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Restoring Harmony in the Klamath Basin

By Roger E. Meiners
and Lea-Rachel Kosnik

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SERIES EDITOR

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Table of Contents

To the Reader

"Restoring Harmony to the Klamath River Basin," by Roger E. Meiners and Lea-Rachel Kosnik, addresses the conflict over water that torments the once-peaceful region around the Klamath River in southern Oregon and northern California. In addition to analyzing the causes of the turmoil, this paper offers specific suggestions for ending the discord.

Roger Meiners is professor of economics and law at the University of Texas at Arlington, as well as a Senior Associate of PERC. He has written and edited a number of books, the most recent of which is *Agricultural Policy and the Environment*, coedited with Bruce Yandle and forthcoming this year. He and Andrew P. Morriss wrote "Pesticides and Property Rights," a previous essay in the *PERC Policy Series*. Lea-Rachel Kosnik is an adjunct professor at Montana State University and a former PERC Research Associate. With Bruce Yandle and Andrew Morriss, she coauthored "Regulation by Litigation: The Diesel Engine Episode," also in the *PERC Policy Series*. The authors were assisted by Terry Anderson, executive director of PERC, and Clay J. Landry, a principal of WestWater Research, LLC, and a former PERC Research Associate.

The *PERC Policy Series* includes short, readable papers on environmental topics. The papers are edited by Jane S. Shaw and produced by Dianna Rienhart. Mandy-Scott Bachelier is in charge of design. This and other papers in the series (a selection is listed at the beginning of this booklet) are available from PERC or on its Web site, www.perc.org.

"Water marketing can release
the creative power of individuals . . . ,
enabling water users to deal with allocation
problems specific to their demands and
their local environmental constraints."
—Terry L. Anderson and Donald R. Leal
Free Market Environmentalism

Restoring Harmony in the Klamath Basin

Roger E. Meiners
and Lea-Rachel Kosnik

Introduction

During 2001, visitors driving along Highway 97 toward the Klamath River basin in southern Oregon were assaulted by billboards such as: "Call 911 Some Sucker Stole Our Water," "Stop the Rural Genocide," and "Federally Created Disaster Area." These signs heralded the site of a fierce battle over water.

Water in the basin was scarce, because precipitation in the region was only about half its average level, but the cause of the fight was not weather. It was the framework of laws, rights, and institutions that govern the allocation of Klamath basin water.

When the federal government told longtime farmers that they could not have irrigation water that summer, a civil war nearly erupted.

The conflict in the Klamath is over who owns the water, and it will not end until there is clarification of property rights to the water and freedom for claimants to trade those rights. The purpose of this paper is to explain the complexity of the current problem and to outline a framework for resolving the problem through recognition of water rights and the promotion of markets.

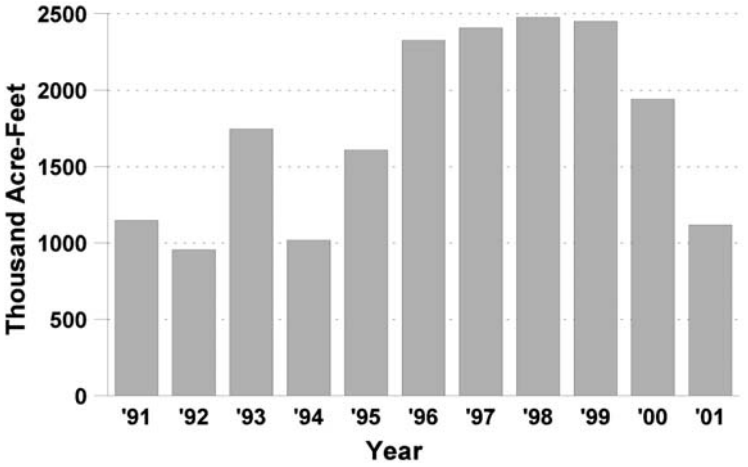
Crisis in 2001

Dry conditions were the ostensible cause of the crisis in the Klamath in 2001, but dry years had occurred before. In 1992 and 1994, Klamath basin water inflow fell to record levels, even lower than in the 2001 season (see Figure 1). Neither of the previous dry years brought about a crisis, however, because the demands for diversions by farmers were not challenged by conflicting claims for other uses of the water.

The trigger occurred in 2001 when conflicting claims by Indian tribes, environmentalists, and federal wildlife managers came to a head, making it impossible to meet irrigation demands. In the spring of 2001, the Bureau of Reclamation, the federal agency responsible for delivering water from the Klamath Reclamation Project to various claimants, notified farmers with contracts for delivery of water that they would receive no water for irrigation that season. Two other federal agencies, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service, had decided that, under the Endangered Species Act, the limited water available in the Klamath basin must stay in the streams to preserve the endangered Lost River and shortnose suckerfish.

Farmers, who traditionally account for about 93 percent (Becker 1999, 22) of water withdrawals in the region, responded with fury. On several occasions, they faced down federal marshals in order

Figure 1
Klamath Lake Water Flow 1991–2001



Source: Hathaway (2001, 13), based on U.S. Geological Survey sensor readings.

to open the canals and—symbolically—release water to their lands. Under intense pressure, the Bureau of Reclamation, nearly four months after its initial decision to withhold all water, agreed to release 70,000 acre-feet for irrigation purposes—about 22 percent of the annual average (Rykbost 2001, 28). It was too late to save agricultural production that season, however, and farmers lost an estimated $157 million (Hathaway 2001, 14).[1]

No lasting solution to the continuing water scarcity problem in the Klamath basin has been implemented. A National Academy of Sciences report, prepared at the behest of the Department of Interior and published in February 2002, found "no sound scientific basis for cutting off water to farmers in 2001 in order to help the habitat of endangered fish" (National Research Council 2002, 4), suggesting that the entire episode may have been an unfortunate error. During the summer of 2002, however, demand for available water sources outstripped available supply, even though increased rainfall and snowmelt led to more precipitation and a wetter season than in 2001.[2]

The Bureau of Reclamation cut back water deliveries to the two national wildlife refuges in the basin, but not to the farmers.

And then, in September 2002, thousands of chinook salmon in the Klamath River suddenly died (Anderson 2002). It appears that a bacterial infection killed them, although low water levels and warm water were probably factors. The chinook salmon in the Klamath River are not endangered, but the fish kill shocked people on both sides of the issue and revived concern over how to keep sufficient water in the river to protect wildlife, especially endangered fish. Adding fuel to the debate were news reports of a study by the U.S. Geological Survey. This study indicated that keeping water in the Klamath river would provide greater economic benefits than diverting it for irrigation (Carlton 2002).

History of the Klamath Reclamation Project

The farmers who protested the cutoffs of irrigation water obtain their water from the Klamath Reclamation Project, which began in 1903 and has long been managed by the Bureau of Reclamation (Hill 1996). The Klamath Reclamation Project consists of 19 canals totaling 185 miles and three main pumping plants that irrigate farms surrounding the Klamath River and its tributaries in southern Oregon and northern California (Hathaway 2001, 1). Smaller private irrigation companies existed in the area prior to 1903, but the farming community took advantage of funding from the federal government to irrigate more land. The project opened irrigated land to homesteaders, war veterans, and eventually all claimants after 1923. By 1955 nearly 200,000 acres of land were under irrigation (Dexheimer 1957, 14).

To ensure a supply of water for the irrigation project, the Bureau of Reclamation in 1905 "appropriated all available water rights in the Klamath River and Lost River and their tributaries in Oregon and began constructing a series of water diversion projects" (*Kla-*

math Water Users Protective Assn. v. Patterson 1999, 1209). Available waters meant those waters not already claimed by private irrigators. The private claims were not quantified, but this did not matter much because those claims were small, and there was plenty of water to meet the demands of the reclamation project.

Under the Reclamation Act of 1902, water project beneficiaries were supposed to repay the federal government for its investment in such projects, but various congressional and bureaucratic decisions over the years have reduced many of these repayment obligations. The General Accounting Office reports that the average irrigation project only covers 47 percent of construction costs (GAO 1996, 3). The money that funds the projects is interest-free, so the real loss is even higher. In contrast, the Klamath project has a relatively good repayment history. Capital costs of the Klamath project were almost $53 million and by 1994 irrigators in the Klamath basin had paid off nearly 75 percent of the costs (GAO 1996, 58, 73).

To the farmers relying on irrigation, the repayment record bolsters their claims to secure delivery of reclamation project water. In effect, they believe they own the project and the water it provides. Moreover, they believe their contracts with the bureau entitle them to delivery.

Conflicting and Unsettled Claims

The irrigators' beliefs about their water rights are at odds with forces that have arisen in recent decades to challenge claims for irrigation water from the Klamath basin project. The water claims come from a variety of demanders including Indian tribes, environmental groups, and federal agencies.

Before turning to these conflicting claims for irrigation water, we must specify what rights the irrigators actually have. All Klamath project water is allocated under Oregon law. Like most west-

ern states, Oregon allocates water under the prior appropriation doctrine (Oregon Water Resources Department 2001). Water rights are obtained when an individual or group diverts water for a beneficial use such as irrigation. As long as there is unclaimed water, people can continue making diversions unless prohibited by state law. If a drought makes it impossible to meet the demands of all claimants, the rule is first come, first served. In other words, the earliest claimant has the most senior right and has first claim on any water in the basin. Once that claim is met, the remaining water is available to the next most senior claimant, and so on. If there is insufficient water to meet all claims, those with the most junior claims—the latecomers—are shut off first.

A western adage, "whiskey is for drinkin' and water is for fightin'," stems from the fact that the dates and quantities of water claimed under the prior appropriation doctrine are not always clear (see Anderson and Snyder 1997). Often, early irrigators and miners began diverting water before there was a government to record or adjudicate their claims. With small numbers of users in a closely-knit community, there was little need for adjudication because people knew one another and their claims. As demands and communities have grown, however, conflicts among diverters have increased. These conflicts are worsened when water is overappropriated, making it necessary to shut off some users when stream flows are low.

Oregon, like most other western states, has not formally adjudicated—that is, officially recognized and affirmed—all prior appropriation claims to water. Since there are tens of thousands of claims, the process takes decades and results in seemingly endless litigation over a resource critical to the value of land. The state government started issuing official permits for surface water in 1909, but claims prior to 1909 have yet to be adjudicated. Formal adjudication began in 1976 under Oregon state law, but this process is far from complete (see *U.S. v Oregon* 1994, 758).

Federal Claims to Klamath Water

Complicating the prior appropriation system and compounding the lack of adjudication are federal claims arising from a variety of sources. First, consider federal claims to water under the Reclamation Act of 1902. The act clearly states that the federal projects should defer to state law with respect to water rights (Bricker and Filippi 2000, 750). Moreover, interpreting the law, the U.S. Supreme Court has stated that the government must "defer to the substance, as well as the form, of state water law" (*California v. U.S.* 1978, 675). But in 1905 the Bureau of Reclamation claimed all available water in the Klamath River and Lost River for the Klamath project. Given that prior appropriation rights were not clearly quantified at the time, this immediately raises a question of just how much water was available in 1905. The 1905 claim by the bureau also implies that all subsequent claims would be junior and therefore would be disallowed if there was not enough water to meet all claims.

These uncertainties contribute to the crisis in the Klamath. In 1995, the bureau sent a letter concerning water rights to the Klamath Project area office, stating that none of the conflicting claims to rights in the region were quantified and that this made it difficult for the bureau to distribute water appropriately. In response, in 1996 the Oregon Water Resources Department (OWRD) questioned the authority of the bureau to manage the Klamath project pending completion of the state adjudication process and, in addition, took issue with federal claims to water for the project. The bureau then reaffirmed its right to manage and plan water projects in the area, even before Oregon had completed the Klamath basin adjudication process, especially as this process has been ongoing for decades with no final resolution in sight (Hathaway 2001, 12).

The Klamath River Basin Compact, ratified by Congress in 1957, was supposed to alleviate this historical conflict. It created a three-member panel (one member from the California Department of

Water Resources, one from the Oregon State Water Resources Board, and one federal representative appointed by the president) whose purpose was to "facilitate and promote orderly development, use, conservation and control" (Hathaway 2001, 9) of the basin. Today, the best that can be said about the Klamath River Basin Compact is that it is "ineffectual" (Jaeger and Clark 2001, 5).

Indian Water Rights

Also complicating the crisis in the Klamath are the claims by Indian tribes. Indians (primarily the Klamath, Modoc, and Snake tribes, collectively referred to as the Klamaths) have been living in the Klamath area for thousands of years (Klamath Tribes 2002), on millions of acres in Oregon and California (Becker 1999, 11).

The treaties the U.S. government signed with the tribes left unresolved a host of legal issues, including water rights issues. A water law analyst for the Confederated Tribes of the Umatilla in Oregon notes that "disputes that have been brewing for many years over tribal water rights are beginning to surface. These disputes cost time and resources to the parties involved, causing 'bad blood' between the parties and severe hardship for those directly impacted" (Shepherd 2002, 901).

Tribal water claims associated with treaties signed in the 1800s are based on a legal doctrine known as the Winters Doctrine, enunciated by the Supreme Court in 1908 (*Winters v. U.S.,* 1908). The case concerned non-Indian prior appropriation claims to water in the Milk River in Montana. Indians on the Fort Belknap reservation protested that these prior appropriation claims were subservient to tribal claims on the grounds that the reservation was formed before non-Indian settlement of the region and that establishment of the reservation surely included the right to sufficient quantities of water for the reservation.

The court held that while the treaty establishing the Fort Belknap Reservation was unclear about water rights (as were most

treaties), the agreement implied that the Indians had a prior claim to the water based on the date when the reservation was established; otherwise the reservation would not be capable of supporting agriculture.

In essence, the Winters Doctrine gave tribal water rights double strength. First, because the treaties establishing reservations predate most non-Indian settlements, the Indian water rights are nearly always senior under the prior appropriation doctrine. Second, the rights are based on treaties made by the federal government, which is part of federal law and therefore trumps state law unless Congress specifies otherwise.

Tribal claims under the Winters Doctrine are weakened, however, by the fact that the doctrine does not quantify tribal water rights. In *Winters v. U.S.* the Court found that "when the Indians made the treaty granting rights to the United States, they reserved the right to use the water of the Milk River, at least to an extent reasonably necessary to irrigate their lands" (*Winters v. U.S.* 1908, 564). Subsequently, the Supreme Court restated the water rights as the amount of water necessary to irrigate the "practicably irrigable acreage," or PIA, on the reservation (*Arizona v. California* 1963). However, this did not clarify the actual quantity of water needed or how much should be reserved for other uses such as fishing. To resolve these questions, tribes had to turn to the courts in long protracted cases. Even when their rights were quantified, they did not have the necessary capital to divert the water for irrigation. Therefore, in terms of competing uses for water, the Winters Doctrine mattered little to irrigators. If Indians did not assert their claims and could not divert the water even if it was judged to be theirs, Indian water rights were ignored in practice but were not lost.

Throughout the 1960s and 1970s tribes began asserting their claims in the courts to water under the Winters Doctrine, but the adjudication is usually very complicated. For example, adjudication of water rights for the Wind River Reservation in Wyoming took years to wind its way through the Wyoming courts and even-

tually through the U.S. Supreme Court. The battle focused on what constituted "practicably irrigable acreage." As long as this term remains uncertain, the result will be "protracted litigation that will not resolve the dispute over water allocation in Indian Country" (Smith 1992, 190).

Certainly this has been the case in the Klamath basin as the Klamath tribe has tried to litigate its water rights. Although its land rights were terminated with the Klamath Termination Act of 1954, the tribe claimed water rights based on traditional hunting and fishing, rather than on irrigated agriculture. In 1974, the U.S. Court of Appeals held that Klamath Indians, despite yielding claims to land under the termination act, retained treaty rights to hunt, trap, and fish free of state regulations on former Indian land (*Kimball v. Callahan* 1974). When the state of Oregon challenged that decision, the court modified its holding, ruling that the state could impose "appropriate standards" to regulate hunting, fishing, and trapping for conservation purposes, but if the Indians did not agree with state regulations, the federal district court was to settle the dispute (*Kimball v. Callahan* 1979).

At the same time those rights were being litigated, the issue of tribal water rights went to federal court for clarification. The Klamath and the federal government sued private landowners and the state of Oregon (*U.S. v. Adair* 1979). Citing the Winters Doctrine and other Supreme Court precedents regarding tribal water rights, the court held that the 1864 treaty granted the Indians an implied right to as much water as was necessary to preserve hunting and fishing rights. Termination of the treaty did not terminate hunting and fishing rights, and, thereby, did not terminate water rights. Furthermore, the court noted, unlike non-Indian water users under state water appropriation doctrine, Indians do not lose water rights if they do not use them. And while their date of priority of use is formally 1864, the treaty recognized the water rights as being immemorial (*U.S. v. Adair* 1979, 349).

The decision was largely upheld by the Court of Appeals (*U.S.*

v. Adair 1984, 1394). It noted that federal courts should normally defer to the states to resolve water allocation issues, but proceedings in Oregon had failed to make substantive progress and had dragged on for so long that the court was proper to act. The only issue on which the district court decision was modified concerned federal government water rights. The court held that certain federal water rights on land purchased from the Klamath have a priority date of 1864; others, a later date. The court noted that the rights should be consistent with Oregon water law, but explained that if the government finds that its water rights are insufficient, Congress "has the power to acquire the additional water the Government may need by explicitly exercising its constitutional authority under article IV, section 3" (*U.S. v. Adair* 1984, 1419).

These decisions did not settle the actual allocation of water, but made clear the strength of the claims of the Klamath tribes and the federal government. Moreover, because the rights emanated from hunting and fishing, they did not require diversion by the tribe and, in essence, grant a right to maintaining an instream flow.

The Klamath Indian tribes continued to press for clarification of the extent of their water rights. In the latest round of the *Adair* litigation, the court held, again, that the tribes' water rights are to support a "moderate living" standard as that relates to hunting, fishing, trapping, and gathering. How much water is that? "Ultimately, the water level cannot be reduced to a level below that which is required to support productive habitat, and the Tribes are entitled to 'whatever water is necessary to achieve' the result of supporting productive habitat" (*U.S. v. Adair* 2002, 1277). That is the guidance given to the state of Oregon as it continues to try to sort out the mass of water claims.

Unless Congress wishes to abrogate the 1864 treaty with the tribes, they are in a strong position, at least with respect to the irrigators. However, the conflict with the requirements of the Endangered Species Act and other claims that arise from other federal statutes means that the law is far from resolved. And even if

the state of Oregon immediately announced an administrative determination of water allocation, the issue would return to court for years of reconsideration of the rights of the disappointed parties. As Justice Hobbs of the Colorado high court notes, the conflicting administrative muddle that has evolved "undermines reliability, promotes disorder, intensifies hostility, leads to takings actions, and generally favors chaos over law" (Hobbs 2002, 49).

Federal Fish and Wildlife Claims

If the federal irrigation claims and Indian claims were not sufficient to have muddied the question of who has rights to water, the Endangered Species Act and other claims for wildlife guaranteed crisis in the Klamath.

Even before implementation of the Endangered Species Act to protect fish in the Klamath, the federal government was claiming water for two federal wildlife refuges in the region. In 1908 President Theodore Roosevelt established the Lower Klamath National Wildlife Refuge, the nation's first waterfowl refuge, containing 46,900 acres in the project area. The refuge was established as a "breeding ground for wild birds and animals" (Hathaway 2001, 10). Eighty percent of the Pacific Flyway waterfowl pass through this basin to reach wintering grounds every year (Becker 1999, 20). Tule Lake National Wildlife Refuge, with 39,116 acres, was established in 1928, also as a preserve for wild birds and animals.

These two refuges hold claims to water rights based on a legal doctrine similar to the Winters Doctrine that reserves sufficient water for managing federal lands and dates the priority of the rights by the founding of the refuge. Neither of these priority dates is senior, as 1908 was three years after the Klamath project's founding. The U.S. Fish and Wildlife Service, which manages the wildlife refuges, has been trying to trump state-based water rights with its own federal claims that also conflict with federal claims arising from the Bureau of Reclamation. The matter is not remotely near settlement.

The Endangered Species Act, with its ability to trump all other claims, precipitated the 2001 crisis on the Klamath. The act first came into play in 1992 when the Fish and Wildlife Service issued a "Biological Opinion" regarding water needs for certain fish in the Klamath basin. With this opinion and the listing of two species of sucker fish as endangered, the bureau changed its operation of the Klamath Reclamation Project. For example, in 1997 it told PacifiCorp, the company that owns the Klamath dam, that water flow through the dam should be reduced to 1,000 cubic feet per second (cfs) to help the fish. At the same time, the Federal Energy Regulatory Commission (FERC) required PacifiCorp to release 1,300 cfs to generate power under the terms of its FERC license. PacifiCorp, caught between its FERC license requirement to generate electricity and the bureau requirement to protect an endangered species, negotiated with the two agencies and cut its water flow. Irrigators, receiving less water, sued for breach of contract for the water they had been promised.

The district and appeals courts held that the irrigators had no claim. Although the bureau operates the irrigation system, including PacifiCorp's dam, for the benefit of the irrigators, the irrigators are not a party to the contract between the government and PacifiCorp, so they could not sue for breach of contract. Furthermore, the courts noted, the bureau must take into account tribal water rights and Endangered Species Act requirements.

During the 1990s, environmental groups correctly sensed an opening for increased water flow to protect wildlife. Several groups sued the Bureau of Reclamation, contending that it had violated the Endangered Species Act by not consulting properly with the National Marine Fisheries Service before approving water diversion from the PacifiCorp dam to irrigators. The Klamath Water Users Association intervened on the side of the bureau, but the court found that the bureau had violated Endangered Species Act procedure. In April 2001, the court issued an injunction against certain water deliveries by the bureau to the irrigators (*Pacific*

Coast Federation of Fishermen Assns. v. U.S. Bureau of Reclamation 2001, 1228). When water ran low, irrigators were cut off.

Farmers Seek Compensation

The conflicting claims resulted in the rule change in 2001 that left the irrigators dry. The affected farmers have sued to obtain compensation on the grounds that their water was taken without due process and just compensation. The outcome of the Klamath users' case is uncertain and prior litigation has not been favorable. The federal district court refused to stop the water diversion in 2001 as the court found that the irrigators' contractual rights were subservient to the requirements of the Endangered Species Act and the rights of the tribes (*Kandra v. U.S.* 2001). Assuming the court to be correct, the irrigators' claim may be for breach of contract.

The farmers take some hope from a takings case involving water rights that, like their pending case, went to the U.S. Court of Federal Claims. In *Tulare v. U.S.*, water rights holders in the Tulare Lake Basin in south-central California sued for compensation for cutbacks of up to 50 percent of their water. The cause was a combination of low precipitation and increased instream holdbacks under the Endangered Species Act to protect two endangered fish species, the delta smelt and winter-run chinook salmon. The court ruled in favor of property owners, finding that "deprivation of water amounts to a physical taking" and that "the federal government is certainly free to preserve the fish; it must simply pay for the water it takes to do so" (*Tulare v. U.S.* 2001, 320, 324).

While the outcome of the Klamath basin case has yet to be determined and may turn on the details of the contract between the irrigators and the Bureau of Reclamation, the fact that the irrigators sued is an indication that they believe they had rights that were violated. When reclamation projects are built, the expecta-

tion of water deliveries is incorporated into the value of the land that receives the water. Although initial owners reap a windfall, subsequent owners must pay the higher value of the land, reflecting an understanding that water will be delivered. Given almost a century of uninterrupted deliveries, farmers with bureau contracts no doubt believe they have a legitimate claim to irrigation water. No wonder they were furious about the shut-off of water in 2001.

Current Proposals

To resolve the conflicts between irrigation and environmental demands, the American Land Conservancy, a nonprofit environmental conservation organization, has proposed that the federal government buy 32,000 acres in the Klamath Reclamation Project area. Under the proposal, willing farmers would sell their land for about $3,000 an acre and thereby reduce the irrigation demand for the basin's scarce water (American Land Conservancy 2001). The Oregon Natural Resources Council, a conservation consortium based in Oregon, has proposed a similar plan, with a higher $4,000-per acre price tag (Cole and Milstein 2001).

Aside from the enormous costs to taxpayers, a hurdle for these proposals is the general scorn with which they are received in the local community. Researchers who interviewed residents of the affected communities concluded that although some individuals may wish to sell and leave the farming community, other farmers feel that "they are betraying the community somehow" (Lach et al. 2001, 19). Any farmer who publicly suggests support for these proposals is condemned and ostracized by his neighbors, they say. Indeed, in October 2002, the Conservancy announced that it had decided these plans were politically impractical at the present time (Milstein 2002).

More substantively, while such proposals offer some short-term relief of water demands, they fail to provide any long-run solution

to the Klamath crisis. What would happen to the land after the government purchased it? The American Land Conservancy recommends that the government simply sell it back to private interests after ten years; the assumption seems to be that after a decade the waters in the Klamath basin will have been "rebalanced," and farming can again continue with full access to required water resources. Yet without resolving the conflicting claims for water, it is unlikely that a decade will magically bring balance, especially if the new landowners have a claim on irrigation water from the Klamath.

A second proposal by the American Land Conservancy—which the organization continues to support—would place conservation easements on the water used to irrigate 20,000 acres of project land (American Land Conservancy 2002). These easements would be voluntary restrictions that would reduce the demand for irrigation water and limit the extent of irrigated agriculture. Because such conservation easements would reduce the value of the land compared to what it would be with irrigation, the farmers who donated them would be eligible for tax deductions as a charitable donation. In a community where the per capita income is below the national average (Becker 1999, 7), few farmers are likely to benefit from tax breaks. Hence, it is unclear who would donate conservation easements. However, the idea of giving up some water use temporarily—without losing long-term use of the water—does hold promise. A water bank is an option that will be discussed below.

Property Rights and Market Solutions

This review of the Klamath River basin conflicts indicates that unclear property rights are causing the crisis and that droughts only aggravate the problem. Until steps are taken to clarify rights, crises will recur as claimants battle over inadequate amounts of water.

With rights to water clarified, voluntary trades could reduce the pressure on limited supplies. Farmers use more than 90 percent of the water withdrawn from the Klamath basin (Becker 1999, 22). If farmers can trade their water to higher-valued uses, they will have an incentive to conserve on water use and to accommodate changing demands by shifting water from one use to another (see Anderson and Snyder 1995, 75–109). Oregon law allows the sale and lease of conserved water, and trades between the Oregon Water Trust and farmers attest to the potential for a water market to solve some of the allocation problems (Anderson and Leal 1997, 94–95).

The potential favorable impact of trades was highlighted in November 2002 with the news that the U.S. Geological Survey had found that returning water to the Klamath, rather than using it for irrigation, would have powerful economic benefits for the region (Carlton 2002). If the Geological Survey is correct that the economic value of the water left in the river for recreational and environmental purposes is many times higher than the value to farmers, there should be sufficient funds to pay farmers to give up some water for such purposes.

Trading water through willing seller-willing buyer transactions is the only harmonious way for such change to occur. Around the West, other trades have achieved environmental benefits while serving the needs of irrigators. These range from small-scale pilot programs (Landry 1998, 8–10) to large-scale trades such as one involving southern California Metropolitan Water District (Anderson and Snyder 1997, 104). Such trades, effected through a water market, could ease the difficulties in the Klamath basin.

The framework for trading exists, but the cost of water trading under existing Oregon law is not trivial, and the ability to transfer is subject to interference by many parties. Limited licenses are available for water diversions. One must apply to the state for permission, so they must be planned well in advance of actual use. Even more important, such licenses "are junior to all other uses and subject to revocation at any time for any reason" (OWRD 2001,

29). In practice, such licenses are not to be used for irrigation except on a one-time basis.

Water leases for irrigation and instream flow rights to improve fish habitat, however, are not uncommon in Oregon. The OWRD allows temporary transfers by lease, so long as it is shown that "no injury will occur" (OWRD 2001, 33). Permanent transfers of water rights, which would give irrigators and other water users secure rights, are subject to state investigation and approval and to opposition by the public (OWRD 2001, 32). In other words, numerous obstacles to trading remain.

Removing Hurdles

A long-term solution to the Klamath basin crisis built on water marketing requires the removal of the major stumbling blocks to trades.

On the State Level

The state of Oregon must speed up the adjudication of water rights, a process started in 1976. Imagine how chaotic the housing market would be if records for title to houses in Oregon were not entirely clear. The legislature would no doubt devote resources to straightening out the records and reducing confusion about who owned what house and who had the right to transfer title. The legislature should do no less for water rights.

Laws that restrict trades should be abolished as well. The "beneficial use" restriction stems from early reclamation law. Adopted by most states, it limits appropriations to particular uses considered appropriate for diversion. This essentially prevents uses that are not deemed "beneficial." Water for instream use, for example, was not originally considered beneficial. The Oregon legislature defined instream use as beneficial in 1987, but other

limitations still hold and deter market allocation for the highest-valued uses of water.

The "use-it-or-lose-it" mandate on project water should also be abolished. Current legislation in Oregon requires that if a water rights holder fails to actively use allocated water in a beneficial manner for a period of five years or more, the claim on the water is lost. Thus, any water left in the basin is in danger of confiscation. This discourages conservation because any water saved (through improvements in irrigation techniques, for example) is essentially lost. It also discourages farmers from decreasing production in order to transfer or sell the water for other uses, including environmentally sensitive ones.

Eliminating geographical restrictions on water transfers would also add flexibility to the system. Currently, contracts for water transfers not only specify the purposes for which water must be used, but state rules limit the geographic range to which water can be transferred. This limitation reduces the exchangeability of water rights.

On the Federal Level

Federal claims should be settled so they don't continually cloud other rights. Over the past two centuries, Congress has been careless about water rights when writing treaties with tribes, creating wildlife refuges and irrigation projects, and setting aside habitat for endangered species. These federal actions have created conflicting claims to water. Courts have rarely overridden federal claims for wildlife refuges, Indian reservations, or endangered wildlife. As a result, farmers who thought they had rights stretching back more than a century have found that their rights are trumped by federal claims. Congress should seek to clarify and quantify its claims once and for all through negotiations with the state.

On a more positive note, some Indian tribes have shown how negotiation rather than litigation can promote settlement of con-

flicting claims (see Smith 1992). These negotiations usually give tribes less water than they might eventually get from a long court battle, but they also give the tribes the ability to market their water away from reservations and give them access to federal money to develop water uses. "Negotiated settlements allow the parties to control the resolution of disputes by avoiding the lottery aspect of water right awards under the PIA [practically irrigable acreage] standard," writes Rodney Smith (1992, 189). If parties could be brought to the negotiating table, perhaps through the Klamath River Basin Compact mentioned above, and could agree to allow claimants to trade their rights, trading could replace fighting over water.

Something like this has happened in the Walla Walla basin near the border of Oregon and Washington, where the Confederated Tribes of the Umatilla and irrigating farmers avoided a protracted conflict over water. Under an 1855 treaty, the Umatilla tribe had been granted the right to fish in perpetuity from the Umatilla River. Later, irrigators were promised water from reclamation projects. In the early 1990s, the Fish and Wildlife Service and the National Marine Fisheries Service warned that greater instream flows in the region were required for endangered species protection. Farmers were put on notice that there might be cutbacks.

On a collision course with farmers, the tribe avoided a Klamath-like crisis. "The tribe's tactic was not to go to the third-generation farmer and point to his irrigation ditch and say, 'Shut that thing off,'" Gary James, manager of the tribal fisheries program, told a *Seattle Times* reporter. "We said, 'We need your help. We are not after you, we are here to stay, and you are too. Why not work together?' Our slogan was 'Negotiate, not litigate'" (quoted in Mapes 2002).

After extensive negotiations, the tribe and the irrigators agreed to establish a water exchange (Confederated Tribes of the Umatilla Basin 2002). During key salmon migration periods, farmers receive irrigation water from the Columbia River and leave an equal amount of water in the Umatilla River. Because the Umatilla River flows into the Columbia, there is no net loss of water. The Umatilla tribes

are active in salmon restoration efforts, funded in large part by the Bonneville Power Administration and the Army Corps of Engineers (both under pressure for their detrimental impact on salmon populations). Other water to maintain instream flows is provided from the nearby McKay Reservoir.

This exchange has a number of attractive features. The public funding puts the responsibility for protecting endangered species on taxpayers' shoulders, rather than burdening either the individual tribes or irrigators; this is appropriate because preservation of endangered species is arguably a public responsibility. Equally important, the exchange fosters cooperation. As James put it, "Each side began to understand where the other was coming from. . . . And as we put this thing together, we began to realize, 'Hey, the other side isn't so bad; they are willing to talk to us'" (Mapes 2002).

The Klamath Project

The Klamath Reclamation Project itself could do more to encourage water transfers on a willing buyer-willing seller basis. The Bureau of Reclamation frequently imposes miscellaneous fees on water transfers in an undisguised attempt to "profit" from water sales in a way prohibited by the actual water rights holder. These added fees increase the transactional burdens of a water transfer, decreasing the frequency with which trades will likely occur. The bureau, recognizing this impediment, has stated in its guidance manual that it will void charges for costs owed the government that might cause financial or economic disincentives to transfers (Amos et al. 1994, 7), yet it continues to assess them. For example, the Central Valley Project Improvement Act of 1992 included an annual charge of $25 per acre-foot for all new municipal and industrial transfers of water, and the solicitor of the department of the interior has indicated that there is no legal limit on how much may be charged (Amos et al. 1994, 10). The state of Oregon also charges a base fee of $200 for all water transfers in the Klamath basin, with

an additional $100 per cfs for permanent transfers or $50 per cfs for temporary transfers (OWRD 2001, 47).

Bank It

If water rights were clarified, water banking is a market approach that could facilitate transfers of water to higher valued uses. The primary role of a water bank is to obtain water from willing sellers and market it to water users. A bank brings buyers and sellers together and negotiates the legal and regulatory procedures necessary to transfer the use of existing water rights. It can be as simple as a bulletin board or clearinghouse for water prices or it can be an organization that takes an active role in buying and selling water. Water banks have been used in Idaho and California and, more recently, in the Yakima basin in Washington. They usually address temporary problems based on drought.

Successful water banks are not created overnight by mere proclamation. Real work and careful consideration are necessary to ensure a successful operation. Fortunately, Idaho and California have a history with water banks dating to the early 1920s, so much is known about their operation.

Whichever form the banks take, at a minimum most banks pool water supplies from willing sellers and facilitate their sale to willing buyers. Through a clearinghouse or bulletin board, potential buyers and sellers post their offers and arrange to trade. An alternative is standing offers to buy and sell at fixed prices. The bank posts fixed prices at which it is willing to buy and sell water at the beginning of the season. The Emergency Drought Banks in the early 1990s in California followed this model. Unfortunately, these prices do not necessarily respond to supply and demand conditions and do not necessarily lead to market clearing.

A third approach, adopted by the California's Emergency Drought Water Bank in 1994–1995, is to buy and sell options to

supply or purchase water. With the California bank, the options-to-buy provided the funds for the bank's operation. The terms and conditions of the contracts specified a maximum price, the quantity of water (or options on water), and the timing of delivery. Recently, the California water bank has started examining the potential for reverse option contracts. Under this arrangement, sellers are paid a fee at the end of the contract if the water bank does not exercise the option to purchase water supplies.

The state of Washington experimented with water banking in the Yakima basin during the summer of 2001 (Roundtable Associates 2002). The bank proved to be a crucial mechanism for reallocating water to the region's highly valued apple and fruit orchards. The market rather than a central regulatory agency determined prices. As expected, prices rose dramatically due to the extreme drought conditions, but water moved from lower-valued to higher-valued uses. The higher prices created an incentive for more people to make water available to the bank, and the rights holders who supplied water were fairly compensated. The Yakima basin experience offers reason to explore a similar approach in the Klamath basin.

Indeed, the Bureau of Reclamation is investigating water banking for Klamath. In early 2002, the bureau issued a biological assessment for the Klamath project that describes the bureau's proposed operation of the project for the next decade (Bureau of Reclamation 2002). This strategy will be presented to both the U.S. Fish and Wildlife Service and the National Marine Fisheries Service to ensure that it will not jeopardize endangered species and will help coordinate what otherwise may be conflicting needs.

The creation of a Klamath Project water bank is a central piece of the strategy. The goal of the bank would be to provide an additional 100,000 acre-feet of water, supplied by three major sources. One is a reduction in irrigation demand, accomplished by compensating farmers for water left instream for a single irrigation season. Another is offstream storage of water. Sources include Agency Lake

Ranch, Lower Klamath area lands, and winter storage in the Tule Lake area. The third source is the use of wells to supplement and replace surface water sources. Beyond these general guidelines, however, the agency has given little indication of the key elements of the bank, such as its structure, participation, contracting, and water pricing.

Local water users are also working to develop a framework for preliminary implementation of a water bank (Milstein 2002). Certainty of water supplies is a key principle. Irrigators insist that in exchange for participation in the water bank, irrigators' demands for water for the rest of the project acreage must be satisfied throughout the growing season. The success of the bureau's banking proposal hinges on landowner participation and, as in any market, participants want to understand their rights.

Conclusion

It is possible, of course, to do nothing and let things rumble along as they have in the Klamath basin. The costs, however, will be high. Maintaining the status quo means declining land values, loss of agricultural productivity, broken contracts, more political interference, reduced property tax revenues and local government services, and reduced income for the region.

From its founding at the turn of the twentieth century, the Klamath Reclamation Project has mirrored events in the western United States. It encouraged a land rush to capture the value of irrigation water, it encouraged agricultural and industrial expansion, and it led to false expectations regarding the security of water availability. Instead of being a mirror, the Klamath basin could be a beacon for water policy in the West. By clarifying water claims and encouraging voluntary exchanges, policy makers have an opportunity to avoid future crises in the Klamath even in times of drought. With the demand for water use between competing interest groups only

growing, the improved paradigm of secure property rights and voluntary water transfers offers the best hope for replacing confrontation with cooperation.

Notes

1. The $157 million refers to total gross agricultural sales, with an additional $79 million lost in reduced personal, employment, proprietary income, and other property values (Hathaway 2001, 14). Farmers in the region believe the damages are far greater and have filed a suit in the U.S. Court of Federal Claims, asserting $1 billion in damages.

2. By September 4, 2002, Klamath Lake water flow had averaged 1,605 acre-feet during the year, as indicated in river-flow data reported by the California Department of Water Resources at http://cdec.water.ca.gov/riv_flows.html.

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