

**The Value of Irrigation Water
In
the Wallowa Valley,
Northeast Oregon**



**John Williams
Associate Professor
Dept Rangeland Resource
Oregon State University
AND
Fred Obermiller
OSU Extension Specialist
Rural Natural Resources Policy**

August 2004

The Value of Irrigation Water in the Willowa Valley, Northeast Oregon

by

John Williams, OSU Extension Staff Chair, Willowa County
Fred Obermiller, OSU Extension Specialist in Rural Natural Resources Policy

August 10, 2004

Introduction

The Willowa Lake Dam (Dam) was constructed between 1917 and 1929. Throughout its operation, it has contributed to the economic well-being of Willowa County and Northeast Oregon. However, the years have taken their toll. It is currently operating at 80% of design capacity and has serious structural problems. In the very near future, local, state and national decision-makers will need to take actions to protect the safety of citizens within the Willowa River watershed and to protect the economy of the region and the watershed environment, which depend on the Dam ("Willowa County's Economic Structure: An Input-Output Analysis" (2004) by Bruce Sorte and John Tanaka of the Department of Agricultural and Resource Economics at Oregon State University.)

In this paper we estimate the economic impacts of the failure to act in such a way that the Dam continues to store a volume of water equal to its current capacity. This paper is a summary of a more detailed analysis that was developed by a group of citizens with a broad range of expertise and perspectives. Our projected impacts are simply estimates, and their greatest value is in projecting the direction and magnitude of these economic effects rather than accounting for precise dollar changes. Our overriding purpose is to value the water now stored behind the Willowa Lake Dam. We welcome comments and the opportunity to discuss the issue. Our contact information is given at the end of this paper.

The Dam, and water stored behind and released from it, benefit local sectors of the economy, particularly irrigated agriculture and tourism/recreation, as well supporting local government services by increasing the property tax base. These benefits may be viewed as costs if the Dam were to be breached, severely damaged, or removed as summarized below. Details on underlying data and assumptions may be obtained from either of the two authors.

To evaluate the economic impacts of irrigation in the Willowa Valley we focus on determining the basic value of the water that is being used and/or stored in the watershed for use in irrigation, and for other purposes. Since the water distribution systems in the Valley are so interrelated it is difficult to separate for valuation purposes stored water from the base flow waters.

It is estimated that in the Willowa Valley there are 45,100 acres of irrigated land. Of these, over 37,000 acres benefit from the stored water behind the Willowa Lake Dam.

The Wallowa Lake Dam is owned and operated by the Associated Ditch Company (ADC), a non-profit organization made up of farmers and ranchers directly irrigating 16,000 acres within the Wallowa Valley. The Wallowa Lake Dam is located on the natural outlet at the north end of Wallowa Lake and raises the lake 28.4 feet above its natural level, creating a reservoir with approximately 52,000 acre-feet of storage.

This storage is added to the natural flow of the Wallowa River, which makes the actual usage by irrigators exceed 88,000 acre feet per year. These waters are utilized, or recycled, several more times by down-river irrigators making any chance of separating the values of stored water and base river flows very difficult. Add to this three different inter-basin transfers of water and it even becomes difficult to estimate the actual amounts, and value, of water flow and storage in the Wallowa River watershed.

In valuing this water we utilize information on annual revenues from farm gate sales provided by the Oregon State University Extension Service. Additional information is obtained from knowledgeable local irrigators and other sources. We draw heavily on the "Input/Output Wallowa Lake Dam Scenario" which was developed from local knowledge and data contained in the Sorte and Tanaka report, referenced above.

Impacts on Agriculture, Tourism and Recreation and Property Values

Since 1969, the real average earnings per job in Oregon and the U.S. have increased 28.4% and 39.7% respectively. In Wallowa County they have declined 1.5%. In 1969, real average earnings per job in Wallowa County were 76.3% of the national average. In 2003, they were 53.8% of the national average (Smith 2004).

Wallowa County's economy is approximately 20% dependent on each of three sectors (1) Agriculture, (2) Tourism and Recreation, and (3) Government spending, which relies heavily on property tax revenues. So, the Dam directly affects 60% of Wallowa County's economy (Sorte and Tanaka 2004. p. 22.).

Effect on Wallowa County Agriculture

We look first at the total value to the agricultural community of foregone acre-feet of water stored in Wallowa Lake. Production losses would occur in the valley if the Wallowa Lake were to be removed or breached. Owners of the Wallowa Lake Dam irrigate 16,000 acres of cropland. The adjudicated water rights for Wallowa County are 5.5 acre-feet of water per acre. About 13,000 acres of those 16,000 acres of land would go dry without the Dam and the other 3,000 acres would only receive water until August 1st. This equates to 79,000 acre-feet of water used for irrigation that would be lost were the Dam to be removed or breached.

With the 79,000 acre-feet of irrigation water, Wallowa County farmers (both ADC members and downstream irrigators using returned flows) currently grow a variety of

different types of hay on 24,250 acres, plus wheat (3,400 acres), barley (2,600 acres), peas (1,300 acres), and oats (600 acres). At current prices, the value of these crops at the farm gate is about \$14,500,000 per year.

Without the 79,000 acre-feet of water, many producers would switch to dryland wheat farming which requires no supplemental irrigation. Many others would be unable to continue producing alfalfa and specialty export market hay crops. Taking into account that conversion to wheat and significant reductions in higher quality hay crops, future farm gate revenues at current crop prices would be reduced by about \$6,200,000 per year to \$8,300,000.

About 58 percent of this foregone revenue is derived from “export sales” to non-local buyers of crops and livestock produced inside Wallowa County. The corresponding \$3,600,000 in lost export revenues measures new dollars directly lost to the local economy if the Dam were to be removed or breached.

In addition to farming, ranching is a significant part of Wallowa County agriculture. The primary livestock commodity, by far, is beef cattle, and due to the current pattern of high quality hay and other crop production in the county, over one-half of the calves are retained and finished before they are sold. With the decline in irrigation and projected changes in crop mix, we estimate that aggregate livestock revenues would decrease from \$13,800,000 to about \$9,100,000, or by \$4,700,000, as ranchers shift toward sales of lighter weight weaned calves and possibly are forced to reduce herd size.

Nearly all, 98 percent, of the beef produced in Wallowa County is sold to outside buyers. We estimate that forgone beef export sales would amount to a little more than \$4,600,000 per year.

Adding the reductions in farm gate crop and livestock revenues together yields our estimate of gross agricultural revenue foregone in Wallowa County were the Wallowa Lake Dam to be breached or removed: \$10,900,000 (\$6,200,000 + \$4,700,000) per year at current prices. Expressed another way, the 79,000 acre-feet of foregone irrigation water have a gross farm/ranch gate revenue value of about \$138 per acre-foot per year. From an economic development perspective, the 79,000 acre-feet of water used for irrigation generate about \$8,200,000 per year in new dollars flowing into the local Wallowa County economy from sales of unprocessed agricultural commodities. The corresponding “raw” agricultural export sales value is \$104 per acre-foot per year.

Effects on Wallowa County Tourism and Recreation

Many local businesses sell to tourists and recreationists, a substantial portion of whom are attracted to Wallowa County by Wallowa Lake. Without the Dam, these businesses will suffer as sales decline—including restaurants, motels, taverns, recreation and amusement establishments and others.

With the Dam, current sales by the composite “recreation sector” amount to about \$30,000,000 per year. If the Dam were removed or breached, the owners of these “recreation sector” establishments and other local people comprising a “focus group” estimated that annual sales to tourists would decline by about eight percent or by \$2,300,000 per year. This impact is analogous to the \$8,200,000 in foregone agricultural export sales bringing the total lost export value at current prices up to \$10,500,000–\$133 per acre-foot per year.

Effects on Wallowa County Land Values and Property Taxes

The 13,000 acres of land that would lose irrigation water are expected to convert to dryland farming. At current farmland prices, irrigated lands sell for about \$2,500 per acre while dryland sells for \$450 per acre. The corresponding decline in farmland values, if the Dam were rendered inoperative, would amount to \$26,600,000. Since these agricultural lands are taxed at less than market value because they are categorized as farm deferral, the substantial decline in market value would result in a mere \$39,100 per year in tax losses to Wallowa County.

As irrigation ditches dry up, we expect property tax values in Joseph to drop by a little over one million dollars. The corresponding decline in property taxes is about \$13,700 per year.

And, as Wallowa Lake itself shrinks and as its elevation declines, we project a \$13,900,000 reduction in the total market value of some 132 lake front properties. We project the total decrease in annual tax revenue to be \$142,800.

In sum, the removal of Wallowa Lake Dam would have adverse effects on both land values and property taxes paid to local government entities. Land values will decline, projected here by \$41,500,000. Property taxes paid to local government also will diminish—by about \$195,600 according to our calculations.

Overall Impact on the Wallowa County Economy

As new dollars from export sales flow into Wallowa County, those dollars are re-spent again and again. Some re-spending directly influences major suppliers of farm and ranch businesses, e.g., feed and seed dealerships. Ultimately, as the dollars percolate through the local economy, all sectors of the economy are impacted to some degree. The question becomes one centered on the overall impact of Wallowa Lake Dam removal or breaching on the local Wallowa County economy.

The pattern and degree of impact differs with the local sector engaged in outside, export, sales activity. These differences are reflected in the differences among local sector “value-added multipliers.” The applicable local multipliers for each agricultural commodity and type of local business are found in the Sorte and Tanaka report, referenced above.

Value-Added Multipliers for Sectors of the Wallowa County Economy

The weighted average value-added multiplier for the crop subsectors (wheat, barley, oats, hay, etc.) is 1.23, and the corresponding multiplier for the livestock subsectors (range, feedlot, etc.) is 1.48. Using the local beef cattle industry as an example, this means that with the Wallowa Lake Dam and its irrigation infrastructure in place, for every dollar in beef or cattle sales to buyers outside the county, another 48 cents in value is added within Wallowa County due to re-spending and value (such as wages) generated as re-spending continues. The same logic applies to the recreation sector, with a weighted value-added multiplier of 1.32.

Overall Local Economic Impact of the Wallowa Lake Dam

Now we are in a position to project the total value of water storage behind the Wallowa Lake Dam to the Wallowa County economy. That value is \$13,300,000, or \$169 per acre-foot per year, not counting any possible additional decreases in value-added due to declines in property values and tax revenues.

As long as the Wallowa Lake Dam is maintained in good repair over the next century, it will continue to generate these annual agricultural and recreation benefits. Conversely, if the Dam were to be removed or breached, these local values would be foregone. Under a removal or a breaching scenario, using a three percent interest rate the present value of the stored Wallowa Lake waters is \$4,433 million; at four percent \$3,325 million dollars, before adjusting for Dam and irrigation system maintenance costs.

Given our assumptions and our data base, we therefore project the current present value of the Wallowa Lake water to Wallowa County and its residents to be between \$4,200 and \$5,600 per acre-foot. This is the range of values against which the net present benefits, if any, to Wallowa Lake Dam removal or breaching must measure up.