The Arizona Riparian Council Newsletter

Volume 9, Number 1 January 1996

EVOLUTION OF THE RIPARIAN ECOLOGY EDUCATION PROJECT (REEP) AT THE HASSAYAMPA RIVER PRESERVE

Val Little, Preserve Manager, Hassayampa River Preserve, Nature Conservancy

The Arizona Chapter of The Nature Conservancy places a high premium on the educational and experiential aspects of conservation work. That priority is evidenced by the Conservancy's preserve system in Arizona. These preserves are highly visible and responsive to the visiting public and to the communities in which they occur. We believe that adequate stewardship of these rare sites with such high biological value is only possible with support from a well-informed and motivated public.

10TH ANNIVERSARY MEETING APRIL 12-13 IN PRESCOTT. SEE INSIDE FOR DETAILS!

This philosophy translates, at the Hassayampa River Preserve, to a broad array of interpretive and educational programs. The core of this programming is the Riparian Ecology Education Program (REEP). The REEP is designed for classroom teachers and for visiting school groups. The goal through REEP is to maximize the experience of each youngster and teacher who visits the Preserve.

In 1994, we were fortunate to be awarded a Heritage Grant from Arizona State Parks, which provided the seed money for development of our two-pronged approach to teaching riparian ecology. The first REEP focus is the creation of a riparian ecology curriculum for high school students. The second REEP feature is an ongoing series of riparian ecology workshops for teachers. These two components make for well-informed teachers and motivated students, enabling us to impart principles of, and appreciation for, riparian ecology — based upon science. Simultaneously, we help foster a conservation ethic among current and future generations.

REEP Curriculum

This curriculum consists of an introductory section and a menu of educational activities from which teachers and students can select. *The Hassayampa River Preserve Introduction to a Riparian*

(...Continued Page 3)

Inside This Issue

EDITORS' MESSAGE

Thank you so much for reading our newsletter so thoroughly. We received a letter from Richard Quartaroli, Glen Canyon Environmental Studies, who pointed out an incorrect citation in our lead article, *The Lower Colorado River Ecoregion* by Wes Martin (Vol. 8, No. 3). The error was ours (not the author's) and was a mistyped volume and page number. The correct citation should be as follows:

Grinnell, J. 1914. An account of the mammals and birds of the lower Colorado River Valley, with especial reference to the distributional problems presented. Univ. Calif. Publ. Zool. 12:51-294.

Thank you Richard for finding it. We encourage everyone to provide us with feedback, good or bad, so that we continue to produce an informative and interesting newsletter.

With this issue we will be starting a new feature. A Volunteer Corner which will list projects seeking volunteer help. Along with the project will be the contact person for that project to be contacted directly. If you have any projects that need voluntary assistance please let us know and we'll put it in the column. However, please be aware that the newsletter only occurs three times a year, so plan ahead.

Please plan to attend our 10th Anniversary meeting (see page 9 for details) in Prescott! Hope to see you there!

Jeff and Cindy

SOIL AND WATER CONSERVATION SOCIETY AT ARIZONA STATE

The Arizona State University (ASU) Student Chapter of the Soil and Water Conservation Society (SWCS) has started a scholarship fund designed to be awarded to students in the environmental field. The Society wants to thank their advisor, Dr. Douglas Green, for his generous contribution. The scholarship has yet to be named and requirements set up for receiving it, these will be determined by members. The goal is to reach a minimum of $10,000.

It is the first scholarship of its kind at ASU. So far the Chapter has raised $400 through donations, membership fees, and a raffle, but they are far from their goal and are seeking donations. They are a nonprofit organization with 501(c)(3) status, thus all donations are tax deductible. Donations should be addressed to The Soil and Water Conservation Society, Department of Planning and Landscape Architecture, Arizona State University, Tempe AZ 85287-

FIRST ANNUAL SWCS POSTER SESSION

A call for posters! The ASU Chapter of the Soil and Water Conservation Society has scheduled a multidisciplinary environmental poster session to be held during the last week of April in the Memorial Union at ASU. This session will be an excellent opportunity for undergraduates, graduates, faculty, and the professional community as it will showcase the variety of research being conducted in all areas of the environment. If you are interested in participation, please contact Terri Warnecki at (602) 940-5284, or Aaron P. Bradford at the Center for Environmental Studies at (602) 965-2975.

(....Continued from Page 1)

Treasure presents an overview of the Hassayampa River Preserve and its importance within the ecosystem. It covers the natural and cultural history of the Preserve and the basics of riparian ecology. This portion of the curriculum also provides an annotated checklist of organisms to be found at the Preserve, de signed for use by any teacher who wishes to use the Preserve as a learning resource.

Other components of the REEP program consist of activities for students to complete before and after their Preserve visit. There are also several options for onsite field study, and a component that assesses the extent of learning which has occurred. These curriculum activities enable a high school class, in any subject, to utilize the Preserve as a teaching laboratory. Students are also able to make a positive and practical contribution to Preserve management via their data collection or analysis, information gathering or problem solving.

REEP Teacher Institutes

These workshops are organized for the benefit of teachers at all levels. The Institutes are designed to help teachers, particularly those who are not science teachers, become informed and comfortable with the topic of riparian ecology. Institute speakers explore various aspects of riparian ecology using the Hassayampa River Preserve as a case in point. In addition, the teachers are prepared by experiencing the same hands-on activities that their students will encounter during their study of the Preserve. The next REEP Institute is scheduled for February 24 and 25, 1996.

We are currently host to nearly 1,000 school children, and we are training 60 teachers each year. Through REEP we believe that teachers and students in central Arizona are getting the most exciting and rigorous introduction to and experience in the subject of riparian ecology available anywhere.

No words ring sweeter in my ears than those of a youngster, who having recently visited Hassayampa on a school field trip, returns with a parent or two in tow, saying "Look Dad, I told you they had mountain lion poop here," or "Come on Mom, you've got to see these cool lizards we learned about." I know then that REEP makes a difference.

CERTIFICATION OF SAND AND GRAVEL FACILITIES BY ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY QUESTIONED

Sand and gravel facilities typically operate within watercourses because these areas provide sources of aggregate which are clean and suitable to meet specifications without expensive processing. The Arizona Department of Environmental Quality (ADEQ) has the authority through Section 401 of the federal Clean Water Act to evaluate projects which are located in or near watercourses. The purpose of ADEQ's review is to minimize negative impacts to water quality from such activities. Also considered are structures and roads, upstream and downstream bridges, and most importantly, riparian vegetation.

In 1993, the Tulloch Rule required sand and gravel plants to obtain a Clean Water Act Section 404 federal permit from the Army Corps of Engineers (Corps). According to the State Mine Inspectors Office, there are 225 aggregate facilities in Arizona. There may be as many as 50 on Indian reservations and another 30 operating outside of watercourses. This leaves a minimum of 145 that will need to be permitted by the Corps and ADEQ. The deadline for filing permits is August 1996, and those who do not apply for a permit are in violation.

It has been proposed that ADEQ precertify all sand and gravel facilities. Precertification means that a set of general conditions would be prepared to cover *all* sand and gravel facilities statewide. Those

(...Continued page 4)

(...Continued from page 3)
conditions would be given to the Corps who puts them into the terms and conditions of the 404 permit. At first this may seem more efficient. However, no two sand and gravel facilities are the same. Each individual facility should be evaluated for impacts to water quality.

Legislation has been proposed addressing the issue of precertification of activities. The 401 Certification process provides a mode to protect bridges, roads, structures, and valuable riparian vegetation from activities that take place in or near watercourses. The Arizona Riparian Council recognizes that the 401 Certification provides the state an opportunity to play an important role in protecting riparian vegetation. If required, the Council will support maintaining ADEQ's role in reviewing projects such as sand and gravel mining through the 401 Certification.

FALL GET-TOGETHER OCTOBER 14-15, 1995

The Fall Get-Together was held at the Sierra Ancha Experimental Research Station near Young, Arizona. The weather was beautiful and the surroundings were very relaxing. We began our meeting by hearing from Jerry Gottfried of the U.S. Forest Service about the long history of the Research Station and work that has been conducted on the Sierra Ancha Experimental Forest over the years. The historical information was quite interesting and the research informative. Howard Okamoto, Pleasant Valley Ranger District, told us how riparian recreation management is being conducted in the Pleasant Valley Ranger District. Following these presentations we all gathered to brainstorm about our annual spring meeting and then everyone was on their own to relax, explore, hike, etc. A good time was held by all, even with all the "logs sawed" in the night. The attendance was very low with only about 15 people. To those of you who didn't attend you were missed and we hope you'll be able to join us next year.

Arizona Riparian Council members listening to Jerry Gottfried, U.S. Forest Service, tell about the history of Sierra Ancha.

SPECIES PROFILE

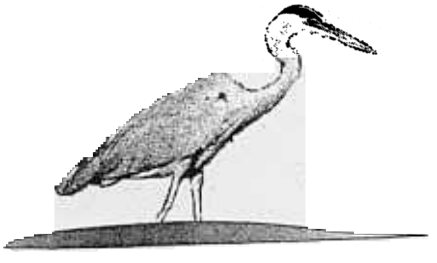
HERON IN.....

Matt Chew, Arizona State Parks

I was admonished at the outset that this was supposed to be a serious discussion of herons, particularly as they relate to the Hassayampa River...

Herons are basically opportunistic predators. They are similarly equipped variations on a single, specialized foraging theme- relatively long legs, long necks and long, stabbing beaks. They eat anything they can catch, which means fish, frogs, tadpoles, crayfish, rodents, small birds, snakes, lizards, turtles, insects, worms, and potentially, each other's nestlings. Don't be shocked. There's a lot of this kind of thing going on out there.

Their long legs facilitate wading in water deep enough to support sizable prey species. Herons also have long toes, a sort of mud-walking version of snowshoes. Long, straight beaks are used both for "closed" jabbing and "open" snatching. But their most unusual hunting tool is that sinuous neck, which allows for instantaneous, chameleon-like strikes from an unexpected distance. Another interesting thing to consider is that a heron must instinctively, or by learning, be able to adjust for refractive distortion when targeting subsurface prey.



Great Blue Heron

There are several members of the heron tribe that frequent central Arizona waters. A couple are widely common, year-round residents. The rest are either more localized, or seasonal visitors.

Great Blue Heron (*Ardea herodias*)

Both words in the scientific name mean heron — *Ardea* in Latin and *herodias* in Greek. This redundancy seems to recur with a few other heron species names as well. Along the Hassayampa, your most likely heron experience would be a rear view of a retreating Great Blue. Great Blue Herons are the perimeter alarm system of a stream riparian community. They are extremely wary and, unlike many visually oriented predators, they have virtually 360 degree vision. They are essentially somewhat claustrophobic, preferring sites where their vision is unimpeded by shrubs or undergrowth. Sometimes, for reasons that can only be guessed at, a Great Blue Heron will allow a human to approach within 50 ft or so, but this is quite the exception.

Great Blues are also the most obviously vocal of our herons. Their typical alarm call sounds something like a raven would if forced to communicate through a vacuum cleaner hose. I've heard a Great Blue make the most pathetic and heart-rending sounds through that hose, too; but that's a story for another time.

As might be expected from their size (42-52 inches long; wingspan to 7 ft; 5-8 lbs), Great Blues can forage in deeper water than many predators. I've seen them up to their bellies, where they can hunt large fish. These are often skewered on a closed or partially open beak, then maneuvered into a head-first position for swallowing whole. Most prey are swallowed this way, to avoid complications; this is probably reversed for crayfish. Along the Hassayampa, their major prey must be longfin dace (*Agosia chrysogaster*) ; and it takes a lot of dace to equal a one or two pound sucker. (Audubon reported seeing a Great Blue Heron pirating fish from an Osprey [*Pandion halieatus*] in flight.)

(...Continued page 6)

(...Continued from page 5)

Great Blue Herons are colonial nesters; in Arizona, their colonies are most likely to be found in stands of large cottonwoods (*Populus fremontii*) or other riparian trees. They typically lay 3-7 eggs, and like other herons feed their altricial young on regurgitated, semi-digested prey.

Herons will migrate from areas where open water is unavailable during the winter. But it seems likely that small desert rivers aren't the greatest habitat for Great Blues. They probably do best along shallow ponds or rivers with deep pools. Ironically, the Salt River through the Phoenix area includes such places, full of small tilapia (*Tilapia* spp.) and other introduced fish that are probably optimum heron fodder. And the herons are hanging around there to prove it.

Twice I have had both motive and opportunity to try to help a distressed Great Blue Heron. One bird was very calm, and very sick. The other was injured, and frantic. While I held the latter, I took a sudden, unexpected, and painful hit in the right temple from that long beak — mainly because I was lucky enough to be turning my head while the bird struck at my eye. There is one believable report that a defensive blue heron put its beak through a wooden boat oar. Be careful.

Green-backed Heron

Green-backed Heron (*Butorides striatus*)

The Green-backed Heron is the hapless victim of a minor taxonomic controversy between the "lumpers" and "splitters" at the American Ornithologists' Union. Informed sources tell me that it will just be the Green Heron again on the next checklist. As the "Green" it was *Butorides virescens*. At the moment (I think) as the "Green-backed" it is *B. striatus*. If the more southerly "Striated Heron" and the "Green Heron" are split again... Controversy! The Green-backed Heron has all this and more. "*Butorides*" is Latin for "bittern," if that allays any confusion. Probably not.

The Green-backed Heron has a 26-inch wingspan, more or less, and is 18-22 inches long. It only weighs 6 or 7 oz; quite a bit smaller than the Great Blue. It is a very cryptic, but also very high-strung little bird, and will flush if approached, even though you might not notice it otherwise. They are one of my perennial favorites to watch. Thanks mainly to fortuitous landscape plantings, I once snuck up to within about 6 ft of one at Encanto Park in Phoenix and watched it pick off a couple mosquitofish (*Gambusia affinis*). There was one at some attraction in Florida that made the news about 10 or 15 years ago by learning to bait minnows with tidbits thrown to it by tourists. It would drop the item on the water, the fish would come to nibble, and the bird would eat the fish. Highly specialized predators are rarely terribly creative, but this one obviously made an important observation one day and capitalized on it.

As you might expect, the Green-backed preys on small critters like minnows, beetles, leeches, and snails to greater effect than its tall cousins do. They are usually solitary nesters, laying 3-6 eggs. There are probably quite a few lurking along the Hassayampa, wherever there are dace to dine on.

Black-crowned Night-Heron (*Nycticorax nycticorax*)

The Black-crowned Night-Heron may or may not be found along the Hassayampa, but it is present in central Arizona, and is an interesting case of a bird adapting to changing circumstances. In the early seventies, its local status was questionable, and there were few

Black-crowned Night-Heron

riparian areas around Phoenix where it could breed. While at a baseball game at Phoenix Stadium in about 1991, I was surprised to see one flying north from the Salt River area. Subsequently we "discovered" that there were numerous nests appearing in palm trees and Aleppo pines (*Pinus halepensis)*

at the nearby Phoenix Zoo. Night Herons have been breeding there with what appears to be considerable success ever since, and are often encountered at drainage runoff puddles in the Salt River channel, and along canals and other irrigation works in the general vicinity. I watched one that appeared to be longingly (and patiently) assessing its chances of picking off some 1-2 lb grass carp (*Ctenopharyngodon idellus*), just out of reach in the SRP Crosscut Canal east of Papago Park.

Black-crowns are nocturnal but not exclusively so. And though fairly large (1.5-2.5 lbs), they're not always easy to notice. Immature birds have a very effective camouflage pattern, but adults are strikingly black, gray and white. They are 23-28 inches long, with a wingspan of about 3.5 ft. They may be the most likely of our herons to eat other birds. They are colonial nesters, sometimes with other heron species, and usually lay 3-5 eggs. *Nycticorax nycticorax* means "night raven, night raven."

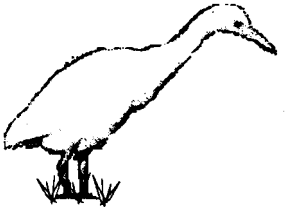
Visitors

Three other heronish birds are also seen with some regularity in central Arizona. All are generally white-plumaged, and all are generally referred to as egrets. In the winter, Great Egrets (*Casmerodius albus*, or "white adorned heron") can be found wherever they have access to fish. We saw a flock of about 60, in flight, during the 1995 Gila River Christmas Bird Count. They are a little smaller than Great Blue Herons, with yellowish bills and black feet. These and their slightly more elegant-looking and smaller cousins the Snowy Egret [*Egretta thula*, or egret (French) egret (Chilean colloquial)] were plundered nearly to extinction to decorate hats around 1900, but are now widely recovered and reestablishing. Snowy Egrets have black beaks, black legs, and bright yellow feet. They have been observed to stir up bottom debris to locate prey. They also sometimes run and chase prey. So, those yellow feet may have a "startle" function, or even provide some contrast or a targeting reference. The last and least white of the three is the Cattle Egret (*Bubulcus ibis*). This is an Eastern Hemisphere native that seems to have found its way from Africa to South America without human intervention, and has spread into temperate areas. It is locally common in agricultural areas of southern California and southwestern Arizona. If any of these species breeds in central Arizona, I haven't heard about it yet.

Great Egret

Snowy Egret

Cattle Egret



ARIZONA WATER PROTECTION FUND COMMISSION AWARDS $6.8 MILLION

Last November, the Arizona Water Protection Fund (AWPF) Commission held two days of meetings to select grant recipients for the first AWPF funding cycle. Eighty-two (82) grant applications were submitted last August, totaling over $27 million. The Arizona Legislature appropriated approximately $10 million to the AWPF from the state General Fund for the first funding cycle. The Commission selected 24 grant recipients at their November meetings, totaling $6,861,490.

Grants were awarded for projects in eight counties within Arizona. The area of the state that had the highest number of projects selected was Cochise County, where six projects will be located. Other counties with more than one selected project included Yavapai (4), Pima (4), Maricopa (2), Coconino (2), and Apache (2). One project was selected in each of the following counties: Pinal, Graham, Gila, and Santa Cruz.

Applications eligible for funding were divided into three general categories: (1) Water Acquisition, Capital Projects, and Other Measures; (2) Research and Data Collection; and (3) Water Conservation. Approximately 95% of the total funding (over $6.5 million) was awarded for 15 projects within the Water Acquisition, Capital Projects, and Other Measures category. Projects within this category are designed to "enhance the quality of Arizona's riparian ecosystems by restoring appropriate physical site conditions." Types of projects which are eligible for funding under this category include acquisition of Central Arizona Project (CAP) water or effluent, watershed based or riparian area protection/restoration plans, upgrading wastewater treatment plants, and developing constructed wetlands.

Nine (9) projects totaling $351,702 were selected for funding within the Research and Data Collection category. Grant funding for all projects within this category are limited to 5% of annual funding. The stated goal of research projects is to "improve our understanding of how changes in water quantity and quality influence function, structure, composition, or integrity of Arizona's riparian ecosystems or how human-related activities influence changes in water quantity or quality."

Projects eligible for funding under the final funding category, Water Conservation, must have a "goal of ultimately enhancing the quality of Arizona's riparian ecosystems by maintaining their water supply, through basic research, education, development or implementation of water conservation programs." Types of projects within this category include purchase of water conservation equipment, conservation demonstration projects, and development of water conservation techniques. The Commission received only four applications for funding within this category. The Commission did not select any of the applications in this category for funding.

According to Tricia McCraw, AWPF Program Manager, the second funding cycle (FY 96) should be initiated this spring. Ms. McCraw anticipates that grant application manuals for FY 96 will be available for distribution in April or May. For more information contact Tricia McCraw at the Arizona Department of Water Resources in Phoenix at (602) 417-2400 ext. 7310.

10th Anniversary Meeting of The Arizona Riparian Council

The Tenth Anniversary Meeting of the Arizona Riparian Council will be held Friday and Saturday, April 12-13, 1996. *Restoration of Riparian Areas* is the theme of the meeting which will be held at the Prescott Resort in Prescott, Arizona. This meeting marks the Council's ten year anniversary and some special activities have been planned. Onsite registration for the meeting will be from 8 to 10 AM on Friday. The morning plenary session will begin at 9 AM with three invited speakers talking on various aspects of riparian restoration. William C. Hunter, with the U.S. Fish and Wildlife Service in Atlanta, Georgia, initiated the formation of the Arizona Riparian Council. He will speak about the Partners in Flight program and the restoration efforts for various bird species. Mike Scott with the National Biological Survey in Fort Collins, Colorado, will speak on geomorphological processes for natural reestablishment of native riparian vegetation. Robert Beschta from the College of Forestry, Oregon State University, Corvallis, Oregon, will provide an ecological perspective for undertaking restoration efforts that are directed at the improvement of riparian/ aquatic ecosystem functions.

Lunch will be at the Prescott Resort and is included in the registration cost. Technical papers will be presented in the afternoon. A brief business meeting will conclude Friday's meeting agenda. Included in this meeting will be the election of President, Vice President, and one Member-At-Large. Currently, Ruth Valencia is running for President and Marie Sullivan is running for Vice President. Since Marie is running for Vice President, her remaining two years of Member-At-Large position will also be up for election. All members are eligible to become officers, so if you are interested or would like to nominate someone, please contact Matt Chew at (602) 542-2148.

A special anniversary banquet has been planned for Friday evening at the Prescott Resort. Along with good food, Duncan Patten will be our dinner speaker. Duncan was the first President of the Council and held that position for first five years. He will tell us about the "good old days" and about some of the restoration projects he has worked on. A silent auction has also been planned to help raise funds for the Council. The items being auctioned will be on display during the meeting on Friday. The highest bidders will be announced after dinner during the evening's entertainment. We have arranged for Les Izmore, a band playing original and classic blues and folk music, to play after the banquet. This will provide an opportunity for you to renew old acquaintances and make new friends. Please bring your spouses and significant others and plan to attend.

A field trip is scheduled for Saturday to look at various riparian areas around Prescott. Field sites have not been confirmed at this time.

Those who preregister for the meeting this year will receive a *free* commemorative 10th Anniversary Arizona Riparian Council mug. These mugs will also be available for purchase at the meeting. We also plan to have new T-shirts for sale. The preregistration form should be inserted into your newsletter, if not, contact Cindy Zisner at 602-965-2490 to get a copy. Please make you hotel arrangements early as this area has high tourism. Double or single occupancy room rates are $75 at the Prescott Resort and their reservation number is 1-800-967-4637. There are also other hotels and motels in the area (contact Cindy Zisner for a list).

WE HOPE TO SEE MANY OF YOU THERE.
PLEASE PLAN TO ATTEND THIS VERY SPECIAL MEETING!

ARC EDUCATIONAL EVENTS

Cindy D. Zisner, Education Committee

As you all know, the newsletter you are reading is one of our greatest educational tools. However. We also have fact sheets available on **Riparian, Functions and Values,** and **Water**. Very soon a fourth sheet will be available concerning flooding. Our sheets have been requested by many state, tribal, and federal agency offices, in addition to schools and The Nature Conservancy Preserves throughout Arizona. In fact, our sheets are used in the Riparian Ecology Education Program at the Hassayampa Preserve (see article page 1). We have also branched out of state to New Mexico through Gila Watch and have had our fact sheets travel as far as Austin, Texas, Missoula, Montana, and Juneau, Alaska.

The fact sheets are also distributed when we attend environmental fairs. Those of you who have attended our annual spring meeting are aware of our tabletop display about riparian areas. When we first had the display, Tanna Thornburg put the photos together and exhibited it at many educational fairs. In addition to Tanna, Marty Jakle, Diane Laush, and Kris Randall have exhibited it for the Council at the Deer Valley High School Environmental Education Fair, Verde River Days, and a Scenic Byway Dedication (Bureau of Land Management).

Through the help of volunteers we attended several fairs in 1994-95 that you're probably not aware of. In September 1994 (Cindy Zisner and family) the display was at Dead Horse Ranch State Park for Verde River Days. In February 1995, we again attended the Deer Valley High School Environmental Education Fair and Easter weekend (April 15 and 16, 1995) we participated in the Phoenix Zoo's *Celebrate Nature* weekend (Jeff Inwood, Kathy Killian, Ron Tiller, Cindy Zisner and family). The Zoo provided materials for us to help children make cattails and we were kept very busy. We were also invited to attend an Earth Day fair but just were not able to do so. On May 18th, we participated in the Navajo Nation Education Fair in Window Rock (Roy Jemison) and, tentatively, this will be held again on May 10, 1996. In September 1995, we were back at Verde River Days in Cottonwood (Kris Randall and Cindy Zisner). On October 5-6, 1995, we shared a booth with the Center for Environmental Studies (Pat Chase and Cindy Zisner) at the Arizona Science Teachers Association Convention in Mesa. We have also been invited to attend the Arizona Wildlife Federation's Walk for Wildlife on February 10, 1996.

Thanks to all of you who have volunteered. If anyone is interested in exhibiting the display or know of any upcoming events, please contact Cindy Zisner at (602) 965-2490 or e-mail at cindydz@asu.edu.

ENVIRONMENTAL ENHANCEMENT PROGRAM U.S. BUREAU OF RECLAMATION, PHOENIX OFFICE

This program was initiated in 1993 to examine opportunities for using existing Central Arizona Project (CAP) funding authorities to benefit fish and wildlife, within the Phoenix Office's service area. Projects emphasize wetland and riparian habitats enhancements. There are three priority objectives that guide the projects proposed under this program: (1) protection of intact, ecologically important habitats and/or ecosystems; (2) restoration of ecologically important habitats and/or ecosystems; and (3) creation of ecologically important habitats.

The highest priority is given to protection of intact habitats and ecosystems because it is recognized that high value habitats (including riparian and wetland habitats) are difficult to restore once they are degraded. Based on the above priorities, the best candidates for protection under priority 1 are areas of high resource value having a high probability of being negatively impacted and which are part of a larger, important landscape unit. Priority 2 projects emphasize those with a high probability of promoting the full recovery of functional habitats or ecosystems; e.g., placing water back into a stream, controlling overgrazing, and restricting off-road vehicle impacts.The priority 3 projects focus on developing habitat resources to meet a local need. Examples include, creating habitat by converting agricultural fields and irrigation water into a wetland/riparian area, or developing habitat along with groundwater recharge.

In order to be eligible for funding under this program a project must meet the following criteria:

- a local sponsor must be willing to ***assume at least 50% of the capital costs*** associated with construction and implementation;
- a local entity must be willing to ***assume responsibility for the operation and maintenance*** of the enhancement project; and
- the project must be ***linked to some feature of the CAP.***

If you would like further information about the projects or the Environmental Enhancement Program, contact Marty Jakle at 602-807-6763; FAX 870-6788; or email at MJAKLE@IBR8GW80.USBR.GOV.

VOLUNTEER CORNER

This is a new feature for our newsletter which will appear dependent upon requests. Please send any volunteer requests to the Editors; plan appropriately as this newsletter is only three times a year. Thank you.

The U.S. Forest Service, Pleasant Valley Ranger Distict is seeking volunteers for the following partnerships.

Adopt-A-Riparian Zone and assist in the management of a riparian zone. Volunteers are needed for the following locations.

Canyon Creek – conduct routine maintenance of exclusion device; conduct riparian interpretative sessions on holiday weekends.

Haigler Creek – conduct routine maintenance of exclusion devices; install vehicle barrier devices to delineate parking areas within the Haigler Canyon Recreation Site.

Reynolds Creek - construct exclusion devices to protect riparian zone; construct new access to Circle Trailhead and obliterate existing access.

Workman Creek - conduct routine maintenance of exclusion device and seed disturbed areas; assist in developing recreation sites.

Design and fund a display on Recreation and Riparian Management for the Canyon Creek Fish Hatchery Visitor Information Center and a display for the Workman Creek area.

If you are interested or have questions, please contact Howard S. Okamoto, Pleasant Valley Ranger District, PO Box 450, Young, AZ 85554 or phone 520-4632-3311.

LEGAL ISSUES OF CONCERN

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

EFFLUENT-DOMINATED ECOSYSTEMS RECOGNIZED IN ARIZONA'S PROPOSED MODIFICATIONS TO SURFACE WATER QUALITY STANDARDS

The Clean Water Act (CWA) requires states to set surface water quality standards to protect navigable waters within their jurisdiction. Water quality standards for a given water are derived by considering the designated uses for that water, and then establishing narrative standards, numeric pollutant concentrations, or in some cases both criteria sufficient to protect those use-associated designations. At least once every three years, states must review their current standards and revise or adopt new standards consistent with the CWA. This "triennial review" must be submitted to the Environmental Protection Agency (EPA) for approval before the new standards can become effective in the state. Currently, Arizona is revising its surface water quality standards and preparing to submit these standards to EPA for approval. One new standard which Arizona has proposed is adoption of less stringent water quality standards for effluent-dominated waters demonstrating ecological benefit.

Before we begin our discussion of net ecological benefit, it may be helpful to discuss exactly what waters are "navigable" and fall within the CWA's jurisdiction. "Navigable water" is by no means a literal term.[1] In fact, navigable water has a broad definition and includes such areas as rivers, streams (including intermittent and ephemeral streams) and their tributaries, lakes, wetlands, arroyos, prairie potholes, playa lakes, and all waters "the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce." (40 Code of Federal Regulations § 122.2.) The CWA today has a potential impact on almost any parcel of land that has virtually any drainage from it or on which significant amounts of standing water may occur. In Arizona, a commonly used, although somewhat misleading, starting point is that any "blue line" appearing on a U.S. Geological Survey quadrangle is a water subject to CWA jurisdiction. Other washes may be waters if they have a discernible water course with well-defined channel banks and connect to a "blue line" through an unbroken series of such water courses. (This rule, commonly known as the "tributary" rule, comes from a famous Arizona case, *U.S. v Phelps Dodge Corp.*) In addition, waters used by migratory birds as habitat also may constitute navigable waters. The final determination of whether a wash is a "water" is made by EPA and the Army Corps of Engineers.

An interesting regulatory twist occurs when a water is effluent-dominated. An effluent-dominated water is defined as water consisting primarily of discharges of treated wastewater. (See Arizona Administrative Code R18-11-101(21).) Oftentimes, effluent flows may create or support certain forms of aquatic life, wildlife, and riparian or wetland habitat. If overly strict surface water quality standards were promulgated to protect these ecosystems, high treatment costs associated with compliance might encourage the point source discharger to completely eliminate the discharge of effluent, possibly resulting in the total loss of the effluent-dependent ecosystem that is created by the discharge.[2] Thus, setting too strict a protective standard can actually cause destruction of the very ecosystem the standard was designed to protect!

Arizona has recognized the importance of maintaining these effluent-dominated riparian and aquatic habitats, and the Arizona Department of Environmental Quality (ADEQ) is seeking a balance between standards sufficient to protect these ecosystems and the public health and environment. Therefore, in this triennial review, Arizona has proposed to modify its surface water quality standards to allow continued effluent discharges at arguably "less protective" contaminant levels when it can be

demonstrated that there is a "net biological benefit" associated with the continued discharge of such effluent. If removal of the effluent would cause more environmental damage than allowing it to continue, the discharger may be able to demonstrate that the effluent is providing a "net ecological benefit."

Before the state will adopt a less stringent water quality standard to support the effluent-dominated habitat, the following must be demonstrated:

(1) The discharge of effluent creates or supports an ecologically valuable aquatic, wetland, or riparian habitat in an area where such resources are limited;

(2) The cost of treatment to comply with a water quality standard is so high that it is more cost-effective to eliminate the discharge of effluent to the surface water;

(3) The discharger must demonstrate that it is feasible to completely eliminate the discharge of effluent which creates or supports the habitat;

(4) The environmental benefits associated with the discharge of effluent under a modified water quality standard exceed the environmental costs associated with elimination of the discharge and destruction of the effluent-dependent ecosystem;

(5) The discharge of effluent to the surface water will not cause or contribute to a violation of a water quality standard that has been established for a downstream surface water;

(6) All practicable point source control discharge programs, including local pretreatment, waste minimization, and source reduction programs are implemented;

(7) The discharge of effluent will not produce or contribute to the concentration of a pollutant in the tissues of aquatic organisms or wildlife that is likely to be harmful to humans or wildlife through food chain consumption.

Arizona has proposed an innovative new standard that seeks to recognize the uniqueness of its arid environment and adaptive ecosystems. Promulgation of arguably "more appropriate" surface water quality standards for effluent-dependent ecosystems in areas demonstrating a net ecological benefit will support ecosystems such as the riparian area downstream of the 91st Avenue Wastewater Treatment Plant in Phoenix, and at the same time will continue to protect the public health and environment. For more information on Arizona's triennial review, contact Chris Vamos at (602) 955-9200 or Steve Pawlowski at ADEQ's Rule Development Section at (602) 207-2227.

ENDNOTES

1. Because the term "navigable" has different meanings depending on whether one is speaking literally about "navigability" or speaking legally, e.g., as the term is used in the CWA, Arizona is proposing to replace the term "navigable water" with the term "surface water" in its current triennial review. Arizona believes that its definition of "surface water" is equivalent to the federal "navigable water" definition.
2. This exact situation led the City of Prescott to stop discharging its treated wastewater into Watson Lake. The habitat lost from the elimination of the effluent discharge has never been regained.

NOTEWORTHY PUBLICATIONS

Pat Ellsworth and Ron Tiller

Biosystems Analysis, Inc. 1995. Life on the edge: a guide to California's endangered natural communities: wildlife. Bio-Systems Books, Santa Cruz, CA. 586 pp.

This book discusses California's 115 threatened and endangered species and chronicles several conservationist's personal stories of recovery efforts. Native American legends and artwork, plus extensive historical discussions are included.

Environmental Data Research Institute. 1994. Environmental Grant-making Foundations: 1995 Directory. 750 pp.

This guide to 600 independent, community, and corporate foundations that give environmental grants is extensively cross-referenced. The profile for each foundation includes the organization's history and philosophy, the application process, sample grants, and limitations.

Environmental Careers Organization. 1993. The New Complete Guide to Environmental Careers. Island Press. 364 pp.

This revised edition includes chapters on environmental education, waste management, pollution control, wildlife management, parks and outdoor recreation. There is also job-hunting information such as required education, internships, and career strategies.

LaRoe, E. T., G. S. Farris, C. E. Puckett, P. D. Doran, and M. J. Mac (eds.). 1995. Our living resources: a report to the nation on the distribution, abundance, and health of U.S. plants, animals, and ecosystems. U.S. Department of the Interior, National Biological Service, Washington, D.C. 530 pp.

This report compiles for scientists, managers, and the lay public, information on many species and the ecosystems on which they depend. As a first step toward a consistent, large-scale understanding of the status and trends of these resources, this report brings together for the first time a host of information about our nation's biological wealth, highlighting causes for comfort and concern.

Mount, J. F. 1995. California rivers and streams: the conflict between fluvial process and land use. University of California Press. 359 pp.

This book provides an overview of the physical and biological processes that shape California's rivers and watersheds. The author introduces basic principles of hydrology and geomorphology and applies them to an understanding of the differences in character of the state's many rivers. He builds on this foundation by evaluating the impact on water ways of different land use practices. $19.95.

Engineering-Science, Inc. 1994. Analysis of water quality functions of riparian vegetation. Arizona Department of Environmental Quality. Phoenix, AZ.

This document reviews and synthesizes the literature and lays out the basic framework for looking at water quality functions of wetland and riparian ecosystems. Information is provided regarding the types of functions and roles of riparian and wetland vegetation affecting or controlling surface water quality. Copies are available from the Arizona Department of Environmental Quality. Contact Publications at 602-207-2202 for more information.

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 May 1, 1996. Please call or write with suggestions, publications for review, announcements, articles, and/ or illustrations.

Jeff Inwood
C/O ASL
1130 E Missouri #110
Phoenix AZ 85014
(602) 263-9522
or
Cindy D. Zisner
Center for Environmental Studies
Arizona State University
PO Box 873211
Tempe AZ 85287-3211
(602) 965-2490
FAX (602) 965-8087
E-Mail: cindydz@asu.edu

The Arizona Riparian Council

Officers

Kris Randall, President ..... (602) 207-4510
Ruth Valencia, Vice President ..... (602) 345-9558
Cindy Zisner, Secretary ..... (602) 965-2490
Diane Laush, Treasurer ..... (602) 870-6763

At-Large Board Members

Matt Chew ..... (602) 542-2148
Russ Haughey ..... (602) 981-9400 ext. 222
Marie Sullivan ..... (602) 640-2720

Committee Chairs

Classification/Inventory
Roy Jemison ..... (520) 556-2182
Education
Cindy Zisner ..... (602) 965-2490
Land Use
Marty Jakle ..... (602) 870-6764
Protection/Enhancement
Vacant
Water Resources
Jeff Inwood ..... (602) 263-9522

TO JOIN THE
ARIZONA RIPARIAN COUNCIL,
CONTACT
Cindy D. Zisner
Center for Environmental Studies
Arizona State University
PO Box 873211
Tempe AZ 85287-3211

(602) 965-2490

ANNUAL DUES ARE $15

CALENDAR

Riparian Ecology Education Project Teacher Institute. February 24-25, 1996, Hassayampa River Preserve, Wickenburg, Arizona. Contact Val Little, Preserve Manager, (520) 684-2772.

Wetlands Conservation and Management. March 31-April 3, 1996, Orlando Marriott, Orlando, Florida. Contact Workshop Coordinator, Ellen Barros, FAX (508) 362-5335.

Arizona Riparian Council 10th Anniversary Meeting. April 12-13, 1996, Prescott Resort, Prescott Arizona. Contact Cindy D. Zisner at (602) 965-2490 about registration.

The Annual Conference on Ecosystems Restoration and Creation. May 16-17, 1996, Sponsored by Hillsborough Community College, Institute of Florida Studies, Tampa, Florida. For more information, call (813) 757-2104.

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.

BT5 1005
Arizona Riparian Council
Center for Environmental Studies
Arizona State University
PO Box 873211
Tempe AZ 85287-3211

ASU
ARIZONA STATE UNIVERSITY