The Arizona Riparian Council Newsletter

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Riparian Protection - The Year of Opportunity

Eva Patten, Arizona Nature Conservancy

"Arizona is known throughout the world for its natural beauty. As the photography in Arizona Highways *so spectacularly portrays, the rivers and streams of our state define much of our cultural heritage. Yet, over the decades, many of these areas have been dramatically altered or have disappeared.*

During the last ten years, a number of study committees have debated this issue and received public comment. Now it is time for action. I urge each of you to seriously consider meaningful legislation that will protect the rivers, streams and riparian areas of the state."

This quote could have come from me, or you, or one of our colleagues, but it didn't. It came from Governor Symington in his State of the State message to the Legislature. The message to the rest of us is that this is a year of opportunity!

The saga of trying to gain protection for riparian areas and to firmly establish instream flow water rights in statute has been a long one. After years of talk and study, last year the issue was raised in the Legislature through SB 1109 which certainly got everyone's attention. This year, with the leadership of the Governor and a firm commitment on the part of the agencies, we have a real chance for success. It is in great measure up to all of us how the last chapter will be written.

November. In cooperation with the Governor's Office, three agencies - the Department of Water Resources (DWR); the Department of Environmental Quality (DEQ); and the Game and Fish Department (AGFD) developed a concept paper for a comprehensive Riparian Protection Act. This was a direct consequence of Governor Mofford's two earlier Executive Orders directing agencies to emphasize riparian protection.

The proposed plan included

- an inventory and assessment to be carried out by AGFD within the next year.
- Clarification and codification of instream flow rights, establishing riparian vegetation as a "beneficial use" equal with other uses and allowing both public and private entities who own land adjacent to the stream to hold instream flow water rights. DWR would have to consider the impacts on riparian habitat when permitting a change in use or point of diversion;
- establishment of a study committee to develop a scheme for protecting riparian habitats from the impacts of pumping groundwater.
- development of a regulatory program for watercourse alteration, including a Watercourse Alteration Board within DEQ to develop Best Management Practices (BMPs); and
- establishment of a Watershed and Enhancement Board to grant loans and provide demonstration projects.

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President's Report

Andy Laurenzi

On December 11th the Sierra Vista *Daily Herald* ran a front page article reporting on the prior day's meeting of the San Pedro Water Management Council. This article, (and a similar article the next day in the *Arizona Daily Star* in Tucson,) called attention to a presentation by Dr. Thomas Maddock on a quantitative groundwater/surface water model of the upper San Pedro River basin developed by Dr. Maddock and his doctoral student Leticia Vionnet (see Mary Wallace's related story on page 3).

This is the third such modeling effort for the upper basin area, and like it predecessors, this modeling effort pointed out that groundwater pumping to meet the municipal needs of Sierra Vista and the Fort Huachuca Army Base has produced a groundwater cone of depression that has grown at an alarming rate during the past 50 years. The shocking aspect of the presentation was the realization that the outermost edges of the cone of depression are now at the edge of the San Pedro floodplain aquifer. While Cochise County instructed Mr. Maddock to limit his modeling efforts to the present day situation, (i.e. 1990 as opposed to 2010), questioning from the audience elicited a projection from Mr. Maddock that under present day usage, the cone of depression would intersect the floodplain aquifer and in all likelihood cause a hydrologic disconnection between the floodplain and regional groundwater aquifers, possibly within 15 years. It is ironic that on the following day, both of these papers carried a story on the expansion of the Fort Huachuca Army base that is likely to add nearly 2000 new employees in the next four years, which suggests that his 15 year estimate may be a conservative one.

Past research indicates that San Pedro River baseflows are maintained in large part by subflow from the regional groundwater aquifer into the floodplain aquifer. A hydrologic disconnection between these two aquifers would reverse this flow of water such that water would then flow from the floodplain aquifer to the regional groundwater aquifer. The end result would be less water in the floodplain aquifer, leading to diminished baseflows and eventual drying up of the river at the point where the cone of depression hits the river. So once again the public is reminded that unregulated groundwater pumping will result in the demise of a significant aquatic and riparian resource in Arizona.

There is time however, to reverse this destructive trend. Unfortunately, it's not clear who will take a leadership role in proposing solutions. The Bureau of Land Management is an obvious choice given their management responsibility at the San Pedro Riparian National Conservation Area and their federal reserved water rights established by Congress at the time the NCA was created. However, these water rights need to be adjudicated in the Arizona State Supreme Court as a part of the Gila River adjudication. This adjudication is likely to take years, if not decades, to complete, not to mention that several substantive legal issues related to groundwater/surface interactions have yet to be resolved in a manner that will protect surface water rights holders from groundwater pumping.

Time, which may be on our side right now, will soon be against us if little substantive action can be taken prior to the adjudication proceedings. Even if the adjudication proceeds in a timely fashion, it remains to be seen how BLM intends to enforce these water rights and what event(s) are likely to trigger BLM action. Clearly at the point where it can be reliably demonstrated that the groundwater cone is impacting river flows, it is already too late.

So where does that bring us. Well much to Sierra Vista's credit, the variety of water users and interest groups are meeting within the context of the San Pedro Water Management Council to explore local solutions to the water supply problem, including the establishment of a local water management entity. Unfortunately, the myriad of interest groups often paralyze the proceedings while leadership skills within the group have yet to emerge. The Water Management Council remains the only viable option to developing solutions that will stem the tide.

A Study of the Water Resources of the San Pedro Basin

Mary G. Wallace
University of Arizona

In the Spring of 1990, the Upper San Pedro Basin Water Resources Council contracted with a student-faculty team from the University of Arizona to examine the water resources of the basin. The university team developed four models: 1) a revision of the MODFLOW model of the U.S. Geological Survey, a groundwater model; 2) MODSIM, a basin-wide model of the surface-groundwater system; 3) WATERBUD, a spreadsheet model of the hydrology, economics, and institutions of the basin; and 4) MATS, a plan evaluation model to represent the values of the people of the basin.

These four models were used to delineate the hydrologic conditions of the basin, specifically stream-aquifer interactions, and also to evaluate the effects of various management options. These options include the creation of an Active Management Area (AMA) similar to those created for Phoenix and Tucson, to create a "customized" Active Management Area which relies upon a pump tax rather than regulation to control water use, water supply augmentation measures, and conservation measures. In addition, a number of scenarios were developed that had varying assumptions about the future climate, population growth and economic activity of the basin.

The revised MODFLOW model indicates a progressive decline in the contents of the regional aquifer, a decline which is expected to accelerate with continued pumping and has caused a cone of depression in the Sierra Vista area. The MODSIM model indicates that two factors explain most of the flow variance in the San Pedro River - surface runoff which replenishes the contents of the floodplain aquifer and also irrigation pumping from the floodplain aquifer. Irrigation pumping from the floodplain aquifer during dry periods depletes the contents of the aquifer and reduces its contribution to maintaining the base flow of the stream.

Irrigation pumping from the floodplain aquifer is largely and quickly offset by recharge from runoff, so that the net overdraft of the floodplain aquifer is much smaller than that of the regional aquifer. However, the stream is intimately linked with the floodplain aquifer, and, next to drought, irrigation pumping has the greatest effect upon stream flow. Increased irrigation pumping beyond present levels will result in depletion of the floodplain aquifer and consequent reductions in stream flows.

WATERBUD analyses indicate that stabilization of the water levels in the floodplain aquifer can be achieved by any option which restricts agricultural pumping in the southern half of the Upper San Pedro basin. These include both the conventional and "customized" AMAs. No option tested can protect instream flows in the riparian area during times of drought and high agricultural pumping, without additional management tools, such as the pumping of the regional aquifer to enhance flows.

Results of the MATS model suggest that three different, relatively homogeneous, groups can be identified in the basin - one group which emphasizes economic factors in comparing the desirability of different water management outcomes, one which emphasizes enviromental factors, particularly the status of theriparian area and a third which prefers local control over water management decisions. Although, the three groups did not agree on which of the five policy options is best, preference was expressed for the "customized" AMA option and for local control of water resources.

The projected impacts of the MODSIM and WATERBUD models are based upon a twenty-year period of analysis, during which time the long-term implications of increasing pumping from the regional aquifer have yet to emerge strongly. Pumping will also affect stream flow in the San Pedro River, although it takes more than twenty years for those effects to be strongly felt. Future analyses should include a longer period of analysis, should investigate drought coping policy options (such as dry year leasing of irrigation water), and should be directed at the analysis of policy options which incorporate many of the elements of the "customized" AMA.

Tonto National Forest Riparian Inventory Help Needed

Lew Myers
Tonto National Forest

The Tonto National Forest is working with the U.S. Fish and Wildlife Service to complete the National Wetlands Inventory on the Tonto. Mapping is complete on 90% of the 3 million acres in the Tonto. Information is well-developed on 1,300 - 1,500 miles of streams. The next steps are a cooperative effort with Arizona Game and Fish to digitize the data on the GIS system and to conduct ground surveys and take photos. The goal is to sample 20% of the areas in the management units.

The Tonto is looking for two qualified botanists with taxonomic expertise as paid summer employees to conduct ground surveys from May 11 - Aug. 30, with a possibility of extension beyond that date. Call Lew at 252-5255 for information. Help is also needed in identifying relatively intact areas throughout the state, such as exclusions or special niches, for comparison benchmarks. Call Lew with information.

River Corridor Studies

Tanna Thornburg
Arizona State Parks

Verde River Corridor Project Report Available

The Verde River Corridor Project (VRCP) was Arizona State Park's first venture at facilitating a broad-based multi-community planning effort for a major river corridor. The overall vision statement developed by the project participants is as follows: "The Verde River Corridor is an invaluable resource to the people of the Verde Valley affecting each resident, landowner, business, and tourist in some way. Planning for the wise use, protection, and enhancement of the Verde River and its associated natural, cultural, scenic, agricultural, economic, and recreational resources should be a priority for everyone."

The VRCP began in 1989 as a locally directed effort with the goals of examining all the uses and values of the river corridor, agreeing on a common vision, and developing a plan of action that could be supported by the public and managing agencies alike. The planning phase of the project culminated in June 1991 with the publication of the final report and plan of action.

The local communities are now working on implementation of the priority recommendations. The VRCP has been an extremely successful project, bringing together many individuals and groups who normally avoid each other and working toward consensus on numerous issues and on a plan of action. Implementation of that effort has begun and local and statewide enthusiasm is running high. The communities are working with ADWR and the Bureau of Reclamation to develop a basinwide water management plan for the Verde. A two day symposium on the Verde River is planned for April or May.

The final report (over 300 pages) and the summary (large fold-out poster) of the VRCP are available from Arizona State Parks, Streams and Wetlands Program, 800 W. Washington #415, Phoenix AZ 85007.

Santa Cruz River Corridor Planning to Begin

The upper Santa Cruz River is an international treasure that deserves protection and careful planning to preserve its rural character, natural and cultural resources and the economic opportunities it represents. To accomplish these goals, many groups and individuals have been exploring ways of dealing with the numerous issues involved in protecting the Santa Cruz.

To help coordinate the planning and consensus building that needs to occur, Arizona State Parks will be facilitating a multi-objective river corridor planning project on the upper Santa Cruz River. This planning process looks at a wide variety of issues - including economic, social, cultural, legal, recreational, and environmental - that can affect the Santa Cruz River and its riparian lands. This process acknowledges two simple yet essential ideas about river management:

- no public action can replace wise use of a river by those living along it, and
- effective river management cannot succeed without local consensus and support.

Some of the objectives that need to be discussed are water quality and quantity issues, riparian protection, private property rights and responsibilities, and economic development.

A public workshop to address the issues will be held on February 22 (See calendar, page 11). The project will involve anyone who wishe to participate, including landowners, communities, organizations and all levels of government. Any recommendations and decisions resulting from the process will be developed by the local communities and the general public. For more information, contact Tanna Thornburg or Pamela Hyde, Arizona State Parks, Resource Stewardship, 800 W Washington, #415, Phoenix AZ 85007 - (602) 542-4174.

Fish Habitat Study

Arizona Game and Fish has just released an important new study, done for the Forest Service, consisting of an evaluation of tools and methodologies for evaluating fish habitat. An important element of the study relates to evaluating impacts of grazing on trout habitat in the Tonto Forest.

For copies of *Evaluation of the USFS Fish Habitat Relationship System in East Central Arizona trout streams,* contact the author, Robert Clarkson at Arizona Game and Fish (602) 942-3000.

Santa Cruz River Atlas - Information Needed

An Atlas of the Upper Santa Cruz River (Mexican border to Tubac) is now being prepared by the University of Arizona College of Agriculture, with the assistance of Friends of the Santa Cruz River and others. This short, easy-to-read booklet will have all kinds of information about the river -historical data to current water quality information. Anyone with information, drawings or photos that might be included should contact Barbara Tellman at the U. of A. Water Resources Research Center - (602) 792-9591. Items that will enliven the booklet are especially needed.

Riparian Council Action Updates

Andy Laurenzi

An important function of the Arizona Riparian Council is to take action on issues affecting riparian areas. Brief descriptions of our most significant actions follow.

Planet Ranch

A letter of support was sent to members of Arizona's Congressional delegation and Rep. George Miller (Chair of the House Committee on Interior and Insular Affairs) concerning the San Carlos Indian Water Rights Settlement (SB 291 and HR 748). While ARC did not take a position on the settlement itself, we strongly supported a small component of the bill which authorizes the Secretary of Interior to acquire the Planet Ranch from the City of Scottsdale. We supported U.S. Fish and Wildlife Service acquisition of the property for inclusion in the Bill Williams Unit of the Havasu National Wildlife Refuge. Planet Ranch, on the Bill Williams River, is currently being extensively farmed by Scottsdale to maintain surface water rights. Scottsdale purchased the ranch almost a decade ago with the idea of transferring the water to Scottsdale. Protection of the ranch is considered critical to long-term maintenance of the extensive Fremont cottonwood-Goodding willow riparian forests in the Bill Williams Unit.

Riparian Legislation

We also submitted comments to ADWR and the Governor on the proposed "Concepts for Instream Flow and Riparian Protection" legislation. See Eva Patten's article on page 1.

EPA Guidelines for Effluent-Dominated Ecosystems

President, Andy Laurenzi attended a meeting held by staff from EPA Region IX concerning proposed changes to EPA's draft "Guidance for Modifying Water Quality Standards and Protecting Effluent-Dependent Ecosystems." Changes discussed reflect EPA response to public comment on the draft policy. The changes were well-received and a final policy is due out soon. They should assist discharge applicants interested in maintaining streamflows in effluent-dominated streams while meeting water quality standards in NPDES permits.

Tres Rios Project

Vice-president Marty Jakle attended a field trip sponsored by the City of Phoenix to tour the Tres Rios project area. This project will utilize some of the effluent currently discharged from the 91st Avenue Wastewater Treatment Plant to create an engineered wetland and linear park to substitute for the riparian habitat now in the river. Marty also had the pleasure of speaking at the Annual Meeting of the Soil and Hydrological Society on "Values and Functions of Riparian Habitats."

Maricopa County Flood Control District -

ARC nominated Russ Haughey for the Maricopa County Flood Control District Advisory Board, a citizen's advisory group whose input is used to assist in formulating Flood Control District policies

Instream Flow Guide

DWR has released *A Guide to Filing Applications for Instream Flow Water Rights in Arizona,,* a guide for people wishing to apply for an instream flow permit. Chapters deal with the process, resource assessment methods, and hydrologic assessment methods.

DWR did not choose one method but offered a range of methods for the applicant to use. For the first time minimum requirements are clearly spelled out.

For information, contact Herb Dishlip at DWR (602) 256-0506.

Aquatic Biology for Teachers

Pat Ellsworth

In June 1990, Environmental Education House Bill 2675 was signed into law, requiring that environmental education be integrated into Arizona's public education system. Many classroom teachers feel that they lack the scientific background and the experience necessary to fulfill this mandate. A new course, Aquatic Biology for Teachers (NAU Bio 571), has been designed to provide such background and experience in a discipline that is both critically important from an ecological standpoint, and ripe with oportunities to fascinate young minds.

Using lecture, lab, and field work, aquatic biology is studied from two perspectives: that of the scientist seeking an understanding of aquatic organisms and habitats and that of the classroom teacher seeking activities to help young learners grasp ecological concepts.
Course objectives include:

1. Appreciation of the uniqueness of water and its importance in biological systems.
2. Realization that an aquatic system can be used to teach all the basic concepts of ecology.
3. Skill in identification of aquatic organisms.
4. Ability to read and understand original research papers in aquatic biology.
5. Awareness of the secondary literature available for classroom use.
6. Integration of aquatic biology across the curriculum.
7. Understanding the need to conserve aquatic ecosystems.

This course has been taught on the NAU campus (Summer, 1991) and as an extension course in Prescott (Fall, 1991). It has been well-received by teachers in grades K-12, from many parts of the state. It will be offered again at NAU during Summer Session, 1992.

A Grazing Controversy: Problems Near the Muleshoe

Jeff Burgess
Arizona State University

The Nature Conservancy, a conservation organization which takes pride in its ability to protect important natural areas while avoiding messy confrontations, is embroiled in a protest filed by the Arizona Cattle Growers' Association (ACGA) against the Bureau of Land Management.

The cattlemen are opposing the final draft of the Arizona BLM's recently issued Safford District Resource Management Plan (RMP). This plan will guide the BLM's management of 1.4 million acres of public land in southeastern Arizona for approximately the next 15 years.

The cattlemen's protest is important because it raises questions about the suitability of desert riparian areas for livestock grazing and, perhaps more significant, the willingness of the BLM to stand behind its decisions to protect publicly owned natural resources.

The cattlemen want the BLM to delete from the RMP the creation of a no-grazing buffer zone around the Nature Conservancy's Muleshoe Ranch riparian preserve, located at the southern end of the Galiuro Mountains.

"We disagree that excluding livestock will help the area'sriparian resources," ACGA spokesperson Jeff Menges said. "In fact, properly managed grazing can be a tool that has beneficial effects."

Menges explained that when cattle hooves trample the ground they make a nice seed bed for plants. Hoof action also helps, he said, break up the crusts which tend to form on the ground and prevent rain from soaking into the soil. He added that grazing also helps stimulate new growth on plants "How do you get your grass to grow? You mow it," he said.Local environmentalists counter that cattle grazing is widely documented as one of the major causes of riparian degradation in the West and they discount the idea that grazing can be beneficial.

"It's an outright falsehood that the West's ecosystems must be grazed and trampled to be healthy, especially the riparian areas," Dr. Thomas Fleischner, Professor of Environmental Studies at Prescott College, said.

"Historically, there were no native herds of large ungulates in the Southwest and even on the Plains the bison were not prone to staying in riparian areas like cattle."

Dr. Fleischner claims that trampling is actually a main cause of erosion. For instance, he said, recent research suggests the living crusts which form on desert soils, called cryptogams, are vital in preventing erosion.

"These crusts are the primary successional stage in desert ecosystems and retain more moisture and make better seed beds than bare soil," he said.

He explained that erosion negatively affects riparian ecosystems by lowering water tables and increasing stream sedimentation.

"And new plant growth doesn't necessarily mean a healthier ecosystem," Dr. Fleischner said. "It may mean new shoots for the cattle to eat. But what about the other public lands management objectives, like wildlife and recreation?"

He said grazing often prevents trees and shrubs from reaching maturity. Mature plants, he explained, provide critical habitat for birds and other wildlife. Mature plants are also important, he said, for providing the shade that's essential in lowering desert stream water temperatures to allow fish and other aquatic life to thrive.

The Nature Conservancy purchased the Muleshoe Ranch base property in 1983 as part of a nationwide effort to protect rare aquatic and wetland systems. Five native five species are found on the Muleshoe's six perennial streams where they thrive without competition from established exotic fish, a very uncommon situation in Arizona.

Of Arizona's 32 native fish taxa, one is extinct, four are extirpated, and 21 of the remaining 27 are currently listed or are candidates for listing. The Muleshoe Ranch represents one of the last strongholds for Gila River ichthyofauna.

With the ranch property, the Conservancy also obtained the BLM grazing permit for the surrounding Muleshoe allotment. The manner in which the allotment is managed is important because parts of these streams cross public land.

The Conservancy has never grazed the allotment but Mammoth, Arizona, rancher Virgil Mercer and his son Mike want the opportunity.

According to the ACGA's protest, one of the reasons they oppose the BLM's plan is the Mercers' desire to acquire the Muleshoe allotment grazing permit. To this end, the Mercers have filed a separate appeal of their own against the BLM. They claim the BLM's regulations require the agency to reallocate the grazing permit to them because the Nature Conservancy isn't using it.

BLM officials admit their regulations require them to reallocate a grazing permit when a permittee takes unauthorized non-use for more than two consecutive years. However, they explain, their regulations also allow them to approve any sort of non-use if they determine it's necessary to protect natural resources.

"The justification for non-use on this allotment is documented in our 1985 Eastern Arizona Grazing EIS," BLM area manager Meg Jensen said.

BLM staff say one of the reasons the Conservancy was able to obtain the ranch in the first place was the

allotment was so overgrazed it was relatively unprofitable.

Nature Conservancy officials point out that they have no argument with the state's ranchers. "The cattlegrowers filed the protest against the BLM, not us," Conservancy spokesperson Tom Collazo said. "We are not aligned with those groups advocating no grazing on public lands."

For example, Collazo said, the Conservancy does not oppose the BLM's proposal in the RMP to authorize the resumption of grazing on a portion of the Muleshoe allotment. The BLM proposes that this smaller area, to be called the Soza Mesa allotment, will replace the Muleshoe allotment. "The Soza Mesa area is not critical in regards to protection of the riparian areas," he said. "We have no policy on public lands grazing in non-critical habitats."

Collazo said the Conservancy is relying on local BLM staff to defend the management decisions in the RMP. "We're not actively preparing a response to the cattlegrowers' protest," he said. "We're counting on the BLM to do the right thing."

The BLM's Jensen explained the protest is being handled by BLM Director Cy Jamison's office in Washington, D.C. She said her office is busy preparing an information packet for him.

"We always put a lot of effort into making good land management decisions. I think we need to defend their soundness."

The Arizona Rivers Assessment

Pamela Hyde
Arizona State Parks

As riparian issues continue to push their way to the forefront in Arizona, a project, coordinated in part by Arizona State Parks, is working to build the information base needed to ensure that wise decisions can be made concerning the future ofriparian areas in the state.

The Arizona Rivers Assessment was begun in 1989 by the Streams and Wetlands Program of Arizona State Parks in cooperation with the Rivers, Trails and Conservation Assistance Program of the National Park Service. This is a statewide comprehensive inventory and evaluation of river and riparian-related resource information. Its purposes are to determine the relative significance of each river segment based on all its environmental values, and to compile of data to support this determination.

At the heart of this project is the fact that it is a cooperative, multi-group effort. It involves local, state and federal agencies, tribes, organizations and individuals who own, manage, or have regulatory responsibilities for riparian areas, or who have information about rivers and resource uses. The goal of the Assessment is to provide a broad-based planning tool that can be used by resource managers, organizations and decision-makers to plan for the future of Arizona's rivers and riparian areas and to balance the needs for resource conservation, recreational use, and economic development. With the input from such a diversity of sources and experts on rivers and resource uses, the comprehensive, balanced, and usable information gathered should be a much-needed planning tool.

The assessment is in two phases.

- Phase I focuses on natural and cultural resources associated with rivers and riparian areas, including fish, wildlife, vegetation, stream hydrology, geologic features and cultural resources. Data is being compiled and evaluated.
- Phase II is underway and will concentrate on river resource uses, including recreation, agriculture, timber, mining, utilities, flood control, water supply, urban riverfront revitalization, and special management areas. General information will be presented indicating where these resource uses occur, however, only recreation will be evaluated and presented in detail because of the diversity of existing recreation uses and the need to address boating-related resources and.

The Assessment should be complete by late-1992. A report will be published and a data base made available for public use. For information, call me at (602) 542-1474.

Wild and Scenic Rivers Proposal

Gail Peters, American Rivers

Riparian Council members are aware of the threats facing our rivers, streams and riparian areas. The legislation proposed by the Governor (See page 1) is a necessary step for cleaning up the instream flow law and to start some meaningful action on riparian protection in the state. But with 48% of our state being federal land, the Arizona Rivers Coalition believes that another step is needed for river protection in Arizona: federal legislation for protection of some of the most outstanding rivers on Arizona federal lands.

The Arizona Rivers Coalition has written a 200 page proposal to protect at least forty Arizona rivers and streams under the Federal Wild and Scenic Rivers Act. A Wild and Scenic River does not have to be a big whitewater river. Little creeks like Cave Creek in Portal can be protected b the Act and are included in our proposal. Designation of these streams, mostly on federal lands, will ensure that the best of our remaining waterways are protected from abuse while allowing for hunting, fishing, and current streamside private land uses to continue.

Arizona's Congressional delegation is now deciding how to respond to the American Rivers proposal. Your letter or phone call to Arizona's senators andyour representative to Forest Service and Bureau of Land Management District Rangers could make a difference. For information or copies of the proosal, call me at (602) 264-1823.

Constructed Wetlands in Arizona

Barbara Tellman
University of Arizona

Constructed wetlands for municipal effluent are rapidly becoming popular in Arizona, largely as a response to increasingly stringent NPDES permit conditions. Nationally, such wetlands have generally proven to be effective in "polishing" treated wastewater, especially for removal of nutrients. In some of the Arizona cases, the wetlands are being designed to take the place of riparian areas, in others they are designed to augment them. Following are brief descriptions of some constructed wetlands projects existing or planned in Arizona.

Pinetop-Show Low is Arizona's pioneer in constructed wetlands, with three functioning wetlands (Jacques Marsh, and Pintail and Redhead Lakes.) Highly treated-waste water enters these wetlands, with the wetlands serving efficiently to "polish" that effluent. There is no outflow from these wetlands; they are in lieu of a discharge which would ultimately have reached the Verde River. These areas provide excellent habitat for migrating waterfowl and other wildlife.

Nogales is considering use of a constructed wetland to polish effluent from the International Treatment Plant in order to maintain flow in the Santa Cruz River. Water quality problems are especially complex here because the flow contains industrial wastewater from Nogales, Sonora, with many uncontrolled pollutants. They hope to construct a pilot plant to test the ability of various types of vegetation to absorb such pollutants as heavy metals and solvents. The riparian area downstream of the treatment plant today is thriving (See page 4) and supports a rich diversity of wildlife.

Phoenix plans to integrate a constructed wetland into a new linear park to partially mitigate for the total loss of effluent flow to the Salt River from the 91st Avenue Treatment Plant. Preliminary proposals call for much of the water to be sent directly to recharge basins. Some of water would, under the proposal, flow through a wetland along the bank before being transported to the farms via pipeline. According to a City of Phoenix spokesman, because of the high water table in the area, dewatering the river should not result in a loss of riparian vegetation.

Sierra Vista is converting an oxidation pond to a wetland, primarily vegetated by bulrushes. This project is approximately one mile from the San Pedro River, but will not discharge to the river.

Pima County is in the very early stages of examining the feasibility of constructed wetlands in connection with one or both of their major treatment facilities.

Constructed wetlands are also envisioned for Sedona, Kingman and Holbrook. I would appreciate learning about any others not mentioned here.

Many questions remain about wetlands construction in an arid desert environment, a rich field for research. These include such issues as: which vegetation is most effective both in removing nutrients or other pollutants, while providing optimum wildlife habitat?

With so much loss of historical wetlands in Arizona and so little opporunity to rehabilitate "natural" wetlands, constructed wetlands offer us real opportunities.

Year of Opportunity - from page 1

December. Comments were received from all quarters, many of them generally favorable to riparian protection. Some felt that the proposals were too far reaching, while others felt they were not effective enough. The DEQ portion was the most controversial as any regulation, of course, is anathema to some. It was difficult for some commenters to understand specifically what the program would achieve, how it would affect landowners and others and how it would be funded. The lack of a riparian defintion (to be developed in the study portion of the new proposal) was pointed out by many as well as the lack of a clear policy statement. Thus, it was back to the drawing board for the agencies who then developed Concept Paper Two.

January. Concept Paper Two was never circulated to the public. It contained a "riparian area" definition and postponed action on a regulatory program. It proposed instead a committee of federal and state officials and private sector representatives to recommend a structure to regulate activity in riparian areas.

As you read this, there will be a bill incorporting these changes and others, but essentially retaining the rest of the concepts from the original paper. As I write this (in mid-January) Senators English, Blanchard and Bartlett are negotiating for some strenghtening measures. It seems that none of them will introduce a separate bill.

The riparian legislation is also a priority for a number of groups who opposed us last year - the cattlegrowers, mining and some business interests. Unfortunately, each bill like this seems to be a test of will as to who will win each battle in the war for control and power within the Legislature, rather than an attempt to ensure a sustainable future for our state. I'm sure we'll be hearing lots about private property, economic loss, over-regulation and so forth. Thus, although what has happened thus far is a giant step forward, it is still in mid-stride. In large part we are the ones to make sure that the foot actually lands - in the right place.

For the latest information, call Marty Jakle at (602) 870-6747 or Eva Patten at (602) 220-0490.

Cook's Lake Update

Diane Lausch
Arizona State University

It looks like the protection of Cook's Lake, a wooded wetland located on the San Pedro River, may soon become a reality. The Bureau of Reclamation has spent two years working with the Environmental Protection Agency to obtain their Section 404 permit from the Army Corps of Engineers. Reclamation has proposed buying and restoring Cook's Lake as compensation for impacts to wetlands resulting from the construction of New Waddell Dam and the modification of Camp Dyer Dam, both located at Lake Pleasant. Acquisition of the Section 404 permit clears the way for providing protection for Cook's Lake in the form of Federal ownership.

Cook's Lake, located on the San Pedro River, 2 miles downstream of its confluence with Aravaipa Creek, has long been appreciated by naturalists for its unique habitat. It is recognized as one of only three wooded wetlands in Arizona. This type of habitat is typically found in the southeastern United States and protection of this unique area will add another jewel to Arizona's crown of protected habitats.

Cook's Lake is well known for its unique flora and fauna, and diversity of species in general. Water fern, very uncommon in southern Arizona was discovered in 1973 and persists today, despite the dry spell that occurred during the 1990 drought. Other wetland plants include lizardtail, watercress, duckweed, sedges, cattails, and buttonbush. In addition to plants, Cook's Lake provides excellent birdwatching opportunities. In summer the wetland is alive with vermillion flycatchers and yellow breasted chats. Zone-tailed and Harris Hawks have nested there and Gray Hawks have been observed perching in the cottonwoods surrounding the wetland. In addition to raptors, yellow-billed cuckoos and southwestern willow flycatchers (both State-listed species) have also been observed onsite. The wetland is also home to the lowland leopard frog, a species receiving increasing attention due to recent declines in local populations. Lastly, Cook's Lake is even home to the south western cave bat, a Category 2 species on the Endangered Species list.

There is even more good news on the horizon. In addition to Reclamation's activities at Cook's Lake, ASARCO will also perform restoration actions in the area. As mitigation for the expansion of the Ray Mine at Hayden, ASARCO will restore approximately 130 acres of farmland (immediately north of Cook's Lake) to mesquite bosque. Together, both mitigation efforts could result in the protection and restoration of over 300 acres along the San Pedro River. We may soon be able to enjoy the haunting whistle of the gray hawk while strolling under a verdant canopy of ash, willow and cottonwood trees.

Arizona Heritage Alliance Update

Eva Patten,
Arizona Nature Conservancy

The Heritage Alliance has proven to be too good an idea to let die. It is re-energized, about to be incorporated and receive 501(c)(3) status and has a Board of Directors. Andy Gordon, an attorney with Lewis and Roca, is the new chair. The Riparian Council has a been a part of this and was one of the first organizations to step forward with a supporting donation. For information, call me at (602) 220-0490.

Western States Riparian Council

Ron Hooper
Bureau of Land Management

The Western States Riparian Council was officially created on Nov. 11-12, 1992 in Las Vegas, Nevada and Ron Hooper of the Arizona Riparian Council was elected the first President. The creation of the Council cumulates a year long effort begun by the Grand Canyon Trust and the Bureau of Land Management.

The idea for the Council originated from a meeting held December 4-5, 1990 in Phoenix. Sixty participants representing a wide range of diverse interests, including conservationists, agency representatives, livestock operators, universities and state riparian coalitions agreed there was need to create such a council to assist in management of riparian resources.

The Western States Council members will include one individual from each state riparian group in those states which either contain or are west of the 100th meridian. The goals of the Council include the fostering of riparian groups in those states where none exist, facilitation of information transfer between individual state coalitions and creation of a layman's handbook of riparian management techniques. Also, the Council will host a workshop/symposium annually in conjunction with a state riparian council meeting. Andy Laurenzi of the Arizona Riparian Council is working on a committee to develop the first such meeting to be held sometime in the second half of 1992 or 1993.

Noteworthy Publications

Pat Ellsworth, Section editor

This new section features recent publications relating to riparian areas and wetlands. Anyone with book or article reviews or suggestions for such reviews should submit them to Pat Ellsworth at 202 S. Virginia Street, Prescott AZ 86303. Many thanks to Julie Stromberg for most of the reviews in this edition.

Books

National Research Council. 1992. Restoration of aquatic ecosystems: science, technology and public policy. National Academy Press. 485 pp.

This book will be released for sale in February or March 1992. The book provides a thorough review of case studies of lake, river and stream, and wetland restoration. It also contains chapters on planning and evaluating aquatic ecosystem restoration, and on integrated aquatic ecosystem restoration, recommended as a necessary alternative to a fragmented restoration approach that is "unlikely to produce a self-maintaining aquatic ecosystem integrated into the larger ecological landscape". The final chapter describes goals and priorities for developing a national restoration strategy. Contact: the National Research Council; WST Board; 2101 Constitution Ave., Washington DC 20418. (203) 334-3422.

Boon, P. J., P. Calow, and G. E. Petts (eds.). 1991. River conservation and management. John Wiley and Sons Ltd. West Sussex, England. 488 pp.

This new and expensive book ($138.00) provides an international treatment of four aspects of river management: the need for conservation; river classification according to conservation potential; recovery and rehabilitation; and legal framework for river protection. A general theme of the book is the need for a greater appreciation of the natural dynamic character of river ecosystems.

Hunter, C.J. 1990. Better Trout Habitat: a guide to stream restoration and management. Island Press. 320 pp.

Written by a Montana-based aquatic biologist, this is the first detailed, readable book to describe the science and art of trout stream restoration. Fourteen case studies of successful trout stream restoration projects are included.

Gruntfest, E. 1991. Multi-objective river corridor planning: proceedings of the urban stream corridor and stormwater management workshop and the multi-objective management of river corridors and their restoration workshop. Assoc. of State Floodplain Managers, Madison. 234 pp.

These proceedings contain papers presented at two conferences, and provide information on multi-objective river corridor management from national, regional, state and local perspectives. Copies are available for $12 from the Association of State Floodplain Managers, P. O. Box 2051, Madison, WI 53701: (608) 266-1926.

Callow, P. and G.E. Petts (Eds) 1992. Rivers Handbook. Blackwell Scientific Publications, Cambridge. 512 pp (Vol. 1)

In two volumes, the Handbook will form a valuable reference for those working in river ecology and management. Volume One covers general scientific and ecological principles for management. Volume Two develops those principles further, organizing them around problems, diagnosis and treatment. Volume One is available in the Spring of 1992 and Volume Two will be available in the Fall of the same year.

Articles and Papers

Scodari, P.F. 1990. Wetland protection: the role of economics. Environmental Law Institute. 89 pp.

The author provides a thorough discussion of market economics applied to wetland functions and values. He includes recommendations for congressional remedies and for improved dialogue between scientists and economists.

Oggins, C.R. and H. M. Ingram. 1990. The community consequences of rural-to-urban water transfers. Udall Center for Studies in Public Policy Issue Paper No. 2. Tucson: University of Arizona. 74 pp.

This document describes the results of a survey of community leaders (from water-gaining and water-losing areas) on rural-to-urban water transfers in the Southwest. The authors use the results to develop specific policy proposals, providing an example of how survey research can play a role in guiding resource management decisions.

Armour, C. L., D. A. Duff, and W. Elmore. 1991. "The effects of livestock grazing on riparian and stream ecosystems" Fisheries 16 (1):7-11.

This article is a draft position paper of the American Fisheries Society. It contains a concise description of the effects of livestock grazing on aquatic ecosystems, and concludes with a list of recommended action that would "contribute to improved livestock management... and maintain habitat of streams on the public lands".

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 area 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 $5.00; additional contributions are gratefully accepted.

This newsletter is published quarterly to communicate current events, issues, problems, and progress involving Arizona's riparian systems, to inform you the members of ARC about Council business, andto provides a forum for you to express your views or news about riparian topics. The Spring issue will be mailed in May, with the deadline for submittal, April 7, 1992. Please call or write me withsuggestionsand offers of articles and/or illustrations. This publication will be as interesting and useful as the members make it.

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Calendar

Feb 22 9:00 A.M. - 1:00 P.M. Rio Rico Swim and Racquet Club. Public Workshop/Open House preliminary to the Upper Santa Cruz River Corridor Study, Santa Cruz County Planning Dept., 281-4685 x 3071.

Feb. 27-29 Arizona Land and People Conference: Environmental Stewardship, U. of A. College of Agriculture, Holiday Inn, Tucson. For information write, College of Agriculture, Forbes Room 325, Tucson AZ 85721.

March 21 Friends of the Santa Cruz River tour through Guevabi Ranch 1:30 p.m. Write FOSC for information at P.O. Box 154, Tumacacori AZ 85640

April 10 - 11 Riparian Council Annual Meeting (See page 12)

May 31-June 6 Annual Meeting of the Society of Wetland Scientists in New Orleans. Call Dr. Mary Landin 1-800-LAB-6WES x 2942 for information.

Sept. 13-17 INTECOL International Wetlands Conference in Columbus OH. Write William Mitsch, School of Natural Resources, 2021 Coffey Road, Ohio State University, Columbus OH 43210 for information.

Oct. 2-3 Western Regional Instream Flow Conference II in Jackson Hole. For informatio: Suzanne Van Gytenbeek, Trout Unlimited (307) 733-0484.

SIXTH ANNUAL MEETING
OF THE
ARIZONA RIPARIAN COUNCIL
APRIL 10 AND 11, 1992

At the Las Campañas Inn - Cottonwood

Registration starts at 8:00 a.m. - Program starts promptly at 9:00 a.m.

Friday Morning General Session - *Protecting Riparian Systems: Meeting the Challenge of Urban Needs*

Friday Afternoon Technical Session

Friday Evening Barbecue: Dead Horse Ranch State Park

Saturday Field Trips: Verde River, Oak Creek, and Tavasci Marsh, with guides from government agencies and the local area.

Cost: Preregistration (includes lunch) for members $35, non-members $45, students $20
Registration at the door $5 extra in each category
Evening barbecue $18 additional

Full meeting information and Call for Papers will be mailed separately to all members. Mail your registration fee to Cindy Zisner at the return address below, or call her at (602) 965-2490 for information.

BT5 1005
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