The Little Colorado River Project: Is New Hydropower Development the Key to a Renewable Energy Future, or the Vestige of a Failed Past?

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INTRODUCTION

The Colorado Plateau consists of a series of stunning plateaus and mesas, all situated within a larger basin.[1] Despite being categorized as an arid region, perhaps the most crucial element in shaping the Plateau's geography, as well as its human past, is its hydrology. The principal water body on the Plateau is the Colorado River. Originating in the Rocky Mountains, it flows west through Colorado, Utah, and Arizona, eventually draining into the Gulf of California in Mexico.[2] The Colorado River basin drains 242,000 square miles of land in the United States, and is the main source of water on the Plateau.[3] Additionally, major tributaries, such as

1 *The Colorado Plateau*, NAT'L PARK SERVICE, https://www.nps.gov/articles/the-colorado-plateau.htm (last visited May 2, 2020).

2 M. John Loeffler & James L. Wescoat, *Colorado River*, ENCYCLOPEDIA BRITANNICA, https://www.britannica.com/place/Colorado-River-United-States-Mexico (last visited May 2, 2020).

3 Charles J. Meyers, *The Colorado River*, 19 STAN. L. REV. 1 (1966).

the Little Colorado River, play important roles in the Plateau's culture and ecology.[4] Over millions of years, these water systems worked tirelessly to erode the Plateau into its distinct terrain. And in modern history, they have become crucial players in the development of agriculture, urbanization, and energy, both on and off the Plateau. Decades of excessive dam-building harnessed the powers of these rivers and their tributaries, providing flood control, irrigation water, and hydroelectricity for growing communities.

Indigenous peoples have called the Colorado Plateau home for millennia. Tribes like the Navajo Nation and Hopi Tribe live near the Colorado River, relying on its tributaries for irrigation, sustenance, and ritual ceremonies. Over the last century and a half, Anglo-American settlers have developed a presence on the Colorado Plateau, shipping its resources out of the region to develop metropolises like Phoenix, Los Angeles, and Salt Lake City. This is especially true of energy development, where coal plants, uranium mining, and hydroelectric facilities have altered the landscape while hampering indigenous livelihoods. The development and exploitation of Plateau resources at the expense of tribal communities has contributed to economic, political, and sociocultural pressures that induce a wariness of further energy development in the region.

Water's role in economic development, as well as its cultural significance, continues to stoke controversy around the Plateau. Following Congress's passage of America's Water Infrastructure Act in 2018, various developers proposed a spate of new hydropower projects to meet state renewable energy goals. Perhaps the most contentious proposal is the Little Colorado River Project ("LCR Project"). The Little Colorado River meets with the larger Colorado River on the eastern edge of the Grand Canyon, forming a scenic confluence where aquamarine-blue waters flow past deep-red canyon walls. The remote area is incredibly picturesque, and home to indigenous sacred sites that have largely been spared from tourist traffic and industrial development.[5] This location, just upstream from Grand Canyon National Park, may become home to the LCR Project.[6] The proposed pumped-storage hydroelectric facility, capable of producing up to 1,500 megawatts of energy, could potentially supply much-needed renewable energy as antiquated forms of generation, like coal, steadily

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4 *Upper Basin of the Colorado River*, AM. RIVERS, https://www.americanrivers.org/river/upper-basin-colorado-river/ (last visited May 2, 2020).

5 Felicia Fonseca, *Hydro Company Proposes to Dam Little Colorado River East of Grand Canyon*, LA TIMES (Oct. 8, 2019), https://www.latimes.com/environment/story/2019-10-08/hydro-company-proposes-to-dam-little-colorado-river-east-of-grand-canyon.

6 *Id.*

decline. However, the site of the proposed project would both flood indigenous sacred sites upstream while making other private cultural areas more accessible to tourists, disrupting sacred practices, and potentially increasing instances of vandalism and destruction.[7] As such, tribes like the Navajo Nation and Hopi Tribe oppose the project. In addition to the destruction of cultural resources, damming the Little Colorado River would create significant environmental and ecological harms.[8] Because of these conflicting interests, the LCR Project presents a modern iteration of an ongoing resource management problem on the Colorado Plateau: the tension between unfettered economic development and preventing environmental and sociocultural harms.

As American states and municipalities increasingly support a transition from fossil fuels to renewable energy resources, electric utilities and developers must come up with solutions to meet existing electricity demand with new sources of clean energy. The Colorado Plateau, a region the Southwest has historically relied upon for power production, contains ample resources to aid in the transition to clean energy. Hydropower represents a particularly controversial source of "clean" energy in the region. This energy source, capable of supplying dependable electricity with hardly any carbon emissions, has a troubling history of environmental harms and blatant disregard for local tribal sovereignty. The recent LCR Project proposal has reignited these tensions, pitting clean energy creation against other environmental and cultural concerns. This Note will investigate how modern laws and policies surrounding hydropower development, environmental stewardship, and cultural resource protections help or hinder hydropower's role in producing clean energy on the Colorado Plateau. While new laws may attempt to speed up hydropower licensing to facilitate new projects on the Plateau, the development of modern law as a whole overwhelmingly signals the end of rampant dam-building in the United States. Therefore, shortsighted hydropower proposals such as the LCR Project are most likely doomed from the start.

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7 Roger Clark, *Second Dam Project Would Flood Sacred Site Near Grand Canyon*, GRAND CANYON TRUST (Sept. 30, 2019), https://www.grandcanyontrust.org/blog/second-dam-project-would-flood-sacred-site-near-grand-canyon; Fonesca, *supra* note 5.

8 Zoe Woodcraft, *Conservationists Intervene in Ludicrous Effort to Dam the Little Colorado River Half a Mile from the Grand Canyon*, EARTHJUSTICE (Nov. 18, 2019), https://earthjustice.org/news/press/2019/conservationists-intervene-in-effort-to-dam-little-colorado-river.

I. THE EVOLUTION OF HYDROPOWER ON THE COLORADO PLATEAU

This Part will explore the mechanics of hydropower, how its presence on the Colorado Plateau developed, and how that energy is often exported to other regions. This Part will also address how recent pieces of federal legislation are seeking to facilitate the next step in hydropower's evolution on the Plateau.

A. Hydropower and the Development of Pumped Storage

Hydropower involves harnessing the kinetic energy of flowing water to create electricity.[9] Because of the closed-loop nature of the Earth's hydrologic cycle, and the lack of greenhouse gas emissions and effluent pollution generally associated with the energy development process, hydropower is considered a renewable energy resource.[10] The basic technology behind hydropower was first used in the United States in the 1880s, and has since evolved into one of the most consistently dominant sources of renewable energy in the country.[11] Hydroelectric facilities are often built into dams with impoundment reservoirs behind them.[12] This conventional dam design allows for controlled releases of stored water to spin turbines within the dam, which transforms the kinetic energy of moving water into mechanical energy, thereby creating electricity. The ability to schedule long, controlled releases of water into the turbines means hydropower projects are capable of providing reliable energy while avoiding intermittency problems, which affect other forms of renewable energy.[13]

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9 *How Hydroelectric Energy Works*, UNION OF CONCERNED SCIENTISTS (Dec. 12, 2014), https://www.ucsusa.org/resources/how-hydroelectric-energy-works [hereinafter *Hydroelectric*].

10 *How Hydropower Works*, U.S. DEPT. OF ENERGY, OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energy.gov/eere/water/how-hydropower-works (last visited Feb. 25, 2020).

11 Peggy Brookshier, *Hydropower Technology*, 3 ENCYCLOPEDIA OF ENERGY 333, 333 (2004); *Hydroelectric*, *supra* note 9.

12 *Id.*

13 MIGUEL CASTRO, INTERMITTENT RENEWABLE ENERGY, HYDROPOWER DYNAMICS AND THE PROFITABILITY OF STORAGE ARBITRAGE 2 (Inter-American Development Bank 2020); *Benefits of Hydropower*, U.S. DEPT. OF ENERGY, OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energy.gov/eere/water/benefits-hydropower#:~:text=Hydropower%20is%20fueled%20by%20water,reliant%20on%20international%20fuel%20sources. (last accessed Oct. 10, 2020).

Another type of hydroelectric facility, which is the kind being proposed on the Little Colorado, is a pumped-storage plant.[14] The system uses two reservoirs, one at a higher elevation than the other.[15] When called upon to produce power, water is released from the higher elevation reservoir into the lower elevation reservoir, spinning turbines to create electricity.[16] When energy demand on the electricity system is low and the cost of power is cheap, the water from the lower reservoir is pumped back up into the higher-elevation reservoir to be used again when demand later increases.[17] Some pumped-storage facilities are "closed-loop," meaning that they transfer water between the upper and lower reservoir only. However, many facilities are built in an "open-loop" design, discharging water into river systems in order to ensure an adequate supply of water without permanently removing it from the larger hydrologic system.[18] The lower reservoir is then refilled by a dammed segment upstream on the same river. As a result, pumped-storage projects often require damming rivers and tributaries.

14 Clark, *supra* note 7.

15 *Types of Hydropower Plants*, U.S. DEPT. OF ENERGY, OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energy.gov/eere/water/types-hydropower-plants (last visited Oct. 9, 2020).

16 *Id.*

17 *Hydroelectric*, *supra* note 9.

18 *See supra* Figure 1.

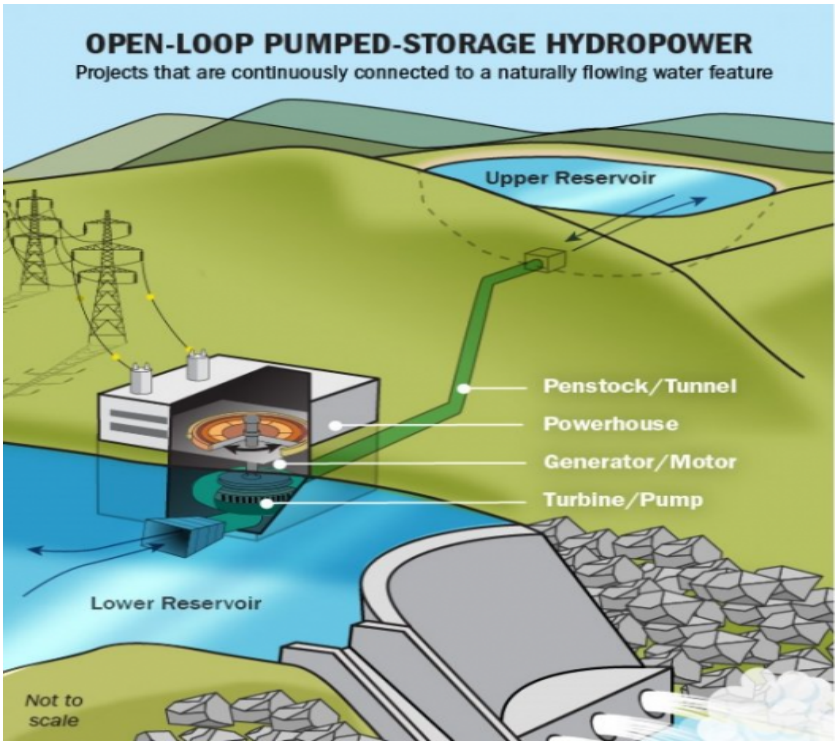

Figure 1: Displaying an open-loop pumped-storage hydropower project, akin to the plans for the LCR Project.[19]

The LCR Project would employ this "open-loop" concept. The pumped-storage facility would be sited on Navajo Nation land near the confluence of the Little Colorado and Colorado Rivers, just a half-mile from the border of Grand Canyon National Park.[20] A lower concrete dam would be installed a few miles above the confluence of the Little Colorado and Colorado Rivers to flood approximately 200 acres of canyon.[21] A second rockfill dam would sit on the rim above the canyon, creating the upper reservoir.[22] The lower dam would alter the hydrology of the river

19 *A New Approach to Pumped Storage Hydropower*, U.S. DEPT. OF ENERGY (June 7, 2019), https://www.energy.gov/eere/water/articles/new-approach-pumped-storage-hydropower.

20 Clark, *supra* note 7.

21 *Id.*

22 *Id.*

just a few miles from the confluence, in turn affecting the Colorado River's downstream ecosystems and water users.[23] This highlights that dams, along with their associated reservoirs, are crucial components of hydropower generation. However, they carry with them many cultural and environmental concerns, which will be addressed later.

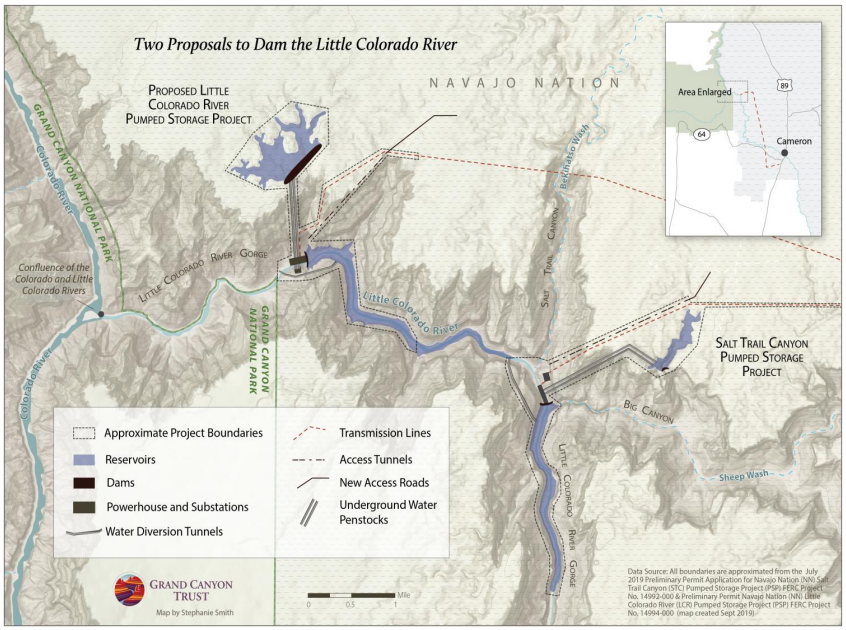

Figure 2: A map depicting the location of the proposed LCR Project on the Little Colorado River, along with the additionally proposed Salt Trail Canyon Pumped Storage Project.[24]

B. History of Dam Construction on the Plateau

Early homesteading laws shaped the development of hydropower on the Colorado Plateau. In 1877, Congress passed the Desert Land Act in an attempt to promote settlement of arid and semi-arid regions of the American West.[25] The Act allowed homesteaders to "reclaim" public land

23 Roger Clark, *New Dam Proposal Threatens Grand Canyon*, GRAND CANYON TRUST (Sept. 27, 2019), https://www.grandcanyontrust.org/blog/new-dam-proposal-threatens-grand-canyon [hereinafter Clark II]; *see supra* Figure 2.

24 Clark II, *supra* note 23.

25 *Desert Land Entries*, BUREAU OF LAND MGMT., https://www.blm.gov/sites/blm.gov/files/Desert%20Land%20Entries.pdf (last visited May 2, 2020).

so long as they constructed irrigation infrastructure to cultivate those lands.[26] This consequently led to an influx of settlement on or near the Plateau, with areas like Arizona's Salt River Valley, home to the Phoenix metropolitan area, and California's Imperial Valley seeing an increase of ranchers and farmers.[27] The population growth in these arid regions necessitated the development of infrastructure to retain and transport water to satisfy the needs of the newer inhabitants, particularly for irrigation. Once numerous government-sponsored surveys mapped the region's water resources and federal laws like the Desert Land Act were enacted, widespread dam development ensued to fulfill this purpose.[28]

Congress created the Bureau of Reclamation in 1902 through the Reclamation Act, a law which established federal funding structures for large-scale irrigation and flood control projects on rivers and waterbodies across the country.[29] The agency found opportunity for projects on the Plateau, seeking to improve the storage and use of water to facilitate economic development in the arid West.[30] The Bureau's—and, by extension, the federal government's—involvement in the development of water infrastructure in the West channeled federal money into dam construction projects, storing huge amounts of water behind concrete barriers so that the government could ensure homesteaders had a constant, dependable water supply.

While many of these dams primarily served the purpose of supplying water for irrigation, rapid population growth in areas near the Plateau during the twentieth century created the need for dams to serve a second purpose. To meet growing electricity demand, the Bureau of Reclamation began selecting sites for hydropower development. Black Canyon was one such location, and became the site of Hoover Dam.[31] The site was initially staked for dam development when Congress passed the Boulder Canyon Act in 1928 (Boulder Canyon being another name for Black Canyon).[32] Around that same time, the economic stimulus created by the New Deal channeled millions more federal dollars into hydroelectricity projects.[33]

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26 *Id.*

27 Karl S. Landstrom, *Reclamation Under the Desert-Land Act*, 36 J. OF FARM ECON. 500, 500 (1954).

28 *See id.* at 222.

29 The Reclamation Act of 1902, 43 U.S.C. §§ 1, 371–616 (1902).

30 *About Us – Mission*, BUREAU OF RECLAMATION, https://www.usbr.gov/main/about/mission.html (last visited May 2, 2020).

31 *Hoover Dam Historical Information*, BUREAU OF RECLAMATION, https://www.usbr.gov/lc/hooverdam/history/storymain.html (last updated Feb. 8, 2017).

32 Boulder Canyon Project Act, Pub. L. No. 642–70, 45 Stat. 1057 (1928).

33 Emilio F. Moran et al., *Sustainable Hydropower in the 21st Century*, 115 PROC. OF THE NAT'L ACAD. OF SCI. 11891, 11891 (2018).

This combined promise of money and labor allowed a conglomerate of companies to propose the largest concrete structure ever built at the time. Hoover Dam, the monolithic icon of the dam construction era, was opened for operation on the Colorado River along the Arizona-Nevada border in 1937.[34] The hydroelectric facility still creates energy to this day, serving up to 1.3 million people in Nevada, Arizona, and California.[35]

The success of the Boulder Canyon Project helped trigger a cascade of dam and hydropower development until the early 1970s.[36] Today, all projects on the Plateau, including Glen Canyon Dam and the accompanying Lake Powell, combine to store five times the amount of water usually furnished by the previously free-flowing Colorado River.[37] Throwing support behind hydropower development, Congress passed the Colorado River Basin Project Act in 1968, which in part encouraged retrofitting existing dams with hydropower-generation equipment.[38] As a result, projects constructed across the country during the twentieth century tripled the United States' hydropower output, which soon provided for forty percent of electric use nation-wide.[39]

Undoubtedly, this federally sanctioned buildup of dams and hydropower generation took full advantage of Colorado Plateau water resources. In total, there are now fourteen large dams on the Colorado River's main stem, and dozens of others throughout the river basin's tributaries.[40] The hydropower generation from these facilities creates enough power to provide over 4,200 megawatts of electricity with Colorado Plateau water, enough for fifteen million people in the region.[41]

C. Shipping Resources Off the Plateau: Phoenix as an Example

It would be an understatement to say that dams on the Colorado Plateau are crucial components for reliable irrigation, flood control, and electricity in nearby communities as they are structured today. But rather than primarily serving Plateau communities and interests, private and public enterprisers have promoted a net-exportation of these resources to outside metropolises. The City of Phoenix exists as a prominent example

34 *Id.*

35 *Hoover Dam*, BUREAU OF RECLAMATION, https://www.usbr.gov/lc/hooverdam/faqs/powerfaq.html (last updated Aug. 1, 2018).

36 Aregai Tecle, *Downstream Effects of Damming the Colorado River*, 10 INT'L J. OF LAKES AND RIVERS 7, 15 (2017).

37 *Id.*

38 Colorado River Basin Project Act, Pub. L. No. 90-537, § 303, 82 Stat. 885 (1968).

39 Moran et al., *supra* note 33.

40 Tecle, *supra* note 36.

41 *Id.* at 17.

of Plateau hydropower benefitting outside communities. Due to its pleasant climate and striking scenery, businessmen, investors, and politicians sought to transform the area from a struggling agricultural town to a bustling urban center capable of attracting business, industry, and homeowners.[42] With federal support and savvy politicking, this vision was well underway towards the latter half of the twentieth century.[43] But the rapid growth of the city mandated a significant increase in power supply.

To keep the skyline free of unsightly power stations and harmful pollutants, Phoenix leaders worked with utility companies and power providers to secure transmission of energy generation from the Colorado Plateau, hundreds of miles away.[44] Though these efforts required connection and construction of coal plants, they facilitated substantial hydropower development as well.[45] Numerous dams were constructed and fitted with turbines to provide hydroelectricity to Arizona's quickly growing urban centers. The push for a bigger Phoenix motivated Arizona legislators to rigorously voice their support for the construction of hydropower projects in the 1960s, which, upon construction, would supply additional electricity to the rapidly growing city.[46]

Political support for these projects continuously realized impactful results, and Arizona's hydropower generation continued to expand in the latter half of the twentieth century. According to 2018 data, almost half of Arizona's total renewable generation comes from hydropower.[47] Plateau dams such as Hoover and Glen Canyon provide large amounts of electricity, which is then transported to major urban areas.[48] Using the development of Phoenix as an example, it is obvious that electricity generated from Colorado River and tributary dams provide substantial amounts of power to regions outside the Plateau. Clearly, hydropower is a crucial component of the current renewable energy mix of Plateau states. This is an important factor to consider when contemplating the need for inclusion of hydropower generation in a shift to renewables on the Colorado Plateau.

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42 ANDREW NEEDHAM, POWER LINES: PHOENIX AND THE MODERN SOUTHWEST 106 (William Chafe et al. eds., Princeton University Press, 2014).

43 *See generally id.*

44 *Id.* at 181.

45 *Id.* at 75.

46 JENNIFER E. ZUNIGA, THE CENTRAL ARIZONA PROJECT 25 (Bureau of Reclamation 2000).

47 *Arizona: State Profile and Energy Estimates*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/state/analysis.php?sid=AZ (last visited May 2, 2020).

48 *Id.*

D. Modern Policies for Dam and Hydropower Construction

Over half of the Colorado Plateau is public land, and as such, any hydropower project sited there would likely have to deal with various levels of federal oversight.[49] Despite a winding down of major projects after the 1960s, federal support for hydropower is experiencing a resurgence in the twenty-first century. In the 2017–2018 federal legislative session, for example, several western legislators made concerted pushes for increased hydropower development in their states. In 2017, Republican Representative Tom McClintock of California introduced the Water Supply Permitting Coordination Act.[50] Garnering the support of other western legislators from Arizona and Colorado, the bill's main purpose was to speed up approvals and environmental analyses for new dam construction, with the hope of creating more water security and hydropower development in the West.[51] The Act would have essentially exempted dams from most environmental laws, limiting environmental review to only one year.[52] Despite ardent protests from environmentalists, regulators, and water law experts,[53] the bill passed the House later in 2017.[54] However, the Senate never sent the bill to committee, and thus it died during the legislative session.

Nonetheless, other dam and hydropower legislation managed to proceed to the president's desk. In 2018, Congress passed the America's Water Infrastructure Act.[55] Among other things, the Act requires the Army Corps of Engineers to assess and develop a list of nonpowered dams across the country which have the greatest potential for hydropower generation.[56] Additionally, the law mandates that the Federal Energy Regulatory Commission ("FERC") expedite licensing procedures to install and operate hydropower facilities in existing dams.[57] Thus, this law seeks to

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49 *Colorado Plateau*, PEAKS, PLATEAUS, AND CANYONS ASS'N, https://www.peaksplateausandcanyons.org/colorado-plateau/ (last visited May 2, 2020).

50 *H.R. 1654 – Water Supply Permitting Coordination Act*, CONGRESS.GOV, https://www.congress.gov/bill/115th-congress/house-bill/1654 (last visited May 2, 2020).

51 *Id.*

52 Bob Berwyn, *Congress Eyes a Bill to Speed Up Dam Construction*, PACIFIC STANDARD (June 14, 2017), https://psmag.com/news/congress-eyes-a-bill-to-speed-up-dam-construction.

53 *Id.*

54 *H.R. 1654 – Water Supply Permitting Coordination Act*, CONGRESS.GOV, https://www.congress.gov/bill/115th-congress/house-bill/1654 (last visited May 2, 2020).

55 America's Water Infrastructure Act of 2018, Pub. L. No. 115–270, 132 Stat. 3765 (2018).

56 *Id.* § 1206.

57 *Id.* § 3003.

speed up the rate of hydropower development across the country.

For environmentalists, Congressional promotion and expedition of hydropower development could be a positive sign in a push to a more renewable future. However, current and future dam projects present environmental and cultural concerns such as loss of species habitat and destruction of cultural sites.[58] Consequently, critics of dams may point out that the Water Infrastructure Act does not seem to present an opportunity to tackle these problems and, more broadly, reassess whether some dams need to exist in the first place. Furthermore, the law does not improve protections for environmental and sociocultural concerns, which often plague existing dams. Whether failed or signed into law, these pieces of legislation show that support for dam construction and hydropower is still alive among lawmakers in southwestern states. These policy ideals promote expedited licensing and construction, risking a repeat of the harms of rampant dam-building that scarred the Plateau in the past.

E. The Result of Renewed Federal Support for Dams

Regardless of these concerns, the renewed federal push for hydropower development has inspired various organizations to pursue hydropower projects on the Colorado Plateau. In addition to the LCR Project, there are several other pumped-storage facility proposals. Pumped Hydro Storage LLC, the same company hoping to build the LCR Project, also proposed a facility just upstream of Salt Trail Canyon in Arizona.[59] This area, within the Navajo Nation and along the Little Colorado River, holds significant cultural value to both the Navajo Nation and the Hopi Tribe; the Hopi's Salt Trail has been used for centuries to collect salt and perform rituals deep within the Grand Canyon.[60] The surrounding areas, once kept relatively private for Hopi cultural use, would be flooded with workers and vehicles to construct the two large concrete dams. Eventually, water from the lower reservoir would flood this sacred area too.[61]

The largest project proposed on the Plateau thus far is Daybreak Power's Navajo Energy Storage Station ("NESS"), to be located on

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58 *See infra* pp. 21, 28.

59 Clark, *supra* note 7.

60 T.J. Ferguson et al., *Kukhepya: Searching for Hopi Trails*, LANDSCAPES OF MOVEMENT: TRAILS AND PATHS IN ANTHROPOLOGICAL PERSPECTIVE 2 (Nov. 18, 2004), http://www.antonylyons.net/antony/Blog/Entries/2012/4/24_Salt_and_Landscape_2_files/nb%20hopi%20Ferguson%20et%20al2.pdf.

61 *Id.*

Navajo Nation near the south shore of Lake Powell.[62] The massive pumped-storage facility, estimated to cost $3.8 billion, would have the capacity to generate 2.2 gigawatts of power.[63] Federal laws like America's Water Infrastructure Act are clearly renewing interest in hydropower development on the Plateau. However, despite FERC's accelerated licensing procedures, breaking ground for construction is still several years off, assuming subsequent licenses even get approved.[64] Ultimately, these project proposals show that, due in large part to federal encouragement, unfettered dam and hydropower development continuously looms as a threat to cultural and environmental interests on the Plateau.

II. HYDROPOWER AS AN ALLY IN THE SHIFT TO CLEAN POWER

This Part will discuss the motivations for a shift to clean power on the Plateau, along with hydropower's potential to contribute to that change.

A. Coal Generation and the Harms of the "Big Buildup"

To increase electricity generation capacity beyond what hydropower facilities could supply, coal-fired power plants began to sprout up throughout the region starting in the 1960s.[65] Long power lines, spanning hundreds of miles, transported the energy created by the coal plants to rapidly expanding cities like Los Angeles, Phoenix, Salt Lake City, Albuquerque, and Denver.[66] These cities demanded more electricity, which led to a "big buildup" of energy generation on the Plateau.[67] However, this "big buildup" was also characterized by the inequities faced by Plateau communities, namely tribes. National and international

62 *Navajo Energy Storage Station*, DAYBREAK POWER, https://daybreakpower.com/navajo-energy-station (last visited May 2, 2020).

63 Joyce Patry, *Massive Battery Proposed Near Retired Navajo Coal Plant, Reports Daybreak Power*, BUSINESSWIRE (Jan. 17, 2020), https://www.businesswire.com/news/home/20200117005017/en/Massive-Battery-Proposed-Retired-Navajo-Coal-Plant.

64 Fonseca, *supra* note 5.

65 CHARLES WILKINSON, FIRE ON THE PLATEAU: CONFLICT AND ENDURANCE IN THE AMERICAN SOUTHWEST 207 (1999).

66 John Weisheit, *Coal-burning Power Plants of the Colorado River Basin*, ON THE COLO. (Oct. 23, 2008), http://www.onthecolorado.com/articles.cfm?mode=detail&id=1224816661155.

67 WILKINSON, *supra* note 65, at 212–13.

corporations opened mines to exploit Plateau coal. These worksites primarily employed Navajo and Hopi people and opened gaping mines on their reservations.[68] As a result of proximity to these operations, tribes have been exposed to the vast majority of the coal industry's environmental and health impacts on the Plateau, including air pollution, water pollution, poor access to healthcare, and a lopsided economic dependence on the root cause of these harms.[69] These wrongdoings became contributing factors for a push by many tribal communities to remove coal production from their lands, and by extension, off the Plateau.[70] They also contribute to the continued local skepticism of energy projects, and their uneven benefits to far-away cities at the expense of Plateau communities. Tribes have historically borne the brunt of the environmental and health impacts of energy development with little economic benefit. The LCR Proposal therefore faces an uphill battle in proving to Plateau communities that the project would not repeat past inequities.

B. Decommissioning Coal and the Shift to Renewable Energy

In recent decades, as a result of these social and environmental concerns, as well as the decreasing financial viability of coal power in general, utility companies and power providers have begun to decommission coal power plants. For example, the Navajo Generating Station, the largest coal plant on the Plateau, closed its doors in 2019.[71] The plant could produce over 2,000 megawatts at full capacity and was an important contributor to electricity demand in Phoenix, Tucson, and Las Vegas.[72] Cheaper energy sources, including natural gas and solar power, as well as aging technologies and equipment within the plant, were factors that doomed its continued operation.[73] With coal generation steadily decreasing thanks to high cost, other plants on the Plateau have met the

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68 Weisheit, *supra* note 66.

69 Laura Dattaro, *Here's What Coal Mining Is Doing to Communities in the Navajo Nation*, VICE NEWS (Mar. 18, 2015, 2:25 PM), https://www.vice.com/en_us/article/wjywkq/heres-what-coal-mining-is-doing-to-communities-in-the-navajo-nation.

70 NEEDHAM, *supra* note 42, at 218.

71 Ryan Randazzo & Shondiin Silversmith, *Navajo Generating Station – the Largest Coal Plan in the West – has Shut Down*, AZ CENTRAL (Nov. 18, 2019), https://www.azcentral.com/story/money/business/energy/2019/11/18/navajo-generating-station-coal-plant-arizona-closes/2567154001/.

72 *Id.*

73 Roger Clark, *Navajo Generation Station's Next Chapter*, GRAND CANYON TRUST, https://www.grandcanyontrust.org/advocatemag/spring-summer-2017/navajo-generating-station (last visited May 2, 2020).

same fate as the Navajo Generating Station.[74] All but a handful of the fifty-one coal plants on or within fifty miles of the Colorado Plateau's geographic area have set closure dates.[75]

In line with the coal plants shutting down, states in and around the Plateau are pursuing their own renewable energy plans. For example, Arizona, which has historically fulfilled a significant portion of its energy needs through coal power,[76] has committed to fulfilling fifteen percent of its statewide energy needs through renewables by 2024, mentioning hydropower facilities as potentially eligible renewable sources.[77] New Mexico, another state whose borders overlap with the Plateau, plans to reach a more ambitious forty percent renewables load by 2025, including hydropower as a part of the mix.[78] These goals rely on and catalyze significant renewable generation increases in the region, and both contemplate the continued use of hydropower to meet their respective targets.

C. The LCR Project and "Clean" Pumped Hydropower

As a result of the "big buildup," cities that surround the Plateau continue to rely on its energy generation; as a result, the region will continue to be seen as attractive real estate for projects that meet the demand for additional renewable energy development. Developer Steve Irwin and his company, Pumped Hydro Storage, evidently see the Plateau this way, hoping to use the LCR Project to meet growing renewable energy demands in the Southwest. FERC introduced this proposal in the federal register in September of 2019,[79] where Pumped Hydro Storage estimated the cost of the project to be $6 billion.[80] After a commenting period, FERC

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74 *U.S. Coal Consumption in 2018 Expected to Be the Lowest in 39 Years*, ENERGY INFO. ADMIN. (Dec. 28, 2018), https://www.eia.gov/todayinenergy/detail.php?id=37817.

75 Taylor McKinnon & Sam Kumasaka, *The "Clean Power Plan" and the Colorado Plateau: Part I*, GRAND CANYON TRUST (Aug. 7, 2014), https://www.grandcanyon trust.org/blog/clean-power-plan-and-colorado-plateau-part-1; Sammy Roth, *Coal Plants are Closing Across the West. Here are the Companies Sticking with Coal*, LA TIMES (Feb. 4, 2020), https://www.latimes.com/environment/story/ 2020-02-04/coal-power-plants-western-us.

76 *Arizona: State Profile and Energy Estimates, supra* note 47.

77 ARIZ. ADMIN. CODE §§ 14-2-1802, 1804 (2020) (effective Aug. 14, 2007).

78 Renewable Energy Act, N.M. STAT. ANN. §§ 62-16-3(H)(2), -4(A)(3) (2019).

79 Pumped Hydro Storage, LLC; Notice of Preliminary Permit Application Accepted for Filing and Soliciting Comments, Motions To Intervene, and Competing Applications, 84 Fed. Reg. 49,723 (Sept. 20, 2019) [hereinafter Pumped Hydro Storage, LLC].

80 Halne'e, *Navajo Chapter Opposes Dams*, SAVE THE CONFLUENCE (Nov. 21, 2019), https://savetheconfluence.com/news/navajo-chapter-opposes-dams.

approved a license to allow Pumped Hydro Storage to complete an in-depth feasibility study.[81] The study will cost several million dollars and take multiple years to complete. This stage of the permitting process will bring environmental and social concerns to the forefront. However, it is unknown how much of an impact those concerns may have on how the project moves forward.

The supposed benefits of the LCR Project echo similar promises once made by other hydropower and coal proposals. Irwin has touted the facility as providing benefits not only for large southwestern communities, but also for those living on the Plateau. In an interview with the Los Angeles Times, Irwin explained that the LCR Project could bring paved roads, potable water, and clean electricity to tribal communities, along with easier access to the Little Colorado for recreation.[82] Irwin believes that these benefits would boost the Navajo Nation's economy, bringing jobs and investment to the Nation.[83] Furthermore, the pumped-storage facility would supply an average of 8,500 gigawatts of clean, renewable power per year.[84] As a comparison, the recently closed Navajo Generating Station was producing approximately 13,000 gigawatts per year.[85] The LCR Project, combined with other proposals like NESS and the Salt Trail Canyon facility, could provide energy to make up for closing coal plants around the Plateau. If Irwin's assertions are true, his project would help meet clean energy goals set by Plateau states while improving local economies.

III. ENVIRONMENTAL IMPACTS OF PLATEAU HYDROPOWER

Though it is worth acknowledging Colorado Plateau dams and their importance in providing water and energy to people in the region, it is equally important to note the environmental impacts that stem from impeding a river's flow with countless tons of concrete. This Part will explore the environmental consequences of hydropower projects and how federal law evolved to account for those impacts.

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81 Pumped Hydro Storage, LLC*, supra* note 79.

82 Fonseca, *supra* note 5.

83 *Id.*

84 Pumped Hydro Storage, LLC, *supra* note 79.

85 *Electricity Data Browser – Navajo*, ENERGY INFO. ADMIN., https://www.eia.gov/electricity/data/browser/#/plant/4941?freq=A&ctype=linechart&ltype=pin&maptype=0&pin=&linechart=ELEC.PLANT.GEN.4941-ALL-ALL.A&columnchart=ELEC.PLANT.GEN.4941-ALL-ALL.A (last visited May 2, 2020).

A. Environmental Impacts

The era of excessive dam-building, spanning from the early 1900s to the 1960s, predated many environmental laws in the United States, including the Clean Water Act, the National Environmental Policy Act, and the Endangered Species Act. Consequently, twentieth century Plateau dam development—and accompanying hydropower projects—proceeded largely ignorant of their environmental impacts.[86] But as the federal government became more cognizant of the ecological and climatic consequences of industrialization, and as public sentiment spurred the environmental movement, the perceptions of dams began to change. Shining examples of man's ability to tame and harness rivers increasingly became seen as brutalist impediments to nature in the eyes of the general public and environmental experts alike.

Multiple studies on water storage projects on the Colorado Plateau have shed light on the environmental impacts of dams. Dams along the Colorado River trap silt from the streamflow behind their concrete walls, where it settles to the bottom of reservoirs. The water that flows from the dam is clearer, which may be more aesthetically pleasing, but has real consequences for the downstream ecosystem. The lack of sediment results in lower deposits on the banks of the Colorado River, which rapidly increases the rate of riparian zone erosion.[87] Riparian zone erosion can affect nutrient cycling, vegetation growth, and flood events.[88] Furthermore, many native fish species in the Colorado River depend on the formation of sandbars, river banks, and the calmer off-channel pools for breeding, all of which are created by these deposits.[89] Sediment also carries nutrients such as nitrogen and phosphorous, which are crucial to ecological processes downstream.[90] Because dams have reduced the Colorado River's sediment transport by ninety percent, this problem

86 Moran et al., *supra* note 33.

87 Justin McDaniel, *Costs and Benefits of the Glen Canyon Dam: A New Study Examines the Impacts of Halting Electrical Generation*, CSG KNOWLEDGE CTR. (July 29, 2016, 3:28 PM), https://knowledgecenter.csg.org/kc/content/costs-and-benefits-glen-canyon-dam-new-study-examines-impacts-halting-electrical-generation.

88 *Riparian Areas Environmental Uniqueness, Functions, and Values*, USDA: NAT. RES. CONSERVATION SERV., https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/?cid=nrcs143_014199 (last visited May 2, 2020).

89 Jess Rudnick, *'Fish Be Damned': Native Fish Populations in the Colorado River Basin Struggle to Survive*, EDUC. AT THE CTR. FOR WATERSHED SCI.: JESSICA RUDNICK'S BLOG (Apr. 13, 2017), https://watershed.ucdavis.edu/education/classes/files/content/flogs/Rudnick_Blogging_Provost-1.pdf.

90 Jim Robbins, *Restoring the Colorado: Bringing New Life to a Stressed River*, YALE ENV'T 360 (Feb. 14, 2019), https://e360.yale.edu/features/restoring-the-colorado-bringing-new-life-to-a-stressed-river.

creates concern over collapsing food chains and the longevity of native fisheries.[91] Therefore, sediment trapping in reservoirs can be harmful for Plateau riparian zones, leading to decreased vegetation, loss of species habitat, and higher rates of erosion.

The tangled web of infrastructure influencing the Plateau's hydrology has resulted in massive changes to its ecology. Because of shifts in sediment content, water temperature, and hydrological flows, many native and endemic species of fish struggle to persist.[92] Areas of the Colorado River Basin closer to the headwaters still have many native fish species, although several are now listed as endangered under the Endangered Species Act.[93] The Lower Basin—where states like Arizona, New Mexico, and California draw their water—has an almost entirely introduced fish population.[94] Different species of fish purposefully or accidentally introduced to the system by people are able to outcompete native species in the dammed river system because they are more resilient to human-induced changes in hydrology.[95] Fish whose lifecycles previously drove them through significant portions of the Colorado River system are now pinned between dams, suffocated by introduced species. Dams on the Colorado River have also flooded unique upstream ecosystems while drying out others downstream.[96] These projects have resulted in a loss to habitat, species, and ecosystem services, to a high degree.

Pumped-storage hydropower projects produce a host of similar environmental harms. Because "open-loop" iterations require constructing a dam to impound river water, they too contribute to the environmental problems discussed above.[97] There are additional unique problems created by pumped-storage projects. For one, the reservoirs and nearby rivers will experience rapid shifts in water level as water is captured or expended in the storage and power generation processes. This can be damaging to flora and fauna in riparian zones.[98] The constant and extreme fluctuations also disrupt sediment on the river or reservoir bottoms, which reduces visibility

91 *See* Rudnick, *supra* note 89.

92 Robbins, *supra* note 90.

93 *Id.*

94 *Id.*

95 Rudnick, *supra* note 89, at 2–3.

96 Robbins, *supra* note 90.

97 *See* NAT'L HYDROPOWER ASS'N PUMPED STORAGE DEV. COUNCIL, CHALLENGES AND OPPORTUNITIES FOR NEW PUMPED STORAGE DEVELOPMENT 9 (2017), *available at* https://www.hydro.org/wp-content/uploads/201/08/NHA_PumpedStorage_071212b1.pdf.

98 *Id.*

in the water.[99] While conventional dams may provide infrastructure to facilitate river species bypassing impediments, the vertical nature of pumped-storage projects prevents this sort of mitigation. This migration barrier exists because if aquatic plants or animals are inadvertently sucked into the system and sent to a higher- or lower-elevation reservoir, there is no good way to return them against the flow to their original habitat.[100] This means that many "open-loop" pumped-storage projects risk increasing the species mortality in an already dammed river system.[101]

B. Modern Environmental Laws and Hydropower

These environmental harms were eventually noticed by policymakers, contributing to a slowing of dam development after the 1960s. As the environmental movement blossomed in the early 1970s, federal legislators passed a slew of environmental laws. These included the Endangered Species Act of 1973 ("ESA"), which forced dam developers and operators to consider and reduce impacts to endangered and threatened aquatic species.[102] If a dam were to jeopardize a listed species' continued existence, this law would have the teeth to stop a dam construction project altogether.[103] In addition to the ESA, laws like the National Environmental Policy Act and Clean Water Act, passed in 1969 and 1972 respectively, impose additional requirements on hydropower project planning and implementation.[104] These laws contributed to a slowing of dam development starting in the 1970s, as the marginal benefits derived from further damming river systems were weighed against stricter environmental protections.[105] In fact, despite new federal efforts to promote dam construction, many modern environmental policies surrounding dams require significant river restoration and impact mitigation, which complicates the cost and logistics of new project

99 FILIP PATOCKA, ENVIRONMENTAL IMPACTS OF PUMPED STORAGE HYDRO POWER PLANTS 19 (2014), *available at* https://pdfs.semanticscholar.org/b3e7/c71677 5cba240aec39f6521c3af28c821a16.pdf.

100 *Id.* at 20.

101 *Id.*

102 Jeremy P. Jacobs, *Dams Seen Driving 'Mass Extinction' of Salmon*, E&E NEWS (Sept. 26, 2017), https://www.eenews.net/special_reports/Damage/stories/1060061615.

103 *See, e.g.*, Tennessee Valley Authority v. Hill, 437 U.S. 153 (1978).

104 Paul Rogers, *California Drought: Why Doesn't California Build Big Dams Any More?*, THE MERCURY NEWS (Aug. 31, 2014), https://www.mercurynews.com/ 2014/08/31/california-drought-why-doesnt-california-build-big-dams-any-more.

105 *Id.*

proposals.[106] Due to FERC's involvement in hydropower development, these federal laws will apply to the agency, taking center stage in the LCR Project planning process. Therefore, FERC and Pumped Hydro Storage must consider alternative strategies that do not harm water quality, endangered species habitat, or other environmental factors. Consequently, modern hydropower projects deal with additional hurdles to development that their predecessors, such as Hoover or Glen Canyon Dam, did not have to work around.

C. Hydropower and Resiliency to Climate Change

While dams and hydropower facilities cause a host of environmental harms, their efficacy can be hamstrung by the environment itself. Climate change, resulting in increased drought on the Colorado Plateau, contributes to lower flows in the Colorado River.[107] Concerns over frequent droughts impact many sectors of the economy, including hydropower generation. When reduced streamflow impacts the volume of water storage in a reservoir, there is less water available to satisfy water rights designated for electric generation. For example, power plant operators at Glen Canyon Dam are increasingly concerned about the decreasing water levels in Lake Powell.[108] If water levels fall below 3,487 feet, the amount of air intake accompanying the water feeding the dam's turbines can significantly damage the machinery.[109] Thus, the turbines become inoperable when the reservoir reaches a certain low-water level. In recent years, Lake Powell's water levels have come within just ninety-eight feet of that mark.[110] Pumped-storage projects would present similar issues when reservoir levels are too low to generate the facility's expected energy. With decreased snowpack in the mountains feeding the Colorado Basin, increased temperatures throughout the Plateau, and large withdrawals of Colorado River water for human use, climate change is a pressing concern regarding the potential efficiency and lifespan of newly

106 Daniel F. Luecke, *Dams: Their Costs and Benefits*, *in* DAMS: WATER AND POWER IN THE NEW WEST 7 (June 2, 1997), *available at* http://scholar.law.colorado.edu/dams-water-and-power-in-new-west/3.

107 Jim Robbins, *On the Water-Starved Colorado River, Drought is the New Normal*, YALE ENV'T 360 (Jan. 22, 2019), https://e360.yale.edu/features/on-the-water-starved-colorado-river-drought-is-the-new-normal.

108 AARON THIEL, CTR. FOR WATER POLICY, CLIMATE CHANGE IMPACTS ON HYDROPOWER IN THE COLORADO RIVER BASIN (Will Kort & Victoria Lubner eds., 2013), https://uwm.edu/centerforwaterpolicy/wp-content/uploads/sites/170/2013/10/Colorado_Energy_Final.pdf.

109 *Id.*

110 *Id.*

proposed hydropower projects.

The increasing cost of hydropower generation reflects the reality of this situation. Studies show that uncertainties surrounding generation during times of prolonged drought tend to increase overall hydropower operation costs.[111] The idea of relying on the Colorado River's streamflow for sufficient reservoir capacity to dependably operate hydropower projects, during relatively unpredictable long-term climatic shifts, creates a variation in operating costs that makes other forms of renewable generation—such as solar power—appear more stable and cost-effective.[112] This uncertainty, reflected in operating costs, could potentially make project developers think twice about the long-term viability of any proposed hydropower projects. Indeed, some studies posit that the costs of running hydropower facilities in dams on the Plateau are increasingly outweighing their benefits.[113]

IV. SOCIOCULTURAL IMPACTS OF PLATEAU HYDROPOWER

On top of environmental impacts and growing uncertainty in the face of climate change, hydropower also presents issues of social and cultural concern to communities on the Plateau. Even before the installation of many of the large-scale hydropower projects in the region, general water resource management and regulation on the Plateau made a habit of neglecting tribal concerns. The Colorado River Compact of 1928, which contains congressionally approved water allocations for the several southwestern states vying for Colorado River water, did not reserve a place at the table for Indian tribes.[114] Subsequent enabling legislation that authorized many of the dam-building projects, including the 1928 Boulder Canyon Project Act, the 1948 Upper Colorado River Basin Compact Act, and the 1956 Colorado River Storage Project Act, similarly failed to account for socioeconomic and cultural detriments water projects would have on Plateau tribes.[115] It is true that, especially in the latter half of the twentieth century, many Bureau of Reclamation projects on the Plateau had tribal economic uplift in mind. However, dam and hydropower

111 Dominique M. Bain & Thomas L. Acker, *Hydropower Impacts on Electrical System Production Costs in the Southwest United States*, 11 ENERGIES 368, 386 (2018).

112 *Id.* at 386–87.

113 McDaniel, *supra* note 87.

114 William D. Black & Jeffrey S. Taylor, *Navajo Water Rights: Pulling the Plug on the Colorado River*, 20 NAT. RESOURCES J. 71, 75–76 (1980).

115 *See id.* at 76–83.

projects went forward with little regard for potential cultural, religious, or economic impacts.

A. Historical Lack of Legal Support for Sociocultural Concerns: The Glen Canyon Dam Example

Although many federally recognized tribes call the Colorado Plateau home, this Note will focus mainly on the Navajo Nation and Hopi Tribe, as their lands and resources are most affected by the proposed LCR Project. During the dam construction era, Navajo reservation lands and cultural resources often stood in the Bureau of Reclamation's way. Glen Canyon Dam, for example, was sited squarely in Navajo lands.[116] Congress authorized construction for the dam in 1956 to provide water storage and hydropower for Lower Basin states, as well as recreation opportunities in the new Lake Powell.[117] Representatives of the Navajo Nation were originally in support of the dam for its irrigation and electricity potential.[118] As such, Navajo Nation representatives and the Bureau of Reclamation entered into an agreement to exchange land necessary to construct and operate the dam.[119] However, the Bureau arguably downplayed the negative impact Glen Canyon Dam would have on Navajo Nation.[120] For one, environmental impacts such as sediment trapping and lower water flow altered ecologies and hydrology upstream and downstream in ways not initially made known to the Navajo Nation.[121] Additionally, Lake Powell presented unforeseen impacts on areas of spiritual and cultural significance.

The Navajo Nation's eventual objection to Glen Canyon Dam may be difficult for European-American politicians, dam proponents, and southwestern inhabitants to conceive. Although the dam did not flood any infrastructure or communities, the waters of Lake Powell instead

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116 *See* Robert Begay, *Doo Dilzin Da: Abuse of the Natural World*, 25 AM. INDIAN Q. 21, 21–22 (2001).

117 *Dam Indians: The Colorado River*, NATIVE AM. NETROOTS (Mar. 3, 2010), http://nativeamericannetroots.net/diary/385.

118 Erika Bsumek, *Imagining Indians and Revisiting Reclamation Debates*, *in* ECO-IMAGES: HISTORICAL VIEWS AND POLITICAL STRATEGIES, 1 RCC PERSPECTIVES 27, 36 (Gisela Parak ed., 2013), *available at* http://www.environmentandsociety.org/sites/default/files/seiten_aus_2013_i1_web_final2_kleiner-2_1.pdf.

119 *The Effects of Glen Canyon Dam on the Navajo Indians*, KENYON COLLEGE, https://www2.kenyon.edu/projects/Dams/gsc05det.html (last visited May 2, 2020).

120 Ro Trent Vaselaar, *Opening the Floodgates: The 1996 Glen Canyon Dam Experiment*, 15 RESTORATION AND MGMT. NOTES 119, 121 (1997).

121 *Id.*

inundated areas of place-based spiritual significance.[122] To the Navajo, the Colorado River exists as a free-flowing, sacred entity.[123] Ceremonies often include visiting certain riparian sacred sites to make offerings to the River.[124] Rainbow Bridge was one such ill-fated sacred site.[125] The Navajo used the natural rock arch, which spanned the Colorado River, as a site for river offerings and other religious ceremonies.[126] For centuries, it was considered a remote location, and the Navajo were able to retain Rainbow Bridge as a relatively private sacred site despite increasing incursion from European-American settlers. Upon the completion of Glen Canyon Dam in 1966, the water level of Lake Powell began to rise, facilitating access to Rainbow Bridge for recreationists.[127] As a result, the number of non-indigenous visitors to Rainbow Bridge skyrocketed.[128] Tens of thousands of tourists began to visit the now designated national monument per year,[129] severely disrupting Navajo cultural practices.[130] Eventually, this disruption pushed the Navajo Nation to challenge the operation of the Glen Canyon Dam in court.

The unexpected inundation of sacred sites caused by the expanding Lake Powell pushed the Navajo Nation to sue the Bureau of Reclamation to limit the water body's growth. In *Badoni v. Higginson*, the Navajo Nation argued that the flooding of sacred sites and increased tourism, resulting from the operation of Glen Canyon Dam, violated their First Amendment rights to freely practice religion.[131] In a shockingly apathetic decision, the Utah District Court chose to balance "the existence of a bona fide, sincere religious claim" with "the nature of the state interests" in recreational and economic opportunities.[132] The court determined that the state interest in recreational opportunities presented by Lake Powell, along

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122 *Dam Indians: The Colorado River*, *supra* note 117.

123 JAMES M. ATON & ROBERT S. MCPHERSON, RIVER FLOWING FROM THE SUNRISE: AN ENVIRONMENTAL HISTORY OF THE LOWER SAN JUAN 34 (University Press of Colorado 2000).

124 *See id.*

125 Harold Carey Jr., *Rainbow Bridge, Utah – Tsé'naa Na'ní'áhí*, NAVAJO PEOPLE (Jan. 31, 2013), http://navajopeople.org/blog/rainbow-bridge-utah-tsenaa-naniahi/ (citing KARL W. LUCKERT, NAVAJO MOUNTAIN AND RAINBOW BRIDGE RELIGION 24 (1977)).

126 *Id.*

127 *Id.*

128 *Id.*

129 *Rainbow Bridge*, NAT'L PARK SERVICE (Mar. 9, 2020), https://www.nps.gov/rabr/index.htm.

130 Carey Jr., *supra* note 125.

131 Badoni v. Higginson, 455 F. Supp. 641, 644 (D. Utah 1977), *aff'd*. 638 F.2d 172 (10th Cir. 1980).

132 *Id.* at 645.

with the irrigation water and electricity supplied by Glen Canyon Dam, outweighed the Navajo Nation's religious preservation arguments.[133] *Badoni* essentially condoned the flooding of cultural sites by water and tourism, setting the precedent that economic benefits, such as hydropower, outweigh the religious and cultural importance of geographic features on the Colorado Plateau.

V. ATTEMPTING TO RECOGNIZE SOCIOCULTURAL IMPACTS OF HYDROPOWER IN THE LAW

This Part will explore legal and regulatory efforts to better mitigate sociocultural impacts of hydropower development to tribal communities on the Plateau. The efficacy of the American Indian Religious Freedom Act, along with FERC regulations for tribal consultation, show that many legal structures related to solving sociocultural inequities in hydropower development fail to live up to the task.

A. Legislation: The American Indian Religious Freedom Act

Soon after the Rainbow Bridge controversy, Congress finally passed legislation which offered at least somewhat better recognition of tribal cultural concerns regarding federal land development. The American Indian Religious Freedom Act of 1978 ("AIRFA") led the way among those new laws.[134] Congress stated that "it shall be the policy of the United States to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions" of their culture.[135] This included protecting "access to sacred sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rights."[136] In pursuit of this goal, Congress effectively required agencies to reduce and eliminate interference with the free exercise of indigenous religious practices.[137]

While this law should have ended federally sanctioned impediments to tribal sacred sites, courts interpreted the Act as more of a hollow sentiment than a legally enforceable set of rules. On appeal, the Tenth Circuit affirmed the Utah District Court's decision in *Badoni* in 1980,

133 *Id.* at 647.

134 American Indian Religious Freedom Act, 42 U.S.C. § 1996 (1978).

135 *Id.*

136 *Id.*

137 *See id.*

essentially gutting AIRFA.[138] Unfortunately, the Navajo Nation had initially hoped AIRFA would give them more of a say in the operation of Glen Canyon Dam and the management of sacred sites turned public parks like Rainbow Bridge.[139]

The Supreme Court decision in *Lyng v. Northwest Indian Cemetery Protective Association* made matters worse. There, the highest court in the land addressed the issue of whether AIRFA could be used to prevent the Forest Service from permitting timber harvesting in a national forest in northwestern California.[140] This area, called the High Country, was sacred land to the Yurok, Karuk, and Tolowa Tribes. Writing for the Court, Justice O'Connor explained that the federal government could not make exceptions in its behavior for individuals due to religious interests.[141] Consequently, AIRFA was deemed to have no legally enforceable provisions.[142] Though Congress later stepped in to convert the area of national forest to a wilderness area, thus preventing the logging venture, the Supreme Court decision severely limited AIRFA's use in defense of indigenous sacred sites from federally sanctioned resource extraction projects. In the wake of this decision, courts have generally construed AIRFA to mean that agencies must consider impacts to tribal cultural resources, but do not necessarily have to do anything about it.[143]

B. Regulation: FERC's Consultation Requirements

In an effort to remediate the fallout from the Supreme Court's decision over AIRFA-based claims, President Bill Clinton signed an executive order in 1994, which stated that "each agency shall consult, to the greatest extent practicable and to the extent permitted by law, with tribal governments prior to taking actions that affect federally recognized tribal governments."[144] While this language proliferated a slew of agency rules outlining their consultation requirements, the varied nature of agency rules has left many tribes confused as to what level of consultation they can expect from any agency, and how much their opinions will even

138 *Dam Indians: The Colorado River*, *supra* note 117.

139 *Id.*

140 Lyng v. Nw. Indian Cemetery Protective Ass'n, 485 U.S. 439, 442 (1988).

141 *Id.* at 453.

142 *Id.* at 455.

143 *See, e.g.*, Wilson v. Block, 708 F.2d 735, 746 (D.C. Cir. 1983).

144 President William J. Clinton, Government-to-Government Relations with Native American Tribal Governments: Memorandum for the Heads of Executive Departments and Agencies, 59 Fed. Reg. 22,951, 22,952 (Apr. 29, 1994).

matter.[145]

As the agency responsible for licensing hydropower projects, it is worth examining FERC's tribal consultation policies. In response to Clinton's executive order, FERC began rule making for its consultation policy, which concluded in 2003. Fortunately, several tribal entities—who checked the Federal Register at the right time—commented during rule-making proceedings, narrowly avoiding the poetic irony of creating a tribal consultation requirement without any tribal consultation.[146] In the final regulation, dubbed the "Policy Statement on Consultation with Indian Tribes in Commission Proceedings," FERC acknowledged its responsibility as a governmental entity to "adhere to certain fiduciary standards in its dealings with Indian tribes."[147] In order to "adhere" to its "fiduciary standards," the agency employs rather vague language in stating that it will "endeavor to work with tribes."[148] Recognizing its function as a quasi-judicial body in charge of granting permits for energy-related development projects, FERC's use of the word "endeavor," makes it clear that the agency seeks to balance interests, which can mean pitting tribal concerns against proponents of energy development. This could be a reason behind FERC's vague consultation language, which allows the agency to incorporate more input from affected tribes, while reserving itself discretion on how much weight to afford that input.

C. Concerns with FERC's Consultation Policy

In the recent past, FERC has shown its propensity to take tribal consultation lightly. In addition to licensing hydropower projects, the agency also approves pipeline siting and construction. In the siting discussions for the Atlantic Coast Pipeline in North Carolina, for example, FERC issued a decision in its draft environmental impact statement ("EIS") concluding that the proposed pipeline route did not disproportionately affect any marginalized communities.[149] However, members of the Lumbee Tribe of North Carolina responded, pointing out that the pipeline would impact 30,000 Native Americans, which was

145 Christy McCann, *Dammed If You Do, Damned If You Don't: FERC's Tribal Consultation Requirement and the Hydropower Re-Licensing at Post Falls Dam*, 41 GONZ. L. REV. 411, 437 (2006).

146 *Id.* at 444.

147 18 C.F.R. § 2.1c (2003).

148 *Id.* § 2.1c(d).

149 Nick Martin, *The Next Standing Rock is Everywhere*, THE NEW REPUBLIC (Oct. 7, 2019), https://newrepublic.com/article/155209/next-standing-rock-everywhere.

misrepresented in the draft EIS.[150] Only after backlash erupted from this revelation did FERC initiate meaningful consultation procedures with the Lumbee Tribe.[151] Construction of the pipeline has not yet begun as of the writing of this Note; thanks to opposition from the Lumbee Tribe. Regardless of the consultation proceedings FERC has put in place, the project has had permits approved every step of the way.[152] FERC's policy is by no means a shining example of tribal consultation policy, but rather a small step in the right direction given past injustices to tribes and the use of their lands and sacred areas.[153] This example demonstrates that although FERC's consultation policy provides tribes with opportunities to express their opinions on energy development projects, it does not ensure that their opinions will manufacture beneficial results for indigenous interests.

D. Analyzing Current Consultation Structures

Though this analysis of tribal consultation is not nearly comprehensive in nature, these histories and laws highlight the fact that licensing hydropower generation on both federal and tribal land creates conflict around the preservation of tribal cultural sites. Despite a multitude of federal laws and regulations to mandate tribal consultation in development projects, there seems to be a continued *Badoni*-like balancing of the public benefits of resource use with indigenous concerns.[154] Agency consultation requirements do not always require actual changes to project development, as evidenced by a Government Accountability Office report from 2019.[155] This insidious fact regarding decision-making often renders "consultation" an ill-defined term with uncertain benefits for tribes.[156] Furthermore, agencies are mostly required to include consultation procedures not because of federal law, but due to presidential executive orders. As a result, consultation provisions stand on shaky ground and have the potential to change between presidential administrations. This ambiguity surrounding consultation applies to FERC's licensing and

150 *Id.*

151 *Id.*

152 Elizabeth Ouzts, *North Carolina Tribes Fear Impact of Atlantic Coast Pipeline Construction*, ENERGY NEWS NETWORK (Mar. 21, 2018), https://energynews.us/2018/03/21/southeast/north-carolina-tribes-fear-impact-of-atlantic-coast-pipeline-construction/.

153 McCann, *supra* note 145, at 454.

154 Derek C. Haskew, *Federal Consultation with Indian Tribes: The Foundation of Enlightened Policy Decisions, or Another Badge of Shame?*, 24 AM. INDIAN L. REV. 21, 21 (2000).

155 Martin, *supra* note 149.

156 *Id.*

hydropower development powers, which has led many scholars to consider hydropower to be a similarly controversial and harmful energy source to the Navajo Nation as coal and uranium development.[157] These concerns are exacerbated by the fact that the Federal Power Act gives FERC near-unlimited authority to site and approve hydropower projects on federal reservations, including Indian reservations.[158] Therefore, regardless of whether a hydropower project is proposed on an Indian reservation or adjacent federal land, FERC's uncertain and weak consultation policy is the only safeguard for a tribe to assert its concerns. It is imperative that, if energy generation on the Plateau trends towards increased hydropower development, tribes like the Navajo Nation and Hopi Tribe have an important seat at the decision-making table so that previous wrongs from the dam-building era are not replicated.

VI. THE LCR PROJECT REVISITED

With the environmental and sociocultural impacts of Plateau hydropower development in mind, this Part will return to the LCR Project, analyzing whether the proposal so far adheres to modern policies and regulations that are geared towards preventing repetition of past harms.

A. Potential Harms of the Project

The several potential benefits of the LCR Project remain speculative and are eclipsed by the near-certain harms associated with it. Because the project necessitates dam construction on the Little Colorado, it will contribute to riparian zone erosion, habitat destruction, water quality reduction, and species loss common to all dams.[159] Specific to this project, these harms would impact habitat for the Humpback Chub, an endangered fish species native to this stretch of the Little Colorado.[160] The Humpback Chub uses segments of the Little Colorado near the confluence as its spawning grounds because the Colorado River, where it spends more of its adult life, has generally lower water temperatures.[161] Due to changes in the hydrology of the region, the Humpback Chub was listed as endangered

157 Martin J. Pasqualetti et al., *A Paradox of Plenty: Renewable Energy on Navajo Nation Lands*, 29 SOC'Y & NAT. RESOURCES 885, 886 (2016).

158 McCann, *supra* note 145, at 420.

159 *See supra* p. 120.

160 Clark II, *supra* note 23.

161 *Humpback Chub*, U.S. FISH AND WILDLIFE SERV., https://www.fws.gov/fisheries/freshwater-fish-of-america/humpback_chub.html (last visited May 2, 2020).

in 1967, a designation which remains to this day.[162] Because the LCR Project would severely alter its critical habitat in the Little Colorado River, Pumped Hydro Storage would have to undergo consultation procedures with the Fish and Wildlife Service, pursuant to the ESA.[163] The Fish and Wildlife Service may list out mitigation procedures or make a finding that there is no project alternative that would not further jeopardize the species.[164] Given the strength of the ESA, this environmental harm alone could therefore be a major obstacle in the development of the project.[165]

B. Community Response

Response from the Hopi Tribe, Navajo Nation, and environmental groups has been overwhelmingly negative. This is largely due to the potential destruction of sacred sites and tribal land by the LCR Project reservoir. The proposed lower dam would flood several miles of canyon, including one of the most important sacred spaces in Hopi religion.[166] This sacred space called Sipapú, or "The Place of Emergence," is the area where the Hopi believe man first emerged into this world.[167] In this spot within Marble Canyon, near the confluence of the Little Colorado and Colorado Rivers, it is believed that man was first taught to respect Mother Earth.[168] As a result, the Hopi maintain a stewardship role over the Grand Canyon area and its cultural sites. It is relentlessly ironic that the area could soon be flooded in an attempt to choke and manipulate the earth's resources for short-term gain. As a result of this, and other harms to cultural resources, the Hopi have expressed their disapproval of the LCR Project to FERC.[169]

In line with the Hopi, several chapters of the Navajo Nation have condemned the proposed hydropower facility.[170] Like the Hopi, the Navajo have similar stewardship and cultural ties to the Grand Canyon.

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162 *Id.*

163 *Id.*; Endangered Species Act, 35 U.S.C. § 1536.

164 Endangered Species Act § 1536(4).

165 Fonseca, *supra* note 5.

166 Clark, *supra* note 7.

167 Larry Torres, *Sipapú: 'The Place of Emergence'*, TAOS NEWS (Oct. 6, 2017), https://www.taosnews.com/stories/sipap-the-place-of-emergence,43429.

168 *Id.*

169 *Hopi Tribe Objects to Proposal to Build Dams on Ancestral Lands*, SAVE THE CONFLUENCE (Oct. 10, 2019), https://savetheconfluence.com/news/hopi-tribe-objects-to-proposal-to-build-dams-on-ancestral-lands.

170 Sinjin Eberle, *Update: Little Colorado River Pumped Hydropower Proposals*, AM. RIVERS (June 4, 2020), https://www.americanrivers.org/2020/06/update-little-colorado-river-pumped-hydropower-proposal/.

Further, the federal government and private developers have a history of making empty promises to the Navajo Nation regarding energy generation.[171] Some residents feel as though similar promises of energy and economic development were made to justify the construction of Navajo Generating Station and Glen Canyon Dam.[172] But in line with past federal development projects, energy was instead shipped to cities like Phoenix and Las Vegas while Navajo Nation communities dealt with harsh job conditions, pollution, and few of the benefits.[173] Pressure from residents has driven Jonathan Nez, president of the Navajo Nation, to issue formal letters opposing the LCR Project.[174]

In filing its proposal with FERC, Pumped Hydro Storage made no attempt to confer with affected groups, such as Navajo Nation and Hopi Tribe communities, about the logistics of the project.[175] In fact, Clark Tenakhongva, the Vice Chairman of the Hopi Tribe, was not made aware of the LCR Project proposal until he read about it on social media.[176] The Navajo Nation was not alerted to the proposal, sited on their own land, until members of the Grand Canyon Trust reached out to inform them.[177] This lack of communication is indicative of the dam-building era of the twentieth century, before better recognition of tribal sovereignty and indigenous roles were considered in resource development. Although FERC's tribal engagement procedures would kick in during subsequent licensing adjudications, this initial lack of transparency implies that Pumped Hydro Storage will be looking to expedite the project with the lowest amount of consultation required. Even at the outset of the project, given FERC's approval of a preliminary license to develop the project, this is surely at odds with the spirit of consultation measures set out in Clinton's executive order, FERC's own regulations, and numerous other laws. A long-lasting hydropower project that garners local support would obviously have to be done with tribal interests and concerns in mind. Without that support, the legal power of local opposition could work

171 Len Necefer et al., *Energy Development and Native Americans: Values and Beliefs about Energy from the Navajo Nation*, 7 Energy Research & Social Science 2 (2015).

172 *See, e.g.,* Halne'e, *supra* note 80; *see also* Debra Utacia Krol, *Navajo Nation Issues Opposition Letter to Little Colorado Confluence Dam Project,* AZ CENTRAL (Aug. 2, 2020), https://www.azcentral.com/story/news/local/arizona/2020/08/02/navajo-nation-issues-formal-opposition-letter-lcr-dam-project/5548405002/.

173 Halne'e, *supra* note 80.

174 *See, e.g., id.*; Krol, *supra* note 172.

175 Halne'e, *supra* note 80.

176 *Id.*

177 Roger Clark, Program Director, Grand Canyon Trust, Address to University of Colorado Law School Advanced Natural Resources Seminar (Mar. 24, 2020).

against the LCR Project's potential success.

C. Developing a Bigger Picture: Takeaways from the LCR Project Proposal

The response to the LCR Project paints a broader picture of the outlook on Plateau hydropower moving forward. Despite modern policies to promote hydropower development, the era of unmitigated, largely unregulated, dam-building is over. Newer proposals like the LCR Project face an uphill battle against environmental protections, consultation requirements, climate change uncertainties, and the resulting higher project costs. More stakeholders, such as ecologists, environmental advocates, and tribal entities, are able to make their voices heard in agency adjudications and lawsuits. Greater stakeholder participation would force FERC at the very least to consider a wider array of consequences to hydropower development besides potential energy output. Yet in response to these well-voiced concerns, Steve Irwin chooses to reiterate that the steep canyon walls and rushing waters of Marble Canyon would make the site the perfect place for a hydropower project.[178] Time and time again, LCR Project developers show that their concerns over project viability extend only to blueprints, financial outlooks, and FERC licenses. Given the threat to endangered species, the disapproval from Navajo and Hopi governments, and the proximity to a national park, it seems unlikely that the LCR Project could continue to later phases of development. While the LCR Project may look good to an engineer on paper, it poses far too many cultural and environmental problems, and thus seems legally and ethically unlikely to succeed.

CONCLUSION: A WAY FORWARD WITHOUT HYDROPOWER?

It is clear that hydropower poses a variety of conflicting benefits and detriments to the Colorado Plateau. On the one hand, hydropower provides a carbon-free source of electricity, which southwestern communities increasingly depend on. It can help meet state renewable energy goals with baseload energy that can support intermittent wind and solar generation. However, given increasing drought due to climate change, severe

178 Scott Buffon, *FERC Flooded with Opposition to Little Colorado River Dam Proposals*, ARIZ. DAILY SUN (Nov. 23, 2019), https://azdailysun.com/news/ferc-flooded-with-opposition-to-little-colorado-river-dam-proposals/article_c75bfc4b-b6e2-528f-bf00-9b8c1c0061dd.html.

environmental impacts, and a history of ignoring cultural concerns, it seems that dams and their accompanying hydropower projects are becoming more socially and economically costly. It throws into question the necessity of even pursuing hydropower projects over developing wind, solar, and battery storage as ways to meet renewable energy goals and serve energy to Plateau and extra-Plateau customers.

Given the social and environmental impacts of dams and reservoirs, public perception of dams has changed significantly from the twentieth century. Hydropower production has been in decline since rampant dam-building slowed after the 1960s.[179] Electricity generated from these types of projects has decreased to around six percent of total energy consumption in the United States.[180] This is a substantial decrease from the forty percent during the mid-twentieth century.[181] Further, something often ignored about hydropower projects is that dams have a finite lifespan.[182] It is easy to question the reasoning behind putting up enormously expensive structures that will require even more funds to eventually break down. This is compounded by the host of environmental and social factors discussed above. This short-term strategy for energy development therefore makes little sense in a region where long-term water and energy planning is a necessity. Despite new laws to expedite licensing, the majority of existing environmental and tribal legislation reflects these major concerns with dam and hydropower development.

Other means of energy development are being lauded for their lower environmental impacts and community support on the Plateau. For example, prior to the Trump-era oil and gas licensing expansion policy, the Bureau of Land Management began supporting siting for wind and solar projects on the Plateau.[183] The Navajo Nation has also pursued other forms of renewable energy, helping to develop the Kayenta solar generation facility, creating energy used exclusively to power 36,000 Navajo homes.[184] These examples show that other forms of renewable energy development can be pursued without needing new and controversial hydropower projects.

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179 Moran et al., *supra* note 33, at 11891.

180 *Id.*

181 *Id.*

182 *Id.* at 11893.

183 *Solar Energy*, BUREAU OF LAND MGMT., https://www.blm.gov/ programs/energy-and-minerals/renewable-energy/solar-energy (last visited May 2, 2020); *Wind Energy*, BUREAU OF LAND MGMT., https://www.blm.gov/programs/energy-and-minerals /renewable-energy/wind-energy (last visited May 2, 2020).

184 Press Release, The Navajo Nation Office of the President and Vice President, Navajo Nation's Renewable Energy Future Takes Big Step Forward with Completion of Kayenta Solar II Generation Facility (2019).

Hydropower does have the potential to provide dependable, base-load energy in communities shifting from fossil fuels to renewable energy generation on the Colorado Plateau. However, proposals like the LCR Project highlight the fact that project developers and regulatory agencies still seem to ignore the well-understood environmental and social costs of these hydropower projects. The checkered history of hydropower production on the Plateau shows that the benefits of those projects are often enjoyed outside of the region while the harmful side effects remain behind. For these reasons, hydropower development is not the most culturally, environmentally, or financially viable form of renewable energy to pursue. If hydropower development makes a resurgence on the Plateau, and projects like NESS, Salt Canyon, and LCR continue into later stages of development, attention must be paid to these past histories of environmental and social harms. In all likelihood, the modern distaste for the impacts of dams may end up making new hydropower projects infeasible. In the interest of protecting indigenous cultural heritage, ecological resources, and long-term energy stability, this infeasibility may be for the best.