Introduction

Water scarcity is one of the most complex and pressing public issues in the arid western United States. Irrigated agriculture remains the largest user of freshwater, accounting for 74 percent of total water withdrawals. Demand for water is constantly growing, and increasingly represents urban interests whose priorities are divided among recreation, protection of threatened or endangered species, urban consumption, and other non-agricultural uses.

Water disputes are complex. Many interests are at the table to voice their demands. Some may choose to work behind the scenes through political lobbying which further complicates the dispute. Long time water users may feel personally attacked by the increased competition for water. Emotions escalate quickly and positions harden. When litigation is involved, the conditions usually worsen. Often this is when market solutions, such as water banks, are proposed. The dynamics at this point are such, however, that water right holders who may have been interested are, at least initially, suspicious or fearful of the solution.

Legislators often propose market solutions, such as water banking, to resolve water supply disputes. A water bank is defined as a water conservation tool that enables voluntary, temporary transfers of water entitlements between willing water right holders and users based on how much water a user needs and when it is needed without a permanent change in water rights.

In the Walker River Basin, water banking has been suggested as one approach to resolve an ongoing dispute involving diminishing lake levels, lower water quality, and declining fisheries at the terminus Walker Lake, as well as Native American demands for increased water rights. A water bank could redirect the flow of water among competitive uses. Benefits include providing water for recreation, and increased stream flows to protect wildlife habitat and ecosystem health. Water banking may encourage more efficient irrigation technology and water conservation practices.

In spite of potential benefits water banking faces numerous barriers to its rapid acceptance. First, the Prior Appropriations Doctrine outlines specific conditions for water use that emphasize a “use it or lose it” model for water usage. Some states have modified their water law to enable water banks to function without sellers or donors risking loss of water rights. Second, there is the potential for negative economic effects on rural communities that depend upon agricultural production. Banking water for Walker Lake or other demands may result in some water being removed permanently from agricultural production, causing

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1 For detailed discussion of the Walker River Basin water dispute and water banking, see Western Resource Issues Education Series of extension fact sheets via Cooperative Extension’s website http://www.unce.unr.edu/publications/natural.htm.
a reduction in associated agricultural supply trade and services. Finally, the most formidable barrier may involve the nature of water disputes and the timing in which water banking is proposed. This barrier is perhaps the most difficult one to quantitatively measure.

Survey of Willingness to Participate in a Water Bank

In 1999, University of Nevada Cooperative Extension conducted a survey of Walker River water rights holders to assess willingness to participate in water banking in the Walker River Basin. Before the survey, Cooperative Extension organized a workshop to educate residents in the basin about water banking. Experienced individuals from the Snake River Water Bank in Idaho and the Drought Water Bank in California presented information about how water banks operate in their respective states. Cooperative Extension also published ten extension fact sheets about the current water dispute, discussed the benefits and costs of water banks, and explained how water banks operate. The fact sheets were sent to all water rights holders in the Basin. Subsequently, a questionnaire was sent to all water rights holders in the basin along with a letter explaining the purpose of the survey, instructions, and a return envelope.

Survey Results

Completed surveys available for analysis represent a 22 percent response rate. Respondents volunteered numerous written comments about their willingness to participate in water banking as a way to resolve the water dispute, providing data for qualitative analysis. All legible written comments were sorted into five groups. The groups are: 1) not willing to participate in water banking; 2) do not know enough to decide; 3) willing to participate with certain conditions or more information; 4) willing to participate but concerned about how the bank would operate, and; 5) willing to participate but concerned about Prior Appropriations and loss of rights. Each group heading lists the percentage of total written comments sorted by group followed by the respondents’ quotes.

Not willing to participate (20%):
- It will never work on a system as the Walker River Irrigation District.
- Quit wasting our time on this issue—water banking.
- Do not support water use that is nonagricultural.
- Low water years everybody suffers. High water years surpluses flow to Walker Lake. I don’t think upstream user should be penalized to give special privilege to fill Walker Lake.
- I don’t feel that trying to bank against mother nature in a desert is a good idea.
- No—we need to eat! Fauna and flora, birds need cover. We need to eat and feed the world!
- If the water bank is compared to federal spending, I don’t approve of it.
- Our water rights are in trust with the federal government. We have no control over them.
- Water banking sounds like a unique way to distribute unused water, however, my reason for not on the above is that any extra water I have goes to expanding my cultivated area.

Do not know enough to decide (11%):
- We have 4 acres of water rights. They have not been used in a year. I know almost nothing about water rights!
- We are a small water right holder and don’t really have enough knowledge to make good comments. I might make a mistake and not have enough water.
- I read the papers on water banking I’d received but I didn’t have enough real understanding of it to make a decision for or against it.
- New to the area. Have not received enough information on water, water rights, and future crops for our acreage.
- I don't know enough about water banking. Need more information on this.

**Willing to participate and/or willing with certain conditions or more information (41%):**
- I would like to see the agreement before committing to numbers of acres. The agreement would have to be very flexible from year to year.
- If a water bank was established, I would be a buyer of water. My acres are water short.
- I believe in some type of water banking. I am water short on a normal year. I would be a buyer not a seller or a lessee.
- I own 2.5 acres. $300 annually would be the fee for the property I own.
- It makes sense—we have water rights and I doubt if they are used to the fullest extent.
- I support the concept. It seems only prudent to have this back-up in water short years.
- Under drought conditions, what mix of considerations would be used to determine the use (availability) of water for agriculture vs. maintenance of wild land resources (as an example)?
- I lease the 400 acres. I believe it is all in alfalfa. Because of this, it would be at the lessee's option to sell water rights.
- I think it can be a good idea. I don't think farmers should be "gouged" in dry years ... the bank should try to be cooperative.
- I am not familiar enough with irrigation to answer the above questions. But I think the water bank is a good idea and I would participate.
- Will ranchers have to bid against the United States treasury for water in dry year? If water is to leave a given area, a percentage of that water should be used for alleviating effects on neighbors (ditch loss, etc.).
- There is not sufficient surface water to go around. Groundwater would have to pumped
- Water conservation is possible, but some in farming would only continue to pump groundwater beyond their allocation— as there are not enough personnel to enforce water usage.
- The price for an acre-foot of water would need to be pretty high ($100/a.f.) to interest me. This would be likely under 2 scenarios: 1) plenty of water: a 100% year, and 2) a low water year-- 65% year. Under a moderate water year, I'd rather be a buyer at low prices.
- Sounds good, but, how do you propose to get 100% cooperation.
- 63-acre ranch—Storage water only.
- [What about] percent lost to evaporation, etc.
- My primary crop is alfalfa. This crop cannot be used as a yearly crop. I need water every year or not at all.
- We usually don't have enough water to irrigate what acreage we have.

**Willing to participate but concerned about how a water bank would operate (15%):**
- Would an agreement to lease water be permanent and irrevocable?
- Water is righted and should be used that way and should be controlled by user.
- If the government is able to get use or control of any more water, we may not get it back in years to come.
- Water banking might be something we would be interested in but only if there was a guarantee that the water rights would be available to us at a later date should we need them. If water banking is agreed to, how long would you be committed to this. Without this information and some type of guarantee that the water rights could be available at a later date, we wouldn’t be interested.

- Is the amount of water to be leased determined by the per-acre duty, or just how is it determined?

- Do we establish a price on normal (100%) year and still get the same price on an above-normal year as it is not cost-effective for our operation, 99% perennial to replace fields that we take out of production?

- More water and water storage would be required—It takes a high flood year to meet demands now. Pumping underground to a remote location would be abominable and dry up aquifers just as in Southern California. Also, I do not intend on bidding against outsiders for agricultural water. We are buyers not sellers!

**Willing to participate but concerned about Prior Appropriation Doctrine and the loss of water entitlement through nonuse of water (9%)**:

- Good idea, but is there a danger that the water seller could lose some of their water right by showing lack of need?

- Not interested in water banking. If you lose your water rights for more than one year at a time.

- We always use all of the water we are allotted.

- It’s like the camel in the tent. Once started it’s too easy for the lessee to claim entitlement and the lessor loses his/her rights.

**The Dispute Involving Walker Lake**

Survey respondents also commented generally about the dispute involving Walker Lake. Sixteen percent of the total number of respondents volunteered the following quotes:

- Destroying farmers to save Walker Lake is dumb.
- This is a naturally occurring event that should not be stopped.
- Fishing is not one of Nevada's significant industries.
- Agriculture should not be allowed to suffer.
- Just give [Walker Lake] the amount of water that is available—not take it from others.
- Only excess water not required by farmers should be used [for Walker Lake].
- It should be the farmer's decision if he can afford the water.
- Walker Lake has been dry before.
- There is not sufficient water available to maintain what we have now.
- I want to do what I wish with my water.
- In the end they are going to have to settle for less.
- Walker Lake can only be saved by the will of Mother Nature.
- Geologically, Walker Lake will continue to dry up.
- Reduce the size and surface area of Walker Lake.
- Politics is driving the move to save Walker Lake.
- Let Los Angeles get their own water source.
- Clean out the river—especially in the lower channels.
- I am skeptical of the agenda of the different parties to get water to the lake.
Walker Lake was drying up before irrigation.

[It's] a complete waste of water to try to keep this going.

**Alternative Water Conservation Measures**

Respondents rated conservation measures alternative to water banking as either good to excellent or fair to poor. Many respondents indicated that they did not have enough information to rate possible conservation measures. Figure 1 illustrates how water rights holders rated conservation alternatives. The results suggest that irrigators are interested in making efforts to conserve water but are more receptive to possible structural changes to the existing system, not investing in new technology and innovation. This response is logical given that producers are unclear about who would pay the costs of adopting alternative conservation measures. Results indicate additionally that irrigators need more information about conservation alternatives.

**Can the Barriers be Overcome?**

According to survey results, the majority of respondents indicate that the potential exists for water banks to help resolve the Walker River Basin dispute. Survey respondents confirm that existing barriers must be overcome.

First, irrigators are more likely to participate if state water law is modified to protect their water rights. Nevada does not have any legal mechanisms currently in place for short-term water transfers. The protection of water rights is a critical condition, since water rights within the Walker River basin require beneficial use and are subject to forfeiture and abandonment under both Nevada and California State Law. Water rights holders are unlikely to participate in water banking if their water rights may be lost.

Second, participation is more likely if irrigators design the water bank. Since water rights in the Walker River Basin are not public, irrigation district board members can play a critical role in selecting...
pricing methods. In addition, they can determine how to alter the system physically in order to store and lease water annually to effectively operate a water bank. There is a clear need to maintain local administrative control over operational procedures.

Third, irrigators believe that current water rights are inadequate to both bank water and farm. Irrigators perceive there is no water to spare. Conservation measures are unlikely to “create” more water. In the Walker River Basin, the principal crop (alfalfa) is a perennial. It is not possible to fallow the crop for one year to temporarily transfer water. Someone would have to receive less water. The result would be fallow fields and potentially negative economic effects. Potential adverse effects will have to be analyzed carefully and be taken into consideration in the bank design.

Fourth, it is questionable whether water banking will provide more water for Walker Lake and resolve the dispute. A positive result depends, to some degree, on the design of the water bank and how its operators determine prices. These considerations probably will influence how many irrigators become buyers rather than sellers of water. If most irrigators become buyers to expand their production, lake levels at Walker Lake are likely to remain the same or diminish further. Only conservation measures that reduce total consumptive use would avoid or minimize this effect.

Finally, the timing for proposing a water bank in the basin is undeniably poor. Given current litigation, the suggestion that water banking might resolve the dispute and/or produce more water for Walker Lake arouses suspicion, fear and confusion rather than a willingness to voluntarily participate. When it comes to water disputes, timing is everything. Water transfers based upon coercion or perceptions of coercion are not likely to succeed. Water banks may potentially resolve the dispute when irrigators’ water rights are clearly defined. Even clearly defined water rights, however, may be challenged through litigation to change existing water law. This often occurs when an interest group successfully convinces lawmakers that the majority of voters want water used for purposes other than agricultural irrigation. In most water disputes when substantial power imbalances such as this develop, it becomes impossible to find an agreeable outcome. When water banking or other market solutions are proposed during such periods of distrust, the result is likely to be increased fear and greater confusion.

Despite the timing, survey results indicate that 41 percent of irrigators who commented are interested in water banking provided they have a better understanding of how a water bank would operate. Additionally, the survey results indicate an opportunity for Cooperative Extension to educate water right holders about water conservation alternatives to water banking. These alternatives include delivery and return ditch consolidation, subsurface or drip irrigation, implementing automated diversion structures on the system, and cultivation of less water intensive crops.

References