitable interpretations of the article stated that supporters of dam removals were naïve at best, and at worst ignorant, to think the tenor of the debate over dams had switched so completely from stopping the construction of new dams to campaigning for the removal of existing dams.⁵

As recently as 1996, it was taboo for anyone associated with For the Sake of the Salmon ("FSOS"), a consensus-based quasi-governmental association with a board of directors representing the gamut of interested parties, from environmental organizations

³ See *Symposium Report: U.S. Water Security Report*, Center for Science and Technology Policy Research, at http://sciencepolicy.colorado.edu/events/security_symposium_2002/workshop/report_water_security.html (Nov. 15, 2002).

⁴ Rita Haberman, *Dam Fights of the 1990s: Removals*, RIVER VOICES (Winter 1995), available at http://www.rivernetwork.org/library/index.cfm?doc_id=160.

⁵ Personal Communications to Peter Lavigne and Rita Haberman, Rivers Network (Winter-Spring 1995).

to the timber industry, to talk about dam removals as a serious option for saving salmon from extinction.⁶ The taboo was so strong that within FSOS, spirited debates included questioning the wisdom of a traveling slide show script, which read in part, “[n]obody is talking about removing dams to restore salmon—habitat, harvest and modifications of dam operations are what is on the table.”⁷ The executive director routinely made variations of this comment in many of his speeches to various groups about how FSOS would help salmon avoid extinction and recover some of its former range. My, how times have changed.

In the United States, and now throughout Europe, the dam debate increasingly focuses on dam removals to restore the naturally functioning river systems for public safety, economic revitalization, recreation, and restoration of endangered species. Still, conflicts over dam construction drag on—notably with the Animas-La Plata project in Colorado.⁸ Some new dam construction projects are occasionally proposed, like the Boundary Creek Hydro Project in Idaho.⁹ Large dam construction proposals occur more often in other countries: the construction of the Three Gorges complex in China,¹⁰ the Narmada Valley in India,¹¹ the repeated proposals to dam all the rivers of northern Quebec,¹² appeals to

⁶ At the time, the author was employed as the deputy director of For the Sake of the Salmon (“FSOS”). Comments from this section come from his experience in that position.

⁷ *Id.*

⁸ Joshua Zaffos, *Writers on the Range: The Terrifying Saga of the West's Last Big Dam*, HIGH COUNTRY NEWS, June 7, 2004. See also Gail Binkly, *Dam's Price Tag Skyrockets*, HIGH COUNTRY NEWS, May 10, 2004; *Animas-La Plata a Financial Boondoggle*, HIGH COUNTRY NEWS, AUG. 8, 1994.

⁹ See Nick Lipkowski, *Top 40 Issue 15: Boundary Creek, Idaho*, American Whitewater, at <http://www.americanwhitewater.org/archive/article/48> (Sept. 7, 2000).

¹⁰ *The Three Gorges Project*, WorldSat International Inc., at http://www.worldsat.ca/image_gallery/gorges/gorges_main.html (last visited Nov. 1, 2004). Construction for the Three Gorges Dam will be finished in 2009, when “the dam will measure about 180 m (about 600 ft) high and about 2.5 km (about 1.5 mi) wide.” *Id.*

¹¹ See *Large Dams on the Narmada River*, Friends of River Narmada, at <http://www.narmada.org/nvdp.dams> (last visited Feb. 20, 2005).

¹² See *Canada-Trends: Dam Constructions*, National Water Research Institute, at <http://www.nwri.ca/threats2full/ch2-2-e.html> (last visited Nov. 1, 2004).

recreate the dams and levees of the Mississippi in the Pantanal region of Brazil, Paraguay, and Bolivia,¹³ and the various projects on the Tigris and Euphrates rivers in Turkey are already under construction or on the drawing boards.¹⁴ By and large, however, especially in the United States and now throughout Europe, the argument in favor of removing dams is to restore naturally functioning river systems for multiple purposes, including public safety, recreation, and restoration of endangered species.

II. THE ULTIMATE MIRAGE: RATIONAL FOUNDATIONS FOR WATER POLICY¹⁵

Myth and deception, at least self-deception, have shaped water policy in the United States far more than the rational examination of ecosystems, the conscious setting of political boundaries, or the rational pursuit of better living water policy and development of re-settled areas. This self-deception has often been a result of muddled thinking, intentional deception, or political distortion, beginning with Congress's blithe dismissal of Major John Wesley Powell's recommendations to form the borders of Western states according to the boundaries of major river watersheds.¹⁶ The deliberate slaughter and relocation of Native Americans enabled the

(stating that "northern rivers hold the most remaining potential for large-scale hydroelectric development in Canada").

¹³ See, e.g., James Brooke, *A 2,000-Mile Highway of Water for Commerce*, N.Y. TIMES INT'L, May 27, 1995, at 16. See also Raphael Heath, *Hell's Highway*, NEW SCIENTIST, June 3, 1995, at 17.

¹⁴ See generally *Status Report, Southeastern Anatolia Project*, REPUBLIC OF TURK. PRIME MINISTRY (June 2000) (on file with author).

¹⁵ The author would like to thank Beth Woodward for her contributions to this section from her course work, Beth Woodward, *A Mirage: Rational Foundations for Water Policy*, (1999) (unpublished manuscript), written in the author's course, *Watershed Futures: The Past and Present of U.S. Water Policy and Administration* (1999).

¹⁶ See *The True Legacy of John Wesley Powell*, National Public Radio, at <http://www.npr.org/programs/atc/features/2002/sept/powell/> (last visited Jan. 26, 2004). William deBuys, an historian, states that Powell vehemently tried "to stop western expansion in its dusty tracks. Powell wanted time to assess the water supply and the natural limits to settling on the land. He wanted to rearrange western boundaries, setting up government by watershed." *Id.*

development of the Mid-Atlantic region and South, thereby eventually eradicating the buffalo and, necessarily, the Native Americans of the Great Plains and the West.¹⁷ Irrational and inequitable foundations of water policy have run a long, darkly humorous course throughout the history of the West.¹⁸

When it comes to dams, the narrator of Pare Lorentz's classic 1937 propaganda film, *The River*—not incidentally sponsored by the Works Progress Administration, ACE, and the Tennessee Valley Authority—captured the American idea of progress when he said “[t]here’s no such thing as an ideal river in Nature.”¹⁹ Named Best Documentary at the 1938 Venice Film Festival and nominated for a Pulitzer Prize in poetry, the film further supported the assumption that progress required dramatically altering and “improving” natural processes and structures.²⁰ *The River* accompanied immigrants to North America in the 16th to 19th centuries, most of whom, with the exception of slaves and

¹⁷ See generally GLORIA JAHODA, *THE TRAIL OF TEARS: THE STORY OF THE AMERICAN INDIAN REMOVALS 1813-1855* (1975) (detailing how settlers and government troops uprooted many Indian tribes and eventually forced the Indians to migrate west). See also DEE BROWN, *CREEK MARY’S BLOOD* (1980) (detailing a fictional account of a woman married to an Indian trader in 1731); DONALD A. GRINDE & BRUCE E. JOHANSEN, *ECOCIDE OF NATIVE AMERICA: ENVIRONMENTAL DESTRUCTION OF INDIAN LANDS AND PEOPLE* (1995) (describing the ecological consequences suffered by Native Americans as a result of environmental abuse by the government).

¹⁸ Literally hundreds of books have been written about various aspects of water policy in the United States. Three of the best are: ALICE OUTWATER, *WATER: A NATURAL HISTORY* (1996) (explaining water treatment and sewage handling), MARC REISNER, *CADILLAC DESERT* (rev. ed. 1993) (describing the American West as a quest to control water, the most important resource) [hereinafter REISNER, *CADILLAC DESERT*], and CHARLES WILKINSON, *CROSSING THE NEXT MERIDIAN: LAND, WATER, AND THE FUTURE OF THE WEST* (1992) (arguing that substantial reform of environmental law in the West is mandatory to control desertification and provide for a healthy future environment).

¹⁹ *THE RIVER* (Farm Security Administration 1938).

²⁰ Pare Lorentz, FCEA NEWSLETTER (Fl. College English Ass., Temple Terrace, Fl.), Spring 2004, at <http://www.flacea.org/Archives/NewsletterS2004.htm> [hereinafter FCEA NEWSLETTER].

others from Africa, had long ago lost the opportunity to know anything resembling truly natural river systems.²¹

Progress was proclaimed in the American Midwest in the latter half of the nineteenth century, only 130 years ago, when the plains were cleared of buffalo, Native tribes, and other tribes transplanted from the East to make way for the generic pastoral substitutes of sheep, cattle, and "plowmen."²² Unfortunately, the vanquished natural systems of prairie dogs, pothole wetlands, scarce rivers, sky darkening flocks of migrating birds, diverse native grasses, buffalo, beaver, wolves, bears, and a myriad of flowers and insects were far more productive and resilient than the relative biological deserts that followed and still exist in most areas today.²³

III. THE AGE OF DAMS

Progress arrived, in the minds of most, with the passage of the Reclamation Act of 1902 and what Marc Reisner has called the "Age of Dams."²⁴ According to Reisner, what the United States accomplished with the reorganization of water systems in the West is unparalleled in human history and is truly astonishing. Reisner states it this way: "[S]imply put, the twentieth century has been the Hydraulic Century, the Age of Dams. At least 95 percent of the world's mentionable dams—usually defined as those more than fifteen meters high—were built in the past hundred years."²⁵

In the midst of the Great Depression, the United States alone built the world's five largest structures simultaneously, and they all were dams—Hoover, Bonneville, Grand Coulee, Shasta, and

²¹ *Id.*

²² See POWER AND THE LAND, *supra* note 2.

²³ See OUTWATER, *supra* note 18, chs. 5-6. See also DAVID S. WILCOVE, THE CONDOR'S SHADOW 87-90 (1994).

²⁴ Marc Reisner, *Western Water and the Limits to Consensus*, CHRON. COMMUNITY, Spring 1999, at 28.

²⁵ *Id.*

Fort Peck.²⁶ More than 68,000 large dams and nearly 75,000 small dams now choke the rivers of America.²⁷

Until recently, out of all the rivers in the United States greater than 200 kilometers long, only the Yellowstone and Salmon Rivers remained entirely free flowing.²⁸ On the entire Colorado River, the only significant free flowing stretch is in Cataract Canyon, above the Glen Canyon dam reservoir in Utah.²⁹ Former Secretary of the Interior Bruce Babbitt would like for people to think that “we now have too many of these dams, some 75,000, the equivalent of one every day since Jefferson wrote the Declaration of Independence.”³⁰

More than two centuries have passed since the United States gained its independence, and America is just beginning to question the logic of its technological “solution” to the West’s inconvenient lack of sufficient precipitation. The forests of the

²⁶ Marc Reisner, *The Age of Dams and its Legacy*, THE EARTH INST. AT COLUMBIA UNIV., Spring 2000, available at <http://www.earthinstitute.columbia.edu/library/earthmatters/spring2000/pages/page23.html> [hereinafter Reisner, *The Age of Dams*].

²⁷ See WILLIAM R. LOWRY, DAM POLITICS: RESTORING AMERICA’S RIVERS 31-33 (2003) [hereinafter LOWRY, DAM POLITICS]. These large dams are more than two stories high. The exact number of dams is not known. There are approximately 75,000 dams in the ACE National Inventory of Dams (“NID”), which is the most comprehensive inventory of dams nationwide. However, this inventory only covers dams that meet minimum height and impoundment requirements, so an unknown number of small dams are not included in the inventory. Of the 75,000 dams in the database, approximately 66,000 are located on rivers, while the remainder impound water off-river. *Id.* See also THE HEINZ CENTER, DAM REMOVAL: SCIENCE AND DECISION MAKING 3-4 (2002) [hereinafter SCIENCE AND DECISION MAKING].

²⁸ See TIM PALMER, ENDANGERED RIVERS AND THE CONSERVATION MOVEMENT (1986) [hereinafter PALMER, ENDANGERED RIVERS]. See also *Removal of Embrey Dam*, Fly Fishing Information Center, at <http://www.flymartonline.com/article306.html> (last visited Jan. 15, 2004). The breaching of the Embrey Dam made the Rappahannock River, at 184 miles, the nation’s longest restored free-flowing river. *Id.*

²⁹ Telephone Conversation with Dave Wegner, President and Chief Scientist, Ecosystem Mgmt. Int’l, and Former Chief, Glen Canyon Ecosystem Studies Unit of the Bureau of Reclamation (Feb. 18, 2005).

³⁰ Bruce Babbitt, *A River Runs Against It: America’s Evolving View of Dams*, OPEN SPACES Q., Feb. 21, 2002.

Northwest, for instance, could more economically store water or transmit it to aquifers at cooler temperatures through snow pack and tree litter.³¹ The Missouri and Mississippi Rivers would not need flood "control" if structures were moved out of their flood plains and the rivers were allowed to deposit their enriching sediment load there. Rivers spread out across wide deltas provide better fish passage than do concrete controlled canals and reservoirs.³²

Technology does offer much. Mathematically, engineers are great problem-solvers. They can build dams with fishways, but the structures they build are generally designed to meet narrow policy objectives. Engineers are rarely informed, or financially rewarded, to investigate the broad view. They do not often have the opportunity to frame the questions they are asked to answer. Until recently, those questions rarely encompassed anything beyond how to provide the cheapest water possible to agriculture and development.

Perhaps most significantly for salmon and other aquatic species, and the people who depend on those resources, is that few dam engineers are also conservation biologists, ecologists, land use planners, or Native American spiritual believers. The overwhelming majority of engineers do not possess the complex perspectives of conflicting economic interests, including those who do not value development as a sacred inevitability. Nor do many engineers fully comprehend the needs of interdependent species or the necessity of healthy free-flowing rivers for the survival of wild salmon.³³ America's cultural focus on dam-happy, narrow technology, however, has begun to lose its monopoly on our imagination as more people come to realize the importance of functional ecosystems in functional societies.

³¹ See, e.g., *2003 Annual Water Quality Report*, CITY OF PORTLAND, OR., at 1.

³² See ELLEN WOHL, *DISCONNECTED RIVERS: LINKING RIVERS TO LANDSCAPES* 203-21 (2004). See generally ARTHUR MORGAN, *DAMS AND OTHER DISASTERS: A CENTURY OF THE ARMY CORPS OF ENGINEERS IN CIVIL WORKS* (1971).

³³ See Michael Black, *Can We Design Ecosystems?: Lessons From the California Rivers*, at *Mitigations as Quasi-Solutions*, in 19 INT'L J. ENGINEERING EDUC. (2002). See generally JIM LICHATOWICH, *SALMON WITHOUT RIVERS: A HISTORY OF THE PACIFIC SALMON CRISIS* (1999).

IV. THE MYTH OF HYDROPOWER

In his book *Lifelines: The Case for River Conservation*,³⁴ Tim Palmer explains in *The Myth of Hydropower* chapter that in the arena of power generation, it is *belief* that threatens river systems, not true need.³⁵ The hydroelectric industry bought and produced numerous forms of great marketing campaigns, starting with Pare Lorentz's movies and Woody Guthrie's Bonneville Power Administration songs and tours.³⁶ The spin continued in the 1950s General Electric television commercials featuring Ronald and Nancy Reagan with all electric-powered houses, complete with electric stoves, lights, and heating systems. The marketing presence is still felt in current television commercials of gushing rapids and happy families with voice-overs touting the benefits of

³⁴ TIM PALMER, *LIFELINES: THE CASE FOR RIVER CONSERVATION* (1994) [hereinafter PALMER, *LIFELINES*].

³⁵ See *id.* at 70-97. See also PALMER, *ENDANGERED RIVERS*, *supra* note 28; TIM PALMER, *THE WILD AND SCENIC RIVERS OF AMERICA* (1993). Tim Palmer is the premier historian of the river conservation movement in the United States. To date, he has written fourteen books about rivers, river protection campaigns, river conservation, and other issues. Palmer writes from thirty years of experience traveling the rivers of North America by foot, canoe, raft, bicycle, and his conversion van "house." *Endangered Rivers and the Conservation Movement* relates the history of river conservation up through the early Carter administration. *The Wild and Scenic Rivers of America* covers the history, management and unfinished agenda of the National Wild and Scenic Rivers System. According to Palmer, *Lifelines: The Case for River Conservation* fills the gap between the two previous volumes by presenting the fundamental case for preservation and intelligent management of rivers in today's perplexing world. See PALMER, *LIFELINES*, *supra* note 34, at xi. *Lifelines* is the author's personal favorite of the three, mostly because of the heartfelt and compelling arguments for changing the way to view and manage rivers.

³⁶ See generally FCEA, *supra* note 20; WOODY GUTHRIE, *COLUMBIA RIVER COLLECTION* (Rounder Records 1987). See also Press Release, Bonneville Power Admin., BPA to Honor Folksinger on 60th Anniversary of His Work (May 22, 2001), available at <http://www.bpa.gov/corporate/BPAnews/archive/2001/nr052201B.pdf>. "Guthrie wrote 26 songs for the Bonneville Power Administration. The BPA hired Guthrie for one month to produce music it would use in a film, 'The Columbia.'" *Id.*

"clean" hydroelectricity.³⁷ Hydropower is championed as a cheap, clean, and irreplaceable energy source, especially when it is promised from large remote projects like Hydro-Quebec's James Bay developments.³⁸

Most incredibly, marketing has led a majority of Americans to believe hydropower supplies the bulk of their energy supply.³⁹ In reality, hydroelectric generation amounted to about thirteen percent of the United States' power generation in 1995.⁴⁰ The relative insignificance of hydropower as an energy source in the United States is easy to discern, particularly when compared to the undeveloped potential for demand-side management⁴¹ and the fast developing potential for wind, solar, and hydrogen power.

V. THE ERA OF DAM REMOVALS

For decades, going back to Edward Abbey's seminal novel, *The Monkey Wrench Gang*, "dam removal was considered a fringe,

³⁷ For background information on the Reagans' work with GE, see William Bird, Jr., *General Electric Theater: U.S. Anthology*, available at <http://www.museum.tv/archives/etv/G/htmlG/generalelect/generalelect.htm> (last visited Mar. 1, 2005). Note that no dams are shown in current commercials.

³⁸ See, e.g., JAMES BAY: A CHALLENGE MET (Hydro Quebec, 1983) (on file with author).

³⁹ *The National Report Card on Environmental Knowledge, Attitudes and Behaviors*, National Environmental Education & Training Foundation, available at <http://www.neetf.org/roper/1997%20Summary.htm> (last visited Jan. 13, 2004).

⁴⁰ Rich Bowers & Margaret Bowman, *Hydroelectric Relicensing: How Relicensing Can Affect Dam Removals*, RIVER VOICES, Winter 1995, at 7.

⁴¹ See *RMI's Approach to Energy*, Rocky Mountain Institute, available at <http://www.rmi.org/sitepages/pid116.php> (last visited Jan 18, 2005).

"Demand-side management," a practice that Amory Lovins helped pioneer and RMI has consistently promoted, recognizes the fundamental equivalence of savings and supply. The cost of saving electricity—or saving any sort of energy, or any sort of resource—should be weighed alongside the cost of producing more of it. Saving energy is usually cheaper, and not only that, it also reduces pollution and many other problems.

Id.

radical approach to river restoration.”⁴² Slowly, the public is learning that dams are not permanent structures;⁴³ they destroy fisheries, are rapidly filling with sediment, and pose safety concerns to downstream users and properties.⁴⁴ As a result, dam removal is finally entering the mainstream of river policy debates.

Some statistical profiles regarding the state of dams in the United States are useful. According to a 2002 Heinz Center Report, *Dam Removal: Science and Decision Making*, many dams were constructed for an economic and structural life expectancy of about 50 years;⁴⁵ 85% percent of these dams will be 50 years or older by 2020.⁴⁶ Many small dams are over 100 years of age.⁴⁷ Power companies, municipalities, and others who own dams are finding that it is far cheaper to remove many dams than it is to repair structural weaknesses or to upgrade dams to current standards for fish passage.⁴⁸

In many cases, dam removal costs less than repairing
the dam, especially where the [power or other]

⁴² See *Dam Removal Today*, American Rivers, at http://www.americanrivers.org/site/PageServer?pagename=AMR_content_997d (last visited Mar. 1, 2005) [hereinafter *Dam Removal Today*]. See REISNER, *CADILLAC DESERT*, *supra* note 18, at 93-96. “Self-help,” as the sabotage of dams might be called, has a long and little known history in the United States. Beginning with the first major dams built in the Merrimack Valley in the 1800s, which were attacked and blown up by farmers, “self-help” has continued through to the decades-long campaign of destruction aimed at the Los Angeles Aqueduct where Owens Valley ranchers have regularly dynamited pipes which were transporting the Owens River water to Los Angeles. See *generally id.* (describing the battles over the Owens Valley) and THEODORE STEINBERG, *NATURE INCORPORATED: INDUSTRIALIZATION AND THE WATERS OF NEW ENGLAND* (1991) (describing the Industrial Revolution in New England from an environmental perspective).

⁴³ *Dam Removal Today*, *supra* note 42.

⁴⁴ *Id.*

⁴⁵ *Id.*

⁴⁶ *Id.*

⁴⁷ SCIENCE AND DECISION MAKING, *supra* note 27, at 41-43.

⁴⁸ Brian Graber, *Potential Economic Benefits of Small Dam Removal*, in DAM REMOVAL RESEARCH: STATUS AND PROSPECTS 56, 57-59 (William L. Graf ed., 2003) [hereinafter DAM REMOVAL RESEARCH]. See also Helen Sarakinos & Sara E. Johnson, *Social Perspectives on Dam Removal*, in DAM REMOVAL RESEARCH, *supra*, at 43-44.

benefits of the dam are marginal or non-existent. Even if the [removal] costs are comparable [or higher], dam removal eliminates the need (and cost) for continued monitoring and repairs in the future.⁴⁹

The Federal Energy Regulatory Commission ("FERC"),⁵⁰ is an independent federal commission which does not report to any cabinet Secretary, but whose members are appointed by the President and subject to confirmation by the Senate.⁵¹ Among FERC's functions is its responsibility to ensure that licensed private dams do not interfere with the public's interest in river conservation.⁵² Most licenses issued by FERC are for periods of thirty to fifty years. The licenses must balance power and other values, including fisheries, endangered species, and recreation benefits.⁵³ Many licensed dams were built before requirements for environmental impact studies and before much thought was given to the loss of broadly-conceived public trust rights to those river resources. Relicensings, now regularly underway, provide the first opportunity to look carefully at the full range of impacts of large dams.⁵⁴ In an effort to protect the well-being of the general public, dam removal may be the best option.⁵⁵

In 1994, FERC ruled that it had the authority, on behalf of the public interest, to order dam removals as a part of the relicensing proceedings. Unfortunately, the Bush administration, as part of its assault on environmental protection regulations and enforcement throughout the federal government,⁵⁶ has proposed new rules for the Department of the Interior ("DOI") and the Department of

⁴⁹ *Dam Removal Today*, *supra* note 42.

⁵⁰ *Id.*

⁵¹ JOHN D. ECHEVERRIA ET AL., *RIVERS AT RISK: THE CONCERNED CITIZEN'S GUIDE TO HYDROPOWER* 19 (1989).

⁵² *Dam Removal Today*, *supra* note 42.

⁵³ *Id.*

⁵⁴ *Id.*

⁵⁵ *Id.*

⁵⁶ See, e.g., Mike Dombeck, *A Rotten Legacy in the Making*, Tidepool, available at http://www.tidepool.org/original_content.cfm?articleid=146676 (Feb. 10, 2005).

Commerce ("DOC").⁵⁷ The new rules remove most public standing to participate in relicensing decisions while allowing dam owners to contest public interest provisions.⁵⁸

President George W. Bush has held up the cynical shield of an artificial "energy crisis" on the West coast in order to camouflage efforts to roll back environmental standards affecting water quality, global warming, the Arctic Wildlife Refuge, and the small percentage of national forest that remains roadless.⁵⁹ The danger of the current energy "price crisis" is not that it will minimize efforts to decommission and remove dams in most areas. Instead, the danger is in making damaging short-term decisions about dam operations in the Columbia hydroelectric system and on various rivers in California that will ultimately have devastating, perhaps fatal, effects on endangered salmon runs.⁶⁰ In the context of the looming energy revolutions in hydrogen fuel cells⁶¹ and micro-power generators⁶² that will make many hydro-dams and much of the existing energy delivery infrastructure obsolete, ten years from now these short-sighted and short-term decisions will look foolish indeed.

⁵⁷ Procedures for Review of Mandatory Fishway Prescriptions Developed by the Department of Commerce in the Context of the Federal Energy Regulatory Commission's Hydropower Licensing, 69 Fed. Reg. 54,615 (Sept. 9, 2004) (to be codified at 50 C.F.R. pt. 221).

⁵⁸ *Id.* at 54,616.

⁵⁹ See Dombeck, *supra* note 56.

⁶⁰ See Reisner, *The Age of Dams*, *supra* note 26. "The Columbia River was once the most prolific salmon watershed on Earth, with annual spawning runs amounting to 15 million fish—some of which went over a hundred pounds. It is now about 7 percent of what it was." *Id.*

⁶¹ See, e.g., AMORY LOVINS & BRETT D. WILLIAMS, A STRATEGY FOR THE HYDROGEN TRANSITION (1999). See also Seth Dunn, *The Hydrogen Experiment*, WORLDWATCH, Nov./Dec. 2000, at 14, available at <http://www.worldwatch.org/pubs/mag/2000/136/>. Dunn describes "a world that is powered not by oil, coal, and other polluting fossil fuels, but one that relies primarily on renewable resources for energy and on hydrogen as an energy carrier, producing electricity with only water and heat as byproducts." *Id.* at 15.

⁶² See Seth Dunn, *Micropower: The Next Electrical Era*, WORLDWATCH PAPER, July 2000, at 33. See generally Amory Lovins & Chris Lotspeich, *Energy Surprises for the 21st Century*, 53 J. INT'L AFF. 191 (1999).

VI. DAM REMOVAL SUCCESS STORIES

According to American Rivers, 600 dams have already “been removed from our nation’s waterways—and at least 100 more are either committed for removal or under active consideration for removal.”⁶³ The summer of 2005 is the five-year anniversary of the victorious effort to remove the 280 meter-long ancient rock crib Edwards Dam on the Kennebec River in Maine.⁶⁴ Built in 1837, in defiance of a statute that forbade interference with anadromous fish runs,⁶⁵ the Edwards Dam was long a prime candidate for removal. In the early 1990s, its license was up for renewal before FERC. As part of the relicensing process, biologists from the U.S. Fish and Wildlife Service, state and local fisheries agencies, the Kennebec Coalition, and many others argued that removal of the Edwards Dam would help endangered Atlantic Salmon, alewives (river herring), striped bass (rockfish), American shad, Atlantic sturgeon, short-nosed sturgeon, and the blueback herring.⁶⁶

In 1994, FERC decided it had the power to order dam removal.⁶⁷ In late 1996, FERC issued a draft Environmental Impact Statement (“EIS”), recommending relicensing with increased fish passage facilities.⁶⁸ In its 1997 Edwards Dam ruling, FERC recommended and ordered the decommission and removal of a dam for the first time.⁶⁹ “This was the first time the FERC determined continued operation of a dam caused unacceptable environmental damage that could not be adequately addressed

⁶³ *Dam Removal Today*, *supra* note 42. See also AMERICAN RIVERS ET AL., DAM REMOVAL SUCCESS STORIES viii (1999).

⁶⁴ See Susan M. Cover, *River Revival: Kennebec Teems with Life 5 Years After Dam Breach*, KENNEBEC J., June 27, 2004, available at http://www.maineenvironment.org/Edwards_Dam/2004_ed_revival.htm.

⁶⁵ See LOWRY, DAM POLITICS, *supra* note 27, at 74.

⁶⁶ *River Flows Free as Edwards Dam is Removed*, Natural Resources Council of Maine, at http://www.maineenvironment.org/Edwards_Dam/free_river.htm (July 1999).

⁶⁷ See LOWRY, DAM POLITICS, *supra* note 27, at 76.

⁶⁸ *Id.* at 77.

⁶⁹ *Edwards Dam Comes Down Thursday*, ENVTL. NEWS NETWORK, June 30, 1999, available at <http://www.enn.com/arch.html?id=15699>.

through any action short of removal.”⁷⁰ One year after removal, water quality above the dam site upgraded to allow both fishing and swimming (class B),⁷¹ macroinvertebrate mayflies and stoneflies dramatically increased,⁷² and an estimated two million alewives (river herring) have returned, along with striped bass, shad, sturgeon, and Atlantic Salmon.⁷³

Removal of the Edwards Dam sparked a firestorm of media attention to dam removals nationwide. Spotlights included the decade-long efforts in Wisconsin, led by the state and the non-profit organization River Alliance of Wisconsin, to remove over 100 small and medium sized dams, culminating in the restoration of the Baraboo River to free flowing conditions for the first time in 150 years.⁷⁴ Similar efforts are underway in Pennsylvania,⁷⁵ New Hampshire,⁷⁶ and Massachusetts.⁷⁷

Countless dams are under consideration for removal. Most dam removals are voluntary efforts, like PacifiCorp’s agreement to remove the Condit Dam on the White Salmon River, a main stem tributary to the Columbia River in the Columbia River Gorge National Scenic Area.⁷⁸ More than 145 U.S. dams have been removed since the breakthrough at the Edwards Dam, and at least

⁷⁰ *Id.*

⁷¹ *One-Year Anniversary of Edwards Dam Removal Celebrated as National Success Story: Kennebec River’s Recovery Benefits Wildlife, People and Communities*, Natural Resources Council of Maine, at http://www.maineenvironment.org/Edwards_Dam/NewsAnniversaryofEdwards1.htm (June 29, 2000).

⁷² LOWRY, DAM POLITICS, *supra* note 27, at 82.

⁷³ *Id.*

⁷⁴ ELIZABETH GROSSMAN, WATERSHED: THE UNDAMMING OF AMERICA 77-79 (2002).

⁷⁵ *Id.* at 7.

⁷⁶ Ralph Jimenez, *So Our Rivers Can Run Free Dams No Longer Needed Will Go on List for Removal*, BOSTON GLOBE, May 28, 2000, at West Weekly 1.

⁷⁷ Beth Daley, *Which Dams Should Go? State Weighs Harm, Charm*, BOSTON GLOBE, July 24, 2000, at Metro/Region A1.

⁷⁸ *Condit Dam (White Salmon River WA) Removal Agreement*, American Whitewater, at <http://www.americanwhitewater.org/archive/article/4/> (last visited Jan. 17, 2005). “[T]his agreement serves as a model for other rivers where dam removal is being considered. After credible scientific study the stakeholders and utility collectively came to the conclusion that dam removal was the best restoration alternative for the White Salmon River.” *Id.*

sixty more were scheduled for removal in 2004.⁷⁹ The rate of successful removal programs accelerates as positive publicity for removal mounts.⁸⁰

VII. CONTROVERSIAL DAM REMOVAL PROPOSALS

Several controversial large dam removal proposals exist in the United States. Notable long running controversies include the 7200 foot-long Rodman (Kirkpatrick) Dam on the Ocklawaha River/Everglades in Florida, which, after a thirty year campaign, may finally be coming down.⁸¹ The newer debate about the dam battle of the 20th century concerns the proposed decommissioning of the Glen Canyon Dam to restore Glen and Grand Canyons and the Colorado Delta.⁸²

Dam removal remains especially controversial in the Pacific Northwest. Two dams on the Elwha River near Olympic National Park in Washington and the Savage Rapids and Elk Creek dams in Oregon are poised on the edge of final removals.⁸³ The battle, which began in the mid-1990s over the proposed renewal of the four dams—Ice Harbor, Lower Monumental, Little Goose, and

⁷⁹ 60 Dams in 15 States to be Removed, American Rivers, at http://amr.convio.net/site/News2?JServSessionIdr001=ufpnj92ks1.app8b&abbr=AMR_&page=NewsArticle&id=6657&news_iv_ctrl=-1 (July 21, 2004). See also *Dams Removed from 1999-2003*, American Rivers, at http://amr.convio.net/site/DocServer/1999-2003_dams_removed_list.pdf?docID=301 (last visited Mar. 1, 2005).

⁸⁰ See *Dam Removal Today*, *supra* note 42.

⁸¹ Craig Pittman, *Governor Sounds the Death Knell for Dam at Rodman*, ST. PETERSBURG TIMES, July 15, 2000, at 1.A. See also *Bush Vetoes Bill Intended to Save Rodman Reservoir*, ST. PETERSBURG TIMES, July 15, 2003, at 5.B.

⁸² See Dave Wegner, *Restoring Glen Canyon: Linking Our Future to the Importance of Our Past*, Glen Canyon Institute, at <http://www.glencanyon.org/library/wegnerover.php> (last visited Jan 10, 2005).

⁸³ Jim Downing, *Elwha Dam Removal Gets Final Go-Ahead*, SEATTLE TIMES, Aug. 6, 2004, available at http://seattletimes.nwsources.com/html/localnews/2001998230_elwha06m.html.

Lower Granite Dams—on the Lower Snake River between Pasco, Washington and Lewiston, Idaho, is destined to play out over the next five to ten years.⁸⁴

VIII. DAMS AND THE LOWER SNAKE

In many ways the battle over the Lower Snake River dams exemplifies the entire sordid history of the “Age of Dams”⁸⁵ and subsequent efforts to undo the damage. Seeds of the current controversy were sown in the 1930s, when barges became large and powerful enough to compete with trains, making possible the year-round occupation of Lewiston, Idaho.⁸⁶

Although steam sternwheelers had been able to navigate the Columbia and Snake Rivers often enough to ferry more than 60,000 people to the Idaho gold fields during the Civil War, navigation to Lewiston throughout the entire year round was not previously possible.⁸⁷ With canals in place on the Columbia River at Cascade Locks and the Dalles and Celilo Falls by 1915, Idaho exerted persistent pressure to build easy passage on the Lower Snake River.⁸⁸ “In 1945 Congress finally authorized the Army Corps of Engineers to construct a series of dams on the Lower Snake. There, between 1955 and 1975 the Engineers built Ice Harbor, Lower Monumental (which backs up the reservoir appropriately named after Herbert G. West), Little Goose, and Lower Granite [dams].”⁸⁹

Ironically, ACE was opposed to these four dams. In testimony before Congress, ACE testified that navigation in itself was not

⁸⁴ David L. Wegner, *Snake River Dam Breaching: River & Salmon Politics in the George W. Bush Administration*, 33 GOLDEN GATE U. L. REV. 419, 428-29 (2003).

⁸⁵ *Age of Dams*, *supra* note 26.

⁸⁶ See Keith Petersen, *Foreword* to OR. NATURAL RES. COUNCIL FUND, THE LOWER SNAKE RIVER PROJECT: SAVING SNAKE RIVER SALMON AND SAVING MONEY 5, available at http://www.onrc.org/wild_oregon/salmonriver98/onrcdam.pdf (last visited Jan. 10, 2005). See generally KEITH PETERSEN & MARY E. REED, *CONTROVERSY, CONFLICT AND COMPROMISE: A HISTORY OF THE LOWER SNAKE RIVER DEVELOPMENT* (1994).

⁸⁷ Petersen, *supra* note 86, at 5.

⁸⁸ *Id.*

⁸⁹ *Id.*

enough to economically justify the dams.⁹⁰ “[W]hile inland navigationists have always been the loudest advocates for the dams, these structures were built at taxpayer expense because of their perceived hydropower benefits. Navigation has always been the tail attempting (usually very effectively) to wag the dog.”⁹¹

Early on, ACE and many others recognized that the four dams presented a major threat to salmon migration. “As early as 1934 the Bureau of Reclamation recognized the difficulty of attempting to get juvenile fish past a major dam.”⁹² In 1947, the Bonneville Power Administration publicly acknowledged the effects of dams on salmon in its employee newsletter *BPA Currents*, with this summary from a Walla Walla hearing on fish and dams:

The [Interior] Department agrees that interests of the Columbia River fisheries should not be allowed indefinitely to retard full development of the other resources of the river. It concludes moreover that the overall benefits to the Pacific Northwest from a thorough going development of the Snake and the Columbia are such that the present salmon run must, if necessary, be sacrificed.⁹³

From 1945 to 1955, the proposals were fought long and hard by the U.S. Fish and Wildlife Service and the Washington and Oregon Fish and Game Departments.⁹⁴ Nevertheless, and despite the 1855 treaty with four Columbia River Tribes guaranteeing their rights to fish in their usual and accustomed places forever, the deck was clearly stacked from the beginning.⁹⁵

Though the intent of powerful agencies and economic interests was clear, “the Lower Snake would today be undammed had

⁹⁰ *Id.*

⁹¹ *Id.* at 6.

⁹² *Id.*

⁹³ *Dams Versus Fish*, BPA CURRENTS, July 25, 1947.

⁹⁴ Petersen, *supra* note 86, at 6-7.

⁹⁵ *Cultural Context: The Columbia River Treaty Tribes*, Columbia River Inter-Tribal Fish Commission, at http://www.critfc.org/oldsite/text/TRP_cul.htm (last visited Jan. 28, 2005).

it not been for the Korean and Cold Wars,”⁹⁶ explaining that the national clamor for atomic superiority over the Soviets outlined a need for a power dam next to the Hanford Nuclear Reservation. “[T]he fish advocates could battle river developers to a standstill when the issue was whether or not to create a navigable waterway to Lewiston. But when the issue of atomic power superiority came into play, they had no chance.”⁹⁷

IX. THE FUTURE OF THE LOWER SNAKE DAMS AND SNAKE RIVER SALMON

The four Lower Snake River dams were never fully developed for hydropower, and they currently generate about five percent of the Northwest’s energy supply.⁹⁸ The region as a whole generates enough power to send surplus power to California in times of need, such as during the summer heat waves of 2000.⁹⁹ The transfer of “surplus” power, however, can mean trouble for salmon. As California experienced its power emergency in the Enron/PGE/BPA artificially-generated 2001 power shortage, Columbia River water needed for salmon passage was released from upstream reservoirs to generate more electricity.¹⁰⁰ Tribal fish biologists argued, to no avail in the face of an administratively-designed “emergency waiver” from the requirements of the Endangered Species Act, that the water released for power generation should be saved for low water conditions in the fall and winter.¹⁰¹ Once again, decisions

⁹⁶ Petersen, *supra* note 86, at 7.

⁹⁷ *Id.*

⁹⁸ See *The Economics of Lower Snake River Dam Removal*, American Rivers, available at http://amr.convio.net/site/DocServer/snake_econ_factsheet_12.04.pdf?docID=588 (last visited Mar. 1, 2005) [hereinafter *Economics of Lower Snake*]. See generally PETERSEN & REED, *supra* note 86 (describing background of the Lower Snake River Development and prepared for ACE’s review).

⁹⁹ Su-Jin Yim & Jonathan Brinckman, *BPA Diverts Electricity to California*, THE OREGONIAN, Aug. 2, 2000, at D01.

¹⁰⁰ *Id.* See also Robert McClure, *California’s Heat Wave Threatens Salmon Here: Power Switch Could Pose Peril from Dams for Fish*, SEATTLE POST-INTELLIGENCER, Aug. 2, 2000, at B1.

¹⁰¹ Press Release, Columbia River Inter-Tribal Fish Comm., Tribes Appeal to BPA for Life-saving Spill as Migration Peak Nears (May 11, 2001), available at <http://www.critfc.org/text/press/01may11.html>.

about power generation are being made with little regard to salmon or Native American treaty rights.

The California energy crisis illustrates the threat to the Lower Snake River salmon population posed by exposure to the politics of distant energy markets. It also shows how the dams undermine the salmon's federal protection. In 2004, California Attorney General Bill Lockyer sued Enron over the 2000 market manipulations.¹⁰² Videotapes aired by CBS showed Enron traders brazenly celebrating the results of their illegal manipulation of the California energy market. The tapes should play a leading role in the upcoming litigation.¹⁰³ Lockyer may be doing his best to refund California ratepayers, but he has no particular duty to victims further removed from the situation.

In the summer of 2000, despite their ostensible federal protection, the salmon fell victim to an eruption of corporate avarice prompted by a botched state energy deregulation. The California legislature has no clear mandate to protect the interests of the Lower Snake River salmon, or even a clear understanding of their vulnerability to changes in energy policy. Deregulation and Enron's corporate culture of greed, lawlessness, and market manipulation can be blamed for the energy crisis itself. However, the collateral vulnerability of distant salmon to the vicissitudes of California state energy politics is the fault of the Lower Snake River dams.

In bankruptcy, Enron sued public utilities across the West in an attempt to recover its energy contract prices. One utility company, the Snohomish County Public Utility District ("the District"), released tapes in its defense against the lawsuit that further incriminate Enron.¹⁰⁴ These tapes purportedly contain similarly offensive conversations between Enron traders about market manipulation. The District contends the videotapes are

¹⁰² Mark Simon, *In Wake of Videos, Lockyer to Sue Enron*, S.F. CHRON., June 3, 2004, at B-3.

¹⁰³ *Id.*

¹⁰⁴ See Gene Johnson, *Enron Gouged Western Customers for at Least \$1.1 Billion, Public Utility Says*, SEATTLE TIMES, June 15, 2004, available at http://seattletimes.nwsources.com/html/snohomishcountynews/2001955796_webenron14m.html.

evidence of fraud, thereby justifying cancellation of the \$122 million contract.¹⁰⁵ The District's ratepayers could end up paying over \$400 per household if Enron wins its lawsuit.¹⁰⁶ This fiasco is just another example of harm caused by the flawed western energy system to which the Lower Snake River dams contribute.

X. LAST GASP OF THE COLUMBIA-SNAKE RIVER SALMON RUNS

In the 1960s, 75,000 adult salmon returned to Idaho streams and rivers. Unfortunately, the Snake River coho were declared extinct in 1985.¹⁰⁷ Snake River sockeye were declared endangered in 1991 when only four adults returned to Redfish Lake.¹⁰⁸ Spring and summer chinook spawned only in tributary streams and appeared on the Endangered Species List in 1991.¹⁰⁹ Steelhead fishing in 1992 and 1993 brought in \$90 million to Idaho and supported 2700 jobs.¹¹⁰ Idaho has had no general salmon fishing since the 1970s.

After years of seemingly endless studies, threats to salmon from dams, habitat loss, ocean harvest, predation in the estuary of the Columbia River, and toxic contamination from pesticide runoff and other chemical discharges seem no closer to resolution or removal.

Salmon and river advocates won a battle in May of 2003, when the District of Oregon ruled that the National Marine Fisheries Service's ("NMFS") salmon recovery plan for the Columbia and

¹⁰⁵ *Id.*

¹⁰⁶ Gene Johnson, *Tapes Broaden Scope of Energy*, VENTURA COUNTY STAR, June 15, 2004, at Business & Stocks, pg. 1.

¹⁰⁷ Philip S. Lansing & Eve Vogel, OR. NATURAL RES. COUNCIL FUND, RESTORING THE LOWER SNAKE RIVER: SAVING SNAKE RIVER SALMON AND SAVING MONEY 1 (1998). See generally Willa Nehlson et al., *Pacific Salmon at the Crossroads*, 16 FISHERIES 4 (1991), available at <http://www.humboldt.edu/~storage/pdfmill/Batch%204/fisheries.pdf>.

¹⁰⁸ See PALMER, LIFELINES, *supra* note 34, at 32-42.

¹⁰⁹ *Id.*

¹¹⁰ DON C. READING, THE POTENTIAL ECONOMIC IMPACT OF RESTORED SALMON AND STEELHEAD FISHING IN IDAHO 3 (Feb. 2005), available at http://www.wildsalmon.org/library_files/EconReportActualFinal.pdf. See also *Economics of Lower Snake*, *supra* note 98.

Snake Rivers violated ESA.¹¹¹ The Court ordered NMFS to revise the salmon plan. Hints from the agency indicate that it thinks the plan needs only "tweaks."¹¹² The rewrite, released on November 30, 2004, also ignores the removal proposal, despite accumulating scientific support.¹¹³ "The agency issued its new draft BiOp on September 9, 2004. Specific actions proposed by NOAA Fisheries to avoid jeopardy include new improvements to hydro dams, expanded control of fish-eating predators, continued implementation of habitat improvements, and continued funding of critical hatchery programs."¹¹⁴

Meanwhile, the Bonneville Power Administration continues to propose spill rate decreases for the summer of 2004 at the four Lower Snake River dams.¹¹⁵ Reduced spill rates put more water through the turbines, potentially increasing hydropower revenues. A spill rate reduction, however, would also kill more young migrating salmon.¹¹⁶ Stiff opposition to an earlier proposal to reduce spill rates by 55% prompted a retreat to a 39% reduction.¹¹⁷ Critics still maintain that the compromise still violates ESA and tribal treaty obligations. A court challenge is likely.¹¹⁸

¹¹¹ Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv., 254 F. Supp. 2d 1196 (D. Or. 2003).

¹¹² See generally *Federal Salmon Plan: New Bush Administration Salmon Plan Attacks Salmon Recovery and Pacific Coast's Salmon Businesses*, Save Our Wild Salmon, at <http://www.wildsalmon.org/library/fed-salmon-plan.cfm> (last visited Mar. 1, 2005).

¹¹³ Press Release, Bush Administration New Salmon Plan Even Worse, Save Our Wild Salmon (Nov. 30, 2004), available at <http://www.wildsalmon.org/pressroom/press-detail.cfm?docid=367>.

¹¹⁴ Luke Miller, *Agencies Prohibited from Curtailing Summer Spill*, National Sea Grant Law Center, at <http://www.olemiss.edu/orgs/SGLC/SandBar/3.3spill.htm> (last modified Oct. 29, 2004).

¹¹⁵ Hal Bernton, *BPA Summer Spill Plan Curtailed to Trim Costs*, SEATTLE TIMES, June 9, 2004, available at http://seattletimes.nwsources.com/html/localnews/2001951691_hydrospill9m.html.

¹¹⁶ *Id.*

¹¹⁷ *Id.*

¹¹⁸ *Id.*

XI. GLEN CANYON DAM AND THE RECOVERY AND RESTORATION OF GLEN AND GRAND CANYONS AND THE COLORADO RIVER

While the battle over the Lower Snake River dams rages in the Northwest, an intriguing debate about the fate of one of the most controversial dams ever built is taking place in the Southwest. Founded and initially operated by Richard Ingebretsen, a quiet, thoughtful, and conservative Mormon medical doctor from Salt Lake City, the nonprofit organization, the Glen Canyon Institute ("GCI"), is leading the charge to decommission the Glen Canyon dam and drain the reservoir, the deceptively named "Lake" Powell, which fills Glen Canyon.¹¹⁹ This debate energizes those who have dreamed of the return of a lost jewel of the world, Glen Canyon. The debate has also returned to the stage two old adversaries, John McPhee's Archdruid¹²⁰ David Brower, and the self-proclaimed Messiah of dams and water in the West, former Commissioner of the Bureau of Reclamation, Floyd Dominy.¹²¹

Ingebretsen, an emergency room doctor in Salt Lake City with a Doctorate of Philosophy in Physics, is a direct descendent of Brigham Young and a licensed river guide. Ingebretsen was one of the last people to see the Glen Canyon before it was filled by the reservoir. As he related in an article in GCI's journal, *Hidden Passage*:

I know how radiant Glen Canyon was. I saw what was left of it when I was a boy. As the reservoir

¹¹⁹ See the GCI website, <http://www.glencanyon.org/>, for a general description of the organization's history and purpose.

¹²⁰ See generally KATIE LEE, *ALL MY RIVERS ARE GONE: A JOURNEY OF DISCOVERY THROUGH GLEN CANYON* (1998); RUSSELL MARTIN, *A STORY THAT STANDS LIKE A DAM: GLEN CANYON AND THE STRUGGLE FOR THE SOUL OF THE WEST* (1989); JOHN MCPHEE, *ENCOUNTERS WITH THE ARCHDRUID (NARRATIVES ABOUT A CONSERVATIONIST AND THREE OF HIS NATURAL ENEMIES)* (1971); ELIOT PORTER ET AL., *THE PLACE NO ONE KNEW, GLEN CANYON ON THE COLORADO* (1963).

¹²¹ See Scott K. Miller, *Undamming Glen Canyon: Lunacy, Rationality, or Prophecy?*, 19 STAN. ENVTL. L.J. 121, 131 (2000). See generally Richard Ingebretsen, *Foreword* to 19 STAN. ENVTL. L.J. xi (2000). Richard Ingebretsen is founder and president of GCI. *Board of Trustees*, Glen Canyon Institute, at <http://www.glencanyon.org/aboutgci/board.php> (last visited Mar. 3, 2005).

began to fill, our Scout troop hiked up the deep, narrow canyons that led to Rainbow Bridge. All the way we encountered waterfalls, slides, huge rocks, and warm pools. My scoutmaster stopped us at one point and said, "You had better remember this now, because next year it will all be underwater." I asked him why they were flooding it. He didn't know.

As a young adult I boated over the same canyon, remembering what I had seen, and my heart ached. Year after year, compulsively, I rafted the Colorado through what remained of Cataract Canyon, wondering why a glorious river system was destroyed. By the early 1990s I had read, studied, and absorbed enough that I began to understand the politics that led to the dam. I founded Glen Canyon Institute to pass on what I had learned and, beyond that, to undo a tragic mistake, to begin the process of getting Glen Canyon back.¹²²

After Ingebretsen founded GCI, he rapidly assembled its Board of Directors, which included David Brower, the executive director and chief strategist of the Sierra Club when the Glen Canyon Dam was constructed. Brower long regretted his role in the compromise that led to the construction of the dam, and he dedicated the remainder of his long and accomplished life to decommissioning the dam and restoring Glen Canyon to its natural splendor.¹²³ Also joining the Board were: engineer Steven Hannon, author of a complex novel about Glen Canyon,¹²⁴ musician, actress, and writer Katie Lee, Lea Rudee, founder and Dean of the School of Engineering at the University of California San Diego, Jeri Ledbetter, Colorado River Guide, and Dave Wegner,

¹²² Richard Ingebretsen, *A Declaration of Independence for the Colorado River*, II HIDDEN PASSAGE, J. OF GLEN CANYON INST. (Summer 1999), available at <http://www.glencanyon.org/publications/hiddenpassage/hp2rich.php>.

¹²³ Mike Ritchey, *Changing Course 37 Years After Glen Canyon Dam Was Built, Some Want It Removed*, DENVER POST, March 19, 2000, at A1.

¹²⁴ STEVEN HANNON, *GLEN CANYON: A NOVEL* (1997).

former director of the Glen Canyon Ecosystem Studies unit of the Bureau of Reclamation, among others.¹²⁵

The distinguished group kicked off a debate culminating in a congressional hearing in 1997, the endorsement of the Sierra Club Board of Directors and the Southern Utah Wilderness Alliance, and more recently, the founding of another group dedicated to the restoration of Glen Canyon.¹²⁶

Aside from burying Glen Canyon with water and sediment, the Glen Canyon Dam has caused major harm to its more famous downstream wonder, the Grand Canyon. Damage to the Grand Canyon is two-fold. First, the Glen Canyon reservoir and dam traps all the sediment that would normally turn the Colorado River brown and be, at least in part, deposited on the many beaches that used to exist in the Grand Canyon.¹²⁷ The lack of suspended sediment in the water, combined with the rapid high and low flows through the Grand Canyon because of the fluctuations in water releases for power generation, have eroded the beaches, destroyed riparian habitat, and harmed many animal and plant species.¹²⁸ Second, the clear reservoir water is also cold from its release in the depths behind the dam. This cold water has driven out warm-water fish accustomed to the cloudy, warm water of the free-flowing river.¹²⁹

In the Spring of 1996, an attempt was made to mitigate the damage in the Grand Canyon. An artificial “flood” was released from the dam [spillway tunnels] to mimic the high flows seen in Spring runoff. After one week of high water release, new beaches and backwater habitats were formed to

¹²⁵ Interview with Richard Ingebretsen (July 1999). *See infra* note 119 and accompanying text.

¹²⁶ Ritchey, *supra* note 123.

¹²⁷ *See* Wade Graham, *Killing a River*, XI HIDDEN PASSAGE, J. OF GLEN CANYON INST. 2 (Winter 2004), available at <http://www.glencanyon.org/publications/hiddenpassage/hp11.pdf>.

¹²⁸ *See* Dave Wegner, *The Vision of Powell: A Call for a River-Wide View*, XI HIDDEN PASSAGE, J. OF GLEN CANYON INST. 3 (Winter 2004), available at <http://www.glencanyon.org/publications/hiddenpassage/hp11.pdf>.

¹²⁹ *Id.* at 3-4.

provide safety for the endangered fish and plants. However, less than one year later, they were all gone—eaten away by the clear, sediment hungry river. The “flood” was a short term success, but now has proven to be a long term failure. Glen Canyon, where the river ran slowly, provided a habitat where fish and other animals could spawn and reproduce. . . . [GCI maintains that] the only viable mechanism to provide for the preservation of the Grand Canyon is to let the river run free. In short, the endangered species of fish and plants in the Grand Canyon will forever vanish from the earth unless we drain Lake Powell.¹³⁰

A twenty-five member panel of stakeholders was assembled by the Department of the Interior (“DOI”) in 1996 to direct scientific research and produce a plan to address the faltering ecology of the Grand Canyon.¹³¹ The panel suffers from the diverse agendas of its membership.¹³² Repeated experiments with artificial floods only emphasize the relationship between the Glen Canyon Dam and Grand Canyon’s troubles, as the panel’s political make-up prevents agreement on an appropriate response. With no DOI plan for the Grand Canyon forthcoming, a lawsuit seems likely. Whether the courts are willing to address the Glen Canyon Dam’s role in the Grand Canyon’s ecology is uncertain.¹³³

In October of 1996, GCI invited leading scientists, engineers, and Bureau of Reclamation officials to its annual meeting in order to discuss draining Lake Powell.¹³⁴ The meeting clarified many other reasons to drain the reservoir.¹³⁵

¹³⁰ Richard Ingebretsen, *History of Glen Canyon and the Glen Canyon Institute*, Glen Canyon Institute, at <http://www.glencanyon.org/aboutgci/history.php> (last visited Jan 20, 2005) [hereinafter Ingebretsen, *History of Glen Canyon*].

¹³¹ Seth Hettena, *Grand Canyon Subject of Debate Over Its Future Course*, VENTURA COUNTY STAR, June 8, 2004, at 9.

¹³² *Id.*

¹³³ *Id.*

¹³⁴ Ingebretsen, *History of Glen Canyon*, *supra* note 130.

¹³⁵ *Id.*

- The lake is filling with sediment at an alarming rate. In perhaps as little as 120 years the reservoir will be filled to the

Inspired by the new data, GCI's board announced plans to seek a process by which to drain Lake Powell.¹³⁶ "Less than two weeks later, the Board of Directors of the Sierra Club followed suit and voted to advocate the draining of the reservoir behind Glen Canyon Dam."¹³⁷ By doing so, GCI, the Sierra Club, and many environmental organizations have dedicated themselves to restoring the Colorado River system.¹³⁸ In order to aid in the argument for the restoration of these ecosystems, GCI commenced a scientific, environmental assessment to determine alternative uses of the Colorado River waters.¹³⁹ Ingebretsen says GCI moved forward with a Citizens Environmental Impact Statement ("EIS") both because Congress refuses to fund a formal EIS and because "past attempts at public environmental assessments have been hampered by decisions predicated by faulty logic, one where mitigation and enhancement are runners-up in a losers game."¹⁴⁰

Meanwhile, the current five year drought in the West has exposed many parts of Glen Canyon long hidden under the stale waters of Lake Powell.¹⁴¹ One of the most famous canyons, Cathedral in the Desert, will be free of water by the end of April, 2005.¹⁴² Recent projections show that if the drought continues at rates

point where the dam is non-functional. Lake Powell is a temporary reservoir.

- The reservoir wastes to bank seepage and evaporation nearly one million acre feet annually, enough to supply Los Angeles with water for about one year or Salt Lake City for about five years.

- Downstream destruction is harrowing. Glen Canyon Dam continues to destroy the ecosystems of regions from the Grand Canyon and all the way to the Sea of Cortez.

Id.

¹³⁶ *Id.*

¹³⁷ *Id.*

¹³⁸ *Id.*

¹³⁹ Ingebretsen, *History of Glen Canyon*, *supra* note 132.

¹⁴⁰ *Id.*

¹⁴¹ Angie Wagner, *As Water Level Falls, Thirst to Drain Lake Powell Rises*, L.A. TIMES, Aug. 10, 2003, at Part 2, pg. 1.

¹⁴² *Timeline Until Cathedral in the Desert is Free of Water*, Cathedral in the Desert, at <http://www.cathedralinthedesert.org/pages/3/index.htm> (last visited Mar. 1, 2005).

prevalent in 2003, the reservoir level may fall below the outlet works as early as 2007.¹⁴³ If that happens, the generators at the dam will become inoperable and water flows through the Grand Canyon will return to a run of the river situation; water will flow out of Glen Canyon through the dam's outlet works at the rate it comes in to the remaining reservoir. GCI hopes the reappearance of the Canyon's wonders will generate further interest in the ultimate goal of complete restoration.¹⁴⁴

New hydrologic studies already underway by a group of scientists working for GCI have convinced the organization that even under significantly wetter conditions, the reservoir likely will never refill.¹⁴⁵ Inspired by these hydrologic studies, GCI is now turning its attention away from a focus on the dam to the design of a bold new plan for managing the dozens of quickly re-emerging wilderness canyons along the reservoir's 180 miles long reach. GCI expects to release a major proposal for establishment of a Glen Canyon National Park in May 2005.¹⁴⁶

CONCLUSIONS FOR THE NEXT TWENTY YEARS

In many respects, swiftly changing power generation technologies could well render moot the *sturm und drang* over the Lower Snake River dam removal proposals, the current spikes in electricity costs throughout the West, and the fights over deregulation of the electricity industry. The Rocky Mountain Institute ("RMI"), the world's premier energy systems think tank,¹⁴⁷ predicts that within the first two decades of the twenty-first century, a

¹⁴³ *Frequently Asked Questions About Restoring Glen Canyon*, Glen Canyon Institute, available at <http://www.glencanyon.org/aboutgci/faq.php> (last visited Mar. 1, 2005).

¹⁴⁴ *Id.*

¹⁴⁵ *Id.*

¹⁴⁶ Telephone Conversation with Chris Peterson, Executive Director, Glen Canyon Institute (Feb. 21, 2005).

¹⁴⁷ See generally Amory Lovins, *Energy Strategy: The Road Not Taken?*, FOREIGN AFFAIRS, Oct. 1976, available at <http://www.foreignaffairs.org/19761001faessay10205/amory-b-lovins/energy-strategy-the-road-not-taken.html>. See also AMORY B. LOVINS, *SOFT ENERGY PATHS: TOWARD A DURABLE PEACE* (1979).

swift change to a hydrogen-based economy will occur with many decentralized electrical power sources, including cost-effective solar generation and hydrogen-powered fuel cells.¹⁴⁸ This energy transition—combined with the pressures of endangered species listings, the aging of America’s dams, and the movement for river and watershed restoration led by River Network¹⁴⁹ (and its hundreds of local partner organizations throughout the 50 states and Canada), American Rivers,¹⁵⁰ International Rivers Network,¹⁵¹ and others—brings the promise of a renaissance of dam removals and decommissionings throughout the world.

If and when RMI’s predicted energy transition happens, it will make the current debates about oil supplies, the Organization of Petroleum Exporting Countries, nuclear power, and hydroelectricity costs and impacts nearly irrelevant. The question to ask now, however, on the Snake, Columbia, Colorado, Mississippi, Missouri, La Grande, Oldman, and countless other rivers throughout North America and around the world, is, “will we be smart enough to act ahead of the energy curve and act in time to save salmon and other endangered aquatic species before they tip to extinction?” Time is short, and the fish are disappearing.

With that question in mind, this Essay will conclude with a poem the author heard on an island in the La Grande River, in the mostly abandoned Cree village of Fort George, Quebec. Margaret Sam Cromarty, a Cree poet and wise elder of her people, whispered this poem in her home in 1991.¹⁵²

¹⁴⁸ See, e.g., Amory Lovins & Chris Lotspeich, *Energy Surprises for the 21st Century*, 53 J. INT’L AFF. 191, 191-92 (1999).

¹⁴⁹ For more information, see the River Network Web site at <http://www.rivernetwork.org>.

¹⁵⁰ For more information, see the American Rivers Web site at <http://www.amrivers.org>.

¹⁵¹ For more information, see the International Rivers Network Web site at <http://www.irn.org>.

¹⁵² Visiting with Margaret and her husband William Cromarty, an Ojibway elder, were the artist Alan Gussow, then Policy Chair of Friends of the Earth, Matt Huntington, Director of Hydropower Programs at American Rivers, and Steve MacAusland, Massachusetts filmmaker and former resident of the Cree village of Eastmain.

Life

By Margaret Sam Cromarty¹⁵³

In this time
of steel
and of speed,
we need
poetry.
Like a friend
warm and true
shedding a tear.
See it hang,
roll down,
feel things unseen.
Drawn
to things we see,
like the setting sun
of breath-taking colors.
A new dawn:
in its blue-shadow world
things move so fast.

Now moving faster and faster.¹⁵⁴

¹⁵³ MARGARET SAM CROMARTY, *Life, in JAMES BAY MEMOIRS: A CREE WOMAN'S ODE TO HER HOMELAND* 51 (1992).

¹⁵⁴ *Id.* Margaret's book of her poetry is "dedicated to the Cree and to those who are not Cree." MARGARET SAM CROMARTY, *JAMES BAY MEMOIRS: A CREE WOMAN'S ODE TO HER HOMELAND* (1992). *Id.*