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Saltcedar Found to be Friend, not Foe of Western Waterways

by Joe Gelt

Water waster, pest plant, an alien invader, the saltcedar or tamarisk is known as a truly villainous plant, the plant that is drinking the West dry. Recent research, however, finds that the much maligned plant can be a valuable and productive member of a riparian plant community. Scientists are concerned, however, that the message has not reached many natural resource managers.

More is at stake here than the reputation of the saltcedar. Also at issue is the contribution of science to land and water management. Are resource managers using the latest research when determining water management issues? Are they even aware of such research? What must be done to get word out so that research is widely known and used?

This is an issue that concerns Ed Glenn, a researcher in the University of Arizona's Environmental Research Laboratory. Glenn is part of a research network that includes scientists from the UA, Arizona State University, U.S. Geological Survey and other agencies and institutions that have studied the saltcedar for over ten years; they argue that the environmental benefits of saltcedar outweigh arguments to eradicate the plant.

In advocating this position they are tak-

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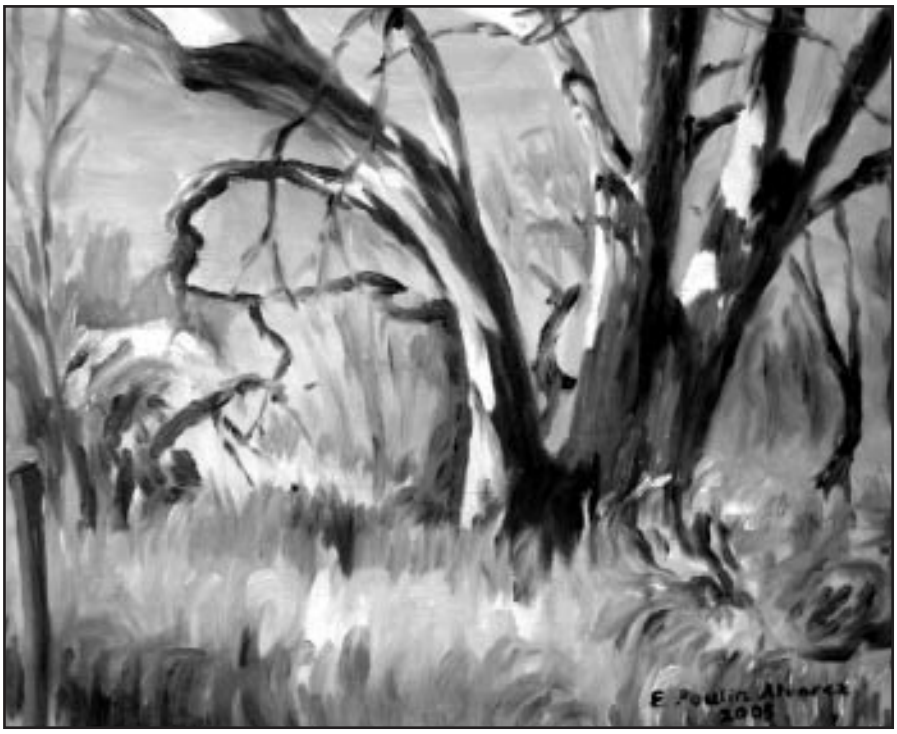

The above painting, titled Tamarisk, was done by Elizabeth Poulin Alvarez. Once considered a scourge of western waterways, tamarisk or saltcedar may actually benefit western riparian areas. Researchers, and at least one artist, have discovered the oft overlooked value of saltcedar. A better view of Ms. Alvarez painting is available at http://www.epoulinalvarez.com/?showimage=23

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Well Owners Along Lower Colorado River Face Stricter Enforcement of Water Laws

Reclamation identifying wells that pump river water without legal entitlement

by Joe Gelt

It is no doubt a sign of the drought-struck times that efforts to strictly account for lower Colorado River water use are now focusing on individual landowners and homeowners who have drilled wells and pump water along the lower Colorado River. Up to now, efforts to regulate Colorado River water use have mainly been directed at the big water users: states, Indian nations and irrigation districts.

Collectively these small-scale water users, most of whom are householders taking care of domestic water needs, consume a significant amount of Colorado River water, an amount estimated at between 9,000 and 15,000 acre feet. Most of this water is pumped from the floodplain but also includes water pumped directly from the river.

Water laws violated

The U.S. Bureau of Reclamation is concerned since much of this water is being taken without an entitlement. In other words, many of these water users are violating

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water law by drilling wells that draw water from the Colorado River. The water they pump and consider groundwater for the taking may, in fact, be subflow of the Colorado River. Who uses Colorado River water and the amount consumed is strictly regulated.

The hard-and-fast law is an individual cannot divert water from the river without a legal allocation. Pumpers illegally using Colorado River water need to legitimize their water use by complying with laws regulating use of the river. Reclamation has proposed rules to ensure better water accounting.

"Reclamation is legally obligated to ensure that all Colorado River water use in the Lower Basin is covered by an entitlement and correctly accounted for," said Lorri Gray, the Lower Colorado Region's Regional Director. "If someone is using Colorado River water without an entitlement, that harms the entitlement holders in Arizona, California and Nevada who do have one, so this proposed rule is necessary and appropriate."

Individual pumpers targeted

This focus on individual pumpers is a logical outcome of stricter water-use accountability taking place along the river. More accurate accountability of water use is the order of the day as the seven Colorado Rivers states ponder strategies to make the resources of a drought-beleaguered Colorado River go further to meet their needs during a period of unprecedented shortages. In brief, every well and river pump counts.

And Reclamation is counting and inventorying the pumps. Charged with providing detailed and accurate records of diversions, return flows, and consumptive use of water diverted from the mainstream of the Colorado River below Lee Ferry, the agency is establishing a procedure for identifying which pumpers are unlawfully using lower Colorado River water. The agency will then know who is using how much water and will be able to offer options to enable users to legitimize their water use.

Reclamation commissioned the United States Geological Survey to develop a method for identifying wells that are pumping groundwater that result in water being drawn from the lower Colorado River. (See insert in this newsletter for a description of the USGS methodology.) USGS is now using the method to inventory wells pumping water from Colorado River aquifer in Arizona, California and Nevada. Although USGS is inventorying every well and river pump that can be located, Reclamation is only concerned with the wells and river pumps that are withdrawing water.

As of September 2008, 3,338 withdrawal wells have been inventoried. The USGS well inventory is approximately 80 percent complete at this time.

Well owners notified

"To determine if these wells are pumping Colorado River water is our job." says Ruth Thayer, Reclamation Group Manager, Water Conservation and Accounting. Rules are now in the making to set the criteria. Thayer says that one of the primary objectives of the rule-making process is to set the aquifer boundary and the methodology to determine the source of the water being pumped. "Once we determine if the wells are using Colorado River water, the next step is to determine whether the use is covered by an existing entitlement."

Water is a highly charged issue, and targeted water users are likely to feel nervous if they feel their water supply is threatened or even questioned. Reclamation is making a special effort to reassure them that they have little to fear from the agency's actions.

Thayer says, "We went out in the fall and conducted public meetings, outreach and education, letting folks know what we are

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WRRC News and Notes

Newsletter Changes The Water Resources Research Center is ringing out the old year and bringing in the new by making some changes to the *Arizona Water Resource* newsletter. Beginning with this issue the *AWR* will contain eight pages rather than 12. Further, rather than being published six times a year, the newsletter will be published five times. Instead of a January-February edition of *AWR*, you will receive a copy of the *Arroyo*.

The *Arroyo* is WRRC's single-issue newsletter — single issue in that it is published once a year (Jan. - Feb.) and focuses on a single critical water issue. The forthcoming issue discusses reclaimed water. You will still therefore be receiving six copies of a WRRC newsletter per year, five *AWRs* and one *Arroyo*. Like so many other organizations during these financial strapped times, the WRRC is making do with less; we remain committed nonetheless to providing important news and information to the Arizona water community.

RFP The U.S. Geological Survey in cooperation with the National Institutes for Water Resources requests proposals for matching grants to support research on the topics of water supply and water availability under the National Competitive Grants Program authorized by section 104G of the Water Resources Research Act. Proposals are due Feb. 20. For additional information check: https://niwr.net/competitive_grants/

Megdal, New CAP Board Member WRRC Director Sharon Megdal along with Warren Tenney, Pat Jacobs and Terry Kibler were elected in November to the Board of Directors of Central Arizona Water Conservation District. They will represent Pima County.

USGS Sponsors Newsletter Supplement

This edition of the AWR includes a four-page supplement describing work being done by the U.S. Geological Survey. The USGS's sponsorship of the supplement helps pay the expenses of publishing this newsletter. We appreciate the opportunity to work with USGS and the agency's generous support.

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ing on some commonly held beliefs about saltcedar. Saltcedar is said to be flagrantly guilty of hogging scarce water supplies, crowding out native vegetation, ruining the quality of wildlife habitat and increasing soil salinity.

Glenn believes that scientists need to take the initiative to educate officials that saltcedar is not the riparian threat some perceive it to be. He says, "Scientists bear the primary responsibility because it is our story to start with, that saltcedar is a water-using plant that aggressively displaces native plants. That did not come from the river managers; it came from scientists."

He explains how saltcedar got targeted for removal to save water. The idea at one time was to remove all vegetation from rivers and then riprap and soil concrete the banks. An emerging environmental movement raised objections. The idea then morphed into controlling just the invasive species as a strategy to save water in the 1960s.

Tamarix aphylla in natural habitat in Israel. Photo courtesy of WikiPedia.

Glenn says scientific studies at the time resulted in predictions of the amount of water that would to be saved by saltcedar removal. He said, "They did crude studies that showed great water use, but even in early 80s USGS scientists were doing more careful studies that showed saltcedar did not use much water. People cherry picked the high-end estimates to promote the idea that they could save a lot of water by clearing salt cedar."

Glenn says misguided opinions about the plant linger partly due to outdated science. Also an emotional reaction predisposes people against saltcedar: some are prejudiced because it is an exotic species, not native to the West.

He says it is important for scientists to establish a consensus; otherwise, he says, "Resource managers hear different things from different people and don't know what to think."

Glenn believes getting the saltcedar message out requires a special effort. One such effort was a recent University of Arizona press release describing recent saltcedar research that was picked up by various news services. He said, "We got about 30 emails [in response to the press release] from many of the people we were hoping to hear from, at the state and federal levels. They said we didn't know this. It was gratifying to get that response.

"Putting that information in academic journals is like throwing a rock in the ocean. I don't think the resource managers and people in environmental groups keep current of the latest science by reading journals."

(At about the time of the UA press release, a story appearing in the *Christian Science Monitor* about efforts to rid western waterways of saltcedar stated, "By some estimates, the slender-branched shrub uses up more of the Colorado River than the residents of Las Vegas and southern Nevada..")

Glenn finds that their message is being heeded, that federal and state officials are receptive to what researchers are finding. He says, "Once you tell people whose job it is to make correct decisions about resource management they are receptive to changing their minds." He mentioned a remark by a Bureau of Reclamation official who said that "(we) are the ones who will bear the brunt of the problem if we clear a lot of saltcedar and all the high expectations go unfulfilled."

Meanwhile as scientists work to redeem the reputation of saltcedar bio-control efforts are underway to remove saltcedar from along western waterways by introducing the beetle, Diorhabda elongata. Its diet consists solely of saltcedar leaves. This is an example of what Glenn says is "science lagging one step behind the practitioners."

(The Christian Science Monitor story noted above described the situation much differently: "Armies of foreign beetles are on the march along the river systems of the desert Southwest, and ecologist Tom Dudley greets them as little green liberators.")

Despite plans to strictly control the beetle the insect is spreading beyond areas of its immediate release. By doing the job it was intended to do — destroy saltcedar — the insect may end up seriously damaging the riparian areas it was meant to protect.

Glenn says that saltcedar research is a "good news story," enabling people to say, "Oh here is something we don't have to worry about." Bad news, however, may be around the bend: The "little green liberators" might be the next problem on rivers in the West.

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News Briefs

AZ Developer to Pay Record Section 404 Fine

To settle alleged violations of Section 404 of the Clean Water Act an Arizona developer and contractor have agreed to pay a combined $1.25 million civil penalty for bulldozing, filling and diverting approximately five miles of the Santa Cruz River without a permit from the Corps of Engineers. According to an EPA press release the settlement is one of the largest Section 404 settlements in EPA's history.

In 2005, the Justice Department and the Environmental Protection Agency filed a complaint against Scottsdale-developer George H. Johnson, his companies Johnson International, Inc. and General Hunt Properties, Inc. and land-clearing contractor, 3-F Contracting, Inc., for violating Section 404 of the CWA that protects against the unauthorized filling of federally protected waterways.

The alleged violations occurred in 2003 and early 2004. At that time defendants bulldozed 2000 acres of the historic King Ranch and La Osa Ranch in Pinal County, areas located within the largest active floodplain of the lower Santa Cruz River.

The EPA press release stated that this stretch of the Santa Cruz River supported a rich variety of vegetation prior to the defendants's land-clearing activities. It included one of the few extensive mesquite forests remaining in Arizona's Sonoran Desert region. These areas form a critical corridor for wildlife to move along the Santa Cruz River and from Picacho Peak State Park to the Ironwood Forest National Monument.

The 2,000 acres were cleared as part of an extensive 18,000-acre development.

Research: Cactus Used to Treat Water; Drip Irrigation's Potential Overrated

Prickly Pear Cactus Used to Treat Water

Desert dwellers needing to treat their drinking water have the means close at hand. A biochemical engineer at the University of South Florida in Tampa has found that the mucilage of the prickly pear cactus, the clear, viscous liquid within the cactus pads, can effectively treat water for arsenic, bacteria, and cloudiness. The mucilage helps the cactus survive by sealing water within the plant.

According to a Sept. 17 article in *Discovery News*, Norma Alcantar became aware of the unique qualities of the cactus from her grandmother's folk wisdom; she was a native of north-central Mexico. Her grandmother used water left over from boiling prickly pear cactus pads, eaten as salads and in other dishes, to clear up cloudy river water to be used for cooking or drinking.

Alcantar found that mucilage binds to the dirt causing particles to coagulate; large clumps are then formed that settle out of the water. According to the article, further research found that the mucilage can form a complex with arsenic large enough to be removed with a sand filter. Alcantar reports that arsenic removal ranges from 80 percent to lower than 50 percent, with the percentage of removal determined by the amount of arsenic in the water supply.

Further, Alcantar's research team also has demonstrated that mucilage can remove bacteria from water by either engulfing the bacteria, thereby starving them or causing the bacteria to bind and settle out of the water.

Study: Drip Irrigation Not Water Efficient

Recent research questions whether drip irrigation is the most water-efficient way to irrigate crops. A New Mexico State resource economist's against-the-grain conclusion almost seems to defy logic by finding that drip irrigation ends up consuming more water than using a less efficient irrigation technique.

Frank Ward's research showed that drip irrigation increases crop yield but at a long-term water cost. Analyzing agricultural water use in the Upper Rio Grande River Basin, Ward found that drip irrigation consumes about half the amount of water as flood irrigation. Plants, however, use more of the water delivered via a drip system resulting in increase yields, with more water lost to evaptransporation. Also the increased yields encourage farmers to plant additional acreage further increasing water demand.

The biggest drawback, however, is that the efficiency of drip irrigation results in less overflow seeping back into aquifers or draining into area rivers or streams. Aquifers then receive less recharge, and less water is available to downstream users.

Ward does not deny the benefits of drip; he just doesn't count conservation among them. According to Ward a more accurate calculation of water use would look at the amount depleted from a basin and not just focus on the amount of flow from an irrigation pump.

Ward's conclusions question the efficacy of subsidies and policies adopted to encourage drip irrigation to conserve water. Water use might actually increase.

Published by the *Proceedings of the National Academy of Sciences*, the study was co-written by Manuel Pulido-Velazquez of the Polytechnic University of Valencia in Spain.

Guest View

Water Conservation Plans Should Consider Need for Sustainability

The short-sighted view is to focus just on short-term benefits

David Modeer contributed this Guest View. Currently Phoenix Water Service director, Mr. Modeer has been appointed general manager of the Central Arizona Project. He will take up his new position early in the new year.

When I agreed to follow-up on Sharon Megdal's sharing with us her trip to Paris, my only qualification was I would not descend into Phoenix's sewers for a photo op. That is one thing we have in common with Paris — strolling through the Salt River Outfall sewer is not a major tourist attraction. Sharon has been a long time supporter of water conservation in Arizona, and I share her enthusiasm. Living wisely within our desert environment continues to be critical for maintaining sustainable communities in Arizona. Convincing Arizona water users to live a low-water use lifestyle will be important to sustainability. However, while we wave the water conservation flag for our customers, we need to be careful not to fall into the trap of using water savings as a new water supply.

In her review Sharon closed with "… convincing Arizona water users to do more to conserve water is a necessary and relatively low-cost way of addressing scarcity." Twenty years ago, the term scarcity meant the lack of water rights needed to meet current or projected demands. Using water conservation to lower demand was a valid response to this type of scarcity. Less demand per customer meant you could serve more customers with the same amount of water. Today, thanks to the work of Sharon and her university colleagues, we now know this is a trap.

Our view over the past 20 years of sustainable yield for surface and ground water supplies has been based on one of the wettest centuries in the last 1,000 years. Researchers have been able to reconstruct stream flows of the Colorado, Salt and Verde river systems over the last 1,000 years, revealing a much dryer past. Dry periods of 20 to 30 years were common, with all three rivers experiencing low flows together more often than not. This history and the potential future of global climate change means that droughts that reduce surface and ground water supplies are a question of when, not if. This creates a double whammy for water supplies "created" through water conservation. First, during these droughts all supplies will be reduced, including the water supply created by water conservation. Second, water conservation will have hardened demand making it more difficult to further reduce demand as a response to drought.

Avoiding this trap requires that communities set a higher standard than that used over the past 20 years. Having a sustainable water supply to meet 100 years of growth under normal water supply conditions is in reality not going to be sustainable. To be sustainable, communities must be able to meet the basic water supply needs of their communities during times of reduced water supply as well as normal.

Many communities are embracing this new standard of adaptation to long-term drought which is changing how we think about water conservation in several ways. First, demand management plans will begin distinguishing between water conservation as part of a low-water use lifestyle and water conservation that is part of drought response. A community's low-water use lifestyle should be able to meet the community's water needs during normal conditions with no negative impact on the economy, environment or desired quality of life. Water conservation during drought will have a short term negative impact on the economy, environment and desired quality of life but only to the degree that the community can quickly recover when drought conditions end. Secondly, water savings from water conservation will not be included in long-term water supply estimates for normal conditions; rather they will be included as part of a long-term drought supply. Water conservation that occurs during drought will reduce the volume of water needed to supplement reduced water supply conditions. Water saved before drought conditions will be treated as water available for banking, providing a water supply available for finite periods during times of reduce surface and ground water supplies.

Unfortunately for some communities in Arizona, the meaning of scarcity is the same today as it was 20 years ago, and water conservation is used to "create" water supplies to meet the scarcity for new or existing demands. For these communities water conservation is simply digging a big hole which will be dry when the scarcity of long term drought comes to town.

It is my strong belief that we must alter our view of water conservation and change our focus from only short-term benefits to a utilization of conservation as a strategy for providing sustainable water supplies. Failure to do this will lead to further tension regarding our water resource allocation when the time of drought and scarcity arrives.

Legislation and Law

Clean Water Act Issues Await Resolution

Santa Cruz River is Navigable But Broader CWA Issue Unresolved

The Environmental Protection Agency has decided that two segments of the Santa Cruz River are in fact navigable. The issue was left unsettled after the U.S Army Corps of Engineers revoked its original May 30 determination of navigability pending further review. This raised statewide and even national concern that the Corps' action might portend a change in its regulatory approach to the Clean Water Act. Navigable rivers are covered under section 404 of the CWA that ensure stricter enforcement of water quality standards.

In face of the controversy, EPA announced in August that it would consider the Santa Cruz River a "special case" and decide the designation itself. A Dec. 3 letter to the Corps from the Benjamin Grumbles, EPA assistant administrator for water, stated that the river segments should be considered "traditional navigable water" as originally posted on the Corps web site.

A navigable Santa Cruz provides environmental benefits. For example, opponents of the proposed Rosemont mine believe the designation would help restrict the controversial facility that would discharge waste into a tributary of the river. Some see the designation as the means to control development.

The river segments are located south and north of Tucson, with one segment stretching from Tubac to Continental and the other extending from Pima County's Roger Road sewage plant to the Pinal County line. Running year-round with treated sewage effluent, the river segments are bright ribbons in a mostly dry Santa Cruz.

The local issue may have turned out well, but navigability continues to be an unresolved issue at the national level. Defining navigable waters became problematic after a 2006 Supreme Court ruling muddied the navigable water concept, a decision that federal officials have been laboring ever since to incorporate into their rule-making. The Corps' decision to review its initial Santa Cruz designation reflected this uncertain state of affairs.

Court to Determine if CWA Allows Cost-Benefit Analysis

On Dec. 2 arguments were heard in the U.S. Supreme Court challenging new Environmental Protection Agency regulations requiring power plants to retrofit water intakes to protect aquatic life. Central to the case is Section 316 of the Clean Water Act that states that the design of structures used for cooling water must "reflect the best technology available for minimizing adverse environmental impact."

In 2004, when the EPA proposed rules for existing power plants, the agency allowed operators to request a variance if the compliance cost was significantly greater than resulting environmental benefits. This was in response to an industry concern that the cost to utilities might be far in excess of any environmental gains.

Environmental groups filed suit, claiming that EPA's cost/benefit analysis violated the law by permitting structures that fail to effectively protect aquatic organisms as required by the CWA. A U.S. Court of Appeals essentially agreed, holding that cost could only be taken into account if used to enable a plant operator to apply "a less expensive technology that achieves essentially the same results."

EPA revised the rule in accordance with the decision; utility groups then petitioned the Supreme Court for review saying that the Appeal Court's finding contradicts more than 30 years of EPA's CWA interpretations. They also argued that Supreme Court precedent allows discretion to regulatory agencies to interpret the statutes.

Entergy Corp. v. EPA, 07-588 is considered a major environmental case and the decision, which is expected in the spring, will likely be an issue in the environmental debates expected with the new administration.

Dissenting View: Boulder Dam, March 24, 1928

It is not surprising that water projects now determined to be essential did not go unquestioned when proposed. Progress is marked by faltering steps and dissenting views. Even the idea of progress is up for debate. The authorizaion of Boulder Dam is no exception as is shown by the following opinon expressed by Congressman Leatherwood (R - Utah) of the Committee on Irrigation and Reclamation

In my minority report of last year on this bill [HR 5773, the Boulder Canyon Project Act] I emphasized the fact that it is a scheme to secure construction by the Federal Government of a power project under the guise of a flood control and irrigation measure... A comparatively simple engineering job of flood control and river regulation, which should not cost more than ten to fifteen million dollars, is here made the excuse for an unprecedented engineering experiment costing not less than $125,000,000 and risking at least 200 million more.

Under this bill the federal government is not to stop when it has finished the job of river regulation and flood control, but is to provide a hydroelectric power supply adequate for more than half the present population of California, a domestic water supply for 10,000,000 hoped-for but nonexistent inhabitants of southern California cities, and irrigation canals for hundreds of thousands of acres of new alfalfa, cotton and corn land in the United States and the water for hundreds of thousands of additional acres in Mexico. Political pressure, and not genuine necessity; buncombe, spread by propaganda, and not facts; log rolling trades, but not merit — all employed over a period of six years — have placed the bill on the calendars of the Congress.

Public Policy Review

by Sharon Megdal

Much Done, Much More to Do to Develop Needed State Water Plan

I have been thinking quite a bit about water planning. Water managers and leaders throughout the state have been discussing the many challenges associated with meeting the water demands of our state's growing population. We've experienced several years of drought conditions, and climate change models predict the Southwest will become drier and hotter. Even in the best of circumstances, we know there is a need to identify additional water supplies to meet expected growth in water demand.

Many water providers acknowledge this need. The 2004 Operational Plan of the Central Arizona Groundwater Replenishment District recognizes the need. The Central Arizona Water Conservation District has initiated its ADD Water Process, which focuses on how new water supplies would be shared — and paid for — by those within the Central Arizona Project service area. The actual sources of additional water are yet to be determined. The Upper San Pedro Partnership has been working on identifying options for additional water supplies. Yavapai County is a hotbed of activity regarding growth and water supplies. Also to be considered in any water supply inventory are the remaining unsettled Indian Nation water rights claims.

But, on a statewide basis, do we have readily available and reliable estimates of how much water is needed where and in what time frame? Do we understand how restrictions on water supplies in one area of Arizona may affect water demand in another? How effective will demand side management be in reducing the need for expensive infrastructure, including treatment facilities? What cushion will Arizona Water Banking Authority storage provide? I learned at a recent national conference that most western states have a state water plan. Should Arizona have one, too? What are the consequences of continuing to look at these matters in a fragmented rather than comprehensive way? A statewide examination would enable us to develop a complete picture of needs, including infrastructure, and priorities and strategies for meeting those needs, as well as to identify supportive legislative actions. Options for paying for infrastructure and water supplies would necessarily be included.

Some might think that sufficient water planning is done in the Active Management Areas, home to more than 80 percent of Arizona's population. The director of the Arizona Department of Water Resources approves Management Plans for the AMAs, but they are not truly water plans. Rather, they are conservation regulations, as mandated by the 1980 Groundwater Management Act, as amended. Historically, they have included an assessment of an AMA's progress in meeting its statutory management goals, along with projections and other useful information, but they have not included plans for achieving these goals.

We are on the cusp of preparing the Fourth Management Plans for the AMAs. The ADWR is preparing assessments for each of the AMAs, but these assessments have not yet been released. Given the two-year lag between official promulgation of the Management Plan regulations and their effective dates, it is clear that the Fourth Management Plans will not be effective before some time in 2011 at the earliest. What should be done if it appears unlikely that one or more of the safe-yield AMAs would not meet this statutory management goal by 2025?

Beyond the AMAs, future growth is expected to be robust, the current downturn notwithstanding. The Statewide Water Advisory Group has been considering the water needs of different parts of the state. While SWAG recommendations have resulted in state legislation regarding adequate water supplies outside the AMAs, the SWAG's charge is not to do water planning.

ADWR has been very busy compiling the *Arizona Water Atlas*, which is a far-ranging source of information by planning areas of the state; information included in the *Atlas* is available on line at www.azwater.gov . The web site states that currently available water-related information for the State of Arizona has been "collected and synthesized" in order to provide a comprehensive overview of regional water supply and demand conditions, identify water resource issues facing Arizona communities, identify missing information and how information access could be improved, and initiate a renewed and more systematic effort by the department to assist Arizona water planning projects and develop solutions. The *Atlas*, however, is not a state water plan. If we don't take advantage of this up-to-date assembly of data, will we be missing an opportunity to understand better the implications of where we are heading?

Do we have the capacity to develop a state water plan, given the shortage of financial resources and the great demands on staff resources at ADWR? Do we have the political will to consider the many difficult questions associated with future water supplies and how to pay for them? Or conversely, can we afford not to develop a state water plan? Do the complexities necessitate taking a big-picture look? If the collective will to develop a plan materialized, could we establish a process for developing the plan that is inclusive and transparent? Can we use development of the Fourth Management Plans to launch a statewide effort?

I would greatly appreciate your sharing your thoughts regarding these many questions by writing to me at smegdal@cals.arizona.edu .

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doing and to provide as much transparency as possible to the public and the districts."

She says responses ranged from those anxious to do what they need to do to obtain a permanent water supply to the other end of the spectrum, with some claiming their water is their own concern. "For the most part most members of the public have been cooperative in having their wells inventoried. ... We are doing everything we can to make this a minimal amount of burden on them and have the least amount of impact."

Options available

Several options are available to well owners found to be illegally pumping. Obtaining an individual water right to Colorado River water would put them legally above board. Such rights are available, at least in Arizona, which has about 10,000 unallocated feet of Colorado River water. Also membership in an existing water district or purchasing water from a city or other provider with such water rights would serve the purpose.

In California, a state with no unallocated Colorado River water, Reclamation has established the Lower Colorado River Water Supply Project. Its purpose is to exchange non-river water for Colorado River water in order to supply impacted well owners on the California side of the river.

If found in violation of federal law, Arizona water users along the Lower Colorado River may not be breaking state law, demonstrating, once again, that consistency is not always a hallmark of water law. Arizona law does not effectively recognize the connection between groundwater and surface water flow; the federal government's enforcement along the lower Colorado River, however, acknowledges that such a connection exists.

Also in reference to Arizona law, most of the wells receiving federal scrutiny would be defined as unregulated wells, requiring a permit but without any obligation to report the amount pumped, providing less than 35 gallons per minute is pumped. This is about 50,000 gallons per day.

Mark Calendar for WRRC's March 17 Conference

The theme of the University of Arizona's Water Resources Research Center's annual conference is "Best Practices in Stakeholder Engagement for Water Resources Planning" and will be held March 17 at the UA Student Memorial Union Ballroom. A collaboration of the WRRC, Morris K. Udall Foundation and Arizona Water Institute, the conference will include a mix of plenary speakers, interactive workshops and posters. You can register on the WRRC 2009 conference web page: cals.arizona.edu/azwater/programs/conf2009. The preliminary agenda also is available on line as is a call for posters; poster abstracts are due Jan. 30.

Please help us spread the word by including the announcement on your web site, in your newsletter or pass it on by word of mouth.