

# ELR

## NEWS & ANALYSIS

### Dusting Off the Blueprint for a Dryland Democracy: Incorporating Watershed Integrity and Water Availability Into Land Use Decisions

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#### I. John Wesley Powell's Blueprint for a Dryland Democracy

In 1878, Maj. John Wesley Powell delivered to the Secretary of the Interior his *Report on the Lands of the Arid Region of the United States* in which he outlined his recommendations for surveying and settling the western lands.<sup>1</sup> In his biography of Powell, Wallace Stegner characterized the suggestions as the “blueprint for a dryland democracy.”<sup>2</sup> The plan was grounded in the “single compelling unity” of the western lands—the overall lack of precipitation.<sup>3</sup> Powell’s recommendations were designed to adapt settlement patterns to the region’s aridity, thus assuring the settlers’ survival and success.

Powell’s suggestions included recognizing not only the fundamental unity of western aridity but also the incredible diversity of western topography, climate, and soil, which affected the ability to take advantage of any available water.<sup>4</sup> In order to accommodate these equally crucial but divergent facts, and to accommodate the needs of settlers, farmers, and ranchers, Powell made several key recommendations. He

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1. JOHN WESLEY POWELL, *REPORT ON THE LANDS OF THE ARID REGION OF THE UNITED STATES, WITH A MORE DETAILED ACCOUNT OF THE LANDS OF UTAH*, H.R. EXEC. DOC. NO. 45-73 (2d Sess. 1878). Powell submitted the report to Secretary Carl Schurz; Schurz transmitted the report to the U.S. House of Representatives, whose Committee on Appropriations ordered the report printed. Although much westward settlement had already taken place by the time of the report’s publication, much land between the wetter portions of the Great Plains and the West Coast remained unsettled. WALLACE STEGNER, *BEYOND THE HUNDREDTH MERIDIAN: JOHN WESLEY POWELL AND THE SECOND OPENING OF THE WEST* 219 (1954). The term “settlement” is used here to refer to settlement by European immigrants and transplants from the eastern and midwestern United States; obviously, the western lands had been occupied by numerous Native Americans for millennia before Powell’s explorations.
2. STEGNER, *supra* note 1, at 202-42.
3. *Id.* at 224.
4. *Id.*

began by categorizing lands according to the uses they would be most suited for, including irrigated farming, pasturage, or timber or mineral production.<sup>5</sup> He suggested basing the government surveys prior to land disposal on topography rather than on the traditional rectangular grid system.<sup>6</sup> Instead of marching lines straight up and down mountains and valleys, a topographic survey would recognize decidedly nonrectangular watersheds and drainage basins. Such a survey would prevent the monopoly of water sources (and by extension, land) by those lucky enough to have water in their quarter section.<sup>7</sup> The result would be to carve out the maximum number of viable settlement parcels, all with some access to water.

Powell also recommended tying the size of land grants to topography and the availability of water—valley homesteads suitable for irrigated farms could be viable in 80-acre parcels, as long as water was available.<sup>8</sup> Higher elevation homesteads more suited to nonirrigated pasturage needed to be many times larger; Powell estimated 2,560 acres, including a core of at least 20 irrigable acres with available water. Having recognized that irrigation was critical in this region to accomplish any kind of agriculture, Powell sent along with his report proposed legislation to authorize formation

5. *Id.* at 224-25. One commentator called Powell’s approach “zoning on a massive scale.” RICHARD WHITE, *IT’S YOUR MISFORTUNE AND NONE OF MY OWN: A NEW HISTORY OF THE AMERICAN WEST* 152 (1991). Note that “urban development” is not among these classifications. At a time when the population of Washington, D.C., was about 178,000, and the entire population of California was just under 865,000, large western cities apparently were not on Powell’s mind. See CAMPBELL GIBSON & KAY JUNG, U.S. CENSUS BUREAU, *HISTORICAL CENSUS STATISTICS ON POPULATION TOTALS BY RACE, 1790 TO 1990, AND BY HISPANIC ORIGIN, 1970 TO 1990, FOR THE UNITED STATES, REGIONS, DIVISIONS, AND STATES* tbls. 19, 23 (2002), available at <http://www.census.gov/population/documentation/twps0056/tab19.pdf> and <http://www.census.gov/population/documentation/twps0056/tab23.pdf> (last visited May 26, 2003).
6. STEGNER, *supra* note 1, at 227. The grid survey dated back many years and was grounded in the desire to regularize the job of surveying the vast newly acquired western territories. *Id.* at 213. The Land Ordinance of 1785 adopted the rectangular survey system of dividing the land neatly into square townships each containing 36 square sections measuring a mile on each side. Thus, each section contained a square mile or 640 acres. GEORGE CAMERON COGGINS ET AL., *FEDERAL PUBLIC LAND AND RESOURCES LAW* 47 (2002).
7. STEGNER, *supra* note 1, at 227.
8. *Id.* at 225-27.

of self-governing irrigation districts to manage water delivery.<sup>9</sup> Eventually, his survey also included assessments of the most promising sites for water storage projects.<sup>10</sup>

As students of western history and water law know all too well, all but two of Powell's key recommendations were ignored. The U.S. Congress eventually embraced parts of Powell's plans for building dams and reservoirs to provide irrigation water to the settlers,<sup>11</sup> and some of his recommendations to empower organized irrigation districts also eventually came to fruition.<sup>12</sup> However, the suggestions to honor water availability, topography, and watersheds in surveying and conveying the western lands were rejected.<sup>13</sup>

What killed Powell's more radical recommendations were the same two factors that often kill water-related reform proposals: rain and politics. Some wet years at the end of the 1870s allowed westerners to deny the long-term reality of the region's aridity, and booster politicians backed by land speculators and other vested interests had every reason to dispute Powell's sober views of what was possible.<sup>14</sup> After the political dust settled, quarter sections of 160 acres marched on across the "Great American Desert"<sup>15</sup> just as they had across the fertile humid lands of Ohio and Iowa. Over the next several decades, thousands and thousands of western homesteaders suffered farm failure, the victims of several years of both normal aridity and crippling drought.<sup>16</sup>

But that was then, and this is now. After early fits and starts, western settlement proceeded apace. In fact, for the past 30 years, in spite of (and in some places, because of) its aridity, the West has grown more rapidly than any other region of the country, and projections for the next several decades show this trend continuing.<sup>17</sup> Most of this recent and future expected growth is in urban areas,<sup>18</sup> but at the same time, the West supports a significant irrigated agricultural industry.<sup>19</sup> By all appearances, the West seems to have over-

come the limitations of aridity, or at least sufficiently adapted to them, even without following Powell's advice. So what is the point of dredging up the dusty old *Report on the Lands of the Arid Region of the United States* today?

Although it is impossible to rewrite history, it is never too late to learn something from it. A hard look at current water use, growth practices, and land use patterns through the lens of Powell's original plan for settlement of the arid lands suggests that modern day settlers and developers of western lands (including governments at all levels) are repeating and compounding the mistakes begun over a century ago. Decisions about growth, development, and land use are still mostly made without due regard for water availability and watershed integrity, resulting in tremendous detrimental environmental, economic, and social costs. This Article recommends dusting off the "blueprint for a dryland democracy" and attempting to incorporate a modern version of some of its cornerstone principles into future land use decisions in order to better accommodate the West's aridity.

This Article concentrates primarily on the western United States because that is where water is most scarce and population is booming. However, even in the East, the most water-challenged states are those that are growing the fastest, such as Georgia and Florida. Furthermore, the broad challenges of integrating water use and watershed protection with land use decisions and growth are not strictly western issues. The western focus simply helps to put a finer point on the discussion of growth in a land of limited resources.

Generally, when the terms land use, growth, and development are used, the context is *urban* growth. This Article weaves together issues of urban and rural land use because both are of tremendous importance in considering future water use. Agriculture accounts for nearly 80% of the total western water consumption, amounting to 143 million acre-feet annually.<sup>20</sup> By contrast, municipal uses account for less than 13% of consumption, for a total of 23 million acre-feet annually.<sup>21</sup> However, with the tremendous population growth projected for western urban and suburban areas, the municipal sector will grow. Although agricultural water use is not projected to grow by any significant amount over the coming decades, it is the elephant in the room in any discussion of water supply. To the extent that western water supplies are already fully developed, future municipal supplies may come from the agricultural sector, just as land for urban development often comes from the agricultural land base.<sup>22</sup> Any long-term consideration of how best to accom-

9. Powell also recommended pasturage districts to manage communal grazing. *Id.* at 229.

10. *Id.* at 305-06.

11. It was not until 1902, with the passage of the Reclamation Act, that Congress embraced portions of Powell's plans for bringing irrigation to the arid lands. Powell died that same year. Even then, Congress carefully selected what it liked and did not enact much of Powell's comprehensive scheme. *See id.* at 366.

12. In implementing the reclamation program, the federal government required irrigators to organize into associations in order to contract for reclamation project water; many had already begun to do so under state statutes authorizing their formation. *See generally* ROBERT G. DUNBAR, *FORGING NEW RIGHTS IN WESTERN WATER* 54 (1983); DONALD PISANI, *FROM THE FAMILY FARM TO AGRIBUSINESS* 129-282 (1984). Except in the early Mormon settlements in Utah, however, the irrigation districts were not multipurpose self-governance institutions. Many years after Powell's death, some of his recommendations for grazing districts were incorporated into the Taylor Grazing Act of 1934. *Id.*

13. STEGNER, *supra* note 1, at 239.

14. *Id.* at 237-40; *See also* WHITE, *supra* note 5, at 227-28.

15. The Great American Desert was what maps of the 1800s called much of the West.

16. *See* STEGNER, *supra* note 1, at 296; WHITE, *supra* note 5, at 402-05.

17. PAMELA CASE & GREGORY ALWARD, *PATTERNS OF DEMOGRAPHIC, ECONOMIC, AND VALUE CHANGE IN THE WESTERN UNITED STATES* 7 (Western Water Policy Review Advisory Commission 1997).

18. *Id.* at 8-9.

19. Even though the agricultural land base has been declining in parts of the West, due mostly to conversion of land to urban growth and exurban residential development, a significant land base of more than 130 million acres remains. The total value of crop sales for the

western states is \$29.48 billion. The West provides approximately 70% of the value of the country's exports in "fruits and preparations," 77% of "vegetables and preparations," and 97% of "tree nuts," and an overall average of 45% of the total value of the country's crop commodity exports. Many of these crops are produced in California. WESTERN WATER POLICY REVIEW ADVISORY COMMISSION, *WATER IN THE WEST: CHALLENGE FOR THE NEXT CENTURY* 2-18 to 2-19 (1998) [hereinafter *WATER IN THE WEST*].

20. *Id.* at 2-23 to 2-24.

21. *Id.* at 2-24 to 2-25.

22. A statement like this generates controversy with some audiences. Although most knowledgeable observers believe that the days of large water supply development are over, others dispute that. The prospect of significant reallocations from agriculture to urban use is also controversial. However, due to the large amount of agricultural water, it would not take that much reallocation to satisfy projected urban demands, and much of the savings could be attained through conservation rather than land retirement. *See generally* WATER IN THE WEST, *supra* note 19, at 1-1, 2-33 to 2-40, & 3-8; Daniel P. Beard, *New Directions for the Bureau of Reclamation*, in *WATER*

moderate water availability in urban land use decisions thus must be not only a discussion about municipal water supply in the abstract, but also about how the western water “pie” is divided among various competing water and land uses.

Part II takes a quick look back at some of Powell’s suggestions and considers how water and land use in the West might be different if those suggestions had been followed. Part III describes the path that western development followed instead and the environmental, economic, and social consequences for watersheds and water supplies. Part IV proposes key changes that could be made to improve the integration of water availability information and watershed integrity into future growth and development decisions.

## II. A Glance Backward: What the Blueprint Might Have Built

I would not be the first to suggest that it was a mistake in 1878 to forsake Powell’s advice to consider watersheds, topography, and water availability in the wave of settlement of the western lands that occurred during the late 1800s and early 1900s. Many others have said the same.<sup>23</sup> Historian Donald Worster, in the final chapter of his critique of the irrigation “empire” built in the American West, went so far as to suggest reviving Powell’s plan and “redesigning the West as a network of more or less discrete, self-contained watershed settlements . . . .”<sup>24</sup> But in detailing what such a redesign would look like, he painted a picture that seems as implausible as a return to the proverbial garden of Eden. He described small, self-managing communities, relying on their own capital, “not participating to any great extent in the national or world marketplace, concentrating instead on producing food and fiber for local use.”<sup>25</sup> According to Worster, making this redesigned West work might require

relearning old, discarded techniques of floodplain and dry farming, finding or creating new cultivars that require little water, shifting to a more pastoral economy based on sheep, goats, and cattle, and diversifying into a variety of craft and small industrial livelihoods. . . .

Relieved from some of its burdens of growing crops, earning foreign exchange, and supporting immense cities, [the New West] might encourage . . . an America in which people are wont to sit long hours doing nothing, earning nothing, going nowhere, on the bank of some river running through a spare, lean land.<sup>26</sup>

Although I like to sit on the bank of a river as much as anyone, what comes to my mind when I read this description is the line from a Talking Heads song: “We used to microwave, now we just eat nuts and berries.”<sup>27</sup> And I keep wondering, would the shepherds use cell phones? In other words, Worster’s image is too pastoral and too much of a

throwback to be even remotely realistic.<sup>28</sup> However, suspending disbelief for a moment to identify the good advice at the heart of Powell’s vision will help to illustrate just what a different path, indeed, western development might have traveled.

Powell believed that, even with full development, the West’s rivers would be unlikely to support huge irrigated acreage or millions of people on farms.<sup>29</sup> This flew in the face of the prevailing belief that “the rain would follow the plow,” and that the area marked on the early maps of the time as the “Great American Desert” simply needed a little manipulation to make it just like Indiana or Illinois.<sup>30</sup> Of course, that simply was not true. Recognizing the inherent limits of the West’s limited water supply was good advice.

Treating the boundaries of watersheds as important natural divides was also good advice. This advice is true for the smallest tributaries to the largest western river basins. Activity in one part of a watershed inevitably affects other parts, in terms of both water quantity and water quality, whether the activity is urban development, timber harvest, dam building, or irrigation. A watershed is a discrete natural system with easily discernible boundaries. Recognizing these natural divides fosters consideration of cause and effect, and can help to internalize both positive and negative environmental externalities.

Treating watersheds as important units for political purposes was good advice, too. Because of the interdependencies of watershed activities, it makes sense for the residents of a watershed to recognize the “whole” in some fashion and to concern themselves with each other and each other’s treatment of the water and watershed. Powell’s recommendations for self-governing watershed institutions were designed to empower and authorize communities to take care, collectively, of the two resources that would sustain them—the land and the water—and thus to best ensure their common survival.

Instead, with the rejection of Powell’s “blueprint,” watershed lines were obliterated, both in nature and politics. The development of the western states became a tale of every man for himself on his 160-acre section, looking for water wherever he could find it, and trying to be “first in time” in bringing it to his homestead in order to avoid having to share the water in times of shortage.<sup>31</sup> With the advent of the fed-

LAW: TRENDS, POLICIES, AND PRACTICE 357-59 (Kathleen Marion Carr & James Crammond eds., 1995).

23. See STEGNER, *supra* note 1, at 229; DONALD WORSTER, RIVERS OF EMPIRE: WATER, ARIDITY, AND THE GROWTH OF THE AMERICAN WEST 132-33 (1985).

24. WORSTER, *supra* note 23, at 333.

25. *Id.*

26. *Id.* at 333, 335.

27. “There was a factory, now there are mountains and rivers . . . . This used to be real estate, now it’s only fields and trees . . . . Don’t leave me stranded here, I can’t get used to this lifestyle . . . .” DAVID BYRNE, (*Nothing But*) *Flowers*, on *NAKED* (Fly/Sire Records 1988).

28. I am sure Worster himself was being as much provocative as serious in his final chapter. And to be fair, his book was published in 1985, before cell phones became ubiquitous. Although the idyllic picture he sketched is hard to envision in the American West of the 21st century, the description might be apt elsewhere. See, e.g., ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION (1990) (describing case studies of community management of common pool resources in Japan (forests and meadows), Switzerland (mountain grazing), and Spain and the Philippines (water and irrigation)).

29. STEGNER, *supra* note 1, at 343.

30. *Id.* at 298.

31. For a brief history of the development of the western prior appropriation doctrine that gives senior rights to the first to use the water, see A. DAN TARLOCK, LAW OF WATER RIGHTS AND RESOURCES §3.2-3.8 (2002). Professor Tarlock has called the prior appropriation doctrine “the ultimate river and watershed engine of destruction because it allows the last drop of a stream to be diverted . . . . and allows trans-watershed diversions.” A. Dan Tarlock, *Reconnecting Property Rights to Watersheds*, 25 WM. & MARY ENVTL. L. & POL’Y REV. 69, 88 (2000). Donald Pisani described it somewhat differently: “The greatest legal innovation in the history of the arid West was the doctrine of prior appropriation, which made water as much of a commodity as land, minerals, trees, crops, and livestock.” DONALD J.

eral reclamation program, irrigators organized collectively for a single purpose only: that of bringing water to their land. Water was transported away from its basin of origin. Any notions of recognizing the carrying capacity of the West's limited water resources, respecting the integrity of watershed boundaries, or cooperating among the occupants of those watersheds were shelved along with Powell's report.

Instead of a "dryland democracy," where the citizens are well aware of the aridity of their world and empowered to govern it accordingly, the West developed into something quite different. Whether it is called a "hydraulic society"<sup>32</sup> or the "Cadillac Desert,"<sup>33</sup> the modern West's relationship to its limited water supply is largely a matter of plumbing and deficit spending.

### III. A Glimpse Around: What Was Built Instead

#### *A. Replumbing the West: Moving Water for Farms and Cities*

There are so many examples of how the West's rivers have been replumbed that the choice of a single example to discuss is quite difficult.<sup>34</sup> Take the Klamath River Basin, a troubled watershed lately covered much in the news.<sup>35</sup> The Klamath River Basin straddles the border between Oregon and California. Rivers in both states contribute to the Klamath system. Several tributaries and Upper Klamath Lake provide flows from Oregon, while the Trinity River and other tributaries enter the Klamath after it crosses the border into California and before it flows into the ocean. Since California was admitted to the Union in 1850, and Oregon in 1859, one crucial line affecting the Klamath was already drawn by the time Powell published his 1878 report, and that was the state line. Thus, from the early days of settlement, the watershed of the Klamath River was bifurcated and made the business of two competing states. Oregon and California treat the portion of the basin that falls within their respective borders essentially as "theirs," free for use without meaningful consideration of the impacts to the out-of-state part of the watershed.<sup>36</sup>

The entire river system in both states has been aggressively replumbed with little regard for the integrity of the watershed. In Oregon, the natural divides between sub-

basins have been erased with irrigation canals.<sup>37</sup> But the starkest example involves the Trinity River, the Klamath's main tributary in California. The Trinity River is dammed in its upper reaches; Trinity Dam allows diversion of a million acre-feet per year of water from the Klamath system.<sup>38</sup> This water flows into an underground tunnel, the Clear Creek Tunnel, which moves the water out of the Klamath River Basin into the Sacramento River. The Sacramento flows south, eventually reaching San Francisco Bay. Some of its water is removed for irrigation use in the Sacramento/San Joaquin Delta, but a great deal travels even further south, through the California Aqueduct and the Delta Mendota Canal.

The Delta Mendota Canal takes water from the Sacramento-San Joaquin Delta to cities in the Silicon Valley south of San Francisco, as well as to the Westlands Water District in California's Central Valley, *the largest irrigation district in the country*.<sup>39</sup> The California Aqueduct carries water to the farms and cities of southern California, *the largest population center of the West*. The emphasis is added for a reason: to illuminate the point that both the Central Valley agricultural empire and the sprawling metropolises of southern California depend on massive plumbing to bring water from distant watersheds.<sup>40</sup>

Meanwhile, the Klamath River Basin is locked in a bitter battle over water supply. The basin has been in turmoil since the summer of 2001, when the Bureau of Reclamation canceled deliveries of irrigation water to farmers with contracts for water from the Klamath Irrigation Project in Oregon in order to keep water in Upper Klamath Lake and the mainstem Klamath River to comply with the Endangered Species Act (ESA).<sup>41</sup> Accusations and lawsuits have continued to fly, especially after an historic fish die-off near the mouth of the Klamath in the fall of 2002.

Trinity Dam diverts up to 90% of the Trinity's water supply. If not diverted, the water, cold and clear, would join the

PISANI, TO RECLAIM A DIVIDED WEST 11 (1992). Either way, the point is the same: water was severed from watersheds and gained value through consumptive use.

32. See WORSTER, *supra* note 23, at 28-29 (quoting Karl Wittfogel, *Ideas and the Power Structure, in APPROACHES TO ASIAN CIVILIZATIONS* (William Theodore de Bary & Ainslie T. Embree eds., 1964).
33. See MARC REISNER, *CADILLAC DESERT: THE AMERICAN WEST AND ITS DISAPPEARING WATER* (1986).
34. See generally HIGH COUNTRY NEWS, *WESTERN WATER MADE SIMPLE 2-3* (1987) (illustrating the West's "four major bathtubs" of the Great Basin and the Missouri, Columbia, and Colorado Rivers, and the "plumbing" that redirects and interconnects them).
35. See, e.g., most recently, *Klamath Water Storage Project Gets Help From Ranch Sale*, Associated Press, Jan. 16, 2003, at BC (ranch acquisition could help the Bureau of Reclamation supply a large portion of the water demanded by federal fish agencies to help threatened and endangered fish in the Klamath River Basin); Michael Milstein, *Fish Die-Off Blamed on Low Flow*, PORTLAND OREGONIAN, Jan. 4, 2003, at B03.
36. The two states do have an interstate compact, signed in 1957, but it largely preserves the two states' independence rather than integrating basin management. See OR. REV. STAT. §§542.610 et seq. (2001).

37. See Peter G. Scott, *State Certification of Inchoate Water Rights on the Upper Lost River: A Prelude to the Klamath Adjudication*, 13 J. ENVTL. L. & LITIG. 475 (1998) (detailing the development of the Klamath Irrigation Project).

38. Michael Milstein, *Tapping the Trinity*, PORTLAND OREGONIAN, Oct. 27, 2002, at A19.

39. At 605,000 acres, the district is bigger than the entire state of Rhode Island. The district's largest crops are cotton, tomatoes, and almonds; according to its own estimates, it contributes \$3.5 billion to the California economy. *Id.*

40. The one million acre-feet of Trinity River water is a drop in the bucket. Many millions of total acre-feet are moved from northern California to the agricultural Central Valley and urban southern California by both the federal Central Valley Project (CVP) and the California State Water Project (SWP). See *United States v. State Water Resources Control Bd.*, 182 Cal. App. 3d 82, 227 Cal. Rptr. 161 (1986), for a description of both the CVP and SWP.

41. Endangered Species Act, 16 U.S.C. §§1531-1544, ELR STAT. ESA §§2-18. See, e.g., *Kandra v. United States*, 145 F. Supp. 2d 1192 (2001) (Klamath Project farmers unsuccessfully sued to enjoin the Bureau of Reclamation from halting water deliveries). The Bureau of Reclamation's 2001 operating plan, giving more water to fish, was prompted in part by an earlier suit, *Pacific Coast Federation of Fishermen's Ass'ns v. Bureau of Reclamation*, 138 F. Supp. 2d 1228 (N.D. Cal. 2001) (fishermen and environmental groups alleged that the Bureau of Reclamation violated the ESA by releasing water for irrigation and water flows in the Klamath River prior to consultation with the National Marine Fisheries Service regarding the project's effects on threatened Coho salmon; the district court issued an injunction prohibiting the Bureau of Reclamation from releasing any water for irrigation until it complied with obligations under the ESA).

mainstem of the Klamath River. And yet, most of the disputing and finger pointing, as well as the search for solutions, has concentrated on the basin's upper reaches in Oregon. The Trinity water, because of its powerful, though "artificial," constituency, is not even on the table for discussion. One Bureau of Reclamation official admitted that "[t]he water from the Klamath Project is only a part of the water in the system, but it's the easiest part to get."<sup>42</sup>

Plumbing and the constituencies at the ends of the pipes have thus completely eclipsed any consideration of watershed integrity.<sup>43</sup> To raise the basic question of how much development, either for irrigation or urban use, the waters of the Klamath River Basin—or any other watershed—"should" support seems futile and old-fashioned indeed. The decisions have apparently been made. But there are reasons to press ahead and ask such questions, in spite of the forces aligned against doing so, because the consequences of continuing on the current path are significant, and because not all western river basins have been fully raided.

### B. Problems in the Plumbed Paradise

For over 100 years, the West has approached its water problem as one of engineering rather than of limits. Only 10 inches of annual precipitation in the Central Valley of California? No problem. Build dams, pumps, tunnels, and canals to bring water 400 miles from northern California and build a great agricultural empire. Only seven inches of precipitation in parts of Nevada? No problem. Build more dams and canals, and Nevada can support not only one of the nation's fastest growing urban areas in the desert (Las Vegas),<sup>44</sup> but also an entire dairy farming industry.<sup>45</sup>

What is wrong with this approach? In the simplest terms, the West is not living within its means, waterwise. To use another analogy, the system robs Peter to pay Paul. Central Valley agribusiness, Los Angeles and Las Vegas, and the Nevada dairy farms, as well as many other cities and farms around the West, are entirely dependent on borrowed water. Meanwhile, the source watersheds suffer.

Yet is it not rather quaint and pointless at this late date to suggest that the West should have limited development in each region to that dictated by the limits of its "natural" water supply? Whether it was a mistake or not, the engineered

water supply is a reality. But the real problem with not living within our means waterwise is that it backfires eventually. Water use is not sustainable at the current rates and trends.<sup>46</sup> Supporting large-scale agriculture and booming metropolitan areas in some of the driest parts of the country is problematic for at least four reasons: it results in tremendous environmental damage; it skews the economy; it imposes significant social costs; and it just plain defies common sense. Each of these problems will be discussed briefly in turn before turning attention to suggestions to curb some of these consequences and change the approach to western water to one that recognizes it as a resource with limits.

### 1. Environmental Consequences

The environmental damage caused by replumbing the West and moving the limited water around to support large-scale irrigated agriculture and urban growth has been well documented elsewhere.<sup>47</sup> A few examples will suffice for the purposes of this Article.

The Colorado River Basin is plagued with a serious salinity problem, the result of repeated irrigation of highly saline desert soils. Salty irrigation water reduces agricultural productivity. In addition to putting stress on growing plants, over time the salt concentrates even further in the soils, steadily worsening the situation. As far back as the 1960s, the problem was so bad that it caused a formal protest from the Mexican government; Mexico objected because the little bit of Colorado River water crossing the border was so salty that it could not be used for irrigation by Mexican farmers.<sup>48</sup> By 1997, the costs of salinity control in the basin were approaching \$1 billion annually.<sup>49</sup> The magnitude of the problem will only increase, as urban areas will soon be forced to treat water further in order to meet required salinity levels for potability.<sup>50</sup>

In addition to salt, irrigation water also picks up chemical pesticides, fertilizers, and other toxic substances. In two nationally publicized instances, irrigation runoff has poisoned thousands of fish and birds in wildlife refuges. In the Kesterson Refuge in California, decades of irrigation in selenium-laden soils by the Westlands Irrigation District created a toxic brew that lead to massive fish kills and muta-

42. Milstein, *supra* note 38 (quoting Jeffrey McCracken of the Bureau of Reclamation). The same article quoted an Oregon farmer and rancher who said: "People are concerned at how focused the hostility has been on us, when all the while a relatively clean and cold Trinity River is sitting there and hardly a topic of conversation." *Id.* On a purely economic basis, however, the water is certainly more "valuable" in its southern California uses than it would be to support fisheries or farming in the Klamath River Basin.

43. In fact, the Westlands District has been able to obtain injunctions against the Bureau of Reclamation to keep water flowing to its farms rather than down the Trinity River. See *Westlands Water Dist. v. United States*, No. CV-F-5327, 1994 U.S. Dist. LEXIS 6276 (E.D. Cal. Apr. 24, 1994); *San Luis & Delta Mendota Water Auth. v. United States*, Nos. CIV-F-97-6140, -98-5261, 1999 U.S. Dist. LEXIS 22369 (E.D. Cal. May 21, 1999).

44. See William E. Reibsame, *Key Trends in Population and Land Use in the West, in WATER AND GROWTH IN THE WEST* (Conference Proceedings, University of Colorado Natural Resources Law Center, June 7-9, 2000).

45. See BUREAU OF RECLAMATION, U.S. DEP'T OF THE INTERIOR, *NEWLANDS PROJECT MAP* (1998) (describing beef and dairy cattle supported by the Newlands Project in Nevada).

46. See generally Robert W. Adler, *Freshwater, in STUMBLING TOWARD SUSTAINABILITY* (Env't. L. Inst. 2002); *WATER IN THE WEST*, *supra* note 19, at 3-2. A widely quoted definition of sustainability is from the "Brundtland Report": sustainable development ensures "that it meets the needs of the present without compromising the ability of future generations to meet their own needs." WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, *OUR COMMON FUTURE* 8 (1987).

47. See, e.g., David H. Getches, *From Askhabad to Wellton-Mohawk, to Los Angeles: The Drought in Water Policy*, 64 U. COLO. L. REV. 523 (1993); *WATER IN THE WEST*, *supra* note 19; CHARLES WILKINSON, *CROSSING THE NEXT MERIDIAN* (1992). See also NICHOLS ET AL., *infra* note 57, at 65-78 (discussing the complex relationship between water quantity and water quality issues).

48. See Getches, *supra* note 47, at 531-34 (describing the various attempts to solve salinity problems in the Wellton-Mohawk Irrigation District in Arizona).

49. DALE PONTIUS, *COLORADO RIVER BASIN STUDY 67* (Western Water Policy Review Advisory Commission 1997).

50. *Id.* In fact, the residents of one urban area took matters into their own hands. In Tucson, Arizona, citizens by initiative rejected the use of Central Arizona Project water from the Colorado River for drinking, not only due to taste, but also because it was corroding residential plumbing. *Id.*

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tions in migratory birds.<sup>51</sup> In Nevada, the same thing happened in the Carson Sink, the location of the Stillwater Wildlife Refuge, which receives runoff from the farmers irrigating with water from the Truckee and Carson Rivers.<sup>52</sup>

Lake Tahoe, famous for its depth and incredible clarity, has been battered by urban growth and tourism. Since the early 1960s, the lake has lost approximately one and one-half feet of transparency each year due to pollution and sedimentation.<sup>53</sup> The Klamath River Basin, where the primary water use in Oregon is agricultural, but where the California tributaries support urban uses as well, has two species of fish listed as endangered or threatened. The commercial fishermen and Native American tribes, who depended on the fisheries for subsistence as well as for important cultural values, have suffered for years from the manipulation of water.

Some might say that this damage is simply the inevitable downside of progress. After all, the economy of the state of California alone is equivalent to the eighth largest economy in the world.<sup>54</sup> The state's Central Valley produces billions of dollars worth of agricultural products, supplying 45% of the country's fruits and vegetables, in addition to exports. So what if it takes a million gallons of water from the Klamath River Basin (and many millions more from other places) to do so? Would that water be better used to support Klamath River Basin fisheries? The urban economy of Los Angeles contributes tremendous value through an international port, the aerospace and entertainment industries, world class educational institutions, and much more. Why would we not see this economic activity as a good return on the water brought from the Klamath River Basin, Colorado River Basin, Owens Valley, and Mono Lake? Northern California, with Silicon Valley, produces economic benefits that ricochet around the world. Would the billions of computer users really rather see the Trinity River and Sacramento River waters used for the endangered Delta smelt instead of producing silicon wafers? These goods and services produced with water supplies from far and wide are not small or unimportant products and contributions to life in the 21st century.

Simply dismissing the environmental degradations caused by water use as the inevitable cost of doing business is misguided, however. First, some of these environmental impacts can be characterized as "fouling our own nest," to the extent that they irreparably damage the water itself, the very resource that is needed for human survival. This is certainly true of the salinity impacts discussed above. Further, even where irreparable damage has not yet occurred, current use trends are not sustainable.<sup>55</sup>

Finally, there is a serious question about whether western citizens are willing to accept these losses. Polling consis-

tently shows high concern about the environment, with concern about water and water quality at the top of the list.<sup>56</sup> In fact, when asked directly "whether environmental protection is more important than economic development when compromise cannot be found," a majority of the public says yes.<sup>57</sup> Those polled consistently rank drinking water, water quality, and loss of species and habitat among the issues about which they are most concerned.<sup>58</sup> Many westerners in particular express deep concern about the loss of natural resources and unsustainable practices of resource use and land and water development.<sup>59</sup>

## 2. Skewed Economies

For those who care about free markets, the West's current system of water use is built on a house of cards. Western agricultural water subsidies are well known and well documented.<sup>60</sup> The example of the Westlands Irrigation District, discussed earlier in the context of the replumbing of the Klamath River Basin, illustrates the magnitude of the problem. The Westlands farmers have received close to a billion dollars in interest subsidies alone for their share of the Central Valley Project.<sup>61</sup> Indeed, Fresno County, where the district is located, was reported to "top the national list in agricultural subsidies."<sup>62</sup>

The farmers in the Westlands Irrigation District admit that they could not afford to grow cotton (the district's largest crop) without existing subsidies.<sup>63</sup> These subsidies give western agricultural products an edge in competition with crops grown in more humid regions without the same subsidies. Perhaps these subsidies can be considered a good investment of government funds, but southern cotton farmers or midwestern tomato growers might have a different opinion. So might the southern Oregon farmers who lost their irrigation water in the summer of 2001 so it could stay in the mainstem Klamath while the Trinity water flowed south to Westlands, or the commercial and tribal fishermen who have been losing ground to the Klamath River Basin Irrigation Project for decades.<sup>64</sup>

56. CASE & ALWARD, *supra* note 17, at 18-24.

57. *Id.* (citing annual polls conducted by the Times Mirror media organization and other national polls). See also PETER D. NICHOLS ET AL., WATER AND GROWTH IN COLORADO: A REVIEW OF LEGAL AND POLICY ISSUES 6 (University of Colorado Natural Resources Law Center 2001) (discussing Colorado polls showing strong desire to protect environmental values, recreation, and agrarian communities). The Colorado growth study quotes the Executive Director of the Colorado Department of Natural Resources as saying "[s]ome people want to use the Upper Colorado fish recovery program to control growth and prevent development . . ." as if the intent is somehow subversive. *Id.* at 61. But the point is rather that some people think growth should be controlled precisely because the impact on natural resources of uncontrolled growth is unacceptable.

58. CASE & ALWARD, *supra* note 17, at 19-21.

59. *Id.* at 19-24.

60. See generally U.S. GAO, WATER SUBSIDIES: IMPACTS OF HIGHER IRRIGATION RATES ON CENTRAL VALLEY PROJECT FARMERS ch. 1 (1994) (GAO/RCED-94-8); WATER IN THE WEST, *supra* note 19, at 3-15 to 3-17.

61. Milstein, *supra* note 38.

62. *Id.* The subsidies paid in Fresno County are 20 times greater than those paid in Klamath County, where most of the Oregon project's irrigators are located.

63. *Id.*

64. Although the Trinity River water doesn't enter the mainstem Klamath River until many miles downstream from the Oregon bor-

51. U.S. GENERAL ACCOUNTING OFFICE (GAO), WILDLIFE MANAGEMENT: NATIONAL REFUGE CONTAMINATION IS DIFFICULT TO CONFIRM AND CLEAN UP (1987).

52. See, e.g., Sandra Chereb, *Death at Stillwater: An Ecological Disaster*, United Press Int'l, Feb. 23, 1987; *Massive Fish Deaths Blamed on High Salt Content*, United Press Int'l, Mar. 9, 1987; Martin Murphy, *Pollution Jeopardizes Shorebird Population*, United Press Int'l, Aug. 21, 1988 (describing 2,000 dead birds and 7 million dead fish, due partly to agricultural diversions of fresh water and concentrations of selenium and other minerals in irrigation return water).

53. See WATER IN THE WEST, *supra* note 19, at 2-16.

54. See California's Department of Finance website at [http://www.dof.ca.gov/HTML/FS\\_DATA/HistoryCAEconomy/index.htm](http://www.dof.ca.gov/HTML/FS_DATA/HistoryCAEconomy/index.htm) (last visited Sept. 1, 2004).

55. See *supra* note 47.

Some of the Westlands farmers are about to receive another subsidy of sorts. The U.S. Department of the Interior has agreed to pay \$107 million to Westlands Irrigation District to retire areas of farmland rendered unusable by salt and toxic minerals.<sup>65</sup> This is the same land whose runoff caused problems in the Kesterson Wildlife Refuge.<sup>66</sup> Some of the Westlands growers sued the government for failing to construct a promised drainage system to drain the salty fields.<sup>67</sup> Under the proposed settlement, the 19 farming families who sued will be paid \$28 million (from the federal payment) by Westlands Irrigation District; Westlands will then take over ownership of the land. Although the land cannot be irrigated, it can be used for dryland farming or lucrative development, worth millions of dollars. Thus the federal government is paying simply to settle the lawsuit, but the farmers and the district receive millions of dollars in cash and keep land worth millions of dollars.

The subsidies for urban water use are a little more subtle, but they exist also. For example, the Central Arizona Project (CAP) cost the American taxpayers \$4.7 billion. Although originally intended to provide irrigation water, instead CAP water now serves Phoenix, Tucson, and other Arizona towns with municipal water. The highly subsidized project is an impressive, though expensive, engineering feat. Water is pumped from hundreds of miles away on the Colorado River and “uphill” nearly 2,000 feet. Even though the water requires expensive treatment before being suitable for domestic consumption, it still represents a “bargain for a modern municipal water supply in the western states.”<sup>68</sup>

Aside from direct subsidies, another way in which the economy of western water use is skewed is by not accounting for externalities. For example, when Los Angeles captured the Owens River in the Sierras and put it in an aqueduct to southern California, Owens Valley, which had supported a flourishing agricultural economy, was devastated.<sup>69</sup> In other words, the city never had to weigh the economic benefits of its water use against the economic costs of the water loss to the basin of origin. To some extent, this failure to consider negative externalities imposed on source communities makes the plumed West a modern form of “colo-

nization.” The large agricultural empires and urban oases subsist on the plunder of a vast countryside.<sup>70</sup>

### 3. Social Costs

Some years ago, Worster wrote about the social impacts of centralized irrigation institutions in the American West.<sup>71</sup> Worster’s work drew somewhat upon earlier studies by Karl Wittfogel of irrigation culture and institutions in pre-industrial China.<sup>72</sup> Wittfogel had concluded that large-scale irrigation inevitably created centralized bureaucracies and ruling classes that wielded tremendous power repressively.<sup>73</sup>

Worster described the irrigation empire built by the Bureau of Reclamation as somewhat of a modern American variation on Wittfogel’s theme. He sketched a picture of a society caught in a “hydraulic trap”—trapped by its own inventions and the associated hierarchy and concentrated power.<sup>74</sup> The trap is hard to spring because the vested interests and people dependent on the “hydraulic apparatus” resist change.<sup>75</sup> Worster suggests that the resulting society is one in which the power elite appropriates “every available drop of water for its canals and pipelines, while providing the masses with a few dribbles to support them in their managed oasis life”; out of gratitude—and thirst—the masses make no trouble.<sup>76</sup>

In discussing reclamation projects in California’s Central Valley, Worster called the irrigation subsidies combined with years of nonenforcement of the Bureau of Reclamation Act’s 160-acre limitation “extravagant welfare for a rich elite.”<sup>77</sup> He detailed an “agribusiness establishment” supported by the toiling of a “rural proletariat.”<sup>78</sup> Over the years, many of the agricultural workers increasingly came from Mexico, helped by government policies friendly to the needs of the agricultural establishment, what Worster calls “a further example of the state’s promotion of the water empire.”<sup>79</sup> In the 1960s, the “proletariat” began to organize and agitate for better conditions, such as through the work of Cesar Chavez and the National Farm Workers Union, and achieved some success in those efforts.<sup>80</sup> At about the same time, however, publicly funded university researchers were

der, preliminary scientific reports investigating the fish kill in 2002 conclude that lack of water in the lower reaches of the Klamath River contributed to the distress in the fish. See, e.g., NORTHERN CALIFORNIA-NORTH COAST REGION, DEPARTMENT OF FISH AND GAME, STATE OF CALIFORNIA, SEPTEMBER 2002 KLAMATH RIVER FISH KILL: PRELIMINARY ANALYSIS OF CONTRIBUTING FACTORS (2003), available at <http://www.dfg.ca.gov/html/kfishkill-rpt.pdf> (last visited May 2003).

65. See Mark Arax & Steve Hyman, *The State Deal Includes \$107 Million to Retire Farmland: U.S. Officials Propose Settling a Growers’ Suit by Paying Them to Stop Farming Poisoned Land: Critics Call It a Giveaway of Taxpayer Money*, L.A. TIMES, Dec. 13, 2002, at B8.

66. See *supra* note 52.

67. The damage to fish and birds was the reason the drainage system was not completed. See Arax & Hyman, *supra* note 65. The government spent almost \$100 million and 10 years trying to figure out how to solve the problem, until the growers filed their lawsuit. *Firebaugh Canal Co. v. United States*, 203 F.3d 568, 30 ELR 20309 (9th Cir. 2000).

68. Holly Jo Franz et al., *An Insatiable Thirst: The Impact of Water Law on Sprawl in the West*, NAT. RESOURCES & ENV’T, Spring 2001, at 228.

69. WILLIAM L. KAHRL, WATER AND POWER 318-74 (1982) (describing the legacy of losing the water to Los Angeles).

70. Some observers take the colonization notion a step further, maintaining that the entire West is a “colony” of sorts, subjugated to eastern capital and industry. See, e.g., RICHARD LAMM, *THE ANGRY WEST* (1982); see also WHITE, *supra* note 5, at 57 (calling the West a “dependency” of the federal government).

71. WORSTER, *supra* note 23, at 6.

72. KARL WITTFOGEL, *ORIENTAL DESPOTISM: A COMPARATIVE STUDY OF TOTAL POWER* (1957).

73. See WORSTER, *supra* note 23, at 27-30. Although some of Wittfogel’s work eventually fell into disrepute because of his tortured efforts to force inconsistent facts to fit his theories in order to carry on anti-communist crusading, Worster argued that Wittfogel’s early insights about the social consequences of large-scale manipulation of nature were still valid. In particular, Worster undertook to answer in the context of the American West what he called Wittfogel’s “profound question: How, in the remaking of nature, do we remake ourselves?” *Id.*

74. WORSTER, *supra* note 23, at 329. Worster attributes the term “hydraulic trap” to Marvin Harris, without citation.

75. *Id.* at 329-30.

76. *Id.* at 330.

77. *Id.* at 294.

78. *Id.* at 295-97.

79. *Id.* at 296.

80. *Id.*

helping to develop machinery to replace the workers and developing agricultural products that could tolerate machine handling.<sup>81</sup>

Although many might scoff or bristle at Worster's dramatic language lumping western citizens into the elite, the masses, and the proletariat, sometimes the truth hurts. The farms in Fresno County, California, containing the Westlands Irrigation District earn a higher net return than those in any other county in the country.<sup>82</sup> It is not likely the pickers or packers who are earning those returns.<sup>83</sup> Meanwhile, the masses happily buy the district's tomatoes and almonds, making no trouble.

#### 4. Defiance of Common Sense

Aside from somewhat abstract (or at least controversial) environmental, economic, and social consequences, ignoring watershed integrity and water availability in making land use decisions simply defies common sense. Drawing a state boundary down the middle of a river, for instance, leads to counterproductive, conflicting, competing, and duplicative actions with regard to the river and its water.<sup>84</sup> Building subdivisions with hundreds of new homes without planning for a stable long-term water supply ensures trouble down the road. Encouraging population growth and large-scale farming in the country's driest areas without serious prior attention to water supply maps out a future of further environmental destruction, as well as economic and social costs.

More than 100 years ago, Powell's *Report on the Lands of the Arid Region of the United States* demonstrated eminent common sense. He recognized that the West's water resources were fundamentally limited and thus required special consideration in their development. Unfortunately, when the report was rejected by the political establishment, those fundamental limits were forgotten.

What changes could be made now, specifically relating to integration of water, land use, and growth issues, that could help to bring the West back under budget on its water resources, and thus to realize, better late than never, the wis-

dom of Powell's blueprint? The next section explores how watershed integrity and water availability could be better incorporated into land use and growth decisions in order to avoid a future that is simply an extrapolation of the past.

#### IV. Looking Ahead: Respecting Watershed Integrity in Order to Live With Limited Water

Powell was absolutely right when he identified aridity as the single most important feature of the West. He was also wise enough to recognize that to cope with this aridity it is critical to treat watersheds as whole, connected units. Finally, he was especially insightful in recognizing that the best way to treat watersheds as units, and thus protect the limited water supply, is to establish cooperative institutions with responsibility for the care of the watershed. Such institutions force and empower people to recognize their dependency on the limited water and the interdependency necessary for all to use it effectively. A return to these three "first principles" should be the business of 21st century western water management.

Stegner once noted that there are three courses of action to take in response to aridity: deny it, try to engineer around it, or adapt to it.<sup>85</sup> Powell had the foresight in 1878 to recommend the third path as the wisest and ultimately most successful.<sup>86</sup> Yet westerners have been following the first two paths assiduously for the entire 20th century. Now, the 21st century must become the century of adaptation. In looking for adaptive mechanisms, Powell's original advice to recognize the limits of the West's water and to respect the watersheds that produce it are important cornerstones that need to be dug out from under the layers of denial and engineering obscuring them. His recommendations on cooperative management, though made in a different era, are surprisingly insightful and useful today. The intervening years have only ratified what Powell sensed so long ago. This section explores the prospects for adapting institutions to help bring western water resources back into proper perspective.

So much good work and writing has been done recently on watershed groups, watershed case studies (both large and small), and barriers to watershed management.<sup>87</sup> Much of

81. *Id.* Worster quoted the chairman of the University of California at Davis engineering department as saying: "The machine won't strike." *Id.* at 297. Worster noted that these technological developments were part of the "vision that had animated the empire from the beginning—of extending its technological control as far as possible, to the total domination of the earth." *Id.* A proposal first floated in 1964 captured some of the excesses of this vision. A California engineering firm staffed with former Bureau of Reclamation employees suggested transporting water from Alaska and Canada all the way to Mexico, irrigating, generating electricity, and providing barge canals all along the merry way. The proposal eventually died but not without garnering support in high places. *See id.* at 316 (describing North American Water and Power Alliance proposal, and noting endorsement by chair of the Senate Select Committee on National Water Resources, Subcommittee on Irrigation and Reclamation).

82. Milstein, *supra* note 38.

83. Imperial County, California, where more than one-half the jobs are agricultural ones, is the poorest county in the state. *See* Seth Hettena, *Feds Warn Lawsuit May Cost Imperial County Its Water*, Associated Press, Jan. 16, 2003, available at <http://www.sfgate.com/cgiin/article.cgi?file=/news/archive/2003/01/16/state1958EST7901.DTL> (last visited Jan. 17, 2003). *See also* Jane E. Larson, *Free Markets Deep in the Heart of Texas*, 84 GEO. L.J., 226-27 (1995) (discussing the studies of agricultural Texas in the 1930s showing the preference for Mexican labor because workers could be paid lower "Mexican wages" instead of "white wages").

84. *See generally* NORTHWESTERN WATER LAW AND POLICY PROJECT, A SURVEY OF COLUMBIA RIVER BASIN WATER LAW INSTITUTIONS AND POLICIES (1997).

85. WALLACE STEGNER, *WHERE THE BLUEBIRD SINGS TO THE LEMONADE SPRINGS: LIVING AND WRITING IN THE WEST* (1992).

86. Powell certainly supported the "engineering" path as well, but as a means of adaptation, not as a means of defeating aridity. *See* DONALD WORSTER, *A RIVER RUNNING WEST: THE LIFE OF JOHN WESLEY POWELL* 362-63, 458-61 (2001) (discussing Powell's views on using science to accomplish human goals).

87. *See, e.g.*, DOUGLAS S. KENNEY, *ARGUING ABOUT CONSENSUS: EXAMINING THE CASE AGAINST WESTERN WATERSHED INITIATIVES AND OTHER COLLABORATIVE GROUPS ACTIVE IN NATURAL RESOURCES MANAGEMENT* (University of Colorado Natural Resources Law Center 2000); UNIVERSITY OF COLORADO NATURAL RESOURCES LAW CENTER, *THE STATE ROLE IN WESTERN WATERSHED INITIATIVES* (1998); BETSY RIEKE & DOUG KENNEY, *RESOURCE MANAGEMENT AT THE WATERSHED LEVEL* (Report to the Western Water Policy Review Advisory Commission by the University of Colorado Natural Resources Law Center 1997); DOUGLAS S. KENNEY ET AL., *THE NEW WATERSHED SOURCE BOOK: A DIRECTORY AND REVIEW OF WATERSHED INITIATIVES IN THE WESTERN UNITED STATES* (University of Colorado Natural Resources Law Center 2000) [hereinafter KENNEY ET AL., *THE NEW WATERSHED SOURCE BOOK*]; Robert W. Adler, *Addressing Barriers to Watershed Protection*, 25 ENVTL. L. 973 (1995). Readers interested in further examination of watershed initiatives, especially at the local level, would be well-rewarded by turning to the wealth of literature published by the University of Colorado Natural Resources Law Center, and in particular Doug Kenney. Dr. Kenney has



this work takes an in-depth look at what works and what does not work, and emphasizes the variety of arrangements that have been created in response to myriad local conditions. In addition, the recent flurry of watershed-level initiatives and research is playing out against a backdrop of earlier attempts at creating larger river basin organizations—attempts that are often characterized as “failures.”<sup>88</sup> It may seem somewhat presumptuous to broach the subject once again, especially with what might appear to be simply a broad-brush, general argument in favor of watershed management, particularly in regard to those larger basin institutions. But what I am trying to accomplish here is this: I am trying to make the case for more aggressively pursuing honest-to-goodness watershed *management* by institutions specifically charged with that function. I make this argument in spite of the recognized need for variety and in spite of the mixed track record of success with watershed and basin groups so far. Why? Because I think it is easy to get distracted by all the particulars—to miss the forest for the trees. I hope to make the case that real watershed governance has not yet been tried, but that it just might provide an elegant and relatively simple way to provide integration that is not possible with many other arrangements that have been tried.

#### A. Creating New Watershed Institutions

Powell's idea in 1878 was to create cooperative institutions—self-organized districts of farmers in the bottom lands and grazers in the higher elevations—to manage water and land cooperatively from the headwaters to the mouths of streams. One might wonder what could possibly be useful about that proposal in the modern West.

When Worster suggested “redesigning the West as a network of . . . discrete, self-contained watershed settlements,” he described small communities engaged in raising low-water crops and stock, detached somehow from the global and national economy.<sup>89</sup> It is fantasy today to propose eliminating the western irrigated agricultural industry that contributes so much to the national and even global economy.<sup>90</sup> It is also fantasy to suggest eliminating the West's immense cities and dispersing the West's largely urban population of tens of millions into small, self-managing, watershed-based communities. Indeed, the trend for the past 30 years has been exactly the opposite, with more and more of the West's residents concentrating into “urban archipelagos.”<sup>91</sup> Far from being sustained by and connected to their own local watersheds, many of these urban areas depend for their water supply on distant sources. Although Los Angeles is the best known example of wide ranging watershed appropriation, it is only one example of many. Denver's water comes in tunnels and pipelines under and over the Rocky Mountains. Phoenix and Tucson are served by the

CAP, bringing water from the Colorado River, many miles away. Salt Lake City and other parts of Utah borrow Colorado River Basin water through the Central Utah Project.

Thus, a complete return to the watershed-based communities Powell envisioned before the dawn of the 20th century is unthinkable and unworkable. But reattaching the West's cities and towns, as well as farms and ranches, to their watersheds and water sources in some fashion is an admirable and achievable goal, necessary to achieve sustainable water management.<sup>92</sup> One way to accomplish such a goal is to create watershed institutions. Just as state identity and accountability followed from initially drawing lines on a map and then creating institutions to govern within those lines, watershed identity could follow from outlining watersheds and then empowering institutions within their borders to deal with issues of common concern. In the case of states, the identity has grown very strong, even though the initial lines were arbitrary. In the case of watersheds, the boundaries are much more grounded in a reality of shared resources and interdependencies, and perhaps an equally strong identity could emerge.<sup>93</sup>

This recognized interdependency was at the heart of Powell's vision. Writing about watershed-level governance some years after his initial 1878 report, he said:

[S]uch a district of country is a commonwealth by itself. The people who live therein are interdependent in all their industries. Every man is interested in the conservation and management of the water supply, for all the waters are needed within the district. . . . Thus it is that there is a body of interdependent and unified interests and values, all collected in one hydrographic basin, and all segregated by well-defined boundary lines from the rest of the world. . . . This, then, is the proposition I make: that the entire arid region be organized into natural hydrographic districts, each one to be a commonwealth within itself for the purpose of controlling and using the great values which have been pointed out. . . . The plan is to establish local self-government by hydrographic basins.<sup>94</sup>

Of course it is too late to create such units as totally self-governing commonwealths “segregated . . . from the rest of the world.” But the basic wisdom is still compelling, and perhaps it is still possible to establish some aspects of “local self-government by hydrographic basins.” It has been suggested that river basins may not be the best management units because such regions do not necessarily have “truth,” but only “utility.”<sup>95</sup> I disagree. Watersheds and river basins do, indeed, reflect a certain coherence and interdependency, whether existing institutions recognize it or not. Thus, basins and watersheds do, indeed, represent a “truth” of sorts. Any regime that ignores these boundaries will ultimately fail,<sup>96</sup> and regimes that recognize them will have enhanced utility because of their underlying truth.

written a number of excellent, well-researched, and in-depth studies on the subject.

88. See, e.g., Adler, *supra* note 87, at 1003-13 (discussing the failure of earlier federal basin programs).

89. See Worster, *supra* note 23, at 33, 35. Although Worster suggested that “[t]hose western farmers who wanted to raise cotton or corn on an extended basis would have to migrate back East . . .” considering the economic contribution of western agriculture, such a mass migration is not likely. *Id.* at 333.

90. See *supra* note 19.

91. CASE & ALWARD, *supra* note 17, at 8-9.

92. See generally A. Dan Tarlock, *Reconnecting Property Rights to Watersheds*, 25 WM. & MARY ENVTL. L. & POL'Y REV. 69 (2000).

93. See Eric Freyfogle, *Ownership and Ecology*, 43 CASE W. RES. L. REV. 1269, 1269 (1993) (discussing “place people” who have ties to a particular place).

94. JOHN WESLEY POWELL, *Institutions of the Arid Lands*, CENTURY MAG., May/June 1890, at 111-16.

95. See C. FOSTER & P. ROGERS, *FEDERAL WATER POLICY: TOWARD AN AGENDA FOR ACTION* (1988).

96. See, e.g., Adler, *supra* note 87, at 991-95 (discussing anarchy that results from fragmentation of water and watershed problems across institutional and issue lines).

Due to a century of replumbing the West, however, cross-basin interdependencies have also been created. Thus, new institutions formed entirely within basins and watersheds will not always go far enough. In some cases, institutions will have to accommodate distant stakeholders and constituencies as well. One commentator has used the word “hydrocommons” to describe communities of interest dependent on common water sources, even though they may cross watershed or river basin boundaries.<sup>97</sup> The challenge is to create institutions that try to reconnect water, land, and people within natural hydrographic units, while also accommodating over 100 years of development that aggressively ignored the importance of those units. Before talking about why and how to do that, however, we first need to recognize that the embryos of watershed-based institutions are already forming.

Watershed groups have been spontaneously springing up around the West during the past several years, precisely to tackle water-related issues on a “problemshed” basis.<sup>98</sup> Watershed entities have proliferated so widely and rapidly as to be dubbed a “movement.”<sup>99</sup> Oregon alone has nearly 90 such groups.<sup>100</sup> Most of these institutions are fairly small and localized in their concerns, working on issues of flow, pollution, and land use. They usually do not “govern” much of anything.

What is less common among the emerging groups are true governance or management institutions, and also larger “umbrella” institutions that can coordinate and link small tributary watershed groups into larger river basin entities.<sup>101</sup> However, even larger entities have come into existence, in a variety of forms, where they offer possible ways of solving cross-jurisdictional problems. For example, in the Sacramento-San Joaquin Delta, several federal and state agencies are working together to solve complex water quality, quantity, and endangered species problems.<sup>102</sup> The CALFED/Bay Delta Program, as it is known, is a highly complex multi-year effort that will ultimately involve changes in irrigation practices, flood control, urban water use, and numerous other water and land use activities.<sup>103</sup>

In the Columbia River Basin, the Northwest Power Planning Council, a regional entity made up of Idaho, Montana, Oregon, and Washington, has operated since 1980 under the mandate of the Northwest Power Act to try to bal-

ance fish and wildlife needs in the Columbia River Basin with hydropower generation.<sup>104</sup> The council represents a unique four-state regional institution created by federal law. However, it has suffered in effectiveness due to its lack of any real management authority; its role is largely advisory, while the U.S. Army Corps of Engineers (the Corps), the Bureau of Reclamation, and the Bonneville Power Administration (BPA) are the institutions with real power for calling the shots and “running the river.”<sup>105</sup> As a consequence of the mounting problems in the Columbia River Basin and the absence of any institution capable of truly coordinating all the interests and making effective decisions, former Gov. John Kitzhaber (D-Or.) proposed a more inclusive entity called the Columbia River Forum.<sup>106</sup> The forum unites 11 tribes, 6 federal agencies, and 3 states to work on the basin’s problems of endangered salmon.<sup>107</sup>

In the Great Lakes region, five states, two Canadian provinces, and the federal government of the two countries have formed what Dan Tarlock has called a “super watershed protection regime.”<sup>108</sup> The Great Lakes agreement began as an effort simply to maintain naturally fluctuating lake levels, but is evolving into a more comprehensive program to protect the entire basin’s ecological and hydrologic integrity.<sup>109</sup> Even further east is another model of a basinwide institution that has been around for years, the Delaware River Basin Compact Commission. For many years, the commission has been managing the Delaware River as a regional resource. Although the commission’s early years were somewhat rocky, in part because the commission’s authority was immediately put to the test by a severe drought,<sup>110</sup> more recent assessments of its performance have been positive.<sup>111</sup> The commission has been called “one of the most powerful regional agencies ever created.”<sup>112</sup> In addition to its significant authority, one of the reasons for the commission’s suc-

97. GARY D. WEATHERFORD, FROM BASIN TO “HYDROCOMMONS”: INTEGRATED WATER MANAGEMENT WITHOUT REGIONAL GOVERNANCE (University of Colorado Natural Resources Law Center 1990).

98. See generally, e.g., RIEKE & KENNEY, *supra* note 87 (containing case studies of 12 watershed groups; noting existence of many dozens more around the West); KENNEY ET AL., THE NEW WATERSHED SOURCEBOOK, *supra* note 87 (describing the watershed movement as a response to the need for integrated regional resources management).

99. KENNEY ET AL., THE NEW WATERSHED SOURCEBOOK, *supra* note 87 (containing case studies of watershed entities from 14 different states).

100. Oregon Watershed Enhancement Board website, at [http://www.oweb.state.or.us/groups/WSC\\_List.shtml](http://www.oweb.state.or.us/groups/WSC_List.shtml) (last visited July 1, 2004).

101. But see KENNEY ET AL., THE NEW WATERSHED SOURCE BOOK, *supra* note 87 (discussing a few emerging “umbrella groups” at the subbasin level).

102. See Elizabeth Ann Rieke, *The Bay Delta Accord: A Stride Toward Sustainability*, 67 U. COLO. L. REV. 341 (1996).

103. *Id.*; see also WATER IN THE WEST, *supra* note 19, at 3-42 to 3-43.

104. 16 U.S.C. §§839-839h; see generally Michael C. Blumm, *The Unraveling of the Parity Promise: Hydropower, Salmon, and Endangered Species in the Columbia Basin*, 21 ENVTL. L. 657 (1991).

105. See Blumm, *supra* note 104.

106. See generally Jonathan Brinkman, *Regional Approach to Fish Advances*, PORTLAND OREGONIAN, Jan. 30, 1999, at B1; Joan Laatz Jewett, *Governors Join Forces in Seeking Control in Fish Recovery Efforts*, PORTLAND OREGONIAN, June 9, 1998, at B1; Joan Laatz Jewett, *Salmon Recovery Plan Hits New Snag*, PORTLAND OREGONIAN, May 30, 1998, at D1; Jonathan Brinkman, *Kitzhaber’s Salmon Effort Raises Some Questions*, PORTLAND OREGONIAN, Nov. 4, 1997, at B1.

107. Notably, the state of Idaho has refused to participate because it doesn’t want to agree to any regional forum that might jeopardize the state’s control over water. See Jewett, *Salmon Recovery*, *supra* note 106. It remains to be seen whether the group will have any real authority, however.

108. Tarlock, *supra* note 92, at 93-98. See also Christine Klein, *East Meets West: The Emerging Water Law of the Great Lakes Basin*, Address Given to the American Bar Association Section on Environment, Energy & Resources Annual Water Law Conference (San Diego, Cal., Feb. 21, 2003) (observed by the author).

109. Tarlock, *supra* note 92, at 94.

110. See, e.g., R. Tim Weston, *The Delaware River Basin: Courts, Compacts and Commissions*, Paper Presented in the Conference Proceedings of Boundaries and Water: Interjurisdictional Issues (University of Colorado Natural Resources Law Center, June 5-7, 1989) (copy on file with author).

111. *Id.*

112. See JOSEPH L. SAX ET AL., LEGAL CONTROL OF WATER RESOURCES: CASES AND MATERIALS 734 (3d ed. 2000).

cess is that it is not just an agreement among states, but also with the federal government.<sup>113</sup>

It appears that when both small and large watersheds get serious about solving their problems, they search for institutions to meet the challenge. All of the entities described so far, both at the local watershed scale and at the larger river basin scale, have been voluntarily created, though sometimes only after a very long, arduous, and complex process. Every entity is different, varying in participants, scope of power, authority, and commitment. Yet only an institution that deals with a water body from its source to its mouth will ultimately be able to own and resolve problems that affect the whole watershed, and only an institution with some level of real decisionmaking authority will be able to effect significant change.

Is there any reason to think that the process of creating new institutions could be, or should be, “pushed” or encouraged somehow, or is it just something to let evolve naturally? The Western Water Policy Review Advisory Commission noted the emerging entities but still recommended the formation of river basin governance institutions to “integrate the management of river basins and watersheds across agencies, political jurisdictions, functional programs, and time.”<sup>114</sup> The commission noted that one reason for forming such bodies is “the need to manage . . . on an ecosystem or watershed basis, recognizing the consequences of many programs and actions within the watershed.”<sup>115</sup> Other reasons identified were to provide coordinated, comprehensive river basin programs among federal, state, and tribal interests, particularly in light of the declining federal water development budget, and the need to create basin governance structures in order to complement and support the growing local watershed group movement.<sup>116</sup> Few of the emerging institutions have effective management or governance authority, and thus will not be able to fill this need.

The commission’s recommendation for river basin governance institutions evoked some knee-jerk criticism in some quarters for proposing “another layer of government,” or for being too “top-down” and weighted with federal interests. But the idea still deserves a fair look.

Indeed, there are three reasons to push the process of creating new water-related institutions. First, institutional change is tough, particularly in light of the existing jurisdictional fragmentation. In 1878, it proved impossible for Powell to overcome the politicians, government employees, and interest groups who had already figured out how to work the system and benefit from the prevailing western land disposal laws—and that was after only a few decades to solidify loyalties and create vested interests. More than 130 years later, the job is even more challenging. River basins and watersheds are fragmented into multiple competing institutions with multiple goals, mandates, and con-

stituencies.<sup>117</sup> The forces holding the current system in place are huge. An equal and opposite force is needed to be applied to create real change and to mold fragmentation into integration.

Second, the gains that could be achieved by creating new institutions with certain attributes are significant enough that an aggressive approach is warranted. At the same time, those gains are common and diffuse enough that there may be no likely champions for change, and thus an aggressive approach may also be necessary.

Third, evolution is not fast enough. The status quo on many western rivers is increasingly unworkable. Regional cooperation provides the only hope for developing viable and durable solutions to problems that are unavoidably regional in nature and scope. Even though some regional cooperation is happening, the formation of every single one of these entities followed many years of conflict. The conflicts arose in part because the preexisting institutions were unable to cope with problems that defied existing fragmented institutional jurisdiction and authority, and yet those very same turf battles can prevent a solution from emerging. Waiting for additional institutions to evolve is too slow to address pressing western water problems. More of a revolution is needed.

Discussing each of these reasons in turn will clarify *why* policymakers should give the process of creating watershed and basin institutions an official boost. Then, the discussion will consider *how* they might do so. Finally, the Article will conclude with some observations about how watershed-based institutions can help achieve Powell’s vision of a truly effective “dryland democracy,” able to cope with multiple water demands in an arid region.

## 1. Overcoming Centuries of Watershed Fragmentation

Existing institutions interact with water supply and watersheds like the blind men with the elephant. The Corps worries about flood control. Meanwhile, a local government may be blithely building up the floodplain, “hardening” the land’s surface with asphalt and buildings, thus increasing surface runoff, and contributing to the destruction of wetlands and other open space, thus decreasing floodwater storage capabilities. At the same time, local farmers (aided by the Bureau of Reclamation and the irrigation district) and fishermen (aided by the State Fish and Wildlife Agency, one or two federal fish agencies, and perhaps a tribe) fight hard over water use, while a nearby community plots future subdivisions that could suck up all the water, leaving nothing for the farmers and fishermen to fight over.

The examples could go on and on, but hopefully the point has been made: fragmented institutions all championing their own mission and fighting for their piece of an increasingly shrinking pie will continue to destroy watersheds, overuse limited water supplies, and preclude sustainable water use. Fragmented institutions cannot take proper care of watersheds—which are necessary for the continued production of water supply—*because no one is in charge of the watershed*. Creating watershed institutions is really the only way to put someone in charge.

Tarlock wrote recently of the “need to redefine both land and water rights to include a landscape conservation compo-

113. Whenever the federal government has a large presence in a river basin, its participation will be critical if any basin governance institution is going to be effective. This is demonstrated by the basin entities that have already been formed in the West. For instance, it was the need for federal and tribal participation that in large part motivated the creation of the Columbia River Forum, in spite of the preexisting Northwest Power Planning Council, which consisted only of states.

114. WATER IN THE WEST, *supra* note 19, at 6-5. The author was a member of this commission.

115. *Id.*

116. *Id.*

117. See generally Adler, *supra* note 87, at 991-95.

ment” in order to overcome the past two centuries in which land and water laws have “functioned to detach property rights from specific landscapes,” thus contributing to landscape degradation.<sup>118</sup> He emphasized the value of “place-based solutions,” such as watershed conservation efforts, in achieving truly sustainable resource use practices.<sup>119</sup> Place-based solutions in watersheds can foster sustainable water use because a watershed group trying to solve present water problems and plan for future uses will be forced to recognize the watershed as a unified system containing a finite amount of water, even if that amount has been artificially augmented through past engineering projects. Only comprehensive place-based institutions with a certain amount of authority can integrate land and water use. Creating an entity with responsibility for a place is a start on “reconnecting property rights to watersheds.”

## 2. Intervention and Investment for Mutual Gain

The gains to be achieved from fostering the creation of watershed institutions, both large and small, are significant. Many of these benefits have been well documented elsewhere.<sup>120</sup> But some of these benefits are more subtle and are just beginning to be explored. For instance, the growing understanding of “ecosystem services”<sup>121</sup> reveals benefits directly relevant to protection and restoration of watersheds as watersheds. Capturing and protecting ecosystem services requires holistic thinking and coordinated management, both of which can be provided by watershed institutions.

Ecosystem services are basic functions and processes that sustain life and that the earth provides for us “free.” They include water and air purification, pollination, climate regulation, pest control, soil renewal, and waste decomposition.<sup>122</sup> Considering water alone, a long list of specific services can be grouped into three general categories: water supply, for drinking and other purposes; other water-related “goods,” such as fish and waterfowl; and instream benefits, including flood storage, pollution dilution, transportation, recreation, and scenic and aesthetic values.<sup>123</sup>

Past practices—including dams, dikes, levees, and diversions—have taken a severe toll on fresh water ecosystem services.<sup>124</sup> Furthermore, other nonwater management activities such as deforestation, poor land use, and pollution have also drastically affected aquatic ecosystem services.<sup>125</sup> Some of these services have no substitutes, or have substitutes only at extremely high costs.<sup>126</sup> Fresh water, for instance, is mostly a nonsubstitutable good or service.<sup>127</sup>

Fostering watershed-based institutions can help get a handle on recognizing and valuing ecosystem services in a variety of ways. If an institution is empowered and directed to manage an entire watershed or river basin, the institution is going to have to consider all aspects of land use, water use, and water management, and the trade offs among them. As just one example, the role of open land and wetlands in water filtration, flood control, and aquifer recharge will have to be balanced against the need for developable land for urban growth and community economic development. Existing fragmented institutions, such as local governments planning new subdivisions, are not likely to consider the watershed’s ecosystem services because they do not have to. It is not the job of a local land use planner to think about ecosystem services, but it would be the job of a watershed institution to do so because the institution’s job *is* the watershed and its integrity.

The protection of ecosystem services provided by watersheds is of tremendous societal benefit, and the loss of such services a corresponding tragedy. But it is a tragedy of the commons, in the classic sense. When everybody loses or gains, no one is motivated to lead the charge to organize or pay for the protection. Thus, recognizing, protecting, and investing in the ecosystem services provided by watersheds requires collective action.

This type of intervention and investment can then spin off other benefits that help advance the understanding about what ecosystem services a watershed provides, and how those services should be valued for decisionmaking purposes. For instance, creating and empowering an institution to “govern” water management in a watershed would create basic data needs about all the ecosystem services currently being supplied by that watershed, including water supply, flood storage, aquifer recharge, stream recharge, purification and filtration, fisheries and other habitat, transportation, recreation, and every other good or service. Requiring this information for watershed planning and decisionmaking will create a “secondary market” for that information.<sup>128</sup> That information market will then generate further research and will lead to a better understanding of the value of those various services.<sup>129</sup> Decisionmaking will thereby be improved, and regulatory requirements can then be established that recognize and protect the ecosystem services that are most crucial. Furthermore, markets can develop that recognize and pay for ecosystem services.<sup>130</sup>

The principle of recognizing and internalizing the value of ecosystem services performed by watersheds is already being acted upon in the case of protecting municipal water supplies. The interest of municipalities in protecting their drinking water supply illustrates at a very concrete level the abstract concepts of respecting watershed integrity, recognizing watershed ecosystem services, and empowering institutions to manage and protect watersheds.

For example, Boston was forced to abandon a water supply reservoir it had used since 1848 because of develop-

nated seawater and comes at an extremely high cost, which is why it accounts for less than 0.1% of total world water use).

118. Tarlock, *supra* note 92, at 69.

119. *Id.* at 111.

120. *See supra* note 87. Benefits include increased communication and coordination among stakeholders and regulatory agencies, decreased gridlock, and progress toward watershed restoration.

121. *See generally* NATURE’S SERVICES (Gretchen C. Dailey ed., 1997).

122. James Salzman, *Valuing Ecosystem Services*, 24 *ECOLOGY L.Q.* 887, 887-90 (1997).

123. S. Postel & S. Carpenter, *Freshwater Ecosystem Services*, in *NATURE’S SERVICES*, *supra* note 121, at 196.

124. *Id.* at 207-10 (detailing the impacts on water resources from human activity).

125. *Id.*

126. Salzman, *supra* note 122, at 890-91.

127. Postel & Carpenter, *supra* note 123, at 197 (noting that freshwater is nonsubstitutable; the next best alternative is technologically desali-

128. Salzman, *supra* note 122, at 897.

129. *Id.* at 897-98.

130. *Id.* at 899.

ment-related pollution.<sup>131</sup> Incredibly, Atlanta has abandoned 8 water sources over a 70-year period because of degradation caused by watershed development and pollution.<sup>132</sup> In contrast, New York City has been much in the news lately for its ambitious \$250 million program to acquire or otherwise protect up to 350,000 acres of land in one of its drinking water watersheds in the Catskill Mountains in order to protect the water's quality and avoid the costs of up to \$8 billion for a filtration system, plus \$300 million annual operating costs.<sup>133</sup>

Western municipalities would do well to study both the positive model of New York City and the hard lessons of Boston and Atlanta, as well as many other cities whose water supply has become contaminated or unuseable for reasons associated with development and pollution.<sup>134</sup> The problem of water source degradation is obviously not a problem unique to the West, but the ability to find replacement sources is much more constrained in the arid states. For that reason, it is even more important for municipalities to protect what they have. This priority requires institutions and authority that allow them to do so. New York City was aided in its Catskills protection effort by significant extra-territorial regulatory authority.<sup>135</sup> Other cities may need to engage directly with basin of origin institutions to accomplish watershed protection goals. The payoff in monetary gains and other benefits make the collective intervention and investment well worthwhile.

### 3. Revolution, Not Evolution

Evolution is slow. Evolution depends on a very drawn-out process of trial and error. Evolution is fine for species adaptation over the span of geologic time. But the West does not have the luxury of geologic time to solve its water problems. Twenty-eight million more people will demand drinking water, places to live, farm-fresh produce, and recreational opportunities over the next 25 years.<sup>136</sup> One researcher has emphasized the inverse relationship in current U.S. growth patterns: "The drier the region, the faster the growth."<sup>137</sup> At the time of this writing, much of the region is experiencing a

record drought.<sup>138</sup> In fact, in some parts of the West, this drought is comparable to the worst droughts of the past 1,400 years.<sup>139</sup> Climate change also casts a shadow of uncertainty over the already stretched-to-the-breaking-point water supply. Meanwhile, litigation "slugfests" continue, as everyone struggles to hang on to their piece of the water pie.<sup>140</sup> Litigation can sometimes spur evolution, but rarely provides durable or comprehensive solutions to complex, multifaceted water disputes.

There really is not time to wait and see how all the voluntary experiments turn out in watershed management and basin governance and then choose the best model.<sup>141</sup> Nor would it necessarily be desirable to hastily mandate a one-size-fits-all institution. But clearly revolutionary adaptation is called for. The next section explores how to foment this revolution.

### B. Strategies for Institution Building

If the goal is to speed up the process of institutional adaptation to the West's water problems, without mandating a cookie cutter solution, how can that goal be accomplished? This section proposes three beginning steps: (1) federal agency coordination and reorganization; (2) federal funding for institutional development; and (3) federal funding for comprehensive watershed and basin planning.

Congress and/or the Administration should catalyze the process of establishing watershed institutions by directing (and funding) the federal agencies who are big players in particular river basins to focus their programs on a basin and watershed basis and to coordinate within basins and watersheds with other federal agencies. The Corps and the Bureau of Reclamation, though both water management agencies, are answerable to two separate cabinet secretaries, the Secretaries of Defense and the Interior, respectively. Each agency is organized along regional lines, but the two agencies' regions are not congruent.<sup>142</sup> The land management

131. TRUST FOR PUBLIC LAND, PROTECTING THE SOURCE: LAND CONSERVATION AND THE FUTURE OF AMERICA'S DRINKING WATER 21 (1997).

132. *Id.* Atlanta has most recently turned to the Chattahoochee River for its water, but that source is not necessarily secure either. Alabama, Florida, and Georgia are locked in a battle over the river. Furthermore, the river was labeled "the nation's most endangered urban river" by American Rivers, in part because of Atlanta's own sewage discharges into the river. *Id.*

133. See TRUST FOR PUBLIC LAND, *supra* note 131, at 6; see also Barton H. Thompson Jr., *Markets for Nature*, 25 WM. & MARY ENVTL L. & POL'Y REV. 261, 293-301 (2000).

134. See TRUST FOR PUBLIC LAND, *supra* note 131, at 6.

135. James Salzman et al., *Protecting Ecosystem Services: Science, Economics, and Law*, 20 STAN. ENVTL. L.J. 309, 315 (2001).

136. See CASE & ALWARD, *supra* note 17, at 30 (projections of 28 million population growth in the western states by 2025); see also NICHOLS ET AL., *supra* note 57, at 2 (describing Case & Alward's estimates as "conservative" and projecting higher growth rates for parts of Colorado).

137. Riebsame, *supra* note 44. Demography has thus overridden topography and aridity in determining water use. See NICHOLS ET AL., *supra* note 57, at 37 ("If water does, in fact, 'flow toward money' in the West, then demography is every bit as important as topography—sometimes more so—in determining the outcome of water conflicts.").

138. National Weather Service Climate Prediction Center, National Oceanic and Atmospheric Administration, *2003 Drought Severity Index by Division*, at [http://www.cpc.ncep.noaa.gov/products/analysis\\_monitoring/regional\\_monitoring/palmer/2003/weekly\\_PALMER\\_2003.html](http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/palmer/2003/weekly_PALMER_2003.html) (last visited May 2003).

139. Shaun McKinnon, *Can We Weather the Drought?*, ARIZ. REPUBLIC, Jan. 19, 2003, at 1A.

140. Three recent significant cases filed include: a suit against the Bureau of Reclamation for compensation for an alleged unconstitutional taking for cutting off irrigation water deliveries to comply with ESA obligations (see Press Release, Christine Souza, California Farm Bureau Federation, Klamath Lawyers Are Pleased With Hearing (Apr. 17, 2002) (on file with author)); a suit against the federal government for reducing California's share of Colorado River water (Imperial Irrigation Dist. v. United States, No. 03 CV 006910 (Jan. 10, 2003); see Press Release, Imperial Irrigation District Sues Department of the Interior to Defend Water Rights (Jan. 10, 2003), available at <http://www.iid.com/pressbox/press.read.php3?which=325> (last visited Sept. 1, 2003)); Seth Hettena, *Feds: Lawsuit May Cost Imperial Valley Water*, Associated Press, Jan. 17, 2003; and litigation successfully challenging the federal government's listing of threatened and endangered fish species in the Columbia River Basin as arbitrary and capricious because hatchery populations were not considered in assessing the species' status (Aalsea Valley Alliance v. Evans, 161 F. Supp. 2d 1154 (2001)).

141. Bob Adler has likened the evolution and experimentation in watershed initiatives to the 1,001 tales of Scheherazade. Adler, *supra* note 87, at 976.

142. See Bureau of Reclamation, *Bureau of Reclamation Regions*, at <http://www.usbr.gov/main/regions.html> (last visited Oct. 4, 2004), and Corps of Engineers, *Map of USACE Engineer Divisions and*

agencies have an entirely different regional structure. The president, by Executive Order, should push these agencies toward coordinated basin organization. Congress should do the same. Furthermore, the Administration should require coordinated program and budget development along basin and subbasin lines.

Reorganizing government is extremely difficult. Entrenched constituencies, including congressional committees, fight to keep the status quo. But the Republican Administration has the opportunity to show that it is really serious about simplifying and streamlining government. And, at least when a reorganization battle is joined in the open, the public has a chance to see the turf battles for what they are rather than having it all happen behind the scenes. Indeed, recent progress toward creating a “homeland security” agency by completely reorganizing and combining existing fragmented agency programs shows that it can be done when the necessary sense of urgency and political will exist. Furthermore, ample legal authority already exists for basin and watershed coordination and activity.<sup>143</sup> Prof. Robert W. Adler has noted that much of this authority “sleeps,” in that it has not been actively exercised.<sup>144</sup> But the framework certainly exists for substantially improved coordination and re-orientation of fragmented efforts.

Federal funding has always made wheels turn in the world of western water. The same incentive that was applied to “reclaiming” the West from the Great American Desert should be applied to fostering and empowering new institutions to meet the challenge of reclaiming western river basins and watersheds from the consequences of the previous century of aggressive water development and growth. The federal government is already spending billions of dollars to address problems caused by a century of water development, while simultaneously continuing to subsidize that very system and encourage overuse of water. A fraction of those billions could go far as seed money to begin work on institution building in each major river basin.

If water leaders in the West went to Congress with a unified proposal for creating a funding source for states, tribes, and federal agencies to draw upon to design, negotiate, and implement river basin institutions, that would be a start. Of course, a unified proposal from western water leaders is a very big “if” indeed. Would these be the water leaders who fly the states’ rights banner and suggest that everything in western water would be fine if not for the annoying federal presence in the form of federal lands, the ESA, and the Clean Water Act (CWA)? Or some of the environmental activists who believe exactly the opposite—that everything would be fine in western water if the federal government would just get serious about its ESA, CWA, and land management responsibilities? Or the tribal leaders who have been left out of nearly every major water project so far?

There are two possible ways that such a proposal could happen. One would be if an alliance could be formed among some unlikely allies, such as the Western States Water Council of the Western Governors Association, the Western

Water Alliance, and other environmental groups active in the water scene, several tribes from different basins, a couple of regional federal land managers, and some of the key western players in the National Conference of State Legislatures and at the local level. But this level of agreement is probably still too ambitious. Another way would be if a particular region offered itself as a pilot project and sought federal funding on that basis.

Why should states and local governments be interested in seeking a regional solution when that would inevitably lead to some yielding of power to a regional institution? Because the existing power is illusory only—it is not the power to achieve workable solutions, but only the power to hold out. Regional institutions, in contrast, offer the power to actually get something done toward solving regional problems. For example, when the Delaware River Basin Compact Commission was formed, it was given substantial power to make decisions on water allocation, water quality, flood control, and land use, insofar as there are major water impacts. The states certainly yielded power to the river basin entity, but what they really did was exchange the power to continue fighting in the U.S. Supreme Court for the opportunity to achieve workable solutions satisfactory to the whole region.

Another possible version of a regional pilot project might be a smaller subbasin that would be willing to experiment with a new form of cooperation. For example, an effort currently underway in the Columbia River Basin could provide such a model. The Northwest Power Planning Council, as noted earlier, has significant responsibilities for trying to balance hydropower production with fish and wildlife needs on the Columbia River.<sup>145</sup> The council fulfills these responsibilities by promulgating a comprehensive fish and wildlife program that then forms the basis for awarding mitigation funds from the BPA for fish and wildlife restoration projects.<sup>146</sup> Recently, the council decided that rather than adopting the next edition of the fish and wildlife program as a “top-down” package from the council, they would instead engage in a “bottom-up” effort around the region.<sup>147</sup>

The council has thus embarked on a three-year basinwide subbasin planning program.<sup>148</sup> Over \$15 million dollars is being divided up among the four basin states. Each state in turn makes its share of the funding available to 62 tributary subbasins, identified within 11 larger ecological provinces. The subbasins have been invited to prepare their own plans, working at the local level.<sup>149</sup> Because Oregon has so many watershed councils in place, many of those entities are taking the lead in their respective subbasins. In the other states, other groups may be the planning entities; for instance, some Indian tribes are playing an active role in the Idaho planning effort.

The plans are intended to be comprehensive, strategic plans for achieving fish and wildlife protection in the basins, covering water quality problems, water quantity issues, and

145. See *supra* notes 104-07 and accompanying text.

146. 16 U.S.C. §§839 et seq. (2000).

147. Telephone Conference with Lynn Youngbar, consultant to state of Oregon on subbasin planning (Jan. 24, 2003).

148. The information in this section is taken primarily from the Northwest Power Planning Council website on the Internet at <http://nwcouncil.org/fw/subbasinplanning/admin/recommendations.htm> (last visited Sept. 3, 2004).

149. The plans are voluntary; however, since they will later be used to distribute federal fish and wildlife restoration funds, any subbasin that wants to compete for those funds will need to do a plan. *Id.*

*Districts*, at <http://www.usace.army.mil/divdistmap.html> (last visited May 30, 2003). See also WATER IN THE WEST, *supra* note 19, at 6-6 to 6-8.

143. See Adler, *supra* note 87, at 1037-87 (describing numerous federal statutes containing authority for watershed-based restoration and protection).

144. *Id.* at 1037.

endangered species requirements. The first thing required in each plan is a comprehensive inventory and assessment of existing subbasin conditions and the potential for restoration.<sup>150</sup> Then, each subbasin is to develop an explicit management component of the plan—described by the council as the heart of the subbasin plan—with concrete objectives and strategies for achieving the objectives in a 10-15 year time frame. The plans will be combined and “built up” into the council’s next iteration of its basinwide fish and wildlife program, which will then be the basis for decisions on where and how to spend the substantial funds dedicated from the BPA’s fish and wildlife restoration account.

The plans are required to address the requirements of the ESA, the CWA, and the Northwest Power Act, as well as to address the policies of the basin states and Indian tribes and to accommodate local- and watershed-level efforts. The federal agencies are working closely with the subbasin entities with the intent that the subbasin plans themselves will become the basis for federal agency compliance with the CWA and ESA, including federal species recovery efforts.

The Columbia River Basin subbasin planning program also highlights the potential for coordinating and sharing baseline data on existing conditions in specific basins and watersheds, including not only hydrologic data, but also data on ecological conditions and human needs. A tremendous amount of data already exists, scattered among the Corps, the Bureau of Reclamation, the U.S. Geological Survey, federal land management and regulatory agencies, tribes, state water resource agencies and other state agencies, and local land use agencies. The challenge is to get these agencies first to share, and then to synthesize, the data, so that basin or subbasin negotiations can begin on a firm foundation. The Columbia River Basin program does just this, by providing a forum and a requirement that all parties involved in subbasin planning first accomplish a collaborative and comprehensive assessment of existing basin conditions.

The beauty of using data collection to initiate a collaborative basinwide effort is that everyone has to start by agreeing on how much water (or any other basin resource) is available to begin with—a very Powellesque notion. Then, the hard work can begin of discussing how to meet competing needs, both present and future. As it is now, the disputants in various basin controversies rarely even talk about how big the total “pie” is because they are too busy arguing about the size of their slices in a vacuum. Doing the math first on the water supply and overall watershed conditions brings a dose of reality to a basin planning process.

The Northwest example also demonstrates the combined power of the carrot of federal funding and the stick of federal legal requirements to integrate larger basin efforts with localized watershed groups. Currently, numerous federal programs make federal money available for development of local plans or other local activities to help achieve various program goals and federal environmental standards.<sup>151</sup> However, the plans required are not comprehensive, and these

programs are not currently coordinated with each other. It would make more sense, both in terms of wise federal spending and of eventual effectiveness, to make federal funds available for *comprehensive* watershed plans that integrate water quantity, water quality, and land use.<sup>152</sup> In exchange for the infusion of federal funds, the plans should be required to address the requirements of federal law, including the ESA, the CWA, and tribal trust responsibilities. This is precisely the approach being used by the Northwest Power Planning Council.

The Columbia River Basin effort is intelligent and promising, and presents a model for a pilot program of nested watershed-to-river-basin planning and management. Although this particular planning process is officially focused only on fish and wildlife issues, it is still far more comprehensive than previous fragmented activities. So far, in the subbasins that have already begun participating, federal, state, tribal, and local entities are working closely and cooperatively together in the planning process, including in interstate basins.<sup>153</sup> The program gives an absolutely critical role of “self-determination” to the local watershed groups and other local institutions and stakeholders, and yet recognizes the primacy of federal, state, and tribal law where appropriate.

The Columbia River Basin effort could certainly be replicated in other basins and expanded to consider broader water and land use issues. The program proves that federal legal requirements and federal money can be good lubricants to create cooperation and institutional creativity. Indeed, participants in the program have noted that it is very likely that new institutions will need to be created in order to implement the plans.<sup>154</sup> This is true both because the plans cover areas that are not congruent with existing governments and jurisdictions and because the projects recommended may be innovative and outside the box of existing laws. For instance, if a plan identifies the need for a water banking or water sharing arrangement of some sort to address water quality or flow problems in a particular subbasin, there may be no existing institution with the necessary authority and jurisdiction to make that happen.

The earlier sections have considered *why* and *how* new watershed institutions should and could be created. The next section addresses *what* these institutions need to do in order to effectively manage watershed resources.

### C. An Action Agenda for Watershed Institutions

Powell was at bottom a planner, who believed in first getting the facts right and then making decisions accordingly. If this

150. The assessment includes describing the water resources (including the watersheds and hydrologic regimes), water uses, and human modifications to the water resources, as well as more broadly describing the anthropogenic disturbances to both the aquatic and terrestrial environment (from urbanization to agriculture and everything in between). *Id.*

151. *Cf. Adler, supra* note 87, at 1037-87 (discussing a wide range of federal programs with local planning components or authority).

152. This suggestion, in turn, reinforces the need for further coordination and even reorganization of federal agencies with water-related responsibilities. Currently, each agency pursues and funds narrowly focused programs in line with particular statutory mandates; no agency truly has comprehensive basin or watershed responsibility or authority, so funding comprehensive plans or other programs could be problematic.

153. For instance, the Walla Walla Subbasin includes Oregon and Washington, the Clark Fork includes Idaho and Montana, and the Owyhee includes Idaho, Nevada, and Oregon.

154. Comments of Gail Achterman, Executive Director of Deschutes River Conservancy at Natural Resources Law Institute Futures Forum, Lewis and Clark Law School (Jan. 17, 2003). The comments were made at a water issues working group at which the author was present and at which there was general consensus on this particular point.

lesson alone were incorporated into western land use decisions affecting water, it could foster tremendous improvement. But fragmentation is the hallmark of the status quo. Land use planners in most western states have no direct responsibility for water supply planning, and water planners and suppliers have no authority over land use. The job of water supply planning falls to municipal or private water providers, often dozens of them in a single metropolitan area; land use planning is also fragmented among numerous local governments. Planners of both sorts generally have plenty of information about projected growth. But rarely do either land use planners or water supply entities have access to comprehensive water supply assessments.<sup>155</sup> Even if fairly decent information is available on existing developed supply, more realistic assessments of future supplies are often lacking.<sup>156</sup>

Part of the reason for this lack of information is the fundamental failure to consider water as a finite resource. The problems of water supply development in general, and water shortages in particular, are normally characterized as an engineering problem: with planning, money, and technology, water can be obtained. The prevailing attitude is a variation on the “Field of Dreams” motto.<sup>157</sup> Instead of “*if we build it, they will come*,” the motto for water suppliers seems to be: “*They will come, so we’d better build it*.” As long as water supply is considered simply a matter of engineering, there really is no need to determine sustainably available supplies because that concept doesn’t exist. What results is big numbers on the demand side of the equation (based on growth projections) but vague numbers on the supply side.

The solution is better information on both true water needs and sustainably available supplies. The ideal scale for gathering this information is the scale that corresponds to hydrologic reality—river basins and watersheds. But then, the real key to building a viable dryland democracy is to put someone in charge of making sure that improved information actually informs and controls future decisions. Thus, the two critical items for empowering effective watershed institutions to manage “hydrographic districts”—whether at the large river basin level or the local watershed level—are getting the facts right and then providing authority to use them. Thus, an action agenda for effective watershed governance institutions must include: (1) requiring the institutions to recognize the carrying capacity of the watershed; and (2) giving the institutions some amount of real integrated management authority. Creating and empowering such institutions would capture the genius of Powell’s original plan: recognizing the importance of the hydrographic boundaries; recognizing that water is a finite resource; and requiring interdependent watershed communities to govern themselves to manage that resource.

155. There are exceptions. For instance, California keeps close tabs on the amount of its overall future water supply statewide. See Nicholas A. Jacobs, *Meeting California’s Water Supply Needs: Whatever Happened to Storage?* 7 W. WATER L. & POL’Y REP. 147, 149 (2003) (describing the California Department of Water Resources regular water supply bulletins). California is better able than most states to provide this information because it has a highly developed and integrated state system and thus has good data on total available water.

156. This is especially true given the uncertain impacts of climate change on water availability and supply. See, e.g., Janet C. Neuman, *Adaptive Management: How Water Law Needs to Change*, 31 ELR 11432-33 (Dec. 2001).

157. Cf. WILLIAM P. KINSELLA, SHOELSS JOE (1982) (book on which the movie *Field of Dreams* was based).

## 1. Carrying Capacity: Treating Water as a Limit to Growth

Edward Abbey, known for hitting more than a few nails on the head with his blunt speech, once said: “There is no lack of water here, unless you try to establish a city where no city should be.”<sup>158</sup> If water was not dammed, piped, and transported thousands of miles all over the West, the region could not support the cities (or farms) that it has today. Future growth will depend on more of the same engineering and plumbing. After all the surface supplies and groundwater have been even more fully utilized than they are now, the pipes will have to reach into the ocean to desalinate saltwater. This is the West’s future, unless somebody, somewhere, decides that enough cities and major agricultural projects have been established where perhaps they should not be.

The economies of the 17 western states have been built in complete denial of the idea that scarcity of water should be a limit to growth.<sup>159</sup> But at some point, water should be a limiting factor for urban growth or other types of new development. New institutions, empowered to plan for and manage watershed activities, should have to begin with a realistic analysis of their water budget, or in other words, an honest assessment of renewable, sustainable water supply. Such an assessment should take stock of the currently developed supply of reliable, deliverable water and consider the useful life of that supply. The useful life determination would include consideration of anything that might reduce that supply in the future, such as climate change impacts, loss of capacity (such as siltation, in the case of a reservoir), potential contamination, and reduction in delivery due to environmental restoration requirements.

Second, the inventory should assess possible new sources of supply, again without rose-colored glasses but with a reasonable view of costs, including construction costs, operation and maintenance costs, social costs, environmental impacts, and renewability of the supply. The analysis of future supply should pay careful attention to principles of watershed integrity by rigorously addressing the full costs (economic, environmental, and social) of transporting the water outside of its source watershed. The result of this two-part analysis would be an assessment of the “carrying capacity” of the region’s water resources.

The region can then assess its demand projections against the carrying capacity and thus begin to make decisions about future growth. But demand projections, too, need to be done more completely and honestly than they presently are. To the extent that projections of future needs are based on assumptions of certain patterns of water use based on historical consumption, those projections are likely inflated. If

158. EDWARD ABBEY, *DESERT SOLITAIRE: A SEASON IN THE WILDERNESS* 30 (1968).

159. It is interesting to note the reluctance to face up to the limits of water for growth. For example, NICHOLS ET AL., *WATER AND GROWTH IN COLORADO*, *supra* note 57, an otherwise excellent study, never even acknowledges the possibility of limiting growth, nor even of seriously strengthening land use controls, as a way of meeting the challenge of finding water for the state’s growing population. The list of future strategies relates primarily to developing or “finding” additional water supplies (through transfers, conservation, etc.). The very last words of the report are “[w]e can’t stop people from coming here, but we can be prepared for it.” *Id.* at 160 (quoting the General Manager of the Southeastern Colorado Water Conservation District). Yet the report also quotes former Secretary of the Interior Bruce Babbitt, saying “[w]e’ve developed enough water resources in the West.” *Id.* at 90.



water users have not been metered or charged by volume for their water, they are probably using much more water than they would under different measuring and fee scenarios.<sup>160</sup> Further, conservation is only beginning to be seriously pursued as a way of augmenting existing supplies and stretching available water. Aggressive conservation programs could considerably dampen future demand.

Finally, another inflationary aspect of demand projections relates to urban sprawl. The typical pattern of urban development in most western states is very sprawling.<sup>161</sup> Only a few states make a concerted effort to concentrate development and curb sprawl. Sprawling development patterns lead to increased water use,<sup>162</sup> and thus projections based on past use practices and patterns overestimate the amount of water truly “needed.”

There are, of course, significant barriers to overcome to start recognizing lack of water as a limit to growth. The first barrier is the notion imbedded deeply in both the American psyche and the economy that a community not actively growing will inevitably stagnate and die. Tax structures, government policies, and other economic incentives are nearly all currently pro-growth.<sup>163</sup> Laws, policies, and incentives are all choices made by legislative bodies and institutions to serve human needs and goals at specific points in time. When the needs and goals change, the choices also need to change. The needs have already begun to change, and the legislative choices need to start catching up.

For example, an existing legal doctrine that may have to change to accommodate current reality is the “duty to serve,” a duty imposed by public utility case law on providers of essential public services. The rule is that public utilities, whether they provide electricity, water, sanitation, or other essential services, have a duty to provide service to any paying customer within their service area.<sup>164</sup> As early as 1915, the California Supreme Court declared that this duty included the duty of a water provider to anticipate future growth and acquire the necessary water supplies to meet projected demand.<sup>165</sup> Although city water providers are not legally classified as public utilities for all purposes, courts have held them subject to the duty to serve.<sup>166</sup>

Thus, the cases adopt the prevailing characterization of a water shortage as basically an engineering problem—with

planning, money, and technology, any water shortage can and should be alleviated, albeit on a reasonable timetable. The law thereby reinforces the prevailing attitude of “they will come, so we’d better build it.”<sup>167</sup>

There are two reasons for local governments’ acceptance of growth as inevitable, and these are the two other barriers to acknowledging that water supply should serve as a limit to growth. One is practical, and one is constitutional. The primary reason that people move from place to place is the availability of work (or at least the perception of such); another very important reason is quality of life.<sup>168</sup> These factors then trigger the need for housing and associated development, including water supplies. Both of these factors are to a large degree outside the control of local governments.

Or are they? A more realistic attitude toward water supply might actually have some influence on migration patterns. Tighter controls on urban water use, such as metering water, charging for water based on volume used, and restrictions on watering lawns and filling swimming pools, might create a more truly western quality of life. Treating water more like a precious and scarce resource would at least assure that those who move West understand that Utah is not just Ohio without humidity.<sup>169</sup> Instead, there are trade-offs to be made for living in the near-desert. The same could hold true for movement of jobs, too. If local governments “charged” the true cost (in terms of water supply) for industrial and commercial development instead of offering incentives to these entities to locate in their communities, the pace of western growth might slow accordingly.<sup>170</sup> The constitutional barriers, too, may be more imagined than real. It is not unconstitutional to run out of water as long as the shortage is truly based on appropriate scientific reasons and not exclusionary behavior masquerading as a shortage.<sup>171</sup>

The duty to serve is not absolute, in any event, and water providers do have authority to manage the pace at which they develop new water supplies and provide service. Thus,

167. See *supra* note 157 and accompanying text.

168. See NICHOLS ET AL., *supra* note 57, at 4 (citing numerous sources); see also CASE & ALWARD, *supra* note 17, at 9-17; Reibsame, *supra* note 44, at 5.

169. In *Desert Solitaire*, Edward Abbey recounted the following dialogue:

“This would be good country,” a tourist says to me, “if only you had some water.”

He’s from Cleveland, Ohio.

“If we had water here,” I reply, “this country would not be what it is. It would be like Ohio, wet and humid and hydrological, all covered with cabbage farms and golf courses. Instead of this lovely barren desert we would have only another blooming garden state . . .”

“If you had more water more people could live here.”

“Yes sir. And where then would people go when they wanted to see something besides people?”

“I see what you mean. Still, I wouldn’t want to live here. So dry and desolate. . . . I’m glad I don’t have to live here.”

“I’m glad too, sir. We’re in perfect agreement. You wouldn’t want to live here, and I wouldn’t want to live in Cleveland.”

ABBEY, *supra* note 158, at 112-13. Perhaps it is the number of western cabbage farms, golf courses, and people that makes it easy to forget that Utah really is not Ohio.

170. However, it appears that the market will bear some fairly steep charges of this type. See Franz et al., *supra* note 68, at 229, 270 (describing per lot charges for water costs of \$2,500 in Arizona and \$15,000 in Colorado).

171. See Larson, *supra* note 83, at 183-86 (describing the city of El Paso’s refusal to extend water to the unincorporated Hispanic towns outside the city).

160. See Barton H. Thompson Jr., *Institutional Perspectives on Water Policy and Markets*, 81 CAL. L. REV. 671 (1993); Kelly Hart, *The Mojave Desert as Grounds for Change: Clarifying Property Rights in California’s Groundwater to Make Extraction Sustainable State-wide*, 9 HASTINGS W.-NW. J. ENVTL. L. & POL’Y 31 (2002).

161. See generally Patrick Gallagher, *The Environmental, Social, and Cultural Impacts of Sprawl*, NAT. RESOURCES & ENV’T, Spring 2001, at 219.

162. *Id.* at 220. In addition to excessive water use, Patrick Gallagher details a litany of other sprawl-related impacts on water resources, including disruption of natural hydrologic functions, interference with groundwater recharge, water pollution, overtaxing of water infrastructure, destruction of wetlands, and increased risk of flooding.

163. See generally SIERRA CLUB, *SPRAWL COSTS US ALL* (1999) (describing federal, state, and local sprawl subsidies, including tax breaks); NORTHWEST ENVIRONMENT WATCH, *THIS PLACE ON EARTH 2002: MEASURING WHAT MATTERS* (2002).

164. See 12 McQUILLIN MUNICIPAL CORPORATIONS §35.12 (West 3d ed. 2004).

165. *Lukrawka v. Spring Valley Water Co.*, 146 P. 640, 645 (Cal. 1915).

166. See, e.g. *Robinson v. Boulder*, 547 P.2d 228, 6 ELR 20418 (Colo. 1976).

a city can turn down new water hook-ups or impose a moratorium on subdivision approval or building permit issuance during times of water shortage.<sup>172</sup> Local governments can also enact “concurrency” requirements, the purpose of which is to match the rate of development with the availability of public services and facilities such as water supply.<sup>173</sup> The basic premise of a concurrency provision is simple: new development will only be approved if the available water supply can support it. Such provisions have been upheld by the courts against challenges by developers.<sup>174</sup> Although one commentator boldly stated that western communities could use concurrency laws to “prohibit development entirely, once the water sources have reached their maximum capacity,”<sup>175</sup> in fact, that is not how concurrency laws have been used in the West. At least not yet. But perhaps they could be. Furthermore, the chances would be improved that they would be by creating watershed institutions with real and integrated responsibility for the health and management of the watershed, and with a mandate to consider the resource’s carrying capacity.

At least one state has provided the legal framework allowing local governments to take a stand on the “maximum capacity” of available water supplies.<sup>176</sup> Oregon has the most comprehensive land use planning requirements of any western state. The law is designed to concentrate urban growth, protect valuable farm and forest land from urban sprawl, and manage the pace and place of growth to assure the timely and cost-effective provision of services and facilities.<sup>177</sup> The program is implemented through plans prepared by cities and counties according to a detailed list of 19 statewide planning goals adopted by the Land Conservation and Development Commission pursuant to state statute.<sup>178</sup>

Before preparing plans, local governments are required to inventory riparian corridors, wetlands, and groundwater resources.<sup>179</sup> In preparing and implementing plans, the plan-

ning agencies are directed to “consider as a major determinant the carrying capacity of the air, land and *water resources* of the planning area.”<sup>180</sup> Further, the state statute declares that local governments should use the “conservation of both renewable and nonrenewable natural resources and physical limitations of the land” as the “basis for determining the quantity, quality, location, rate and type of growth in the planning area.”<sup>181</sup> These are lofty goals, but so far no community in Oregon has seriously tested the limits of these directives and powers. However, a watershed institution with similar authority would certainly be well positioned to stand behind its carrying capacity analysis. The clash of aridity and the “duty to serve” would then come to a head.

However, forcing communities to quantify the finite limits of their available water resources is only the beginning. In order to properly conform resource use to those limits, watershed institutions must have integrated authority to make development and use decisions accordingly, including decisions affecting both water and land, as both are integral parts of the watershed as a whole.

## 2. Integrated Decisionmaking Authority

Once a region has a clear and complete picture of its water resources and a realistic assessment of how much deliverable water supply those resources can support, this information must be closely linked to development and growth decisions. This connection can be made in a number of ways. The most effective way will be to require land use planners to conform their decisions, including everything from zoning to infrastructure expansion to subdivision approval, to the currently available or reasonably developable water supply. As noted earlier, treating the carrying capacity of a watershed as a true limit is part of this necessary decision-making authority.

One of Powell’s points in his report so many years ago was that the West’s aridity had to be respected and understood by its citizens, and they should be empowered to make decisions based on their understanding. That understanding and empowerment should begin at the tap. Watershed institutions should utilize water pricing strategies to make sure that all water use is judged against the preciousness of the resource.

Beyond that, watershed institutions must be empowered to protect the watershed itself, for the ecosystem services it produces in terms of water supply, as well as other benefits. They must be given real authority to govern water quantity, water quality, and land use decisionmaking. The authority should resemble that of the Delaware River Basin Compact Commission.<sup>182</sup> The commission’s power begins with comprehensive planning power to formulate a plan for long-term basin development. The commission also has authority over every aspect of Delaware River water management, including water allocation, water quality, flood control, watershed preservation, hydroelectric power generation, and rec-

172. See, e.g., *Swanson v. Marin Mun. Water Dist.*, 128 Cal. Rptr. 485 (Cal. 1976).

173. Adam Strachan, *Concurrency Laws: Water as a Land Use Regulation*, 21 J. LAND, RESOURCES & ENVTL. L. 435, 435 (2001). In addition to concurrency requirements, cities can charge the full cost of water development, as discussed earlier. See *supra* note 170 and accompanying text.

174. See, e.g., *Golden v. Planning Bd. of the Town of Ramapo*, 285 N.E.2d 291, 2 ELR 20296 (N.Y. 1972). Challenges can include takings claims, due process claims based on the right to travel, and equal protection challenges. See Strachan, *supra* note 173, at 445-49.

175. Strachan, *supra* note 173, at 435.

176. See OR. REV. STAT. §§197.005 et seq. (2003), and the website of the Oregon Department of Land Conservation and Development at <http://www.lcd.state.or.us/index.html> (last visited May 30, 2003).

177. See generally OREGON DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT, OREGON STATEWIDE PLANNING PROGRAM (2003), available at <http://www.lcd.state.or.us/publicat/dirpubs.html> (last visited Sept. 1, 2003).

178. *Id.*

179. OREGON DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT, OREGON’S 19 STATEWIDE PLANNING GOALS AND GUIDELINES, Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces (1974, amended 1996) [hereinafter OREGON PLANNING GOALS]. Among the other significant resources to be inventoried under Goal 5 (such as wildlife habitat, wilderness areas, and cultural areas), local governments are also required to inventory “mineral and aggregate resources,” a testament to the lobbying strength of the Oregon Concrete and Aggregate Producers Association! The goals can be found in OR. ADMIN. R. 660-015-0000 et seq. (2004), or at the Oregon Department of Land Conservation and Development website at <http://www.lcd.state.or.us/goalhtml/goals.html> (last visited May 30, 2003).

180. OREGON PLANNING GOALS, *supra* note 179, Goal 5 (emphasis added). This language is repeated in Goals 6 (Air, Water, and Land Resources Quality) and 11 (Public Facilities and Services).

181. *Id.*, Goal 5.

182. See generally JEROME C. MUYS, INTERSTATE WATER COMPACTS: THE INTERSTATE COMPACT AND FEDERAL-INTERSTATE COMPACT (National Water Commission 1971).

reational use. Furthermore, the commission's approval is required for all projects in the basin that will have a substantial effect on the basin's water resources. Investing a watershed institution with this kind of comprehensive purview and clear decisionmaking authority can help link water supply and quality, basin development, and land and water use, as they should be for any sensible decisionmaking.

Watershed governance can also provide a laboratory for experimentation in civic republicanism because it anticipates the citizens of a specific locale working together to manage shared resources.<sup>183</sup> Making some sort of watershed institution mandatory and giving the entity specific responsibilities and authority forces the group to search for resource allocation decisions that both work for all stakeholders and comply with existing laws. This is particularly true if the mandate includes conforming resource use to a clearly defined level of the watershed's carrying capacity.<sup>184</sup>

## V. Conclusion

In a book advocating ecologically based land use planning, William Honachefsky quoted Winston Churchill's observation that "Americans usually do the right thing, but only after exhausting their alternatives."<sup>185</sup> In retrospect, it seems that Powell's 1878 vision for development of the arid western lands may indeed have contained elements of "the right thing" for respecting watershed integrity and matching development to water availability. Some of the reality-based line drawing around watersheds and water

supplies that Powell suggested would be just as radical and challenging today as it was in 1878—more so, in fact, because the lines would need to be superimposed on more than a century of conflicting jurisdictions and contrary development.

In spite of all the forces aligned against change, however, the forces aligned in favor of change are significant as well, and most of the alternatives seem to be exhausted. Crying out for a change in the way of doing business in water management are a chorus of nasties: mounting species loss and ESA listings of water-dependent species around the West; thousands of western water bodies listed as "water quality limited"; frequent trips to court by states, Native American tribes, environmental groups, and property rights groups; and looming water shortages. In other words, although the political forces holding the system in place are daunting, the natural forces working to pull it apart are growing and undeniable. Eventually, the natural forces will win one way or another.

One commentator writing about the "disconnects" between water and growth management noted that when the ancient Anasazi were faced with harsh natural conditions, they either accepted those conditions, adapted to them, or moved on to a more hospitable region.<sup>186</sup> Modern western American civilization has so far refused to fully accept the region's aridity. Before we are forced to move on, I would suggest we try a little more adaptation, in spite of the political pain. The compelling need to search for holistic and durable solutions to rectify the damage caused by over a century of development in disregard of watersheds and water supply should prompt us to try to rise to the challenge and do the right thing by designing watershed governance institutions.

Those institutions need to be granted bold authority to decide not to live beyond their water means, even if that means deciding not to grow. Further, watershed entities, large and small, need to "govern" watershed activities. In only a few years, Powell's *Report on the Lands of the Arid Region of the United States* will be 150 years old. It is time to write the sequel and to try once again to implement the "blueprint for a dryland democracy."

183. Whether such entities will actually make "good," or at least defensible, decisions for the resource, whether they will have an appropriate level of political accountability, and where they will fit in the current structure of federal, state, and local governance are admittedly difficult questions that will need careful examination over time. See KENNEY, ARGUING ABOUT CONSENSUS, *supra* note 87, at 56-58.

184. Formalizing watershed institutions' roles to some degree and clarifying rules for participation and accountability can help to avoid the mushy or distorted concept of the "common good" that might otherwise emerge from a less structured, less inclusive, or less bounded watershed initiative. Cf. Eileen Gauna, *The Environmental Justice Misfit: Public Participation and the Paradigm Paradox*, 17 STAN. ENVTL. L.J. 3 (1998) (noting the difficulty of trusting a vague deliberative process in which participants are expected to set aside self-interest in favor of an undefined notion of the greater good).

185. WILLIAM B. HONACHEFSKY, *ECOLOGICALLY BASED MUNICIPAL LAND USE PLANNING* 13 (1999).

186. Lora Lucero, *Water and the Disconnects in Growth Management*, 31 URB. LAW. 871, 872 (1999) (citing CHARLES T. DUMARS ET AL., *PUEBLO INDIAN WATER RIGHTS: STRUGGLE FOR A PRECIOUS RESOURCE* (1984)).