The Arizona Riparian Council Newsletter

Volume 7, Number 2 Spring 1994

Habitat Protection/Restoration Through the Partners for Wildlife Program

Marie Sullivan, U.S. Fish and Wildlife Service

What do the Santa Cruz River, Sonoita Creek, San Pedro River, Verde River, Agua Fria River, Aravaipa Creek, and Bill Williams River, and all have in common? They all support riparian and wetland habitat which is currently or proposed to benefit from habitat protection and/or restoration activities through the Fish and Wildlife Service's (Service) Partners for Wildlife (PFW) program. Ranging in size up to 640 acres and encompassing up to four miles of riparian habitat, these projects will benefit migratory species, particularly neotropical birds, and federal endangered, threatened, or candidate species such as the Gila topminnow (*Peociliopsis occidentalis occidentalis*), Soutwestern willow flycatcher (*Empidonax traillii extimus*), or Huachuca water umbel (*Lilaeopsis schaffneriana*).

PFW is a stewardship program initiated by the Service nationwide to involve willing landowners, conservation groups, the corporate sector, Native Americans, and others wanting to restore fish and wildlife habitat on non-federal (private, city, county, tribal, and state) lands while leaving the land in private, non-federal ownership. The focus of the program is to maintain, improve, enhance, or reestablish biological diversity by providing increased quantity and improved quality of habitats for migratory birds, including neotropical species, waterfowl, and shorebirds; endangered, threatened, or candidate plants and animals; and the riparian, wetland, cienega, and other habitats necessary for continued maintenance of these species for the benefit of the American public.

Establishment of partnerships in cottonwood and willow riparian areas, such as those associated with the river systems discussed above, is a priority of the Service due to the diversity of neotropical migratory birds, such as certain hawks, hummingbirds, flycatchers, warblers, vireos, orioles, tanagers, buntings, and grosbeaks associated with these areas.

Traditional strategies for restoring wildlife habitat have often involved uncoordinated action from governmental agencies and conservation groups or limited acquisitions of crucial habitat. PFW is a call to action with willing landowners, agencies, groups, and conservationists to work together to restore America's wildlife. For example, in Arizona, The Nature Conservancy, Arizona Game and Fish Department, Soil

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In This Issue

PRESIDENT'S MESSAGE

Julie Stromberg, Past President

Briefly, I would like to thank you for allowing me to serve as President of the Arizona Riparian Council. The length of the President's term has declined semi-exponentially from Duncan Patten's five years to Andy Laurenzi's two years, to Marty Jakle's one year, whose precedent I am following. ARC continues to play a strong role in riparian issues throughout the state, thanks to the activities of the ARC Board and of the entire roster of dues-paying members that number about 200. It is with pleasure that I hand over the reins to our new ARC President, Kris Randall.

ARIZONA RIPARIAN COUNCIL ANNUAL MEETING MAY 6-7, at the PHOENIX ZOO

The Annual Meeting was once again a great success for the 134 participants, thanks to the hard work of Cindy Zisner, Diane Laush, Kris Randall, Julie Stromberg, and Marie Sullivan.

The opening session featured a series of talks dealing with riparian protection. Eva Patten led off by discussing activities and possible recommendations of the Riparian Area Advisory Committee (RAAC). Ed Fox, Director of the Arizona Department of Environmental Quality, talked about his agency's report on impacts of human activities on riparian areas.

Duane Shroufe, Director of the Arizona Game and Fish Department, described his agency's project of mapping perennial streams and developing a classification system for them.

Rita Pearson, Director of the Arizona Department of Water Resources, described new legislation, providing riparian protection/enhancement funding (See Andy Laurenzi's article on page 3 for more information on this bill.) She also described her agency's study providing important background information which may help pave the way towards conjunctive management of groundwater and surface water. (See Kris Randall's article on page 5 for more information about RAAC and the agency studies mentioned above.)

The second half of the morning featured a variety of talks. Joseph Feller (Arizona State University) discussed the Comb Wash Case, an example of grazing controversy in Utah. (See Robert Ohmart's article on page 6 for a discussion of this case.) Mark Heitlinger (Arizona Nature Conservancy) discussed the BIOTA project in which community involvement and planning were used as biodiversity protection tools. Finally, Rey Stendell, National Biological Survey, described the Survey's role in riparian issues.

The afternoon technical session included a wide range of topics. Keith Duncan (New Mexico State University) described a successful saltcedar control project. Julie Stromberg (Arizona state University - ASU) discussed the consequences of groundwater decline for riparian and wetland vegetation along the San Pedro River. Nancy Brian (Northern Arizona University) talked about canyon bottom species and vegetation dynamics in the dewatered creek bed of Walnut Canyon National Monument. Duncan Patten (ASU) discussed vegetation response to channel and sediment changes along the Hassayampa River following the winter 1993 floods. John Rinne (Forest Service) talked about "fishes and fines" in the West Fork Allotment, Apache-Sitgreaves National Forest. Barbara Tellman (University of Arizona - U of A) presented the results of her study of how Western states manage connected groundwater and surface water. Leticia Vionnet (U of A) discussed the impact of groundwater development in the stream-aquifer relationship. Julia Fonseca described Pima County Flood Control District's experience with obtaining an instream flow permit for Cienega Creek. Laurie Wirt (U.S. Geological Survey) discussed her work finding the origin of water to springs at Bingham Cienega, on the lower San Pedro River.

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Arizona Water Protection Fund Established

Andy Laurenzi
Arizona Nature Conservancy

On April 25, 1994, Governor Symington signed into law House Bill 2590 which establishes the Arizona Water Protection Fund and Commission to help protect and restore Arizona's rivers and streams and associated riparian habitats. An outgrowth of recommendations made by the Governor's Central Arizona Project (CAP) Advisory Committee, the Fund will provide $5 million a year to landowners, organizations and local, state and federal agencies "for the development and implementation of measures to protect water of sufficient quality and quantity to maintain, enhance and restore rivers and streams and associated riparian habitats, including fish and wildlife resources that are dependent on these important habitats." Funds shall be provided for the following purposes:
a) acquisition of CAP water or effluent; b) development, promotion and implementation of water conservation programs outside of Active Management Areas;
c) research, data collection, compilation and analysis; and
d) capital projects or specific measures consistent with the purposes of the Fund. Priority attention will be given to projects that benefit perennial or intermittent streams, include a cost sharing component, include broad-based local involvement and provide for the continued maintenance of the portion of the river and stream and associated riparian habitat that are enhanced by the project.

Funds will be made available through a grants program administered by a 15-member citizen's Commission appointed by the Governor, Speaker of the House and Senate President. Several slots on the Commission require technical expertise in water resource management and riparian habitat conservation. The legislation provides that the Commission establish grant guidelines every three years following a public input process and with additional input provided by Natural Resource Conservation Districts. The Arizona Department of Water Resources and the Arizona State Land Department will provide administrative and technical assistance to the commission. A total of $10 million was appropriated for fiscal years 1995 and 1996.

DESERT PLANTS REBORN!

Desert Plants, the unique journal of Boyce Thompson Arboretum and the University of Arizona has come to life again after several years in dormancy. Articles in this semi-technical journal focus on some aspect of desert plant ecology, horticulture, landscape architecture, morphology, and physiology as well as history of desert regions and desert plant scientists. Subscriptions are $10 for individuals and $15 for institutions (2 issues in 1994). Contact Dr. Margaret Norem, 2120 E. Allen Rd, Tucson AZ 85719. Back issues of all but Volume 4 are available for a cost of $5.00 from the same address.

State Parks News

Matt Chew
Arizona State Parks

Heritage Funds Purchase Sonoita Creek Property

In January, Arizona State Parks (ASP) closed a $2.8 million deal to acquire nearly 5,000 acres in Santa Cruz County, including about 3 miles of lower Sonoita Creek frontage. The creek supports a diverse riparian community composed of cottonwood, willow, ash, elder, mesquite, and many other trees and shrubs. Many native fishes are present and 62 bird species were identified on the site in April 1994.

Preliminary inventories and management planning are underway. Water supplies to the creek are relatively secure, since ASP controls releases to the creek via Patagonia Lake Dam. Development concepts include non-motorized trails, interpretive sites and minimal perimeter parking areas. Expectations are that Sonoita Creek State Natural Area Park will be administered as a subunit of Patagonia Lake State Park. An opening date has not been announced.

Rivers Assessment Lives

ASP and the National Park Service (NPS) are reviewing the Arizona Rivers Assessment technical report. After any needed revisions, the Steering Committee will conduct a final review. NPS is preparing text for an executive summary to be published in the summer of 1994.

Ecosystem Profile

Julie Stromberg,
Arizona State University

Fremont Cottonwood-Goodding Willow Forests Part II: Flood and Succession; and Dams and Management Choices

Fremont cottonwood (*Populus fremontii*) and Goodding willow (*Salix gooddingii*) are "pioneer" trees that are adapted to flood disturbance. The active flooding during recent decades has stimulated much new recruitment of these trees. Recruitment depends on a sequence of events that most often occurs during wet winters when Pacific storms are frequent and abundant. This sequence includes a high velocity winter or spring flood with sufficient scouring force to clear away vegetation and deposit new sediment on a portion of the floodplain; flood surges during the period of spring seed dispersal to moisten seeds and substrates; and a high and slowly receding water table to keep the seedlings alive during their first year.

Timing of the flood peak and of the receding flood waters influences seedling establishment. Early season floods favor species such as cottonwood and willow that disperse their seeds in spring. During the very wet conditions of 1993, many rivers remained at high stage for much of the summer and a sequence of species established in the flood scour zone throughout the growing season. At the Hassayampa River, for example, Fremont cottonwood was the first to germinate as the waters began to recede in spring, followed soon after by Goodding willow. The river was still over its banks in mid-summer, and saltcedar (*Tamarix chinensis*) was also able to establish in abundance, overlapping with Goodding willow in many areas. It remains to be seen whether the saltcedar will be outcompeted by the over-towering willows, or to what extent they will survive in subsequent floods. As the waters continued to recede, seepwillow (*Baccharis salicifolia*) and arrowweed (*Tessaria sericea*) germinated along the river edge in late summer.

Floods initiate the process of plant succession. The 25-year return flood at the Hassayampa in winter, 1993 scoured away much sediment and reduced much of the floodplain to a level just above the water table. This allowed for the invasion of an abundance of wetland plants including tropical cattail (*Typha domingensis*), bulrush (*Scirpus americanus*) and rushes (*Juncus xiphioides*), together with the woody seedlings. Over time, the vegetation will trap sediment during small floods and re-initiate the process of terrace building. Soils on the stabilized terraces will increase in silt, clay, organic matter and nutrient content, causing compositional shifts to species adapted to the drier or more fertile conditions. As the cottonwood and willow trees mature, species such as velvet mesquite (*Prosopis velutina*), graythorn (*Ziziphus obtusifolia*), spike dropseed (*Sporobolus cryptandrus*), New Mexican copperleaf (*Acalypha neomexicana*), and many others will establish in the understory or in light gaps. This never-ending process of change is one of the factors responsible for the high biodiversity of riparian ecosystems.

Floods are unpredictable. This is particularly true of winter floods in southern Arizona, where summer monsoon storms are more dependable than are winter storms. During a period from about 1930 to 1960, for example, there were no large winter floods along Sonoita Creek or the Santa Cruz River, and thus opportunity for recruitment of cottonwoods was limited. Past decades have seen the return of winter floods and cottonwood recruitment in this area. To maintain this generation of trees, however, groundwater must be managed to insure that overpumping does not lower water tables beyond about 3 m (10 feet) as is occurring in some overdrawn reaches of the upper Santa Cruz River.

As evidenced by the climatic vagaries that control river flows on the Santa Cruz, Hassayampa, and other free-flowing rivers, nature makes some of our water management decisions for us. Other aspects of water management, are under our control, and can favor or harm riparian ecosystems depending on how we set our priorities. Historically, the largest stands of cottonwood-willow forests grew along large desert rivers such as the Colorado, Gila, Salt and Verde, that are now diverted, dammed, and regulated. Restoration of water tables and flow regimes to some of these rivers is possible but would take a major change in water management strategy. On others, restoration of riparian river flows is

realistically possible and in some cases is actively being pursued. For example, the National Biological Survey and the Bureau of Reclamation (BOR) are pursuing studies to determine appropriate river flows for the Bill Williams River below Alamo Dam. The Center for Environmental Studies, BOR, Central Arizona Water Conservation District and the Arizona Department of Water Resources are pursuing studies to provide for simultaneous groundwater recharge and riparian restoration below New Waddell Dam on the Agua Fria. The Fort McDowell Water Settlement Act requires minimum flows into the Lower Verde below Bartlett Dam, and there are potential opportunities to request high flows of appropriate magnitude and timing. On the Colorado River, BOR and the U.S. Fish and Wildlife Service are working to provide flows for native fish. Concepts that are being explored by other agencies include the possibility of increasing flows on the Salt River between Stewart Mountain Dam and Granite Reef Dam, with the goals of providing groundwater recharge and beneficial flows for fisheries. Biological resources are beginning to be integrated into the decision making process for dam releases. These important first steps need follow- through and commitment.

Update on the Riparian Area Advisory Committee (RAAC)

Kris Randall, ADEQ
Riparian/Wetland Coordinator

During its monthly meetings, the RAAC has been identifying the major issues concerning riparian areas in Arizona. Five major issues have been identified - water availability; river channel alterations; adjacent land uses and nonpoint source water quality problems; point source water quality problems; and restoration and exotic species. RAAC will utilize these issues in developing nonregulatory and regulatory strategies for riparian area protection. The 1992 legislation directs the RAAC to identify these strategies and to analyze the fiscal, economic, and environmental impacts of such strategies. Compilation of information on new and on-going programs both in Arizona and in other states was needed to produce an Interim Report by July 1, 1994. To perform this immense task, a contract was awarded to the College of Environmental Planning at Arizona State University (ASU), using the skills of Jackie Rich, Ginny Coltman, Fritz Steiner, and Ruth Yabes. Funds were made available from the Arizona Game and Fish Department.

ASU was instructed to develop a range of five alternative strategies consisting of: 1) nonregulatory, 2) mostly nonregulatory, 3) mostly regulatory, 4) regulatory and 5) no action or status quo. Each of the five alternative strategies utilized the five identified major issues. Potential measures were reviewed by RAAC members during a facilitated workshop. At the workshop, some measures were added and others were recombined. RAAC members also indicated those measures they believed had the greatest and the least promise for success in Arizona. Members were hesitant to eliminate some measures completely.

Even from such a diverse group as RAAC, three common ideas have surfaced. First, there was a preference for decision making at local levels. This is consistent with the new revisions proposed in the Clean Water Act where the emphasis is on watersheds. Second, it was recognized that existing laws and programs should be more effective. These laws are going to continue and therefore should be modified. And third, existing programs should be flexible to be more effective in different physical and social environments.

Fiscal, economic, and environmental impacts of the alternatives were discussed by the RAAC at another workshop. A general approach is being taken in analyzing these impacts. The ASU team asked RAAC to comment on whether particular measures have a positive, negative, or neutral impact.

A draft report was developed by the ASU team and submitted at the May 19th RAAC meeting. Public meetings were held from May 31 through June 8.

Riparian researchers wanted!

If you are a riparian researcher in any field and have not completed a questionnaire in order to be included in a forthcoming Southwest Riparian Expertise Directory, there's still time. Please call Barbara Tellman at (602) 792-9591 to request a copy of the questionnaire, or FAX your request to her at (602) 792-8518. The directory will go to press in June.

Judge Rules Cattle Out and Riparian Issues Other Than Grazing Must Be Evaluated on Utah Bureau of Land Management Allotment

Robert D. Ohmart
Center for
Environmental Studies
Arizona State University

After almost 3 years and 18 hours of expert testimony, an administrative law judge has told the Bureau of Land Management (BLM) to cease grazing in five riparian habitats draining the east side of Cedar Mesa in southeastern Utah. Further, if the canyons are to be grazed again, BLM must do an Environmental Impact Statement and weigh resource values such as riparian vegetation, wildlife, recreation, and archaeological sites to domestic livestock grazing.

These five canyons provide 10% of the forage on the Comb Wash Allotment and contain some of the most breathtaking geology in the region. Riparian experts testified to the degradation of riparian areas by domestic livestock such as channel incisement to bedrock, floodplain terraces supporting only tumbleweed and snakeweed, streambanks cut and eroding, and the waning cottonwood–willow forests. Recreationists voiced objection to fecal material, placentas, and dead cattle in the streams. Archaeologists testified to the destruction of Anasazi dwellings through trampling and urinary and fecal wastes.

Unknowingly, BLM established a perfect riparian control over 20 years ago when cattle were excluded from Grand Gulch on the west side of Cedar Mesa. All things being equal, gradient, soils, etc., Grand Gulch has over the 20+ years aggraded from bedrock and supports a luxuriant native plant community of cottonwoods and willows. Coyote willow abounds in Grand Gulch yet is rare or absent in the five eastern canyons. All age classes of cottonwoods up to 25 years thrive in Grand Gulch whereas all young ages classes are virtually absent in the five canyons. Grand Gulch stands as living testimony to the impacts that unmanaged domestic livestock grazing had on the degradation and ultimate collapse of riparian systems. Geologists, fluvial geomorphologists, and riparian ecologists all testified that the only explanation for the ecological differences between the control and the degraded canyons was domestic livestock use.

This case has very important implications where natural resources with high values occur on public lands. This is the first case in history where a judge has considered the environmental impact of grazing or whether grazing is in the best interest of the public. The agency, be it the U.S. Forest Service or BLM, can now be taken to task for not weighing the values of these resources against grazing in the public interest. Grazing, in many instances, may not be the best use in the public's interest and possibly should be reduced or eliminated.

What will be the cost to the tax-paying public in lost grazing fees, fencing, etc., from the judge's ruling? Since the permittee was not grazing the full preference on the allotment the cattle will probably be shifted to the remainder of the allotment which means zero revenue loss. If the above were not true there would be about $300 lost per year in grazing fees for all five canyons. There are no fencing costs since the canyons were fenced many years ago and cattle were driven into the canyons and kept there until all palatable vegetation within reach was consumed. Remnant cross fences show how cattle were driven to the upper ends of the canyons and held there and then gates opened downstream to insure full and complete forage utilization. The final costs will be paying a BLM employee to wire the gates closed and make necessary fence repairs as the system heals, the public recreates, and the spirits of the Ancient Ones enjoy a cattle–free environment.

With respect to affected interests the judge was very critical of BLM's refusal to involve these parties and wrote "BLM's exclusion was not an accident or oversight ..." Letters to participate in the process were ignored and "In each case, BLM responded with open defiance."

Numerous organizations intervened with BLM such as the American Farm Bureau Federation, the National Cattleman's Association, the American Sheep Industry Association, and the Public Lands Council. The attorney for the Farm Bureau stated, "The judge clearly ignored the countervailing testimony we offered. There are two sides to this case but you would never know it by reading his decision." The BLM Area Manager stated, "It does seem our witnesses and staff were not given as much credibility as professionals..."

In reality, their witness testimony was weak and in many instances demonstrated to be totally incorrect. National Wildlife Federation witnesses and Joe Feller provided strong credentials and testimony.

This case is a giant step in demonstrating the public values of riparian habitats in their own right. Heretofore, they have been defended in the light of endangered species and wildlife habitat which has clouded their total value. Twelve years of benign neglect has only made the price of restoration higher and in many instances, total cattle exclusion is the only alternative. If we are to persist in the arid West, water quantity and quality enter the equation along with other resource values

Stream Channel and Riparian Reference Areas - Request for Information

The Stream Systems Technology Center is developing a partnership with the University of Arizona to develop an inventory of undisturbed or recovered channel and riparian reference sites on public lands. They seek to locate a wide variety of sites which can be visited and studied. Please contact Dr. Pete Hawkins at the University of Arizona's School of Renewable Natural Resources if you can recommend appropriate sites.

NEWS BRIEFS

Round Table Discussion with Secretary of the Interior Bruce Babbitt

Marty Jakle wrote an article about this important February 15th meeting in Phoenix. Unfortunately, space and timeliness problems preclude printing that article in full. What follows is a very brief summary.

Secretary Babbitt presided over a round table discussion that included representatives of many groups including the Sierra Club, the Cattlegrowers Association, the Woolgrowers Association and the Nature Conservancy. Only panelists were allowed to comment. Babbitt opened with a broad overview of four major areas of debate: governance, water rights, fees, and standards and guidelines. He offered a goals statement to the group "Our goal is to have a healthy and diverse rangeland ecosystem." Consensus was not reached on this.

Some of the major concerns raised were:

. whether all public lands should be available for grazing;

. that the debate should not be on how to manage cows, but managing for other values such as wildflowers and camping;

. lack of money for effective monitoring;

. how to integrate ecosystem planning and new NPDES regulations; and

. a need for economics to be at the core of grazing reform.

Ed Note: A draft EIS on public lands grazing has been issued, entitled Rangeland Reform 1994 is available at BLM and Forest Service offices.

Streambed Ownership

The streambed ownership problem discussed in our last issue is far from settled. Implications of the recommendations of the legislatively mandated commission described in that issue disturbed large numbers of influential people in affected areas. The 1994 legislature has passed a bill narrowing their previous definition of "navigable stream."

The commission will revisit the matter and develop new recommendations. This time, however, the legislature will have the final say. In the meantime, the Center for Law in the Public Interest which sued the state to bring the issue to a head, is considering further action. As their attorney, said, " The bill requires the commission to ignore all kinds of evidence ... and sets up numerous roadblocks to determining navigability." More about this in our next issue as it develops.

New Upper Santa Cruz Active Management Area

The Tucson AMA has been split, with the Upper portion of the Santa Cruz basin getting its own AMA. This area will be treated as a unique water management situation. The new approach is an exciting development for riparian protection, as for the first time limited coordinated management of groundwater and surface water is possible in Arizona. The City of Nogales, Friends of the Santa Cruz River and other local interests worked hard to gain this additional control to better manage their water and keep the river flowing.

MASTER'S THESIS

Rehabilitation of a Degraded Riparian Area along a Portion of the Salt River in Central Arizona

Kristine Elaine Randall

Human activities have severely altered the extent and condition of riparian ecosystems in Arizona. This research developed a method whereby degraded riparian areas could be rehabilitated to a higher functional level by revegetating with native riparian plants. An ecologically based revegetation plan was developed to evaluate sites in a portion of the Salt River in Tempe, Arizona. Cottonwoods (*Populus fremontii*) established in the Salt River channel in 1988 were used as indicators of available water. Temporal and spatial variation in the biotic parameters of xylem water potential, foliage density, and shoot and radial growth indicated water availability at three sites.

The study area was stratified into three sites based on presumed water availability. A drain outfall discharged into the Salt River at the storm drain site. The river and subsurface groundwater influenced the channel site. Possible leaks from the Grand Canal may provide water to the canal site.

The storm drain site had high xylem water potentials, high foliage density, and the greatest radial growth. Using radial growth as the dependent variable and ten environmental parameters as independent variables, a multiple regression analysis showed that early winter precipitation explained 54% of the variation in radial growth at this site. The channel site also had high xylem water potentials, but low foliage density, and the lowest radial growth. No environmental parameters significantly explained variability of radial growth at this site. Xylem water potentials were also high in the canal site where foliage density was low and radial growth was slightly lower than the storm drain site. Winter precipitation explained 69% of the variation in radial growth.

Environmental parameters of hydrology, geology, and fluvial geo-morphology influenced water availability, establishment and maintenance of riparian vegetation, and overall channel geometry. A measurement of the positive influence of these parameters was the diversity in ages of trees at each site. Four age classes were present at the channel site and the greatest number of class I trees (0 to 2 years). Fluvial processes had a greater effect at this site than at the other sites.

Based on analysis of the biotic and environmental parameters, sites were ranked for probability of revegetation success. The storm drain site was ranked the highest. Early winter precipitation, which entered the site via a storm drain outfall, was the primary source of water for this site. The canal area was ranked second and early winter precipitation was also indicated as a source of water for this site. Neither precipitation, streamflow, nor groundwater could explain the water source for the channel site. Dynamic fluvial processes are most apparent at this site making maintenance of vegetation more intensive. Therefore the channel site was ranked third. This research provided a method for revegetation of riparian vegetation by utilizing natural processes.

Meeting - from page 2

Patti Fenner (USFS) and a group from three high schools discussed their cooperative efforts to monitor three segments of Cave Creek. David Robbins (Arizona Constructed Wetlands) told about he is working with the Arboretum at Flagstaff to develop a constructed wetland for wastewater.

The brief business meeting resulted in election of Kris Randall as President and Ruth Valencia as Vice President. Diane Laush, Treasurer, reported that ARC is solvent, although definitely not wealthy.

The evening dinner featured Jeff Williamson, Deputy Director of the Phoenix Zoo, discussing ways the Zoo could help with riparian education.

Saturday field trips featured riparian issues including mining, grazing, water quality, and effluent release on three watercourses near Superior. Kris Randall led a trip to Queen Creek; Russ Haughey led the trip to Pinto Creek; and Roy Jemison led the Arnett Creek trip. Lunch at Boyce Thompson Arboretum featured Director Bill Feldman, talking about the Arboretum's concerns on Queen Creek and Arnett Creek.

Copies of abstracts of most of the talks can be obtained for $2 from Cindy Zisner (965-2490).

Partners - from Page 1

Conservation Service, and Natural Resource Conservation Districts are assisting in providing financial and/or technical assistance to landowners.

PFW is a win-win program for all entities involved by providing financial assistance to landowners who have an interest in protecting our natural resources, but who may lack the financial capability of doing so while providing habitat protection and restoration for a diversity of species.

Before a project is funded, the willing landowner is asked to sign a cooperative agreement to maintain the project area for a minimum of ten years. By signing the agreement, the landowner agrees to restrict noncompatible activities within the project area. Projects are generally funded for $10,000 or less, but additional funding may be available for larger projects which have a significant benefit for wildlife and at least 50% of the cost is provided by other cooperators. In many areas, Conservation Districts, local businesses, State agencies, and other organizations have provided additional funds so landowners have minimal out-of-pocket expenses.

Cottonwood Springs, located on Sonoita Creek approximately eight miles upstream of Patagonia, is the site of one of the first PFW projects implemented in Arizona. The riparian ecosystem along this portion of Sonoita Creek supports cottonwood-willow gallery forest, mesquite bosque, and cienega habitats. Cottonwood Springs provides valuable habitat for many neotropical migratory species including green kingfisher (*Chloroceryle americana*), yellow-billed cuckoo (*Coccyzus americanus*), willow flycatcher and many species of warblers, orioles, tanagers and flycatchers. The Springs also supports the endangered Gila topminnow and the federal candidates Huachuca water umbel and Huachuca springsnail (*Pyrgulopsis thompsoni*). Gray hawk (*Buteo nitidus*), zone-tailed hawk (*B. albonotatus*) and common blackhawk (*Buteogallus anthracinus*) have also been observed nearby.

Through the PFW program, 20 acres of the riparian ecosystem were fenced to exclude cattle grazing to protect the vegetation from grazing impacts, increase the potential for natural regeneration of the riparian and wetland vegetation, improve the natural hydrology of the area, and protect the habitat of the sensitive species. To compensate the landowner for restriction of the spring for grazing, a solar-powered drinker system was installed. Thus, the landowner was able to continue his grazing activities while additional wildlife habitat is protected. The Nature Conservancy is a participant by implementing the monitoring activities.

Other projects that have been implemented or will be funded this year range from fence construction to restrict cattle grazing in sensitive habitats and installing livestock drinker systems on adjacent upland areas, to habitat protection for sensitive herptofauna,and environmental education regarding functions and values of southwestern riparian areas.

Any project that improves wetland, riparian, or other important habitat for native fish and wildlife populations may be eligible. If you are interested in learning more about this program, have a potential project, or want to actively participate in restoration efforts, please contact Marie Sullivan, Private Lands Biologist, at (602) 379-4720.

Many Thanks to Julie Stromberg for her excellent work as Arizona Riparian Council President

Heritage Alliance has a Busy Legislative Session - *Eva Patten*

Amazing, but true, a few legislators continue to introduce bills to subvert the intent of the Heritage Fund. This year it was proposed that Heritage Funds be used to compensate ranchers for depredation of their range by wildlife. Another bill required compensation from the Fund to private property owners who are regulated under the Endangered Species Act. Thanks to quick action and many calls to legislators, neither bill saw the light of day.

We learned that a strong Heritage Alliance is needed and thus we have instituted regular renewable memberships for organizations and individuals. We are proud to have the Riparian Council as a member along with 25 other organizations , 9 cities, and over 230 individuals. To join, send $10 (individuals) or $25 (families). Call Stacy Clawson-Damp at (602) 244-8291 for information on how you can join. We need your support!

NOTEWORTHY PUBLICATIONS

Pat Ellsworth
Section Editor

BOOKS

Calow, P., and G.E. Petts (eds.) 1994. *The Rivers Handbook, Vol. II.* Blackwell Scientific Publications. 576 pp.

Volume I: Hydrological and Ecological Principles was published in 1992. Volume II: Problems, Diagnosis, and Management should be available in June of 1994.

Hildrew, A., D.G. Raffaelli, and P.S. Giller (eds.) 1994. *Aquatic Ecology*. British Ecological Society, Symposium #34. Blackwell Scientific Publications. 640 pp.

This book is a product of a joint meeting between the BES and the American Society for Limnology and Oceanography. It represents the whole spectrum of aquatic systems and an international group of authors.

Mangun, W.R. (ed.) 1992. *American Fish and Wildlife Policy: The Human Dimension.* Southern Illinois University Press. 272 pp.

Steven J. Bissell reviewed this publication in the journal, *Conservation Biology*, recommending the book to "policy makers for the purpose of integrating public concerns and issues with technical, ecological management programs."

Palmer, T. 1993. *The Wild and Scenic Rivers of America.* Island Press. 339 pp.

In this comprehensive book on river protection, Palmer explains how and why rivers are chosen for designation as "Wild and Scenic," and also looks at state and local protection systems.

BOOKLETS

Graves, W. (ed.) 1993. *Water: the Power, Promise, and Turmoil of North America's Fresh Water.* National Geographic Special Edition (Nov.). 120 pp.

In this special issue, seven articles examine supply, development, pollution and restoration. A double map supplement is included. Excellent for educational purposes. Order from the National Geographic Society, 1145 - 17th St., NW, Washington, DC 20036-4688. $2.65.

U.S. Environmental Protection Agency. 1991. *The Watershed Protection Approach: An Overview.* EPA/503/9-92/002. 8 pp.

This little publication describes the rationale for a watershed approach to protecting rivers, bays, estuaries, and aquifers, and emphasizes the need to involve all stakeholders in the decision-making process. It is available from the Office of Wetlands, Oceans, and Watersheds, U.S. EPA, 401 M St., SW, Washington, DC 20460.

ARTICLES

Blaustein, A.R., D.B. Wake, and W.P. Sousa. 1994. Amphibian declines: judging stability, persistence, and susceptibility of populations to local and global extinctions. *Conservation Biology* 8: 60-71.

The authors argue that long-term population data are necessary for rigorous evaluation of reports of decline. Due to several constraints, many amphibian populations may not be able to recolonize areas after local extinction.

Grumbine, R.E. 1994. What is ecosystem management? *Conservation Biology* 8: 27-38.

Grumbine draws from an extensive literature review to provide a working definition, five goals, and short- and long-term policy implications of ecosystem management.

Streever, W.J. and S.A. Bloom. 1993. The self-similarity curve: a new method of determining the sampling effort required to characterize communities. *Journal of Freshwater Ecology* 8:401-403.

The method described here uses species richness, species abundance, and species identity data. The user plots the Morisita similarity of two sample sets from one community against increasing sampling effort. When sampling adequately represents the community, the curve plateaus near a value of 1.

The Arizona Riparian Council (ARC) was formed in 1986 as a result of increasing concern over the alarming rate of loss of the State's riparian ecosystems. It is estimated that less than 10% of the State's original riparian acreage remains in a natural form. These habitats are considered Arizona's most rare natural communities.

The purpose of ARC is to provide for the exchange of information on the status, protection, and management of riparian systems in Arizona. The term "riparian" includes vegetation, habitats or ecosystems that are associated with bodies of water or are dependent on the existence of perennial, intermittent, 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 are $10. Additional contributions are gratefully accepted.

This newsletter is published three times a year to communicate current events, issues, problems, and progress involving Arizona's riparian systems, to inform ARC members about Council business, and to provide a forum for you to express your views or news about riparian topics. The Summer Issue will be mailed in September, with the deadline for submittals August 15, 1994. Please call or write with suggestions, publications for review, announcements, articles, and/or illustrations. Information on computer disk (any type) or via E-Mail is preferred.

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The Arizona Riparian Council

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Annual dues are $10.

Calendar

Aug. 8-12. Pinon-Juniper Symposium. Flagstaff. U.S. Forest Service and others. Contact Doug Shaw (505) 842-3256.

Sept. 6-9. International Trout Stream Habitat Improvement Workshop. Calgary AB. Trout Unlimited Canada. Contact Garry Szabo (403) 221-8365.

Sept. 7-11. Sky Island Institute. Portal AZ. Tucson Audubon Society and others. Contact Cynthia Lindquist (602) 629-0757.

Sept. 19-23. Biodiversity and Management of the Madrean Archipelago: The Sky Islands of the Southwestern United States and Northwestern Mexico. Tucson. U.S. Forest Service and others. Contact Leonard DeBano (602) 621-2543.

Sept. 22-23. Water Quality in the Sustainable West. Utah National Park Service Water Quality Task Force. Contact Jack Wilbur (801) 538-7098.

Sept. 30 - Oct. 2. Eco-Retreat. Environmental Literacy: Pathway to Our Future. Heber AZ. Arizona Association for Learning in and about the Environment. Contact Lynn Krigbaum 7620 N. 15 Ave. Phoenix AZ 85021.

Nov. 13-14. Environmental Ethics and History Conference. Prescott. Arizona Humanities Council. Contact Laura Stone (602) 257-0335.

Dec. 7-8. Riparian Management: Diverse Values - Seeking Common Ground. Boise ID. University of Idaho. Contact Terry Tindall (208) 736-3600.

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