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BENEFICIAL USE, WASTE, AND FORFEITURE: THE INEFFICIENT SEARCH FOR EFFICIENCY IN WESTERN WATER USE

By
Janet C. Neuman*

Near the turn of the last century, many of the western states adopted the requirement of continuous beneficial use without waste in their water codes. These laws provided that unused water, or water that was used wastefully, would no longer be part of the user's water right and would be available for appropriation by others. Professor Neuman conducts a comprehensive critique of how well the beneficial use doctrine has performed since its universal adoption one hundred years ago, and assesses its potential for helping to meet the water demands of the next century. She reviews the slow evolution of the common law of beneficial use, highlighting the doctrine's ineffectiveness in curbing wasteful uses of water. She also explores legislative and administrative treatment of beneficial use and waste, again with attention to whether efficiency improvements have been obtained. Professor Neuman probes historical reasons for the failure of the beneficial use doctrine to foster greater efficiency, and she compares current needs to the purposes for adopting the doctrine in the first place. Professor Neuman further argues that contemporary water demands require a more systematic approach to improving efficiency in western water use. She outlines an agenda of proposed reforms for western courts, legislatures, and administrative agencies to make the beneficial use doctrine more responsive in order to stretch scarce western water resources to meet twenty-first century water needs.

* Associate Professor of Law, Northwestern School of Law of Lewis & Clark College. B.A., Drake University, 1975; J.D., Stanford Law School, 1979. I would like to thank John Thorson for inviting me to participate in a 1997 conference sponsored by the Ford and Hewlett Foundations, where my work on this Article began; I was further assisted by a research grant from Northwestern School of Law. I would also like to thank Lewis & Clark law students Bart Thomas, Ben Wolff, and Keith Hirokawa, and Brett Swift, of the Law School's Natural Resources Law Institute, for able research assistance; John Thorson, Brigette Bilyeu, and Greg Hobbs for generosity with information, ideas, and inspiration; and Dan Tarlock and my colleagues, Mike Blumm and Jim Huffman, for helpful discussion and comments on earlier drafts. The views expressed in the final product are, of course, the author's alone. Many thanks are due as well to the editors of *Environmental Law* for extra efforts on an expedited basis.

I. INTRODUCTION

Beneficial use, without waste, is the basis, measure, and limit of a water right. This incantation is an accepted catechism in western water law. Since 1848, when the California gold rush gave birth to the basic principles of the western prior appropriation system, a right to use water has been acquired by applying water to a beneficial use. The right continues only as long as the beneficial use continues, without waste. Nonuse results in forfeiture, and wasteful use is prohibited.

At the turn of the last century, the majority of the western states codified their water laws, including universal adoption of the concepts of ben-

eficial use, waste, and forfeiture.[1] Now, one hundred years later, it is possible to look back and see how well these bedrock principles have performed, especially given the growing pressures on western water supplies. When the original water codes were adopted, the West was a relatively unpopulous region.[2] A century later, the West is the fastest-growing region in the country.[3] The population is exploding, while scarce water supplies stay the same.[4] At the same time, Native American tribes are seeking their share of the water, promised long ago but never delivered, and often in areas where local supplies are already overappropriated.[5] Improved scientific understanding and environmental laws not envisioned a century ago also create demands for water to be used in different ways or

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[1] Professor Tarlock notes that the requirement of beneficial use "was initially imposed by the courts and carried over into the Wyoming permit system widely copied in the West." He also credits the Mormons with the roots of the beneficial use concept. A. DAN TARLOCK, LAW OF WATER RIGHTS AND RESOURCES § 5.16(1) (1998). The Wyoming Water Code was adopted in 1890. Mark Squillace, *Wyoming*, *in* 6 WATERS AND WATER RIGHTS 865 (Robert E. Beck ed., 1991). Over the next three decades other states followed suit including Nebraska (1895); Idaho and Utah (1903); Nevada, New Mexico, Utah, North Dakota, South Dakota, and Oklahoma (1905); Oregon (1909); Texas (1913); California (1914); Kansas and Washington (1917); and Arizona (1919). Robert E. Beck, *Introduction and Background*, *in* 2 WATERS AND WATER RIGHTS § 11.03(b)(3) n.67. Though the codes differed in coverage and detail, all of them incorporated certain basic concepts, including beneficial use as the basis of a water right, loss of the right by nonuse, and prohibitions against waste. In fact, many of the western states had statutes incorporating the concept of beneficial use that predated the rest of their water codes. *See* Norman K. Johnson & Charles T. DuMars, *A Survey of the Evolution of Western Water Law in Response to Changing Economic and Public Interest Demands*, 29 NAT. RESOURCES J. 347 (1989).

[2] PAMELA CASE & GREGORY ALWARD, WESTERN WATER POLICY REVIEW ADVISORY COMM'N, PATTERNS OF DEMOGRAPHIC, ECONOMIC AND VALUE CHANGE IN THE WESTERN UNITED STATES: IMPLICATIONS FOR WATER USE AND MANAGEMENT 30-31 (1997). One hundred years ago, irrigation—which would eventually become the West's biggest water user—was still an experiment in its infancy. *See generally* DONALD J. PISANI, TO RECLAIM A DIVIDED WEST: WATER, LAW, AND PUBLIC POLICY 1848-1902 (1992) (discussing nineteenth century development of water management in the West); DONALD J. PISANI, WATER, LAND, AND LAW IN THE WEST: THE LIMITS OF PUBLIC POLICY, 1850-1920 (1996) (discussing nineteenth century water management policy in the West and its relationship to land and other natural resources).

[3] *Id.* (projecting additional western growth between 2000 and 2025 of approximately 28 million people, a growth rate of nearly 30%, much higher than the rest of the country).

[4] Significant augmentation of the western water supply is not likely in the near future. The best sites for reservoir projects have already been used, the federal budget for large dam construction has been shrinking for years, and environmental concerns would likely prevent new major storage projects. *See* WESTERN WATER POLICY REVIEW ADVISORY COMM'N, WATER IN THE WEST: CHALLENGE FOR THE NEXT CENTURY 2-12, 2-13, 2-35 (1998) [hereinafter WATER IN THE WEST]. Weather modification and desalinization do not present large-scale, cost-effective options at this time. *Id.* at 3-11 to 3-12. Even the Bureau of Reclamation, which built many of the existing storage projects, says:

> [T]here is no 'new water' to develop, no new dams to store water for the dry season, and little new groundwater resources to pump from the earth. . . . Thus, the challenge to provide 'new water' becomes focused on our ability to conserve, protect, transfer, recycle, and sustainably manage the already existing water more efficiently and effectively to meet the growing multiple needs of the West for the future.

BUREAU OF RECLAMATION, STRATEGIC PLAN 1997-2002, at 4 (Apr. 14, 1997).

[5] WATER IN THE WEST, *supra* note 4, at 3-45.

simply left in the streams.[6] Efficiency in water use is therefore crucial.[7] The time is right to examine whether the current system can deliver the efficient practices needed to stretch finite supplies to meet growing and changing demands.[8]

This Article dissects the beneficial use doctrine, and its corollaries, waste and forfeiture, looking closely at their operation, evaluating them against their purposes, and considering whether they can promote efficient water use practices for the twenty-first century. The Article argues that the doctrinal trinity of beneficial use, waste, and forfeiture, though it may have accomplished certain nineteenth and twentieth century goals, is ill-equipped in its present form to achieve the levels of efficiency that will be necessary to meet twenty-first century western water demands. Part II analyzes the current state of the law of beneficial use, tracing its evolution over the past century and comparing the roles of courts, legislatures, and administrative agencies in the application and evolution of the law. The requirement of "beneficial use without waste" sounds tight, as if water users must carefully husband the resource, using every drop of water completely and efficiently to avoid both forfeiture and waste. In actuality, the system is quite loose. Beneficial use is in fact a fairly elastic concept that freezes old customs, allows water users considerable flexibility in the amount and method of use, and leaves line drawing to the courts. The prohibitions against waste—even the threat of forfeiture for nonuse—are mostly hortatory concepts that rarely result in cutbacks in water use. In fact, there is widespread agreement that there are significant inefficiencies in western water use, in spite of these concepts of good husbandry that are built into the law.[9]

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[6] *Id.* at 2-12 to 2-14.

[7] Throughout this Article, the term "efficiency" will be used to mean accomplishment of the desired result with a minimum amount of water. This is distinct from an economist's definition of efficiency. *See, e.g.*, JACK HIRSHLEIFER, ET AL., WATER SUPPLY: ECONOMICS, TECHNOLOGY, AND POLICY 36-42 (1969) (defining economic efficiency using principles of equimarginal value in use).

[8] Other commentators have previously examined aspects of the beneficial use doctrine. *See generally* George W. Pring & Karen A. Tomb, *License to Waste: Legal Barriers to Conservation and Efficient Use of Water in the West*, 25 ROCKY MTN. MIN. L. INST. 25-1 (1979); Stephen F. Williams, *The Requirement of Beneficial Use as a Cause of Waste in Water Resource Development*, 23 NAT. RESOURCES J. 7 (1983); Steven J. Shupe, *Waste in Western Water Law: A Blueprint for Change*, 61 OR. L. REV. 483 (1982); A. Dan Tarlock, *The Changing Meaning of Water Conservation in the West*, 66 NEB. L. REV. 145 (1987); Eric T. Freyfogle, *Water Rights and the Common Wealth*, 26 ENVTL. L. 27 (1996). However, even though demographic and environmental trends are converging to intensify the pressure on available resources, no comprehensive discussion of the beneficial use doctrine has occurred within the last several years.

[9] *See* NATIONAL WATER COMM'N, WATER POLICIES FOR THE FUTURE 299-306 (1973); WATER IN THE WEST, *Supra* note 4, at 6-24, 6-25; Shupe, *supra* note 8, at 486; *see also* TARLOCK, *supra* note 1, at 5-89 (noting that although "[t]he principal function of the beneficial use doctrine is to prevent waste . . . . [waste] is a "generous standard because it defines water rights by the lowest common denominator and makes it difficult to limit the use of water" and "the doctrine has not been a major mechanism to curb waste.").

Part III then returns to the roots of the beneficial use doctrine, exploring the doctrine's original purposes of avoiding speculation and monopoly, maximizing the use of a scarce resource to help settle the West, and providing flexibility to water users. Part III assesses whether the doctrine has accomplished those purposes over the past 100 years and discusses whether the original purposes are still relevant for the twenty-first century. The Article argues that the doctrine only partially accomplished its original purposes, while encouraging over-use of water, and that these purposes require adjustment for meeting future water demands. Part IV considers the prospects for effective use of the doctrine to achieve efficiency in water use, concluding that in order to obtain meaningful efficiency improvements, western courts, state legislatures, and administrative agencies all need to play a role in adapting the doctrine to current needs. Recommended reforms are outlined for each of the three branches.

II. The Beneficial Use Doctrine Throughout the Twentieth Century

A thorough understanding of the beneficial use doctrine as it stands at the end of the twentieth century requires examining state constitutions, state statutes, a large body of case law, recent legislative initiatives, and the activities of state water allocation agencies. This examination reveals a doctrine that allows, and even encourages, inefficient water use. Even legislatures and administrative agencies recently attempting to foster efficiency and conservation have often foundered on the vagueness and generosity of the doctrine as it has developed over the past one hundred years.

A. Statutory and Constitutional Treatment of Beneficial Use

The water codes of all of the western states and some state constitutions include the term "beneficial use." Constitutional treatment of beneficial use ranges from simple statements declaring the right to appropriate water for beneficial use,[10] to more normative provisions requiring reasonable and nonwasteful water use.[11] Statutes of nine states intone in nearly identical language that "beneficial use, without waste, is the basis, mea-

[10] *E.g.*, Ala. Const. art. VIII, §13 (stating water may be appropriated for beneficial use); Colo. Const. art. XVI, § 6 ("The right to divert the unappropriated waters of any natural stream to beneficial uses shall never be denied."); Mont. Const. art. IX, § 3 (making water available for appropriation for beneficial use); Neb. Const. art. XV, §§ 4-6 (establishing right to divert unappropriated water); Utah Const. art. XVII, § 1 (confirming existing rights to use water for beneficial purposes); Wyo. Const. art. VIII, § 3 ("Priority of appropriation for beneficial uses shall give the better right."); N.M. Const. art. XVI, § 1 ("All existing rights to the use of any waters in this state for any useful or beneficial purpose are hereby recognized and confirmed.").

[11] *E.g.*, Cal. Const. art. X, § 2 ("General welfare requires that the water resources of the state be put to beneficial use . . . and that the waste or unreasonable use . . . of water be prevented.").

sure, and limit of a water right,"[12] and the remainder refer in some way to beneficial use.[13] Some states specifically identify or list certain uses as beneficial, either in the constitution or in statute. For example, the Idaho Constitution recognizes agriculture, mining, milling, power, and domestic purposes as beneficial.[14] Texas statutes list as beneficial uses agriculture; gardening; domestic uses; stock raising; mining; manufacturing; industrial and commercial uses; recreation; pleasure; and oil, gas, and sulfur production.[15] States that list specific beneficial uses in statutes normally began with a basic list many years ago, covering the late nineteenth century needs of domestic use, farming, and some industry, and then supplemented their statutes over time to add more "modern" purposes, such as instream uses for recreation and fish and wildlife. In other words, statutory expressions of beneficial use have changed to reflect changes in values and changes in scientific understanding. However, these lists are generally interpreted as nonexclusive.[16]

Conversely, some states specifically provide that a particular use is *not* a beneficial use. For example, Oklahoma declares that use of water in coal slurry pipelines does not qualify as beneficial.[17] Kansas statutes provide that evaporation of water from sand and gravel pits is not a beneficial use.[18] Idaho law states that it is not a beneficial use of geothermal water to use it for any purpose other than its heat value.[19]

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[12] *See* ARIZ. REV. STAT. ANN. § 45-141(B) (West Supp. 1998); NEV. REV. STAT. § 533.035 (1997); N.M. STAT. ANN. § 72-1-2 (Michie 1997); N.D. CENT. CODE ANN. § 61-04-01.2 (Michie 1995); OKLA. STAT. tit. 82, § 105.2(A) (1990); OR. REV. STAT. § 540.610(1) (1997); S.D. CODIFIED LAWS § 46-1-8 (Michie 1987); UTAH CODE ANN. § 73-1-3 (1991); WYO. STAT. ANN. § 41-3-101 (Michie 1997).

[13] *See* ALASKA STAT. § 46.15.260(3) (Michie 1997) ("[B]eneficial use means use of water for the benefit of the appropriator."); CAL. WATER CODE § 1240 (West Supp. 1998) ("[A]ppropriation must be for some . . . beneficial purpose."); COLO. REV. STAT. § 37-92-103(4) (1997) (defining beneficial use); IDAHO CODE § 42-104 (1996) ("[A]ppropriation must be for some . . . beneficial purpose."); KAN. STAT. ANN. § 2a-718 (1997) ("[A]ll appropriations of water must be for some beneficial purpose."); MONT. CODE ANN. § 85-2-102(2)(a) (1997) ("Beneficial use . . . means: a use of water for the benefit of the appropriator."); NEB. REV. STAT. § 46-202(2) (1993) (stating that the water of the state is subject to appropriation for beneficial use); TEX. WATER CODE ANN. § 11.002 (West Supp. 1998) ("Beneficial use means use of the amount of water which is economically necessary for a purpose authorized by this chapter."); WASH. REV. CODE ANN. § 90.54.020(1) (West Supp. 1998) (declaring enumerated uses as beneficial).

[14] IDAHO CONST. art. XV, § 3.

[15] TEX. WATER CODE ANN. §§ 11.002, 64.003(19) (West 1998).

[16] Some of the statutory or constitutional lists explicitly state that they are nonexclusive. *See* MONT. CODE ANN. § 85-2-102(2)(a) (1997) ("including but not limited to"). But even those that do not so state seem to be interpreted that way. *See* Department of Parks v. Idaho Dep't of Water Admin., 530 P.2d 924 (Idaho 1974) (stating that the list of uses in the Idaho Constitution is not exhaustive).

[17] OKLA. STAT. tit. 27, § 7.6 (1997); *see also* MONT. REV. CODE ANN. § 85-2-104 (Smith 1979) (repealed 1985) (identifying coal slurry pipelines as non-beneficial uses).

[18] KAN. STAT. ANN. § 82a-734 (1997); *see also* CAL. WATER CODE § 31144.74 (West 1984) (water incidentally produced in mining or excavation is not beneficially used).

[19] IDAHO CODE § 42-233 (1996).

A few states attempt to elaborate on the concept of beneficial use with a statutory definition of the term. For instance, Colorado law provides that "'[b]eneficial use' is the use of that amount of water that is reasonable and appropriate under reasonably efficient practices to accomplish without waste the purpose for which the appropriation is lawfully made."[20] A definition in Texas law includes similar concepts of reasonableness, but adds economics, brains, and hard work to the mix: "'Beneficial use' means use of the amount of water which is economically necessary for a purpose authorized by this chapter, when reasonable intelligence and reasonable diligence are used in applying the water to that purpose."[21]

In spite of these statutory and constitutional distinctions, there seems to be little significant variation among the states in the general interpretation and application of the beneficial use doctrine. State courts borrow liberally from other states in developing the concept of beneficial use for resolution of disputes before them.[22] In fact, the Ninth Circuit Court of Appeals has described the beneficial use doctrine as a matter of general law among the western states.[23]

B. Judicial Treatment of Beneficial Use

1. The Role of the Courts

Until recently, the job of defining the contours of the beneficial use doctrine has fallen mainly on the courts. Every western state makes "beneficial use without waste" the limit of a water right, yet only a few states attempt to define or expand upon that concept with further statutory language.[24] As noted, many of the statutes that do exist contain undefined concepts of "reasonableness," "appropriateness," and "diligence"—terms that beg for interpretation just as much as the term "beneficial use" itself. Of necessity, then, it has been left to the courts to define, interpret, and apply the basic requirement.[25]

In addition to the usual function of hearing individual cases as they come up, the courts play a special role in western water law—that of conducting general stream adjudications. Every western state has a general stream adjudication process for determining the various water rights on

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[20] COLO. REV. STAT. § 37-92-103(4) (1997); *see also* ALASKA STAT. § 46.15.260(3) (Michie 1998); MONT. CODE ANN. § 85-2-102(2)(a) (1997); N.D. CENT. CODE § 61-04-01.1 (1995); S.D. CODIFIED LAWS § 46-1-6(6) (Michie 1987); TEX. WATER CODE ANN. § 11.002(4) (West 1988).

[21] TEX. WATER CODE ANN. §11.002(4) (West 1988).

[22] *See, e.g.*, Washington Dep't of Ecology v. Grimes, 852 P.2d 1044, 1054 (Wash. 1993) (citing cases from California, Montana, and Utah); New Mexico v. McLean, 308 P.2d 983, 987 (N.M. 1957) (citing Oregon case).

[23] United States v. Alpine Land & Reservoir Co., 697 F.2d 851, 854 (9th Cir. 1983) ("We do not deny or overlook the differences in water law among the various western states. However, on the point of what is beneficial use the law is 'general and without significant dissent.'") (citing 1 WATERS AND WATER RIGHTS § 19.2 (R. Clark ed., 1967)).

[24] *See supra* notes 12-21 and accompanying text.

[25] Administrative agencies, too, can provide further clarification for unclear statutory terms but, for the most part, western water agencies have not done so. *See infra* Part II.C.4.

any particular water body or stream system.[26] Although different states' statutes provide for varying degrees of administrative involvement, eventually a court is required to issue a final decree describing and quantifying all of the claimants' valid legal water rights.[27] It is in the context of general stream adjudications that courts have the most potential influence on the development of the beneficial use doctrine. Rather than having before them only one or two water users and perhaps a state agency, they are reviewing the water-rights claims of numerous parties throughout a particular geographic area. Normally, the state water resources agency is also involved in the adjudication as an administrative fact finder before the entire matter comes to the court, as a technical adviser to the court, or as an actual party to the adjudication.[28] Both the individual parties and the agency (in any of those roles) can provide data, information, and expert opinion on customary water use practices, achievable efficiencies, historical practices, available technologies, economics, and any other evidence necessary or helpful to the court in determining appropriate levels of water use. Not surprisingly, many of the court decisions on beneficial use have grown out of general stream adjudications.[29]

As developed in the courts, beneficial use has two different components: the type of use and the amount of use.[30] In order to be legally beneficial, the type of use must be something socially acceptable.[31] As to the amount of use, there must be actual use in an amount that is not wasteful.[32] If a water user uses too much water, he is wasting it, and if he does not use it at all, he is obviously not beneficially using it. The first component, type of use, generated a number of cases some years ago, but more of the recent skirmishing has been on the amount of use.

2. Type of Use

Like the legislatures, the courts have incorporated, to some degree, changes in public values and increased scientific knowledge as they have reviewed and approved specific uses as beneficial. Uses determined by courts to be beneficial, even without statutory lists to this effect, include standard uses such as irrigation,[33] mining,[34] stock watering,[35] industrial

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[26] *See generally* A. Lynne Krogh, *Water Right Adjudications in the Western States: Procedures, Constitutionality, Problems and Solutions*, 30 LAND & WATER L. REV. 9 (1995); DAN CRAMMOND, NORTHWEST WATER LAW AND POLICY PROJECT, COUNTING RAINDROPS: PROSPECTS FOR NORTHWESTERN WATER RIGHT ADJUDICATIONS (1996).

[27] *See* Krogh, *supra* note 26, at 18-19.

[28] *Id.* at 17.

[29] *See infra* notes 57-64, 68-84, 90-105, 166-96 and accompanying text.

[30] Robert E. Beck, *Prevalence and Definition*, *in* 2 WATERS AND WATER RIGHTS, *supra* note 1, § 12.03(c)(2) [hereinafter Beck, *Prevalence and Definition*]

[31] *Id.*

[32] *Id.*

[33] Gallagher v. Basey, 1 Mont. 457, *aff'd*, 87 U.S. (20 Wall.) 670 (1874).

[34] Union Mill & Mining v. Dangberg, 81 F. 73 (D. Nev. 1897).

[35] First State Bank of Alamogordo v. McNew, 269 P. 56 (N.M. 1928).

uses,[36] and municipal uses.[37] Courts also have deemed storage for the above purposes, as well as flood control, beneficial use.[38] More unusual uses also upheld by courts include turning water onto a meadow to strand fish,[39] fish propagation,[40] waterfowl and wildlife habitat,[41] frost prevention,[42] and flushing fields after irrigation season to remove boron left by groundwater.[43] Types of uses that have failed the test of beneficial use include flooding fields to form several feet of ice for preservation of soil moisture,[44] soaking a field to make it easier to plow,[45] carrying off debris during the irrigation season,[46] flooding to exterminate rodents,[47] using water to transport and deposit sand and gravel for mining,[48] and drilling and testing wells with temporary pumps.[49]

The evolution of the judicial treatment of beneficial use is similar to the changes in statutory treatment discussed earlier.[50] In the late nineteenth and early twentieth centuries, concepts of beneficial use focused on a limited category of activities associated with then-predominant uses

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[36] *In re* Plains Elec. Generation & Transmission Coop., Inc., 750 P.2d 475 (N.M. Ct. App. 1988).

[37] *In re* Board of County Comm'rs, 891 P.2d 952 (Colo. 1995).

[38] Pueblo West Metro. Dist. v. Southeastern Colo. Water Conservancy Dist., 689 P.2d 594 (Colo. 1984).

[39] Lobdell v. Hall, 3 Nev. 461 (1868). It is unlikely that stranding fish would pass muster today as a beneficial use, or at least a nonwasteful one, given our improved technology as well as an increased appreciation for keeping fish in the streams. In fact, the Lobdell case does not contain a clear holding that turning water into a meadow to strand fish was a beneficial use, even in 1867, other than the following statement in the opinion denying a rehearing: "I cannot see but that it is just as legitimate for an Indian to turn water over meadow-lands, to enable him to catch fish for his subsistence, as for a white man to turn it over the same land to increase the growth of grass." *Id.* Indeed, the practice was no longer being followed by the time the case got to court. However, the defendant irrigator in that case was allowed to prove that his priority date predated plaintiff's. *Id.* The earlier priority date depended on use of defendant's ditch by Indians to divert water for catching fish, before defendant bought the property. *Id.* Thus, by implication, stranding fish was found to be a beneficial use.

[40] Faden v. Hubbell, 28 P.2d 247 (Colo. 1933).

[41] *In re* Water Right Claim No. 1927-2, 524 N.W.2d 855 (S.D. 1994).

[42] Neubert v. Yakima-Tieton Irrigation Dist., 814 P.2d 199 (Wash. 1991).

[43] Benz v. Water Resources Comm'n, 764 P.2d 594 (Or. Ct. App. 1988).

[44] Blaine County Inv. Co. v. Mays, 291 P. 1055 (Idaho 1930).

[45] Hennings v. Water Resources Dep't, 622 P.2d 333 (Or. 1981).

[46] *In re* Water Rights of Deschutes River & Tributaries, 286 P. 563 (Or. 1930). Although the court in this case alternated between calling the use nonbeneficial and wasteful, it finally seemed to decide that 40 cubic feet per second (cfs) claimed by a power company to carry off debris from its dam was not a beneficial use, at least during irrigation season when that water could otherwise be used to irrigate some 1600 acres of land. *Id.* at 577. However, the court allowed the company's use during the winter (as well as another 10 cfs to remove ice) as long as it did not interfere with storage requirements for irrigation. *Id.* at 578.

[47] Tulare Irrigation Dist. v. Lindsay-Strathmore Irrigation Dist., 45 P.2d 972 (Cal. 1935).

[48] Joslin v. Marin Mun. Water Dist., 429 P.2d 889 (Cal. 1967). In addition to applying the general concepts of beneficial use, California courts also have a constitutional provision requiring reasonable use of all water users with which to test water use. CAL. CONST. art. X, § 2.

[49] Danielson v. Milne, 765 P.2d 572 (Colo. 1988).

[50] *See supra* notes 15-16 and accompanying text.

of water such as domestic uses, farming, stock raising, mining, milling, power production, and other fledgling manufacturing enterprises. As public values and water-related activities changed and scientific understanding grew, a wider range of accepted uses was recognized as beneficial, including recreation and aesthetics, wildlife habitat, and pollution abatement. At the same time, also due to changing values and increased knowledge, particular practices that may not have raised an eyebrow in earlier times were revealed as nonbeneficial when viewed with a more contemporary perspective.[51] But, as mentioned earlier, beneficial use consists of two components: type of use and amount of use. And, as the next section will show, the courts have had more difficulty grappling with the second component.

3. Amount of Use: Forfeiture and Waste

Beneficial use includes the requirement of actual, active use. Nonuse of all or part of a water right can result in forfeiture or abandonment.[52] Beneficial use also includes the requirement of nonwasteful use. Water that is legally wasted (even though actively used) is not a legitimate part of the water right and can be deleted from the entitlement upon challenge.[53]

Court decisions discussing the amount component of beneficial use are more helpful in giving clear guidance on forfeiture than on waste. Although occasional decisions reduce a water right for nonuse of part of the right, thereby declaring partial forfeiture, very few court cases actually find a particular use to be legally wasteful. The cases that do exist contain

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[51] Professor Sax described this evolution succinctly: "When uses cease to be seen as beneficial, however long-standing, they are repudiated in favor of modern conceptions of beneficiality." Joseph L. Sax, *The Limits of Private Rights in Public Waters*, 19 ENVTL. L. 473, 478 (1989). It seems that a distinction can also be made, however, between the scrutiny given to placeholder uses compared to that given to current uses. In other words, a water user may be claiming a water right for a current, ongoing use, or he may be claiming a current right for one type of use, but seeking an early priority date based on an earlier and different use now discontinued, and thus just a placeholder in the chain of use. My sense after reading numerous beneficial use cases is that the scrutiny is greater for current uses and not as strict for earlier placeholder uses. There seems to be almost an unstated presumption that if a use went unchallenged until it was later replaced by another use, the earlier use will be found beneficial. *See, e.g.*, Lobdell v. Hall, 3 Nev. 507 (1867).

[52] C. Peter Goplerud III, *Protection and Termination of the Water Right*, *in* 2 WATERS AND WATER RIGHTS, *supra* note 1, § 17.03. Although courts sometimes confuse forfeiture and abandonment, or use them interchangeably, they are actually two different ways to lose a water right. Abandonment is a common-law concept, covering the intentional relinquishment of a water right; thus, proof of abandonment requires showing both nonuse *and* intent. Forfeiture, on the other hand, is a creation of statute. Nonuse for the prescribed statutory period constitutes forfeiture; intent to relinquish the right does not need to be proven. *Id.* § 17.03(a), (b). In most states, forfeiture has replaced abandonment as the dominant method of losing water rights. Thus, having just cautioned against using the terms interchangeably, I am going to use forfeiture as the generic term for loss of rights by nonuse.

[53] Some courts combine waste and forfeiture, saying that a wasteful use produces a forfeiture just as nonuse does. See, for example, the cases discussed in Goplerud, *supra* note 52, § 17.03(b), n.56. However, in this Article, I maintain a distinction between the two, because a wasteful user is using water, while a forfeiter is not.

many flowery pronouncements about the importance of preventing waste and limiting water rights to the amount beneficially used, but the courts rarely cut back the water being used. This is perhaps understandable because it is easier for a court to determine that a certain amount of water simply has not been used by the water right holder than it is to make a value judgment about whether the amount of the particular use is appropriate given local custom or a more generalized notion of reasonably efficient practices. The following discussion reviews the easy cases first—the actual use or partial forfeiture holdings—and then considers the harder waste cases.

a. Actual Use and Partial Forfeiture

A review of cases throughout the West over the past one hundred years reveals a fairly consistent resolution of disputes where it is proven that a water user is not beneficially using all of the water claimed, either in a particular dispute or a general adjudication. Courts uniformly hold that nonuse of all or part of a water right demonstrates a lack of beneficial use, and when it comes time to confirm or decree the amount of a water right, the right should only reflect actual, historic, beneficial use. Thus, the Supreme Court of Washington, in 1922, overturned a trial court's award of all the waters in a lake to a party and instead awarded the amount of one cubic foot per second (cfs), which was shown to be the amount of actual use.[54] Ten years later, in 1932, the Ninth Circuit upheld a decision by the Idaho Federal District Court awarding a water right to the Twin Falls Canal Company based on the actual use of water from a reservoir for irrigation, but refused to grant the canal company a "controlling interest of the river for [twenty-five] miles of slack water upstream, irrespective of beneficial use."[55] The appellate court noted: "The trial court recognized the right of appellant to the volume of water actually appropriated for beneficial purposes . . . . The extent of beneficial use is an inherent and necessary limitation on the right."[56]

A more recent Montana case also emphasized actual use as controlling over a water user's paper right.[57] The Supreme Court of Montana was faced with a challenge to a Montana statute that required courts adjudicating water rights to state in the final decree "the amount of water, rate and volume included in the [water] right."[58] The claim was that the statute was unconstitutional as applied to water right holders who already had earlier decreed rights stated only in terms of a flow rate, because a total volume cap might give them less flexibility (and perhaps less water) than a right decreed only in flow terms.[59] The court recognized that the volume of

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[54] Ortel v. Stone, 205 P. 1055 (Wash. 1922).

[55] Twin Falls Canal Co. v. American Falls Reservoir Dist. No. 2, 59 F.2d 19, 23 (9th Cir. 1932), *cert. denied*, 287 U.S. 638 (1932).

[56] *Id.*

[57] McDonald v. Montana, 722 P.2d 598 (Mont. 1986).

[58] *Id.* at 599.

[59] *Id.* at 600-01.

water actually used by the appropriators varied year by year due to variations in weather, soil conditions, and other factors, and that it was "natural therefore that irrigators would fear that the expression of a volume amount in acre feet as a limit of their right would adversely affect their flow rights to the use of water under certain conditions."[60]

The court's response to the irrigators' fear was a discussion of the beneficial use doctrine as a limit to their water right, no matter how their paper right was stated.[61] In particular, the court pointed out that the beneficial use requirement is a continuing constraint on a water right:

> *He is entitled to only the beneficial use of the amount of water called for by his appropriation or decree when he has need therefor, and providing his distributing system has a sufficient capacity to carry such an amount of water* . . . . So long as a party has all the water his necessity requires or that his ditches will carry, it is immaterial that he has a right, under decree or otherwise, to a greater flow from the creek.[62]

Thus, regardless of whether the proof of one's right is in the form of a prior decree, a permit, or a claim based on mere use or prescription, "the Water Use Act contemplates that all water rights, regardless of prior statements or claims as to amount, must nevertheless, to be recognized, pass the test of historical, unabandoned beneficial use."[63]

The Montana Supreme Court concluded that it does not really matter how a decree is expressed, whether in flowrate or acre feet, or some combination thereof, because "such expression of amount is not the final determining factor. It is best expressed in the statutes of other states: beneficial use shall be the basis, measure, and the limit of all rights to the use of water."[64] The court thus rejected the constitutional challenge to the Montana statute. Although there was no explicit finding of nonuse or partial forfeiture in the *McDonald* case, the reasoning supports the principle that the amount of water actually used on an ongoing basis represents the limit of a water right.

At least one court has called the beneficial use requirement a "condition subsequent" attached to all water rights.[65] This notion captures succinctly what the Montana court was saying in *McDonald*: beneficial use continues to operate as a limit on lawful water use, no matter what the paper right says.[66] Water rights are thus defeasible property rights.[67]

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[60] *Id.* at 602.

[61] *Id.* at 602-06.

[62] *Id.* at 602.

[63] *Id.* at 604.

[64] *Id.* at 605. Taken literally, this language might suggest that a water user could also *exceed* the amount of the paper right in favor of beneficial use, but paper rights are normally interpreted as a maximum ceiling on water rights.

[65] *In re* Application A-15738 of the Hitchcock & Red Willow Irrigation Dists., 410 N.W.2d 101, 106 (Neb. 1987).

[66] *McDonald*, 722 P.2d at 604.

[67] Another way of saying this is that the right itself is conditional, subject to loss for failure to use it beneficially. Pring & Tomb, *supra* note 8, at 25-10; *see also* Sax, *supra* note 51, at 476-77 (discussing the ways in which water rights differ from other property rights).

In 1997, the Washington Supreme Court had the opportunity to consider the application of the beneficial use requirement in an appeal by an irrigation district of its award in the general adjudication of water rights in the Yakima River Basin.[68] An earlier consent decree had granted the district a total amount of 114,000 acre feet of water.[69] However, the district had never been able to accept the full amount of water because it would have exceeded the safe carrying capacity of the district's canals.[70] The trial court in the adjudication thus awarded the district the amount of 110,700 acre feet, based on a finding that the lesser amount represented the maximum safe carrying capacity of its canals.[71]

The state challenged the award, claiming that the district's past actual use did not support even the lower amount because the most the district had ever used, in a severe drought year, was 109,309 acre feet.[72] Noting that "[t]he principle that water must be used for a beneficial purpose is a fundamental tenet of the philosophy of water law in the West," the supreme court overturned the trial court's use of the capacity of the delivery system as the measure of the district's right.[73] The court remanded the case with an instruction to "calculate beneficial use based upon diversion and actual use, as required by the law of this state."[74] The court also directed the trial court on remand to consider whether part of the district's right had in fact been abandoned or forfeited by nonuse.[75]

Most recently, in two interlocutory appeals in the ongoing Snake River Basin Adjudication (SRBA), the Idaho Supreme Court considered the concept of partial forfeiture of a water right and its overall relationship to the beneficial use doctrine.[76] Although the concept of partial forfeiture of a water right seems to be nearly universally accepted throughout the western states,[77] a group of water rights holders in the SRBA challenged whether partial forfeiture could occur under Idaho law. Their argument was based on the wording of the Idaho forfeiture statute, which reads as follows: "*All* rights to the use of water . . . shall be lost and forfeited by a

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[68] Washington Dep't of Ecology v. Acquavella, 935 P.2d 595 (Wash. 1997).

[69] *Id.* at 598.

[70] *Id.*

[71] *Id.* at 599.

[72] *Id.* at 600.

[73] *Id.* at 599. Meanwhile, the neighboring state of Oregon seems to have embraced the use of system capacity as a legitimate measure of a water right, regardless of whether actual use has been less than that. *See* OR. REV. STAT. § 540.610(3) (1997); *see also* discussion *infra* note 85.

[74] *Acquavella*, 935 P.2d at 600. This approach was again confirmed in *Washington Dep't of Ecology v. Theodoratus*, 957 P.2d 1241, 1244 (Wash. 1998). The *Theodoratus* case is especially interesting because the Washington Supreme Court expressly approved a change in administrative agency practice, away from 40 years of allowing use of system capacity to measure a final water right. *Id.* at 1249.

[75] *Acquavella*, 935 P.2d at 600-02. Washington's forfeiture statute, providing that nonuse for five consecutive years constitutes forfeiture, was enacted in 1967. A challenge based on nonuse for the period prior to 1967 would have to meet the standards for common-law abandonment instead of the statutory forfeiture provision. *Id.*

[76] Idaho v. Hagerman Water Right Owners, Inc., 947 P.2d 400 (Idaho 1997).

[77] *See* TARLOCK, *supra* note 1, § 5.18(1).

failure for the term of five (5) years to apply it to the beneficial use for which it was appropriated . . . ."[78] The challengers argued, and the trial court agreed, that the use of the word "all" meant that forfeiture was an all or nothing concept, and there was no room to read-in the possibility of a forfeiture of only part of the right.[79]

The Idaho Supreme Court, while noting that the case was one of first impression, concluded that earlier cases had assumed the possibility of partial forfeiture, and had in fact limited water rights holders to actual past amounts of use, even though the particular cases had ultimately been decided on different legal issues.[80] The court also noted that partial forfeiture is recognized by the Idaho Department of Water Resources in its administration of water rights,[81] and that an interpretation of the statute allowing for such a result was supported by classic canons of statutory construction.[82] Finally, the court found that allowing for partial forfeiture represented the best policy, because otherwise "a water user could hold the water against all subsequent appropriators by using only a part of the water."[83] The court capped its reasoning by returning to the touchstone of beneficial use: "Integral to the goal of securing maximum use and benefit of our natural water resources is that water be put to beneficial use. This is a continuing obligation."[84]

The case law is thus consistent, both over time and throughout the West, in applying actual beneficial use as an ongoing requirement in maintaining appropriative water rights. Because beneficial use is the *limit* of the right, nonuse of part or all of the paper right forfeits that portion of the right, as long as the nonuse has continued for the requisite statutory forfeiture period by the time the court scrutinizes the right.[85] Beneficial use is

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[78] IDAHO CODE § 42-222(2) (1997 & Supp. 1998) (emphasis added).

[79] *Hagerman*, 947 P.2d at 402.

[80] *Id.* at 405.

[81] *Id.* at 407.

[82] *Id.* at 406.

[83] *Id.* at 408.

[84] *Id.* In a second opinion, issued the day after the partial forfeiture opinion, the Idaho Supreme Court clarified that forfeiture, abandonment, adverse possession, or estoppel are the only ways to lose a water right once it has vested, and that a water right cannot be reduced simply for "reduction in beneficial use" unless the reduction amounts to one of the four situations listed above. *Id.* at 409. In a later opinion in the SRBA, Special Master Bilyeu noted that although the court's list appears to be comprehensive, Idaho also prohibits waste. *In re* SRBA, Case No. 39576 (Twin Falls County Court, Idaho 1997) (Special Master's Findings of Fact) (Subcases 34-00060, 34-00259F, 34-00738E, 34-02412C, and 34-13562).

[85] Curiously, at least one western state seems to be retreating from this approach—not in the courts, but in the legislature. In 1997, Oregon amended its forfeiture statute to provide that water users will not be subject to partial forfeiture even if they use less water to accomplish the designated beneficial use, as long as they have a "facility capable of handling the entire rate and duty authorized under the right" and they are "otherwise ready, willing and able to make full use of the right." OR. REV. STAT. § 540.610(3) (1997). This statute seems virtually to eliminate partial forfeiture in Oregon and to seriously undermine the beneficial use requirement, as well as take away any incentive to use the Oregon conserved water program. *See* Krista Koehl, *Partial Forfeiture of Water Rights: Oregon Compromises Traditional Principles to Achieve Flexibility*, 28 ENVTL. L. 1137 (1998).

also the *measure* of the right, and this aspect of the beneficial use concept gives rise to the corollary waste doctrine.

b. Waste

No water user is entitled to use more water than is reasonably needed to accomplish his or her particular beneficial use, whether it is irrigation, domestic supply, manufacturing, or any other use of water that passes the straight face test of types of use accepted as beneficial. How much is too much? The definition of waste that has developed in case law is a customary standard, as explained over half a century ago by the California Supreme Court:

> In so far as the diversion exceeds the amount reasonably necessary for beneficial purposes, it is contrary to the policy of the law and is a taking without right and confers no title, no matter for how long continued. . . . However, an appropriator cannot be compelled to divert according to the most scientific method known. He is entitled to make a reasonable use of the water according to the general custom of the locality, so long as the custom does not involve unnecessary waste.[86]

Stated succinctly, "[w]aste can be legally defined as the amount of flow diverted in excess of reasonable needs under customary practices."[87] Irrigation practices that conform to local custom will therefore rarely be found wasteful.[88] The doctrine of beneficial use is thus not a technology-forcing standard.[89] Applying a custom-based standard is obviously a fact-intensive, case-by-case exercise that evolves over time. Yet a careful reading of a century's worth of cases reveals precious little real evolution.

In 1925, the Oregon Supreme Court reviewed the adjudication of water rights in the Silvies River, a stream in southeastern Oregon.[90] The Silvies flows through three relatively flat, high-elevation valleys before emptying into Malheur Lake, a large, shallow, high desert lake that grows and shrinks in size seasonally by thousands of acres.[91] The river floods the flat valleys and the lake with spring snow melt and then essentially runs dry by July.[92] Early settlers took advantage of the natural flooding and

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[86] Tulare Irrigation Dist. v. Lindsay-Strathmore Irrigation Dist., 45 P.2d 972 (Cal. 1935).

[87] Shupe, *supra* note 8, at 491. Shupe notes that "the legal concept of waste is disturbingly dissimilar from its physical definition" of the volume of flow diverted that is not consumptively used. *Id.* at 491.

[88] However, in situations where local custom has lagged behind available, reasonable improvements in efficiency, the custom itself may be found to be wasteful. Erickson v. Queen Valley Ranch Co., 99 Cal. Rptr. 446, 450 (Cal. Ct. App. 1971).

[89] TARLOCK, *supra* note 1, § 5.16(3)(b). The absence of a technology-forcing requirement in the water quantity arena is thus in marked contrast to the regulation of water quality, where use of "best available technology," or a variation thereon, is required for pollution control. *See generally* WILLIAM H. RODGERS, JR., ENVIRONMENTAL LAW 54 (2d ed. 1994); Sidney Shapiro & Thomas McGarity, *Not So Paradoxical: The Rationale for Technology-Based Regulation*, 1991 DUKE L.J. 729 (1991).

[90] *In re* Water Rights in Silvies River, 237 P. 322 (Or. 1925).

[91] *Id.* at 325. *See also* WILLIAM G. LOY ET AL., ATLAS OF OREGON 169 (1976).

[92] *Silivies River*, 237 P. at 325.

constructed very little in the way of permanent irrigation works.[93] They placed dams and other obstructions in the river to increase the spring flooding over their land, and built canals and ditches only where necessary.[94] The court expressed some disdain for this low-tech irrigation style, even in 1925, and even though it was customary:

> It has long been the custom in Oregon to utilize sloughs and depressions in the ground in the construction and extension of ditches and canals, as a means of conveying water to lands for the purposes of irrigation. Such means, however, are obviously wasteful . . . and should be sanctioned only until a fair opportunity is had to construct ditches or canals and pipelines, or other artificial works, where necessary, to conserve the water and minimize the waste thereof . . . .[95]

However, it does not appear from the remainder of the opinion that the court actually limited anyone's water right on this basis. It seems instead that the court did in fact continue to sanction such methods.[96]

In 1930, in an appeal of a general adjudication of the rights to use water from the Deschutes River (another Oregon river on the dry side of the mountains), the Oregon Supreme Court said:

> It is a duty of the court in adjudicating water rights to suppress all wasting of water, and the court may go further and declare what shall constitute the economic use of the water and . . . fix its proper duty by a decree awarding the use of a certain amount of water for that purpose.[97]

However, when it came to carrying out its judicial duty to decree the proper water duty for irrigation uses in the Deschutes Basin, the court encountered some difficulty. The case had originally come to the Oregon Supreme Court in 1930. At that time, the court punted the problem back to the state engineer for a two-year study to determine the amount of water necessary "to produce fair results."[98] The state engineer came back with a 164-page study.[99] After examining seepage and evaporation losses that ranged as high as sixty-five percent for some of the irrigated lands at issue,[100] the state engineer said "it is believed" that repair and lining of canals might decrease these losses, but suggested that the irrigation districts do further studies to see if such improvements would be feasible.[101]

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93 *Id.* at 327.

94 *Id.* at 325.

95 *Id.* at 328.

96 In fact, similar methods are still being used in Malheur Basin today. *See* LOY, *supra* note 91, at 71 (describing flood irrigation in this area).

97 *In re* Water Rights of the Deschutes River, 286 P. 563, 577 (Or. 1930). The court is using the word duty in two ways: to describe the court's duty to enforce the law and suppress waste, and as a term of art in water law. In the latter usage, "water duty" means an amount of water specified per acre as necessary to grow typical crops. *See* TARLOCK, *supra* note 1, § 5.16(1).

98 *In re* Water Rights of the Deschutes River, 36 P.2d 585 (Or. 1934).

99 *Id.* at 585.

100 *Id.* at 586.

101 *Id.* at 587. My colleague Jim Huffman insists that a properly functioning market would solve this problem of feasible improvements with ease. Perhaps so. If the farmers in the

Faced with such equivocation, the court said: "After the careful investigation and experiments made by the state engineer, and according to the painstaking report, it does not appear that the percentage of losses determined and allowed by the trial court can be decreased."[102] Yet at the same time, the court noted that there was only one irrigation project in the entire state that had worse soil conditions for irrigation than the area in question, and that there was not enough water in the river to supply all the water awarded by the decree in any event.[103] The court concluded its discussion of duty (water duty, judicial duty, and the duty of the water master to carry out the decree) by essentially telling everyone to go out and do the right thing:

> A large amount of water was awarded to the Central Oregon Irrigation District [which had losses of 45%], and no doubt strenuous endeavor will be made to conserve all of the water possible with a true regard to the junior water rights . . . .[104]
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> [T]he land in cultivation at Cline Falls and the amount of water necessary . . . should be measured by the water master, or some competent person, and the amount of the water necessary to irrigate the same, limited by the duty of water and the irrigation season and in accordance with the decree of adjudication, . . . should be allotted by the water master and no more. . . . In other words, no water should be wasted . . . .[105]

The court thus affirmed its judicial duty to suppress waste by declaring the proper economic use of water, and affirmed the duty of the state engineer and his water masters to enforce whatever the court might declare on a day-to-day basis.[106] The court acknowledged that the users before them were losing, on average, half of their water in conveyance through leaky canals in poor soil.[107] But the court could not say for sure that they could do better, and because the methods were customary, the court still would not call the practices waste.[108] In other words, with a straight face, the court declared it to be a beneficial use without waste to irrigate in the Oregon High Desert, in an area containing some of the worst soils in the state, with conveyance losses of up to forty-five percent of the water diverted.[109] Of course, that result would probably be expected with a custom-based standard.

Deschutes Basin had to pay for their irrigation water, then presumably they would line their ditches when the cost of doing so would be exceeded by the value of the water saved, regardless of what a court said about waste. But in fact there is no such properly functioning market in western water, *see infra* Part IV.D, and water users are free to use (and lose) as much water as they want, until a court or agency declares it waste.

102 *Id.* at 588.

103 *Id.*

104 *Id.*

105 *Id.* at 589 (quoting Broughton v. Stricklin, 28 P.2d 219 (Or. 1934)).

106 *Id.* at 588.

107 *Id.*

108 *Id.*

109 *Id.*

About the same time, a California court faced a similar dilemma in trying to decide if challenged water usage was legally wasteful.[110] Plaintiff Tulare Irrigation District and others filed a quiet title action against defendant Lindsay-Strathmore Irrigation District to enjoin the defendant district from pumping water out of the watershed.[111] Appealing from a judgment for plaintiffs, the defendant argued that plaintiffs used poor methods of diversion, resulting in excessive water use and average conveyance losses of forty to forty-five percent.[112] The court discussed the issue of reasonable efficiency and waste at some length:

> There can be no doubt that [plaintiffs] as a group do not divert the water in the most scientific manner. There can be no doubt that in some cases, because of the paralleling of the ditches of some of the [plaintiffs], there is an uneconomic use of water. . . . The courts cannot and, even if they had the power, should not compel these appropriators, many of whom have been diverting water for over fifty years, at their expense, to build new systems of diversion. . . .
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> . . . .
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> An appropriator is not compelled either to irrigate in the most scientific manner known or to divert in the most scientific manner known. . . .
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> . . . .
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> . . . . He is entitled to make a reasonable use of the water according to the custom of the locality and as long as he does so, other persons cannot complain of his acts.[113]

The court noted that various studies introduced into evidence showed that many irrigation systems in the San Joaquin Valley had average conveyance losses exceeding forty percent, including federal reclamation projects, and that some losses ranged as high as almost sixty percent.[114] Against that standard, plaintiffs' forty percent losses in earthen ditches and porous soil were certainly customary.

Some courts during this time period did in fact find certain water uses to be wasteful. For instance, in 1922 the Idaho Supreme Court reviewed a claim of a water user to water that had been salvaged by changing from ditches to a pipeline.[115] The previous ditch system had lost more than half the water diverted in conveyance.[116] The court refused to allow the water user to keep all the water saved, noting that the previous losses were "unreasonable" and "excessive."[117] However, the court made it clear that it

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110 Tulare Irrigation Dist. v. Lindsay-Strathmore Irrigation Dist., 45 P.2d 972 (Cal. 1935).

111 *Id.* at 975.

112 *Id.* at 1009.

113 *Id.* at 1009-10 (citations omitted). The *Tulare* court did draw the line at drowning gophers, however, declaring that use nonbeneficial. *Id.* at 1007.

114 *Id.* at 1009.

115 Bassinger v. Taylor, 211 P. 1085 (Idaho 1922).

116 *Id.* at 1086.

117 *Id.* Idaho case law, in contrast to some other states, allows the right to conserved or "salvaged" water to inure to the benefit of the party who effected the savings. Reno v. Richards, 178 P. 81 (Idaho 1918). Other states reason that by conserving water, a water user simply demonstrates that the same beneficial use can be accomplished with less water, so the water right should shrink after the conservation, with the salvaged water going back to the system. *See, e.g.*, Southeastern Colo. Water Conservancy Dist. v. Shelton Farms, Inc., 529

was not the general loss of half the water in leaky ditches that was excessive, but the fact that the ditches unreasonably allowed water to spread out at several locations.[118] Apparently, unlined earthen ditches were acceptable, as long as they did not spill over too much.

In 1932, the federal district court in Montana also found certain irrigation ditches to be unreasonably wasteful.[119] The court recognized that a water user "is not bound to extraordinary diligence in means and method of use," but rather "reasonable care in construction and maintenance of appliances."[120] The court found that particular uses fell short of that standard, where the water was conveyed more than five miles from the point of diversion through open, poorly constructed, poorly maintained ditches (in places "no more than an injuriously wide and shallow brook"), allowing "excessive evaporation, seepage and absorption."[121] Although the court did not explicitly reduce the ditch owners' water rights by any given amount, it did refuse an injunction on behalf of those ditch owners against diversions by other water users until those defects were remedied.[122]

In the 1920s and 1930s, it was both customary and acceptable to irrigate poor soil with earthen ditches, losing half or more of the water in conveyance, as long as the ditches were really ditches and were only reasonably leaky. Even though competing water users made strenuous arguments that such use was wasteful, and the reviewing courts grappled at length with the issues, all the while decrying waste, in the end, the courts refused to declare the practices legally wasteful because they were customary.

Very little changed over the next half century. Water use had to be completely out of line with local custom or blatantly inefficient to merit an actual finding of waste from a court. For example, in 1957 the New Mexico Supreme Court declared a constantly flowing artesian irrigation well to be wasteful.[123] The trial court had upheld the rancher's use of a naturally flowing artesian well to irrigate native grasses for stock, but the Supreme Court reversed on a finding of waste. The water was allowed "to run uncontrolled for twenty four hours a day over grazing lands without an irrigation system" and without any floatmeters or controls of any kind.[124] The court noted the following: "Waste of water must not be practiced. Wasteful methods, so common among the early settlers[,] do not establish a vested right to their continuance. Such methods were only deemed a privilege,

P.2d 1321 (Colo. 1974) (water user salvaged water by removing phreatophytic vegetation; could not get decree to use salvaged water free of call); Salt River Valley Water Users' Assoc. v. Kovacovich, 411 P.2d 201 (Ariz. Ct. App. 1966) (water user could not spread conserved water to nonappurtenant land).

118 *Bassinger*, 211 P. at 1086. I cannot resist pointing out the irony of the names of the streams at issue in this case: "Dry Creek" and "Little Lost River."

119 Dern v. Tanner, 60 F.2d 626 (D. Mont. 1932).

120 *Id.* at 628.

121 *Id.*

122 *Id.*

123 New Mexico v. McLean, 308 P.2d 983 (N.M. 1957).

124 *Id.* at 987.

'permitted because it could be exercised without substantial injury to any one.'"[125]

Although the New Mexico court did not discuss custom specifically, the sense of the opinion is that this particular water user's method, though perhaps historically customary, may have been out of line with current local custom. The lazy method of simply letting artesian water run over the land was no longer sufficient, especially given increased pressures on the local supply.[126]

In 1971, another waste case reached the California appellate courts.[127] In *Erickson v. Queen Valley Ranch Co.*, the California court found the loss of five-sixths of the amount of a diversion in transmission to be wasteful.[128] In this case, the trial court had specifically found that these transmission losses were reasonable and consistent with local custom.[129] The appellate court acknowledged that "[i]t is doubtless true that water in the arid desert areas of Mono County is frequently transported by open ditch" and "that much of the flow may be lost by absorption and evaporation."[130] The court further noted that "an appropriator who has for many years conveyed water by earth ditches may not be compelled at his own expense to install an impervious conduit."[131] But at some point even a customary use can be disallowed, and the trial court was wrong to place "the seal of judicial approval on what appears to be an inefficient and wasteful means of transmission."[132] The New Mexico and California cases did not necessarily herald a tightening up on waste. Instead, they demonstrated irrigation behavior that was outside even the generous bounds of acceptable conduct.

Beginning in 1980, a series of cases arising out of an irrigation project in Nevada came to federal court, eventually resulting in several reported opinions from the Ninth Circuit Court of Appeals.[133] The project involved was the Newlands Project, the very first project authorized under the 1902 Reclamation Act.[134] The Newlands Project decisions outline a business-as-usual view of irrigation practices in arid western states consistent with the cases fifty years before.

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125 *Id.* (quoting Hough v. Porter, 98 P. 1083, 1102 (Or. 1909)).

126 *Id.* at 988 ("Water appropriators . . . on each of the artesian basins of the state are numerous. . . . The need for water is imperative, and often the supply is insufficient.").

127 Erickson v. Queen Valley Ranch Co., 99 Cal. Rptr. 446 (Cal. Ct. App. 1971).

128 *Id.*

129 *Id.* at 582.

130 *Id.* at 585.

131 *Id.* (citing Tulare Irrigation Dist. v. Lindsay-Strathmore Irrigation Dist., 45 P.2d 972 (Cal. 1935)).

132 *Id.* The losses in the Erickson case were approximately 83%. *Id.*

133 The two pertinent to this discussion are: *United States v. Alpine Land & Reservoir Co.*, 503 F. Supp. 877 (D. Nev. 1980) and *United States v. Alpine Land & Reservoir Co. (Alpine I)*, 697 F.2d 851 (9th Cir. 1983). The case was actually begun by the federal government as a quiet title action in 1925, and proceeded as a "virtually comprehensive adjudication" of the waters of the Carson River, with a decision finally rendered in the trial court in 1980. *Alpine I*, 697 F.2d at 853.

134 GARY A. HORTON, STATE OF NEVADA DEP'T OF CONSERVATION AND NATURAL RESOURCES, TRUCKEE RIVER CHRONOLOGY 25 (1995).

The Newlands Project involves diversions from both the Truckee and Carson Rivers in west-central Nevada, near Reno, for irrigation of approximately 73,000 acres of farmland.[135] The farmers grow alfalfa and other forage crops, which in turn feed dairy and beef cattle, to provide dairy and beef products to the Reno-Sparks-Lake Tahoe area, as well as some for export from the region.[136] The area's normal annual rainfall is only five inches, and this industry could not exist without irrigation.[137] The district court heard conflicting testimony on how much water was required to irrigate alfalfa in the project area, and eventually awarded water duties of 3.5 acre feet per acre for bottomlands and 4.5 acre feet per acre for benchlands.[138] The United States challenged those awards on appeal.[139] The Ninth Circuit noted that the proper irrigation water duty is:

> that measure of water, which, by careful management and use, without wastage, is reasonably required to be applied to any given tract of land for such period of time as may be adequate to produce therefrom a maximum amount of such crops as are ordinarily grown thereon. It is not a hard and fast unit of measurement, but is variable according to conditions.[140]

The court stated that "[i]t is settled that beneficial use expresses a dynamic concept"[141] but that it cannot include any element of waste, which thus "precludes unreasonable transmission loss and use of cost-ineffective methods."[142] So far, the opinion tells us nothing new, though one might question precisely how cost-effectiveness is supposed to be determined.[143] The court also suggested that a use "cannot be 'unreasonable' considering alternative uses of the water."[144] Applying all of these general pronouncements to the case at hand, the Ninth Circuit reasoned as follows:

1) the beneficial use controversy in the case was a matter of fact;

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135 BUREAU OF RECLAMATION, U.S. DEP'T OF INTERIOR, NEWLANDS PROJECT MAP (June 1988) [hereinafter NEWLANDS MAP].

136 *Id.*

137 *Id.*

138 U.S. v. Alpine Land & Reservoir Co., 503 F. Supp. 877, 888, *modified by*, Alpine I, 697 F.2d 851 (9th Cir. 1983), *cert denied sub nom.* Pyramid Lake Paiute Tribe v. Truckee-Carson Irrigation Dist., 464 U.S. 863 (1983).

139 *Alpine I*, 697 F.2d at 853.

140 *Id.* at 854 (quoting Farmers Highline Canal & Reservoir Co. v. City of Golden, 272 P.2d 629, 634 (Colo. 1954)) (additional citations omitted).

141 *Id.* at 855.

142 *Id.* at 854 (citations omitted).

143 The court's reference to cost-effectiveness, without further explanation, raises more questions than it answers. Cost-effective according to whom? The individual user only? Junior users? Society at large? And on what time horizon—one season only? Five years? A reasonable amortization period?

144 *Alpine I*, 697 F.2d at 854. It is not clear what the court meant by this. On the surface, the statement suggests that a water use, to be considered beneficial and valid, must survive some kind of a comparative review. Is this particular use more beneficial than some other use? That is an approach only occasionally taken by the courts, however. *See In re* Water Rights of Deschutes River & Tributaries, 286 P. 563 (Or. 1930).

2) there was uncontradicted testimony that the water duty awarded by the trial court reflected the amounts customarily provided to the farmers for the 75 years the project had been operating;
3) the irrigation district's evidence tended to show that the farmers' historical water use was reasonable;
4) although the government's evidence tended to show that historical crop yields could be obtained with less water, the testimony of the government's expert was essentially in agreement with the district's evidence once it was "corrected" for the fact that it was based on experimental rather than actual field conditions, and that it had improperly used 26 years of crop yield data as the baseline rather than the most recent decade of higher yields.[145]

At the end of the day, then, the Ninth Circuit upheld the water duties awarded by the trial court as "well within a permissible view of the weight of the evidence."[146]

The *Alpine* cases demonstrate how resistant to real change the beneficial use without waste doctrine has been. Some might question the wisdom of diverting nearly the entire flow of two rivers to grow alfalfa in a region that receives five inches of annual natural precipitation,[147] while destroying two native fish species in the process.[148] But the legal doctrine of beneficial use does not frame the question in those terms. Instead, the beneficial use analysis asks: Is irrigation a beneficial use? Of course. Are the methods used customary? Yes, for seventy-five years, farmers in the Newlands Project have grown alfalfa with water delivered through open, earthen ditches, with associated conveyance losses. Could they do better? Experiments suggest that perhaps they could, but since no one has actually tried it, we cannot be sure. Therefore, the court cannot legally force them to do better. In other words, until the custom changes for reasons entirely unrelated to the legal requirements, the courts will not rule anybody out of line. Once enough people change methods, then the waste doctrine can help pick up the stragglers. The pace of change, slow enough through common law evolution, is thus rendered even more glacial due to use of a customary standard.[149]

The substantive law on waste allows a wide range of acceptable conduct. The low expectations of the substantive law are then overlaid with procedural deference as well. An administrative agency might review and approve certain practices within the loose parameters of acceptable custom. A trial court then reviews the agency's factual determinations, giving due deference to the agency's expertise and its view of any conflicting evidence. The appellate court then gives appropriate deference to the trial court. By the time the matter reaches the highest appellate court, the question of whether the particular use of water makes any real sense is cloaked in three or four layers of cottony deference and discretion, un-

145 *Alpine I*, 697 F.2d at 856-57.

146 *Id.* at 857.

147 NEWLANDS MAP, *supra* note 135.

148 The Lahontan Cutthroat trout and the Cui-ui are both currently listed as endangered or threatened. 50 C.F.R. § 17.11 (1998).

149 *See supra* text accompanying notes 86-132.

likely to be unwrapped and scrutinized. Thus, the use of hundreds of thousands of acre feet of water per year to support a dairy industry in the Nevada desert continues unabated.[150]

At about the same time that the latest round of Newlands Project litigation was working its way through the Ninth Circuit, a California court again reached a decision that particular practices of water use were wasteful.[151] The California Department of Water Resources investigated the use of water by the Imperial Irrigation District (IID) in southern California.[152] The investigation came in response to a request by a neighboring nondistrict farmer whose land was being flooded by the Salton Sea which received the district's tailwater.[153] After a hearing, the State Water Resources Control Board (Board) issued a decision finding IID's water use wasteful and ordering the district to repair defective tailwater structures and develop a water conservation plan, including a plan for reservoir construction.[154]

The district challenged the Board's decision.[155] The court of appeals noted that "[t]here was no dispute . . . that very large quantities of water . . . were being lost" through canal spill and excessive tailwater and, although the parties' experts disagreed, "their differences were of degree, not kind."[156] The estimated losses ranged from 53,000 to 135,000 acre feet annually from canal spill, and from 312,000 to 559,000 acre feet annually

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150 And a fine industry it is. *See supra* text accompanying notes 135-36. I do not mean to denigrate the dairy farmers of the Lahontan Valley by questioning this water use in general.

151 Imperial Irrigation Dist. v. State Water Resources Control Bd. (IID I), 275 Cal. Rptr. 250 (Cal. Ct. App. 1990).

152 The Imperial Irrigation District encompasses an area where, historically, "sandstorms lashed across the desert in blinding sheets . . . ." Thomas E. Sheridan, *The Big Canal: The Political Ecology of the Central Arizona Project*, *in* WATER, CULTURE & POWER: LOCAL STRUGGLES IN A GLOBAL CONTEXT 162, 167 (John M. Donahue & Barbara Rose Johnston eds., 1998). Average annual precipitation is about three inches or less per year, while evaporation is about five feet per year. *Water Resources: Salton Sea/California*, WESTERN STATES WATER COUNCIL NEWSLETTER (WESTERN STATES WATER COUNCIL, Midvale, Utah), Spring 1998 (on file with author). The district was formed in 1911, and is now the single largest agricultural water user from the Colorado River, accounting for 2.87 maf annually, or almost 20% of the river's average annual flow. The district produces cotton, alfalfa, and produce. DALE PONTIUS, WESTERN WATER POLICY REVIEW ADVISORY COMM'N, COLORADO RIVER BASIN STUDY 13 (1997).

153 *IID I*, 275 Cal. Rptr. at 254. The Salton Sea was originally just the Salton "Sink," but it was flooded and enlarged to a lake 72 feet deep and covering 150 square miles in 1905, in part because of the irrigation canal cut from the Colorado River to the sink. Sheridan, *supra* note 152, at 168.

154 *IID I*, 275 Cal. Rptr. at 260.

155 Imperial Irrigation Dist. v. State Water Resources Bd. (IID II), 231 Cal. Rptr. 283 (Cal. Ct. App. 1986). Although originally the trial court ruled that the Board lacked jurisdiction to adjudicate the issue of unreasonable water use, that decision was reversed by the court of appeals. *Id.* The trial court then undertook a substantive review of the Board's decision, holding that the Board's findings were supported by the evidence, and that decision prompted a second appeal.

156 *IID I*, 275 Cal. Rptr. at 255.

from excessive tailwater.[157] The dispute centered on whether the losses were reasonable or wasteful.[158]

Although the *IID* case involved many important issues,[159] the heart of IID's challenge was that the Board's finding of unreasonable use of water should not be upheld. IID argued that if a water use is beneficial, it is by definition reasonable.[160] Thus, the fact that IID's canal spills and excessive tailwater produced benefit to Salton Sea fish and wildlife and power production made even those losses reasonable.[161] In response, the court quoted the 1935 *Tulare* opinion:

> What is a beneficial use, of course, depends upon the facts and circumstances of each case. What may be a reasonable beneficial use, where water is present in excess of all needs, would not be a reasonable beneficial use in an area of great scarcity and great need. What is a beneficial use at one time may, because of changed conditions, become a waste of water at a later time.[162]

The district argued that the power being exercised by the state Water Resources Control Board represented a substantial erosion of the district's autonomy and an unfair intrusion into its business.[163] However, the court rejected this argument and affirmed the Board's decision finding IID's water use practices unreasonable and wasteful.[164] The court commented:

> It is time to recognize that this law is in flux and that its evolution has passed beyond traditional concepts of vested and immutable rights . . . . In affirming this specific instance of far-reaching change, imposed upon traditional uses by what some claim to be revolutionary exercise of adjudicatory power, we but recognize this evolutionary process, and urge reception and recognition of same upon those whose work in the practical administration of water distribution makes such change understandably difficult to accept.[165]

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157 *Id.*

158 *Id.* Because the disagreement was thus over ultimate facts rather than basic facts, the appellate court reviewed the decision more as a "conclusion of law than an issue of fact." *Id.* Characterizing the issue this way allowed more scrutiny by the appellate court and less deference to factual findings below. *But see* United States v. Alpine Land & Reservoir Co. (Alpine I), 697 F.2d 851, 856 (9th Cir. 1983) (treating beneficial use as a matter of fact).

159 The appellate court first rejected IID's argument that state law had vested local irrigation districts, rather than the Board, with the power to determine which irrigation practices are reasonable. The court next rejected IID's argument that any interference by the Board with IID's water rights, as vested property rights, violated due process as a taking without compensation. *IID I*, 275 Cal. Rptr. at 260-61. Noting that "there can be no doubt that the Board's intrusion into IID's previously untrammeled administration of the use of water in its district was substantial," nonetheless the court found no unconstitutional taking. *Id.* at 260. "Put simply, IID does not have the vested rights which it alleges. It has only vested rights to the 'reasonable' use of water. It has no right to waste or misuse water." *Id.* at 261.

160 *Id.* at 265.

161 *Id.*

162 *Id.* (citations omitted). Of course, it is worth recalling that in spite of that language, the Tulare court still upheld 40% conveyance losses. *See supra* text accompanying notes 86, 110-14.

163 *IID I*, 275 Cal. Rptr. at 266.

164 *Id.* at 267.

165 *Id.*

Although the court's language is perhaps more diplomatic, a loose translation might be "buck up, little buckaroo."

The most recent court decisions on the waste doctrine have emerged from general stream adjudications in Washington[166] and Idaho.[167] In 1993, the Washington Supreme Court decided an appeal arising out of the adjudication of water rights in the Marshall Lake and Marshall Creek drainage basins in eastern Washington.[168] One party of the many whose claims were adjudicated appealed the trial court's decree.[169] In the claim at issue, Clarence and Peggy Grimes had requested three cfs flow rights for irrigation and 1520 acre feet of storage rights in Marshall Lake reservoir for domestic supply, irrigation, and recreation.[170] The decree instead awarded them 1.5 cfs and 920 acre feet of storage, more than 3/4 of which was for evaporative loss.[171]

The Supreme Court affirmed the trial court's award,[172] holding that the reliance by the referee (and in turn by the trial court) on a "generic water duty" for irrigation of alfalfa in the Marshall Lake basin to determine a reasonable water right for the Grimeses was supported by a preponderance of the evidence.[173] The measurement of the water duty was derived from the expert testimony of a state employee, who, in turn, relied upon a study by Washington State University that had examined water requirements for specific crops in forty locations around the state, including one location that was five miles from Marshall Lake.[174]

Mr. Grimes had testified that his existing system (utilizing fifty-six sprinklers, among other things) required a flow of up to three cfs to deliver one cfs to his seventy-three acre field.[175] He apparently acknowledged that the system was "highly inefficient, causing one-half to two-thirds loss of water."[176] The decreed water duty allowed him only a twenty-five percent conveyance loss.[177]

The court noted that reasonable, not absolute, efficiency is required.[178] The court further stated that "[w]hile customary irrigation practices common to the locality are a factor for consideration, they do not justify waste of water."[179] Although the Washington Supreme Court's opin-

166 Washington Dep't of Ecology v. Grimes, 852 P.2d 1044 (Wash. 1993).

167 *In re* SRBA, No. 39576 (Twin Falls County Court, Idaho 1997) (Special Master's Findings of Fact) (Subcases 34-00060, 34-00259F, 34-00738E, 34-02412C and 34-13562).

168 *Grimes*, 852 P.2d at 1044.

169 *Id.* at 1047. In fact, the Grimeses only appealed the decree as to one of five claims they had submitted. Three of their other four claims had been confirmed as requested, and one denied. *Id.* Although the appeal only involved one set of water rights, a group of 35 irrigation districts appeared on the users' side as amicus curiae.

170 *Id.*

171 *Id.*

172 *Id.* at 1051.

173 *Id.*

174 *Id.* at 1050-51.

175 *Id.* at 1051.

176 *Id.*

177 *Id.*

178 *Id.* at 1051-52. The court does not say what it means by absolute efficiency.

179 *Id.* at 1053 (citations omitted).

ion never explicitly said that the Grimeses' use was wasteful and out of line with local custom, it certainly implied as much,[180] eventually affirming the lower court's decree awarding the Grimeses only half the amount they had claimed.[181] The court furthermore turned away a takings challenge for the diminishment of the appropriation, because beneficial use "operates as a permissible limitation on water rights."[182]

The efforts of a state agency to use expert testimony on appropriate water duties to limit historical water use were not as successful in the Idaho adjudication.[183] In a recent opinion by one of the special masters in the Snake River Basin Adjudication, the court refused to accept the agency's recommended level of efficient water use.[184] The Director of the Idaho Department of Water Resources (Idaho Department) recommended that a particular water user be limited to a diversion of 4.13 cfs, rather than the 5.96 cfs that the farmer had requested and apparently had been using.[185] The farmer testified that he had been irrigating his land using a border system of irrigation for over sixty years.[186] The Idaho Department concluded that using 5.96 cfs was not a reasonable beneficial use because it was inefficient.[187] Based on computer modeling, the Idaho Department had calculated "a theoretical quantity it believes is sufficient if Anderson improves his irrigation system."[188]

The special master expressed frustration with being asked to apply a theoretical efficiency level to reduce a water user's right below the level of historic use:

> Mr. Peppersack [Department employee] has never been to Anderson's farm nor observed the irrigation system from which Anderson irrigates. He did not consider the historical use of water at the Anderson farm and did not compare historical use to his recommendation. IDWR believes Anderson's farm should be irrigated more efficiently . . . .
>
> The Idaho Supreme Court has, like courts in other western states, prohibited water users from wasting water.
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> However, the Hubble Analysis goes beyond traditional notions of prohibiting waste. The Hubble Analysis provides a *theoretical* calculation of the quan-

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180 *Id.* at 1051, 1054.

181 *Id.* at 1055.

182 *Id.* (citations omitted).

183 *In re* SRBA, No. 39576 (Twin Falls County Court, Idaho 1997) (Special Master's Findings of Fact) (Subcases 34-00060, 34-00259F, 34-00738E, 34-02412C, and 34-13562).

184 *Id.* at 6.

185 *Id.* at 1.

186 *Id.* "A border system uses surface water applied by gravity. Borders of earth are built up at intervals [about 60 feet apart on this field] to guide water down the field." *Id.* at 3.

187 *Id.* at 2.

188 *Id.* The computer modeling process is known as the "Hubble Analysis," named after the engineering firm that developed the model for the Idaho Department of Resources. The Hubble Analysis involves integration of multiple variables (including irrigation system, soil type, crop type, root depth, field length, set times (the period of time for irrigating), conveyance losses, and evapotranspiration rates) through use of a computer program to determine field application efficiency. *Id.* at 4. In fact, in this instance the Idaho Department of Water Resources used a furrow system as the irrigation system variable, rather than a border system, because it felt that border systems are inefficient and a furrow system is similar. *Id.*

> tity a water user *should* need if he improves his historical irrigation system to comply with IDWR standards of "reasonable efficiency." The Hubble Analysis did not account for historic use and disregarded the type of irrigation system historically used. The policy of requiring "optimum efficiency" from water users has not been recognized by the legislature or the Idaho Supreme Court. This court declines to adopt this requirement as law where neither the legislature nor the Idaho Supreme Court has adopted the policy. Anderson did not waste water . . . .
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> . . . .
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> The Hubble Analysis is undoubtedly a useful engineering tool. But this court is not persuaded that it is superior to a lifetime of observations on the Anderson farm.[189]

What is the difference between Mr. Grimes and Mr. Anderson? Why was the Washington Department of Ecology successful in reducing the Grimes water right, while the Idaho Department of Water Resources failed to convince the court to limit the Anderson right? The easy answer could be that Mr. Grimes was truly wasting water, while Mr. Anderson was not. Another possibility could be that the Washington court was more willing to push water users to adopt better irrigation methods than the Idaho court. Both of those explanations may have some validity, but they miss some important points. Idaho's proof was theoretical, based on a computer model.[190] The model itself must have been developed using experimental data, but perhaps the agency did not explain that well enough to persuade the court of its practical application and validity.[191] Washington's proof, on the other hand, seemed to be more reliant on actual field data.[192]

The Idaho court criticized the Department of Water Resources for not having visited the Anderson farm.[193] Though it is not apparent whether the Washington agency employees had visited the Grimes farm, they did use actual data from a point within five miles of the farm.[194] There is also the fact that Mr. Grimes admitted to some inefficiency, whereas Mr. Anderson steadfastly insisted that he was efficient and diligent, even staying up all night while he was irrigating to avoid wasting water.[195]

These differences probably account for the difference in result more than any real absolute difference between the two uses. After all, both Mr.

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189 *Id.* at 4, 6-7 (citations omitted).

190 *Id.* at 2.

191 *Id.*

192 Washington Dep't of Ecology v. Grimes, 852 P.2d 1044, 1050-51 (Wash. 1993).

193 *In re* SRBA, No. 39576 (Twin Falls County Court, Idaho 1997) (Special Master's Findings of Fact) (Subcases 34-00060, 34-00259F, 34-00738E, 34-02412C, and 34-13562).

194 *Grimes*, 852 P.2d at 1050.

195 *In re SRBA*, No. 39576 at 5; *see also Grimes*, 852 P.2d at 1051. Without meaning any offense to anyone, and especially not to Mr. Anderson, I am reminded of a bumper sticker I saw recently that said "Jesus is coming: look busy!" One could also say, "[t]he watermaster is coming: look busy!" There is a sense in which the beneficial use doctrine rewards those who look busy, regardless of whether the activity actually makes sense. Manually guiding water through ditches in the middle of the night seems more responsible than letting leaky sprinklers run unattended, but focusing on those details avoids the larger question of how to encourage efficient use of a public resource on a larger scale.

Grimes and Mr. Anderson used significant amounts of water per acre to irrigate in similar country.[196]

Even the *Imperial Irrigation District* case seems less revolutionary when it is scrutinized carefully. Although the irrigation district had been using water the same way for years, the problems caused by its excess spillage had grown worse in recent years, giving rise to the specific complaint of a neighboring landowner whose land was being flooded as a result.[197] Thus, there was actual damage to another user, beyond the usual situation of not getting one's water.[198] The district really had very little control over its water, and just sent it through the system of ditches with no dams or other means to control the flow and delivery.[199] In this sense, it was committing some of the same sins that had bothered courts as far back as 1957[200] and even during the 1920s and 1930s.[201] The fact that the transgressor was one of the largest irrigation districts in the state, and that the practices had gone unchallenged for eighty years, perhaps says more about the consequences of leaving waste enforcement primarily to the courts than it does about the actual conduct at hand.[202] This does not mean that the district was not wasting water; it suggests instead that waiting for a case to come to court is a rather inefficient way of encouraging irrigation districts to change their methods.

4. Summary of the Beneficial Use Doctrine in the Courts

Some important observations emerge from a critical reading of a century of beneficial use, waste, and forfeiture cases. From state to state there is very little variation in how the concept of beneficial use has been developed and applied, to the point that beneficial use can be said to be a matter of general common law throughout the western states.[203] This is true in spite of some distinctions in constitutional and statutory treatment of beneficial use among the states.

Beneficial use is a somewhat flexible concept, changing over time to accommodate developments in thinking about water use, such as changes in science and values. In that regard, most of the western states now in-

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196 *In re SRBA*, No. 39576 at 3; *Grimes*, 852 P.2d at 1051.

197 Imperial Irrigation Dist. v. State Water Resources Control Bd. (IID I), 275 Cal. Rptr. 250 (Cal. Ct. App. 1990); *see also* WESTERN STATES WATER COUNCIL, *supra* note 152 (Salton Sea elevation is 25 feet higher than it was in the 1920s).

198 *IID I*, 275 Cal. Rptr. at 254.

199 *Id.* at 265.

200 *See* New Mexico v. McLean, 308 P.2d 938, 998 (N.M. 1957) (regarding water allowed to run uncontrolled for twenty-four hours a day over grazing lands "without a constructed irrigation system" and without floatmasters or controls) (discussed *supra* notes 123-26).

201 See cases cited *supra* notes 115-22 for discussion of overflowing ditches.

202 The lack of challenge for so long also certainly reflects the political power of the irrigation district, which the court candidly acknowledged. *IID I*, 275 Cal. Rptr. at 266. Furthermore, in *IID I*, the layers of discretion and deference that exist when an appellate court reviews a trial court, which in turn has reviewed an agency, worked in favor of upholding the waste finding, rather than upholding the practice. *See supra* text accompanying note 150.

203 *See supra* note 23.

clude among the types of uses deemed beneficial, uses that were not part of the early twentieth century legal landscape, such as scenic and aesthetic uses, recreation, fish and wildlife habitat, and other instream uses of water.[204]

Courts have performed an important, but constrained, role in clarifying and applying the doctrines of beneficial use, waste, and forfeiture. Court cases have been helpful in giving the thumbs up or thumbs down signal on what uses qualify as beneficial under the law, and they have allowed the list of acceptable uses to evolve and change along with the evolution in values, knowledge about water use impacts, and understanding about the importance of water for somewhat nontraditional purposes.[205] Courts have corrected the outlier cases, identifying the most egregious uses as nonbeneficial or wasteful.[206]

As with any common law doctrine, however, change is inevitably slow-paced—evolutionary and incremental rather than revolutionary—and rarely proceeds in a straight line. This is particularly true for the amount component of the doctrine as opposed to the type component. Though courts have found it relatively easy to impose partial forfeiture for nonuse of water,[207] they have had more difficulty giving any real teeth to the waste doctrine.[208] In one hundred years of waste cases, only a handful of activities have been declared wasteful.

Case law is inherently limited in how effective it can be. Because cases arise sporadically, on the occasional challenge to a specific use, they can only sketch out partial boundaries based on the most extreme situations. The use of a customary standard continues to insulate historic practices, retarding the doctrine's evolution even more. Methods of irrigation that have not changed since the late 1800s are acceptable precisely because they are still in widespread use, and thus customary, even if much more efficient practices are available and would be possible and even practical. Where waste is identified by a court, usually the methods under review are pretty obviously beyond the limits of acceptable water use, and other courts would probably have decided the same cases similarly. Like pornography, if waste is bad enough, we know it when we see it.[209] But case law does not and cannot address the question of a reasonable or desirable level of efficiency systematically, even in general stream adjudications.

In fact, when it comes right down to it, the common law beneficial use doctrine, as it has developed over the past century, does not appear to be an efficiency-seeking doctrine at all. It is instead a laissez-faire legal doctrine that leaves the water users alone for the most part, once in a while reining in a bad actor or an especially egregious practice. Whether

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204 *See supra* text accompanying note 51.

205 *See* Part II.B.2.

206 *See* Part II.B.2 and II.B.3.b.

207 *See* Part II.B.3.a.

208 *See* Part II.B.3.b.

209 Justice Stewart, after struggling to define hard core pornography, said, "I know it when I see it." Jacobelli v. Ohio, 378 U.S. 184, 197 (1964) (Stewart, J., concurring).

or not that is the most effective approach is an important question. If more efficient practices are needed to stretch the West's water supplies, they are not likely to come from the slow development of western states' common law. An imprecise standard enforced primarily through case law is inherently a cumbersome way to encourage efficiency. Any comprehensive attempt to flesh out the waste doctrine or create general efficiency standards would seem more likely to come from legislatures or agencies. The next section explores legislative and agency activity in recent years.

C. Western Legislative and Administrative Efforts at Improving Water Use Efficiency

1. The Role of Legislatures

For the most part, western legislatures seem to have been satisfied to leave the beneficial use doctrine to the courts, only occasionally giving further statutory direction, usually in response to crises, such as severe local water shortages.[210] In these instances, the legislature (or the state water management agency at the legislature's direction) typically takes a more assertive, proactive role in prescribing appropriate and allowable amounts of water use, instead of leaving that decision to the individual water users within judicial sidebars. Some states have also passed statutes that bypass the question of beneficial use without waste entirely, and simply provide incentives to use less water to free up water supplies for additional uses.[211]

2. Legislation in Response to Crises

a. Critical Groundwater Management Programs

Several western states now have some form of critical groundwater management program.[212] Such programs generally have the following characteristics: 1) a trigger mechanism of some sort to identify a problem area with an acute water shortage or overdraft,[213] 2) a designation of a geographic area in which the problem exists and which will be included in

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[210] *See, e.g.*, N.M. STAT. ANN. § 72-1-2.2 (Michie 1978); OR. REV. STAT. § 536.710 (1994); WASH. REV. CODE ANN. § 43.37.210 (West 1997).

[211] *See, e.g.*, CAL. WATER CODE § 1004 (West 1966); IDAHO CODE § 42-217 (1989).

[212] *See, e.g.*, ARIZ. REV. STAT. ANN. § 45-401-636 (West 1994 & Supp. 1997); CAL. WATER CODE §§ 12920-12924, §§ 10750-10767, §§ 12879-12879.6 (West 1994 & Supp. 1998); IDAHO CODE § 42-233a to 42-241 (1996 & Supp. 1998); KAN. STAT. ANN. § 82a-1038 to 82a-1376 (1997); MONT. CODE ANN. §§ 85-2-506 to 85-2-520 (1997); NEB. REV. STAT. §§ 46-656 to 46-674.20 (1993 & Supp. 1997); OR. REV. STAT. §§ 537.730-537.742 (1997); WASH. REV. CODE ANN. §§ 90.44.400-90.44.500 (West 1998); WYO. STAT. ANN. §§ 41-3-912 to 41-3-919 (Michie 1997).

[213] *See, e.g.*, MONT. CODE ANN. § 85-2-506(2)(a) (1997) (trigger of withdrawals in excess of recharge). Sometimes the problem to be addressed is not the lack of enough water to go around, but rather a well interference problem. Well interference occurs where wells are spaced too closely together, and the hydraulic cone of depression created by each well interferes with pumping by other wells close by. The solution to these problems is to regulate well spacing and pumping rates; if that is done, there is enough water for everyone. On the other hand, it is the groundwater crises that have to do with overdraft and insufficient supply for all pumpers that are pertinent to this Article.

a special management area,[214] and 3) special requirements that apply within the designated management area to try to address the problem.[215] Meanwhile, the rest of the state outside the specially designated area continues under the regular management scheme.

Most of the critical groundwater management programs do not directly regulate methods of water use. Instead, the programs simply prohibit new wells and require reductions in pumping by existing users, often on a pro rata basis, leaving it up to the individual water users how they will adjust to that reduction.[216] An irrigator, for example, could respond by irrigating fewer acres, changing crops, using more efficient methods to support the same use with less water, or, perhaps acquiring substitute water. The specific requirements are normally developed by administrative agencies under general statutory authorization, but even the rules normally relate only to how much water can be pumped, without any directions as to how that water can or should be used once withdrawn.[217]

How do such programs change the beneficial use doctrine? At the very least, the question of what constitutes beneficial water use is placed in a larger context. By legislating additional state control to limit the amount of water use in critical areas, these states are declaring that private use of water, even under vested rights, occasionally must give way to the larger public interest. Or, in other words, even though each individual user's water use may be beneficial in the abstract, the cumulative impact of all uses is unsustainable and unacceptable. The overall harm of groundwater overdraft or depletion of water supply is greater than the benefit of individual uses, and the police power can be used to restrict the harm. Groundwater in a particular aquifer is a classic "commons" resource.[218] Each person's withdrawal is valuable to him but has costs to others and to the aquifer that the user does not take into account. Eventually, the users themselves are damaged when the aquifer is drawn down beyond their reach or entirely depleted. Governmental intervention is an effective and accepted means to address commons problems, in order to foster a more socially optimal use of the resource.

To some extent, critical groundwater management simply displaces the notion of beneficial use with a crisis response. The fact that a user is beneficially using water, even without legal waste, is beside the point; faced with an emergency of sorts, everyone must cut back. It is interesting that so far this sort of critical area management has only been applied to

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214 *See, e.g.*, WYO. STAT. ANN. § 41-3-912(c) (Michie 1997) (area defined geographically and stratigraphically).

215 *See, e.g.*, WYO. STAT. ANN. § 41-3-915(a) (Michie 1997) (corrective controls can include prohibition of additional appropriations, pro rata cutbacks, or termination of junior withdrawals; voluntary agreements among pumpers are also encouraged).

216 *Id.*; *see also* MONT. CODE ANN. § 85-2-507(4)(a)-(g) (1997) (corrective provisions can include prohibiting further appropriations and apportioning permissible withdrawal among users).

217 *See, e.g.*, OR. ADMIN. R. 690-507-0610 to 690-507-0840 (1998).

218 *See* Garret Hardin, *The Tragedy of the Commons*, 162 SCI. 1243 (1968).

groundwater and has not been used generally for surface water.[219] Faced with a surface water shortage, temporal priority controls and allocates the available water to seniors only.[220] The same approach could be used to deal with groundwater shortages,[221] but legislatures seem more willing to mandate an approach of sharing the shortage of groundwater.[222]

One particular critical groundwater program deserves closer scrutiny because it goes beyond simply requiring reduced pumping and directly regulates the methods of water use. The Arizona Groundwater Act (Act) was passed in 1980 in response to overdraft in some groundwater basins totaling as much as two million acre feet over safe annual yield.[223] The Act originally established four active management areas (AMAs); a fifth has since been added.[224] The AMAs cover about eighty percent of the state's population and sixty-nine percent of the overdraft.[225] Within the AMAs, groundwater use is strictly regulated, with the goal in most areas of reducing withdrawals to the level of safe annual yield by 2025.[226]

Two significant features of the Act's regulation within AMAs pertinent to this discussion are as follows: 1) a prohibition against bringing any new

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219 Some states do have special provisions for surface waters during droughts, but they usually provide only for short-term changes in how water rights may be exercised. *See, e.g.*, OR. REV. STAT. §§ 536.700-536.780 (1997). Oregon's drought statutes explicitly authorize the state, during declared droughts, to require agencies and political subdivisions to develop plans to promote conservation, salvage, and reuse of water, and to prevent waste. OR. REV. STAT. § 536.780 (1997).

220 This is precisely what distinguishes the prior appropriation doctrine from the riparian doctrine; in the latter system, all users cut back on a pro rata basis in times of shortage. Of course, each of these methods is arbitrary to some degree, and neither decides cutbacks with reference to the value (economic or otherwise) of the various uses.

221 In fact, some western states do follow strict priorities rather than pro rata reductions in dealing with groundwater overdraft. *See, e.g.*, Baker v. Ore-Ida Foods, Inc., 513 P.2d 627 (Idaho 1973) (explaining that Idaho law prohibits overdraft; priorities would be used to bring withdrawal back within safe annual yield, as long as seniors use reasonable pumping methods).

222 Why is this? The answer is probably a combination of history, politics, and science. In most places, intensive groundwater use came later than surface water use. In some cases, that puts surface water users in a senior (and thus more favorable) position, giving them both more legal and political power than later groundwater users. In addition, some western states do not apply a pure prior appropriation system to groundwater, but use different allocation doctrines and mechanisms. Finally, the fact that many aquifers recharge, if at all, much more slowly than surface water sources, means that simple enforcement of priorities on a short-term basis will not necessarily solve shortages.

223 *See generally* Desmond D. Connall, Jr., *A History of the Arizona Groundwater Management Act*, 1982 ARIZ. ST. L.J. 313; Jon L. Kyl, *The 1980 Arizona Groundwater Management Act: From Inception to Current Constitutional Challenge*, 53 U. COLO. L. REV. 471 (1982). Both articles stress that a major reason the Arizona legislature acted to curb groundwater use was because the federal government had made solving the groundwater problem a condition for federal funding of the Central Arizona Project, a surface water project to deliver Arizona's share of Colorado River water.

224 ARIZ. REV. STAT. ANN. §§ 45-411, 45-411.03 (West Supp. 1997).

225 Kyl, *supra* note 223, at 482.

226 ARIZ. REV. STAT. ANN. § 45-562 (West Supp. 1997).

agricultural land under irrigation,[227] and 2) authorization of mandatory efficiency measures for all water users, supported by measurement and reporting requirements.[228] The specific requirements implementing these mandates are established by the Arizona Department of Water Resources (Arizona Department) in a series of management plans.[229]

The Arizona Department has developed detailed standards for achieving significant improvements in water use efficiencies in order to meet the overall goal of ending groundwater overdraft by the year 2025.[230] To develop the standards, the Arizona Department studied existing water uses in various sectors of the economy, such as irrigation (including landscaping and golf courses, as well as agriculture), municipal use, and industrial use.[231] With the help of technical advisory groups and user groups, the Arizona Department then developed a range of conservation alternatives and assessed the costs, benefits, and environmental and social impacts of the alternatives.[232] Eventually, the Arizona Department was able to formulate specific conservation measures for the various water use sectors.[233] Those measures represent the Arizona Department's judgment of reasonably achievable levels of efficiency, and they form the basis for regulation of legal water use.[234] In other words, once the Arizona Department adopts conservation requirements in management plans for AMAs, they become mandatory maximum water use levels for all water rights holders using groundwater in those areas. There is some additional incentive for achieving even greater water savings because the statute also adopted a charge for the use of groundwater, based on the volume used.[235]

The required conservation methods vary by sector of water use. For municipal use, "reasonable reductions" in daily per capita water use are required, with specific targets set individually for each water provider.[236] The industrial sector must comply with the following technology standard: use of the "latest commercially available conservation technology consistent with reasonable economic return."[237] Irrigated agriculture (responsible for nearly ninety percent of the water use in the state)[238] must comply with water duties developed for localized areas, based on a standard of

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227 *Id.* § 45-452. Additional areas outside of AMAs can also be designated as "irrigation non-expansion areas." *Id.* § 45-432.

228 *Id.* §§ 45-563 to 45-563-01. *See generally* Kyl, *supra* note 223, at 491-94.

229 ARIZ. REV. STAT. ANN. § 45-563 (West Supp. 1997).

230 *See generally* Katherine Jacobs & Thomas Carr, Groundwater Management in Arizona: An Evolving Prospective 1 (unpublished presentation) (on file with author). Ms. Jacobs and Mr. Carr were both Area Directors for Active Management Areas in Arizona.

231 *Id.* at 7-11.

232 *Id.*

233 *Id.* at 9-11.

234 *Id.* at 15.

235 ARIZ. REV. STAT. ANN. § 45-611 (West 1994 & Supp. 1998).

236 Jacobs & Carr, *supra* note 230, at 10.

237 *Id.* at 11.

238 Kyl, *supra* note 223, at 473.

"maximum conservation consistent with prudent long-term management practices."[239]

To determine "maximum conservation consistent with prudent long-term management practices," the Arizona Department performed detailed economic and technical analyses, including five years of gathering data on soils, leaching, irrigation technology, and fifty-six different crop budgets around the state.[240] At the end of its investigation, the Arizona Department determined that adopting methods of level basin irrigation and trickle irrigation would result in the most water savings for agriculture.[241] After preparing an economic feasibility analysis for implementing these methods in different areas, the agency determined that most farms within the AMAs could reasonably achieve irrigation efficiencies of eighty-five percent by the year 2000.[242]

The preferred method of implementing the efficiency standards in Arizona is through voluntary compliance.[243] The Arizona Department carries out a comprehensive public education campaign, working cooperatively with the county agricultural extension agents to get the word out to farmers and other water users about the requirements and to help the users develop compliance plans.[244] However, if voluntary compliance is not forthcoming, enforcement can occur through administrative enforcement proceedings, penalties, and even criminal prosecution.[245]

The Arizona statute represents a significant change in traditional notions of beneficial use and waste. For instance, the prohibition against bringing new land under irrigation is tantamount to a legislative declaration that from here on out, at least in certain areas of Arizona, irrigated agriculture will no longer be a beneficial use of ground water, although significant existing irrigated acreage will, of course, be grandfathered. Further, in imposing mandatory efficiency measures, the Arizona legislature recognized that Arizona's critical overdraft problem could not wait for gradual changes in custom and slowly evolving improvements in water use practices under the common law waste doctrine enforced by the judiciary. Arizona's program thus jump starts the waste doctrine by pushing custom toward more efficient practices. The eighty-five percent efficiency target for Arizona groundwater users is a far cry from efficiencies as low as thirty-five to forty percent that have received the judicial stamp of approval in the past.[246]

Arizona's Groundwater Management Act stands out because of its aggressive regulatory approach to mandating conservation and efficiency. No other state in the intervening decade has even approached that level of comprehensive management and regulation of water efficiency stan-

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239 Jacob & Carr, *supra* note 230, at 9.

240 *Id.*

241 *Id.*

242 *Id.*

243 *Id.* at 13-14.

244 *Id.*

245 *Id.* at 15.

246 *See supra* Part II.B.3.b.

dards.[247] Contrasting other legislative efforts with the Arizona program, however, will round out the discussion of the legislative approach to the beneficial use doctrine up to the present time, and begin to lay the groundwork for discussing the potential for legislative action to further adapt the beneficial use doctrine for life in the twenty-first century.

b. The Oregon Plan

Another legislative effort, potentially leading to more aggressive state regulation of water use in response to a crisis, is the Oregon Plan for Salmon and Watersheds, now known as "the Oregon Plan."[248] The Oregon Plan is a comprehensive state program originally created to restore coastal salmon and thereby to convince the National Marine Fisheries Service (NMFS) not to list Oregon coastal salmon species under the Endangered Species Act.[249] In April 1997, the state and NMFS entered into a memorandum of agreement whereby NMFS deferred listing coastal salmon stocks to let the state try its plan, under strict timelines for showing improvement in conditions for the fish.[250] However, in June 1998, an Oregon federal court held that "it was arbitrary and capricious for [NMFS] to rely on future, voluntary and untested habitat measures" promised in the state's restoration plan, in the hope that the state's actions would alter the current threatened status of the species.[251] Nevertheless, the state is proceeding to implement the plan and has broadened the plan's scope beyond the coast, to attempt to reverse the decline of salmon and steelhead stocks statewide.[252]

The lion's share of the Oregon Plan has nothing to do with the beneficial use doctrine or waste, or with water rights at all. Much of the plan concerns fisheries management, habitat management, and other land use practices, especially relating to the timber industry.[253] But one measure included in the plan relates to efficiency in water use practices.[254] The Oregon Water Resources Department (Oregon Department) stated that it

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[247] Of course, not even Arizona's program is truly comprehensive. It leaves out a good portion of the state, and does not cover surface water at all. *See* Jacobs & Carr, *supra* note 230, at 1.

[248] *The Oregon Plan* (last modified Nov. 5, 1998) <http://www.oregon-plan.org/> [hereinafter *The Oregon Plan*]. The Oregon Plan was originally called the Oregon Coastal Salmon Restoration Initiative. The details of the plan were not codified in statute, but were referred to in Chapters 6, 7, 8, and 39 of the 1997 Oregon session laws. 1997 Or. Laws 6, 7, 8, 39.

[249] *The Oregon Plan*, *supra* note 248.

[250] Endangered and Threatened Species; Threatened Status for Southern Oregon/Northern California Coast Evolutionary Significant Unit (ESU) of Coho Salmon, 62 Fed. Reg. 24,588, 24,605-06 (May 6, 1997).

[251] Oregon Natural Resources Council v. Daley, 6 F. Supp. 2d 1139, 1159 (D. Or. 1998). The court found that NMFS had expressed concerns and criticisms about whether the state's plan would be sufficient to change the species status which NMFS itself had found to warrant listing. *Id.* at 1148-49.

[252] Draft Exec. Order, The Oregon Plan for Salmon and Watersheds (1998) (on file with author) (Oregon's governor had not signed the final version prior to publication; however, it was anticipated that it would be signed by early February, 1999).

[253] *The Oregon Plan*, *supra* note 248.

[254] *Id.*

would develop "regional efficiency standards" as part of the plan, in order to reduce consumptive water use and improve stream flows for fish habitat.[255] The Oregon Department explained the measure as follows:

> Water rights grant the user the amount of water which can be used beneficially to meet a specific purpose. Watermasters restrict the amount of water diverted when they discover practices which "waste" water due to inefficiencies. Stopping inefficient uses results in less water being diverted, and therefore, more water is left in the stream to meet instream demands.[256]

The Oregon Department proposed to form interdisciplinary working groups in basins with stream flow problems and to develop basin-specific efficiency standards by June of 1999.[257]

The Oregon Department efforts got off to a slow start. In fact, the 1998 Annual Report on the Oregon Plan prepared by the governor's office reported that "[t]he Water Resources Department has not made significant progress developing regional efficiency standards. This concept is controversial and divisive. It is unlikely that agreement on appropriate goals can be achieved in the timeframe contemplated under the Oregon Plan."[258]

Why has the Oregon Department been unable to move ahead with development of efficiency standards? A report submitted to the Oregon Department by an independent contractor reveals just how difficult addressing efficiency can be, particularly without clear direction and backing from the legislature itself.

First of all, the report revealed some disagreement among water users and other constituencies about certain fundamental points, such as whether widespread inefficient practices exist and whether more efficient practices generally would yield sufficient instream flows to benefit fish.[259] However, at the same time, water users themselves were readily able to identify examples of significant inefficient water use.[260] Most frequently mentioned were 1) conveyance systems that lose large amounts of water through evaporation and leakage, 2) flood irrigation, 3) inattention to water management by non-commercial farmers, and 4) losses due to operational problems within irrigation districts, such as inadequate controls over timing and scheduling of water delivery and unsophisticated information about water needs.[261]

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255 *Id.*

256 *Id.*

257 *Id.*

258 OREGON GOVERNOR'S NATURAL RESOURCE OFFICE, THE OREGON PLAN FOR SALMON AND WATERSHEDS, ANNUAL REPORT SUMMARY 18 (1998) (on file with author).

259 PAM WILEY, NORTHWEST WATER LAW & POLICY PROJECT, REPORT AND PROCESS RECOMMENDATIONS, WATER USE EFFICIENCY STUDY 4 (1998). The report was the result of a contract between the Water Resources Department and the Northwest Water Law and Policy Project at Northwestern School of Law of Lewis & Clark College, of which this author is a Co-Director. *Id.* Ms. Wiley conducted numerous interviews with various stakeholders interested in water use. *Id.*

260 *Id.* at 4.

261 *Id.* at 4-5. This list sounds like a litany of waste cases considered by the courts, *see supra* Part II.B.3.b, but most of those cases ended up with no finding of legal waste because the methods were customary. Study respondents also noted that flood irrigation and leaky

The water users struggled when asked to define waste, inefficiency, and efficiency.[262] Although nearly all the participants acknowledged the existence of significant waste, it was usually attributed to someone else; they felt their own practices were not wasteful, though perhaps they could be more efficient.[263] In the end, the report author concluded that in order to produce results in terms of increased streamflows, the issues of attacking waste and improving efficiency should be decoupled and approached separately.[264]

The study reported a strong sentiment that unauthorized use of water (and lack of enforcement of the actual terms of water rights by the state) is a serious problem.[265] The participants strongly believed that it is unfair to demand efficiency improvements from the majority of legal water users when unauthorized users and blatant waste go unpunished.[266] The report described "broad acknowledgment" that measuring and reporting are an important part of curbing unauthorized uses and improving water conservation, and "equally broad skepticism" that measurement can be achieved because of cost and resistance by water users.[267] The report also concluded that the cost of efficiency improvement is significant and cannot be borne by individual farmers and ranchers.[268]

The reason for discussing in detail the Oregon Plan's regional efficiency standards proposal, even though it is still in its infancy, is to highlight the difficulty of legislative and administrative refinement of the beneficial use doctrine, even when facing a crisis. In response to the crisis of diminishing salmon runs, and to avert yet another endangered species listing within the state, the state adopted the Oregon Plan. Recognizing that inadequate streamflows are part of the problem, the plan vowed to make more efficient consumptive water use part of the solution in order to put more water back into the streams.[269]

The reason Oregon's efficiency program is still struggling to get off the ground is that the state finds itself in a catch-22 situation. Water users as a group believe that the state should first crack down on unauthorized users and those who are really wasting water.[270] But users do not want water use measured, because measurement can then be used as the basis for regulating "me" as well as "that other guy."[271] Furthermore, the users cannot define waste, but they say it is a problem the state should deal with before asking legal users to become more efficient.[272] Finally, measure-

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ditches may in fact be creating secondary benefits as well, such as groundwater recharge, maintenance of wetlands, and delayed and cooler return flow. WILEY, *supra* note 259, at 4.

262 *Id.* at 6-7.

263 *Id.* at 22.

264 *Id.* at 1, 22.

265 *Id.* at 6.

266 *Id.*

267 *Id.* at 16-17, 23.

268 *Id.* at 15.

269 *Id.* at 2.

270 *Id.* at 6.

271 *Id.* at 16.

272 *Id.* at 7, 22.

ment, enforcement, and improved efficiencies are all going to be expensive, and the users do not believe they can afford it.[273]

What does all of this say about beneficial use and waste? The vagueness of the doctrines as they have existed over the past one hundred years hamper even a crisis-inspired legislative effort. If a state legislature says nothing more specific than "address efficiency and waste,"[274] as the Oregon legislature did in adopting the Oregon Plan, it has not moved the ball forward one bit, because the effort is immediately mired in the unclear historical definitions of those terms. Oregon's approach differs from Arizona's considerably in the degree to which the legislature itself took on the problem of efficiency. The Oregon Plan certainly attempts to enlist improved water use efficiencies to solve the crisis of low stream flows contributing to species extinction, but the legislature did not go far enough in redefining the operative terms. As long as the terms "beneficial use," "waste," and "inefficiency" keep their unclear historical meanings, it seems that little forward progress can be made.

Rather than, or in addition to, adopting crisis-inspired legislation as explicit authority to address waste and inefficiency, some western states have focused on incentives to conserve as a positive means of encouraging efficiency improvements. The next section examines that approach.

3. Incentives to Conserve

A number of states have adopted some form of conserved water statute.[275] Conserved water statutes side-step the issue of beneficial use and waste, to some extent, by directly encouraging water rights holders to take steps to save water by improving their efficiency. The statutes specifically authorize water users to retain and use water saved, rather than having it simply revert back to the stream for further appropriation.[276] Such statutes explicitly counteract prevailing case law doctrines that would otherwise prevent a water user from acquiring any legal rights to salvaged or conserved water.[277]

For example, the Oregon conserved water statute provides that the water user may use or sell seventy-five percent of the conserved water under the same priority date as the original water right; twenty-five percent goes to the state, either for instream flows, if needed, or for junior appropriators.[278] California gives the conserver the rights to all of the

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[273] *Id.* at 15, 23.

[274] *Id.* at 2.

[275] *See, e.g.*, CAL. WATER CODE § 1004 (West 1998); MONT. CODE ANN. § 85-2-419 (1997); OR. REV. STAT. §§ 537.455-537.500 (1997); WASH. REV. CODE ANN. § 90.42.020 (West 1992).

[276] MONT. CODE ANN. § 85-2-419; OR. REV. STAT. § 537.490(1); WASH. REV. CODE ANN. § 90.42.010 (West Supp. 1999).

[277] The reasoning goes like this: because beneficial use is the limit of a water right, if the water user can accomplish the same beneficial use (*i.e.*, irrigation) with less water, then the legal right is only to that lesser amount. Any water saved by becoming more efficient is therefore not part of the conserver's water, but belongs to the system. *See supra* note 117.

[278] Act of Oct. 4, 1997, Ch. 726, 1997 Or. Laws 1927 (relating to establishment of Water Conservation Program) (Section 3 of the Act applies until July 1, 1999, after which OR. REV.

saved water,[279] as does Washington, unless public funds have been used in the project, in which case the parties may negotiate for a share of the water to go instream as what is termed a state-held "trust water right."[280]

This reasoning does not necessarily mean, however, that the user was wasting water before improving his efficiency. In fact, the premise of conserved water statutes is that the water saved was *not* being wasted before, because if it were, the water right holder would have no right to it, and should not be allowed to keep it or sell it, as the conserved water statutes provide. But because there is little proactive waste enforcement,[281] a charge of waste is not likely to be leveled frequently at a party seeking to take advantage of conserved water statutes.

Conserved water statutes would seem to offer a win-win solution to improving water use efficiency. The programs offer a positive incentive; the water user has wet water to keep or sell, and in some states the public will benefit as well. The same beneficial use will continue but will be accomplished with less water. And the whole issue of waste is neatly avoided, unless another party raises it during the administrative process.[282] Yet the conserved water programs have not been widely used and have not produced significant conservation efforts.[283] Oregon's law has been on the books since 1987, and the first conserved water right under it was not issued until 1997.[284]

There are several reasons for the limited effectiveness of these programs. First of all, conservation and efficiency improvements are very expensive.[285] Many water users have neither the technical know-how nor the funds to adopt significant water conservation methods. Second, participation in a conservation project is entirely voluntary.[286] Conserved water statutes are thus unlikely to create any widespread improvement in water use efficiencies. Unless the potential value of the saved water to the user (either for use or sale) is significant, there really is not much incentive for water users to pursue conservation measures. Changing technologies and methods is not only expensive, it is also disruptive and inconvenient. Because waste is not aggressively enforced, the status quo is the path of least resistance. Finally, given how little water users and agencies in many ar-

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STAT. § 537.470(3) becomes applicable). The public portion may be greater than 25% if public funds were used in the conservation project. *Id.*

279 CAL. WATER CODE § 1011(a).

280 WASH. REV. CODE ANN. § 90.42.030 (West Supp. 1999).

281 *See* Karen A. Russell, *Wasting Water in the Northwest: Eliminating Waste as a Way of Restoring Streamflows*, 27 ENVTL. L. 151, 153 (1997).

282 *See* OR. REV. STAT. § 537.470(4) (allowing objections to the proposed allocation of conserved water) (effective July 1, 1999).

283 *See, e.g.*, Mark Honhart, Comment, *Carrots for Conservation: Oregon's Water Conservation Statute Offers Incentives to Invest in Efficiency*, 66 U. COLO. L. REV. 827, 832-53 (1995).

284 Interview with Andrew Purkey, Executive Director, Oregon Water Trust, in Portland, Or. (Jan. 12, 1999) (confirming that a conservation project funded by the Trust was the first conserved water right approved by the state).

285 *See* Shupe, *supra* note 8, at 518-21; *see also infra* text accompanying notes 440-43.

286 *See, e.g.*, OR. REV. STAT. § 537.463 (1997) (effective July 1, 1999).

eas know about actual water use patterns and amounts, it is very difficult to quantify water savings precisely, and to resist claims that any change in one user's practice will deprive another user of return flow.[287]

The foregoing discussion of legislative efforts to implement and enhance the beneficial use doctrine and bypass the prohibition of waste also touched upon the role of administrative water agencies, because most of the legislation reviewed required agency implementation. However, in order to complete the analysis of the beneficial use doctrine at the close of the twentieth century, it is necessary to consider the role of administrative agencies in the absence of special legislation.

4. The Role of Administrative Agencies

Even without specific direction from crisis or conservation statutes as discussed above, state water resource agencies are in a potentially powerful position with regard to clarifying and enforcing the beneficial use, waste, and forfeiture doctrines. The basic statutes proclaiming beneficial use as the standard are fairly general and often vague.[288] Although most of the interpretation and line-drawing has been left to the courts in resolving periodic individual disputes,[289] the agencies that implement the statutory schemes day-to-day would seem to have a great deal of leeway to forge their own interpretations.

It is hardly rocket science to say that state water agencies have ample authority to define and elucidate the concept of beneficial use through either adjudication or rulemaking. It is an elementary principle of administrative law that when an agency has been given general rulemaking power, it has authority to flesh out general statutory phrases with more specific requirements.[290] In fact, occasionally courts have held that agencies are obligated to do so, because the statutory language does not give clear enough guidance as to what behavior is acceptable or unacceptable.[291]

One could certainly argue that the terms "beneficial use" and "waste" are so vague as to give insufficient direction. Given that these terms have been in the water codes for a century, and have been the subject of many cases, this may seem an odd argument to make at this late date. Apparently, water users, water masters, and others have enough of an idea of what the terms mean to function reasonably well day in and day out. But

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287 *See* Honhart, *supra* note 283, at 844-53; E. Blain Rawson, *Agricultural Water Conservation in Utah: More than Just a Drop in the Bucket*, 14 J. ENERGY NAT. RESOURCES & ENVTL. L. 437, 442 (1994).

288 *See supra* notes 24-25.

289 *Id.*

290 WILLIAM F. FOX, JR., UNDERSTANDING ADMINISTRATIVE LAW §§ 18, 19 (3d ed. 1997); *see also* KENNETH CULP DAVIS & RICHARD J. PIERCE, JR., ADMINISTRATIVE LAW TREATISE 234 (3d. ed. 1994); Chevron v. Natural Resources Defense Council, 467 U.S. 837 (1984) (holding that agencies can construe ambiguous statutes, as long as their construction is reasonable).

291 *See, e.g.*, Megdal v. Oregon Board of Dental Examiners, 605 P.2d 273 (Or. 1980) (broad legislative standard of "unprofessional conduct" required further specification by rules); Sun-Ray Drive-In Dairy, Inc. v. Oregon Liquor Control Comm'n, 517 P.2d 289 (Or. Ct. App. 1973) (broad statutory language such as "demanded by public interest or convenience" required agency to establish clear standards for application of the law by rule).

what has really happened is that the lack of clarity in what constitutes waste has simply resulted in de facto adoption of the lowest common denominator as the working definition.[292] If the behavior does not shock the conscience, it is allowed.

Not surprisingly, administrative agencies have generally followed the lead of their legislatures, mostly leaving the job of defining the contours of the beneficial use doctrine to the judgments of individual water users, and ultimately to the courts. Agencies do not generally take an active approach to prescribing methods or amounts of water use.[293] It is rare to find any administrative rules further defining beneficial use or waste, except in response to crisis statutes passed by the legislature.

Some state water resource agencies do attempt to require new water rights applicants to achieve some minimal standard of water usage.[294] Faced with overappropriation on many water sources, and near-capacity uses on others, agencies need to stretch any water available for appropriation as far as possible. The usual approach is to specify an allowable water duty for particular uses, and to limit applicants to that amount, regardless of the initial requests. For instance, in Washington, estimates of the amount of water needed for irrigating crops at various points around the state were developed by the Washington State University Agricultural Research Center in 1982.[295] This study is used by the State Department of Ecology as a guideline in quantifying and issuing new agricultural water rights.[296]

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[292] Precisely this outcome might be predicted by public choice theory. The constituents who have a vested interest in keeping the standard vague, such as agricultural users, are the most likely to be highly organized and to lobby both legislatures and agencies to preserve the status quo. *See* Michael C. Blumm, *Public Choice Theory and the Public Lands: Why "Multiple Use" Failed*, 18 HARV. ENVTL. L. REV. 405, 407, 415-22 (1994).

[293] The author conducted telephone interviews with the water allocation agencies of Arizona, California, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming. The following discussion is based on those telephone interviews. Other than the uses of water duty discussed infra, and occasional enforcement against egregious practices or particular unauthorized uses, the agencies do not prescribe or police amounts of water use. Although it is difficult to prove a negative, it seems safe to say that there is precious little assertive administrative enforcement activity against waste around the West. Arizona treats its groundwater more strictly, as already discussed, and Colorado seems to take a more aggressive approach than some other states. *See, e.g.*, COLO. REV. STAT. §§ 37-84-101 to 37-84-125 (1998). Other than that, however, most state agencies are hard-pressed to recount any ongoing antiwaste enforcement activities when asked, and few reported cases are found, other than those discussed in Part II.B.3.b previously.

[294] *See, e.g.*, IDAHO CODE § 42-202(3) (1998).

[295] L.G. JAMES, ET AL., AGRICULTURAL RESEARCH CENTER, WASHINGTON STATE UNIVERSITY, IRRIGATION REQUIREMENTS FOR WASHINGTON—ESTIMATES AND METHODOLOGY, RESEARCH BULLETIN XB-0925 (1982).

[296] Telephone Interview with Linda Pilkey-Jarvis, Washington Dep't of Ecology (Nov. 25, 1998). This is the same study that was used by the Department in the *Grimes* case. Washington Dep't of Ecology v. Grimes, 852 P.2d 1044, 1050 (Wash. 1993); *see also supra* text accompanying note 174.

Idaho also applies a standard water duty for new irrigation applications: one cfs per fifty acres, which translates to 0.02 cfs per acre.[297] Oregon applies a range of duties for agricultural applications, some as high as six acre feet per acre.[298] Utah duties range from two acre feet per acre to six acre feet per acre, depending on where in the state the use is.[299]

All such water duties, however, still simply represent a customary approach to water use. The duties used by the agencies are not ambitious targets but are essentially average amounts of water use for certain crops in specific localities. The agencies are thus not pushing new users to new levels of efficiency, but simply assuring that they will be consistent with existing custom and practices.[300]

In transfer proceedings, agencies may also scrutinize the transferor's water right to see if any part of the right has been abandoned or forfeited by nonuse, or to see if the water usage has been wasteful.[301] In either case, the amount allowed to be transferred may be something less than the paper right.[302] It appears to be standard practice in most of the states to allow only the amount of actual, historic beneficial use to be transferred.[303] Other than this examination during transfers, however, agencies generally do not review water uses for forfeiture. They take a reactive rather than proactive posture.[304]

Furthermore, no matter how assertive agencies could be in seeking efficiency when reviewing new applications, or how effectively they could declare forfeitures during transfers, there would be little impact on the overall state of western water use because many western rivers and streams are already overappropriated.[305] With outstanding paper water rights exceeding the amount of wet water available, many new water uses are out of the question. Transfers also only affect a few water rights. It is only by improving efficiencies among the existing users, who by and large are *not* transferring their water, that any real gains will be made.

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297 IDAHO CODE § 42.202 (1998); Telephone Interview with Idaho Dep't of Water Resources (Nov. 24, 1998).

298 Oregon Water Rights Certificates (on file with author).

299 Telephone Interview with Utah Div. of Water Rights (Nov. 25, 1998); *see also Utah Div. of Water Rights* (last modified Dec. 22, 1998) <http://nrwrt1.nr.state.ut.us>.

300 In fact, some of the duties used in Oregon simply come from old court decrees. Telephone Interview with Dwight French, Oregon Water Resources Dep't (Nov. 25, 1998).

301 *See generally* Owen L. Anderson, *Reallocation*, *in* 2 WATERS AND WATER RIGHTS, *supra* note 1, § 16.02(b).

302 *See, e.g.*, James N. Corbridge, Jr., *Historical Water Use and the Protection of Vested Rights: A Challenge for Colorado Water Law*, 69 U. COLO. L. REV. 503 (1998).

303 *See*, TARLOCK, *supra* note 1, § 5.17(5).

304 Colorado may be an exception as far as forfeiture is concerned. Colorado statutes require the State Engineer to maintain an abandonment list to keep track of water rights that are not being exercised, allowing their eventual termination. COLO. REV. STAT. § 37-92-401 (1997).

305 *See, e.g.*, Albert W. Stone, *Privatization of the Water Resource: Salvage, Leases, and Changes*, 54 MONT. L. REV. 99 (1993).

But as to existing users, agencies play a largely passive role. They do not seek out wasteful practices for active enforcement.[306] Occasionally, particularly egregious practices may be routed out, such as continually running sprinklers over roads or refusing to install floatmeters to insure pump shut-off when a certain amount of water has been diverted.[307] However, these practices usually come to an agency's attention by way of complaint rather than through their own investigations.[308] Agencies simply do not actively seek to define and enforce against waste or inefficient water use.[309]

The administrative approach to beneficial use, forfeiture, and waste thus appears to mirror the judicial approach. The water duties that are applied to new applicants essentially codify the same generous customary standards of beneficial use that courts use in their reviews of challenged uses. Scrutinizing water rights in transfer proceedings to determine actual historic use is the equivalent of the courts' application of the partial forfeiture doctrine. The agencies do not go looking for either forfeiture or waste but simply react to the worst of the complaints brought to them. Agency activity may thus address the outrageous conduct outside even the generous customary parameters, but agencies are not aggressively advancing the cause of improved efficiency in western water use.

5. *Summary of the Beneficial Use Doctrine in Western Legislatures and Water Agencies*

Although it would seem that legislatures and administrative agencies are better positioned than courts to approach beneficial use, forfeiture, and waste systematically and comprehensively, they certainly have not done so. Several states have reacted to local water crises with some additional regulatory controls,[310] but, with the exception of the Arizona Groundwater Management Act, none of the states have addressed actual water use practices with an eye towards improving efficiency. The several states that have adopted conserved water statutes still rely entirely on water users to take the initiative for improving efficiency, and few users have stepped forward.

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306 *See generally* Russell, *supra* note 281, at 157-87. Sometimes lack of resources prevents active enforcement. For instance, Washington Department of Ecology's enforcement staff was slashed to virtually nothing in budget cutting, and they can do little enforcement even in response to complaints. Pilkey-Jarvis, *supra* note 296.

307 Interview with Barry Norris, Oregon Water Resources Dep't (Sept. 23, 1997) (describing examples of the department's waste enforcement).

308 *Id.* Even the investigation of the Imperial Irrigation District by the California State Water Resources Control Board was started by a complaint rather than by the agency's own proactive enforcement. *See supra* note 153.

309 Once again, public choice theory helps explain why this is so. Those groups who are most likely to organize and exert pressure on agencies are those most benefited by a weak waste doctrine. *See* Blumm, *supra* note 292, at 407, 415-22.

310 *See* Part II.C.2.a & Part II.C.2.b.

Even in Arizona, what began as an ambitious program is not easily achieving its lofty goals.[311] Water use efficiencies have seen improvements but have not yet reached the target of eighty-five percent efficiency.[312] The water use reductions that have occurred are attributable more to reduction in irrigated acres than to conservation improvements.[313] Apparently, even a hard shove from the legislature is barely enough to overcome the inertia of the beneficial use doctrine as it has been interpreted and applied by all three branches for a century.

How did a legal doctrine that purports to husband a scarce resource become the shield for so much inefficiency? In order to appreciate why western water use is so resistant to change and why more efficient practices seem so elusive, it is necessary to dig yet a little deeper into the pedigree of the beneficial use doctrine. The next section examines the doctrine's original purposes and evaluates how well the doctrine has achieved those purposes. The discussion also considers whether those purposes are still as important as they were a century ago. This analysis reveals that the beneficial use doctrine has accomplished certain historical purposes, but was never really designed to foster the kind of efficient water use now required in the West.

III. Purpose of the Beneficial Use Doctrine: Then and Now

A. Original Purposes

The beneficial use doctrine, and its corollaries, waste and forfeiture, had three original purposes: 1) avoiding speculation and monopoly;[314] 2) maximizing the use of a scarce resource for all;[315] and 3) providing flexibility to the water user, thus allowing the user (rather than courts, legisla-

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311 *See* Phoenix Active Management Area, *Draft Third Management Plan, Chapter on Water Budget* (visited Jan. 6, 1999) <http://www.adwr.state.az.us> (discussing goals and status); *see also* Letter from Rita Pearson, Director, Arizona Water Resources Dep't to Interested Parties, Aug. 31, 1998 (visited Jan. 6, 1999) <http://www.adwr.state.az.us> (discussing failure of AMAs to achieve safe yield in withdrawals).

312 Pearson, *supra* note 311.

313 Telephone Interview with Tom Holway, Assistant Director, Arizona Dep't of Water Resources (Nov. 24, 1998).

314 Samuel C. Wiel, Water Rights in the Western States 407 (3d ed. 1911); *see also* Beck, *Prevalence and Definition*, *supra* note 30, § 12.03(c)(2) n.105; Tarlock, *supra* note 1, § 5.169(1) (tracing the roots of the beneficial use requirement to the Mormons, who "conditioned the privilege of property ownership on the productive, non-speculative use of the property and policed the distribution of essential commodities"). For an excellent general history of the development of western water rights, see Robert G. Dunbar, Forging New Rights in Western Waters (1983). *See also* Gregory J. Hobbs, Jr., *Colorado Water Law:An Historical Overview*, 1 Water L. Rev. 1 (1997) (tracing the development of Colorado's water law, and noting how the developing doctrines tried to achieve both security and flexibility, while preventing monopoly of the resources).

315 Beck, *Prevalence and Definition*, *supra* note 30, § 12.03(c)(2); Tarlock, *supra* note 1, § 5.16(1) (noting that the major function of the beneficial use requirement is to prevent waste); *see also* Schodde v. Twin Falls Land & Water Co., 224 U.S. 107, 118 (1912) (use of water wheel was unreasonable method of diversion because it required too much of the whole streamflow to facilitate diverting one user's fraction).

tures, or agencies) to determine appropriate improvements in water use practices except in extreme circumstances.[316] Each purpose, and how well the doctrine served it, will be discussed in turn.

1. Preventing Speculation and Monopoly

The fact of aridity quickly became apparent to European settlers of the West in the nineteenth century.[317] Outside a few moisture-blessed regions in the Pacific Northwest and parts of northern California, the scarcity of water was an obvious constraint on settlement and farming. When something as important as water is scarce, those who control it can be powerful indeed.[318] The fear of concentrated power and control over resources in the developing West shaped water law generally and the beneficial use doctrine in particular.

In 1911, in his treatise on western water rights, Samuel Wiel wrote about California's adoption of its constitution in 1879. He wrote: "[I]t seems that a strong sentiment had been aroused against capital and monopoly. The leader of the movement, Dennis Kearney, addressed himself chiefly, in this regard, against the railway and steamship lines; but in the convention the movement was widened to include other public services, including water."[319] California and many other states adopted constitutional or statutory provisions asserting public ownership to water,[320] in part due to this anti-monopoly sentiment. Public ownership then provided the foundation for private usufructuary rights based on beneficial use. Concern about speculation and monopoly also fueled the early western case law rejecting the riparian doctrine and adopting prior appropriation principles.[321] In one of a series of court decisions in which western states embraced the prior appropriation doctrine, the Utah Supreme Court said:

> Riparian rights have never been recognized in this Territory, or in any State or Territory where irrigation is necessary; for the appropriation of water for the purpose of irrigation is entirely and unavoidably in conflict with the common-law doctrine of riparian proprietorship. If that had been recognized and applied in this territory it would still be a desert; for a man owning ten acres of land on

316 *See infra* Part III.A.3.

317 PATRICIA NELSON LIMERICK, THE LEGACY OF CONQUEST: THE UNBROKEN PAST OF THE AMERICAN WEST 135 (1987).

318 The perceived evil of monopoly is that if one person or entity controls a product that is the object of social demand, that person can control the amount produced and the price demanded. The result is insufficient quantity, inflated price, and suboptimal quality. *See, e.g.*, VERNON A. MUND, MONOPOLY: A HISTORY AND THEORY 95 (1933). The problem is particularly acute when the monopoly affects essential services, such as water supply. In this case, those who need the service or product are completely at the mercy of the supplier, and the "servant becomes the master." WALTER ADAMS & HORACE M. GRAY, MONOPOLY IN AMERICA: THE GOVERNMENT AS PROMOTER 39 (1955).

319 WIEL, *supra* note 314, at 149.

320 *Id.* at 148-51; *see also* Beck, *Prevalence and Definition*, *supra* note 30, § 12.01 tbl.12-1 (listing public ownership provisions throughout western states).

321 WIEL, *supra* note 314, at 147-48.

> a stream of water capable of irrigating a thousand acres of land or more, near its mouth, could prevent the settlement of all the land above him.[322]

Wiel noted that the very definition of an appropriation required an intention by the appropriator to use the water beneficially: "The intention must be *bona fide* and not for speculation, such as an intention to store water for monopoly."[323] The concerns about monopoly were, of course, part of a larger social movement and a much bigger set of issues than just those relating to the development of western water codes and jurisprudence. Wiel noted that his 1911 treatise "was written in the time of the conservation movement, the Pinchot-Ballinger controversy, the regulation of monopoly, and Mr. Roosevelt's New Nationalism."[324] Understandably, the developing water law reflected the populist mood of the times.[325]

The actual use component of the beneficial use doctrine guarded against speculation and monopoly. Because actual, beneficial use was required, no one could acquire all of the water and thereby monopolize a scarce and valuable resource. Nor could anyone speculate by holding water without using it, and then make a steep profit by selling it to those who needed it. Although the historical references often lump speculation and monopoly together, they are not one and the same. Monopoly, as discussed above, refers to super-concentrated market power, whereby the monopolist controls so much of a resource that he can depress supply and/or quality and inflate price.[326] Monopoly is the opposite of competition; flourishing competition is supposed to increase supply and quality and decrease price.[327] Speculation, on the other hand, simply refers to acquiring a resource or good for later use or resale rather than for immediate, actual use.[328] Speculation can occur without monopoly. Speculation is not necessarily bad, in the same sense as monopoly is perceived to be. Indeed, speculative fever was actually an important driving force in early western land and resource development, and as long as it was equal opportunity speculation open to ordinary folks as well as wealthy capitalists, it was encouraged rather than frowned upon.[329] But certain key components of the evolving legal systems maintained an antispeculative charac-

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322 Stowell v. Johnson, 26 P. 290 (Utah 1891) (discussed in WIEL, *supra* note 314, at 168).

323 WIEL, *supra* note 314, at 406-07 (citing Weaver v. Eureka Co., 15 Cal. 271 (1860)).

324 WIEL, *supra* note 314, at 166.

325 The same populism shaped the provisions of the Reclamation Act favoring small farmers, 43 U.S.C. § 431 (1994) (limiting delivery of reclamation water to farms of 160 acres), the Forest Reserve Acts, Law of Mar. 3, 1891, ch. 561, 26 Stat. 1095 (codified in scattered sections of 16 U.S.C. and 43 U.S.C.) (repealed in part, 1976) (allowing the designation of public lands as forest reserves) and the Federal Power Act, 16 U.S.C. §§ 791a-828c (1994 & Supp. 1997) (creating the Federal Power Commission with exclusive authority to license hydroelectric projects on the nation's navigable waters). Nevada Senator Newlands, a chief proponent of the Reclamation Act, testified as follows: "We all wanted to preserve that domain in small tracts for actual settlers and homebuilders. We all wanted to prevent monopoly and concentration of ownership . . . ." 35 CONG. REC. 6674 (June 12, 1902).

326 MUND, *supra* note 318, at 100.

327 *Id.*

328 WIEL, *supra* note 314, at 661-62.

329 LIMERICK, *supra* note 317, at 67.

ter. On the land side, the homestead laws required actual settlement and occupancy to obtain land patents.[330] As for water, adoption and codification of the beneficial use doctrine assured that there would be no speculation in water.[331]

Of course, as the West began to urbanize, the prohibition against speculation served as a barrier to planning and development of adequate municipal supplies to accommodate future needs. Most states eliminated this barrier by providing special protections for municipalities, allowing them to hold, or at least acquire rights to, water supplies for future use.[332] But for everyone else, the requirement of actual beneficial use remained.

2. Maximizing the Use of a Scarce Resource

If the purpose of the actual use component of the beneficial use doctrine was to spread water among ordinary folks who would put it to use, the antiwaste component of the doctrine was designed to stretch the scarce resources a little further. No one should use water wastefully, because someone else could probably use that same water productively and beneficially, thus increasing the overall value to society. An early federal judge put it this way: "In the appropriation of water, there cannot be any 'dog in the manger' business by either party, to interfere with the rights of others, when no beneficial use of the water is or can be made by the party causing such interference."[333] Wiel explicitly stated the rule that "[a]n excessive diversion of water for any purpose cannot be regarded as a diversion for a beneficial use."[334] Wiel further cited a quartet of Oregon cases from the early 1900s for the declaration that "[a]t all times that the water is not required by one or more, it must be at the disposal of others."[335]

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330 *Id.* at 125.

331 In fact, without smoothly functioning water markets, there is little reason to speculate; so many barriers exist to water right transfers that it is very difficult to buy and sell water just to make a profit. *See infra* text accompanying notes 352-56 and Part IV.D.

332 There are a variety of ways of accomplishing this purpose. Some states explicitly exempt municipalities from forfeiture statutes or allow municipalities to reserve water for future uses. *See, e.g.*, NEV. REV. STAT. § 533.030(3) (1997); N.M. STAT. ANN. §§ 72-1-9, 72-12-8 (Michie 1997); N.D. CENT. CODE § 61-04-23 (1997); OR. REV. STAT. § 540.610(2)(a) (1997); UTAH CODE ANN. § 73-1-4 (1998). Other states have achieved the same result through case law recognizing that development of large-scale municipal supplies cannot realistically be held to the same strict use it or lose it requirements as other water uses. *See, e.g.*, City & County of Denver v. Sheriff, 96 P.2d 836 (Colo. 1939) ("[I]t is not speculation but the highest prudence on the part of the city to obtain appropriations of water that will satisfy the needs resulting from a normal increase in population within a reasonable period of time."). *See generally* Janis E. Carpenter, *Water for Growing Communities: Reforming Tradition in the Pacific Northwest*, 27 ENVTL. L. 127 (1997).

333 Union Mill & Mining Co. v. Dangberg, 81 F. 73, 119 (Nev. 1897) (quoted in WIEL, *supra* note 314, at 504, 504 n.17.

334 WIEL, *supra* note 314, at 504.

335 *Id.* at 504, 504 n.25 (citing Mann v. Parker, 86 P. 598 (Or. 1906); Gardner v. Wright, 91 P. 286 (Or. 1907); Hough v. Porter, 95 P. 732 (Or. 1908), 98 P. 1083 (Or. 1909) (supplemental opinion), 102 P.728 (Or. 1909) (petition for rehearing); Whited v. Cavin, 105 P. 396 (Or. 1909)).

The ultimate goal of spreading the scarce western water resource among as many productive users as possible was to settle the West. The western landscape was vast and arid; it would not easily become a settled and productive part of the growing nation and its economy. Individual efforts to make the desert bloom would be rewarded both with land and the necessary water to make the land productive.[336] The best way envisioned to do that in the late 1800s was to require nonwasteful beneficial use of all water users, and then reward that behavior with a vested, secure water right.

3. Flexibility for Water Users

It is more difficult to find explicit pronouncements of flexibility as an express, original purpose of the beneficial use doctrine. However, a careful reading of early cases and commentary reveals that flexibility for water users was as much a part of the developing doctrine as the antimonopoly and antiwaste concerns.

Reviewing case law developments prior to 1911, Wiel stressed that what constituted beneficial use or waste in any particular instance was "a question of fact in each case."[337] He further noted that "[b]eneficial use necessarily varies with the humidity of seasons."[338] The doctrine of beneficial use without waste, as it began to take shape in the early decisions, traced a continuum, with a range of acceptable methods of water use tailing off into unacceptable methods. Farmers were not required to furrow their land before irrigating, even though doing so would have used less water.[339] But using a dam to spread out water for cattle to wallow in was found wasteful, as too much water was lost to evaporation.[340] From the early days, irrigators were thus given a good deal of latitude to determine what their actual and appropriate needs were, with the courts to correct for excesses only. The "system of irrigation in common use in the locality, if reasonable and proper under existing conditions," was to be the standard, even if a more economical method might have been available.[341] Early decisions made it clear that the courts generally would not decide for the farmers what methods they should use, but would only prevent extravagant and overtly wasteful practices.[342]

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336 *See generally* WALLACE STEGNER, BEYOND THE HUNDREDTH MERIDIAN: JOHN WESLEY POWELL AND THE SECOND OPENING OF THE WEST 7 (1954); CHARLES WILKINSON, CROSSING THE NEXT MERIDIAN: LAND, WATER AND THE FUTURE OF THE WEST 13-19 (1992).

337 WIEL, *supra* note 314, at 507.

338 *Id.* (citing Gotelli v. Cardelli, 69 P. 8 (Nev. 1902)).

339 Nephi Irrigation. Co. v. Vickers, 81 P. 144 (Utah 1905) (cited in WIEL, *supra* note 314, at 509, 509 n.8).

340 Ferrea v. Knipe, 87 Am. Dec. 128 (1865) (cited in WIEL, *supra* note 314, at 508-09, 509 n.6).

341 WIEL, *supra* note 314, at 509-10.

342 Rodgers v. Pitt, 129 F. 932, 943 (Nev. 1904) (cited in WIEL, *supra* note 314, at 510, 510 n.14) ("The court cannot, in the absence of any law upon the subject, compel the farmers to use any particular system."); *see also supra* Part II.B.3.b.

Keeping the definition of waste fairly loose and generous thus provided water users with a great deal of flexibility. They could determine their actual use in any given season based on what crops they decided to plant and what the weather was like, rather than on a predetermined rigid formula of what would either be legally sanctioned as beneficial or legally prohibited as waste. And since the water was free, most users would err on the side of overuse. But as long as water rights holders were beneficially using water in good faith,[343] the details of how they used it would be up to them and would not actively be regulated by the state or the courts.

Tying waste to custom early on meant that the law itself has not forced improvements in technology.[344] Instead, such changes were supposed to move in response to market forces rather than legal forces.[345] Water users would improve their efficiencies when it became cost-effective to do so. For example, consider an alfalfa farmer who uses flood irrigation. His irrigation costs are low. He pays nothing for the water or water rights themselves. His delivery system perhaps consists of an inexpensive, low-maintenance plywood headgate on an open diversion ditch. To irrigate, he simply removes the boards in the headgate, lets the water flow into his ditch, and then lets the water spread out over his fields.

To change to a more efficient, less wasteful system, such as a pump, pipes, and sprinklers, would cost money for installation, operation, and maintenance. The farmer will make the change only when he can recoup the costs of this investment. For example, if the value of alfalfa goes up or he changes to a higher value crop, or if he can improve his productivity because of the increased control allowed by a more targeted, responsive delivery system, then he may increase his profits enough to cover his costs. If the law instead forces him to be more efficient, the argument goes, he may be forced out of farming, or forced to change crops for nonmarket reasons, thus resulting in too little alfalfa production.[346]

The beneficial use doctrine, as it took shape at the turn of the last century, thus served the following three purposes: 1) preventing speculation in and monopolization of a scarce and valuable resource, 2) maximizing the use of that scarce resource to support many uses and thereby promote economic development, and 3) retaining flexibility for the individual water users. After a century, has the beneficial use doctrine accomplished its purposes?

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343 WIEL, *supra* note 314, at 509 ("Beneficial use is not what is actually consumed but what is actually necessary in good faith.").

344 The technology-forcing approach to regulation of water quality contrasts with this laissez-faire approach to water quantity. *See supra* note 89.

345 And yet, the operation of market forces was stymied from the beginning because there was no water pricing device. *See infra* Part IV.D.

346 The flip side of this argument is that because there is no charge for water (the only farming input other than solar energy with no direct cost, because land, labor, seed, chemicals, equipment, and so on all need to be purchased), and because the law does not contain stringent efficiency requirements, alfalfa is probably currently being overproduced in the arid West.

B. Evaluating the Doctrine As Applied Against Its Purposes

There are two questions to ask in evaluating the beneficial use doctrine against its professed purposes. First, has it achieved the original purposes? More importantly, are those purposes still compelling in the waning years of the twentieth century?

1. Prevention of Speculation and Monopoly

a. Achievement of Original Purpose

The beneficial use requirement has fairly effectively achieved the purpose of preventing outright speculation in western water resources. No one in the West, except municipalities or states, holds water for future use.[347] Every other water rights holder must continually demonstrate ongoing beneficial use, with, at most, a four-year break in use now and then.[348] Although the state water resource agencies usually do not actively seek out forfeitures for enforcement, they do tend to terminate forfeited water rights when forfeiture is brought to their attention,[349] as do courts reviewing water usage.[350] In this sense, water is treated differently than land. Speculators can (and do) buy and hold land for future uses, but they cannot easily do the same with water.

However, the beneficial use doctrine is sometimes criticized for encouraging covert speculation.[351] Because it is impossible to hold water for future use overtly, the only way to save water for later use is by using as much as possible now.[352] If the value that can be captured later upon use or resale is high enough, it may justify present expenditures for diverting and using water, especially if those expenses are relatively low. In other words, prohibiting anyone except the state from reserving water for future use "merely force[s] the would-be speculator to disguise his activity by wasting resources in the construction of diversion works that are either economically unjustifiable regardless of their timing, or premature."[353]

It is impossible to say how often this type of disguised speculation occurs. Perhaps certain water users have run the numbers and are operating in this fashion,[354] but it is hard to imagine that a large number of indi-

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347 Some states also allow reservation of water for future needs. Beck, *Prevalence and Definition*, *supra* note 30, § 12.03(c)(2); Anderson, *supra* note 301, § 16.02(5).

348 Five years is the typical statutory forfeiture period. *See id.* § 17.03 n.46.

349 *See supra* Part II.C.4.

350 *See supra* Part II.B.3.a.

351 *See* Beck, *Prevalence and Definition*, *supra* note 30, § 12.03(c)(2); C. MEYERS & R. POSNER, NATIONAL WATER COMM'N LEGAL STUDY NO. 4, MARKET TRANSFERS OF WATER RIGHTS: TOWARD AN IMPROVED MARKET IN WATER RESOURCES 39-43 (1971); Williams, *supra* note 8, at 7.

352 *See* MEYERS & POSNER, *supra* note 351, at 39-43; Williams, *supra* note 8, at 7-8. As then-Professor (now Judge) Williams pointed out, another way to hold water for later resale is to buy water rights and lease them back to the current user. But that method means paying whatever the seller will accept for the water rights, while a new appropriation may cost less.

353 Williams, *supra* note 8, at 13.

354 In southern California's Imperial Valley, Western Farms, owned in part by the billionaire Texas Bass Brothers, bought approximately 45,000 acres of irrigated farmland expressly for the purpose of fallowing the land and selling the water rights to San Diego. Marc Lifsher,

vidual western irrigators are consciously and intentionally irrigating *only* with an eye toward selling off their water rights at a later date. Certainly, the present system encourages water users to err on the side of using too much, because the penalty for nonuse is loss of the water, and because water carries no price tag to influence a user to reduce the amount of use.[355] In that sense, one could say that water users probably speculate on their own account on a regular basis. Furthermore, the fact that both land and water values are likely to appreciate over time may keep someone farming (and irrigating, because land with water rights is worth more than land without) until the time is right to sell. However, that is different than a decision to construct diversion works and *begin* irrigating just to hold the water for future use.[356]

As for preventing monopoly, the analysis is a little more subtle. The beneficial use doctrine prevents monopolization by speculators, but allows individual water rights holders to control large blocks of water (or all the water in an area) as long as they enjoy a protectable senior priority date and are actually using the water. For instance, individual water users may control all of the water on small streams, especially in dry years when only the most senior water uses can be met. But control of very localized water resources by a farmer or two is certainly not a monopoly in an economic sense. Multiplying this pattern of control over entire river basins certainly results in particular rivers being held hostage to historic use patterns. Although nearly eighty percent of the water withdrawn in the West is used by agriculture,[357] the rights to use that eighty percent share are scattered among nearly 200,000 individual water rights holders.[358] This is not the usual big guys market share control that causes monopolization concern—there is no Microsoft® of western water. In fact, the distribu-

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Why Shipping Water to San Diego Has Been Harder than It Looked, WALL ST. J., July 1, 1998, at CA1. Although the negotiations with San Diego fell through (in part because Western Farms could not sell the water rights directly without the approval of the Imperial Irrigation District), the Bass Brothers instead sold the land and associated water rights to U.S. Filter, a water treatment company, which in turn is negotiating its own deal with the Imperial Irrigation District and the San Diego Water Authority for sale of 250,000 acre-feet of water rights to San Diego, without fallowing the land. *Id.* The Bass Brothers reportedly bought the property for $100 million and then sold it for $250 million in stock a few years later. *Id.* This certainly looks like speculation in water rights to me, although in a slightly different form than described by Williams. Williams, *supra* note 8, at 7.

355 *See infra* note 458.

356 One famous example of using irrigation to hold water for future use is the Los Angeles Aqueduct Project, built in the early 1900s to bring water from the Owens Valley in the Sierra Nevada Mountains to Los Angeles for future municipal use. *See* WILLIAM L. KAHRL, WATER AND POWER 130-41 (1982). In order to satisfy beneficial use requirements, the water was used to water citrus groves and other crops in the San Fernando Valley until it was needed for municipal use. *Id.* Saving water for future municipal supply is now taken care of directly, eliminating this particular form of speculation. *See supra* note 332.

357 WATER IN THE WEST, *supra* note 4, at 2-22 to 2-23.

358 The Bureau of the Census, U.S. Department of Commerce, reported in its 1984 Farm and Ranch Irrigation Survey that the 17 western states contained 179,473 irrigated farms. BUREAU OF THE CENSUS, U.S. DEP'T OF COMMERCE, SPECIAL REPORT SERIES AG84-SR-1, 1984 FARM AND RANCH IRRIGATION SURVEY, TBL.19 (1986). In contrast, the remaining 20% is spread among millions of people, if the individual users of urban water are considered.

tion of water rights is in many ways economically counter-intuitive. In many instances, the most valuable senior rights are held by an assortment of farmers, often individuals rather than large corporate interests. Often, the most senior rights are devoted to producing crops that command the lowest values in the marketplace.[359]

If the objection to monopolization really reflects, at least in part, concern about market access, then whether market power and control of the resource are in the hands of a few large corporate interests, or a larger number of smaller interests such as individual alfalfa farmers, the impact on access may be the same, at least in a given locality. The problem is that the resources are locked up and cannot move freely in the marketplace either way, even though not as a result of monopoly.

The existing distribution of water rights is not entirely attributable to the beneficial use doctrine, of course. Other aspects of western water law contribute to maintaining these historic and fragmented use patterns. For instance, once a water right has vested, every western state requires administrative approval for changes in the place, time, or type of use.[360] In reviewing such changes, the states apply a no injury test.[361] If the change will injure a junior appropriator, such as by changing the amount, place, or timing of return flow that the junior depends on, the transfer will not be approved.[362] This protection of the status quo prevents transactions from occurring that might otherwise move water from one use to another.[363]

Other factors contributing to the existing distribution of water rights to agriculture, and to many small users, are the historic policies subsidizing such uses. The basic premise of the federal reclamation program, responsible for a good deal of western water development, was that small farmers would be favored.[364] Limitations were placed on landholdings; a farmer was not eligible for reclamation project water if he owned more

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359 *See, e.g.*, ERNIE NIEMI & TOM MCGUCKIN, WESTERN WATER POLICY REVIEW ADVISORY COMM'N, WATER MANAGEMENT STUDY: UPPER RIO GRANDE BASIN 55-59 (1997).

360 Anderson, *supra* note 301, § 16.02(a), (b).

361 *Id.* § 16.02(b).

362 *Id.*

363 *See generally* Reed Benson, *Maintaining the Status Quo: Protecting Established Water Uses in the Pacific Northwest, Despite Rules of Prior Appropriation*, 28 ENVTL. L. 881 (1998).

364 *See* Ivanhoe Irrigation Dist. v. McCracken, 357 U.S. 275, 292 (1958) (noting that the policy of Congress, from the beginning of the Reclamation Program in 1902, was to distribute benefits to the largest number of people; this policy was accomplished by limiting land ownership); *see also* David Getches, *Colorado River Governance: Sharing Federal Authority as an Incentive to Create a New Institution*, 68 U. COLO. L. REV. 573, 630 (1997) (noting that when Congress passed the Reclamation Act it intended to aid the settlement of the West and believed that this economic expansion depended on supporting small family farms).

than 160 acres.[365] Further, the projects were heavily subsidized to make sure small farmers could afford the water.[366]

The beneficial use doctrine is thus part of a larger context in which numerous policies have worked together to favor mostly small agricultural water users. Local monopolies can certainly occur, by municipalities or other users as well as agricultural users, but for the most part, monopolization of western water resources has not been a serious problem.[367] The beneficial use doctrine gave all kinds of parties an equal chance at initiating water use for any legitimate purpose, and the resulting concentrated control is merely the result of valuable senior positions in key areas or acquisition of rights over time in spite of the barriers to market transfers.

b. Twenty-First Century Purposes

One hundred years ago, westerners were worried that wealthy capitalists and land barons would buy up all the land and water in a speculative frenzy and eventually monopolize (or at least get very rich on) these valuable and scarce resources, thereby putting the little guy at their mercy and preventing ordinary folks from sharing in the wealth of the western frontier.[368] As the twenty-first century approaches, perhaps speculation and monopoly of water supplies are no longer so worrisome, or at least not in quite the same way. Indeed, so much of the water supply is already allocated that there is not enough unclaimed water left for anyone to monopolize.[369]

Transfers have now become the perceived threat that speculation and monopoly were one hundred years ago, at least to rural communities and many agricultural interests. The agricultural community fears that Los Angeles (either the city itself, or Los Angeles as a symbol for all urban areas in the West) will somehow acquire all of the water from the farmers.[370] In other words, the fear is that urban uses will come to dominate western

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[365] Reclamation Act of 1902, 32 Stat. 388 (160 acres for individual, 320 acres for couples) (amended 1982). The Reclamation Act of 1982 changed this to 960 acres. 43 U.S.C. § 390dd (1986).

[366] *See, e.g.*, WATER IN THE WEST, *supra* note 4, at 5-40; *see also* Peterson v. United States Dep't of the Interior, 899 F.2d 799, 803 (9th Cir. 1990) (discussing Reclamation Act's primary goal of subsidizing water to irrigate small family farms). These provisions themselves reflected the populist, antimonopoly political philosophies of the early 1900s. *See supra* note 325.

[367] *See supra* notes 354-59 and accompanying text.

[368] Historian Patricia Limerick says: "If Hollywood wanted to capture the emotional center of Western history, its movies would be about real estate. John Wayne would have been neither a gunfighter nor a sheriff, but a surveyor, speculator, or claims lawyer." LIMERICK, *supra* note 317, at 55.

[369] *See, e.g.*, CRAIG BELL, WESTERN WATER POLICY REVIEW ADVISORY COMM'N, WATER IN THE WEST TODAY: A STATE'S PERSPECTIVE 3 (1997); Harrison C. Dunning, *State Equitable Apportionment of Western Water Resources*, 66 NEB. L. REV. 76, 87 (1987); WATER RESOURCES COMM'N, STATE OF OREGON, REPORT OF THE WATER RESOURCES COMMITTEE TO THE FORTY-EIGHTH LEGISLATIVE ASSEMBLY 72 (1955).

[370] For a history of Los Angeles' water supply and the resulting legacy of mistrust, see KAHRL, *supra* note 356, at 375-436.

water use, and destroy western agriculture.[371] This concern is somewhat different in nature and degree from the historic concern with monopoly, however. First, domestic and municipal use, whether by a tiny hamlet or a huge metropolitan area, generally have always been recognized as beneficial uses. Second, although Los Angeles as a municipality is a single corporate entity, it represents a metropolitan area of over fifteen million individual citizens[372] and thus is not quite like some of the corporate villains of the nineteenth and early twentieth centuries, who operated on behalf of a few moneyed investors. Third, it would take massive transfers from agricultural uses to urban uses to alter the current 80/20 market share[373] in favor of agriculture and create anything close to a monopoly for urban users in general and Los Angeles, or any other city, in particular. To the degree that some reallocations and changes are occurring, they are part of much larger demographic and socioeconomic trends, whereby the West is becoming more urbanized and the economy is diversifying well beyond the historic natural resource based economy.[374]

Concern still exists, however, that speculation in and excessive control over water are inappropriate and undesirable.[375] It is perfectly acceptable for land developers to buy land and simply hold it empty until the value appreciates and then sell or develop the land at a profit. It is equally acceptable for speculators to attempt to acquire and control certain scarce resources, such as precious metals or valuable minerals, for later sale at a profit. Yet, water has been treated differently.[376] Land is either public or private; private ownership gives a bundle of sticks of rights to the fee owner. Water rights ownership is a use right rather than a fee simple ownership right; public ownership of the resource and the protection of third parties through the no injury rule limits the number of sticks held by the water user.

There are a variety of explanations for this mixed character of water rights ownership, although each of them is true for some other resources as well. Water is not only scarce, at least in the West, but absolutely necessary for life.[377] It is fluid and fugitive, constantly in motion. It defies pos-

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371 This fear of water transfers from rural to urban uses was described in the Wall Street Journal article on the Bass Brothers. Lifsher, *supra* note 354, at CA1 ("Western Farms' idea to fallow the land was met with deep suspicion by the [irrigation district] board, as well as by other area residents. They worried that the whole region could be sucked dry, just as the City of Los Angeles had turned the Owens Valley into a dust bowl in the 1920s.").

372 THE WORLD ALMANAC 381 (Robert Famighetti et al. eds., 1999).

373 WATER IN THE WEST, *supra* note 4, at 2-24.

374 *See generally* CASE & ALWARD, *supra* note 2; WILLIAM E. REIBSAME, WESTERN WATER POLICY REVIEW ADVISORY COMM'N, WESTERN LAND USE TRENDS AND POLICY: IMPLICATIONS FOR WATER RESOURCES (1997).

375 *See, e.g.*, Chatfield East Well Co. v. Chatfield East Property Owners Assoc., 956 P.2d 1260, 1264, 1267 (Colo. 1998) (discussing well company's right to aquifer water underlying subdivision).

376 *See generally* Sax, *supra* note 51, at 475-76; *see also* Carol M. Rose, *Energy and Efficiency in the Realignment of Common-Law Water Rights*, J. LEGAL STUD. 264, 264-67 (1990).

377 Don Cox, a member of the Imperial Irrigation Board, who had been critical of the Bass Brothers' entry into the southern California water market, *see supra* note 354, said: "I look on water kind of like air. There are some things that are essential to life. . . . What if you

session and ownership; it cannot be absolutely held in the same way that land or gold nuggets can be.[378] The law defines water rights in such a way as to get quite close to actual ownership but not free of the public interest. Water is a common resource; this is why nearly all of the western states declare it to be a public resource.[379] Perhaps it is the cumulative effect of all of these characteristics that makes water somewhat unique.

Or perhaps water's uniqueness has more to do with its importance in particular places, as the foundation of local ecosystems, and as part of regional geography and culture. Water cycles from air to ground (and underground) and back again, part of a balanced and complex hydrological cycle. The notion of treating water as a commodity, completely apart from its value in place, is troubling. Investment entities hold large inventories of real estate on their books, simply for the investment value, but it is hard to picture similar treatment for water. Imagine receiving a pension fund annual report proudly announcing acquisitions of blocks of water rights as a hot new investment opportunity.[380] Water is not entirely like the intangible shares of a corporation, nor exactly like tangible real property, but somewhere in between. Water is not a completely fungible commodity but has reality in a particular place, such as the Colorado River, the Columbia River, or the Missouri River. Can one speculate in a river? Should one be allowed to monopolize a river? Perhaps the desire to prevent speculation and monopoly in water has not waned much in the past one hundred years.

However, while protecting water from rampant speculation and damaging monopoly may still be important, it is also fair to say that there is a growing interest in making water use more accountable economically. Indeed, the more scarce and critical a resource, the more important it is to

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privatized air? It sounds kind of ridiculous, but water is an essential ingredient for life, and I don't know if you can come in and let people get a monopoly on water." Jay Root, *Liquid Investment Basses' Deals Spotlight Struggle for Water Rights*, FORT WORTH STAR-TELEGRAM, Mar. 8, 1998, at 1. Rodney Reagan, president of a conservation district board in Texas, where the Basses were also buying water rights, expressed concern about the emerging water market drying up farmland and devastating the rural economy. He said: "The speculators are already out there, trying to lock up water supplies, just like buzzards circling over a road kill." *Id.*

378 "Water is not like a pocket watch or a piece of furniture, which an owner may destroy with impunity." Sax, *supra* note 51, at 482.

379 WIEL, *supra* note 314, at 11-12.

380 Perhaps that day is not so far off, however. U.S. Filter, the company that purchased the Bass Brothers' Imperial Valley holdings, *see supra* note 354, announced in a press release:

> These land and water assets, added to our already formidable balance sheet, position us to provide all of the products and services required by our industrial, commercial, agricultural, residential and municipal customers. . . . We have long believed that the most important ingredient in the global growth of industries and municipalities will be water.

U. S. Filter, *United States Filter Corporation Announces the Acquisition of the Property and Water Rights in California and the Southwest Owned by Bass Entities*, PRESS RELEASE, Aug. 4, 1997, at 1. An investment and research firm, Deutsche Morgan Grenfell, "noted that fresh water can be sold 'at nearly a 100 percent profit' and conservatively calculated U.S. Filter's waterholdings to be worth $44 million a year." Root, *supra* note 377, at 1.

have the allocation system right.[381] Many interest groups, from conservative business leaders to environmental groups, are calling for water to move more freely in response to market forces.[382] It appears, then, that the twenty-first century goals regarding speculation, monopoly, and the treatment of water as an economic commodity generally, may be somewhat mixed and even conflicting. There is still a strong sense that speculation in water is undesirable and inappropriate because so many people and communities depend on it. Sometimes the antispeculative sentiment really seems to be more a feeling that it is not fair for someone else to profit so richly, especially from someone else's loss. For instance, the sentiments expressed against the Bass Brothers' transaction in southern California, discussed above,[383] were couched in antispeculation and antimonopoly terms. However, there was really no danger of monopoly because the Bass Brothers were only buying 200,000 acre feet of water rights in an irrigation district with a total of 2.87 million acre feet of rights.[384] The real distress was that the original proposal involved fallowing 45,000 acres of farmland and the deal eventually resulted in more than a one hundred percent profit for the Basses, just by holding and reselling the land and water.[385] In other words, monopoly and speculation continue to be lumped together and condemned, when the real concern seems to be a general dismay that water continues to run uphill to money, and somebody might make stunning profits from a resource everybody needs and wants for their own purposes.[386]

Whether the beneficial use doctrine can serve all these insistent mistresses any better in the twenty-first century than it has in the twentieth century perhaps remains to be seen. Regardless, these demanding and somewhat conflicting purposes still apparently exist.

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381 I thank my colleague Jim Huffman for emphasizing this point to me and for challenging my insistence that water is different, and Mike Blumm for helping to articulate the opposite argument. Although they may both disagree with my final statements on the subject, my statements are perhaps a little less fuzzy than they were originally due to their help and criticism.

382 *See, e.g.*, Jim Mayer, *Group Sets Course to Change Flow of State's Water: Calls for Free Market System*, SACRAMENTO BEE, Sept. 11, 1991, at A1 (describing a report issued by the Bay Area Economic Forum, a "cadre of corporate leaders . . . composed of business heavy weights," urging development of a market "for water to be bought and sold much like other commodities"); John Barbour, *Wet Winter or No, West Has Learned Its Lessons: Market Pricing Is Possible Step to Manage Water*, ORANGE COUNTY REG., Sept. 22, 1991, at B08 (noting that farmers and conservationists were growing more willing to put a price on water, and that several states and the Bureau of Reclamation were moving toward water marketing).

383 *See* Root, *supra* note 377, at 1.

384 *See* PONTIUS, *supra* note 152, at 13.

385 Lifsher, *supra* note 354, at CA1.

386 *See* Root, *supra* note 377, at 1 (quoting Greg Ellis, director of the Texas Edwards Aquifer Authority, about adopting rules on maximum groundwater withdrawals: "Do we have people that we classify as speculators attempting to put pressure on the board to adopt the rules a certain way? Yes, [b]ut so are the irrigators . . . and so are the cities.").

2. Maximization of Water Use

a. Achievement of Original Purpose

The anti-waste component of the beneficial use doctrine was intended to spread scarce water to many users, but the preceding pages of this Article reveal all too well that the beneficial use doctrine has not been particularly effective at maximizing the use of water. The doctrine certainly encourages diversion and use—indeed, overuse—of water. In this sense, beneficial use has been instrumental in supporting and encouraging economic development and settlement of the arid West. But because the concept of waste is so generous and poorly defined, and because forfeiture is not aggressively enforced, the doctrine does not even begin to maximize the number of users who could be supported by a given amount of water. Many streams in the West are currently overappropriated and have been for some time.[387] Water is a limiting factor for development in some areas and is in great demand for nonconsumptive uses as well. Employing a tighter definition of waste would free up water to support additional uses, whether consumptive or nonconsumptive. In other words, the beneficial use doctrine encourages maximum consumptive use of water by any given water user, but does not necessarily maximize the number of water users. The detailed discussion in Part II above demonstrated that inefficient uses of water abound, while burgeoning population growth is knocking at the door, thirsty for new supplies, and existing tribal and environmental needs remain unsatiated. The beneficial use doctrine can be credited with helping settle the West, populating the seventeen most arid states in the country with thirty percent of the country's citizens, and with supporting a multi-million dollar agricultural industry. But the doctrine's performance in encouraging efficient water use, and thus spreading a scarce resource as far as possible, seems to have hit a plateau. Using a custom-based, lowest common denominator standard has prevented maximum water usage. The entire foregoing discussion amply demonstrates that although the professed purpose was to support a maximum number of users, the maximum looks more like a minimum in practice. In short, the doctrine, as it has been implemented and interpreted, simply is *not* an efficiency-seeking doctrine. The existing beneficial use doctrine fails miserably at encouraging users to accomplish their use with a minimum of water.

b. Twenty-First Century Purposes

The implementation of this original purpose, perhaps more than any other, seems out of kilter with current needs. The West is the fastest growing region in the country;[388] the objective is no longer to encourage settlement and economic development, but to cope with what exists and what is coming. The challenge is no longer to adopt laws and policies that en-

387 *See* WATER IN THE WEST, *supra* note 4, at 6-1.

388 CASE & ALWARD, *supra* note 2, at 7.

courage taking more water out of streams and putting it to productive economic use, but to adopt laws and policies that encourage accomplishing those productive purposes efficiently, as well as putting some water back instream so that healthy ecosystems can coexist with productive human economies. Improving efficiency in water use is becoming increasingly important, as total demands (and competition among types of uses) continue to increase the pressures on a finite supply.

To meet increased demands on an admittedly limited and already stressed supply, water law doctrines must actively discourage waste and encourage continual improvements in water conservation and efficiency. The existing legal standard for waste simply ratifies existing custom. Reliance on a legal standard that endorses custom will not encourage the desired conservation behavior. Custom does not evolve fast enough to cope with severe overappropriation, critical instream demands, increasing competition among diverse demands, and population growth across the West.

On the eve of the twenty-first century, more than one hundred years after the adoption of the beneficial use doctrine, water law must truly encourage not just efficient maximization, but optimization of water use. It is even more important now to support as many valuable uses as possible and, in order to do that, stricter efficiency requirements are needed.

3. Flexibility

a. Achievement of Original Purpose

In one sense, the beneficial use doctrine has effectively achieved a necessary level of flexibility for individual water users. With a few exceptions,[389] the law does not dictate how much water farmers or others must use to accomplish their purposes. The law does not tell a farmer to grow alfalfa or avocados, when to irrigate, whether to use pipes and sprinklers, flood irrigation, or center pivot systems. Instead, the law says that as long as the farmer follows generally accepted farming practices for his or her locality, the water right is secure.

Some inherent tension is thus apparent in the doctrine itself. The third purpose, flexibility for water users, is in some ways inconsistent with the second purpose, maximizing society's productive use of water. Further, the doctrine is meant to be flexible and almost self-enforcing, rather than involving a lot of regulatory oversight; yet, at the margin, there is a great deal of potential regulatory power. If a water user crosses the line of acceptable use into either wasteful use or nonuse of the water, the hammer of the law can come down and reallocate that water to someone else. It would seem very important to know precisely where that line is, because the consequences of crossing it are severe, resulting in a loss of water. But the fuzziness of the definition of both beneficial use and waste prevents a clear sense of what behavior is unacceptable. Because the standard ratifies custom, the fuzziness works to the advantage of the water user, making nearly all behavior acceptable. From the users' perspective

[389] *See* discussion *supra* Part II.C.2.a (discussing groundwater management programs).

the line—though important—is so generous that they do not need to give it much thought or worry.

In other ways, however, the doctrine only partially achieves even the purpose of flexibility. The doctrine ties users' hands because it actually penalizes them for conservation and innovation. By relying on custom, the doctrine freezes old ways of doing things and gives no incentive to improve. The notion that needed improvements in the efficiency of water use will come from market forces rather than legal requirements is illusory because there is no true free market.[390] The underlying subsidies (not only of water itself, but also crop and land subsidies) skew the market.

Indeed, what flexibility there is lies in the hands of individual water users; there is little flexibility in the hands of the states as water managers, unless they are willing to brave the political battles to address waste and efficiency head-on, or unless they evade the beneficial use doctrine completely.[391] The western states declare water to belong to the public.[392] Yet most states hand over control to individuals through issuance of water rights, usually in perpetuity, and with few requirements to practice efficient water use.[393] In many cases, all of the available water has been allocated, leaving nothing to address new requests or nonconsumptive needs.[394]

b. Twenty-First Century Purposes

Any legal doctrine, to be effective, needs to be consistent with both the kind of behavior that is desired and the kind of behavior that is expected, given human nature. Therein lies the rub. Part of the desired and necessary behavior is as little waste as possible. But flexibility is still crucial to water users, especially irrigators. Farmers will continue to make their cropping decisions based on a number of variables having little to do with the technicalities of their water rights. They will irrigate their crops throughout the growing season as they see fit, without necessarily considering whether irrigating or not on this particular day will result in an arguable forfeiture of the water right, or if it is wasteful or beneficial in a legal sense. Farmers are going to watch the sky more than the watermaster, and will continue to treat their water rights as if the amount of water is highly flexible, as long as they are using the water beneficially to themselves and as long as, on an overall average basis, they believe they are operating within the limits of their paper rights.

The beneficial use doctrine must recognize these realities and somehow incorporate a workable degree of flexibility for individual water users. In fact, the beneficial use doctrine ought to encourage experimentation and innovation rather than discourage it. Further, providing some flexibility to state water managers to cope with growing and changing

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390 *See infra* Part IV.D.

391 *See supra* Part II.C.

392 WIEL, *supra* note 314, at 11-12.

393 *See supra* Part II.C.

394 *See* WATER IN THE WEST, *supra* note 4, at 3-6, 5-5.

water demands will be even more important as population growth continues.

The three original purposes of the beneficial use doctrine are thus all still important, but the emphasis has shifted somewhat. Actively improving efficiency and guarding against waste in order to maximize beneficial use has become more important with the passage of time and the burgeoning growth in the West. If the western population is actually going to grow by another thirty to fifty percent in the next few decades,[395] every drop of water will become even more valuable and precious, and interest in preventing inefficient uses will grow on a commensurate basis. But even though society's interest in preventing waste is perhaps on the increase, the legal doctrine must still build in some desirable level of flexibility, simply in recognition of the way water users actually operate on a day to day basis. Stretching scarce water supplies has taken on a new urgency, and flexibility is a matter of continuing necessity. Preventing speculation and monopoly, though still purportedly of interest, lurks in the background as code for anxiety about changing water uses.

IV. The Prospects for the Beneficial Use Doctrine to Achieve Efficiency in Western Water Use: Reform and Refinement for the Twenty-First Century

Stretching existing water supplies to meet growing and changing demands will be the central challenge of western water management in the new millennium. Barring meaningful reforms, the century-old beneficial use doctrine and its corollaries, waste and forfeiture, are not the right tools for the job. This trio of doctrines accomplished certain purposes that were important in the late 1800s and early 1900s, albeit with varying degrees of success, but the doctrines really were not designed to maximize efficiency in water use, and their record of performance toward that goal is poor indeed.

How could beneficial use, waste, and forfeiture be reformed to better achieve efficiency? Just as implementation of the beneficial use doctrine has been divided among courts, legislatures, and agencies, each of these branches could play a role in tightening up the beneficial use requirement.

A. Judicial Agenda

Part II.B above concluded that the judicial role in applying, much less improving, the beneficial use doctrine has been limited and constrained. Courts can do no more than decide the cases brought to them. Even taking all of the western states together, it is unlikely that many of the individual cases filed in the next few years will require the interpretation and application of the beneficial use, waste, or forfeiture doctrines. Nevertheless, because of the number of general stream adjudications currently working their way through the courts of various western states, the courts do in fact have an important role to play. In Arizona, two adjudications cur-

[395] Case & Alward, *supra* note 2, at 30.

rently underway encompass two-thirds of the state.[396] Idaho is currently adjudicating a single river and groundwater basin that covers ninety percent of the state.[397] Montana is adjudicating practically all of that state's water.[398] New Mexico and Utah are each conducting adjudications that encompass thirteen different rivers; New Mexico's cases affect major cities, towns, industries, and numerous Indian and Hispanic communities.[399] Washington and Wyoming are engaged in ongoing statewide adjudications, and most other western states are in the midst of at least one significant adjudication.[400]

This heavy schedule of ongoing general stream adjudications means that the courts of several of the western states have before them, or will at some point in the near future, large numbers of individual water rights claimants. Without exception, it is the obligation of a court in a general stream adjudication to decree the appropriate amount of each and every claimant's water right. Every state has the same general requirement of beneficial use without waste as the basis, measure, and limit of every water right. Thus, it is incumbent upon the courts in these cases to consider the parameters of the beneficial use doctrine and prohibit waste in the water use practices before them. Of course, the degree of scrutiny that any particular court gives to existing rights and levels of efficiency will depend to a great degree on what approach the state water management agency takes to the issue, as well as on the arguments of the nonstate parties before them. Nevertheless, a court has ample power and authority to request briefing and evidence on these issues if necessary to aid in its decision, regardless of whether the parties advocate active examination of existing efficiencies in water use.

As a practical matter, these adjudications are all at different stages of the proceedings. Many of them may be well beyond the stage at which issues of efficiency can be raised and fully developed. But to the extent that the issues are still relevant and timely, judicial scrutiny is certainly appropriate.

Throughout the past century, the courts have been instrumental in the growth and adaptability of the beneficial use doctrine, to whatever incremental extent that has occurred. New uses have been recognized as beneficial to reflect changing social values and broadening scientific understanding. Particularly wasteful practices have been curtailed, with a nudge to the water users to become consistent with changing practices around them. It is completely appropriate for a court reviewing water-losing practices, even those that may be customary, to question whether the customs themselves are wasteful. This is simply a matter of asking the next question, instead of taking for granted that if everyone is doing it, it

396 Colloquy, Dividing the Waters (Oct. 1997) (unpublished presentation, Big Sky, Mont.) (on file with author).

397 *Id.*

398 *Id.*

399 *Id.*

400 *Id.*

must be okay. The courts in *Imperial Irrigation District*[401] and *Grimes*[402] did no more than this.

Exhorting the courts to scrutinize water rights for waste is hardly asking for judicial activism. Instead, by doing so, the courts would be recognizing the beneficial use doctrine for what it is—an element of the common law. The common law is touted to be flexible and adaptable, and though accountable to precedent, not a mummified relic.[403] What constitutes waste in 1999, with the western population about to pass an estimated eighty-eight million,[404] ought to be both quantitatively and qualitatively different than what was recognized as waste in 1900, when most of the nation lived in the East.[405] Further, it is not unreasonable to expect the perception of waste to be considerably different at a time when sophisticated water saving technologies are widely available compared to a time when primitive devices represented not only the norm, but the only choice.[406] Also, eminently reasonable is the expectation that water use practices should adapt to advances in scientific knowledge about the importance of water in situ.

Many courts might agree with the general principle that the beneficial use doctrine should continue to evolve and not be used as a shield for inefficient water use methodology, no matter how widely practiced. However, they might balk at the next step of translating that general principle into a specific ruling declaring that any particular user's operation is losing too much water. A court might feel that in order to make such a ruling, it would need to tell the user what level of loss would be acceptable, which would require the court to become expert in whatever the water user's business was and then tell the user how to run the operation. But a court does not need to go that far. It is enough simply to find that the current practice is wasteful, and if it is customary, that the custom itself has become wasteful. It is then entirely up to the water users (perhaps in conjunction with the state water agency) to determine what changes in method, technology, or practice would reduce the losses.

Another aspect of some of the recent waste cases deserves emphasis as an area for courts to consider in their review of water rights, especially in general stream adjudications. In the *Alpine* case, discussed in Part II.B.3.b above, the court said that a water use should not be "'unreasonable' considering alternative uses of the water."[407] This way of looking at

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401 Imperial Irrigation Dist. v. State Water Resources Control Bd., 275 Cal. Rptr. 250 (Cal. Ct. App. 1990) (discussed *supra* notes 151-65).

402 Washington Dep't of Ecology v. Grimes, 852 P.2d 1044 (Wash. 1993) (discussed *supra* notes 168-82).

403 OLIVER WENDELL HOLMES, THE COMMON LAW 1 (1881) ("The life of the law is not logic but experience . . . . The law embodies the story of a nation's development through many centuries, and it cannot be dealt with as if it contained only the axioms and corollaries of a book of mathematics.").

404 CASE & ALWARD, *supra* note 2, at plate 22.

405 *Id.* at 2.

406 *See* COUNCIL FOR AGRIC. SCI. & TECH., FUTURE OF IRRIGATED AGRICULTURE 22-24 (1996) (discussing improved agricultural technologies).

407 United States v. Alpine Land & Reservoir Co., 697 F.2d 851, 854 (9th Cir. 1983).

whether a use should be considered beneficial has not received much discussion, but it represents a reasonable extension of the inquiry. For example, take a water user similar to Mr. Anderson in the *SRBA* case discussed in Part II.B.3.b above. The farmer had been using the same methods of "border" irrigation for sixty years.[408] Sixty years ago, the primary alternative use for the water would probably have been another irrigated farm. In 1999 however, alternative uses include unmet senior tribal needs, as well as the dire need for increased instream flows to support endangered fish species, to provide adequate wildlife habitat, to manage water quality problems, and to satisfy recreational and aesthetic demands, before even considering additional consumptive demands.[409] It seems that a judge could certainly defend a decision which asked the simple question: reasonable compared to what?, and concluded that, in the current context, historically acceptable—even customary—flood irrigation practices are no longer reasonable and beneficial.

Nearly twenty years ago, one commentator suggested a helpful five-step waste analysis for a court to employ in the irrigation context:

> 1) The protectable water right is the right to accrue benefits from watering crops.
>
> 2) Once technologies have developed that allow more efficient conveyance and application of water, the use of old, water-intensive practices becomes a privilege rather than part of the vested right.
>
> 3) With full appropriation of local supplies, the privilege is lost and use of the excess water becomes waste.
>
> 4) Once the statutory forfeiture period has run, the wasted portion reverts to the state.
>
> 5) Courts (and agencies) should determine how much has been forfeited as waste and allow diversion of only as much water as is reasonably needed under modern practices.[410]

This suggested line of reasoning remains commendable and valid today and has application to all water users, not just irrigators.

Although the courts are not the likely source of a revolution in western water use efficiency, it is perfectly reasonable to encourage the western judiciary, especially those courts involved in general stream adjudications, to continue the evolutionary process of adapting the beneficial use and waste doctrine to life in the twenty-first century. Suggested roles for administrative agencies and state legislatures are outlined in the next two sections.

B. An Administrative Agenda

Perhaps the most bang for the buck in efficiency improvements could come from state agency action. Agencies clearly have ample existing and largely untapped authority to further define the parameters of allowable

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[408] *In re* SRBA, No. 39576 (Twin Falls County Court, Idaho 1997) (Special Master's Findings of Fact) (Subcases 34-00060, 34-00259F, 34-00738E, 34-02412C, and 34-13562), at 3.

[409] *See generally* WATER IN THE WEST, *supra* note 4, at 2-33 to 2-35, 3-6.

[410] *See* Shupe, *supra* note 8, at 492.

water use through administrative rules or adjudicative decisions.[411] Agencies also have the legal, if not political, mandate to enforce against waste by water users.[412] Effective agency action should be a three-legged stool: 1) applying efficiency standards to all new water rights granted, 2) seeking efficiency improvements for all existing water rights holders, and 3) aggressively enforcing against waste.

1. New Users

The West is a land of limits, at least as far as water is concerned. Laws and policies that do not recognize those limits are ultimately doomed to fail. In this spirit, new applicants for water rights in western states should be required to meet a standard of best practicable conservation technology. The goal should be to accomplish the proposed water use with a minimum of water. This approach differs significantly from the feeble prescriptions of water duties currently applied by agencies.[413] These water duties are extremely generous, perpetuating existing practices rather than requiring or even encouraging any improvement.[414]

Of course, the difficulty with a best practicable conservation technology standard is in defining the term "practicable." There are, however, decades of experience to borrow from in the air and water quality areas.[415] Further, Arizona's experience in implementing its groundwater management program shows that it can be done.[416] Arizona has a technology-based standard for industrial groundwater users.[417] For irrigated agricultural users, Arizona's standard is "maximum conservation consistent with prudent long-term management practices," but that standard, too, has essentially been translated into a technology-forcing, if not technology-based, requirement by the work groups who determined that level-basin irrigation would be the preferred method of maximum conservation, and that with those methods, efficiencies of eighty-five percent could be achieved.[418] Although users are free to use whatever conservation methods they want, the amount of water allowed to them is based on the eighty-five percent required efficiency level.[419]

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411 *See supra* text accompanying notes 290-91. If agencies feel that their past practices of leniency constrain them from suddenly taking a stricter approach in individual permit decisions, transfer approvals, or enforcement proceedings, they simply need to proceed by administrative rule rather than through case by case adjudication.

412 After all, most state statutes declare beneficial use without waste as the limit of a water right.

413 *See supra* text accompanying notes 294-300.

414 *See supra* text accompanying note 300.

415 *See generally* Alan S. Miller, *Environmental Regulation, Technological Innovation and Technology Forcing*, NAT. RESOURCES & ENV'T, Fall 1995, at 64; D. Bruce LaPierre, *Technology-Forcing and Federal Environmental Protection Statutes*, 62 IOWA L. REV. 771 (1977).

416 *See generally* Jacobs & Carr, *supra* note 230 (describing history and accomplishments of Arizona's Groundwater Management Program).

417 *See* ARIZ. REV. STAT. ANN. § 45-565(A)(2) (West Supp. 1997).

418 *See* Jacobs & Carr, *supra* note 230, at 9.

419 Holway, *supra* note 313.

Developing such a standard in other states and achieving both public and user acceptance for it will be no small task. Time, effort, political skill, and resources will all be required. User group representatives, technical experts, and economists or other financial advisers must all be involved. But the goal of improving water use efficiencies to extend existing water supplies certainly ought to be worth the investment. Equivalent planning, negotiating, and expenditures would be needed to augment water supplies in other ways, and conservation is no different.

2. Existing Users: Efficiency Improvements

To impose a conservation requirement on new water users without requiring similar improvements of existing users would be unfair and would put the new users at a significant disadvantage. This disadvantage would compound the disadvantage already inherent in being a junior appropriator in the prior appropriation system. In fact, a technology-forcing standard applied only to new users would serve as an artificial barrier to market entry. In order to level the playing field, existing users need to adopt technological improvements as well. Because most of the water in many localities is already fully appropriated,[420] it is also only by addressing existing uses that conservation and efficiency improvements will make any headway in producing "wet water" for nonconsumptive or new consumptive uses.

The challenge of improving efficiencies for existing uses is of course even more daunting than trying to develop a conservation standard for new users. Here, too, agencies will need to do significant groundwork in terms of consultation with water users in various economic sectors, as well as with technical advisers of many sorts. It may not be politically possible to apply a technological standard retroactively without legislative blessing, but it may be more palatable to specify water use reduction targets for existing users. Achieving these targets then becomes a process of assisting water users with choosing among various means. Like Arizona, states may put voluntary compliance at the top of the menu, choosing to put resources first into education and water user assistance, such as through extension programs, demonstration pilot projects, and the like. Eventually, however, in order to make real progress in water savings, state water agencies will need to insist upon achievement of the reduction targets.

One key to success can be gleaned from the comparison of Arizona's Groundwater Management Program and Oregon's Plan for Salmon and Watersheds.[421] Although Arizona's program is still evolving and certainly could not be called an unqualified success,[422] in at least one key particular it has an edge over the Oregon approach. The goal itself—reduction of groundwater use to the safe annual yield of the aquifers[423]—is clear, de-

[420] WATER IN THE WEST, *supra* note 4, at 3-6.

[421] *See supra* Part II.C.2 and II.C.5.

[422] *See supra* notes 311-13.

[423] ARIZ. REV. STAT. ANN. § 45-562 (West Supp. 1997).

monstrable, and set by law. Oregon's overall goal, saving salmon, and even the more limited goal for the efficiency standards of increasing instream flows,[424] is not clear, easily demonstrable, or explicitly provided by statute. Thus, as administrative agencies set about the business of improving efficiencies, they would do well to provide the necessary clarity, even if their legislatures have not done so.

In order to justify requiring existing water users to conserve and improve their efficiencies, agencies need to do their homework. In addition to the day-to-day authority to administer water rights, many of the western water management agencies also have legally mandated responsibilities to perform some sort of water supply planning.[425] Rather than (or at least in addition to) planning to augment supplies through proposed storage projects, the western water resource agencies ought to have an effective conservation platform in their supply agenda.[426] Even if funding assistance is required for users to become more efficient,[427] conservation is still likely to be the least-cost alternative to expensive new forms of supply augmentation. State energy regulators have begun to see the wisdom of pursuing conservation as a least-cost alternative for developing new supplies.[428] Responsible water management agencies should do no less. An agency with a well-documented water development plan that includes a well thought out conservation component stands a much better chance of persuading water users that the program is both necessary and sensible and not simply regulators out to take their water.

When water rights are under review by an administrative agency for approval of a transfer or other change to the water right, only the amount of actual, past historic use should be allowed to be transferred, and the proposed new use should be held to the same standard of efficiency as a new application. However, water users could perceive this increased scrutiny as an impediment to transfer. Simply by invoking the administrative approval process, they have subjected their water rights to possible reduction. To diminish this perception and effect, and to make the transfer process more of a carrot than a stick, agencies should provide an expedited process for obtaining rights to conserved water that could run concurrently with the transfer process.

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424 *The Oregon Plan*, *supra* note 248.

425 *See, e.g.*, CAL. WATER CODE § 10910 (West 1998); OR. REV. STAT. § 536.220 (1997); TEX. WATER CODE ANN. § 16.051 (West 1998).

426 Some states have required conservation planning for urban water suppliers, but not for agricultural users. *See, e.g.*, COLO. REV. STAT. § 37-60-126 (1998). Other states encourage conservation planning, but do not require it. *See, e.g.*, OR. ADMIN. R. 690-086-0120 (1998).

427 *See infra* text accompanying notes 440-42.

428 *See generally* Ralph C. Cavanaugh, *Least-Cost Planning Imperatives for Electric Utilities and Their Regulators*, 10 HARV. ENVTL. L. REV. 299 (1986); Roger D. Colton, *Utility Financing of Energy Conservation: Can Loans Only Be Made Through an Investor-Owned Utility*, 64 NEB. L. REV. 189 (1985); Michael Malecek, *Money for Nothing: Restricting Rates to Encourage Conservation*, 11 VA. ENVTL. L.J. 589 (1992); NORTHWEST POWER PLANNING COUNCIL, THE GREEN BOOK: TRACKING PACIFIC NORTHWEST UTILITY CONSERVATION AGREEMENTS 1978-92, VOLUME I, REGIONAL SUMMARY (1994); SYMPOSIUM, 19 ENERGY POL'Y 194-287 (1991).

An important component of any program is first to encourage, and eventually to require, efficiency improvements from existing water users in a strong and effective conserved water program. Agencies need to do some soul-searching to see why the conserved water statutes have been so little used. Such statutes may eventually become superfluous as the agencies take the initiative to identify conservation targets and methods. But strengthened conservation programs could also provide a significant first step toward water use reduction during the voluntary phase of any program.[429]

At the end of the day, however, as the Oregon Water Resources Department is learning,[430] a western water agency that wants to be successful in improving users' efficiencies cannot only focus on getting across-the-board improvements in otherwise legal and legitimate water uses. Sooner or later, the issues of waste and other unauthorized water uses need to be tackled head-on. Confronting this reality sooner rather than later will demonstrate good will and a sense of fairness to the majority of legal water users whose cooperation is needed to accomplish maximum water savings.

3. Existing Users: Waste Enforcement

Part II.C.4 above reported a meek and passive approach by state water management agencies to the investigation and elimination of wasteful water use practices. This reticence can be attributed to a combination of factors: 1) inadequate information about water use, 2) political pressure against taking action, 3) insufficient staff and resources, and 4) an unwillingness (or perceived lack of authority) to give some concrete definition to a fuzzy concept. Although these barriers are all very real, it borders on irresponsibility to hide behind them and refuse to take action at least to attempt to enforce the law. A brief fictional digression can help illuminate the problem and some obvious steps toward a solution.

Suppose an anthropologist from another galaxy sets his spacecraft down in an alfalfa field in the middle of Nevada (using the lights of Reno and Las Vegas to guide the landing). Early the next morning he greets an astonished farmer, out to clear vegetation from his irrigation ditch, with this question: "What is the most precious and scarce natural resource in this area?" Given that it is the sixth year of one of the West's recurring seven-year drought cycles, the farmer, once he catches his breath, says "water." The anthropologist, whose special interest is tool development, says: "Ah, you must have highly developed technology for measuring and rationing this valuable resource. Will you show it to me?" When the farmer

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[429] The concept of tax amnesty programs may provide a useful analogy. During a set period of time, water users could come in to the agency and negotiate conservation plans without fear of reprisal for what might otherwise be arguably unauthorized or excessive water use. Of course, this approach runs the risk of being unacceptable to those water users who are complying without the benefit of amnesty. It depends, as a matter of policy, on which is more important—getting the taxes paid (in this case, getting the water saved) or punishing those who may be currently disobeying the law.

[430] *See supra* Part II.C.2.b.

gestures to the open ditch as the distribution device, and explains that measurement is not required, it is the visitor's turn to be astonished.

The story illustrates that it does not take an alien to see that earthlings behave strangely at times. Is it not astounding that most of the irrigation water diversions in the West are not measured in any way?[431] And is it not equally surprising that some of the western cities with the most serious water supply challenges do not require water metering or tiered payment for water use?[432] A basic component of a water management program seeking efficient use of a scarce resource ought to be measuring and monitoring. Every single existing water user ought to be required to install a device that measures the amount of water taken. How else can an agency even begin to determine whether the terms of water rights are being complied with, much less whether a user is wasting water?[433] In fact, chances are that the simple act of measurement would produce some significant reductions in unauthorized water use. Even the best-intentioned water users may be using water beyond the terms of their water rights, but if they have no way of monitoring their own use for compliance, they cannot correct their behavior.[434]

An agency can and should go beyond measurement and reporting, however. An effective enforcement program needs to have people in the field, checking for excessive or unreasonable water use, not simply waiting for complaints from other water users. In order for such monitoring to be effective and fair, the agency needs predetermined parameters to determine what is excessive and unreasonable. Part IV.B.2 above discusses the need for agencies to develop clear, measurable standards to guide efficiency improvements for the bulk of existing users. But there is a difference between wasting water and being able to become more efficient—or at least water users themselves perceive such a difference.[435] Presumably, then, water users would feel betrayed if aspirational conservation goals suddenly became not only the ceiling of desirable behavior, but also the floor of required conduct for purposes of enforcement. Water users might find regulations more acceptable if the regulations defined waste as water use that fell significantly short of the targets by some identified percentage. Alternatively, agencies might identify particular practices as waste, beginning with those that they currently enforce against, such as irrigating

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431 *See, e.g.*, Russell, *supra* note 281, at 188 n.279, 189 n.281, 201.

432 MARK REISNER & SARAH BATES, OVERTAPPED OASIS: REFORM OR REVOLUTION FOR WESTERN WATER 55-56, 112 (1990); *c.f.* PETER ROGERS, AMERICA'S WATERS: FEDERAL ROLES AND RESPONSIBILITIES 146 (1993) (describing recall of Tucson, Arizona, city government by electorate because of an increase in the price of water).

433 *See* WILEY, *supra* note 259, at 16-17, 23 (discussing recognition by water users that measurement is important for enforcement purposes).

434 Letter from Reed D. Benson, Executive Director, WaterWatch of Oregon, to Jan C. Neuman, Author (Annual WaterWatch Membership Renewal Letter) (describing how summer streamflows in the Wood River in Oregon were 30-40% higher after WaterWatch convinced the Water Resources Department to install measurement devices to regulate water use and curb suspected unauthorized use).

435 *See supra* text accompanying note 262-64 (discussing the perceptions of water users found in Oregon's efficiency study).

roads or refusing to install proper shut-off devices to prevent clearly excessive diversions. However, a credible list would go much further than that. It is time to address head-on the matters of flood irrigation in the desert and conveyance systems that lose half or more of their water to evaporation and seepage.

A law review article cannot possibly make recommendations specific enough to accommodate the variety of western water users and localized conditions. This is precisely the kind of detail that needs to be tackled by agencies in case-by-case enforcement actions, or perhaps in administrative rulemaking. The point is simply that it is time for this hard work to begin, and for the agencies to stop avoiding taking any action whatsoever by hiding behind the almost anything goes looseness of the waste doctrine.

C. A Legislative Agenda

Parts IV.A and IV.B above describe actions that western courts and administrative agencies could, and should, take to refine and reform the beneficial use doctrine. Significant gains could be made in the efficiency of western water use if the courts began holding water use practices and customs accountable to the reality of water demands in the 1990s and beyond. Administrative agencies should take simple steps such as requiring measuring and reporting by all water users, as well as more difficult steps such as fleshing out beneficial use and waste through adoption of administrative rules. This proposed judicial and administrative activity could take place well within the bounds of existing state constitutional and statutory law on beneficial use. What, then, is needed from western state legislatures?

Experience to date suggests that legislative action may in fact be required to clearly direct the courts and agencies to do the jobs described. Although the judicial scrutiny suggested earlier would seem to be comfortably within the next generation of an evolving common law doctrine of beneficial use,[436] many judges, particularly elected ones, may still feel discomfort at raising questions about previously unquestioned water use practices, especially if the agency or other parties before them are not asking for that scrutiny. Further, the administrative agenda sketched out above, though not a stretch of existing authority, is fraught with political pitfalls.[437] An agency that would mount a proactive attack on waste and efficiency without giving at least some thought to the potential political backlash from water users would have to be either supremely confident or terribly naive. A legislative mandate to address these contentious issues could provide welcome political cover, and perhaps necessary funding as well.

Of course, that is not to assume that western legislatures themselves are yet willing to weather the political firestorms of addressing water use efficiency. It would probably be unrealistic to suggest that either the legis-

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[436] *See supra* Part IV.A.

[437] *See supra* Part IV.B.

lative or administrative recommendations made here could be carried out without a political battle. The same campaigns that would be mounted against agency action could likewise paralyze legislative action. In fact, even significant scrutiny of water use practices by the courts could result in a political backlash, with western legislators scrambling to codify previous lenient standards and insulate certain practices from judicial review. However, legislatures may have a greater ability than agencies to marshal leadership, rise above the fray, and focus attention on the larger issues of acute and growing water needs that require joint planning and problem solving. Western state legislative leaders with an interest in water policy, whatever their political persuasion, ought to be pulling together interest groups and constituencies with a common commitment to solving imminent water supply problems, such as urban and rural water suppliers looking for reliable municipal and domestic water supplies, environmental groups concerned about instream flows, and progressive agricultural leaders who realize that the best defense is a good offense.

Irrigated agriculture already perceives itself as under siege from many quarters, but particularly from those who advocate reallocation of water from agriculture to urban, tribal, or environmental uses.[438] Suggestions that irrigators could or should use water more efficiently, much less that they waste water, will undoubtedly meet with organized political opposition and defensive maneuvering. Although the political objections will be couched in the broadest and most righteous of terms—such as alleged unconstitutional taking of property, cries of "war on the west," objections to over-reaching regulation, and the like[439]—much of the real underlying anxiety and motivation will be about money.

After all, improving efficiencies in western water use will be expensive. Changing from flood irrigation or other low-tech irrigation methods to pumps, pipes, sprinklers, or high-tech systems could cost thousands of dollars per acre for installation and ongoing operational costs; that would quickly add up to hundreds of thousands of dollars even for fairly small farms.[440] Lining or enclosing over a hundred thousand miles of leaky ditches would add huge additional costs.[441] A twenty year old estimate

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[438] *See* COUNCIL FOR AGRIC. SCI. & TECH., *supra* note 406, at 5; *see also* Letter from Western States Water Council to Western Water Policy Review Advisory Comm'n (Nov. 14, 1997) (on file with author).

[439] COUNCIL FOR AGRIC. SCI. & TECH. *supra* note 406, at 5; *see also* Tam Moore, *Untitled*, CAPITAL PRESS, July 10, 1998; Tom Kenworthy, *Study on West's Water Favors Cities*, OREGONIAN, June 25, 1998, at A14.

[440] NATIONAL RESEARCH COUNCIL, A NEW ERA FOR IRRIGATION 65-66 (1996) (More than 60% of the West's irrigated lands still use gravity to distribute water. Efficiency improvements, such as field leveling, sprinklers, or drip systems, range up to over a thousand dollars per acre in capital costs alone. *Id.* at 65.); *see also* Shupe, *supra* note 8, at 520 (conservation costs on a specific farm might range from $25 an acre for leveling, to over $1000 an acre for trickle irrigation).

[441] *See* Shupe, *supra* note 8, at 519 (citing a 1979 governmental study estimating that it would cost as much as nine billion dollars to improve the western irrigation water conveyance network, consisting of over 30,000 miles in the general delivery system and over 90,000 miles of on-farm ditches).

outlined total costs of nearly $15 billion to adopt conservation improvements in irrigated agriculture westwide, just to improve irrigation efficiencies from forty-one percent to fifty-eight percent.[442] Substantial expenditures will also be required to effect water savings in the municipal and industrial sectors, even though the gains in water saved will not be as great overall.[443] The benefits in terms of reduced water diversion and consumption would be enormous, however, amounting to tens of millions of acre feet per year just from irrigation water savings.[444] Indeed, the economic benefits from this investment in conservation were estimated twenty years ago to be hundreds of millions of dollars annually, with the construction program itself generating payrolls of thirty million dollars.[445]

Whether the individual water users should be expected to pay for these improvements is subject to logical and passionate arguments on both sides. If current practices are viewed as nonbeneficial or wasteful, it is certainly fair for the users to pay for necessary changes—that much is required by the very terms of their water rights. On the other hand, if the users have been lulled into inaction by the acquiescence and laissez-faire approach of the courts, the legislatures, and the agencies over the past one hundred years, then requiring investments of this magnitude by the users alone seems less just. Although this Article argues that a reading of the beneficial use doctrine and its corollaries appropriate in 1999 suggests that the users, and those who oversee them, have the responsibility to effect some change, the issue of how those changes will be financed is still really a separate question.

If the real goal is substantial water savings rather than assigning blame or legal responsibility for the current inefficiencies, then getting bogged down in the fight over who pays will simply postpone achievement of that goal. A great deal of skirmishing could be avoided by simply facing the reality that aggressive movement toward conservation carries a large price tag, and then going about the business of deciding how the effort will be financed. In fact, it would be a political coup for the representatives of irrigated agriculture to take the initiative and organize a political campaign to take on the problem of improving conservation proactively, concurrently seeking funding to finance improvements, rather than organizing defensively to protect their long-held claimed rights to use water inefficiently.[446]

Of what should a legislative mandate consist? In general, there are two models from which to choose, one complicated and one simple. Arizona's Groundwater Management Act is an example of a fairly compli-

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442 *Id.*

443 *Id.*

444 Because agriculture currently accounts for nearly 90% of western consumptive water use, just a 10% reduction in agricultural water use would double the supply available for municipal and industrial uses. *Id.* at 520.

445 *Id.*

446 *See* COUNCIL FOR AGRIC. SCI. & TECH., *supra* note 406, at 16 ("Future water policies at both federal and state levels . . . probably will treat irrigated agriculture more as an equal among competing users and less as a favored child.").

cated legislative scheme.[447] The statutory code sections go on for hundreds of pages, in the nature of a tax code; the legislature gave specific direction on every aspect of groundwater management.[448] The level of detail reflected in the Arizona Act is a product of a difficult ten-year process of negotiating the compromise legislation.[449] Perhaps this bureaucratic solution should not be wished upon other states.

A simpler approach could be equally effective, however. The legislature could make findings about pressing water supply needs, the failure of the existing beneficial use requirement to promote affirmative efficiency improvements, and the infrequency of use of the available conserved water statutes, if any. The statute could then direct the state water management agency to develop a plan for meeting future water supply needs, and require that the plan place conservation and more efficient use of existing supplies at the top of the list of preferred alternatives. Further, the agency could then be directed to develop administrative rules and other procedures to accomplish three things: 1) to enforce aggressively against waste; 2) to pursue forfeitures not only in transfer proceedings, but also independently; and 3) to require the best practicable conservation technology in every sector of water use for both new users and, on a phased-in basis, for existing water users.

The debate about what is practicable would then, of course, be shifted from the legislative hallways to the administrative offices. This is similar to the Arizona approach, where the agency has the job of fleshing out the statutory requirement of "maximum conservation consistent with prudent long-term farm management practices" for irrigation uses and "the latest commercially available conservation technology consistent with reasonable economic return" for industrial uses.[450] This is an appropriate place for such a debate because an agency can perhaps more effectively use advisory groups to help explore alternatives and inform the rulemaking process, and because administrative rules are more flexible in dealing with changes over time.

The suggestion of an across-the-board best practicable conservation technology standard does not mean mandating a one-size-fits-all requirement, nor does it mean conservation at all costs. Determining what is practicable necessitates consideration of costs and benefits, and necessary flexibility for water users, as integral parts of deciding how much efficiency and conservation makes sense for any given water use sector. However, it is important that cost-benefit analysis not be used to completely forestall efficiency improvements.[451] It is very possible that an in-

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447 ARIZ. REV. STAT. ANN. § 45-566 (West 1994 & Supp. 1997).

448 *Id.*

449 *Id.*

450 *Id.*

451 When the original Clean Air Act and Clean Water Act were adopted in the 1970s, industry claimed that the pollution control requirements would put them out of business. For instance, when the Clean Air Act required a 90% rollback in certain auto emissions within five years, Lee Iacocca and other auto industry executives said that the limits "'could prevent continued production of automobiles'" and "'do irreparable damage to the American

dividual farmer legitimately could claim that he cannot afford any technological improvement whatsoever if the costs and benefits are looked at only from his perspective. If a farmer is growing alfalfa, or any number of other forage crops that do not fetch a high value in the market, and if both his water use costs and his profit margin are now very low, any cost of conservation technology may be prohibitive. If, on the other hand, the costs and benefits are examined on a larger scale, the cost of subsidizing that farmer's conservation improvements may easily return substantial benefits.[452] It is critical for a legislature serious about solving this problem to keep the analysis at that broader level. This may necessitate decoupling the funding issue from setting the technological standard. An important part of a legislative package then becomes a fund available to help finance the called-for improvements.

D. A Word About Markets

The bulk of this Article is concerned with examining the beneficial use doctrine in its current form—with responsibility for its implementation divided among the judicial, legislative, and administrative branches—and considering how the doctrine's performance could be improved by each of those branches. Although a comprehensive discussion of the potential role of water markets is beyond the scope of this Article, a brief discussion of how a legal economist, particularly a market environmentalist, might approach the problem of the inefficiency of the beneficial use doctrine is in order.[453] At the very least, an introduction to a market approach serves to highlight why reform of the doctrine is needed.

Some legal economists might argue that attempting to improve the efficiency of western water use by encouraging courts to tighten up the common law definition of beneficial use without waste, and encouraging legislatures and agencies to adopt requirements for more efficient water use, are all misguided, and that we should let the market do it. Markets can allocate scarce resources efficiently, and thus might seem eminently suited to help with western water allocation. An overview of market theory[454] and a comparison to the actual practice of western water allocation, however, reveal a vast gulf between the two, rendering the market strikingly inadequate for solving the growing problems of water scarcity, either comprehensively or soon.

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economy.'" Miller, *supra* note 415, at 65 (quoting M. Weisskopf, *Auto Pollution Debate Has Ring of the Past*, WASH. POST, Mar. 26, 1990, at A1). Of course, it is common knowledge that such dire predictions did not come true.

[452] *See supra* notes 444-45.

[453] Although I am not an economist, and therefore may be venturing dangerously far onto thin ice with the following discussion, I think it is important to anticipate and briefly consider a market solution argument.

[454] This overview of market operation is drawn from ROBERT KUTTNER, EVERYTHING FOR SALE: THE VIRTUES AND LIMITS OF MARKETS 11-13, 16-17 (1997). If I have misstated or oversimplified the discussion, the fault is mine, however.

At the heart of a functioning market is a price mechanism: price reflects what a resource is worth to willing buyers and sellers.[455] Fluctuating supply and demand and corresponding adjustments in price distribute the resources to an efficient allocation of uses—an allocation that represents the highest and best use of those resources as an aggregate of the many individual valuation decisions.[456]

In addition to a responsive price mechanism, a smoothly functioning market depends on several key assumptions: 1) that consumers have perfect information in order to accurately assess goods and make valuation decisions; 2) that perfect competition exists—there are many suppliers, and buyers have the freedom to shop around; 3) that other parts of the system besides consumers are also mobile, such as capital and labor; 4) that both buyers and sellers behave rationally to maximize their well-being (*i.e.*, buyers will look for the best products at the best price, and sellers will seek maximum profits); and 5) that there are no significant externalities—costs or benefits not captured in the price.[457]

Applying these factors to western water allocation reveals that there simply is no smoothly functioning market in western water, and never has been. In the first place, the basic core component of price is missing. No western state charges water users for water.[458] Even when there are middlemen who serve as water suppliers—municipal water suppliers, irrigation districts, and other private, public, or quasi-public entities—they rarely charge for the water itself, but rather for their service and delivery systems.[459]

To say that water has no price in most initial allocation transactions does not mean that it has no value, but it is most frequently an indirect value, reflected in secondary markets outside any direct water market.[460] In agriculture, land with water rights is worth more than land without water rights, and land with very senior water rights is worth more than land with junior water rights.[461] Therefore water has a value that is reflected and paid on the real estate market. Water is also sometimes bought and sold by itself, apart from land, such as in the purchase of water from

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455 *Id.*

456 *Id.*

457 *Id.*

458 NATIONAL RESEARCH COUNCIL, *supra* note 440, at 88, 122 n.2 (There is no charge for the use of the water itself and most irrigators pay less than 1/100 of a cent per gallon for delivery of the water. Urban users pay an average of 16/100 of a cent per gallon for delivery and treatment.).

459 *See id.* at 64 ("The prices of most agricultural inputs are established in markets, where prices indicate relative scarcity through supply and demand. In contrast, irrigation water prices are typically not set in a market. Water prices usually reflect only the cost of supplying water and generally do not convey market signals . . . .").

460 *Cf. id.* at 64-67, 88-89 (explaining higher values of irrigated agricultural operations, and citing estimates of the value of water in irrigation ranging from $9 to $103 per acre foot, with 90% of irrigation water being valued at $30 or less, and urban values at around $100 per acre foot.)

461 *Id.*

farmers for municipal supply, or for conservation purposes.[462] But this is a relatively recent phenomenon, and the fact that the holders of the water, who are now the sellers, obtained the water without having to be buyers themselves, inevitably skews the valuation. Economists have called this the "endowment effect": a person will normally demand more to give something up than he would pay to acquire it in the first place.[463]

Without a price signal to create the basis for market transactions, the rest of the assumptions become superfluous, but they are problematic as well when applied to western water. Are there externalities not captured in the price? Of course: without a basic price, all costs and benefits become externalities, and these can be significant. External costs include the damage to ecosystems from overappropriation of water. External benefits include wetlands and groundwater recharge created by inefficient flood irrigation. None of these factors currently need to be accounted for by buyers and sellers.[464]

Are there many suppliers, and freedom to choose? In every state, the state itself is the initial supplier, and anyone who wants a water right must come to the state. Second-tier suppliers, such as public drinking water suppliers and irrigation districts, are quasi-public entities not subject to normal economic competition. Do buyers and sellers behave rationally, from an economic perspective? The state as seller certainly does not seek to maximize profits. Initial applicants for water rights, as buyers, do not need to consider the price of water in their decision making because there is no price.

There is very little unappropriated water left in many areas of the West,[465] and most of the water was passed out free many years ago, mostly to farmers, on a first come, first served basis rather than with any market allocation scheme. Existing water rights holders thus become potential sellers, but it is not clear that they operate only on the basis of rational economic behavior. A farmer in many parts of Colorado probably

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462 *See generally Transaction Update*, WATER STRATEGIST (providing quarterly summaries of recent water sales). As demand for water grows, pressure is also increasing to make western water distribution more responsive to market mechanisms, *see supra* note 382, and the number of market transactions will continue to grow. However, these transactions will not likely effect large scale changes in western water use any time soon.

463 *See* KUTTNER, *supra* note 454, at 45 (discussing Cornell economist Richard Thaler's term "endowment effect" and its demonstration in numerous experiments).

464 This is true at least in the original allocation transaction. All of the western states require transfers of water from one use to another to go through a state approval process. In these transfer proceedings, the transfer will not be approved unless it can occur without injury to existing rights of junior appropriators. *See* Anderson, *supra* note 301, § 16.02(a), (b). For example, if a junior water user is relying on the return flow from an inefficient senior user, he would be injured by any change in the senior's water use that would increase the percentage of the diverted water actually used. The use of a "no injury" standard for transfers thus elevates a positive externality to the level of a protected legal right in third parties. The no injury standard is often identified as a barrier to market transfers. *See* MEYERS & POSNER, *supra* note 351, at 39-46; David Getches, *Pressures for Change in Western Water Policy*, *in* WATER AND THE AMERICAN WEST: ESSAYS IN HONOR OF RAPHAEL J. MOSES 143, 151 (David H. Getches ed., 1988).

465 WATER IN THE WEST, *supra* note 4, at 3-6.

could sell his water right for municipal use for more than he can make using the water right in farming.[466] By the same token, a farmer in the arid parts of the Columbia River Basin could sometimes make a better profit selling water to government agencies or conservation groups to aid fish habitat than in farming.[467] The fact that these transactions do not occur more frequently is partly attributable to the various barriers to transfers, but it is also attributable to the fact that farmers choose to hold on to their water for noneconomic reasons—to continue farming as a lifestyle choice, to keep a family farm going, to avoid adverse reaction from their neighbors, and a host of other motivations.

It is in this jumbled context hardly resembling a smoothly functioning market that the current beneficial use doctrine exists. Thus, it is meaningless to talk about avoiding government interference and letting the market do it. In order truly to let the market accomplish water allocation, western states would essentially have to wipe the slate clean and start all over. They would have to start by creating price signals for water use. Realistically, this cannot be done retroactively, because most of the water is already allocated in the form of vested property rights. It is a little late to price the water that has already been allocated, but the alternative of charging only new appropriators and creating a windfall for existing appropriators could not be justified on either economic or equitable grounds.

In fact, returning to the discussion of the roots of the beneficial use doctrine, the ways in which the system of western water allocation departs from a pure market system are the direct result of conscious choices. The western states all asserted public ownership over water, precisely because private ownership of something so scarce and critical to life would put too much power in the hands of its owner. Looking back with hindsight, it is easy to see all the things that the early water administrators did not do that they might have done to make the job of improving water use efficiency easier today. They might have leased water for definite terms, rather than giving out nearly perpetual water rights. Such a system would have retained more public control over a public resource and clarified that water is distinct from other types of private property. Early administrators might have charged a fair market value price for water, increasing with the amount of water used, to test the uses to which water was being put. That approach would have built a market of sorts. Instead, early legislators and administrators opted for a mixed system, neither entirely a private market nor completely government controlled. This is the system, with all its inconsistencies and imperfections, that confronts water managers at the beginning of the twenty-first century.

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466 *Transaction Update*, WATER STRATEGIST, Fall 1997-Winter 1998, at 15 (describing a transfer to the city of Fort Collins from three farmers, two who are retiring. The transfer comprised 30.25 acre feet per year at $41,000.); *Transaction Update*, WATER STRATEGIST, Fall 1996, at 13 (describing a transfer of water share from a farmer to the St. Vrain-Left Hand Water Conservancy Co.).

467 *See, e.g.*, *Transaction Update*, WATER STRATEGIST, Summer 1997, at 16 (describing a purchase from irrigators by the Oregon Water Trust to augment streamflows for fish).

The entire system cannot easily be dismantled and rebuilt with all the necessary pieces to construct a smoothly functioning water market. Simply using the market argument to resist judicial intervention or government regulation, or even tinkering with the system to make it more market-like around the edges, will not necessarily produce a better system for achieving economically efficient water allocation.[468] I will leave to another day a more thorough discussion of just how effectively western water allocation could be made more amenable to market principles without losing track of the very reasons that the system is not a pure market today. Suffice it to say, for current purposes, that it is not a simple either/or choice between seeking regulatory reforms (whether in judicial, legislative, or administrative fora) or letting the market do it.

E. Summary: A Reformed Beneficial Use Doctrine

The foregoing discussion in Part IV outlined a comprehensive agenda for improving efficiency in western water use. The courts should scrutinize water rights claims in general adjudications and individual actions and ask hard questions about whether uses are truly beneficial and nonwasteful by 1999 standards. Administrative water agencies need to bite the bullet and aggressively enforce against waste and forfeiture, promote conservation, and give clear legal guidance for an updated beneficial use doctrine. Western state legislatures should embrace the responsibility to insure water supplies for their future citizens, and give courts and agencies a mandate and funding to seek efficiency improvements. Without strategic reforms, the demands of twenty-eight million additional thirsty people in the arid West in the twenty-first century will be satisfied only at great economic, social, and environmental costs.

V. CONCLUSION

One hundred years ago, the western states declared, practically in unison, that beneficial use, without waste, would be the basis, measure, and limit of water rights. The right to the arid West's most precious and scarce resource was to be earned by continuously putting the water to productive purposes; nonuse would result in a forfeiture, as would wasteful use. How has the beneficial use doctrine performed during the intervening century? Beneficial use has shown itself to be adaptable to new circumstances, but only up to a point. The doctrine has accommodated new types of uses, as societal needs and scientific understanding have grown. Nonuse of water occasionally results in forfeiture, at least when the issue is squarely presented to a court or agency. But the doctrine has revealed itself to be woefully inadequate at eliminating waste and encour-

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[468] *See generally* KUTTNER, *supra* note 454, at 19 (discussing the "General Theory of the Second Best," propounded in the 1950s by Richard Lipsey and Kelvin Lancaster, which "holds that, when a particular market departs significantly from a pure market and yields an outcome that is not 'optimal' in market terms, attempts to make it more marketlike in some, but not all, respects will have indeterminate results for economic efficiency—and sometimes perverse ones.").

aging efficiency. Beneficial use affirmatively protects inefficient water use customs and practices. Although originally intended to maximize the use of a scarce resource, the doctrine instead freezes historical patterns and methods and limits the possibilities for future optimal water use. Inefficient practices are endorsed and water users have little incentive to conserve or improve.

At the same time, a poorly functioning water market further constrains improved efficiencies. The vague definitions of the beneficial use and waste doctrines, in combination with the protection of third party water users in transfers, prevent transactions from occurring that could foster conservation. The market as it exists is not likely to deliver efficient water use any time soon, and the system would require substantial overhaul to enable market transactions to occur in any volume.

The courts, legislatures, and administrative agencies share responsibility for implementing the beneficial use doctrine, and they therefore share the responsibility for refining and reforming the doctrine if it is to deliver the efficient water use practices needed in the twenty-first century. Part IV outlines a comprehensive agenda for reforming the beneficial use doctrine in western courtrooms, legislative hallways, and administrative offices. Each branch could make a significant contribution to improving western water use efficiencies; all three together could create real supplies of wet water to carry the West into the next millennium.

A John Prine song contains this wonderful description of the confusion at a four-way stop sign: "The yield went around, and around, and around, until Pamela finally tried . . . . And just then the man in the light blue sedan hit Pamela's passenger side." I submit that the yield has been going around long enough on the western water law doctrines of beneficial use, waste, and forfeiture. The courts have been yielding to custom, and assuming that if concrete change is needed, it should come from the users, the legislature, or the executive branch. The legislatures and administrative agencies hang back, knowing that it is probably their turn to go, but afraid of the possible political collision with water users. While everyone sits around the intersection idling their engines, the fuel in the tank—in this case, the western water supply—is dwindling. It is time for one or all of the drivers to step on the gas. With careful maneuvering, at least one of the vehicles for reforming the beneficial use doctrine should make it out of gridlock and move the law forward toward efficient use of scarce western water.