foundation. Part II will then identify four fissures already roiling the Law of the River and discuss the issues they present relating to the human right to water.

I. THE LAW OF THE RIVER

The allocation of water in the Colorado River basin is governed by a unique and complex legal regime. Like many legal regimes governing the allocation of natural resources, the Law of the River, as it is known, arose over the past century in response to various crises and developments that each posed some new challenge to individuals and states whose future depended on water from the river. The

states recognized that Mexico would likely have some entitlement. The states agreed that any Mexican share that could not be satisfied by waters in surplus of those allocated under the Compact would be satisfied by equal reductions in the Upper and Lower Basin allocations.[13]

The Compact does not specifically allocate water among the individual states, focusing solely on dividing water between the Upper and Lower Basins. Congress effectively allocated water among the Lower Basin states by means of the Boulder Canyon Project Act of 1928, which conditionally approved the Compact, authorized the construction of Boulder Dam, and empowered the Secretary of the Interior to enter into contracts for the delivery if its impounded water. The Supreme Court later held, in *Arizona v. California*,[14] that California was entitled to 4.4 m.a.f., Arizona 2.8 m.a.f., and Nevada 300,000 acre-feet of water annually, with California also having an entitlement to half of any water in excess of 7.5 m.a.f. in the Colorado at Lee Ferry.[15] The Upper Basin states entered into a separate compact in 1948, allocating approximately 3.9

Such a canal would likely enable even greater water use in California,

Even with the numerous statutory mandates – or perhaps because of them – much of the operation of the Colorado River facilities falls to the discretion of the Secretary or the Bureau of Reclamation. Of course, their discretionary decisions are subject to both the National Environmental Policy Act[26] and the Endangered Species Act,[27] which impose both procedural and substantive limitations on the management of the river. Not only must the Bureau of Reclamation evaluate the environmental impacts of its river operations and consult with the Fish and Wildlife Service regarding threatened and endangered species, but it must also constrain its operations to avoid "jeopardiz[ing] the continued existence" of any such species.[28guarsu]

security that Upper Basin users will not be shut off in order to provide water to the Lower Basin or to Mexico under the Compact or the Treaty. Third, the Interim Shortage Guidelines adjust the Law of the River to provide incentives for users to maximize water available to the system by augmentation or extraordinary conservation measures. These incentives operate by permitting water users to capture the benefit from "intentionally created surplus" (ICS), water that, without the extraordinary measures, would be lost to the system.[35] Rather than such surplus water being apportioned under the decree in *Arizona v. California*, the water user who creates ICS is entitled to 95 percent of the additional system water. The result is to powerfully incentivize conservation and other measures that prevent "waste."

In addition to the Interim Guidelines, there are several other side agreements, mostly directed toward conservation and water banking to alleviate the impacts as Arizona achieves full use of its share. The ICS regime in the Interim Shortage Guidelines, o/-6(perm)6(itti)p(-05p)ent2Sn the IH0 -1a4

within Mexico increases the importance of storage in the U.S. (particularly Lake Mead) for water that might be used in Mexico.

Due largely to the extensive use of water upstream in the Colorado River and its tributaries, water in the lower Colorado River is highly saline and of potentially poor quality for irrigation in Mexico, reducing crop productivity. Much of the salinity is the result of the irrigation of saline soils throughout the watershed, but it is

governments.

To be sure, there are pockets within the U.S. where there is still no access to basic water necessary for personal and domestic use.[54] As discussed below, one of these pockets is in Indian country along the Colorado River.[55] But this number reflects a small proportion of the overall population of the Colorado River Basin.

Second, because the amount of water necessary to fulfill basic drinking water and sanitation needs is small, it would appear that most vital human needs could be fairly easily met without major disruption of existing allocations. After all, nearly eighty percent of Colorado River water in both the Upper and Lower Basins is put to agricultural use, and much of this use is inefficient, because of either the marginal quality of the lands to which it is applied or the use of inefficient methods of conveyance or irrigation. This suggests that, to the extent that an over appropriated river is a problem, it should be a problem susceptible to a solution in which water saved by improving the efficiency of agricultural water use is redirected to serve vital human needs.[56]

2. Alternative Views of a Human Right to Water

Despite the narrow thrust of the human right to water to provide basic drinking water and sanitation, there has been some recognition that the human right to water might extend beyond sanitation. Both scholars and the U.N. Committee on Economic, Social and Cultural Rights ground the emergent human right to water in an array of other recognized human rights. These include the right to life, the right to health, the right to housing, and the right to food.[57] Comment 15, for

54. A study by the Rural Community Assistance Project found that 1.7 million people in the U.S. lived in housing units that lacked full plumbing facilities. RURAL COMMUNITY ASSISTANCE PARTNERSHIP, S

example, notes that "the importance of ensuring sustainable access to water resources for agriculture to realize the right to adequate food" and calls upon nations to "ensure that there is adequate access to water for subsistence farming and for securing the livelihoods of indigenous peoples."[58]

A human right to water that encompassed the right to water for food production would not necessarily have significant implications for the allocation of Colorado River water. Irrigation water from Colorado River is an essential input for farms that produce a high proportion of the nation's winter produce. But the farms served by Colorado River water are not subsistence farms; rather, at least within the U.S., they are generally large operations that produce food not for the subsistence of the farmers or even local populations but for the national market. A human right to water based on a right to adequate food would seem too constrained to ensure water for the production of commodity produce.

B. Fault Lines on the Colorado River from a Human Rights Perspective

1. Lower Basin Foreclosure of Upper Basin Development

Under the Law of the River, the Upper Basin within the U.S. bears the primary risk of shortage. Specifically, should conditions on the river decline to the point that the natural flow and storage in the Upper Basin reservoirs are insufficient to supply the required deliveries to the Lower Basin and to Mexico in a given year, the Upper Basin would have to forgo using its apportioned share in order to meet delivery obligations at Lee Ferry. This is the result of the Compact's expression of the allocation in terms of the Upper Basin's obligation to deliver water to the Lower Basin and for Mexico.[59] In

58. *Comment 15*, *supra* note 53, at ¶ 7.

59. Upper Basin states could argue that the Compact bars them only from depleting the river's flow or otherwise withholding water from the Lower Basin, rather than requiring a delivery of 7.5 m.a.f. even in the event of natural reduction in the flow. *See, e.g.*, RETHINKING THE FUTURE OF THE COLORADO RIVER, *supra* note 5, at 43 (Dec. 2010), http://www.rlch.org/archive/wp-content/uploads/2010/12/CRGI-Interim-Report.pdf (citing E. Kuhn, *The Colorado River: The Story of a Quest for Certainty on a Diminishing River (Roundtable Edition)*). Most scholars disagree, viewing the operation of the Compact to, in fact, impose a delivery obligation of an average 7.5 m.a.f. plus one half of Mexico's 1.5 m.a.f. share. *Id.* (citing David Getches, *Colorado River Governance: Sharing federal authority as an incentive to create a new institution*, 68 U. COLO. L. REV. 573 (1997) and D. Wegner, *Environmental Restoration: Challenges for the New Millennium: Looking Towards the Future:*

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approach to ESA compliance by allowing payments into a fund to support habitat conservation efforts, which include both habitat restoration and fish stocking.[67] Both of these programs, in which water users essentially make payments for permits, have been criticized as likely being inadequate to recover the imperiled species.[68]

Also instructive is the increasingly apparent inadequacy of the current legal and cooperative regime to adequately address the decline of the endangered humpback chub and other species of native Colorado River fish downstream of Glen Canyon Dam. In this stretch of the river, intractable conflicts between endangered species, water rights, and hydroelectric power generation, combined with opaque statutory requirements about how to address those conflicts led to legal confusion about how to lawfully operate Glen Canyon Dam.[69] Facing a determination that the operation of Glen Canyon Dam would jeopardize the continued existence of the humpback chub in violation of the ESA, the Secretary of Interior created the Glen Canyon Adaptive Management Work Group (AMWG) in 1997.[70] A multiparty stakeholder group, the AMWG's purpose is to provide advice to the Secretary regarding the formulation and implementation of an adaptive management program for Glen Canyon Dam in order to assist the Secretary in meeting environmental and other obligations under the law.[71] The work of the AMWG includes recommending research and monitoring plans to enhance knowledge of how the operation the dam affects the environment in the Grand Canyon, including the humpback chub.[72] Although the AMWG has overseen the experimental use of alternative flow regimes, the dam still operates under the same default fluctuating flow regime that the Fish and Wildlife Service determined in 1994 was jeopardizing the

67. *Id.* at 187.

68. *Id.* at 188 ("[T]he MSCP is really just a program to *mitigate* the impacts of incremental harm caused by proposed future changes in river operations. . . ." but "does not constitute comprehensive environmental restoration."); *Id.* at 123 ("population trends for the four listed species [in the Upper Basin] are not encouraging.").

69. Alejandro E. Camacho, *Beyond Conjecture: Learning about Ecosystem Management from the Glen Canyon Dam Experiment*, 8 NEV. L. J. 942, 947–49 (2008).

70. Joseph M. Feller, *Collaborative Management of Glen Canyon Dam: The Elevation of Social Engineering over Law*, 8 NEV. L. J. 896, 917–921 (2008).

71. U.S. DEP'T OF THE INTERIOR, GLEN CANYON DAM ADAPTIVE MANAGEMENT WORK GROUP CHARTER (1997), *available at* http://www.usbr.gov/uc/rm/amp/amwg/pdfs/amwg_charter.pdf.

72. *Id.*

humpback chub.[73] And the ecological resources of the river remain in jeopardy, despite two recent lawsuits to force the Bureau of Reclamation to comply with its obligations under the ESA.[74]

Overall, the ability of the existing legal regime to effectively respond to the ecological collapse of Colorado River and its dependent species is in reasonable doubt. The famously toothy ESA, with its outright prohibition of harm and jeopardy to endangered species, has failed to ensure any sustained recovery of imperiled Colorado River fish despite two decades.Indeed, the Bureau of Reclamation continues to assert that its ability to respond is severely limited by the Law of the River, which narrows its discretion respecting the delivery of water to the Lower Basin and to Mexico. As with the other major fissures on the Colorado River, the problem of ecological collapse seems likely to worsen with climate change.[75]

If the current legal regime seems unfit to address the threatened ecology of the Colorado River, it is fair to ask whether some other regime–one, say, based on a human right to water–might offer assistance. Unfortunately for the native fish of the Colorado River, a human right to water offers little to depend on. The problem is the expression of the emergent human right to water in minimalist and utilitarian terms. It is a right that is narrowly focused on *human* needs, specifically clean drinking water and sanitation.[76] But the conditions that threaten the river's native fish–including the disruption of the natural flow regime, dam blockage of fish passage, and the deprivation of sediment necessary to their habitat–are simply too far removed from the concerns of providing a minimal source of clean water to be fruitfully addressed by a legal regime focused so narrowly on the latter.

It is certainly possible to hypothesize situations in which the ecological stability of a river system might more fully overlap with a human right to water. There might be river systems in the world in which preserving the ecological functioning of the river is integrally linked with providing clean water and sanitation to people relying on the river, such as where wetlands provide "ecosystem services" such

73. Lawrence Susskind, Alejandro E. Camacho, and Todd Schenk, *Collaborative Planning and Adaptive Management in Glen Canyon: A Cautionary Tale*, 35 C

quasi-human rights approach to Indian water rights with the potential to lead to a secure "wet" water supply for Indian people.

a) The Legal Basis for Navajo Water Rights

The Supreme Court recognized in 1908 that tribes held water rights in lands set aside by Congress as reservations in the amount necessary to fulfill Congress's purpose in creating the reservations, and that those rights had priority as of the date of the reservation.[80] The place of Indian federal reserved water rights in the Colorado River regime has been uncertain and a source of great trepidation for non-Indian water users along the river. When the basin states forged the Colorado River Compact, they excluded the tribes from the negotiations and agreement. The Compact dispatched with potential Indian water rights by vaguely stating: "Nothing in this Compact shall be construed as affecting the obligations of the U.S. of America to Indian tribes."[81]

More than half a century after the Compact, the Supreme Court clarified two significant issues that potentially gave Indian water rights in the Colorado River Basin the status of sleeping giants. In *Arizona v. Colorado*,[82] in which the Court recognized the apportionment of water among the Lower Basin states, the U.S. had asserted and sought to quantify reserved rights on behalf of five tribes with reservations along the lower Colorado River. First, Indian water rights to Colorado River water are charged against each state's apportioned share.[83] Giving that finding punch, the Court also approved the Special Master's decision to quantify the tribes' rights based on the amount of "practicably irrigable acreage" that exists on the reservations, which had been set aside to provide Indians with agricultural homelands.[84] Quantification of water rights using the "practicably irrigable acreage" standard, which has become the most widely applied standard for quantifying Indian reserved rights, is a factually-intensive but variable process, involving the assessment of soils for arability, analysis of the engineering feasibility of delivering irrigation water to arable lands, and consideration of economic costs

80. Winters v. United States, 207 U.S. 564 (1908).

81. Colo. River Compact, art. VII (1922).

82. Arizona v. California, 373 U.S. 546 (1963)

83. *See id.* at 601.

84. *Id.* at 600–601.

and benefits of actually delivering technically deliverable water to technically arable lands.[85]

The rights of the five tribes quantified in *Arizona v. California* under the practicably irrigable acreage standard totaled about one million acre feet of water diverted to be applied to about 135,000 acres of arable land, about 500,000 acre feet of which may be consumed.[86] In the Colorado River Basin, about two dozen other tribes likely hold federal reserved water rights that may affect the availability of water to other users. Only some of these water rights have been quantified or settled. Most significant among the outstanding claims is that of the Navajo Nation, whose reservation is the largest in the country, covering some 24,000 square miles, or nearly ten percent of the entire Colorado River Basin. Although counsel for the Navajo estimated in 1997 that Navajo rights could total five m.a.f.,[87] the tribe did not voluntarily assert any water rights in court until 2003, when it sued the U.S. to enjoin its further facilitation of water development in the Lower Basin before quantifying and considering Navajo rights in the Colorado River.

Despite the potentially large quantity of Navajo and other Indian reserved water rights in the Colorado River Basin, considerable uncertainty has always characterized the extent of potential Navajo rights. First, although the PIA standard can result in large awards of water to Indians in arable lands close to the water source, this may not be the case with Navajo rights. Diverting water from the Colorado River and moving it to Navajo lands would be difficult and expensive, even if technically feasible. A court applying the PIA standard could find that the cost, for example, of pumping water from the canyons of the Colorado River hundreds of feet in elevation to Navajo lands, would diminish or negate the economic value of the water, rendering the lands not "practicably" irrigable. Second, although the Supreme Court accepted the special master's use of the PIA standard in *Arizona v. California* as "the only feasible and fair way" to measure the Indian reserved rights then at issue, it stopped short of mandating

85. *See, e.g.*, Barbara A. Cosens, *The Arizona Homeland Standard Measure of Indian Water Rights*, *in* TRIBAL WATER RIGHTS: ESSAYS IN CONTEMPORARY LAW, POLICY, AND ECONOMICS 50 (John E. Thorson, et al, eds., 2006).

86. Arizona v. California, 373 U.S. at 596.

87. Water Education Foundation, 75th Anniversary Colorado River Compact Symposium Proceedings 60 (1997) (remarks of Stanley Pollack, Water Rights Counsel, Department of Justice, Navajo Nation).

comprehensive settlement of Navajo reserved rights presented special problems. In 1975, New Mexico initiated a general adjudication of all waters in the San Juan River, a major tributary of the Colorado River along the northeastern boundary of the Navajo reservation, leading to extended negotiations over Navajo rights in New Mexico. As mentioned, the tribe did nothing to assert its claims to Colorado River water in the Lower Basin until 2003.

After years of negotiation, the Navajo Nation, the U.S., and New Mexico, along with other interested parties, reached an agreement regarding Navajo claims to water from the San Juan River system. The complex agreement has four main components.[98] First, overall it secures to the Navajo a right to divert about 600,000 acre-feet and to consume about half of that. Most of this water would be used for irrigation. Second, the federal government will pay approximately $700 million to construct a network of pipelines to carry about 20,000 acre-feet of water to areas in the eastern area (Upper Basin) of the Navajo reservation, the Jicarilla Apache reservation, and the city of Gallup for municipal and industrial use. This project will carry clean water for household use, for the first time, to thousands of Navajo and who have relied on hauling water to their homes from distant points. Third, the Navajo agree to subordinate their early priority to some of the water, including the bulk of their irrigation water and all of the Navajo-Gallup pipeline water to a date that would require them to share in any shortages with other non-Navajo users of water stored in Navajo Dam. The settlement became final in December 2010, after Congress authorized and funded the Navajo-Gallup Water Supply Project, the Interior Department decided to implement it, and the Secretary signed the agreement.[99]

The Navajo Nation has also recently approved settling its claims to water in the main stem of the Colorado River (Lower Basin), the Little Colorado River and groundwater within its reservation in Arizona. The Northeastern Arizona Indian Water Rights Settlement[100] continues the approach of the San Juan Basin settlement

98. Exec. Summary of the San Juan Basin in N.M. Navajo Water Rights Settlement Agreement, Office of the N.M. State Eng'r, (Apr. 19, 2005) *available at* http://www.ose.state.nm.us/legal_ose_proposed_settlements_sj.html.

99. George Hardeen,

to focus on securing wet water to Navajo homes, many of which are presently un-served. If finalized, which is contingent upon approval by the Hopi and other entities, as well as congressional authorization and funding, it will authorize the use of the Navajo-Gallup pipeline to deliver about 6,400 acre feet to Navajo communities in the Lower Basin in Arizona. Under the settlement, federal money will pay for an additional pipeline from Lake Powell (in the Upper Basin) to carry about 11,000 acre-feet per year to several Navajo communities and an additional 4,000 acre-feet per year to Hopi villages. Federal dollars will also pay for two groundwater projects to deliver nearly 10,000 additional acre-feet per year to other Navajo communities. The agreement guarantees Navajo nearly unfettered use of groundwater from two aquifers on the reservation, as well as difficult-to-use unappropriated water in the Little Colorado River. Lastly, it secures just 31,000 acre-feet per year from the main stem of the Colorado, water that may be used, marketed or leased.

These settlements reflect a significant departure from the PIA-based quantification methods prevalent in Indian water rights settlements toward a quasi-human-right-to-water approach.[101] They seem fundamentally structured to ensure that a shamefully underserved Navajo population gain actual access to clean water for household and other uses. Together, these settlements provide for a vast expansion of the availability of drinking water to Navajo communities, paid for mostly by the federal government. Yet it bears emphasis that securing that basic access to water comes at a price. In the case of the Northeastern Arizona Indian Water Rights Settlement, that price is the relinquishment of claims of what some had, perhaps

101. I use the term "quasi-human-right-to-water" because the quantity of water secured for Navajo communities is likely more than justified by the narrowest measures of water needed for drinking and sanitation. In a video posted on their website, the Navajo Nation Water Rights Commission notes that the amounts are sufficient to secure 160 gallons per person per day based on estimates of population growth to 2040. Northeastern Ariz. Indian Water Rights Settlement, *Water Infrastructure Projects*

unrealistically, expected to be vast amounts of water from the Colorado River in order to secure what might be seen as an

III. CONCLUSION

The Colorado River is surely one of the most utilized rivers on the planet. We have manipulated it to accomplish many things, including providing a basic water supply for millions of people in the U.S. and Mexico and irrigating millions of acres of land to provide food and fiber. The Colorado River's extensive infrastructure, both physical and legal, has arisen in response to human needs but without any particular attention to the notion of a human right to water. So, too, have developed the deep problems, both human and ecological, that now plague the system. With the recent emergence of the human right to water in international law, the basic question is: What does the human right to water do for the problems along one of the most developed rivers in the richest nation on earth? Does it add anything that might help frame the problems of the river system in a helpful new light as we head toward new crises hastened by climate change?

As important as the human right to water may be in less developed areas of the world, I remain ambivalent about its role in the Colorado River system. On the positive side, it seems apparent that the core concerns of the human right to water – basic access to clean water for drinking and sanitation – have been fairly well served by the Law of the River and the physical infrastructure it supports. The one major exception is the fact that so much of Indian country is so poorly served. But the recent Navajo water rights settlements, striking a new direction in the settlement of reserved water rights claims, will go some distance toward closing that gap.

On the less optimistic side are the increasingly critical and stubbornly intractable ecological problems that attend a river system so heavily manipulated for human uses. The Law of the Colorado River, like western water law in general, developed to promote utilitarian values, particularly the human use of water to support economic activities such as agriculture, natural resources development, energy generation and industry. Water that has been deployed for human use has come at the expense of the natural environment. Given the fact that scarcity, ecological values and uses of water stand in opposition to human uses, ecological protection and restoration demands a redeployment of water from human uses to the environment. Because of its narrow focus on basic human needs, the human right to water seems unlikely to provide a new tool for addressing ecological problems in the Colorado River basin. Indeed, because of the imperative power of its focus–basic human needs–

there is some risk that it could create a further human demand for water that will come at the expense of the environment. As the human right to water gains force–politically or legally–it will be important to see that its demands are met first from existing human uses rather than from water essential for the ecological integrity of the system. This will be no easy task for a legal system founded largely on priority and the protection of prior uses.