

Water Allocation in the Klamath Reclamation Project
Brief # 2

Potential Benefits of Water Banks and Water Transfers

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Since publication of the Oregon State University–University of California report on Klamath Basin water allocation,¹ the Bureau of Reclamation (BOR) and Klamath Water Users Association (KWUA) initiated a pilot project to compensate growers who agree to withhold irrigation from 12,000 acres of Project lands. This “Pilot Water Bank,” in place for the 2003 growing season, was a step toward more flexible and cost-effective water allocation in times of shortage. It differed in several key respects, however, from the mechanisms outlined in Chapter 19 of the report. This brief discusses how “water banks” could lower the cost of water shortages in the Upper Basin.

What is a water bank?

A water bank might work something like a financial bank (or credit cooperative). This type of bank facilitates exchanges among customers (or members) who want to buy (borrow) and those who want to sell (deposit). In the case of a credit cooperative, the institution may be little more than a clearinghouse that facilitates exchanges among members and charges a small fee to cover its operating costs. Financial

resources are transferred from those who deposit funds for a price (interest earned) to those who pay (in interest) to borrow funds. An independent water bank could operate in much the same way, with limited involvement or funding by government.

How does a water bank work?

The willingness of irrigators to buy or sell water would depend on the difference between the price of water and the net revenue each farmer expects to earn by irrigating. We can think of the revenue expected to be generated by a unit of irrigation water as the value of that water. Likewise, this revenue represents the losses that would be incurred if water were withheld. Thus, for a given price of irrigation water, a farmer would be willing to purchase water if he expects a unit of water to generate more revenue than it costs. If another farmer expects a unit of water to earn less than he could sell it for, he might want to sell it. If all farmers earned the same net revenue per unit of water, little would be gained from water transfers.

In the Upper Klamath Basin, net revenues (and hence the value of water) differ dramatically across location, soil class, and crop. These differences are reflected in agricultural land prices, which range from as high as \$2,600 per acre for Class II lands in the Tule Lake area, Malin, and the Poe Valley to as low as \$250 to \$300 per acre for Class V lands along the

¹Braunworth, Jr., W.S., Welch, T., and Hathaway, R. eds. *Water Allocation in the Klamath Reclamation Project, 2001: An Assessment of Natural Resource, Economic, Social, and Institutional Issues with a Focus on the Upper Klamath Basin*, SR 1037 (Oregon State University and the University of California, 2002).

Sprague and Williamson rivers (see Brief #1, and the OSU–UC report, p. 371). In this situation, the potential for mutual benefits among irrigators who trade water is very large.

Figures 1 and 2 illustrate irrigation water values in the Upper Klamath Basin. These values reflect market land prices and rental rates, as well as acreage and crop rotation data. All irrigated acres in the Upper Basin are represented in Figure 1; Figure 2 shows only those acres within the Klamath Reclamation Project. Short-run losses from irrigation curtailment likely would be higher than these figures, but they still would vary by about a factor of 20.

Based on Figures 1 and 2, withholding water from 50,000 acres costs \$8.5 million if the acres left dry are taken from the right-hand side of Figure 1. The same level of curtailment costs only \$1.25 million if the acres are taken from the left-hand side of Figure 1—a reduction in cost of 85 percent!

In the event of a shortage, a water bank or other market mechanism could reduce the overall cost of irrigation curtailment by facilitating transfers of water from irrigators at the left-hand side of Figure 1 to those at the right-hand side. At a price lower than the values on the right-hand

side, but higher than those on the left-hand side, willing buyers and sellers could negotiate transactions that would benefit both parties.

Obstacles to water banks in the Klamath Basin

It is important to note that obstacles currently exist to implementation of a basin-wide water bank. Irrigators in the upper portions of

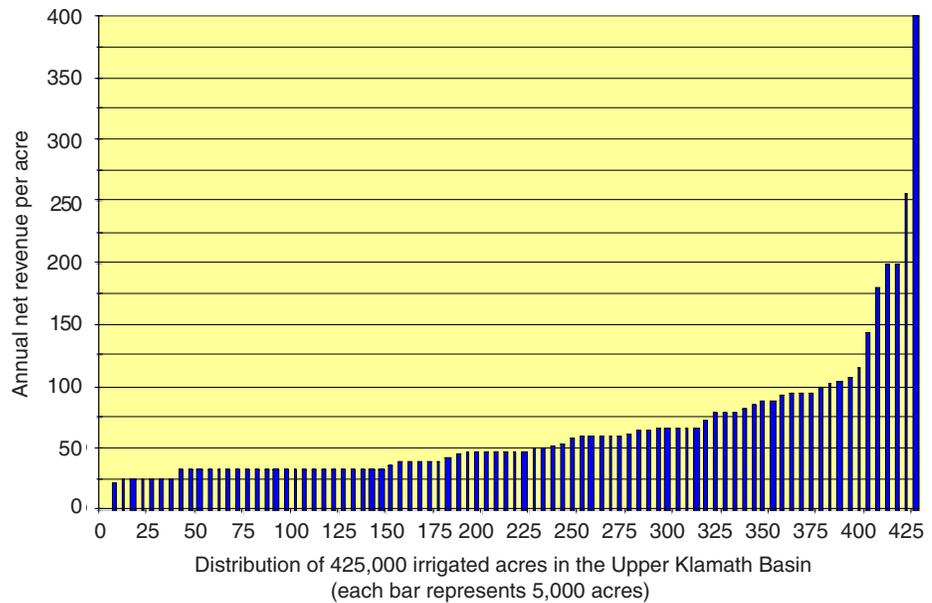


Figure 1.—Irrigation water values in the Upper Klamath Basin: annual net revenue per acre across location, soil class, and crop rotation.

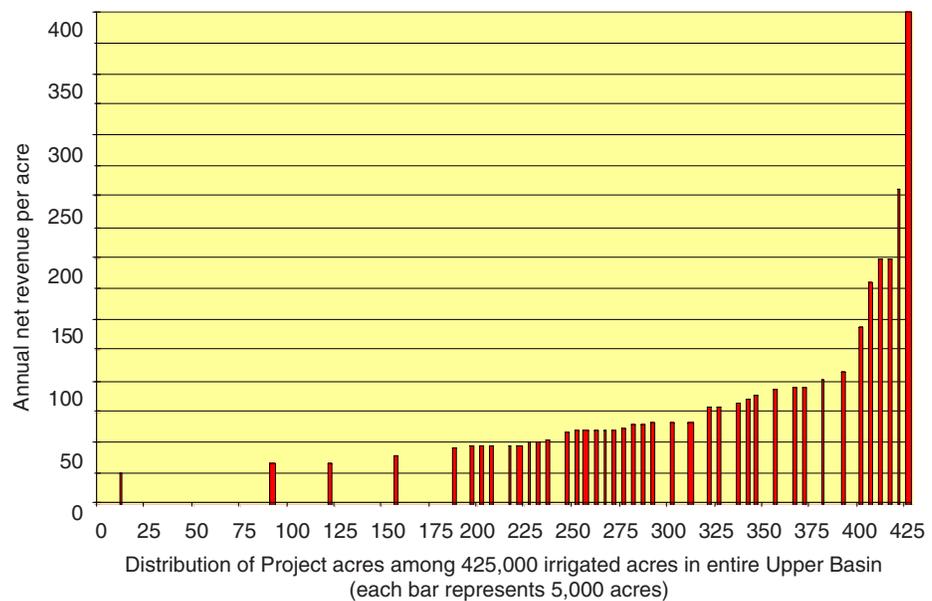


Figure 2.—Irrigation water values in the Klamath Reclamation Project: annual net revenue per acre across location, soil class, and crop rotation.

the basin cannot participate fully until the water rights certification process is completed. Meters and gauges likely would be needed to monitor and enforce diversions. Also, possible “third-party effects” might limit potential transactions.² For these reasons, and given transaction costs and other rigidities, the benefits from a water bank might be less than those suggested above. Over time, however, other sources of variation in net returns among farmers and across plots (e.g., crop price fluctuations or land fallowing) might increase the benefits beyond those estimated above.

The 2003 Pilot Water Bank

Two aspects of the 2003 Pilot Water Bank limited its potential for significant cost reductions. First, it involved only Project irrigators, so it could not take advantage of the wider variation in irrigation values basin-wide. As shown in Figures 1 and 2, most of the low net revenue uses of water occur outside the Project, so water transfers from these areas to Project areas offer the greatest scope for lowering costs during

shortages. The possible inclusion of irrigators outside the Project will depend to a large extent on the progress made toward certification of water rights outside the Project. Nevertheless, the BOR has announced plans for a 2004 Pilot Water Bank Program, which is open to non-Project irrigators.

Second, these pilot programs are not financially independent, as a credit cooperative or clearinghouse for water would be. The 2003 pilot program was operated more as a purchasing agent, with all transactions financed externally (in this case, by taxpayers) and with the price fixed in advance. In the proposed 2004 program, prices will be determined in a bidding process rather than being set in advance.

By contrast, an independent water bank would not be subject to the uncertainty of taxpayer funding. If the process were competitive, and if both both buyers and sellers of water were represented, the price would be determined by the willingness of buyers and sellers to pay or accept a given price, and both buyers and sellers would benefit.

²When a water right is transferred, holders of water rights between the two points of diversion might be affected adversely. Such transfers would be prohibited by the Oregon Water Resources Department. In the Klamath Basin, however, most transfers would move senior water rights from upstream to downstream, where land is more productive. Third-party effects would be minimized because more water would be flowing past intermediate diversion points rather than less.

For more information

Braunworth, Jr., W.S., Welch, T., and Hathaway, R. eds. *Water Allocation in the Klamath Reclamation Project, 2001: An Assessment of Natural Resource, Economic, Social, and Institutional Issues with a Focus on the Upper Klamath Basin*, SR 1037 (Oregon State University and the University of California, 2002).

Water Allocation in the Klamath Reclamation Project, Brief #1: *The Value of Irrigation Water Varies Enormously Across the Upper Klamath Basin*, EM 8843-E (Oregon State University, 2004).

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