The Arizona Riparian Council Newsletter

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LOWER SANTA CRUZ EFFLUENT RECHARGE PROJECT

Julia Fonseca, Pima County Flood Control District Project Manager

The Arizona Water Protection Fund has joined Pima County Flood Control District, the U.S. Bureau of Reclamation, the Town of Marana, and Tucson Water in an effort to construct a recharge project which will enhance an adjacent riparian area. Effluent diverted directly from the lower Santa Cruz River would be utilized for the project. The project area is located in the Town of Marana. The project site was chosen because it is one of the few stable places where effluent can be diverted from the channel without invasive earthworks and without diminishing flows to the most significant effluent-supported riparian areas along the river.

The lower Santa Cruz River flows only in response to storm flows and releases from the Ina Road wastewater treatment facility. Depth to groundwater in the project area is over 200 feet and stream sediments are sandy, so in most places, only a narrow strip of vegetation (cattail, *Typha* spp.; Goodding willow, *Salix gooddingii*; tamarisk, *Tamarix* spp.) is supported by the effluent flows. This vegetation has high rates of turnover due to high-velocity scour which occurs in the main channel during floods. Surveys sponsored by the Bureau of Reclamation found that the densest and most stable riparian vegetation occurred not in the main channel, but in a natural channel into which a local rancher has diverted effluent for pasture irrigation. The diversion channel was inundated during the floods of July 1990 and January 1993 but the vegetation has persisted.

Objectives of the project are:

To determine what infiltration rates can be maintained in basins with side slopes vegetated with emergent plants and riparian trees, and in basins fully vegetated with native grasses tolerant of periodic inundation. If successful, the project design and maintenance concepts will be transferred to other recharge projects in the Tucson area.

2. To provide trails, descriptive literature and interpretive signs, describing the pilot project operation. Trails at the effluent pilot project site may eventually be linked to a longer riverine trail network along the Santa Cruz River.
3. To revegetate the area outside the recharge basins with plants that will improve wildlife habitat value and which, once established, could survive if the recharge activities cease. The project area also will be fenced to exclude livestock.

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Inside This Issue

PRESIDENT'S MESSAGE

The Arizona Riparian Council has been in existence for 10 years now. As we begin the second decade, we need to look at the strengths and weaknesses of the organization to ensure that the Council provides service to its members and fulfills its mission. In the Constitution of the Arizona Riparian Council (I'll bet you didn't even know we had a Constitution), the founders listed six purposes and objectives for the organization. These objectives are reprinted here in the newsletter (p. 3) because they provide a means of assessing accomplishments as well as an indication of areas for growth. Some of these are lofty objectives and require a real commitment of resources. They will certainly not all be accomplished in the next few years. I believe it is important for all members to be aware of the original objectives of the organization so that 10 years from now we may be able to say that we have accomplished all of them.

As we all know, conserving riparian areas in this state is a long-term effort and the Council needs to maintain a role in those efforts by providing a forum for the exchange of information on the status of riparian areas in Arizona, including research needs and findings. This objective has been fulfilled primarily through the annual meeting and the newsletter. Both these tools have been very effective, but in the course of 10 years, the amount of activity surrounding the study, management, and conservation of riparian areas has grown. In the next year, I would like to explore some additional ways in which the Council can provide members with opportunities to discuss these issues.

One of the agenda items at the next Board of Directors meeting will be to discuss the idea of setting up training opportunities for members and agency staff. Potential topics include hydrology, aquatic insects, geomorphology, plant identification and ecology, habitat evaluation techniques, range evaluation techniques, riparian wildlife (birds, herps, mammals, fishes), and phycology (algae). We would like your input on other topics, suggestions for possible instructors, VOLUNTEERS!!!!, training locations, best time of year, and best time of week (weekdays or weekends). By sharing ideas and resources, we can make this a successful activity that will have broad-ranging benefits, and it might even be a lot of fun.

In the meantime, I would like to encourage all members to use the newsletter as a means of informing others of current and/or proposed research or activities. Remember, it doesn't have to be a long article. Even a brief description of your work may catch the attention of someone who is planning to conduct the same type of activity or who could benefit from your results or experience. Don't wait for the "call from the editors." Please take the initiative to communicate with your colleagues. The newsletter is an inexpensive and relatively painless means of accomplishing this.

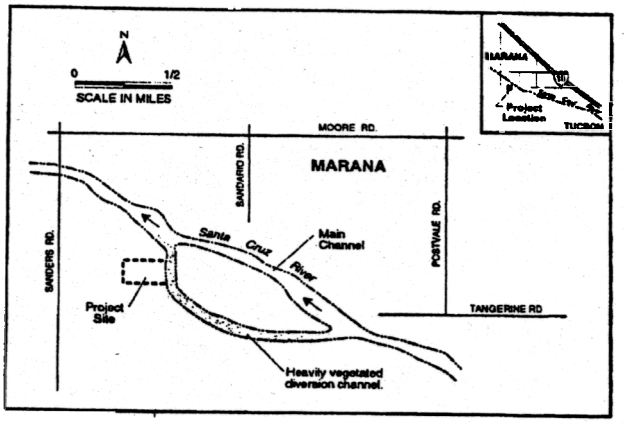
Finally, I would like to thank everyone who participated in the Annual Meeting in Prescott. I would especially like to thank all those who took the time to fill out the evaluation form. To date, we've received eight ideas for future topics, nine names for future plenary speakers, and many helpful comments. If you have not yet returned the form, it's not too late. In fact, if you think of something three months from now that you think would be helpful in planning Council activities, pick up the phone or use e-mail to let us know. You're input is *always* welcome. In fact, this is a great way to get involved without a major commitment of time. Board of Directors meetings are mostly about officers and members-at-large coming together to brainstorm ideas for fall and annual meetings, educational activities, and the newsletter. You don't have to attend these meetings to have your ideas represented. Just contact me, or one of the other officers, members-at-large, or committee chairs and request that they present your ideas and return to you with a response. At the next Board of Director meeting we will be setting dates for future meetings and these will be posted in the next newsletter so everyone has advance notice. If you are interested in attending, you are encouraged to call Cindy Zisner before the meeting to check on the time, location, and any schedule changes. I look forward to hearing from you.

Ruth Valencia

(....*Continued from Page 1*)

4. To characterize wildlife, aquatic macroinvertebrates, and vegetative resources associated with an important effluent-dominated stream, and provide an opportunity to monitor the effects of differences in flood-related disturbance processes.
1. To identify and monitor any biologic effects that may result from establishing other habitat types that are now rare to the area (e.g., marsh and grassland) and increasing the areal extent of riparian vegetation.

As part of the U.S. Bureau of Reclamation's High Plains Program, the District will develop a groundwater and surface water quality monitoring plan, which will be reviewed and approved by personnel from U.S. Environmental Protection Agency and the U.S. Geological Survey, in addition to regulatory agencies. The water quality monitoring plan will also be designed to address the needs of the recharge facility and aquifer protection permits issued by the Arizona Department of Water Resources and Arizona Department of Environmental Quality, respectively.



Researchers and contractors take note: one of the first efforts that will be funded by the Arizona Water Protection Fund is survey and development of a monitoring plan for existing plants (including algae), macroinvertebrates, birds, and herpetofauna. If you would like to be placed on the mailing list for the request for proposals, please contact Julia Fonseca at 520-740-6350.

CONSTITUTION OF THE ARIZONA RIPARIAN COUNCIL

ARTICLE II
PURPOSES AND OBJECTIVES

Section 1. Purpose. Within the framework of an entity organized exclusively for charitable, educational, and scientific purposes....the Council exists to provide for the exchange and transmittal of information on the status, protection, and management of riparian systems in Arizona.....

Section 2. Objective. To stimulate and support studies in all phases of ecology, management and protection, and related intrinsic values of riparian systems.

Section 3. Objective. To provide a clearinghouse of information among all agencies, organizations, and individuals engaged in work on riparian systems through appointment of work committees, preparation of bibliographies and abstracts, and related methods.

Section 4. Objective. To function in an advisory capacity on questions involving management, conservation, and protection of riparian systems, and to adopt such measures as shall tend to ensure the continued survival and maintenance of healthy riparian systems.

Section 5. Objective. To establish programs whereby the public is made aware of the importance of proper management and protection of riparian systems.

Section 6. Objective. To publish symposium proceedings and transactions of meetings in order to present current information on problems relating to the preservation of riparian systems and to commend outstanding action by the public and professionally engaged individuals supporting the purposes of the Council.

ANOTHER GRAZING MYTH EXPOSED

Jeff Burgess

A couple of years ago I accompanied some U.S. Forest Service staff on a horseback inspection of a livestock grazing allotment located in the eastern Superstition Mountains of Arizona's Tonto National Forest. As we neared a muddy cattle tank, perched on a chaparral-covered hill, we scared off several mule deer that were taking a drink. The District Ranger turned in his saddle toward me and told me how he was glad livestock were allowed to graze public lands because deer would be scarce if there weren't any livestock waters.

The theory that wildlife native to the West's arid ecosystems depend upon livestock waters for survival is a popular one. It seems many federal land managers believe it. Almost every environmental assessment of a livestock management plan I've read has warned that eliminating grazing could result in local wildlife populations suffering from the lack of livestock waters. Most ranchers also seem to believe it and they frequently offer it in defense of livestock grazing on public lands.

The idea that wildlife depend on livestock-type waters is so prevalent there's a 1,300-member conservation group, called the Arizona Desert Bighorn Sheep Society, that works with the Arizona Game and Fish Department (AGFD) to try and increase sheep numbers by constructing permanent waterholes in the Sonoran Desert. Statewide, the AGFD maintains more than 725 waterholes at an annual expense exceeding $750,000.

...numerous studies have shown it's the amount and quality of suitable habitat that has the most influence on wildlife populations.

But considering how widely the theory is accepted, it's surprising how little scientific evidence there is to support it and how much there is that contradicts it. For instance, a recent review (Broyles 1995) of the bighorn sheep water development program AGFD has conducted in the Cabeza Prieta National Wildlife Refuge during the last 50 years concluded, "It has not been shown that these developments are necessary, beneficial, or without harmful side effects."

Another study recently conducted in southern New Mexico (Burkett and Thompson 1994) compared wildlife populations at 20 sites that had man-made waters with the same number of similar sites lacking permanent surface water. They found that "definitive effects of artificial water sources on native wildlife species were not detectable." In other words, they didn't find more wildlife in the area with the man-made waters. Another recent study conducted in western Arizona (Krausman and Etchberger 1995) looked at desert mule deer and bighorn sheep populations in the area of the Central Arizona Project canal before and after its construction. They found that, "additional water was not important to the deer or sheep populations."

In addition to questioning their utility, the studies suggest livestock-type waters may even have a negative effect upon native wildlife. For example, they could facilitate the spread of diseases or they might support populations of non-native and feral animals.

Yet the idea that more water means more wildlife, like so many myths of the Old West, sounds good. It's an easy concept for hunters and hikers to believe because they know one of the best places to spot wildlife is around waterholes.

However, just because an animal stops to take a drink at a waterhole doesn't necessarily mean it's relying on that water for its survival.

But what about all of those biologists warning us the majority of the West's wildlife depend, in some way, upon riparian areas for their survival? Well, just because there's water doesn't mean there's riparian habitat. The fact is, few livestock waters support significant amounts of riparian habitat. Many of them are so trampled by cattle they are considered sacrifice zones.

Besides, numerous studies have shown it's the amount and quality of suitable habitat that has the most influence on wildlife populations. Water is just one component of habitat and most Western wildlife species have adapted to its scarcity.

The tacit message from this new research is that just because something's good for cattle doesn't mean it's good for the land and the wildlife. Any analysis of the impacts of livestock grazing on native wildlife populations should focus on grazing's net effects. I doubt if there are very many situations on Western public lands where the marginal benefits being provided by livestock waters are outweighing the degradation cattle are inflicting on the entire area's natural habitat.

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ARIZONA WATER PROTECTION FUND 1996 GRANT APPLICATION MANUALS NOW AVAILABLE

The Arizona Water Protection Fund (AWPF) recently released its application manual for the 1996 funding cycle. In addition, AWPF staff will hold a series of application preparation workshops throughout the state to assist potential grant applicants. Grant application manuals or information on the application workshops is available by contacting Sherry Gates at the Arizona Department of Water Resources (602) 417-2400 ext. 7016.

DESERT PLANTS JOURNAL SEEKING SUBSCRIBERS

Desert Plants is a unique botanical publication produced by the University of Arizona for the Boyce Thompson Arboretum, intended for amateur and professional desert plant enthusiasts. It has been described as *...devoted to broadening knowledge of plants indigenous or adapted to arid and subarid regions, and to encouraging the appreciation of these plants.* Journal articles cover many aspects of desert plants including ecology, morphology, and physiology of the plants, horticulture and landscape architecture, and historic information on desert plant explorers. The journal is semitechical in nature, publishing a variety of manuscripts of varying levels of sophistication. For further information or to subscribe contact Dr. Margaret Norem, *Desert Plants*, 2120 E Allen Rd, Tucson AZ 85719; phone (520) 318-7046.

SPECIES PROFILE

THE KANAB AMBERSNAIL (KAS, *OXYLOMA HAYDENI KANABENSIS*)

Clay Nelson, Northern Arizona University

Since the experimental high flows in the Grand Canyon this part March, an increased public interest in the Canyon's flora and fauna has recently taken place. Therefore, it seems like an opportune time to write about one of the most exciting and cryptic organisms in the Colorado River corridor, the Kanab ambersnail (KAS, Succineidae: *Oxyloma haydeni kanabensis*). This organism has received a lot of much needed attention in the last few months, the bulk of which focuses on its endangered status and extant population in the Grand Canyon. However, when looking at more than just the habitat of the ambersnail and its vulnerability to high flows released from Glen Canyon Dam, it proves to be a truly fascinating species in its own right.

The Kanab ambersnail was proposed for emergency listing as an endangered species by the U.S. Fish and Wildlife Service in 1991 (England 1991*a*, *b*) and was subsequently listed (England 1992). Only three Kanab ambersnail populations were known to have existed at that time. Two populations occurred in southern Utah; one of which was extirpated due to development (Stevens et al. 1995). The second population occurs on privately owned land and is also threatened by commercial development. The third population exists at Vaseys Paradise in the Grand Canyon.

Only three Kanab ambersnail populations were known to have existed at that time.

Vaseys Paradise is a cool dolomitic spring which flows from the Red Wall Limestone of the Grand Canyon into the Colorado River. The vegetation around the spring consists mainly of monkey flower (*Mimulus cardinalis*), water cress (*Nasturtium officinale*), and poison ivy (*Toxicodendron rydbergii*). The ambersnails, which measure approximately 13 mm in length at maturity, are primarily found on the water cress and secondarily on the monkey flower. This raises an interesting question about the ambersnail's behavior concerning a host plant shift from the native monkey flower to a non-native water cress. A significant preference for water cress has been observed, but the benefits and reasons for this shift have not been answered. In the winter season, a degree of the vegetation dies off, which helps to explain the high winter mortality of the ambersnail population. However, the Kanab ambersnail experiences a swing in population size from 18,600 in March to approximately 104,004 in September. Peak reproduction takes place in mid-summer (Stevens et al. 1995) and snails enter a state of dormancy for the winter. Why does such a large percentage of the population not survive the winter? The reasons for this high mortality are also unknown and would be a great advancement in the understanding of the Kanab ambersnail's life history if answered.

Probably the most interesting aspect of the Kanab ambersnail's ecology is that it acts as a

host to a parasitic trematode, *Leucochloridium*. Infested snails contain one or two pink and green or brown-banded sporocysts that measure approximately 10 mm long and pulsate out of the snail's eyestalks at 2-second intervals. At high population densities, up to 25% of the population may be parasitized by this trematode (Stevens et al. 1995).

> *The life cycle of the genus* Leucochloridium *is especially adapted to infestation of many kinds of passive definitive hosts. The molluscan first intermediate host is always marsh-living* Succinea *species....The miracidium develops within the mollusc into a much-branched sporocyst within tailless cercariae are formed. These encyst within the sporocyst and each metacercaria can be seen to be surrounded by a thick protein coat. The metacercaria-filled sporocysts become very large, up to 12 mm in length, and pulsate rhythmically; their walls are striped with an alternating red and green or brown bands, given them the appearance of small caterpillars.*
>
> *At this stage the sporocysts penetrate a tentacle of the mollusc which they dilate and cause to pulsate. When the mollusc moves on to a leaf the movements of the tentacles and their pronounced colour attract birds. The tip of the tentacle usually only has to be touched, either by the leaf or by the bird's beak, for the sporocyst to break out and creep around the leaf, where it is eaten by the bird. A single parasitized mollusc can produce sporocysts containing metacercariae for a considerable time and can thus be a source of infestation for many birds* (Baer 1971).

Through observation, many birds have been seen around Vaseys Paradise, though only mice have been observed actually preying on the snails. If the Kanab ambersnail is an intermediate host, what is the definitive host for the *Leucochloridium*?

Many aspects of the Kanab ambersnail's life history, predator-prey interactions, behavior, and population dynamics need to be investigated in order to preserve this species, and property mitigate flow regimes from Glen Canyon Dam. The Kanab ambersnail is a very unique species in a very unique situation which has drawn quite a bit of media attention due to the experimental high flows in the Grand Canyon. However, after the snail's "15-minutes of fame" is over, many questions concerning its past, present, and future still need to be investigated to keep this species and the biodiversity of the Grand Canyon intact.

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PINTO CREEK: COTTONWOOD OR COPPER?

Pamela Hyde, Southwest Director, American Rivers

Another of Arizona's quality riparian areas — Pinto Creek, on the Tonto National Forest near Globe — is threatened, and without quick and concerted action will be lost. A large segment of the 28-mile length of Pinto Creek flows year round, and supports a healthy cottonwood-willow (*Populus fremontii-Salix* spp.) riparian forest. The riparian vegetation provides important habitat for breeding neotropical birds and a wide diversity of other wildlife species, and the creek serves as an important movement corridor. The elusive eared trogon (*Euptilotis neoxenus*), a rare neotropical bird, has been sighted in the Pinto Creek region, and botanists have recently discovered a hornwort — a small, water-loving moss that is rare in Arizona — in the area. The Tonto National Forest has found more than 8 miles of Pinto Creek eligible for Wild and Scenic River designation based on its scenic, riparian, and ecological values. Furthermore, Region IX of the U.S. Environmental Protection Agency has declared Pinto Creek "an aquatic resource of national importance," a designation that has only been given seven times nationwide since it was established in 1992.

During dry years, the mine's water demands might completely dry up Pinto Creek.

Cambio, Inc., a Canadian company whose gold mine in Guyana recently suffered a massive dam failure, is proposing to build the Carlota copper mine right on top of Pinto Creek and its tributary, Powers Gulch. The main pit would be directly in Pinto Creek, forcing the permanent relocation of approximately a mile of the creek out of the pit area and into a diversion channel. The heap leach pad would lie in Powers Gulch, requiring another mile-long permanent diversion channel for that tributary, and posing a threat of pollution in Pinto Creek.

The mine will use an estimated 1,600 acre-feet of water per year (750-1,200 gallons per minute) from three to five wells along Pinto Creek, with the highest water use in the summer when surface flows in the creek are the lowest. During dry years, the mine's water demands might completely dry up Pinto Creek. Furthermore, Carlota would not be the only draw on the water in Pinto Creek.

When the mine is shut down in 20 years, the legacy to Pinto Creek will be harsh. A mile of Pinto Creek will be confined to a permanent diversion channel lined with soil cement. Over in Powers Gulch, the heap leach pad will contain spent ore that cannot be neutralized. The area would have to be permanently monitored, despite "restructuring" of the heap to promote runoff, to ensure that no acid mine drainage is leaking into the creek system. Reclaimed areas will be revegetated, but the natural riparian systems cannot be reestablished.

A Draft Environmental Impact Statement for the Carlota Copper Project was released by the Tonto National Forest in February 1995 and a Final Environmental Impact Statement in the spring 1996. If the U.S. Forest Service and Army Corps of Engineers issue the necessary permits with no opposition from the Environmental Protection Agency, the project could be initiated within a year.

Your letters to the Environmental Protection Agency, the Army Corps of Engineers, and the U.S. Forest Service are urgently needed. Write:

Dick Sanderson
U.S. EPA, Federal Activities Division
401 M. Street, SW
Waterside Mall (Mail Code 2251A)
Washington DC 20460

Jimmy Bates
Deputy Director of Civil Works
Operations, Construction, and Readiness Division
Regulatory Branch, Department of the Army
U.S. Army Corps of Engineers
Washington DC 20314-1000

Paul Stewart
Tonto National Forest
2324 E. McDowell Rd
Phoenix AZ 85006

For more information, contact Pamela Hyde at American Rivers, (602) 234-3946.

1996 SPRING MEETING MARKS THE DECADE PLATEAU FOR ARC

This year's spring meeting was held in windy Prescott and included the celebration of the Council's 10th anniversary. The turnout was fantastic with over 110 attendees. Commemorative 10th Anniversary mugs were given to all pre-registered attendees and newly designed t-shirts were on sale. A silent auction was held throughout the day with many interesting items to bid on.

The theme for this year's meeting was *Restoration of Riparian Areas*. The morning plenary session included four speakers and a short panel discussion. Robert Ohmart, Center for Environmental Studies at Arizona State University, discussed three anthropogenic stressors on riparian habitats including water management, groundwater pumping, and livestock grazing. William Hunter, U.S. Fish and Wildlife Service in Atlanta, Georgia, gave an overview of the Partners in Flight program and how utilizing methodologies similar to those incorporated in the Partners in Flight program can help establish population and habitat objectives for birds. Mike Scott, National Biological Survey in Fort Collins, Colorado, discussed the importance of understanding long-term stream geomorphic processes on the restoration of riparian ecosystems. Julio Betancourt, U.S. Geological Survey in Tucson, Arizona, provided insight on the link between riparian areas in Arizona to global-scale climatologies. All four speakers participated in a question-and-answer session to close out the morning program.

The afternoon technical session included 14 presentations on a variety of topics including revegetating abandoned farmland, restoration efforts along the Bill Williams River, rehabilitation of degraded riparian areas along the Salt River, and the importance of xeroriparian areas to homeowners in Pima County. We also had four posters presented at the meeting.

A special anniversary banquet was held Friday evening featuring Duncan Patten, the Council's first President and cofounder, who spoke on what the Council has accomplished and suggested new directions for the organization. Following dinner there was musical entertainment by the Les Izmore band. Saturday morning there were field trips to Inscription Canyon Ranch, Watson Woods, Pine Creek, and Mint Creek.

1996 Annual Meeting Expenses

Expenses	
Breaks/lunch	$1,287.35
Banquet	1,101.75
Setup Fees:	
Bar	62.84
Dance Floor	25.00
Exhibit Table	25.00
Meeting Room	75.00
Tax	192.83
Tip	452.54
Meeting deposit	500.00
Additional expenses	296.03
Postage costs	294.40
Printing costs	446.07
T-shirts	1629.53
Mugs	590.73
Invited speaker ticket	268.00
TOTAL	$7,247.07
Deposits	
Registration	$4,447.50
Donations[1]	1,237.50
Silent auction[2]	565.00
T-shirt sales[3]	240.00
Mug sales[4]	20.00
Dinner	675.00
Refunded deposit	500.00
TOTAL	$7,675.00
Total deposits	$7,675.00
Total expenses	7,247.07
PROFIT	**$427.93**

[1]A big thanks to Ruth Valencia and Marie Sullivan for soliciting the donations and silent auction items. With a $500.00 APS donation we were able to reduce the dinner cost by nearly half resulting in our largest attendance.

[2]Silent auction items were donated. The amount displayed is from the sale of the items.

[3]We will recover costs of t-shirts as we sell them at future functions. Anyone wishing to purchase one should contact Cindy Zisner.

[4]Ninety-two people pre-registered and received free mugs. We still have a few left to sell for $5 each.

RIVER REVEGETATION PROJECT

Robert D. Ohmart, Center for Environmental Studies, Arizona State University

A cooperative effort by private industry, academia, university students, citizen volunteers, a rancher, the Arizona Riparian Council, and the U.S. Forest Service put 3,000 bank willow (*Salix exigua*) slips back into their habitat along 4 miles of the Verde River from Perkinsville downstream. Its importance is paramount in desert rivers in providing the woody root element, in conjunction with the fibrous roots of sedges (*Carex* spp., *Cyperus* spp.) and rushes (*Juncus* spp.), to stabilizing the banks of streams in the Southwest. It is a low-growing willow that spreads by seed and underground stems called rhizomes that sucker to give rise to new plants. This underground mat of woody roots and rhizomes will develop within a few years providing a riprap of vegetation that is highly resistant to the erosive forces of water when the river is in floodstage.

Maximum tree height is 6-8 feet. Another common name of the plant is coyote willow because the dense short growth naturally provided along streams allowed the wiley coyote to slip away if pursued by humans. Most importantly, once developed as dense habitat along the river's edge, the above ground portion will protect the water-deposited soils trapped in them in floods by flattening down and the leaves and stems slicking water from these soils. As the floodwater recedes the willowy stems spring vertically to begin slowing the sediment-laden waters and combing sediments out of the water building a natural berm and higher banks along the river's edge. The water outside the channel and willows is slowed returning to the river and sedimentation occurs on this area which is called the overbank or primary floodplain. This area receives nutrient-rich sediments and overbank saturation which promotes the establishment and growth of tree willows and cottonwoods (*Populus* spp.) plus more grasses, sedges, and rushes. The cottonwood-willow habitat is the most important wildlife habitat in the Southwest, supporting such species as willow flycatchers (*Empidonax traillii extimus*), Bell's vireos (*Vireo bellii*), summer tanagers (*Piranga rubra*), and other native species which depend on this habitat for their survival in Arizona. If this 4 miles of stream can be recovered, it will be a small but significant step in improving the quality of life for everyone by preventing more sediments and topsoil from our forest from being transported to Bartlett Reservoir, which reduces water-holding capacity. Wildlife habitats will be improved for a number of native birds and fish whose population numbers are rapidly declining throughout the Southwest.

When the area is grazed again it will only be done in the winter months when cattle are not attracted to the leafless willows and cottonwoods but to the dormant rushes, sedges, and grasses. The grazed species will have had the full growing season to store energy, set seed, and put up new plants from their rhizomes as well. The cattle will be removed from this riparian pasture when these herbaceous species still have a stubble height of 6 inches. Should a winter flood occur this guarantees soil protection from the erosive forces of the floodwaters and allows more nutrient-rich sediments to be trapped to further enrich the system. Everyone wins!

Willow Flycatcher

Students from Arizona State University, Northern Arizona University, and private citizens volunteered people power to cut, trim, and plant willow slips on February 23-24, 1996. Superior Companies (sand and gravel operation) in Phoenix allowed willow slips to be cut from their private lands in Camp Verde. The Verde Canyon Railroad company that runs the train tours from Clarkdale to Perkinsville, provided transportation of volunteers and willows into this roadless and otherwise difficult area to enter. The rancher has made the commitment to improve this river reach and control cattle grazing of the area until improvement occurs. This

U.S. Forest Service provided special use permits and moral support to accomplish the task. Arizona State University faculty provided technical and logistical support in the project.

An outstanding meal and comraderie were shared Saturday evening, capping the efforts of two grueling days of cutting and planting willow slips. We now wait for Mother Nature's cooperation and support as the cuttings begin to root themselves, bud out, and put on leaves.

For more information contact, George Yard, RR4, Box 960A, Flagstaff, AZ 86001-3127; Phone (520) 308-1365 or Robert D. Ohmart, Center for Environmental Studies, Arizona State University, PO Box 873211, Tempe AZ 85287-3211; Phone (602) 965-4632.

VOLUNTEER CORNER

The Nature Conservancy, Hart Prairie Preserve (14 miles from Flagstaff) seeks volunteers for a riparian restoration project in the Bebb's willow community. Tasks will include range plant surveys, willow counts, soil moisture determinations, fencing, removal of an earthen dam and associated ditches, and more. Volunteers will be needed from May through October, or any portion thereof. Photographers are always welcome. Housing may be available for volunteers staying at least six weeks. Volunteers are also needed to design and build an interpretative nature trail, as well as to design a teacher's workbook to prepare students for their visit to the Preserve. Trail construction, graphics, and/or education experience desired.

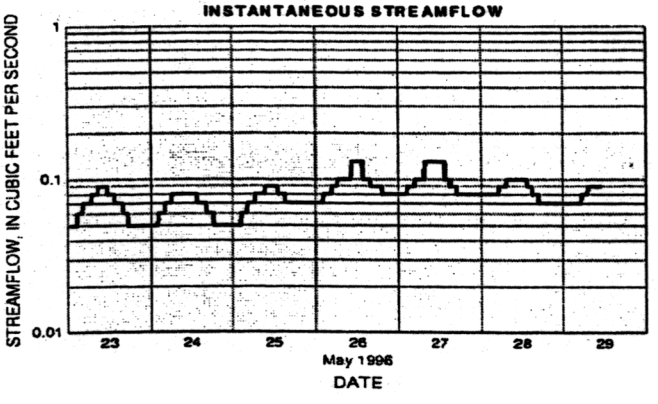
In addition, volunteers are needed to work in guest services and interpretation at the Preserve between June and September. A one-month minimum commitment is required. Housing may be available at the Preserve.

For information on these volunteer positions, please call Shelly Silbert at (520) 774-8892 or write: The Nature Conservancy, 114 N. San Francisco St., Suite 100, Flagstaff AZ 86001.

WHAT'S ON THE NET?

Cindy D. Zisner

In this issue we've made reference to the Grand Canyon through the SPECIES PROFILE of the Kanab ambersnail. As many of you are aware of the controlled flooding of the Colorado River I thought you might be interested in knowing about the U.S. Geological Survey (USGS), Water Resources of Arizona web site. The address is http://wwwdaztcn.wr.usgs.gov/flood.html and is sometimes difficult to get to because of Internet traffic. However, once there you can learn about the controlled flood, see real-time data, find out about beach conditions, etc., and the other links are endless. You can also see real-time data for selected stream-gaging sites in Arizona at http://wwwdaztcn.wr.usgs.gov/rtsw.html. The USGS cautions that this is *provisional* data that have not been reviewed or edited and are not citeable until that has occurred and been approved by the USGS. As an example I have downloaded a copy of the San Pedro River station at Charleston, AZ on May 29, 1996. Data is transmitted from each station at 3 to 4 hour intervals. Information concerning the accuracy and appropriate uses of these data or other hydrologic data may be obtained by contacting Chris Smith, U.S. Geological Survey, WRD, 375 S. Euclid, Tucson AZ 85719; phone (520) 670-6024 X251.



LEGAL ISSUES OF CONCERN

David Nelson and Chris Vamos, Law Offices of Kane Jorden von Oppenfeld Bischoff & Biskind, P.L.C.

PRIVATE AND PUBLIC INTERESTS IN CONFLICT: REGULATORY TAKINGS

Property owners who are denied permits to fill and develop "waters of the United States" on their property often seek to recover their economic losses by claiming that the government should pay for preserving such waters or wetlands on private property. This claim is often referred to as a "taking." The Fifth Amendment to the U.S. Constitution provides that no private property shall be taken for public use without just compensation. "Regulatory takings" are alleged to occur when environmental statutes and regulations significantly impact private property rights. Thus, "regulatory takings" claims are made when a state prohibits building in rural or riparian areas or on mountain ranges in urban areas, when the federal government prohibits billboards on interstate highways, when a local town council prohibits junkyards, or when a government study proposes to regulate any activity on private property that gets in the way of private profits.

To date, most takings challenges have been resolved in the courts. The leading federal "takings" case is *Lucas v. South Carolina Coastal Council.* In *Lucas*, the U.S. Supreme Court held that an environmental regulation which deprives a private property owner of all viable economic use is a governmental taking requiring compensation. However, the Supreme Court did not articulate a bright line test for determining at what point all "economically viable use" of the property has been taken, triggering governmental compensation. For example, when a regulation requires a developer to leave 90% of a rural tract in its natural state, it is unclear whether the courts would analyze the situation as one in which the owner has been deprived of all economically viable use of the burdened portion of the tract, or as one in which the owner has suffered a mere diminution in value of the tract as a whole.

"Regulatory takings" are alleged to occur when environmental statutes and regulations significantly impact private property rights.

The leading "takings" case in Arizona is *Corrigan v. City of Scottsdale.* Ms. Corrigan, whose father owned the D.C. Ranch, purchased 5,738 acres of undeveloped land in the McDowell Mountains. In 1963, the City of Scottsdale rezoned the area, establishing "no development" zones which effectively prohibited development of 74% of Corrigan's land. The Arizona Supreme Court affirmed that the zoning ordinance was unconstitutional under Arizona's Constitution, and further, that Ms. Corrigan was entitled to damages for a "temporary taking." The City of Scottsdale was required to compensate Ms. Corrigan for her economic loss suffered between the time the "no development" ordinance went into effect and the time it was declared unconstitutional.

Private property advocates continue to lobby their legislators to make governmental takings a legislative concern, seeking to broaden the definition of "taking" beyond that set forth in the federal and state constitutions. In May 1995, the U.S. House of Representatives passed H.R. 961, to amend the Federal Water Pollution Control Act. In its reauthorization, the House crafted provisions to take into account the potential for regulatory takings and offer greater protection to private property owners, in particular,

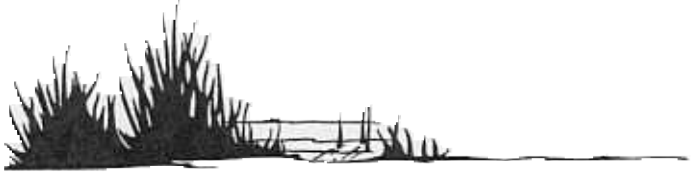
those affected by wetlands regulations under Section 404.

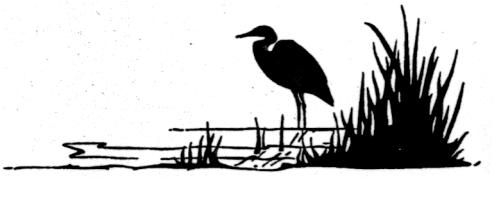
In Section 802 of H.R. 961, the statement of purpose for wetlands management, the House made clear that Section 404 should not "limit the use of privately owned property so as to diminish its value" [Section 802(b)(2)]. To carry out this goal, the House put forth wetlands Title VIII, creating three classifications of wetlands jurisdiction. Class C Wetlands, for example, would include "wetlands within industrial, commercial, or residential complexes or other intensely developed areas that do not serve significant wetlands functions as a result of such locations," and would no longer require a permit. In removing permit requirements, the House bill essentially removed regulation, and thereby the chance for regulatory takings, of all Class C wetlands.

Where an area is still regulated as a wetland following the amendments, H.R. 961 attempts to resolve the baseline controversy of when the government must offer compensation. Under 404(d), Right to Compensation, the federal government would compensate property owners where agency action limits property use and fair market value of that portion of property diminished by 20% or more. Where diminished by 50% or more, the government would, in some cases, buy the entire property for fair market value.

Other aspects of H.R. 961 make it easier to obtain a wetlands permit and lessen the chance that a property owner will be denied the opportunity to develop his or her land. Particularly relevant to Arizona, H.R. 961 provides that the mitigation requirements for Class A and B wetlands areas (those that require permits) would be met if activities are carried out in accordance with a state-approved reclamation plan or permit requiring recontouring and revegetation following mining activities. H.R. 961 also mandates Mitigation Banking regulations, another means by which to satisfy mitigation requirements, and allows for both the preservation and donation of Class A and B wetlands and the creation of wetlands.

While H.R. 961 has passed the House, the bill has yet to be taken up by the Senate, and faces a doubtful future in the election year. Representing the groundswell of support for private property rights, however, it is likely to resurface in some shape or form following the election, and offer some form of takings compensation. For more information on regulatory takings issues, please contact Rolf von Oppenfeld or the authors at 955-9200. For those interested in tracking the latest legislative developments in the Clean Water Act reauthorization, Congressional Representatives generally will provide their constituents with copies of proposed legislation.





NOTEWORTHY PUBLICATIONS

Ron Tiller

BOOKS

Graf, W. L. 1994. Plutonium and the Rio Grande: Environmental Change and Contamination in the Nuclear Age. Oxford University Press. 352 pp.

The author offers a history of the disposal of plutonium from Los Alamos National Laboratory into nearby canyons leading to the Rio Grande. The book includes extensive appendices, maps, and photographs.

PROCEEDINGS

Shaw, D. W. and D. M. Finch, tech coords. 1996. Desired future conditions for Southwestern riparian ecosystems: Bringing interests and concerns together. Gen. Tech. Rpt. RM-GTR-272. Fort Collins, CO: U.S. Dept. Agric., Forest Service, Rocky Mtn. For. Exp. Stn. 359 p.

This symposium brought together scientists, natural resource managers, conservationists, and representatives from the private sector to share their findings, ideas, and visions for managing, conserving, and restoring riparian ecosystems. The proceedings is divided into sections on the history, ecology, and management of the Rio Grande; general ecosystem hydrology and ecology; human history, values, needs; ecosystem restoration and recovery; and current and desired future conditions.

ARTICLES

McCormick, F. H., B. H. Hill, L. P. Parrish, and W. T. Willingham. 1994. Mining impacts on fish assemblages in the Eagle and Arkansas Rivers, Colorado. Journal of Freshwater Ecology 9:175-179.

These researchers observed significant differences in fish assemblages among sites impacted by mining and control or recovering sites. Low species richness at all sites made it difficult to apply the Index of Biological Diversity. However, a native fish, the Paiute sculpin (*Cottus beldingi*), may well serve as an indicator species in this area. Sculpins disappeared from sites adjacent to mining influences though they were numerous a few hundred meters upstream.

Shafroth, P. B., J. M. Friedman, and L. S. Ischinger. 1995. Effects of salinity on establishment of *Populus fremontii* (cottonwood) and *Tamarix ramosissima* (saltcedar) in southwestern United States. Great Basin Naturalist 55(1)58-65.

The exotic saltcedar has replaced native cottonwood along many streams in the southwestern U.S. These researchers used controlled field and lab experiments to examine the influence of river salinity on seed germination and first-year survival of saltcedar and Rio Grande cottonwood. Germination of cottonwood was reduced by 35% with increasing salinity under field conditions, whereas saltcedar remained unaffected. No significant effects of salinity were observed on mortality or above- and below-ground growth of both species.

Hart, R. H. and W. A. Laycock. 1996. Repeat photography on range and forest lands in the western United States. J. Range Manage. 49:60-67.

Repeat photography is a valuable tool for demonstrating the effects over time of climate, management and other variables on range and forest lands. In this article the authors present a bibliography of 175 publications using repeat photography, with information on the ecosystems photographed, states where they are located, and dates when the photographs were taken. Several references are included for Arizona riparian areas.

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 $15. 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 January with the deadline for submittal of articles August 15, 1996. Please call or write with suggestions, publications for review, announcements, articles, and/ or illustrations.

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The Arizona Riparian Council

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CONTACT
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(602) 965-2490
ANNUAL DUES ARE $15

CALENDAR

The Salt Cedar Management Workshop. June 12, 1996. Marriot's Rancho Las Palmas Resort, 41000 Bob Hope Dr., Rancho Mirage, California 92270-4416. Contact Carl E. Bell at (619) 352-9474 or FAX (619) 352-0864.

Soil and Water Conservation Society's 51st Annual Conference. July 7-10, 1996, Keystone Resort, Colorado. Call 1-800-THE-SOIL (843-7645) for more information.

Wetlands '96: Forming Fair and Effective Partnerships. July 9-12, 1996, Key Bridge Marriott, Washington, D.C. Contact the Association of State Wetland Managers, PO Box 269, Berne, NY 12023-9745; (518) 872-1804; FAX (518) 872-2171.

Ninth Annual Hydrological Society Symposium. September 12-14, 1996. Prescott Resort, 1500 Highway 69, Prescott, Arizona. Contact Suzanne Kirk at (602) 861-7452 for registration information; you may FAX a completed registration to her at (602) 861-7431.

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