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TAMARIX, BEETLES, AND LIZARDS: EVALUATING THE IMPACTS OF BIOCONTROL ON HERPETOFAUNA

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INTRODUCTION

Riparian areas of floodplains typically provide a mosaic of productive habitats (Stanford et al. 2005, Latterell et al. 2006), which support many species of wildlife, particularly in semi-arid regions. Within the southwestern United States, non-native saltcedar (*Tamarix* spp.) is the third most frequently occurring woody plant in riparian areas (Friedman et al. 2005). Resource managers can control saltcedar invasion using a suite of techniques, including chemical herbicides (Duncan and McDaniel 1998), mechanical removal, and burning (DiTomaso 1998). Alterations to riparian areas through activities to control nonnative plants have the potential to impact a variety of habitat types used by wildlife (Bateman et al. 2008a, Bateman et al. 2008b). In 2001, the tamarisk leaf beetle (Coleoptera: Chrysomelidae *Diorhabda* spp.; Fig. 1), a biological control agent, was field tested and released in several states in the West to control saltcedar through defoliation (DeLoach et al. 2003). Currently, the leaf beetle is beginning to enter the lower Virgin River system on the Arizona/Nevada border. Beetles were moved by managers to St. George, Utah in 2006 and have dispersed downstream. During this summer, beetles are poised to

defoliate saltcedar across the Virgin River Valley.

Beetles are active from spring to fall and adults and larvae can be found in the leaf litter below saltcedar. Therefore, there is ample opportunity for adult and larvae leaf beetles to overlap with wildlife foraging in vegetation near ground level. Beetles scrape the



Figure 1. Adult tamarisk leaf beetle (photo by Heather Bateman).

foliage of saltcedar, causing it to dry out, but this defoliation can take several years to kill the plant. Understanding the impacts of leaf beetle biological control has not been completely addressed in terms of effects on vertebrate fauna and other components of the ecosystem. Several research teams from University of California Santa Barbara, University of Utah, and the U.S. Geological Survey

are investigating impacts of biocontrol on such elements as wildlife, arthropod, and native plant communities. My research lab is investigating the potential impacts of biocontrol on herpetofauna in riparian areas, by determining the degree to which species of lizards prey on leaf beetles and how reptile abundances relate to microhabitat characteristics of sites where leaf beetles have been introduced. Our objectives are to 1) determine if species of lizards prey on leaf beetles and if they have a preference for adults or larvae compared to other arthropods, and 2) determine how herpetofauna community structure (both in terms of species richness and species abundance) differs among sites before and following beetle establishment.

METHODS

We established eight field sites including four saltcedar-dominated riparian areas and four mixed
Cont. pg. 3 Beetles

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PRESIDENT'S MESSAGE

Did you know that Earth Day celebrated its 40th anniversary this year? I did not really celebrate on its official day of April 22. Instead I went to work and did my usual routine. However, that weekend I did help construct an outdoor classroom. Did you do anything to celebrate this day?

I know that between work duties and the needs of our families we are all busy. I suggest that once in a while you take a moment and look at the natural world we live in. Look at the waves of water that lap up on the shoreline. Or watch a hawk that glides on a thermal of air. Or sit under the shade of a big cottonwood tree and watch how sunlight peeks through the branches.

On days when I am feeling overwhelmed with budgets, reports, and every-day life, I find if I turn my thoughts to nature, things slow down – kind of like a scene from the *Matrix*. Reconnecting with nature helps me remember to why I chose to work in the field of biology.

It is interesting to think about what kinds of things were happening when Earth Day was started in 1970. Many of the federal laws we work with today came on to the scene. The National Environmental Policy Act, created in 1969; the Clean Air Act was signed in 1970; the Federal Water Pollution Control Amendments was signed in 1972 and later major amendments were enacted in 1977 as the Clean Water Act; and the Endangered Species Act was signed in 1973. Do you think we cared more about the environment back in the 1970s than we do now? Or was it a different generation and with different values? Sixteen years after Earth Day the Arizona Riparian Council was formed in 1986. It began out of concern for protecting and preserving valuable riparian habi-


tats. That concern is still important today.

The ARC Board of Directors is planning the next annual meeting. Our 2010 meeting just did not come together. I know I got extremely busy with the American Recovery and Reinvestment Act, aka Economic Stimulus (another federal program I would rather not group with the above-mentioned programs). So the Board thought having the 2011 meeting in Yuma as we planned would still be a good idea.

There are several issues worthy of discussion for our meeting. There are wetland and riparian restoration projects that are on-going in Yuma. International issues concerning the flow of the Colorado River into Mexico. Wildlife concerns in nearby areas such as the Salton Sea, to name a few. Please send us an email and let us know what you think about having our 2011 meeting in Yuma. Knowing that ARC members are interested in attending this annual meeting will help us in our planning. Please know that you are always welcome to help with the planning. We would love to hear from you.

The Fall Campout and Get-Together Meeting will be October 16-17, 2010 at Three Links Farm north of Benson. We will have Aaron Citron and Liz Petterson from the Arizona Land and Trust, Diane Laush from the Bureau of Reclamation and Peter Warren from The Nature Conservancy to talk about conservation easements. For more details and registration go to the website at <<http://azriparian.org/2010/fallmtg2010.htm>>.

I recommend that you take time and reconnect with nature. It brings sanity to a crazy world.

Kris Randall, President 



Courtesy of <http://hubpages.com/hub/earth-day-clip-art>

Beetles from pg. 1

native tree (*Populus*, *Salix*, and *Prosopis*)-saltcedar areas in 2009. We used capture-mark-release methods to compare herpetofauna abundance and species richness from trapping arrays established along the Virgin River in Arizona and Nevada. Feeding trials were conducted in a lab using four common lizard species to determine if leaf beetles (Fig. 2) were a potential food source and if lizards preferred to eat leaf beetle adults over similar-sized crickets (family Gryllidae).

PRELIMINARY RESULTS AND DISCUSSION

During the summer of 2009, we established study sites in reaches of the Virgin River where leaf beetles had not yet colonized. Herpetofaunal traps were open June-August and we had 605 captures representing eight species of amphibians and reptiles. Over 60% of captures were tiger whiptails (*Aspidoscelis tigris*). Preliminary results indicated that relative abundances of lizards were similar in saltcedar and mixed sites, however species-specific abundances differed with desert spiny lizards (*Sceloporus magister*) being more abundant in mixed sites.

Three out of four lizard species did consume leaf beetles during feeding trials and lizards did not appear to show a preference for leaf beetles over crickets. One species, the tiger whiptail, did not feed on leaf beetles or crickets during trials because of its active foraging life history which was not conducive to being housed in a terrarium. However, we did find leaf beetle elytra (hardened forewing) in whiptail scat from areas where beetle were abundant. The other three species (side-blotched lizard, *Uta stansburiana*; long-tailed brush lizard, *Urosaurus graciosus*; and desert spiny lizard) readily ate leaf beetles.

These results provide baseline information on herpetofauna abundances in riparian habitats prior to biological control and identify leaf beetles as a potential food source for native reptile species. During this summer 2010, we will work to confirm our findings on leaf beetles as potential prey and monitor sites expected to experience defoliation. This study will provide insight into how biocontrol along the Virgin River could impact important consumers in the riparian ecosystem. Currently, this topic is fraught with controversial decisions and conflicts between (and at times among) biologists

and policy makers. The long-term goal of my research includes a balanced understanding, based on scientific inquiry, of how human-altered systems and control of nonnative plants may affect native species. This work will become more crucial as riparian ecosystems face a future of growing human influence in which restoring the integrity of these ecosystems will become central to the conservation of biodiversity.

ACKNOWLEDGMENTS

This work is being supported by the Department of Applied Sciences and Mathematics at Arizona State University-Polytechnic and in collaboration with Steven Ostoja of the U.S. Geological Survey and Tom Dudley and Michael Kuehn from University of California Santa Barbara. Field techniques have been approved by the ASU Animal Care and Use Committee (protocol #09-1051R).

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Figure 2. Graduate student Danny Nielsen collecting tamarisk leaf beetles (*Diorhabda sp.*) for lizard-beetle feeding trials along the Virgin River in Arizona.

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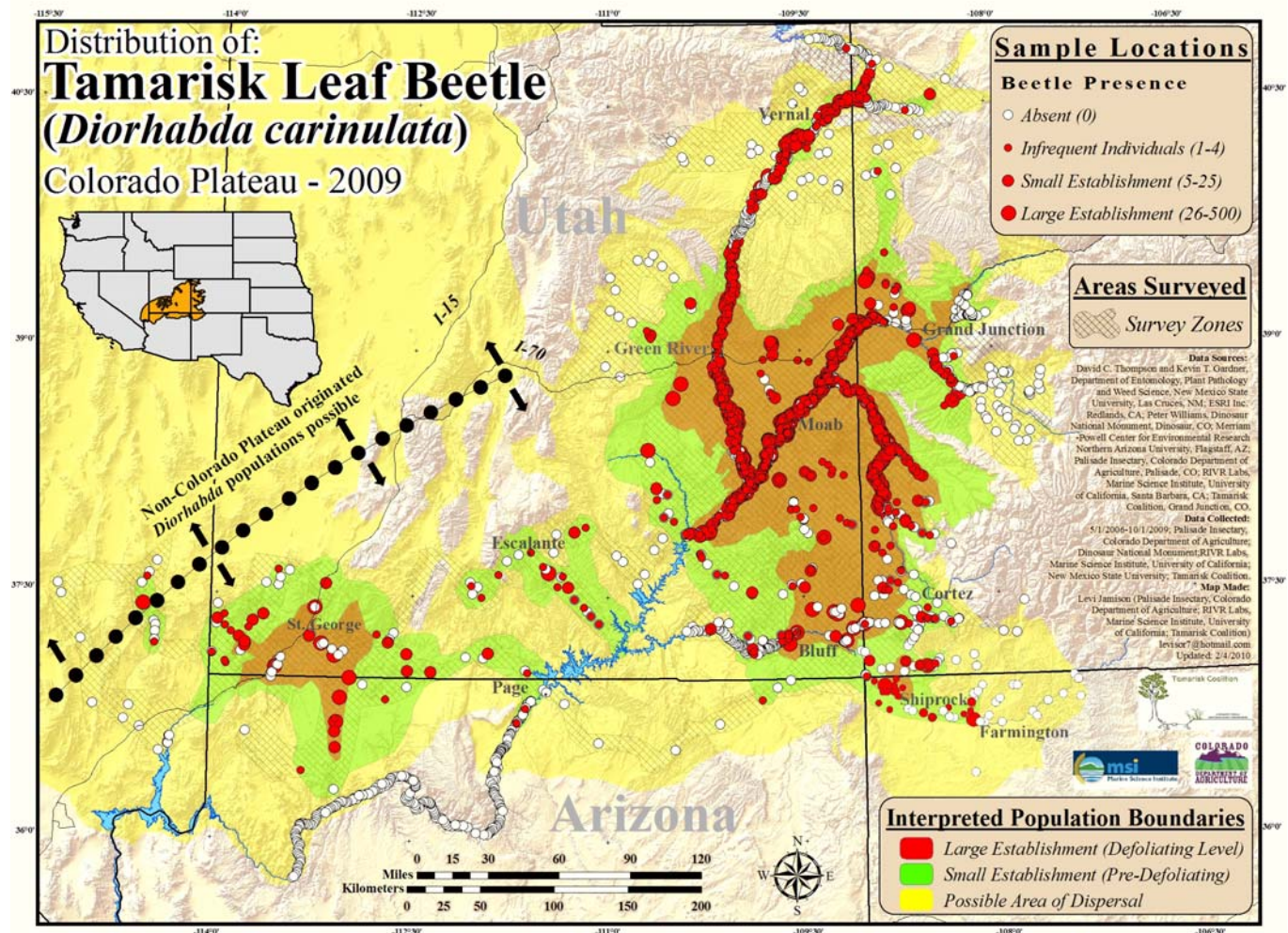


Figure 3. Distribution of tamarisk leaf beetle (*Diorhabda carinulata*), Colorado Plateau 2009 (Jamison 2009).

PHOTO CONTEST — EXPLORING ARIZONA'S EXTRAORDINARY RIPARIAN AREAS

Do you have a photo of an extraordinary riparian area in Arizona? Would you like to share your photo talents with other members? This is your opportunity. The Arizona Riparian Council is having a photo contest to see who has the most extraordinary photos of riparian areas in Arizona, and, your photo may be used in our first-ever calendar!

TERMS

Entry into the Arizona Riparian Council's Exploring Arizona's Extraordinary Riparian Areas Photo Contest (the "Contest") begins on August 15, 2010 and ends on October 1, 2010.

Eligibility: Contest is open free to active Arizona Riparian Council members or nonmembers with a \$20 membership fee. To enter, go to our website at <<http://azriparian.org/2010/photcontest.htm>> and follow the instructions to complete the registration form and upload a photograph that illustrates one of the following four themes:

- Landscapes
- Wildlife
- Plants
- People in nature

There will be a first, second, and third place photo selected from

each theme. Each first place winner will receive \$50 and free registration to the 2011 Annual ARC meeting. Second place a year's membership and t-shirt, and third is a year's membership. The photos will be used in the Arizona Riparian Council's 2011 calendar! It will be available for purchase by the end of the year. The photos will also be used in a new updated website!

PHOTOGRAPH REQUIREMENTS

Each entry must comply with the following requirements:

- Photographs must be in digital format. No print or film submissions will be accepted for entry into this contest.
- The photograph need not be taken with a digital camera; scans of negatives, transparencies, or photographic prints are acceptable.
- All digital files must be 5 megabytes or smaller, must be in JPEG or .jpg format, and must be clean and clear when enlarged to 8.5 X 11 inches (at least 300 dpi), as they will be used in the calendar.
- Written personal releases from people who appear in the photo submitted (or their

parents or legal guardians if such persons are minors). Mail release forms to: Arizona Riparian Council C/O Cindy Zisner, Global Institute of Sustainability, Arizona State University, PO Box 875402, Tempe, az 85287-5402 or fax to Cindy Zisner at (480) 965-8087. Your submission will not be accepted without it.

- The photo must not contain material that violates or infringes another's rights, including but not limited to privacy, publicly or intellectual property rights, or that constitutes copyright infringement.
- The photo must not contain brand names or trademarks.
- The photo must not contain material that is inappropriate or slanderous.
- The Arizona Riparian Council is not responsible for lost, late, incomplete, invalid, damaged, misdirected, or blurred or otherwise indiscernible photos, which shall be disqualified.





SPECIES PROFILE



WATERCRESS (*NASTURTIUM OFFICINALE*)

by Carol Birks, Arizona Department of Water Resources

Watercress is native to Europe and Asia but is naturalized all over the United States, including Arizona. It is a perennial plant that grows in wet places and prefers slow-moving water. It has hollow, creeping or floating stems, 1 to 2 feet long that root easily and produce small, shiny green- or bronze-colored leaves. In the summer and fall small white flowers appear.

Watercress belongs to the Brassicaceae (formerly Cruciferae) family of plants along with more familiar members like broccoli, brussel sprouts, cabbage, kale, turnips and cauliflower. Cruciferous food crops are widely cultivated and considered very healthy because they contain high concentrations of vitamin C, soluble fiber and nutrients that have cancer fighting properties.

Commercially produced watercress is grown in beds using clean running water. Wild watercress, however, can be found in a variety of environments which can include still, poor quality water containing parasites or bacteria. The liver fluke, which is transmitted by sheep and cattle, is occasionally found on watercress when nearby livestock pollute waterways. Before proper sanitation procedures were established watercress facilitated the spread of typhoid. Therefore, caution is advised when collecting plants in the wild and be aware of the environment they are growing in. Always wash thoroughly!

The benefits of watercress are far greater than the risks and using watercress in a salad or as garnish is worldwide. England made watercress sandwiches famous in the 19th century as part of the working class diet. They were



Photo by Robert H. Mohlenbrock @ USDA-NRCS PLANTS Database / USDA NRCS. 1995. Northeast wetland flora: Field office guide to plant species. Northeast National Technical Center, Chester.

usually eaten for breakfast and if people were too poor to buy the bread, they ate just the watercress, which became known as the "poor man's bread." It was common to see vendors' selling bunches of watercress on the streets of merry old England. Watercress became an early example of a modern concept, convenience food. Other countries also make soup out of watercress. The French combine it with potatoes to make a thick soup. The Italians flavor their famous minestrone soup with it and the Chinese add it to egg drop and wonton soup.

Watercress also has medicinal uses that can be traced back to the Romans, Greeks and Persians. It has been reported that Hippocrates, the father of medicine, located his first hospital close to a stream. Fresh watercress grew there and he gave it to his patients. Greek soldiers were given a watercress tonic before going into battle and

the 16th century herbalist Culpeper claimed it could cleanse the blood. It is brimming with more than 15 essential vitamins and minerals. It contains more iron than spinach, more vitamin C than oranges, three times as much Vitamin E as lettuce and more calcium than milk.

Watercress juice is a good intestinal cleanser, removes toxic impurities from the body, heals kidney and bladder inflammations, regulates glands, dissolves rheumatic poisons, eradicates skin affections and stimulates the circulation system. Eating watercress daily can significantly reduce DNA damage to blood cells, a trigger to cancer development and reduces the levels of toxic enzymes in the lungs of smokers.

Watercress, like so many things in nature, is beautiful to look at and beneficial too. As our *Cont. pg. 11* *Watercress*



LEGAL ISSUES OF CONCERN

By Richard Campbell, U.S. Environmental Protection Agency*

WILL RENEWED OPERATION OF THE YUMA DESALTING FACILITY RESULT IN REDUCED FLOWS OF WATER TO THE CIENEGA DE SANTA CLARA WETLANDS?

**Editor's Note: Richard teaches environmental law and policy at San Francisco State University, and continues to work as an attorney with the U.S. EPA Region 9 in San Francisco. The opinions expressed herein do not represent the views of the U.S. EPA.*

Drought and increasing demands on Lower Colorado River (River) water by Arizona, Nevada and California prompted the U.S. Bureau of Reclamation (Bureau) to renew operation of the Yuma Desalting Plant (YDP) on May 3, 2010, as part of a 12-18 month pilot project. If the pilot project proves successful, then operation of the YDP may result in a reduction of water flow and an increase in salinity in water that currently reaches the Cienega de Santa Clara wetlands complex just south of the Southern International Boundary with Mexico. A reduction in the flow and quality of water to the Cienega de Santa Clara (or "Santa Clara wetland") as the result of operation of the YDP raises significant environmental legal issues on both sides of the Southern International Boundary.

THE YDP FACILITY

Why the YDP exists requires a brief discussion of the "Law of the River." In 1922, Congress ratified the Colorado River Compact, which allotted 7.5 million acre-feet (maf) of Colorado River water to the "Upper Basin" states of Wyoming, Colorado, Utah, and New Mexico, and 7.5 maf to the "Lower Basin" states of Arizona, California, and Nevada.¹ The 1922 Compact also recognized that the U.S. would need to negotiate with



Aerial photo of the Yuma Area Office and the Yuma Desalting Plant. Photo credit: Andrew Pernick; Bureau of Reclamation.

Mexico to determine how much Colorado River water would flow across the Southern International Boundary into Mexico.² In 1928, Congress passed the Boulder Canyon Project Act (BCPA), which resulted in the apportionment of the Lower Basin 7.5 maf allotment of Colorado River water as follows: 2.8 MAF to Arizona, 4.4 MAF to California, and 300,000 AF to Nevada.³

In 1938, the Bureau completed construction of Imperial Dam, which straddles the Arizona-California state lines 20 miles northeast of Yuma, Arizona. Imperial Dam was built to divert Colorado River water to irrigation projects in California and Arizona, including the Gila Project, which now includes the irrigable lands of the Wellton-Mohawk Irrigation District.⁴

In 1944, the U.S. entered into a treaty with Mexico⁵ that obligated the U.S. to deliver 1.5 maf

of Colorado River water.⁶ In 1947, the Gila Reauthorization Act authorized the use of Colorado River water from the Gila Project for irrigation of up to 117,000 acres in the Wellton-Mohawk area.⁷ In 1951, Arizona created the Wellton-Mohawk Irrigation and Drainage District (WMIDD) to provide a legal entity able to contract with the United States to repay the cost of the Gila Project.⁸ In 1952, the Bureau completed construction of the Gila Project and Colorado River water began flowing through the Gila Gravity Main Canal to the WMIDD. Wellton Mohawk land is naturally very saline, and agricultural return flow from WMIDD to the Colorado River, in combination with increasing salinity concentrations in the Colorado River from upstream diversions, impoundments and return flows, caused salt concentrations in Colorado River water to reach levels that resulted

in crop destruction in Mexico's Mexicali Valley just south of the Southern International Boundary in the 1960s. In 1965, Mexico and the United States entered into a bi-national agreement for the construction of a 12-mi concrete-lined channel known as the MODE (Main Outlet Drain Extension) that would divert Wellton-Mohawk return flows away from the Colorado River to what is now the Cienega de Santa Clara wetlands.⁹ The MODE canal was seen as a temporary solution to the salinity problem at the time (but as discussed below, still operates to deliver saline water to Mexico). In 1973, Mexico and the United States entered into a bi-national agreement that obligates the U.S. to limit salt content to acceptable limits.¹⁰ In 1974, the Colorado River Basin Salinity Control Act of 1974 (Salinity Control Act) authorized construction of the YDP to treat the supersaline irrigation return flows from the WMIDD prior to its discharge to the Colorado River. The treated water is intended for inclusion in the 1.5 maf allotment of Colorado River to Mexico. The benefit of this inclusion is that the Bureau preserves the like amount of water in Lake Mead, and that water is then made available to satisfy the water demands of Lower Basin state users.

Construction of the YDP was completed in 1992, and operated briefly until floods in 1993 damaged the facility. The YDP uses filters and reverse osmosis (RO) to treat the WMIDD irrigation return flows. The resulting "product water" flows down a concrete-lined canal and is discharged into the Colorado River. The concentrate flow is discharged from the YDP into the MODE via an underground pipe originating at the YDP. These flows then proceed down a Bypass Drain, a concrete-lined canal, past the Southern International Boundary and to the Cienega de Santa Clara. Salinity in the Bypass Drain generally is approximately 2664

ppm (expressed as TDS).¹¹ With the exception of brief operations in 2007, the YDP has not been operated since 1992, for reasons of cost, and because of controversy associated with the impact of operations on the Cienega.

THE CIENEGA DE SANTA CLARA

The Cienega, a 15,000-acre wetland, is home to several endangered species and is a major stop-over for birds migrating north and south along the Pacific Flyway. Its ecological importance has been well documented in the Arizona Riparian Council newsletters.

WHY THE NEED TO OPERATE THE YDP?

On January 14, 2009, Central Arizona Water Conservation District (CAWCD), the Metropolitan Water District of Southern California (Met), and the Southern Nevada Water Authority (SNWA) jointly wrote the Bureau to determine whether additional water could be obtained by operation of the YDP. All three agencies offered to fund the YDP pilot project in return for a designation of the processed water as "surplus" water. Intentionally created surplus (ICS) credits made in accordance with the Bureau's 2007 Colorado Interim Guidelines would provide water to these three agencies above and beyond their current allotments.

Why Need a Relatively Insignificant Amount (Roughly 20,000-30,000 af) of Colorado River Water?

From SNWA's perspective it is easy to see: 30,000 af can supply roughly 120,000 people with water for a year, and comprises nearly 10% of Nevada's 300,000 acre Colorado River allotment. Pat Mulroy, SNWA's Director, is desperately searching for water because Nevada's demand for water has outstripped

its 300,000 af allotment of Colorado River water, and because the Nevada Supreme Court ruled this year that SNWA's applications to pump 190,000 af from rural areas of Nevada to the greater Las Vegas area were invalid.¹²

Arizona's CAWCD could use the water. The CAWCD was created in 1971 by the Arizona Legislature for the purpose of contracting with the Secretary of Interior for Lower Colorado River water delivered via the Central Arizona Project. In 1972, the Secretary of Interior entered into a "master contract" with the CAWCD for delivery of Colorado River water through the Central Arizona Project (CAP) to Arizona subcontractors. However, the 1968 Colorado River Basin Project Act,¹³ which authorized funding and construction of the CAP, provided that the CAWCD, and its subcontractors (mainly Arizona agriculture at the time, but increasingly municipal users), have junior priority to all pre-1968 (pre-Colorado River Basin Project Act) contractors, i.e., California and its 4.4 maf allocation.¹⁴ Thus, in a drought situation, as may be happening now, CAWCD is first in line to lose water to California. Although California's Metropolitan Water District of Southern California (Metropolitan) has senior rights to a portion of California's 4.4 maf of Colorado River water by virtue of an agreement reached with other California water right holders in 1931, Metropolitan was created in 1928 for the express purpose of finding as much water as possible for cities and communities in Southern California. Since Metropolitan has its own Colorado River Aqueduct to bring in water from the Colorado River, its natural inclination would be to try and obtain as much proportional share of any ICS credits.

Continued next page

ENVIRONMENTAL IMPACT OF OPERATION OF THE YDP

In August 2009, the Bureau released its Environmental Assessment (EA) of the Pilot Project pursuant to the National Environmental Policy Act (NEPA).¹⁵ According to the EA, approximately 38,000 af of WMIDD irrigation return flow water will be delivered via the MODE to the YDP. The YDP treatment process will yield approximately 22,000 af of produced water that will be delivered to the Colorado River and to Mexico. Approximately 9,600 af of brine water left over from the treatment process will be discharged back to the MODE from the YDP for delivery to the Cienega wetlands. By virtue of a commitment from the U.S., Mexico and a partnership of U.S. and Mexico non-governmental organizations, another 30,000 af will be discharged to the Cienega via the MODE during the life of the pilot project.

The EA also recounts that “both countries have committed, pursuant to [International Boundary and Water Commission] Minute 306 and through the Colorado River Joint Cooperative Process, to continue bi-national cooperation regarding the Cienega and to address long-term approaches to maintain the environmental values of the Cienega.” Minute 306 was entered into December 12, 2000, and resulted in the creation of a binational task force to study and share information regarding the Cienega.¹⁶

The EA also recognizes the diplomatic process and consultations undertaken through the IBWC resulted in the proposal and consideration of cooperative actions to address the Cienega. Cooperative actions were documented in the *Joint Report Of The Principal Engineers Concerning U.S.-Mexico Joint Cooperative Actions Related To The Yuma Desalting Plant (YDP) Pilot Run And The Santa Clara Wetland*.



Exterior photo of one of the three large solids contact reactors located on the grounds of the Yuma Desalting Plant. Photo credit: Alex Stephens; Bureau of Reclamation.

A binational team is going to monitor the effects of running the YDP. The team includes three universities (University of Arizona, Mexico’s National Institute of Ecology, and the University of Baja California, Mexicali); the Central Arizona Water Conservation District, the Southern Nevada Water Authority, and Metropolitan Water District of Southern California; and two non-governmental organizations, Pro-Natura and the Sonoran Institute. The Biosphere Reserve of the Upper Gulf of California and Colorado River Delta is also a partner.¹⁷

LEGAL ISSUES

The EA makes clear the Bureau’s position that the Cienega should be addressed through continuing diplomatic dialogue through the U.S. and Mexican Sections of the International Boundary and Water Commission, rather than NEPA compliance. “Reclamation’s decision to prepare an EIS or a FONSI will be based on the EA’s analysis of environmental impacts occurring in the United States as a result of the proposed Pilot Run.”¹⁸

Should the 12-18 month pilot project convince the Bureau that the YDP should be operated on a long-term basis, another NEPA analysis would need to be per-

formed. The question may arise at that point whether the Bureau should expand its scope of analysis to include the effect of the YDP on the Cienega wetlands. The extraterritorial application of NEPA is an open question.¹⁹ Some courts have held that where there is special geographic or political relationship between the U.S. and the country where federal action may produce environmental impacts, NEPA may apply.²⁰

An additional issue is whether the Bureau must take the federal Endangered Species Act into account if long-term operation of the YDP were to reduce water flows to the Cienega wetlands and reduce endangered species habitat. The extraterritorial application of the Act is an open legal question. In *Defenders of Wildlife, Friends of Animals & Their Environment v. Lujan*, 911 F.2d 117 (1990), the Eighth Circuit Court of Appeals found that the Act’s broad, inclusive language; its legislative history; and its policy implications, justified application of the Act to federal actions with effects to endangered species in other countries. However, this case was overruled by the Supreme Court on procedural grounds and the substantive issue of the Endangered Species Act’s extraterritorial application was never reached. In 2000, Defenders of Wildlife and

other organizations sued the Bureau, alleging violation of the consultation requirements of the Endangered Species Act with regard to protected species in the Colorado River Delta in Mexico. At issue was Bureau's Multi-Species Conservation Plan (MSCP) for the Colorado River. The MSCP plan only took into account the Bureau's operation of the River to the Southern International Boundary. The court found that the Bureau did not need to conduct Endangered Species Act consultation with US Fish and Wildlife Service on impacts south of the border because it had no discretion to deliver water to the Delta, and without discretion to act, there is no need for consultation. The court reasoned that although

there is no serious question that Reclamation's ongoing operations on the lower Colorado River have had and will continue to have a significant impact on the delta region and the species in question,

the Bureau had no discretion to provide water to the Delta where:

*a Supreme Court injunction, an international treaty, federal statutes, and contracts between the government and water users ... account for every acre foot of lower Colorado River water.*²¹

In doing so, however, the court suggested that "an actual controversy remains as to the application of the Endangered Species Act to nondiscretionary agency actions within the United States that have extraterritorial effects." *Id.* at 65. Thus, the issue for the Bureau with regard to its operation of the YDP is whether the operation is a discretionary or nondiscretionary action.

REFERENCES

1. The Colorado River Compact, 70 Cong. Rec. 324 (1928), at art. II; available from the U.S. BuRec website at: <<http://www.usbr.gov/lc/region/g1000/pdfiles/crcompct.pdf>>
2. See *id.* art. III (c) ("If, as a matter of international comity, the United States of America shall hereafter recognize in the United States of Mexico any right to the use of any waters of the Colorado River System, such waters shall be supplied first from the waters which are surplus ... and if such surplus shall prove insufficient for this purpose, then, the burden of such deficiency shall be equally borne by the Upper Basin and the Lower Basin ...").
3. Arizona did not agree to this apportionment in 1928 because its 2.8 maf allotment was offset by its rights to Gila River flow. In *Arizona v. California*, 373 U.S. 546 (1963), the Supreme Court made clear that Arizona's 2.8 MAF was for Colorado River water only, and was not offset by its diversion of Gila River water.
4. As well as the All-American Canal and the Coachella Canal, in California. Information obtained from the Imperial Irrigation District website at: <<http://www.iid.com/Water/ImperialDam>>.
5. *Treaty Between the United States of America and Mexico Respecting Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande*, Feb. 3, 1944, U.S.-Mex., art. 10, 59 Stat. 1219, 1237 (1944), available from the Colorado River Commission of Nevada website at: <<http://crc.nv.gov/1944mexicanwatertreaty.htm>>.
6. *Id.* Article 10.
7. July 30, 1947 (61 Stat. 628).
8. Information obtained from the Wellton-Mohawk Irrigation District website at: <<http://www.wellton-mohawk.org>>.
9. Recommendations on the Colorado River Salinity problem. Approvals, Minute 218 of the International Boundary Water Commission (IBWC), March 22, 1965, available from the IBWC website at: <<http://www.ibwc.state.gov/Files/Minutes/Min218.pdf>>.
10. *United States-Mexico Agreement on Colorado River Salinity*, Minute No. 242 of the International Boundary Water Commission (IBWC): Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River, August 30, 1973, available from the IBWC website at: <<http://www.ibwc.state.gov/Files/Minutes/Min242.pdf>>.
11. YDP EA at 32.
12. *Great Basin Water Network v. Taylor*, 222 P.3d 665, 2010 Nev. LEXIS 2 (January 28, 2010).
13. 43 U.S.C. §§ 1501-56.
14. Section 1521(b) of the Colorado River Basin Project Act.
15. 42 USC 43421 et seq.; The EA was also performed in accordance with the Council on Environmental Quality (CEQ) regulations (Title 40 of the Code of Federal Regulations [CFR] Parts 1500-1509), and the Department of the Interior (DOI) and Reclamation NEPA procedures (516 DM 14).
16. YDP EA at 8.
17. *Water OnLine*, "UA-Led Team Studies Effect Of Yuma Desalting Plant On Cienega de Santa Clara" (April 29, 2010) available at: <<http://www.wateronline.com/article.mvc/UA-Led-Team-Studies-Effect-Of-Yuma-Desalting-0001?VNETCOOKIE=NO>>.

- 18. YDP EA at 8, fn. 3.
- 19. *Natural Resources Defense Council, Inc. v. Nuclear Regulatory Com.*, 647 F.2d 1345 ("NEPA's legislative history illuminates nothing in regard to extraterritorial application")
- 20. See, e.g., *Wilderness Soc'y v. Morton*, 150 U.S.App.D.C. 170, 463 F.2d 1261 (1972); *People of Enewetak v. Laird*, 353 F. Supp. 811 (D.Hawaii 1973); *People of Saipan ex rel. Guerrero v. Department of the Interior*, 356 F. Supp. 645 (D.Hawaii 1973), *Sierra Club v. Adams*, 188 U.S.App.D.C. 147, 578 F.2d 389 (1978) (NEPA applies to federal construction in Panama).
- 21. *Defenders of Wildlife v. Norton*, 257 F. Supp. 2d 53 (D.D.C. 2003)



Watercress cont. from pg. 6

knowledge of the environment and its connections to our health increases it is imperative to protect the natural environment and to encourage species diversity because the compounds found in nature may save us from our past.

The Watercress Darter National Wildlife Refuge in Alabama is named after the federally endangered watercress darter fish (*Etheostoma nuchale*). This is a small fish found only in Alabama and inhabits the watercress beds of the Black Warrior River drainage (US Fish and Wildlife Service Fact Sheet no date). In the Sacramento Mountains in New Mexico watercress was found to be an important food for wild turkeys (Goerdnt et al. 1985). There are many studies about the chemical properties of watercress and effects on humans, but not as many on wildlife even though it is an part of many aquatic habitats.

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Watercress Darter

PANEL MUST DECIDE WHO OWNS STATE'S RIVERBEDS

by Howard Fischer, Capitol Media Services

Editor's note: Reprinted from the Arizona Daily Star at www.azstarnet.com; Posted: Thursday, May 20, 2010.

Sand and gravel companies are at risk of losing title to the land they now occupy in Arizona riverbeds.

In a unanimous decision, the Arizona Court of Appeals has ruled that a special commission used the wrong legal standards in determining the Salt River was not navigable at the time Arizona became a state.

That issue is more than a bit of trivia. It will determine who owns thousands of acres of land in the river.

Hanging in the balance are the rights of sand and gravel companies and others that have been using – and mining – the land for years because they bought it and assume they own it.

If the river is ruled “navigable,” it means the state actually owns the property.

The new ruling will have implications beyond the Salt River. The standards for determining navigability will also have to be used to make determinations for the Verde, San Pedro, Santa Cruz and Gila rivers, said Joy Herr-Cardillo, attorney for the

Arizona Center for Law in the Public Interest.

When Arizona became a state in 1912, the federal government gave it title to all navigable streams within its borders. That fact was ignored until 1985, when the state made a claim to the land.

After that, the Legislature approved a measure to allow those who presumed they owned the land to pay a fee of \$25 per acre and obtain title to any land in question.

The Arizona Center for Law in the Public Interest filed suit and the state Court of Appeals, in its first ruling, concluded that law was an unconstitutional gift of public lands.

In response, lawmakers set up a commission to determine which streams were navigable at statehood.

In 2005, the Arizona Navigable Stream Adjudication Commission issued a ruling that the Salt River between the Granite Reef Dam and where it flows into the Gila River is “an erratic, unstable and undependable stream.” Even if Roosevelt Dam were not there – it was built slightly before statehood – there was no way that in 1912 the river could be considered navigable, the commission concluded.

But appellate Judge Lawrence Winthrop, writing for the court, said the commission must consider the condition of the river in 1912 in its “ordinary and natural condition,” before dams, canals and other man-made diversions.

The river obviously “was in its natural condition before the Hohokam people arrived many centuries ago and developed canals and other diversions, Winthrop wrote. But he conceded there is little, if any, historic data from that period.

The judge said the diversions put in by the Hohokam largely disappeared due to non-use over the centuries and, by the 1800s, the river had pretty much returned to its natural state before farming began in what would become the Phoenix area. Evidence from that period is the best test, he said, sending the issue back to the commission.



ATTENTION ARC MEMBERS! WE NEED YOU!

By Cindy D. Zisner, Secretary/Education Chair/Newsletter Editor

Dear members, the Board of Directors REALLY, REALLY needs your help. We need it in several ways. First, of all many of you have not yet paid your 2010 dues. Please do so at your earliest convenience. If "PLEASE RENEW" is after your name on the mailing address of this newsletter if you are in arrears. Our \$20 dues are for the calendar year January-December. Many have registered at the spring meeting in the past, but since we are not having our spring meeting this year we need you to send them in directly to me or through Paypal on our website (see address on inside of last page). An email reminder was sent but evidently a postcard would have been a better choice on my part, my apologies.


Second, we would really appreciate your help in planning our spring and fall meetings. We have monthly Board meetings on the third Wednesday at 4:30 PM. We are always in need of leads for speakers and ideas for field trips. You can always email any of the board members. Their addresses are at the end of this newsletter.

Finally, this is a personal plea. We need more involvement and new Board members. Everyone's lives are busy these days, but we need to step up and keep our organization continuing to be involved in riparian habitat education, conservation, restoration and research. Some of us on the Board have been there for a very long time and we feel that new input is needed if we are to survive. I personally feel that the Arizona Riparian Council can take credit for everyone now knowing what riparian even is, but I digress. Kris Randall, ARC President was Vice President in

1993 and became President in 1994, 1995, 1998-2002. Her current term started in 2008 and will end next year at our annual meeting. Diane Laush was first elected Treasurer in 1991 and served until 1997. She recently was re-elected in 2009 and will serve until 2012. Tom Hildebrandt was Vice President from 2002-2004 and became President in 2005 and served until 2009. He continues to be involved as Co-Chair of the Policy Committee along with Kris Randall. Tom also along with Tim Flood (another long-term member) initiated our RSRA Team to evaluate streams. Diana Stuart, ARC Vice President, was an At-Large Board Member in 2004-2006 and became Vice President in 2008 and her term ends next year as well. There were others who filled in along the way and to them we are grateful. Finally we get to me, Cindy Zisner. I have been Secretary of this organization since 1989 and I have seen many changes over the years. I attended the founding meetings as did some of the others I've mentioned. I have also been the Education Chair and since 1995 the newsletter editor, being preceded by Barbara Tellman, Ron Smith, and Tanna Thornburg along with coeditors of mine, Jeff Inwood and Paul Marsh. I also do the website which is sorely in need of an updated look and I could use some help for a new look.


The point of all of this is I am fearful that the Council has been progressively losing steam and may cease to exist in the coming years unless we get new committed individuals to become board members – not for just one term. Start as an at-large member

and progress up the ladder to President! I'd hate to see us dissolve since we have done so much and there is always so much more to do. Please contact us and volunteer!!! Thanks for reading my rants.

Cindy D. Zisner, Secretary 

ANNOUNCEMENTS

- ★ Alicyn Gitlin, has accepted a position with the Sierra Club as their Conservation Coordinator for the Grand Canyon Ecosystem. Alicyn is an At Large Board Member of the Arizona Riparian Council Board of Directors.
- ★ Evelyn Erlandsen, has resigned her Project Manager position with the Arizona Water Protection Fund to take a post with the U.S. Bureau of Reclamation in Sacramento, California.

If you have any other announcements about changing jobs, promotions, births, deaths, etc. that you'd like the Arizona Riparian Council membership to know please send them to Cindy Zisner at Cindy.Zisner@asu.edu or (480) 965-2490 and she will put in the newsletter. 

RIVER NETWORK'S 11TH ANNUAL NATIONAL RIVER RALLY

by Alicyn Giltin, Member at Large and Conservation Coordinator, Sierra Club

We decide to protect rivers because we love nature, but we get the best work done when we work effectively with people. River Network's 11th annual National River Rally in Snowbird, UT, abounded with messages about how to accomplish the job: make contacts, ask what watershed residents want, engage youth, seek out disenfranchised communities, listen, communicate, and never forget to say thank you to supporters, volunteers, members, and donors. Inspiring and motivated individuals from all over the country shared successes and strategies for fixing past mistakes and preventing future ones, and revitalizing both human and aquatic communities in the process.

Workshops taught attendees about strategic planning, improving water quantity and quality, the water/energy nexus, ecological restoration, environmental justice, Superfund clean-ups, interactions with government agencies and political leaders, and, of course, obtaining funding. In the evening, an environmental film festival exposed issues that still need work. Special sessions throughout the weekend, including a ridiculously entertaining "River Idol" competition, a board member social, and an "Issues Lunch," encouraged networking between attendees.

River Network proclaims on its website (www.rivernetwork.org), "If a watershed leader misses Rally, (s)he would need to take an hour-long seminar nearly every other week for a year to get the same level of training." This

year's rally focused on "bridge building" strategies. Attendees included city and tribal planners, local government officials, U.S. Geological Survey, Environmental Protection Agency, National Park Service, watershed groups, community organizers, river and bay keepers, funding organizations, coalition builders, land trusts, watchdog groups, nonprofit board members, architecture and busi-



Nancy Stoner, Deputy Assistant Administrator for US Environmental Protection Agency's Office of Water, the Keynote Speaker, addressing Rally attendees during Saturday's lunch.

s specialists, educators, GIS technicians, and restoration practitioners.

An inspiring session was entitled "Urban Transformation: The River as a Community Organizing Tool." Chris Pazos and Melinda Alvarado-Vega of the Chelsea Creek Action Group in MA empower youth to take ownership of their riverfront and force changes to happen. They assisted 3,000 grade-school students with transportation so that they could confront Jim Gordon during a speech at Boston University, to ask him why he was proposing a diesel power plant on the bank of

Chelsea Creek, blocks from their school, while he claimed to be environmentally concerned in his campaign to build the Cape Wind Farm. Gordon withdrew plans for the generator. Young people also raised over \$1,000,000 to create waterfront parks and river access. The group organizes "Know What's Up Youth Concerts" and created an environmental justice tour available to everyone on Google Earth. EkOngKar Khalsa, Mystic River Watershed

Association, showed photos of the work that still lies ahead: all of the jet fuel for Logan Airport and most of the road salt for MA is stored on the banks of Chelsea Creek. The salt is "protected" from rain by a flimsy tarp cover – but improvements are being made because local residents are learning to have pride in place.

Other workshops focused on technical skills. Shelli Bishcoff-Turner, Conservation Impact, laid out a clear, logical plan for ensuring that organizations remain

strong and relevant by building constituents and capacity through proper marketing. Allen Pressel, CharityFinders, educated attendees about effective social media. Baird Straughan, LeadGreen, introduced the databases that river and watershed organizations identified as the best for organizing membership information.

River Rally 2011 will be June 3-6, 2011, in North Charleston, SC. Workshop proposals are due October 8, 2010. River Network is dedicated to supporting river and watershed groups in their efforts to sustain a healthy country.





The Arizona Riparian Council (ARC) was formed in 1986 as a result of the increasing concern over the alarming rate of loss of Arizona’s riparian areas.

It is estimated that <10% of Arizona’s original riparian acreage remains in its natural form. These habitats are considered Arizona’s most rare natural communities.

The purpose of the Council is to provide for the exchange of information on the status, protection, and management of riparian systems in Arizona. The term “riparian” is intended to include vegetation, habitats, or ecosystems that are associated with bodies of water (streams or lakes) or are dependent on the existence of perennial or ephemeral surface or subsurface water drainage. Any person or organization interested in the management, protection, or scientific study of riparian systems, or some related phase of riparian conservation is eligible for membership. Annual dues (January-December) are \$20. Additional contributions are gratefully accepted.

This newsletter is published three times a year to communicate current events, issues, problems, and progress involving riparian systems, to inform members about Council business, and to provide a forum for you to express your views or news about riparian topics. The next issue will be mailed in December, the deadline for submittal of articles is November15, 2010. Please call or write with suggestions, publications for review, announcements, articles, and/or illustrations.

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CALENDAR

Arizona Riparian Council Board Meetings. The Board of Directors holds monthly meetings the third Wednesday of each month and all members are encouraged to participate. Please contact Cindy Zisner at (480) 965-2490 or Cindy.Zisner@asu.edu for time and location.

Verde River Days, September 25, 2010. Dead Horse Ranch State Park. For more information go to <http://verderiverdays.com>. Interested in volunteering at the ARC Booth, contact Cindy.Zisner@asu.edu.

Arizona Riparian Council Fall Meeting and Campout, October 16-17, 2010, 3 Links Farm, north of Benson. We will learn about conservation easements. For more information and registration go to <http://azriparian.org/2010/fallmtg2010.htm>.

Arizona Riparian Council Spring Meeting, *Wetlands on the Edge: Challenges of Wetland and Riparian Restoration*, Spring 2011, Yuma, AZ. Check <http://azriparian.org> for updates or contact Cindy.Zisner@asu.edu for more information.
