



Court OKs ADWR's Regulation of Water Providers

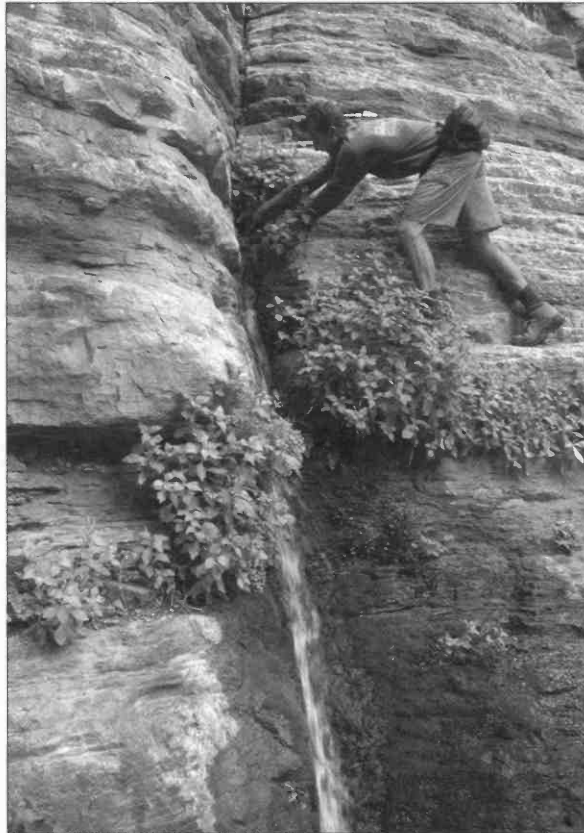
by Joe Gelt

Not likely to be disputed is the premise that a successful water conservation program results in water users consuming less water. What has been disputed — a dispute the Arizona Supreme Court recently resolved — is whether the Arizona Department of Water Resources should regulate water providers or water users to encourage water-saving practices and habits.

The Arizona Supreme Court unanimously decided that, although ADWR has the authority to regulate water use by end users, the agency can instead set water conservation standards to be met by water providers who then must encourage their customers to adopt water saving behavior.

The Arizona Water Company, the utility that initiated the suit, argued that the legislative intent of the Groundwater Management Act was that the state agency should regulate the people actually using the water, not the water providers. ADWR's position was that it was neither politically nor administratively feasible for the agency to regulate end

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The United States Geological Survey turned 125 this year, its founding appropriation signed March 3, 1879. Water resources and geologic investigations in Arizona began with Major John Wesley Powell's exploration of the Grand Canyon in 1869 and 1871. In 1889, the Survey, under Powell's directorship, established the "division of hydrography." Streamflow-gaging stations and groundwater monitoring sites were installed throughout the western states. USGS work in the Grand Canyon continues today. The photo shows USGS hydrologic technician Jim Parent taking water samples at Monument Spring in the Grand Canyon. The sampling is part of a regional study of the Redwall-Muav Limestone aquifer on the Coconino Plateau.

In Settling CAP Affairs AZ Confronts Project's New Mexico Unit

"Son of CAP" is viewed as threat to Gila River

by Joe Gelt

In the history of Arizona water affairs the Central Arizona Project stands out as a rallying point, its cause championed by generations of Arizona politicians who labored to have it authorized, funded, constructed and then operated to serve state water needs. What is not widely known about a project so thoroughly Arizonan is that it includes a New Mexico Unit.

Determining the significance of the New Mexico Unit has recently emerged as an issue to be reckoned with, its newly acquired prominence linked to congressional consideration of the Arizona Water Settlement Act, S. 437. The work of Arizona lawmakers, S 437 is intended to resolve various CAP matters. During congressional deliberations, the New Mexico Unit arose as a piece of unfinished CAP business.

It is a multifaceted issue, with Arizona and New Mexico officials now meeting to negotiate each state's best interest while environmentalists cast a wary eye on New Mexico's efforts to take advantage of its CAP allocation by claiming 18,000 acre feet of Gila River water.

(A headline on a March 7 commentary piece appearing in the "Albuquerque

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New Mexico Unit...continued from page 1

Journal” ascribes paternity of the New Mexico Unit to Arizona and identifies its environmental threat: “Son of CAP Poses Threat to Wild Gila River”)

Origins of CAP’s New Mexico Unit

In 1968, New Mexico had reason to share Arizona’s satisfaction when the Colorado River Basin Project Act, P.L. 90-537, was passed authorizing the CAP since the law allocated 18,000 acre-feet of water to New Mexico. Along with the allocation, the New Mexico Unit included authorization to build Hooker Dam or suitable alternative in the upper reaches of the mainstem of the Gila River in New Mexico.

New Mexico’s CAP advantages might be viewed as compensation for previous neglect. In 1964, four years before CAP was authorized, the U.S. Supreme Court adjudicated states’ use of water in the Colorado and Gila basins. The court allotted Arizona and California water based on future growth, but did not extend the same consideration to New Mexico, which was assigned the same amount it had been using as of 1957. The decision rankled New Mexico officials.

Payback time came in 1968 when New Mexico’s congressional delegation sought to hold up the proposed CAP project. Its strategy paid off when New Mexico was able to negotiate a complex series of agreements that resulted in the state gaining certain concessions as part of P.L. 90-537. The law authorizing the \$3-billion CAP thus acquired a New Mexico Unit.

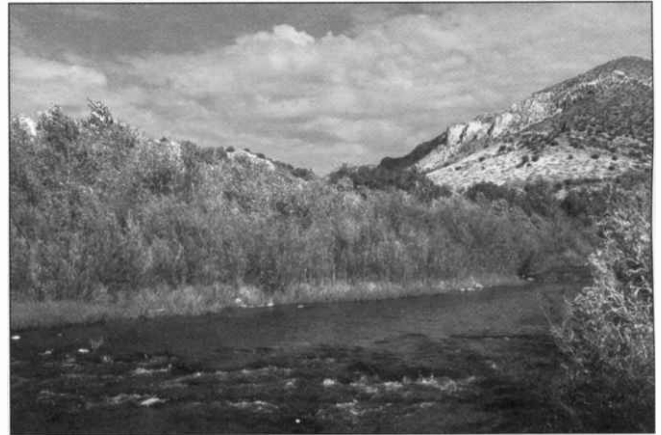
Geography Complicates Allocation

It is clearly evident that New Mexico would confront daunting obstacles in any effort to claim a CAP allocation. CAP water is pumped from the Colorado River on Arizona’s western boundary into the central part of the state, far from the New Mexico border. How then can a CAP allocation be put to use by New Mexico water users?

Key to understanding the workings of the New Mexico Unit is realizing that the CAP allocation is, in fact, part of a strategy to enable New Mexico to exchange 18,000 acre feet of Colorado River water for an equal amount of Gila River water. Arizona irrigators have rights to the Gila River as it flows through Arizona from New Mexico. The law would allow New Mexico to exchange its CAP water with Arizona irrigators for their rights to water on the Gila River. Such a trade would make 18,000 acre-feet of Gila River water available for use in New Mexico.

Downriver in Arizona, water from the CAP canal could then be pumped back into the Gila River to replace water taken in New Mexico. In effect, water taken from the Gila River in New Mexico to meet a CAP obligation would be repaid downriver with CAP water pumped back into the Gila River.

This is not the simple exchange that such a brief overview might suggest. Complications abound. Whatever water is removed from the Gila River must be replaced at a location where the CAP canal is sufficiently close to the Gila River to enable a transfer from canal to river. Situated in such an area, the San Carlos Irrigation Project is able to accept the substitute Colorado River water in lieu of Gila River water. SCIP is located close to Phoenix, about 200 miles from the New Mexico border.



*The Gila River flows through the Cliff-Gila Valley in New Mexico.
Photo: Nanda Currant*

If such a deal were worked out, the Arizona farmers irrigating about 30,000 acres along the Gila River in the Duncan-Virden and Safford valleys would suffer consequences without reaping any benefits. They reside and farm in an area between where water would be removed from the Gila River in New Mexico and the point near Phoenix where Colorado River water would be substituted for Gila River water.

The plight of these Arizona water users, however, was not overlooked. The law protects them by stating that whatever water the New Mexico Unit diverts cannot cause them economic injury or cost. Before water is diverted in New Mexico, therefore, enough Gila River water must be bypassed to meet the water rights and needs of those users. Options for acquiring excess water, however, are limited, mostly confined to capturing surplus or high flows from spring runoff of high mountain snowmelt.

New Mexico Considers a Reservoir

Water thus captured would likely require a reservoir and distribution system to regulate the water through releases, with water delivered to users either within the Gila Basin or in the adjacent Mimbres Basin in the vicinity of Silver City. And to accommodate that need P.L. 90-537 authorized the building of Hooker Dam or suitable alternative in the upper reaches of the Gila River.

Some preliminary work was done to investigate possible reservoir sites. In 1979, the U.S. Bureau of Reclamation undertook an Upper Gila Water Supply Study, with Phase I identifying several sites for further investigation. Further planning studies were conducted in 1985-86 that identified new alternatives, including off-stream storage options. All examined alternatives, however, raised environmental concerns and were of questionable economic feasibility. No preferred alternative was identified.

Further, the studies could not document a demand for water within a 50-year planning period equivalent to 18,000 acre-feet per year. It was suggested that the project be scaled back accordingly. BuRec decided to defer further studies until New Mexico officials could identify who would contract and pay for the supplemental water supply.

Obstacles to New Mexico claiming its CAP allocation have

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Water Vapors

WRRC Promotes Research, Conducts Conference

The Water Resources Research Center had recently collaborated with other University of Arizona water centers in awarding water research funding to UA researchers. Also, a WRRC conference, devoted to agricultural water issues, was recently conducted.

Water Research Grants

Thanks to a voter-approved sales tax increase in 2000, the Arizona university system receives special funding to support technology and research-based initiatives. The University of Arizona uses some of its funds from this source for a Water

Research Center for Environmentally Benign Semiconductor Manufacturing; Center for Sustainability of Arid and semi-Arid Hydrology and Riparian Areas; and Water Quality Center. Awards for 2004-05 fiscal year were recently announced.

Of the 48 proposals submitted by UA faculty and staff 11 new projects were funded. The new projects will share

\$400,000, with \$800,000 available to support 16 continuing multi-year projects. Total leveraged funds from outside agencies for 2004-05 will be over \$420,000, if all pledges are fulfilled. About 80 student positions are available in funded projects. Four one-year projects funded in FY 2003-04 will be completed this year

WSP also includes a student fellowship awards program, to recognize outstanding undergraduate and graduate students pursuing water resource studies. Student awards were recently announced, with four undergraduate students awarded \$4,000 each and five graduate students receiving \$16,800 each.

The WSP grants program is scheduled



John F. Sullivan of the Salt River Project moderated the above panel at the Water Resources Research Center's spring conference. He introduced his group as the "water buffalo panel," a water buffalo defined as a person in the water business for 25 years. Water buffalos seated at the table from left to right are: Bill Perry, Matt VanBaale, Sheldon Jones, Grant Ward and Don Pope. Photo: Joe Gelt

to continue through FY 2005-06, with a possible extension beyond that time.

For more information about the WSP awards, including the names of recipients and titles of new and ongoing research projects, check the WSP web site: <http://uawater.arizona.edu>.

WRRC's Annual Conference

WRRC's tradition of sponsoring an annual, statewide conference continued, with the latest event conducted at Casa Grande on April 28. The Casa Grande conference was titled, "Future of Agricultural Water Use in Arizona" and included varied and diverse topics and speakers. For information about what occurred at the conference, see "Special Project," on page 9.

Dr. Wierenga Steps Down as WRRC Director

Peter Wierenga will be stepping down as Water Resources Research Center



director after July 1. The WRRC is a small enough unit that when one of our staff vacates a position we are very much aware of the

departure. When the person leaving is Dr. Wierenga we feel a special sense of regret. We will miss his capable leadership, his friendly disposition, his genuine interest in all of us. WRRC director since 1997, Dr. Wierenga will continue at WRRC in a more limited capacity and remain a faculty member within the University of Arizona's Department of Soil, Water and Environmental Science. Dr. Sharon Megdal will take over as WRRC director.



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Sustainability Program (WSP) competitive grants project. The program is jointly administered by the WRRC along with three other UA water centers: Engineering



News Briefs

AZ Bans Gas Additive to Protect Water

The Arizona Legislature approved a bill banning methyl tertiary butyl ether (MTBE), a gasoline additive shown to contaminate water supplies as well as having other public health concerns. MTBE's use as a gas additive produced a cleaner grade of gas with resulting air quality benefits, but with water quality drawbacks.

"The ban is an important step in protecting Arizona's precious water resources from MTBE contamination," said Steve Owens, director of the Arizona Department of Environmental Quality.

Owens made it a top department priority to obtain U.S. Environmental Protection Agency approval for removing the requirement that Arizona's Clean Burning Gasoline contain MTBE. EPA approved Owens' request in the fall of 2003. Gasoline sold in the Phoenix metropolitan area is no longer required to contain MTBE during summer months.

The bill would ban MTBE in all gasoline statewide, beginning January 1, 2005.

Arizona's action is in line with decisions taken by numerous other states including California to ban MTBE from their fuel supplies.

MTBE has been a major issue in efforts to enact a federal energy bill. Objections have been raised about language in the act that would bar defective product claims against producers of MTBE. Critics say this could result in a huge increase in the cost of clean drinking water in communities threatened with contamination.

Toxic Plume Near Colorado River

California and Arizona officials are addressing concerns that a groundwater plume contaminated with hexavalent chromium may reach the Colorado River and threaten drinking water supplies in Southern California and central Arizona. Hexavalent chromium, also known as Chromium 6, acquired public notoriety when featured in the film

"Erin Brockovich."

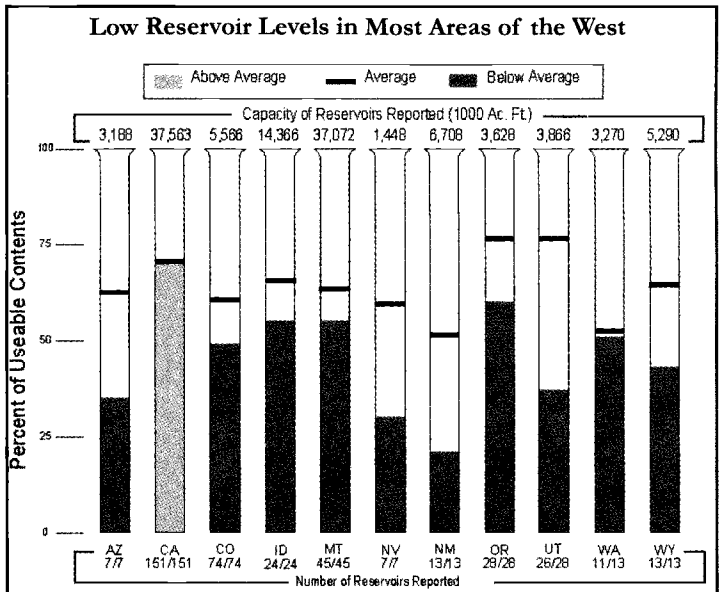
The source of the plume is the Pacific Gas and Electric Topock pumping station where, between 1951 and 1964, six million gallons of chromium-tainted water was dumped each year into a wash near Needles, California. The contaminated water leached into the groundwater, to later begin seeping toward the Colorado River, at a location

upriver of the intakes for the Metropolitan Water District and the Central Arizona Project. The edge of the plume is estimated to be about 65 feet from the Colorado River.

Officials emphasize that hexavalent chromium has not been detected in the Colorado River at locations sampled along the western shoreline of the river. The Arizona Department of Environmental Quality is working with California officials to determine the full extent of contamination and reduce the potential threat to public health and the environment.

Groundwater extraction wells are pumping approximately 24,000 gallons per day of groundwater containing hexavalent chromium from the Topock site ranging in concentrations from 5 to 7 parts per million, to be trucked in tanks to Los Angeles for treatment and disposal. MWD requested that PG&E construct an underground barrier 1,600 feet long and 100 feet deep to further protect the river

ADEQ is consulting with PG&E and the California Department of Toxic Substance Control to be kept informed about clean-up activities and to ensure Arizona water resources are safeguarded. In April, ADEQ sampled water and sediment at nine locations along the Colorado River and Lake Havasu, without detecting any hexavalent chromium.



ADEQ has set up a web site to provide information for citizens concerned about the issue and who want to learn more: <http://adeq.state.az.us/function/about/chromium.html>.

WATER 2025 Funds Three Arizona Projects

Interior Secretary Gale Norton chose Arizona as the setting for announcing approval of more than \$4 million in water conservation grants under the Water 2025 Secretarial Challenge Grant Program. Three Arizona recipients received awards: Gila Gravity Main Canal Board, the Salt River Project and the Yuma County Water Users Association.

The Challenge Grants are part of the Water 2025: Preventing Crisis and Conflict in the West program that supports realistic, cooperative approaches and tools with the most likelihood of successfully addressing water supply challenges in basins facing the greatest potential risk of conflict and crisis.

The program targets the western region, with 19 projects selected from ten western states. California (\$915,000) received the largest amount of Water 2025 money, while Colorado (\$19,000) was awarded the least. Arizona received \$730,000.

New Fissure-Like Surface Cracks Occurring in Arizona

Most Arizonans know about earth fissures, cracks in the earth's surface that are the result of land subsidence due to excessive groundwater pumping. Recent Arizona Geological Survey research is showing, however, that fissures are not the only kind of surface cracks occurring in the state. Many of the newer cracks AZGS is investigating are giant desiccation cracks or GDCs and are not generally thought to be directly related to groundwater pumping.

GDCs began to be noticed about 1998 when AZGS started getting numerous reports of new cracks appearing in various and widely scattered areas of the state. Up to that time, such cracks were mostly explained as earth fissures. The new cracks, however are a different species of crack, caused by the drying out or desiccation of clay-rich soil and sediment. Researchers are finding GDCs are much more common than was previously thought, more common, in fact, than earth fissures.

AZGS geologist Raymond Harris says, "I think this latest round of cracks is forming because of the drought. But they also formed during other cycles. The earliest ones we know about are located out by Bowie and San Simon and around the Willcox area. They were visible on the first aerial photos taken in the mid 1930s."

Similar to but much larger than mud cracks or soil cracks, GDCs are up to three ft. wide, nine ft. deep, with some as long as 1,000 ft., and they form polygonal blocks. Distinguishing GDCs from earth fissures involves mapping their features to determine their size and geometry. Earth fissures are generally longer, straighter and deeper than GDCs. A GDC's defining characteristic is the formation of polygons.

Harris says it is sometimes difficult to distinguish between the effects of earth fissures and dessication cracks. In some areas, like in Bowie, San Simon and Willcox, recent earth fissures are superimposed on earlier dessication cracks.

He says, "The earth fissures came later, creeping up from a depth even deeper than the dessication cracks. By the time they get close to the surface they capture the pre-existing dessication cracks and may take on a slightly polygonal form. ... It is really hard to tell where one stops and the other begins."

In certain circumstances, dessication cracks can be traced to

groundwater pumping. The causal relationship between the two, however, is different than that between groundwater pumping and earth fissures.

Harris says, "Cracks are found in some places where there has been groundwater pumping but the groundwater levels have been so low for so long I don't see how they can be connected. ... If the groundwater level is 200 ft down that is not affecting the top 50 ft. where desiccation is occurring. The trigger could have been groundwater pumping 50 or 60 years ago, and cracks are just now forming because of the drought."

The causes of GDC are complex, with no single model able to explain all occurrences. More readily identifiable is their area of occurrence, in clay-rich layers that were deposited in lakes or playas in internally drained basins. They are expected to occur more frequently with the continuation of the prolonged drought and the encroachment of development on the margins of desert basins. CDGs pose much of the same problems to developers and land planners as earth fissure and require similar mitigation measures.

Harris asks that anyone noticing large ground cracks they believe might have been caused by desiccation to contact him at 520-770-3500 so the location can be added to the AZGS database.

A recent AZGS study documents the results of reconnaissance mapping of GDCs in the state. See "Giant Desiccation Cracks in Arizona: Arizona Geological Survey Open-File Report 04-01." Check the AZGS website for information about the publication. (<http://www.azgs.az.gov>)



The above may look like an earth fissure caused by groundwater pumping but is, in fact, a desiccation crack running down a Graham County road. Photo: Raymond C Harris.

Following are brief descriptions of the Arizona projects:

The Gila Gravity Main Canal Board, in partnership with the City of Yuma and NAD Bank, will make canal system improvements to conserve water, restore canal capacity and improve operation efficiency. Five irrigation districts, the City of Yuma and other domestic water users will benefit from the project. Resulting savings will be about 45,000 acre feet of water per year. The total project cost is \$2,207,775 with a Water 2025 contribution of \$284,000.

Salt River Project's funding will support construction of the New River-Agua Fria Underground Storage Project, an artificial groundwater recharge facility with a total capacity of one million acre feet. It is designed to take available water supplies, including both excess Central Arizona Project and reclaimed water, and store it in underground aquifers for use in the future. In addition to BuRec and the Salt River Project, the partners include the cities of Avondale, Chandler, Glendale and Peoria. The total project cost is \$13,000,000, with a Water

2025 contribution of \$200,000.

Yuma County Water Users Association will upgrade a Supervisory Control and Data Acquisition system and implement a new water tracking and measurement system. The project also includes reconstruction of key diversion structures along the main canal. This modernization will reduce Colorado River diversions and provide an overall savings in water diversions of 12,000-20,000 acre feet per year. The total project cost is \$615,552, with a Water 2025 contribution of \$246,221.



Guest View

Arizona Should Take Heed of Feds' Pressure to Shift California Water Use From Ag to Urban

Bill Swan contributed this Guest View. He is an attorney working in the areas of water rights and environmental law, with special focus on the law of the Colorado River

Spread across approximately 500,000 acres of the arid desert of southern California, the Imperial Irrigation District (IID) is both blessed and cursed. IID and the farmers of the Imperial Valley are blessed because they hold a senior-priority Colorado River water entitlement of incredible size and value (about 3.4 million acre feet); more than Arizona and Nevada put together). But IID is also cursed – for the very same reason – it has a huge water entitlement in a geo-political situation where 18 million urban residents along the southern California coastal plain (served by the Metropolitan Water District of Southern California [MWD]) covet IID's water.

Former Interior Department Solicitor John Leshy put it this way: "IID is in the path of urban water growth." In other words the urban areas of southern California are growing rapidly, for better or worse, and those areas do not have senior-priority water rights to rely on. This imbalance is the foundation for the attack on IID that occurred in 2003 – an attack that could be repeated more frequently around the West as urban users look longingly toward the senior water rights of farmers and irrigation districts.

Part of this story is that for many years MWD used large amounts of what is known as "unused apportionment" to meet its annual water supply needs. By using about 800,000 af per year from Arizona and Nevada, without compensation, MWD was able to meet its needs largely by relying on the water entitlements of others.

That situation came to an end in the late 1990s when the other six basin states demanded that California "get its house in order" and reduce its use down to its lawful apportionment of 4.4 maf per year. Focusing on water transfers from the agricultural sector (IID) to the urban sector, IID, MWD, the Coachella Valley Water District, and San Diego worked on a complex bundle of agreements that would facilitate such transfers – to the tune of about 500,000 af per year from the IID service area to the MWD and Coachella service areas. However, for many complex reasons farmers and other residents within the IID service area resisted the transfers included in what came to be known as the Quantification Settlement Agreement (QSA). Because the QSA did not come to fruition in accordance with certain deadlines related to other programs instituted by the Department of the Interior, California's water use was slashed – overnight – to 4.4 maf per year on January 1, 2003.

In taking this action the Department of the Interior made a very critical decision in relation to how it would use its influence in the coming months – Interior decided to side with the urban interests against IID. Interior issued policy decisions which dictated how much water could be used by the Southern California agencies in

2003, and IID's entitlement was cut by about 350,000 af. IID then quickly brought suit to challenge Interior's actions.

As a result of the litigation IID's full entitlement for 2003 was restored, but the court was faced with the demand of the government to review, in one way or another, IID's reasonable use of water. The court eventually allowed Interior to proceed to initiate a "417 proceeding" against IID, while recognizing that all aspects of the dispute would be subject to judicial review in the end.

Interior Department regulations contained in 43 CFR Part 417 spell out a process whereby Interior claims the right to review the "reasonable use" of water by contractors of Colorado River water in the lower basin. Prior to the IID situation these regulations were not employed in a consistent manner among all users in the lower basin, and the regulations had never once been used to actually cut back the entitlement of a user.

What ensued was a long and detailed administrative analysis of IID's reasonable use of water from the perspective of the Bureau of Reclamation, IID, and numerous expert witnesses. This process was moving to the stage of appellate review by the Secretary when the QSA documents were executed in October of 2003, and the IID litigation and the government's 417 proceeding were thereafter dismissed as a part of the package of QSA settlements.

So what are some of the lessons learned from the IID experience? First, times have indeed changed and urban growth and priority shifts, throughout the Southwest, have led to tension between urban water users or the environment on the one hand and agricultural users on the other hand. Second, the Interior Department has gone on record, in the Southern California region, as favoring urban users over the agricultural users. And third, agricultural water users must stick together in their efforts to protect their most valuable resource – senior vested water rights largely perfected in the early part of the last century.

Could IID's experience be repeated in Arizona? This is a difficult question with no clear answer. On the one hand the IID situation can be seen as somewhat unique to the circumstances of the water right imbalance in Southern California and the failure of those urban users to provide for their increasing water needs in a responsible and timely manner. On the other hand, I think the answer lies in the particular circumstances at hand – in other words, maybe when water is more abundant this kind of attack is less likely to occur in Arizona, but when water is scarce Arizona farmers could face a similar fate.

If the current drought continues we all know that the urban areas of Arizona will eventually need to look to other sources, particularly if the CAP entitlements are cut back though the declaration of a shortage in the lower basin. When that happens the Phoenix

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Pro-Active Use of the Endangered Species Act Provides Valuable Research Data

by Henry Messing*

The Bureau of Reclamation (Reclamation) has been active in Arizona since 1903 when work began on the Salt River Project. Seventy years later, with the passage of the Endangered Species Act, the way those activities were carried out changed.

The Endangered Species Act (ESA), amended, Section 7, paragraph (a)(2), obligates consultation with the U.S. Fish and Wildlife Service or National Marine Fisheries Service to “insure that any action authorized, funded, or carried out by such agency ... is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species...”

As a result of these consultations, Reclamation’s Phoenix Area Office (PXAO) instituted mitigation to either minimize the impact of construction or to replace lost or damaged habitat resulting from its projects. Just two examples are the construction of fish barriers on Aravaipa Creek to reduce encroachment on native fish habitat from the CAP aqueduct system and purchasing southwestern willow flycatcher habitat to replace that lost due to Safety of Dams modifications to Theodore Roosevelt Dam. PXAO continues efforts to acquire habitat for the flycatcher and plans to construct additional fish barriers in locations throughout the state to protect endangered native fish.

Section 7(a)(2) states that each agency shall use the best scientific and commercial data available. A frequent concern during many consultations is that there is a lack of good science about the ecology and habitat requirements of a particular species.

To help alleviate this problem, the Bureau of Reclamation can sometimes use its authorities to gather needed information as



A solar-powered satellite platform transmitter terminal is attached to a juvenile bald eagle. The device will enable biologists to better understand the bald eagle’s foraging ecology. Photo: U.S. Bureau of Reclamation

Sec. 7(a)(2) Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an “agency action”) is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action by the Committee pursuant to subsection (h) of this section. In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available.

provided under Section 7(a)(1). Section 7(a)(1) is the introductory paragraph of the Endangered Species Act, Section 7. It states that federal agencies should carry out programs for the conservation of endangered and threatened species. In times of lean federal budgets and many fiscal demands, Reclamation finds this approach allows it to maximize the benefits of discretionary activities like this in carrying out its core mission of delivering water and power.

While many of these activities have been small in scope and funding, the benefits are significant. Information gathered through these activities can pave the way to making more informed decisions during the Section 7 consultation

Sec. 7(a) Federal Agency Actions and Consultations. (1) The Secretary shall review other programs administered by him and utilize such programs in furtherance of the purposes of this Act. All other Federal agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species listed pursuant to section 4 of this Act.

* Lead General Biologist, Phoenix Area Office, Bureau of Reclamation

process and assist in conservation efforts and the overall battle against extinction.

The Bald Eagle

The bald eagle is on the verge of becoming an endangered species success story. In 1995, the bald eagle was down-listed to threatened, and the Fish and Wildlife Service has published a proposal to remove the eagle from the list altogether. Arizona supports a relatively small population of desert nesting eagles that can be found along the Verde and Salt rivers east of the Phoenix metropolitan area on up to the high elevation pine forests in the vicinity of Luna Lake near the New Mexico border.



Photo: U.S. Bureau of Reclamation

This small population is somewhat isolated from other breeding populations in the West and occupies habitat that is drier, warmer, and less vegetated than is the habitat typically used by the species.

In addition, approximately 400 eagles winter in the state. This population is also unique in that some pairs begin incubation in late December, with most eggs laid in January or February.

By the time some of our Arizona eagles are ready to take flight and fledge, their more northern cousins may still be in the egg.

In 1970, there were two known breeding territories in the state. In 2004, that number had increased to 46. Perhaps the most critical management action that fostered this recovery was the implementation of the Arizona Bald Eagle Nestwatch Program.

Under the guidance of the Arizona Game and Fish Department, seasonally employed "Nestwatch" personnel collect behavioral and disturbance-related data, escort people out of breeding areas when necessary, rescue eaglets that have fallen out of nests, and educate the public about the species.

PXAO continues to support the Nestwatch Program by providing funding to hire Nestwatch personnel stationed at breeding areas on lakes near Reclamation-owned dams. In addition, along with the Salt River Project, PXAO provides helicopter support for winter and breeding season surveys. These surveys are critical in determining the status of each breeding area and whether the eagles have been successful in fledging young. We like to think Reclamation's support of this multi-agency effort has contributed to the proposal to remove the species from the endangered species list.

Another aspect of the bald eagle's presence in Arizona involves the San Carlos Apache Tribe and its significant economic benefit from the sport fisheries in San Carlos Reservoir behind Coolidge Dam. Several times during the ongoing drought, water levels have dropped precariously low. In an attempt to maintain a minimum pool on the reservoir and avoid a fish die off, the Tribe has requested that Reclamation execute a water exchange that would keep water in the reservoir and deliver it to downstream users via the Central Arizona Project aqueduct system.

Unfortunately, diminishing flows in the Gila River downstream of Coolidge Dam could potentially impact nesting bald eagles. Two bald eagle breeding pairs are known to nest nearby and likely forage on the reservoir. Another pair nesting downstream of the dam is thought to forage on the river. As the reservoir diminishes in size, and if flows in the river cease during the critical breeding period, competition for food among these birds could result in reduced productivity. Looming in the background is an effort in Congress to pass a more comprehensive Arizona water rights settlement act which would increase the demands for Gila River water and have implications for native fish and the endangered southwestern willow flycatcher, as well as the eagles.

During Reclamation's Section 7 consultation with the Fish and Wildlife Service, it became evident that no one really knew for sure where the downstream eagles foraged and if they used the reservoir at all.

As a result, PXAO is utilizing Section 7(a)(1) to increase the understanding of the eagles' foraging ecology on San Carlos Reservoir and the Gila River. Through this authority, we are entering into a collaborative study with the Arizona Game and Fish Department and the San Carlos Apache Tribe Fish and Wildlife Department. PXAO will fund the Arizona Game and Fish Department to capture two bald eagles and outfit them with Satellite Platform Transmitter Terminals.

The transmitters weigh approximately 80 grams and will be attached to the eagles within a backpack-mounted harness configuration. The transmitters will provide daily location data that will allow biologists from all three agencies to monitor, from their offices, the eagles' lake and river use.

This cutting-edge technology eliminates the need for biologists to perform time-consuming and costly field work in extremely rugged terrain. This data will provide a much clearer picture of the foraging ecology of the bald eagles and will be of use in any future consultations involving Reclamation that result from the pending settlement act.

Southwestern Willow Flycatcher

When Reclamation first consulted on the impacts of the modified Roosevelt Dam on the endangered southwestern willow flycatcher, little was known about the distribution and status of the bird in the state. Reclamation was obligated to fund an extensive banding and survey effort to learn as much about the bird as possible. When the first surveys were completed in 1993, there were 5 known territories at the lake. As survey efforts increased in intensity, and as the habitat increased in quantity and quality, that number increased to 134 during the 2003 breeding season.

Although we have learned much about how the overall population is doing on a drainage by drainage basis, we know remarkably little about how individual birds use their breeding habitat. Southwestern willow flycatcher conservation and management has been hindered by this lack of information on breeding territory and home range size. These factors are important in understanding habitat requirements and population trends, determining mitigation and compensation habitat needs, and planning habitat creation and restoration projects, while allowing Reclamation to fulfill its core water and power mission.

In 2002, using 7(a)(1) funding, PXAO funded a pilot study to learn if radio telemetry could be successfully used on the endangered flycatcher. Telemetry is an invasive and potentially harmful technique, and a careful evaluation of the feasibility and safety of the technique was a prerequisite to using it on an endangered species. Therefore, transmitters were attached to surrogate species such as song sparrows, yellow-breasted chats and a non-endangered subspecies of willow flycatcher.

With the use of hand-held receivers, biologists were able to maneuver through dense vegetation quietly but quickly until the signal strength indicated the bird was close to the tracker. Once close to the bird, the tracker could move in slowly in an attempt to see the bird without affecting its behavior.

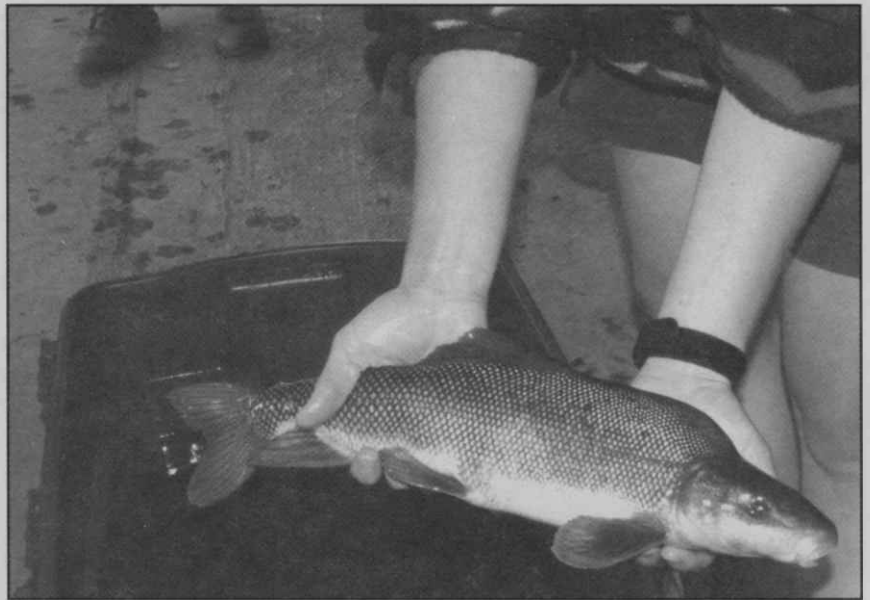
After the results of the pilot study were analyzed, and with the blessing of the Fish and Wildlife Service, USGS biologists began to capture and put transmitters on the endangered flycatchers during the spring and summer of 2003.

After birds were captured in mist nets, small 0.454-gram transmitters were glued to their skin just above the base of the tail. The weight of the transmitters was approximately 3.8% of the flycatchers' body weight and was deemed to not be detrimental to the ability of the birds to fly and forage. After the transmitter was secure, the birds were released back to the point of capture. Because of their small size, the life of the transmitters was an estimated 21 days.

Birds were caught throughout the breeding season. Twenty male flycatchers were caught in 2003 and



Southwestern willow flycatcher with transmitter. Photo: USGS



Razorback sucker raised in Lower San Pedro River Preserve pond. Photo: U.S. Bureau of Reclamation

over 370 tracking hours were spent collecting location data. The mean home range size of territorial, breeding flycatchers was similar to territory sizes published in other studies of the willow flycatcher from across the United States. Not only did home ranges vary in size, but they could also be classified into both contiguous and non-contiguous home ranges. In some cases, flycatchers seemed to concentrate their activities into two distinct areas.

Results from this study indicate that while adult male flycatchers at Roosevelt Lake used multiple habitat types, mature riparian habitat was most commonly used. The proportion of use of this vegetation type was more than twice that expected based on availability. This study will be continued through the 2004 breeding season.

Razorback Sucker

The uniquely shaped razorback sucker once occurred in all the major rivers and larger streams within the vast Colorado River basin of the western United States. Razorback suckers are now precariously close to extinction with less than 1,000 of the original 65,000+ population surviving in Lake Mohave. There are also perhaps 5,000 to 8,000 survivors of 85,000 fish stocked since 1992. Population size in the upper Colorado River basin has fallen to near 500 individuals. It is hard to believe that as late as 1949, a commercial fishery for razorbacks existed in Saguaro Lake, east of Phoenix. The reasons for the decline of this endangered fish are many and include dam building, impairment of water quality, and interactions with non-native fishes.

In an attempt to stem the decreasing trend in razorback populations, millions of larval and small juvenile fish were stocked into the Verde and Gila rivers in the early 1980's. This effort was largely a failure as predatory non-native fish were suspected of devouring the razorbacks.

In an effort to maintain a population of adult fish in river



Pima Pineapple Cactus. Photo: U.S. Bureau of Reclamation

systems highly “polluted” with non-native fishes, biologists began raising razorback suckers in grow-out ponds and hatcheries. Once the fish reached an optimum size, they could be stocked with a minimal risk of being eaten by the non-natives. These efforts would at least stem the declining trend in the population until biologists could implement management activities that would allow the fish to move towards recovery.

In 1996, The Nature Conservancy acquired a ranch on the Lower San Pedro River near Winkelman, Arizona. Purchased with funds from Reclamation appropriations, the acquisition was part of the biological opinion on the impacts of the modified Roosevelt Dam on the endangered southwestern willow flycatcher.

The property also contained a number of aquaculture ponds. With the objective of producing adult size fish for repatriation into the Gila River Basin, PXAO modified an existing catfish pond by deepening it, sealing the bottom and installing a water delivery system from an existing well. These modifications were funded through the (a)(1) program.

The pond has received several stockings of fingerling sized fish from the Dexter National Fish Hatchery in New Mexico. The growth and health of the razorback suckers has been phenomenal and the first batch of fish was stocked into the Verde River by the Arizona Game and Fish Department. In 2003, PXAO constructed gravel beds in the pond in the hope the fish will spawn naturally and negate the need for future stocking with hatchery raised fingerlings. In addition, plans are now underway to use the pond as a refugia for other threatened and endangered fishes such as desert pupfish and Gila topminnow.

The Pima Pineapple Cactus

The Pima pineapple cactus is an attractive hemispherical plant about 4- to 18-inches tall and 3- to 7-inches in diameter. The silky yellow flowers appear in early July with the summer rains. Reclamation has been and is still involved in a variety of activities within the Tucson basin which have the potential to affect the Pima pineapple cactus.

In the early 1990's, Reclamation had proposed construction of a reservoir near Black Wash southwest of Tucson as part of the Central Arizona Project. The reservoir would serve as a backup supply of water when routine maintenance of the CAP canal in-

terrupted water deliveries. This project was never implemented as originally designed and is on hold pending review of other alternatives. In developing feasibility studies on these alternatives and other water conservation and delivery projects proposed for the Tucson area, Reclamation has identified a need for more information on the distribution and biology of the cactus.

This information will make the best science available in any future Section 7 consultations with the Fish and Wildlife Service.

In an effort to better understand pineapple cactus distribution and population characteristics and how future Reclamation operations will affect the cactus, PXAO funded surveys on over 2,000 acres of land to define the range limits for the Pima pineapple cactus. An additional 2,700 acres were surveyed to identify potential refugia locations.

In addition, PXAO has been providing funding for additional surveys and various research projects to help the Fish and Wildlife Service prepare a recovery plan. An additional 2,700 acres of habitat in the Altar Valley was surveyed for Pima pineapple cactus. These surveys provided information on 567 new cacti locations.

PXAO also is currently providing a grant to the University of Arizona to continue their research into the reproductive ecology of the Pima pineapple cactus. This research, which will be completed in 2005, involves the application of florescent dyes to the cactus to determine the pollen flow between individual plants. Preliminary information (from summer of 2003) indicates most pollen grains travel less than 200 meters, but some were found 1 kilometer from the site.

Finally, PXAO is funding a separate research project conducted by Southwest Botanical Research to collect morphometric (external plant characteristics) measurements on Pima pineapple cactus. It is expected that this information will aid in the determination of the taxonomic validity of this species and help determine whether the Pima pineapple cactus is a valid subspecies to be listed under the ESA. This research will be conducted this summer and a report finalized in December 2004.

The Future

For the biologists who have been intimately involved with the studies and surveys, Section 7(a)(1) has provided an opportunity to better understand how some endangered species interact with their environment and how severe the threats to their existence are. It also has enabled Reclamation to help develop measures to aid and protect these species while continuing to deliver water and power in the arid West. In some cases, these Section 7(a)(1) studies present an unparalleled opportunity for scientists to witness the recovery of a once endangered species.

U.S. Bureau of Reclamation

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Legislation and Law

ADWR Regulation...continued from page 1

users, that regulating water companies was far more efficient. ADWR implemented this policy by imposing gallons-per-capita-per-day requirements on municipal providers.

This decision has been a long time coming. AWC filed suit in 1990 in response to ADWR's Second Management Plan. After Maricopa County Superior Court and the Arizona Court of Appeals sided with AWC, ADWR appealed to the Supreme Court.

While the issue was wending its way through the courts, ADWR essentially put enforcement of its municipal water conservation program on hold. Now that the Supreme Court has resolved the issue in ADWR's favor, the question is what actions will the agency take to revive its municipal water conservation program.

What must be realized, however, is that the Supreme Court decision comes at a time when the agency is feeling the effects of significant budget and staff cutbacks. In 1990, the agency had 239 FTE, with the fiscal year 2004 budget down to 168. The agency has been having to do more with less, and any effort to get the water conservation program back on track would require it to do even more. Something would have to give.

Assistant ADWR Director Jim Holway describes the bind confronting the agency in enforcing conservation standards with severe budget and staff restraints. He says, "When we did not have enough staff to do our job we started to look at what not to do. One of the things we stopped doing was something we weren't able to enforce anyway, the municipal water conservation standards.

"I won't go so far to say we stopped paying attention entirely, but we very much reduced the attention we gave to the program, and we put the resources to other things. ... We still don't have enough staff, and it would be a matter of prioritizing. Now that the program is enforceable, do we take people off something else and move them back there?"

He hopes after the next fiscal year the agency will receive adequate funding to hire staff to maintain agency programs.

Holway believes the decision in the court case will provide an opportunity for the agency to consider changes to its water conservation program. With the agency back in the water conservation

business, it cannot only enforce standards but also consider possible new approaches to achieving its goals, possibly as part of its Fourth Management Plan.

He says, "We have been telling people that as part of the Fourth Management Plan we want to start doing some new thinking about what is the best way to set up a municipal conservation program. ... It has been a number of years since anyone has taken a really serious look at how this whole conservation program works."

"We need to do some thinking within the agency, and then we need to have some conversations with the larger water community. Do we tweak the GPCD program just a little bit to bring it up to date? Or do you make some more fundamental changes?"

Holway says attempting such a dialogue without a resolution of the basic question raised by the case would have been difficult. He says, "It would have been a little hard to work out a new program with such a fundamental issue up for argument. With that legally resolved, we can now move forward thinking about how to construct the program."

Some officials believe the water conservation movement lost momentum as the result of the prolonged lawsuit. ADWR options were reduced, and the agency did not provide the leadership to encourage water conservation. Some water utilities awaited the outcome of the suit before making major investments in water conservation programs.

Other factors might also have contributed to reducing the effectiveness of the water conservation message. Kathy Jacobs, former director of the Tucson Active Management Area, says, "For a while we were trying to figure out how to use the excess CAP water. At the same time, we were trying to force municipal water conservation. Somehow those two messages did not go well together.

Now may be more propitious times for promoting water conservation. Jacobs says, "Now ADWR has clear authority to enforce conservation requirements, and there is a drought. I think people are understanding the limitations of the long-term water supply. All this may come together in a good way."

The Court also addressed AWC's objection to ADWR including CAP water within its GPCD calculations. The Court ruled that the state agency could figure CAP water into the formula. ■■

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and Tucson urban areas will be likely to turn to groundwater first. But if matters get worse it is possible that the urban users could eventually look to the senior right holders – like the agricultural districts in the Yuma area – for temporary supplies. If that were to happen, the scenario starts to look awfully similar to the California situation. And the message to the agricultural users will be the same – cooperate and transfer water, even if only temporarily, and if you do not cooperate we have ways of investigating your water uses or otherwise making your life miserable.

The bottom line for agricultural users in Arizona and the

rest of the Southwest is this – the situation is changing and the demand for reliable water supplies is increasing. On the one hand our society values and respects private property rights, but on the other hand urban users like to speak of the "highest and best use" of water or the problem with growing "low value crops." In the end agricultural users face a similar challenge – how to farm the same amount of land with less water, and then move the saved water to the cities or the environment – hopefully with appropriate compensation and before being threatened with the power and influence of the federal government. ■■

Opinions expressed in the "Guest View" are the author's and do not necessarily reflect the views of the Water Resources Research Center.



Publications & On-Line Resources

FACTOIDS: Drinking Water, Ground Water Statistics for 2003

There are approximately 160,000 public water systems in the United States. Each of these systems regularly supplies drinking water to at least 25 people or 15 service connections. Beyond their common purpose, the 160,000 systems vary widely. Tables included within this publication group water systems into categories that show their similarities and differences. The document can be downloaded at http://www.epa.gov/safewater/data/pdfs/factoids_2003.pdf

ASDWA Issues Position Papers

The Association of State Drinking Water Administrators has revised and updated position papers on a number of issues: drinking water security; regulatory process; funding for state drinking water programs; small system affordability; maximizing state resources for public health protection; source water protection; primacy; funding for infrastructure; public health protection through targeted support; and regulatory enforcement. The various documents are available at <http://www.asdwa.org/position.html>.

DRINK Web Site Tracks Drinking Water Research

EPA is launching a Drinking Water Research Information Network (DRINK) web site to track on-going world-wide drinking water research. The DRINK website will help disseminate information within the research community, assess future research priorities, provide updates on regulations and support programs that protect drinking water and public health. Active DRINK partners include the U.S. EPA Offices of Water and Research and Development, the American Water Works Association Research Foundation, WateRe-

use Foundation and the Water Research Commission in South Africa. The DRINK system connects to EPA's ORD Environmental Information Management System database and to external drinking water research organizations including academic institutions and international organizations. The DRINK website is available at: <http://www.epa.gov/drink>



Understanding Water and Terrorism

H. Court Young, National Trade Publications, Inc., 210 pp., \$14.95.

This book takes on a timely topic: terrorism's threat to our water supplies. Identified as one of the eight critical infrastructures, the country's water supply systems have been getting due attention to ensure their safe and continued operation, and this book is contributing to that effort.

The book addresses such questions as: How vulnerable is our water supply? What kind of attack can be made? By whom? How can we protect against attack? If attacked, how can we respond?

The author includes a historical view of attacks on water, with analysis of what groups pose current threats to water supplies. He identifies vulnerable areas of a water system, such as the computer network, and describes infrastructure changes made since September 11 to protect the nation's water supply. He provides advice about preparedness and identifies contaminating agents most likely to be used to attack a water supply. The book is clearly written with a broad audience in mind and can be ordered online at <http://www.watertechbooks.com>

New Mexico Unit...continued from page 2

been sufficiently challenging that the state has not used even a drop of its CAP water. Yet New Mexico's strategy for claiming its CAP allocation has turned out to be plan deferred, not abandoned. The topic was duly mentioned in the 2003 New Mexico state water plan when it noted that the CAP allocation "may be the last undeveloped, renewable water source in the region and is therefore key for future development in the region." The plan further states, "Construction of a reservoir or suitable alternative for impounding and storing the water is needed to take advantage of this additional water source."

New Mexico's Best and Last Chance

New Mexico officials believe now is the time to act and pursue the state's longstanding CAP allocation. The window of opportunity turns out once again to be legislation for which Arizona is seeking congressional approval: the Arizona Water Settlement Act, S. 437. The bill is to resolve various CAP matters critical to Arizona including some Indian water right issues as well as Arizona's federal CAP repayment obligation. New Mexico figures it also has some unfinished CAP business deserving of attention as part of S. 437. Officials from both states are meeting to discuss

issues and work out details.

(That S. 437 is a day of reckoning to at least some New Mexico officials is evident from a March 7 commentary piece in the "Albuquerque Journal." Grant County Attorney Jack Hiatt is quoted as describing S. 437 as a "window of opportunity" for New Mexico to get its rightful share of the Gila River. The same article quotes Catron County representative Howard Hutchinson as saying, "There is no doubt — this is not only our best chance [to capture the water], it's our last chance.")

In its negotiations with Arizona, New Mexico wants assurances that nothing in S. 437 will threaten its 1968 Colorado River Basin Project Act 18,000 acre-foot allocation. The state also is seeking funds to develop the storage and delivery facilities needed for the New Mexico Unit to be up and operating, delivering water to state water users. New Mexico officials even have identified a funding source. They propose that the New Mexico Unit be partially funded through the use of the Lower Basin Development Fund. According to S 437, CAP repayments, instead of going to the U.S. Treasury, would be used to establish this fund for supporting Indian water projects in Arizona. New Mexico of-

Continued on page 12



Special Projects

Agricultural Water Issues Featured at WRRC's Annual Conference

By Sharon Megdal and Joe Gelt

The "Future of Agricultural Water Use in Arizona" was the title and theme of the University of Arizona's Water Resources Research Center's April 28 conference in Casa Grande. It is a broad topic, to be understood in reference to other water issues in the state, and the conference took the broad view. Following is a sampling of some of the information presented at the conference.

That agriculture represents a long-standing tradition within the state was abundantly clear from the roster of speakers of varied and diverse backgrounds and interests. Many of those currently involved in agriculture introduced themselves as the fourth, fifth or sixth generation working the same farm. The future was the theme of a young farmers' panel, made up of university students intent on returning to their family farms to fulfill their professional lives as active farmers or ranchers.

Speakers noted that water availability deserves special attention as an agricultural concern. More efficient water use is critical to any sustained agricultural effort. Matt VanBaale described water use in the dairy industry and what it being done to use water more efficiently. Dairies are able to reuse water for various operations.

Agriculture, like other water users in the state, must now look beyond water conservation to consider other strategies for coping with water scarcity due to drought. Non-Indian farmers would be the first Central Arizona Project water users to suffer cutbacks if a shortfall were declared on the Colorado River, with urban areas the last to receive cuts. Questions were raised whether pumps have been maintained to enable irrigation districts to return to groundwater in the event CAP supplies were cut back. It was felt that they were.

Sheldon Jones, executive director of the Agri-Business Council of Arizona, summarized the results of a survey completed by irrigation district managers on the likely impact of the drought on agricultural activities. Jones said, "The impact includes increased groundwater depletion, increased energy demand and reduced supply, income loss for farmers and the district, fewer planted acres and reduced financial viability." Grant Ward of the Santa Cruz Water and Power District Association noted that, "Drought is not just a water issue but more importantly it is an energy issue." Higher power costs will hurt farmers.

Agricultural water supplies also are threatened by urban water users who often seek additional water resources at the expense of farmers. Arizona Farm Bureau President Kevin Rogers decried preferences given to urban and industrial water users over agricultural users and declared all water users need to do their part to conserve water. Young farmers' panel member Brian Hogue expressed fears that Tucson will some day seek to tap into water supplies close to his family ranch in Wilcox.

A theme running through the conference was the importance

of agriculture in the U.S. and Arizona economies, and its likelihood of maintaining its importance in the future. Jim Butler, United States Department of Agriculture Deputy Under Secretary for Farm and Foreign Agricultural Services, announced that U.S. agriculture adds \$4 trillion to the nation's economy. AFB President Rogers stated that Arizona agriculture generates more than \$6 billion annually to the state's economy, not counting the \$1 billion nursery industry that is part of agriculture.


Although agricultural activity in some parts of the state is on the decline, it is on the upswing in other areas. Agriculture's bottom line has benefitted from productivity improvements. Rogers touted the agricultural gains that have resulted with the application of biotechnology, specifically noting its effectiveness at reducing the input costs for cotton.

Keynote speaker Ralph Grassi of the American Farmland Trust addressed the topic "Achieving Public Goals on Private Property: A New Model for the 21st Century." He urged the Arizona agricultural community to formulate proposals for capturing value for land stewardship and open space preservation. Grassi described the difficulty in quantifying and capturing the value of agricultural land in urban areas. He noted there is no set answer to the question of how much compensation and/or regulation is right and recommended expanding tools to provide incentives and compensation, such as conservation easements and soil conservation programs.

Attorney Bill Swan provided an Arizona perspective on the Imperial Irrigation deal recently worked out in Southern California. In a sense, the deal represents the urban-agricultural water issue writ large, and Swan says it has implications to Arizona. Farmers need to take heed and protect their water rights from encroaching urban interests and not feel a false sense of security about water right priorities. He suggests organizing and working with state leadership and others, but also be ready to litigate. (See "Guest View," p. 6 for Swan's discussion of urban vs. agricultural water use.)

Native American speakers stressed the growing importance of Indian agriculture. Both Lt. Governor Mary Thomas of the Gila River Indian Community and Daniel Preston of the San Xavier Indian Reservation said recently acquired water rights are providing the tribes the means to cultivate traditional crops. Both Thomas and Preston spoke of the importance of Indian and non-Indian farmers working together, with a sense of mutual respect.

The conference encouraged conversations beyond the usual audience. In fact, with many of the 250 registrants not from the agricultural sector, the conference was itself a conversation beyond the usual audience. It must have allayed the concerns expressed by Arizona Department of Agriculture Director Donald Butler that the speakers were not speaking to the choir.

(All the written materials prepared in advance of the conference and some of the power point presentations are available at the WRRC website, www.cals.arizona.edu/azwater/ )



Announcements

Salinity Forum Call for Papers, Posters

A call for papers and posters has been issued for the International Salinity Forum, to be conducted April 25-27, 2005 at Riverside, California. Session topics include social and economic costs; understanding salinization (processes); desalinization technologies for watersheds; irrigation drainage and return flow in saline environments; brackish and saline waters – use and disposal; wastewater (sewage) re-use; reclamation of saline/sodic soils; plant salt tolerance and breeding (cellular and whole plant response); and plant crop responses to salinity in cultivated and rangeland settings. Deadline for abstracts is Dec. 31, 2004. Abstract template and information available at <http://www.waterresources.ucr.edu> (click on: News/Events.) For more information on call for papers and posters contact: Heidi Hadley, phone: 801-524-3886; email: hhadley@uc.usbr.gov For conference information contact: Dennis Neffendorf, phone: 817-509-3225, email: Dennis.neffendorf@ftw.nrcs.usda.gov

Conference on Water Allocation Issues

The Universities Council on Water Resources (UCOWR) and the National Institutes for Water Resources (NIWR) are sponsoring a conference titled, "Allocating Water: Economics and the Environment," in Portland, Oregon, July 20- 22. This conference is an opportunity for academics, representatives of federal and state agencies, water managers, and other professionals to discuss approaches and policies for allocating water. Presentations will include interesting and innovative case studies, analyses of current water allocation problems in several U.S. river basins and proposed new techniques. Discussions are expected to identify approaches for consideration in water resources research, education, legislation and policy. For additional information about the conference check "calendar of events" in the UCOWR web site: <http://ucowr.siu.edu/>

AHS Symposium Focuses on Value of Water

Titled "Focusing on the Value of Water," the Arizona Hydrological Society 17th Annual Symposium will be conducted in Tucson, Sept. 15-18. The event will include workshops, technical sessions, field trips and social activities. The plenary session will be lead by two nationally recognized water economists, Dr. Gary Wolff, principal economist and engineer, Pacific Institute of Oakland and Dr. Janie Chermak, associate professor, University of New Mexico. For more information about the symposium check the AHS web site: <http://www.azhydrosoc.org>

Arizona Water Law Conference

An Arizona Water Law conference will be conducted in Scottsdale, Aug. 12-13. Sponsored by CLE International, the conference/course will enable participants to earn up to 12 hours MCLE credit. Topics include Indian reserved rights; Arizona Water Settlement Act; restoration of CAP's priority to Colorado River water; Arizona

prior appropriation law; and Gila and Little Colorado River adjudications. Most faculty members are from Arizona organizations and agencies involved in water and include representatives from the Arizona Department of Environmental Quality, Central Arizona Project and the Navajo Tribe. For information about the conference and to register call 800-873-7130 or check the CLE International website: <http://www.cle.com>

Dam Safety Conference

A Dam Safety conference will be held in Phoenix, Sept. 26-30, for persons interested in the latest policy and technical information on dam safety. Sponsored by the Association of State Dam Safety Officials, the conference will include technical sessions, workshops and two field trips. Technical session topics include dam security issues; extreme events; dam failures and incidents; dam safety regulatory programs; and owner issues. A workshop on dam removal and environmental issues also will be conducted. For further information about the conference call 859-257-5140 or email info@damsafety.org or check the ASDSO website <http://www.damsafety.org>

Transboundary Water Management Symposium, Nov. 16 - 19

The Second International Symposium on Transboundary Water Management will be conducted in Tucson,

2nd International Symposium on
**Transboundary
Waters Management**
Tucson, AZ
November 16-19, 2004

Nov. 16 - 19. Hosted by the University of Arizona's Center for Sustainability of semi-Arid Hydrology and Riparian Areas (SAHRA), the event will include keynote speeches and panel discussions by recognized experts addressing a range of topics critical to improved transboundary waters management (crossing national, state, tribal and other borders). This second symposium will build on the review and analysis of transboundary basins and aquifer management issues that occurred in November 2002 in Monterrey. Topics ranging from quantity and water quality management, impacts of climate fluctuations, building flexibility and robustness into compacts, and improved sharing of data will be considered. Market-based allocation approaches, ecological conservation, and the need for greater hydrologic literacy among decision-makers also will be included because of their relevance in the international and interstate water resources arena. For additional information contact: Rannie Fox, SAHRA, phone: 520-626-6974; email: rannie@sahra.arizona.edu, or check the web site: www.sahra.arizona.edu/twm/



Public Policy Review

by Sharon Megdal

Should Yuma Desalter Operate? Varied, Complex Issues Are Raised



In May, I visited the Yuma Desalting Plant, which has recently been the focus of much attention. Whether or not the plant is operated has implications for water deliveries to Mexico under U.S. treaty obligations and is important to Central Arizona. It is also important to those concerned about the Cienega de Santa Clara environmental habitat. My visit was very informative.

The U.S. Bureau of Reclamation built the plant to address the high salinity of tail water from the Welton-Mohawk Irrigation District. About 100,000 acre feet of irrigation water applied to district land but unused by crops was flowing back to the Colorado River. Its very high salt content raised concerns about the water. To meet the requirements of Minute 242 of the 1944 treaty with Mexico, the treatment plant was built to remove the salt from the Welton-Mohawk tail water. To keep the salty water from flowing into the Colorado River while the plant was under design and construction, Reclamation built a 53-mile bypass canal. This canal diverted the water to the Santa Clara Slough in Mexico.

The bypass canal was built as an interim measure prior to the plant becoming operational. Completed in 1992, the plant operated only for a short period in 1993. It was shut down due to operational issues. Also, excess Colorado River flows met water obligations to Mexico without operating the plant.

Over the years the Santa Clara Slough, now known as the Cienega de Santa Clara, has benefitted from this "bypass" water. In recognition of the important habitat of the Cienega and surrounding area, the Mexican government declared the region a Mexican National Biosphere. There is significant interest in keeping the Welton-Mohawk tail water flowing to the Cienega. But, at the same time, the water was intended to be used to meet the U.S. obligation to deliver 1.5 million acre feet of water to Mexico annually. During wet years, meeting this obligation has not been of concern. In times of drought, however, every drop of water counts, and the water deliveries to the Cienega do not count toward meeting the U.S. obligation. Many Arizona water interests are concerned that the federal obligation to deliver 1.5 million acre feet of water annually to Mexico be satisfied without causing disproportionately adverse effects to Arizona.

What started out as a water quality issue has essentially become a water quantity matter. With drought conditions persisting, storage along the Colorado River is at very low levels. If Welton-Mohawk water is not treated for delivery to Mexico, that water has to come from elsewhere. Recently, the water has come from storage at Lake Mead. If river supplies, including amounts in storage, are short, Central Arizona Project deliveries are the first to be cut, as the CAP holds the most junior rights to the river. The worst case scenario: The entire 1.5 million-acre-foot CAP entitlement would be cut before others with Colorado River allocations experience cutbacks.

This is why the Central Arizona Water Conservation District, the operators of the CAP, have been advocating operation of the Yuma Desalting Plant.

Water issues are complex. And the question of whether or not to run the Yuma Desalting Plant is no exception. There are multiple implications to consider, including environmental and economic. The U.S. Bureau of Reclamation, with responsibility for operating the Yuma Desalting Plant and managing the Colorado River generally, is considering its options. Governor Napolitano, who recently visited the plant, and others in Arizona are likewise evaluating alternatives. Scrutiny of the complicated modeling of the Colorado River scenarios continues. Significant uncertainties are involved. We know there will be shortages. Their frequency and severity over the next 100 years will determine the impacts on the region served by CAP and the Colorado River watershed more generally. If CAP experiences a cutback, users of non-Indian agricultural water will be the first to be cut back within the Arizona system.

These users of CAP water have rights to use groundwater, but their ability to do so depends on the condition of their well delivery systems, and there could be significant cost implications associated with the re-substitution of groundwater for surface water. The Arizona Water Banking Authority has been storing water on behalf of CAP municipal water users for several years. So, the impact of any future municipal supply cutbacks will depend on their cumulative size relative to the amount of water stored by the bank. If agriculture returned to groundwater and municipal water users began drawing upon stored water, water tables throughout Central Arizona would obviously be affected.

What are the costs and benefits of running the Yuma Desalting Plant to treat the tail water from the Welton-Mohawk Irrigation District? A lot of effort is going into identifying alternatives, including land fallowing in Arizona. Everything depends upon projections and assumptions. The answer to the question is difficult to provide but must be pursued.

Visiting the plant and the adjacent national water treatment research center helped me realize that the Yuma Desalting Plant is an asset, not the "white elephant" it has been called. It can be operated, if not to treat the irrigation tail water, then to treat water for other purposes, such as delivery of Colorado River water to municipalities in Arizona and/or in Mexico.

Yes, issues related to operating the plant are complex. Their resolution will likely require not only careful analysis but compromise and flexibility.

Note: Good background papers on the Yuma Desalting Plant are "The Yuma Desalinization Plant: Arizona Perspectives," by Tom Carr, Arizona Department of Water Resources (August 2002) and "Dealing with the Colorado River's Salinity: What is the Future of the Yuma Desalting Plant?" by Sue McClurg, Water Education Foundation (Winter 2003-2004). ■

New Mexico Unit...continued from page 8

officials propose that up to \$150 million be set aside from this source for its unit or project.

A funding source is critical to New Mexico's plans. Without gaining financial support the state would not be able to develop its CAP allocation.

For their part, Arizona officials want assurances that diversions in New Mexico will not adversely affect water users along the Gila River in Arizona. This means determining monthly flow parameters that must be maintained to protect Arizona water users. Only when these are exceeded would New Mexico be able to pump from the Gila River. Also, Arizona officials want to restrict Lower Basin Development Funds for use in current and future Indian water right settlements in Arizona.

Resolving the issues between the two states has delayed congressional action on S. 437, with further progress awaiting a final agreement between Arizona and New Mexico. Reports indicate that such an agreement has been worked out, and markup of the bill is expected to begin by the end of June. The details of any agreement have not been made public.

Environmentalists, Critics Raise Concerns

Meanwhile environmentalists have their doubts about the New Mexico Unit, saying the project poses a threat to the Gila River. They note that the Gila River is the last mainstem river in New Mexico without a major water development project. Except for some minor diversions, the Gila River is essentially a perennial and unregulated flow, its waters flowing even during drought. The Gila River supports native fish and wildlife, including imperiled species such as the loach and spikedace minnows and the southwestern willow flycatcher.

They say that whatever diversion technique is adopted will reduce water available for wildlife, vegetation, nutrient cycling and other vital river functions. For example, removing water from the river would reduce flooding events vital to creating cottonwood-wil-

low forests along the river's shores.

Critics of the project remind state officials about the BuRec studies done in the 1979 and the mid-1980s that examined potential reservoir sites including off-stream storage options. The studies were not supportive of the project.

Cost also is a factor in the critics' case against the project. Whatever federal funding might be forthcoming will not cover the complete cost of the project. New Mexico will have to pitch in a sizable amount in construction costs plus substantial annual costs. Some of this will fall on economically distressed regions of the state that directly benefit from the project. Critics say these economic commitments betray recklessness since no cost benefit analysis has been done to study the project's economic viability.

Some critics and environmentalists even question the project's rationale. They say the additional water resources are not needed, arguing that sufficient undeveloped water supplies are available in the Mimbres and Gila basins. They claim purchasing those rights would be significantly cheaper than obtaining water from a costly water development project. They also suggest that adopting conservation measures would significantly contribute to water supplies in the area, further undermining the need for the project.

Critics also fault the project for an apparent lack of planning. They say substantial funding is being requested, without specifying how the water obtained by the funding will be used. They complain that state officials have not been forthcoming with details about water development plans. Instead, officials say decisions will be made at the local level by folks who would benefit from the project.

Finally, some critics say the New Mexico Unit is an idea that has come and gone, that times have changed since it was included within P.L. 90-537. With the passage of time, some of the projects authorized by the law have proven not to be viable. For example, Congress authorized Charleston and Cliff dams in Arizona as part of the CAP but they were never constructed. Some critics contend that the New Mexico Unit should experience the same fate. ■



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