

IN SITU:
AN OVERVIEW OF LEGAL METHODS AND POLICY TRENDS
FOR THE RESTORATION AND PROTECTION OF IN-STREAM WATER

By
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INTRODUCTION

In the last thirty years the alarm has sounded concerning the health of our natural ecosystems.¹ Water is central in this concern because ecosystem development and maintenance depend on its availability and quality. This lifeblood of our landscape has been dammed, diverted, controlled, and utilized to such an extreme that some watersheds have lost the ability to function. The physical restructuring of water regimes can impair an ecosystem by decreasing biodiversity and resilience, increasing disease, and changing community structure. These, in turn, impair the ecosystem’s “services” of flood control, water quality, and fish and wildlife. Substantial impacts on human health and economic activity result from the disruption of these ecosystem services.²

Fortunately, there are legal methods already in place to remedy watershed degradation caused by inadequate and altered stream flows. This paper examines the legal tools available to restore and protect in-stream water flows, particularly in California.

First, this Article discusses traditional water allocation schemes with respect to in-stream flows. The California Constitution and California water codes lend support toward protecting in-stream water by implied conservation standards and administrative mandates. Part II of this Article explores the states’ power to protect its water resources from impacts of federal projects and federally approved private projects by developing strong state water quality standards—which include in-stream flow requirements — under the Clean Water Act. In Part III, the Article discusses the Wild and Scenic Rivers Acts, California

¹ See D. J. Rapport et al., *Assessing Ecosystem Health*, 13 TRENDS IN ECOLOGY AND EVOLUTION 397, 397 (1997) (stating criterion for determining health of ecosystem as system stability, sustainability, and ability to maintain organization, autonomy and resilience to stress).

² See *id.* at 399.

Fish and Game Code section 5937, and the common law doctrines of Public Trust and Reserved Rights, and how each might be used to restore in-stream flows. Finally, in Part IV, two alternative approaches to water management — flood simulation and dam decommissioning — are presented as creative options for incorporating in-stream values into water resource management schemes.

I. BASIC STATUTORY FRAMEWORK AND ADMINISTRATIVE AUTHORITY FOR THE PROTECTION OF IN-STREAM WATER

A. Traditional Water Allocation In The West

The water allocation scheme in the West evolved from the mining era in the mid-1800s and still reflects these pioneer beginnings. The doctrine of prior appropriation developed to allocate water rights to miners and settlers in arid lands west of the 100th meridian.³ To secure a water right, a claimant must take water out of the stream and put it to a “beneficial use.”⁴ The “first in time has a first in right” to the claim, senior to future appropriators. The claimant must use the water continuously, even unnecessarily, to retain the right. These historical roots of the appropriation doctrine seem incompatible with in-stream, natural uses of water because they strongly encourage water diversion for off-stream use. The “use it or lose it” rule encourages wasteful water practices when water is not needed in a given year. However, modern constitutional and statutory criteria for appropriative rights do contain conservation measures which can be used to protect in-stream flows.

B. Reasonable Use and Beneficial Use

Both the “reasonable use” and “beneficial use” criteria found in California’s Constitution and water codes provide implied conservation measures favorable toward in-stream flows. Article X, section 2 of California’s Constitution establishes a reasonableness standard for water use, requiring that “waste or unrea-

³ See MARC REISNER & SARAH BATES, *OVERTAPPED OASIS: REFORM OR REVOLUTION FOR WESTERN WATER* 62 (1990) (explaining that western water law is largely predicated on use of water for activities such as mining, in contrast with riparian rights, which only depend on land ownership).

⁴ See CAL. WATER CODE § 1240 (West 1971).

sonable use or unreasonable method of use of water be prevented”⁵ The “reasonable use” doctrine applies to all water right holders, including holders of riparian rights.⁶ The State has broad authority to determine reasonable water use, as well as an implied responsibility to prevent wasteful water practices.⁷

Article X further provides that “conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare....”⁸ When the statute was first written, this public policy of water conservation implied using every drop for development purposes. The term “conservation” has since reverted to its truer meaning, rendering the amendment applicable for protecting in-stream values.⁹

Appropriative water rights vest only when water is put to “beneficial use.”¹⁰ California’s list of beneficial uses includes in-stream values.¹¹ California’s State Water Resources Control Board (SWRCB or “Board”) ranks in-stream uses evenly with other beneficial uses when analyzing the relative benefit of an appropriation.¹²

⁵ CAL. CONST. art. X, § 2. “It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare” *Id.*

⁶ See CAL. WATER CODE § 101 (West Supp. 1998). Riparian water rights are held by owners of property adjacent to a stream and allow water use for domestic purposes. In 1928, it was *appropriators* that successfully lobbied the California legislature to amend article X, section 2 of the State Constitution to include riparian water right holders. The appropriators’ effort was a backlash to the California Supreme Court’s decision in *Herrminghaus v. Southern Cal. Edison Co.*, 200 Cal. 81, 252 P. 607 (1926) (holding that downstream riparian user has no duty to conserve water to detriment of upstream appropriative users).

⁷ See *Imperial Irrigation Dist. v. State Water Resources Control Bd.*, 186 Cal. App. 3d 1160, 231 Cal. Rptr. 283 (1986).

⁸ CAL. CONST. art. X, § 2.

⁹ See Harrison Dunning, *Article X, Section 2: From Maximum Water Development to Instream Flow Protection*, 17 HASTINGS CONST. L.Q. 276 (1989).

¹⁰ Traditional “beneficial uses” were domestic, industrial, and agricultural uses. See REISNER & BATES, *supra* note 3, at 63.

¹¹ See CAL. WATER CODE § 1243 (West Supp. 1998). Beneficial uses include fish, wildlife and recreation. A free-flowing river is also considered a beneficial use within the meaning of article X, section 2 of California’s Constitution. See CAL. PUB. RES. CODE § 5093.50 (West 1984).

¹² See CAL. WATER CODE § 1257 (West 1971); Anne J. Schneider, *Legal Aspects of In-stream Water Uses in California: Background and Issues*, Governor’s Commission to Review California Water Rights Law, Staff Paper #6, at 36 (1978).

C. The State Water Resource Control Board's Power To Protect In-Stream Flows

The SWRCB is California's lead agency responsible for water allocation and water quality protection. The SWRCB administers and regulates water rights. Obtaining a water right in California involves an "application-permit-license" process.¹³ Even after the Board grants a water right, it can change permit conditions based on new data. The Board can deny or modify permits if it becomes clear that the water allocation violates the beneficial use criteria or the public interest.¹⁴

The Board has opportunities to protect in-stream flows at each stage of the application process. First, the Board determines whether water is available for allocation.¹⁵ Sections 1243 and 1243.5 of the California Water Code give the Board broad discretion in deciding whether sufficient water will remain in-stream for protection of fish, wildlife, and recreation when considering an application for a new appropriation.¹⁶ If the Board determines that water is available for the proposed appropriation, it still must decide whether approving the appropriation would best serve the public interest.¹⁷

D. The Role Of Department Of Fish And Game In Protecting In-Stream Flows

The SWRCB can impose terms and conditions on new appropriations that protect in-stream uses and the public interest. Terms and conditions come either from Board regulations or in response to protests by the public or the Department of Fish and Game (F&G).¹⁸ F&G is California's public trust agency for fish and wildlife.¹⁹ F&G's knowledge and expertise in conservation make it the appropriate agency to request conservation terms in new appropriations. In requesting the inclusion of in-stream flow conditions, F&G bears the burden of proving that in-stream flows are necessary for each individual water right application. Normally the Board adopts F&G's terms in exchange for a withdrawal of the protest. However, such negotiated agreements are not binding on the Board.

¹³ See Water Commission Act of 1913, ch. 586, 1913 Stat. 1012.

¹⁴ See CAL. WATER CODE § 1243.

¹⁵ See CAL. WATER CODE § 174 (West 1971).

¹⁶ See CAL. WATER CODE §§ 1243 and 1243.5 (West Supp. 1998); Schneider, *supra* note 12, at 35.

¹⁷ See Schneider, *supra* note 12, at 35.

¹⁸ See *id.* at 40.

¹⁹ See CAL. FISH & GAME CODE § 1913(c) (West 1984).

Critics of the current system point out that its case-by-case nature of protest and negotiation brings F&G into the planning process far too late and does not adequately protect long-term in-stream flows for fish and wildlife. Even when water is left in the stream in one instance, the same water remains subject to future appropriations. Because F&G must protest each case, in-stream flows remain vulnerable to future diversion.²⁰ Incorporating minimum in-stream flow requirements—using F&G recommendations—into California's water quality plans would increase the efficiency of this process by applying F&G's expertise more effectively.

II. THE RELATIONSHIP BETWEEN FEDERAL AND STATE LAWS AFFECTING IN-STREAM FLOWS

A. Federal Hydropower Projects and State Water Quality Standards

Technically, water regulation falls under state jurisdiction. However, in actuality, the federal government controls much of California's water. Settlement of the West depended on irrigation. People thought that huge water projects were the only feasible way to capture the scarce water resources necessary to thrive in an arid climate. Section 8 of the 1902 Reclamation Act suggests a cooperative relationship between state and federal governments, deferring to state water law in governing the "control, appropriation, use, or distribution of water" within its boundaries.²¹ In the same breath, section 8 authorizes the construction of massive dams, diversions and canals designed to irrigate the West. These behemoths can cause mass environmental degradation, in part because the federal government is exempt from protective state regulations inconsistent with federal programs.²²

Despite federal authority, California has the means to reduce impacts from federal projects on its water resources. In *California v. United States*, the Bureau of Reclamation ("BuRec") applied to SWRCB for an appropriative water right to build the New Melones Dam, a component of the Central Valley Project.²³ The

²⁰ See Schneider, *supra* note 12, at 44.

²¹ 43 U.S.C. § 383 (1994).

²² See REISNER & BATES, *supra* note 3, at 76.

²³ 438 U.S. 645 (1978). The Central Valley Project (CVP), one of the two major water projects in California, is owned and operated by the federal government. The CVP supplies water to more than a third of

SWRCB granted the right with twenty-five conditions attached. The Board designed these conditions to afford stream flow protection for fish and wildlife. BuRec protested, arguing that under section 8, the Reclamation Act preempted the Board's authority to impose conditions on the project. In the end, the Supreme Court upheld the SWRCB's requirements. The Court interpreted section 8 to find state primacy over the "control, appropriation, use, or distribution of water," unless the state's requirements are clearly inconsistent with congressional directives of the project.²⁴ This case illustrates the state's ability to maintain high environmental standards and further water quality protection goals by protecting minimum flows from large federal projects.

B. Federal Review of Private Projects

Under the Federal Power Act (FPA), the Federal Energy Regulatory Commission (FERC) has exclusive regulatory authority over private hydropower projects on navigable waters.²⁵ In 1986 Congress amended the FPA, requiring that FERC determine whether a project is in the public's interest before issuing a license. These amendments direct FERC to give fish, wildlife, recreation, and energy conservation equal consideration before issuing a license.²⁶

Hundreds of dam owners will have to apply to FERC for relicensing in the next decade. In the relicensing process, FERC must apply the same environmental considerations that are required for new permits.²⁷ The FERC review process presents a significant opportunity to implement measures for in-stream values not previously considered when the projects were originally built.²⁸

Similar to section 8 of the Reclamation Act, section 27 of the FPA preserves state laws consistent with the "control, appropriation, use or distribution of water

California's irrigated agricultural lands. Estimates of the CVP's cost exceed \$15 billion, resulting in over 20 dams and reservoirs and 500 miles of canals. The dams have closed off almost 350 miles of upstream habitat for migrating fish, and extensive pumping has led to saltwater intrusion problems in the San Francisco Bay and San Joaquin Delta. *Saving California's Last Salmon*, HEADWATERS, Winter 1997. Combined, the two projects (plus the Imperial and Coachella federal projects) allocate nearly half of California's surface water to farmers, municipalities and industry. See REISNER & BATES, *supra* note 3, at 108.

²⁴ See *California v. United States*, 438 U.S. at 678; REISNER & BATES, *supra* note 3, at 83-84.

²⁵ See Federal Power Act of 1920, 16 U.S.C. §§ 791a-825r (1994).

²⁶ See 16 U.S.C. § 803(a)(1) (1994).

²⁷ See *Confederated Tribes and Bands of the Yakima Indian Nation v. FERC*, 746 F.2d 466 (9th Cir. 1984).

²⁸ See Phillip M. Bender, *Restoring The Elwha, White Salmon, And Rogue Rivers: A Comparison Of Dam Removal Proposals In The Pacific Northwest*, 17 J. LAND, RESOURCES & ENVTL. L. 193 (1997).

used in irrigation or for municipal or other uses, or any vested right acquired therein.”²⁹ However, in *California v. FERC* the Supreme Court decided that section 27 did not encompass state minimum flow requirements.³⁰ This case diverged from the Court’s opinion in *California v. United States*,³¹ which held that the similar provision of the Reclamation Act preserved the state’s control over water.³² In *PUD #1 of Jefferson County v. Washington Department of Ecology* (hereinafter *Jefferson County*), the Court clarified some of the confusion surrounding state control over water projects.³³

C. Jefferson County

In May 1994, the U.S. Supreme Court ruled in *Jefferson County* that states have authority to regulate water quality standards, including in-stream flows,³⁴ via state certification requirements contained in section 401 of the Clean Water Act (CWA).³⁵ *Jefferson County* effectively overruled *California v. FERC* and confirmed the states’ power to impose water quality standards on federally licensed hydroelectric projects.³⁶

In *Jefferson County*, a county utility district (Jefferson County PUD No.1) and the city of Tacoma, Washington, proposed a project that would divert seventy-five percent of the Dosewallips River for power generation. The state had classified the affected portion of the river as “Class AA” under Washington’s

²⁹ See Federal Power Act of 1920, 16 U.S.C. §§ 791a-825r (1994).

³⁰ *California v. FERC*, 495 U.S. 490, 498 (1990) (refusing to recognize in-stream water as proprietary water right).

³¹ 438 U.S. 645 (1978). See *supra* text accompanying notes 21-24.

³² Section 8 of the Reclamation Act of 1902 provides, “[N]othing in this Act shall be construed as affecting or intending to affect or to in any way interfere with the laws of any State or Territory relating to the control, appropriation, use, or distribution of water...” 43 U.S.C. § 383 (1994).

³³ See *PUD #1 of Jefferson County v. Washington Department of Ecology*, 511 U.S. 700 (1994). Other cases leading up to *Jefferson County* include *Escondido Mutual Water Co. v. La Jolla Band of Mission Indians*, 466 U.S. 795 (1984) (allocating specified quantity of water to certain Indian Tribes that would otherwise be used by licensee), and *Monongahela Power Co. v. Marsh*, 484 U.S. 816 (1987) (holding that CWA compliance does not frustrate purpose of FPA, thus FERC licenses are not exempt from CWA review).

³⁴ See *Jefferson County*, 511 U.S. at 734.

³⁵ See CWA § 401, 33 U.S.C. § 1341 (1994).

³⁶ See Katherine P. Ransel, *The Sleeping Giant Awakens: PUD No.1 of Jefferson County v. Washington Department of Ecology*, 25 ENVTL. L. 255 (1995). Ms. Ransel represented 18 conservation and fishing organizations in *Jefferson County*.

water quality standards. Designated uses for Class AA waters include salmonid migration, rearing, spawning, and harvesting.³⁷

The utility district sought a CWA section 401 certificate from the Washington Department of Ecology, a necessary requirement before FERC could license the project.³⁸ Under the CWA, section 401(d) requires states to set forth effluent limitations and other limitations necessary to comply with the Act and any other appropriate state law requirements.³⁹ Based on water quality standards for the Dosewallips River, the Department of Ecology conditioned its certification of the project on a requirement that at least fifty percent of the river's flow remain in the stream to protect fisheries.⁴⁰

The Washington Supreme Court upheld the state's authority to require minimum flows for water quality certification under section 401(d) of the CWA. It concluded that FERC's authority under the FPA did not preempt these conditions. Further, the Washington Supreme Court held that the CWA provisions must be incorporated into FERC's licensing process.⁴¹

Section 303 of the CWA requires the states to protect their waterways by establishing water quality standards for all waters within the state.⁴² Water quality standards have two components: (1) designated uses, and (2) numeric and narrative water quality criteria designed to protect such uses.⁴³ Additionally, state water quality standards must include antidegradation controls to ensure the integrity of state water quality.⁴⁴

On appeal to the United States Supreme Court, *Jefferson County* resulted in a seven to two decision confirming state certification authority over federally approved projects under section 401 of the CWA. First, the Court held that section 401 conditions could be based on narrative criteria as well as specific chemical and numerical criteria.⁴⁵ Second, it held that a designated use is separately enforceable from criteria designed to protect the designated use because criteria may not always be enough to protect the designated use of the river.⁴⁶

³⁷ See *Jefferson County*, 511 U.S. at 706.

³⁸ *Id.* at 709.

³⁹ CWA § 401(d), 33 U.S.C. § 1341(d).

⁴⁰ See Ransel, *supra* note 36, at 255.

⁴¹ See *id.* at 262-63.

⁴² See CWA § 303(a), 33 U.S.C. § 1313(a) (1994).

⁴³ See CWA § 303(c), 33 U.S.C. § 1313(c)(2)(A) (1994).

⁴⁴ See CWA § 303(d), 33 U.S.C. § 1313(d)(4)(B) (1994).

⁴⁵ See *Jefferson County*, 511 U.S. at 716.

⁴⁶ See *id.* at 715.

Third, the Court held that the CWA's antidegradation provision also justified the state's imposition of an in-stream flow condition.⁴⁷ Fourth, the Court held that once a discharge is found in connection with a federally licensed activity, under section 401(a)(1) of the CWA, states may impose conditions relating to the entire activity, not merely the point of discharge.⁴⁸ These holdings affirm the variety of mechanisms states have to influence federally approved projects, providing backup where a narrow focus on numeric standards might otherwise fail to adequately protect water quality.

In *Jefferson County*'s most far-reaching ruling, the Court held that *water quality includes water quantity* and that no artificial distinction can be made between them.⁴⁹ Lack of water is a form of "pollution," a term defined by the CWA as "man-induced alteration of the chemical, physical, biological, and radiological integrity of water."⁵⁰ The Court's holdings in *Jefferson County* set the stage for future battles between states and the federal government extending beyond hydroelectric projects.⁵¹

Incorporating in-stream flow requirements into state water quality plans forces prospective and traditional water users, including the federal government, to comply with state water quality protection goals.⁵² The CWA mandates that states formulate water quality standards and allows states to promulgate stan-

⁴⁷ See *id.* at 719. EPA has promulgated regulations under section 303 of the CWA requiring statewide antidegradation policy to include implementation methods "consistent with ... existing in-stream water uses and the level of water quality necessary to protect the existing uses ..." 40 C.F.R. § 131.12 (1998).

⁴⁸ See *Jefferson County*, 511 U.S. at 712.

⁴⁹ See *id.* at 719 (emphasis added).

⁵⁰ CWA § 502(19), 33 U.S.C. § 1362(19) (1994). In contrast, the dissent in *Jefferson County* would have limited the states' regulatory power to encompass only discharges and activities directly related to discharges under §401(a)(1). See *Jefferson County*, 511 U.S. at 726.

⁵¹ For example, the fact that section 401(d) certification applies to "any" federal license that "may result in any discharge" could also have major implications for timber and grazing activities that create non-point source pollution. A broad definition of "any discharge" would greatly expand the scope of permits that need compliance with section 401. See Ransel, *supra* note 36, at 267. Case law has failed to clarify the scope of section 401. For example, in *Oregon Natural Desert Ass'n v. Dombek*, 151 F.3d 945 (1998), *withdrawn from bound volume*, the Ninth Circuit initially reversed a lower court's decision against the Forest Service for the Service's failure to obtain section 401 state certification before granting a grazing permit in the Malheur National Forest. The Ninth Circuit narrowly interpreted "discharge" within the scope of § 1341 of CWA to exclude "non-point source" pollution. However, as noted above, this case was later withdrawn from publication in the bound volume, leaving the scope of section 401 unsettled.

⁵² See Ransel, *supra* note 36, at 271.

dards which are more stringent than federal standards.⁵³ The outcomes of both *California v. U.S.* and *Jefferson County* turned on water quality standards set in each state-established water quality plan under the CWA. The state water quality plan, supported by the CWA, provides the crucial framework to further water quality goals, including the implementation of in-stream flows.

III. ADDITIONAL LAWS IMPORTANT FOR PROTECTING IN-STREAM FLOWS

A. *Wild and Scenic Rivers Acts*

In 1968 Congress enacted the National Wild and Scenic Rivers Act (WSRA),⁵⁴ designed to preserve a representative fraction of outstanding free-flowing rivers in the United States. Rivers are classified under the federal Act as “wild,” “scenic,” or “recreational” based on the degree of development on or near the waterway.

A river may be added to the WSRA system by an act of Congress or by order from the Secretary of the Interior at a state’s official request. The lead management agency first determines if a river is eligible. Eligible rivers or river segments must be free-flowing and meet federal water quality standards. Additionally, the river must have one or more outstanding natural or social values — such as recreation, scenery, wildlife, history, or geology. Once declared eligible, the waterway is protected from development while the agency considers its suitability for designation. This is a subjective process that weighs political controversies, local and state interests, costs, and development proposals.

Once added to the national system, federal actions — such as funding, planning, or approving projects — which adversely impact the river are prohibited.⁵⁵ Currently, the WSRA protects over 1900 miles of streams in California.⁵⁶ The WSRA provides an excellent mechanism for protecting the few remaining California rivers with an unimpaired flow.

⁵³ See CWA § 510, 33 U.S.C. 1370 (1994). The Porter-Cologne Water Quality Control Act establishes California’s comprehensive water quality program and is administered by the nine regional boards. CAL. WATER CODE §§ 13000-13245 (West 1971).

⁵⁴ Wild and Scenic Rivers Act of 1968, Pub. L. 90-542, 82 Stat. 913 (codified as amended at 16 U.S.C. §§ 1271-1287 (1994)).

⁵⁵ See 16 U.S.C. § 1278(a).

⁵⁶ See J. Haas, *National Wild and Scenic Rivers in California: A Status Report*, Friends of the River (1998).

The 1972 California Wild and Scenic Rivers Act ("California Act") — fashioned after the WSRA — preserves rivers with "extraordinary scenic, recreational, fishery or wildlife values" in a free-flowing state.⁵⁷ The California Act restricts dam construction and other impoundment facilities, and it also prohibits state entities from participating financially or otherwise in any project that could affect the natural condition of designated rivers. The California Act's classification of "wild," "scenic," or "recreational" corresponds to the river segment's current level of development. To keep river conditions consistent with their designation, the California Act requires that responsible agencies develop and implement management plans.⁵⁸ Unfortunately at the present time, California does not take an active role in managing the State system. Both the federal and state Wild and Scenic River systems lack adequate funding to complete studies and management plans, reducing the efficacy of both Acts.⁵⁹

B. California Fish And Game Code §5937

California Fish and Game Code section 5937, another mechanism to protect the State's in-stream flows, played a crucial role in restoring the Mono Lake Basin.⁶⁰ Section 5937 forbids the dewatering of creeks below dams.⁶¹ The Mono Lake controversy exemplifies how altering natural water regimes affects ecosystems.⁶² Over time, long-held water rights diverted by the city of Los Angeles dramatically lowered the lake's level, upsetting its fragile ecosystem.

In *California Trout, Inc. v. State Water Resource Control Board* (hereinafter *Cal Trout*), a non-profit recreational fishers association invoked Fish and Game Code

⁵⁷ The California Wild and Scenic system includes segments of the Smith, Klamath, Scott, Salmon, Trinity, Eel, Van Duzen, American, E. Carson and W. Walker Rivers. North coast rivers and the lower American were added to the federal system in 1982. *Id.*

⁵⁸ See Schneider, *supra* note 12, at 88.

⁵⁹ See Haas, *supra* note 56.

⁶⁰ CAL. FISH & GAME CODE § 5937 (West 1984).

⁶¹ See *id.*

⁶² Mono Lake supports large numbers of waterfowl with brine shrimp and alkali fly populations that thrive in the lake's saline environment. Nesting birds found safety from predators on the lake's islands until the lowered water level exposed a path accessing the sanctuary. Diversions lowered the lake 45 feet, leaving barren alkali flats that created health hazardous dust storms in the area. The decreased surface area of the lake isolated wetlands from the lakeshore, substantially decreasing habitat for waterfowl as well as increasing the salinity of the lake to intolerable levels for fly and shrimp populations that support the birds. See Cynthia L. Koehler, *Water Rights and the Public Trust Doctrine: Resolution of the Mono Lake Controversy*, 22 *ECOLOGY L.Q.* 541, 563 (1995).

section 5937 to restore flows and protect brown trout in Rush Creek and Lower Lee Vining Creek, tributaries to Mono Lake.⁶³ In particular, section 5937 requires that “the owner of any dam shall allow sufficient water at all times ... to pass over, around or through the dam, to keep in good condition any fish that may be planted or exist below the dam.”⁶⁴ Reading section 5937 in conjunction with Fish and Game Code section 5946 — which specifically mandates section 5937 compliance in the Mono Lake Basin — the *Cal Trout* court determined that the California Legislature intended that trust resources take precedence over municipal water supply and other competing uses.⁶⁵ Ultimately, the *Cal Trout* court’s holding established an absolute priority to maintain fish in good condition.⁶⁶

C. Common Law Doctrines

The Public Trust Doctrine and the Reserved Rights Doctrine have powerful influences over management agencies’ decisions regarding water resources. Lengthy lawsuits are certain to follow agency decisions that do not comply with the Public Trust Doctrine. Furthermore, traditional water allocation and management are shifting to conform to the premises defined by the Reserved Rights Doctrine. Both doctrines provide opportunities to restore in-stream flows where traditional water uses previously dominated.

⁶³ 207 Cal. App. 3d 585, 255 Cal. Rptr. 184 (1989). An earlier case addressing the Mono Lake dispute was *National Audubon Society v. Superior Court*, 33 Cal. 3d 419, 658 P.2d. 709, 189 Cal. Rptr. 346 (1983). In *Audubon*, the California Supreme Court issued the Mono Lake Decision, a major development of the judicial public trust doctrine. Courts weighed long held water rights with their impacts on the watershed of origin. *Audubon*, 33 Cal. 3d at 419, 658 P.2d. at 709, 189 Cal. Rptr. at 346. In *Audubon*, the SWRCB was eventually assigned the duty of adjudicating water allocation in the Mono Lake Basin. SWRCB reached its final decision in 1994, reducing LADWP’s water diversions to allow the lake to rise 16 feet and establishing minimum flows for the lake’s tributaries. See Koehler, *supra* note 62, at 543. For a discussion of the public trust doctrine see *infra* text accompanying notes 67-77.

⁶⁴ CAL. FISH & GAME CODE § 5937.

⁶⁵ See CAL. FISH & GAME CODE § 5946 (West 1984). The case was later brought to the court a second time to order enforcement of the original injunction mandating stream flows into Mono Lake’s tributaries. The court refused to allow further delay of flow releases due to the Board’s untimely review of public trust issues in the Mono Lake Basin. “It is undeniable that a well-balanced diet is preferable to an unbalanced diet. But starvation is hardly justified by a delayed feeding, however nutritious. No water means no compliance with section 5946; imprecise compliance is immeasurably superior to no compliance.” *California Trout, Inc. v. Superior Court*, 218 Cal.App.3d 187, 207, 266 Cal. Rptr. 788, 799 (1990).

⁶⁶ *Cal Trout*, 207 Cal. App. 3d at 601, 255 Cal. Rptr. at 191-92.

1. The Public Trust

The customary public trust concept is distinguishable from the Public Trust Doctrine. The broad concept of public trust has its underlying principles in common law and in legislation under various concepts such as police power, navigable servitude, and public use. Further, serving the public interest is the mandate for many government agencies.⁶⁷ In contrast, the Public Trust Doctrine is a distinct legal doctrine dealing with states' sovereign responsibility to protect certain resources such as navigable waterways and wildlife. The argument that the federal government should also share in this burden has merit, but to date, federal public trust responsibilities lie only in federal legislation and agency regulation.⁶⁸

The Public Trust Doctrine originated from Roman law principles incorporated into English law.⁶⁹ States succeeded to the trust responsibility as they entered the Union and gained ownership of navigable waters in their territory.⁷⁰ The state owns fee title to the beds of navigable waters and the public holds an easement on the water over them.⁷¹ The state has standing to sue, as a property owner, for damage or degradation to the public interest resource. However, the Public Trust Doctrine encompasses more than a fee simple property right. Public trust resources are subject to public rights which cannot be extirpated by state legislation. The state cannot relinquish its trust responsibilities by passing

⁶⁷ Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 473, 498 (1970) (discussing how citizen participation and standing can be used to increase accountability in governmental decision making).

⁶⁸ Portions of trust principles developed in federal law are inextricably linked with the Commerce Clause of the Constitution. See U.S. CONST. art I, § 8. Because navigation is considered a function of commerce, all navigable streams are subject to federal regulation. JOSEPH L. SAX ET AL., *LEGAL CONTROL OF WATER RESOURCES: CASES AND MATERIALS* 525-32 (2d ed. 1991). Navigational servitude gives the federal government the right to destroy state property rights on navigable rivers without providing compensation. This superior right is not limited to the purpose of "promoting" navigation, and has been construed to allow construction of projects, such as diversions and dams, which actually hinder navigation. *Id.*

⁶⁹ "By the law of nature these things are common to mankind—the air, running water, the sea and consequently the shores of the sea." J. INST. 2.1.1; see Koehler, *supra* note 62, at 545.

⁷⁰ See *Pollard v. Hagen*, 44 U.S. (3 How.) 212 (1845) (holding that new states admitted to Union are given same sovereign authority as sister states, including property interest in submerged lands, under "equal footing" doctrine); Koehler, *supra* note 62, at 545.

⁷¹ See Jeffrey S. Silvyn, *Protecting Public Trust Values in California's Waters: The Constitutional Alternative*, 10 UCLA J. ENVTL. L. & POL'Y 355, 358 (1992).

the resource into private ownership.⁷² Furthermore, a trust easement still exists in instances where public trust resources are in private ownership.⁷³

Under the Public Trust Doctrine, the state must protect traditional public uses including commerce, fishing, and navigation. In 1971, the California Supreme Court decided *Marks v. Whitney*, adding fish and wildlife habitat, ecological studies, and aesthetics to the list of uses protected by California's Public Trust Doctrine.⁷⁴

In 1983 the California Supreme Court further expanded the Public Trust Doctrine in *National Audubon Society v. Superior Court*.⁷⁵ This decision established the California water rights system and the Public Trust Doctrine as an "integrated system of water law."⁷⁶ The *Audubon* court stated that the public trust must be protected in *all* water allocations, "so far as feasible."⁷⁷ The holding reestablished the usufructuary nature of water rights. In other words, a water right has always been public property subject to private use.

The Public Trust Doctrine remains inchoate as to its full ramifications for in-stream water resources. Its recent expansion by the California courts reflects policy trends favoring the protection and enhancement of water quality. The Public Trust Doctrine can prevent future environmental degradation by guiding decision makers when considering new projects. It is also powerful in its retroactive nature, providing a vehicle to remedy past deleterious water allocations.⁷⁸

2. The "Public Use Right"

California's "public use right,"⁷⁹ an ancillary method for protecting the public trust, establishes a public right to access and use navigable waters. States may set their own standards in defining navigability.⁸⁰ California courts have

⁷² See *Illinois Cent. R.R. Co. v. Illinois*, 146 U.S. 387, 452-53 (1892) (holding that Illinois legislature did not have power to transfer lakefront property into private ownership).

⁷³ See *id.*

⁷⁴ 6 Cal. 3d 251, 259-60, 491 P.2d 374, 380, 98 Cal. Rptr. 790, 796 (1971).

⁷⁵ 33 Cal. 3d 419, 658 P.2d. 709, 189 Cal. Rptr. 346 (1983).

⁷⁶ 33 Cal. 3d at 426, 658 P.2d. at 712, 189 Cal. Rptr. at 349.

⁷⁷ *Id.*

⁷⁸ See Harrison C. Dunning, *Instream Flows and the Public Trust*, in *INSTREAM FLOW PROTECTION IN THE WEST*, 4-1, 4-10 (Lawrence J. MacDonnell & Teresa A. Rice eds., 1993).

⁷⁹ See CAL. CONST. art. X, § 4.

⁸⁰ See *Silvyn*, *supra* note 71, at 11. In California, the definition of navigable has been broadened to apply to all waters that float a small pleasure craft such as a kayak.

interpreted public use values to include a wide range of ecological concerns, such as those identified in *Marks v. Whitney*.⁸¹ For example, California recognizes fish dwelling and spawning in water as a protected public interest, separate from fishing use.⁸²

Several aspects of the public use right separate it from the public trust doctrine. The public use right is not a property right. Instead, it confers a constitutional and statutory right of public use.⁸³ The public use right also protects resources that affect the public's use of water. The right extends into waterways on solely private lands which eventually flow into public waters.⁸⁴ The public use right affects many land use activities including grazing, farming, and timber harvesting. The public use right protects existing public uses after conditions have changed due to reservoirs and other modifications,⁸⁵ and it does not limit protection of water to its condition upon statehood.

3. Native American and Other Reserved Rights

In 1908 the U.S. Supreme Court held in *Winters v. United States* that federal reservations included "implied" water rights predating any subsequent water appropriators.⁸⁶ This Reserved Rights Doctrine applies equally to all land set aside by the federal government such as national parks, forests, military bases, wildlife refuges, wilderness areas, and Native American reservations. However, Reserved Rights are only senior to appropriations after the land was set aside, and only to the extent necessary to fulfill the specific *original* congressional purposes of the reservation.⁸⁷

Under the Reserved Rights Doctrine, Native Americans hold extensive water rights senior from the time of a reservation's establishment. The enormous

⁸¹ 6 Cal. 3d 251, 259-60, 491 P2d 374, 380, 98 Cal. Rptr. 790, 796 (1971).

⁸² See *People v. Truckee Lumber Co.*, 116 Cal. 397, 48 P. 374, 374 (1897) (holding that property owner could not harm fish in non-navigable stream).

⁸³ See CAL. CONST. art. X, §§ 3-4; CAL. PUB. RES. CODE § 7991 (West 1984).

⁸⁴ See *Silvyn*, *supra* note 71, at 18.

⁸⁵ See *id.* at 14.

⁸⁶ 207 U.S. 564 (1908).

⁸⁷ See, e.g., *Cappaert v. United States*, 426 U.S. 128 (1976) (upholding water claim to preserve pupfish habitat at Devil's Hole National Monument as consistent with reservation's purpose); *U.S. v. New Mexico*, 438 U.S. 696 (1978) (rejecting claims for in-stream water in Gila National Forest, established in 1899, because original purpose of reservation was timber production and watershed protection, not wildlife protection).

potential of Reserved Rights became manifest in *Arizona v. California*, where the Supreme Court granted over 900,000 acre feet per year to tribes in the lower basin states of the Colorado River.⁸⁸

Currently, many Native American water claims are in court, unsettling traditional allocations of over forty-five million acre feet of western water per year. To date, the courts have not established a uniform precedent for allocating Reserved Rights.⁸⁹ The courts disagree on how to equitably allocate scarce water in the West between historic, non-native appropriations and federally reserved Native American water rights that legally predate the traditional users.

On Native American lands, the quantity of a reserved right is typically defined by the "practicably irrigable acreage."⁹⁰ Fishery-based standards may also be used as an alternative. Once quantity is established, courts differ on how the water may actually be used. One issue is whether in-stream flows are consistent with the purpose of the reservation.

Some courts have found that reserved rights on Native American reservations can only be used for irrigation because the purpose of the reservations was, and is, converting Native Americans into "civilized" farmers. In 1988, the Wyoming Supreme Court confirmed the Shoshone and Northern Arapaho tribal water right of one-half million acre-feet (MAF)⁹¹ from the Wind River.⁹² However, the court then refused to recognize Native American rights for any use other than agriculture, effectively taking back the tribe's water because the tribe lacked the necessary infrastructure for irrigation.⁹³

⁸⁸ 373 U.S. 546 (1963).

⁸⁹ See Michael R. Moore, *Native American Water Rights: Efficiency and Fairness*, 97 NAT. RESOURCES J. 62 (1989). Two methods are used to resolve Native American water rights claims: the first is a general stream adjudication in state court, subject to federal review. McCarren Amendment, 43 U.S.C. § 666 (1952) (authorizing joinder of United States in state adjudication of water rights in stream systems). The second method involves a settlement negotiation with state governments, the federal government, and affected water users.

⁹⁰ The "practicably irrigable acreage" is determined by calculating the amount of water needed to irrigate the reservation land. See *Arizona v. California*, 439 U.S. at 421.

⁹¹ The term "acre-foot" is the quantity of water required to cover an area of one acre to one foot in depth.

⁹² See *In re General Adjudication of All Rights to Use Water in the Big Horn River System*, 753 P.2d 76 (1988), *aff'd sub nom.* *Wyoming v. United States* 492 U.S. 406 (1989).

⁹³ See SARAH F. BATES, ET AL. *SEARCHING OUT THE HEADWATERS: CHANGE AND REDISCOVERY IN WESTERN WATER POLICY* 85 (1993). On appeal, the U.S. Supreme Court did not review this issue. See *Wyoming v. United States*, 488 U.S. 1040 (1989) (limiting scope of grant of certiorari by Supreme Court to other issues).

Others support defining the "purpose" of Native American reservations as encouraging a broader goal of Native American economic and cultural self-sufficiency.⁹⁴ Many tribes feel their water would best serve them flowing in the stream, providing fisheries and spiritual values. In-stream flow markets are forming in the Snake River basin as a result of the Fort Hall Indian Water Rights Settlement Agreement, approved by Congress in 1990.⁹⁵ The Shoshone-Bannock Tribal Water Supply has a tentative agreement with the Bonneville Power Administration (BPA) for upstream river water to supply spring flows for migrating salmon. The Shoshone-Bannock Tribal Water Supply is also negotiating with BPA to sell winter stream flows to the South Fork Snake River fisheries below the Palisades Reservoir.⁹⁶

Allowing broad uses under the Reserved Rights Doctrine benefits tribes financially, serving the congressional purpose of encouraging tribal sovereignty and self-sufficiency. At the same time, it benefits the West's declining fisheries. However, no guarantee exists that tribes will protect in-stream flows. Some tribes may decide to divert the water, although most reservations lack the resources to do so.

IV. GO WITH THE FLOW — MANAGEMENT SCHEMES FOR ENHANCING THE BENEFITS OF IN-STREAM FLOWS

Recently, officials charged with water guardianship, as well as the general public, have experienced a paradigm shift in the way they think about water. This shift is beginning to manifest itself in some very overt ways. Flood simulation and dam decommissioning present two innovative but controversial techniques for restoring in-stream values which reflect policy trends towards restoring natural stream systems.

⁹⁴ See REISNER & BATES, *supra* note 3, at 96.

⁹⁵ See Pub. L. 101-602, 104 Stat. 3059 (1990).

⁹⁶ See Pat Ford, *Idaho Avoids the Courts*, HIGH COUNTRY NEWS Aug. 27, 1990; Deborah Moore & Zach Willey, *Water In The American West: Institutional Evolution And Environmental Restoration In The 21st Century*, 62 U. COLO. L. REV. 775, 791 (1991).

A. Maintaining Natural Flow Dynamics

In addition to ensuring adequate water quantities for in-stream uses, it is also important to ensure the water is doing the right things at the right time. It is not enough to merely sustain a static quantity of water in a stream or lake. The natural processes of the watershed also need protection and restoration. Complex river ecosystems depend on the occurrence of high and low flows, sediment load, and temperature.⁹⁷ High flows are necessary to transport the bed load of a river, which, in turn, maintains a healthy stream channel.⁹⁸ Flows high enough to move the entire sediment load (fine silts to boulders) form transient gravel bars and gravel beds that provide habitat for wildlife and fish.⁹⁹ This knowledge has led to flood simulation management efforts by resource agencies throughout California and the western United States.

The most visible and expensive of these experiments took place in March of 1996 in the Grand Canyon. Since 1968, the Glen Canyon Dam has drastically changed the dynamics of the mighty Colorado River. Unnaturally low flows inhibited the river from transporting sediment.¹⁰⁰ Gradually, beaches, sandbars, and slack backwaters, which all provide valuable habitat, have disappeared from the canyon below the dam.

On March 26, 1996, the Bureau of Reclamation released 1200 cubic meters of water per second from the dam, for seven days.¹⁰¹ These large flows carried sediment downstream and deposited it, immediately rejuvenating many beaches.¹⁰² The ecological experiment cost an unprecedented \$1.5 million in lost revenue from hydroelectric power.¹⁰³ The experiment confirmed the need for periodic large flows to maintain a healthy ecosystem. Perhaps more importantly, it provided much needed scientific data and a successful, innovative example of new approaches to solving in-stream flow problems.¹⁰⁴

⁹⁷ See Marcia Barinaga, *A Recipe for River Recovery?*, 273 SCIENCE 1648, 1648 (1996).

⁹⁸ See *id.*

⁹⁹ See *id.* at 1649.

¹⁰⁰ See Bernice Wuethrich, *Deliberate Flood Renews Habitats*, 272 SCIENCE 344, 344 (1996).

¹⁰¹ See *id.*

¹⁰² See *id.*

¹⁰³ See *id.*

¹⁰⁴ See *id.*; G. Richard Marzolf, et al., *Perspectives on River Restoration in the Grand Canyon*, 79(4) BULL. ECOLOGICAL SOC'Y AM. 251, 251-53 (1998).

B. Dam Decommissioning:
An Example of Current Perceptions About In-Stream Flows

Over 74,000 major dams currently inhibit the circulation of our nation's rivers.¹⁰⁵ While dams benefit society by providing irrigation, enhanced navigation, and a relatively clean source of energy, they can devastate the natural processes of river systems. The most dramatic and obvious environmental impact of altered fluvial systems is the recent decline in anadromous fisheries.¹⁰⁶ In addition, many dams constructed in the early 1900s are inefficient and unsafe by modern standards.¹⁰⁷ Even traditional cost-benefit analyses cannot justify their continued maintenance and operation.¹⁰⁸ For these reasons, dam owners and agency officials are beginning to seriously consider dam removal as a viable and acceptable alternative to relicensing. These recent policy trends toward dam decommissioning support public interest values by restoring in-stream water resources and associated ecosystems.

The Western Canal Water District in California was one of the first water management agencies to implement this innovative mitigation technique. Butte Creek, a tributary of the Sacramento River, marked one of the ceremonies on the Secretary of Interior Bruce Babbitt's "sledge hammer tour," celebrating the destruction of dams.¹⁰⁹ Rerouting irrigation water through underground pipes allowed the removal of small dams on Butte Creek which had previously blocked passage for the once abundant spring-run Chinook salmon and steelhead.¹¹⁰ "Dams are not like the pyramids in Egypt that stand for eternity," said Mr. Babbitt on his dam-busting tour. "Dams do, in fact, outlive their function."¹¹¹

FERC will review hundreds of other privately owned dams in the next decade for relicensing. As a result of FERC's reviews, owners may opt for re-

¹⁰⁵ See Micheal T. Pyle, *Beyond Fish Ladders: Dam Removal as a Strategy for Restoring America's Rivers*, 14 STAN. ENVTL. L. J. 97, 99 (1995).

¹⁰⁶ There are 116 species of native fish in California, 7% are extinct and 56% either declining or considered at risk of extinction. The anadromous fishes, species that migrate to the ocean and back into freshwater to spawn, face the highest risk of extinction. *Saving California's Last Salmon*, HEADWATERS, Winter 1997.

¹⁰⁷ See Dam Safety Act, 33 U.S.C. §§ 467-467n (1994); Bender, *supra* note 28, at 189.

¹⁰⁸ See Pyle, *supra* note 105, at 102; see also, Zygmunt J. B. Plater, *Reflected in a River: Agency Accountability and the TVA Tellico Dam Case*, 49 TENN. L. REV. 747, 758-60 (1982) (noting that cost-benefit analysis indicated construction of Tellico Dam could not be economically justified after project was nearly complete).

¹⁰⁹ See Bruce Babbitt, Remarks of Interior Secretary Bruce Babbitt, Ecological Society of America Annual Meeting, Baltimore, Maryland, August 4, 1998.

¹¹⁰ See Marc Reisner, *Deconstructing the Age of Dams*, HIGH COUNTRY NEWS, Oct. 27, 1997, at 8-10.

¹¹¹ See Babbitt, *supra* note 109.

removal when retrofit costs for safety measures and fish passage exceed a dam's benefit. In addition, FERC may order dam removal if, upon review, a new license cannot satisfy statutory standards.¹¹²

Decommissioning larger dams is more complex, but the benefits from removing them could be proportionate to their size. For example, two antiquated, private dams on the Elwha River in Washington State block what was once a thriving salmon-producing watershed. The 200-foot Glines Canyon Dam was up for relicensing in 1994 and the 100-foot Elwha Dam had never been licensed.¹¹³ Both dams are unsafe, have no fish passage facilities, and combined supply only a minimal amount of electricity for the region.¹¹⁴ The dams also interfere with the treaty rights of the Lower Elwha-S'Klallam Tribe.¹¹⁵ After a decade of dialogue, stakeholders reached consensus that the dams should be removed.¹¹⁶ In 1997 Congress appropriated money to dismantle the dams.¹¹⁷ Studying these dam removals will provide important scientific information for similar projects in the future.

Dam removal would greatly benefit the fisheries in the Columbia Basin. Billions of dollars have been spent attempting to revive the Basin's once prolific salmon fishery. Despite these expenditures, planning efforts have failed to remediate the decline and ultimate demise of affected species.¹¹⁸ Eighty percent

¹¹² See Federal Energy Regulatory Commission, Project Decommissioning at Relicensing, Policy Statement (Dec. 14, 1994) (Docket No. RM93-23-000). 60 Fed. Reg. 339 (1995) codified at 18 C.F.R. § 2.24 (1998). For a discussion of FERC's responsibilities when licensing, see *supra* notes 30-33.

¹¹³ See Bender, *supra* note 28, at 30.

¹¹⁴ See Pyle, *supra* note 105, at 119-20.

¹¹⁵ The Treaty of Point No Point guaranteed fishing rights. Treaty of Jan. 26, 1855, 12 Stat. 933. See Bender, *supra* note 28, at 112.

¹¹⁶ The 1995 EIS developed by the Department of Interior identified dam removal as the only alternative to restore 70 miles of fish habitat in Olympic National Park. See Bender, *supra* note 28, at 15.

¹¹⁷ The Elwha River Ecosystem and Fisheries Restoration Act of 1992, Pub. L. No. 102-495, 106 Stat. 3173, authorized \$29.5 million for dam removal and associated costs. The funding of this project may have set a harmful precedent in that industry may believe taxpayers will compensate for future removals of old, inefficient, and even illegal dams. FERC could have ordered the owner to pay for the removal and restoration costs of the Elwha Dam. See Pyle, *supra* note 105, at 122.

¹¹⁸ The Northwest Power Planning Council was created in 1980 (Pacific Northwest Electric Power Planning and Conservation Act of 1980, 16 U.S.C. § 839 (1994)) for the conflicting and probably irreconcilable dual mission of doubling salmon runs while maintaining cheap electricity production for the Pacific Northwest. The Council spawned the "adaptive management" approach of natural resource planning for large ecosystems. What began as a good idea in theory resulted in largely academic planning exercises that succeeded only in avoiding compliance with applicable environmental laws. See Michael V. McGinnis, *On the Verge of Collapse: The Columbia River System, Wild Salmon, and the Northwest Power Planning Council*, 35 NAT. RES. J. 63, 70 (1995).

of fish mortality in the Basin is directly caused by hydropower development.¹¹⁹ Plans call for drawing down reservoirs on the lower Snake River, a major tributary of the Columbia, in order to increase flow velocities for migrating juveniles.¹²⁰ However, these drawdown plans have not been implemented due to cost impacts to the power industry, utilities, and ratepayers.¹²¹

Recent endangered species listings have prompted further reevaluation of the lower Snake River dams.¹²² Removal of these privately owned dams would open up hundreds of miles of habitat. An environmental impact statement developed by the U.S. Army Corps of Engineers, due at the turn of the century, will examine the controversial alternative of breaching these dams. In the mean time, Senator Slade Gorton (R-WA), chair of the Senate Appropriations Subcommittee on Interior Related Agencies, has held up funding for the Elwha dam removal for a guarantee that Columbia Basin dams not be altered — including flow regimes — without congressional approval.¹²³

The decommissioning of federal dams pose perhaps the greatest challenge. As previously described, state regulatory codes and federal environmental laws can modify how federal dams function, but neither can bring a federal dam down. Federal dams are directly authorized by Congress and require congressional action for removal.

The venerable David Brower accepts personal responsibility for his role in the construction of the Glen Canyon Dam.¹²⁴ He is now a major force behind the recent campaign to restore the Grand Canyon by draining Lake Powell. The

¹¹⁹ See *id.* at 85.

¹²⁰ See The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs and Yakima Tribes 2-1 (1996); Northwest Power Planning Council, Amendments to the Columbia River Basin Fish and Wildlife Program (Phase Two) (Dec. 1991); National Marine Fisheries Serv., U.S. Dept of Commerce, Endangered Species Act—Section 7 Consultation: Biological Opinion: Reinitiation of Consultation on 1994-1998 Operation of the Federal Columbia River Power System and Juvenile Transportation Program in 1995 and Future Years 92-94 (Mar. 1995); Michael C. Blumm, et al., *Beyond The Parity Promise: Struggling To Save Columbia Basin Salmon In The Mid-1990s*, 27 ENVTL. L. 21 (1997).

¹²¹ See Marc Reisner, *Coming Undammed*, 58 AUDUBON 64, 64 (1998). The four lower Snake River dams, Ice Harbor Dam, Lower Monumental Dam, Little Goose Dam, and Lower Granite Dam produce 4-7 percent of the electricity in the region and also raise river levels for barge traffic. *Id.*

¹²² Fall, spring, and summer chinook salmon are listed as threatened and sockeye is listed as endangered. 50 C.F.R. § 17.11 (1998).

¹²³ See Joni Balter, *Gorton Treads Cautiously Around a Northwest Icon*, SEATTLE TIMES, May 03, 1998; *supra* text accompanying note 117.

¹²⁴ Colorado River Compact of 1922, Colo. Rev. Stat. § 37-61-101 (1990). In 1922, several western states signed the Colorado River Compact, prompted by fear that California would appropriate all the river's water before other states had a chance. The water was allocated between the Upper Basin states (Colorado, Wyoming, Utah and New Mexico) and the Lower Basin states (California, Arizona and Nevada). The Up-

idea of draining the reservoir was also spurred by Richard Ingebretsen, president of the Glen Canyon Institute. The Sierra Club endorses the plan, which has received countrywide support.¹²⁵

David Wegner, an ecologist with the Bureau of Reclamation, headed the Glen Canyon Environmental Studies to assess impacts of the dam on the Grand Canyon.¹²⁶ The Havasuppai tribe, whose reservation borders the Colorado River 108 miles below the dam, assisted Wegner with the study. Over the years, the Havasuppai tribe watched the dam inundate sacred sites, extirpate native plant species, and decimate habitat for big-horned sheep and other spiritually and economically valuable wildlife.¹²⁷

Clearly, a long-term solution is needed. Congress should not disregard decommissioning Glen Canyon dam as lunacy. Fifteen percent of the Colorado River's annual flow (2.2 MAF) is lost in Lake Powell through evaporation and seepage into the sandstone of Glen Canyon — more than enough water to fulfill the United States's treaty obligation with Mexico.¹²⁸

The Colorado Compact should also be reevaluated.¹²⁹ The Compact allocates fifteen MAF between the Upper and Lower Basins. However, the Colorado River's actual average discharge is much lower.¹³⁰ Conflicts over the Compact's overallocation heighten as states and Native American tribes further develop and demand their share of the water.¹³¹ Wegner has joined with Ingebretsen to

per Basin matched the Lower Basin's Boulder Canyon Project Act (Hoover Dam) with the Colorado River Storage Project and Participating Projects (CRSP). The CRSP proposed a collection of major and minor water projects that would supply water to all developing cities within the Upper Basin states and to every irrigable acre of land. Projects were to be funded by large "cash register dams" that included Flaming Gorge Dam, Echo Park Dam, and the infamous Glen Canyon Dam. David Brower was then the president of the Sierra Club. He launched a movement to defeat the Echo Park Project in Dinosaur National Monument by alerting the public to the Canyon's aesthetic beauty and exposing the real cost-benefit analysis of the project. Brower agreed not to oppose the Glen Canyon Dam if Echo Park were abandoned, a decision he has since called a mistake. The CRSP bill took seven years to pass. The Echo Park Project was eliminated in exchange for the then little known Glen Canyon Dam. See George Sibley, *A Tale of Two Rivers: The Desert Empire and the Mountain*, HIGH COUNTRY NEWS Nov. 10, 1997 at 11.

¹²⁵ See Greg Hanscom, *Reclaiming a Lost Canyon*, HIGH COUNTRY NEWS Nov. 10, 1997 at 13.

¹²⁶ The study led to the simulated flood in 1996 that attempted to build back beaches and flush out sediment in the riverbed of the Canyon. This Band-Aid measure was ineffective ecologically but important in that it marked the first time the Bureau of Reclamation considered the environment its top priority.

¹²⁷ See Hanscom, *supra* note 125, at 11.

¹²⁸ See Sibley, *supra* note 124, at 15; Treaty Respecting Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande, Feb. 3, 1944, U.S.-Mex., 59 Stat. 1219, 1237.

¹²⁹ See Colo. Rev. Stat. § 37-61-101 (1990); Sibley, *supra* note 124, at 12.

¹³⁰ See Sibley, *supra* note 124, at 12.

¹³¹ See *id.* at 13.

prepare a "Citizens' Environmental Assessment," modeled after the National Environmental Policy Act.¹³² They plan to make their document available for public review. It is unlikely the Assessment will change policy on its own, but it may encourage further, serious investigation of dam decommissioning as a viable option for restoring the Colorado River.

CONCLUSION

The last thirty years have seen a dramatic shift in water resource management. Declining fisheries, pollution, and loss of biodiversity have generated public concern for aquatic ecosystems. In addition, California's escalating population increases the urgency for allocation of scarce water resources to assure future environmental protection. These issues have precipitated a transition in western water policy: traditional out-of-stream consumptive uses are giving way to recognition of in-stream values, such as ecological conservation and recreation.

California's Constitution and water codes provide a statutory framework for administrative agencies to include in-stream flows and values in decisions regarding water appropriations. Further, by incorporating in-stream flow requirements into strong state water quality control plans prescribed by the CWA, California can protect its waterways from the impacts of federal and federally approved projects. California can also look to statutory provisions such as the State and Federal Wild and Scenic Rivers Acts and Fish and Game Code section 5937 to provide agency decisionmakers with additional tools to protect in-stream resources. Finally, the common law doctrines of Public Trust and Reserved Rights are potentially powerful mechanisms for correcting past inappropriate and fulsome water allocations. These doctrines demand decisions that protect and restore precious water resources in the West.

It is important for California to exercise its powers *now* to protect in-stream water flows. Established legal tools for protecting in-stream water and its associated resources are only effective if applied. This Article's description of legal methods and policy trends aimed at keeping water in-stream is by no means exhaustive. New and creative solutions will arise as water allocation adjusts to serve a growing population, a deteriorating environment, and changing public needs, perceptions, and values.

¹³² 42 U.S.C. §§ 4321-4375 (1994).