

ARIZONA RIPARIAN COUNCIL

THIRD ANNUAL MEETING
CASA GRANDE, ARIZONA
DECEMBER 2-3, 1988



PROGRAM AND ABSTRACTS

ARIZONA RIPARIAN COUNCIL
Third Annual Conference
December 2-3, 1988
Francisco Grande
Casa Grande, Arizona

PROGRAM

FRIDAY, DECEMBER 2

8:00-9:00 AM Registration
9:00-9:10 AM Introduction (Duncan Patten)
9:10-9:40 AM Bureau of Land Management Riparian Programs (Beau McClure, U.S. Bureau of Land Management, Phoenix, AZ)
9:40-10:10 AM Corps of Engineers 404 Permitting (David Castanon, U.S. Army Corp of Engineers, San Francisco, CA)
10:10-10:30 AM BREAK
10:30-11:00 AM Environmental Protection Agency Evaluation of 404 Permitting (Phil Oshida, Environmental Protection Agency, Region 9, San Francisco, CA)
11:00-11:30 AM Maricopa County Flood Control District Floodplain Management (Doug Plasencia, Maricopa County Flood Control District, Phoenix, AZ)
11:30-12:15 PM Arizona Riparian Council Business Meeting: Constitution/By Laws Changes, Dues, etc.
12:15-1:30 PM LUNCH (Buffet at Francisco Grande)
1:30-2:30 PM Holistic Resource Management
PROS: Ken Vensel, U.S. Forest Service, Happy Jack, AZ and Donald Roberts, Rancher
CONS: Steve Johnson, Defenders of Wildlife, Tucson, AZ

2:30-3:15 Recommendations for Riparian Legislation and Management: Arizona Riparian Council Endorsement

- * Commission on the Arizona Environment (Dan Campbell, The Arizona Nature Conservancy, Tucson, AZ)
- * Arizona State Parks (Tanna Thornburg, Arizona State Parks, Phoenix, AZ)

3:15-3:30 PM BREAK

3:30-4:10 PM Committee Reports

4:10-5:00 PM Committee Meetings

6:00- No Host Bar and Barbecue by Pool at Francisco Grande

SATURDAY, DECEMBER 3

8:30-12:15 PM CONTRIBUTED PAPERS

8:30-8:45 AM Water Quality Standard Issues and Arizona Riparian and Wetland Areas (J. G. Wegrzyn, Arizona Department of Environmental Quality, Phoenix, AZ)

8:45-9:00 AM Arizona's Nonpoint Source Assessment Report (C. Russell, Arizona Department of Environmental Quality, Phoenix, AZ)

9:00-9:15 AM Agricultural Pesticide Contamination of Riparian Areas -- An Overview (B. Munson, Arizona Department of Environmental Quality, Phoenix, AZ)

9:15-9:30 AM Presence of Trace Metals and Pesticides in Selected Biota from the Lower Colorado (W. G. Kepner, U.S. Fish and Wildlife Service, Phoenix, AZ; D. B. Radtke, U.S. Geological Survey, Tucson, AZ; W. C. Hunter, U.S. Fish and Wildlife Service, Phoenix, AZ)

9:30-9:45 AM Dredge and Fill Permitting and the State's Water Pollution Control Program (E. K. Swanson and D. M. Hains, Arizona Department of Environmental Quality, Phoenix, AZ)

9:45-10:00 AM The Willow Flycatcher: Arizona's Most Endangered Riparian Passerine (B. T. Brown, Consulting Engineer, Tucson, AZ)

W. C. Hunter, U.S. Fish and Wildlife Service, Phoenix, AZ)

10:00-10:15 AM Status Changes of Bird Species Using Revegetated Riparian Habitats on the Lower Colorado River from 1977-1984. (B. W. Anderson, Revegetation and Wildlife Management Center, Blythe, CA; W. C. Hunter, U.S. Fish and Wildlife Service; R. D. Ohmart, Center for Environmental Studies, Arizona State University, Tempe, AZ)

10:15-10:30 AM BREAK

10:30-10:45 AM A 1973 Water Fable and 1988 Observations (J. Linkswiler, Engineer, Phoenix, AZ)

10:45-11:00 AM Use of the General Aquatic Wildlife System in Conjunction with Fish Surveys on Three Northern Arizona Streams (S. Schuhardt, Arizona Game and Fish Department, Flagstaff, AZ)

11:00-11:15 AM Riparian Area Survey and Evaluation System -- Southwestern Region, USDA Forest Service (R. Lafayette and P. Luehring, USDA Forest Service, Albuquerque, NM)

11:15-11:30 AM Revegetation of the Tempe Rio Salado with Native Riparian Plants -- A Land Use Plan. (K. Randall and D. T. Patten, Center for Environmental Studies, Arizona State University, Tempe, AZ)

11:30-11:45 AM Visitor Management in a Riparian Wilderness. (S. Moore and S. Brickler, University of Arizona, Tucson, AZ)

11:45-12:00 PM A Season at the Hassayampa River. (J. Stromberg and D. T. Patten, Center for Environmental Studies, Arizona State University, Tempe, AZ)

12:00-12:15 PM Riparian Vegetation Response to Stream Diversion: Clues for Instream Flow Requirements. (D. T. Patten and J. Stromberg, Center for Environmental Studies, Arizona State University, Tempe, AZ)

12:15- Committee Meetings and Lunch (for those who stay)

ANDERSON, B. W., W. C. HUNTER, and R. D. OHMART. Revegetation and Wildlife Management Center, Blythe, CA 92225; U. S. Fish and Wildlife Service, Phoenix, AZ 85019; Arizona State University, Tempe, AZ 85287-1201. Status Changes of Bird Species Using Revegetated Riparian Habitats on the Lower Colorado River from 1977 to 1984.

Two dredge-spoil sites were revegetated with native riparian trees, and another site cleared of saltcedar (Tamarix chinensis) and revegetated with native shrubs on the lower Colorado River. All sites were censused for birds all seasons before and during revegetation and as vegetation matured. Bird species were grouped by natural-history characteristics to detect changes in types of species during site development. Most species responded positively within two years after planting, including a few rare species.

Response time of species and season in which they responded suggest that revegetation sites are treated first as secondary ("sink") habitats, attracting non-breeding, postbreeding, or young-of-the-year individuals. Later, species may respond to revegetated habitats as "source" habitats, which are important for increasing overall population stability. Transition time from sink to source habitat depends on size of the revegetation effort, how rapidly the habitat attains a high-quality level, distance to large natural stands of high-quality habitat, and ability of target bird species to produce "excess" individuals.

Although we attracted two to three pairs of Yellow-billed Cuckoos (Coccyzus americanus) that successfully bred two years in a row, our efforts were too little, too late to prevent extirpation of this species from the lower Colorado River three years later. Our efforts are the largest successful revegetation attempts in Arizona and California, and the only ones to document thoroughly vegetation growth and development and bird use of sites relative to natural vegetation. Despite all this, we were unable to attract many raptors, cavity nesters, and late-breeding species. Evidence suggests this was due to sites not being large enough, and probably not habitat quality. When target species are of primary interest, revegetation efforts should be planned to support at least several breeding pairs when completed.

BROWN, B. T., and W. C. HUNTER. Consulting Ecologist, P.O. Box 3741, Tucson, AZ 85722; U.S. Fish and Wildlife Service, Phoenix, AZ 85019. The Willow Flycatcher: Arizona's Most Endangered Riparian Passerine.

Portions of the Colorado, Gila, Salt, and San Pedro River drainages were surveyed for nesting Willow Flycatchers (Empidonax traillii) between 1982 and 1988. Particular attention was focused on the nesting ecology of their two largest known populations in Arizona, which are located along the headwaters of the Little Colorado River near Greer and along the Colorado River in Grand Canyon National Park.

Arizona's largest single population of Willow Flycatchers, in Grand Canyon, is representative of the species' documented historical use of low-elevation riparian floodplains. Surveys of this population from 1982-1987 indicated 2-11 pairs in two distinct locales. All nests (n = 12) located during the study period were found in tamarisk (Tamarix ramosissima), in patchy habitats dominated by tamarisk and coyote willow (Salix exigua). The frequency of tamarisk constituting nest-site habitat was significantly greater than the frequency of was significantly greater than the frequency of tamarisk in adjacent riparian habitat. Four of eight nests were parasitized by Brown-headed Cowbirds (Molothrus ater). The Willow Flycatcher population near Greer occurred in high-elevation riparian habitat dominated by willow patches, and was similar to those populations found in the Rocky Mountains and Sierra Nevada ranges.

Willow Flycatcher populations have declined in the Southwest, but the steepest decline has been in Arizona. Only 25 pairs may remain in Arizona, although a systematic of the species has not been made. Habitat loss, habitat change, and heavy parasitism by Brown-headed Cowbirds appear to be factors responsible for some or all of the decline.

RANDALL, K. E., AND D. T. PATTEN. Center for Environmental Studies, Arizona State University, Tempe, AZ 85287-1201. Revegetation of the Tempe Rio Salado with Native Riparian Plants -- A Land-use Plan.

The Salt River has endured many changes in the course of its existence. It is one of the most intensely managed rivers in Arizona, with dams and diversion projects, sand and gravel operations, and land-use developments within its floodplain.

Presently, a project is under consideration by the City of Tempe to develop its portion of the Salt River. The project is in its early planning stages. Inter-relating ecological factors present in the stream channel need to be addressed in order for a land-use plan to be in harmony with the environment.

We have initiated a study to develop an ecologically based land-use plan for the area with emphasis on re-establishing riparian and wetland vegetation. The study takes a multidisciplinary approach involving both historical and field research. The historical research has included review of descriptions and photographic accounts of the area which have provided information on the types and locations of past riparian vegetation and occurrences of channel bed changes and channel migration.

Locations of existing riparian vegetation and species are being mapped. Populus fremontii is being used as an indicator of groundwater availability. Levels of water utilization by P. fremontii have been measured through use of parameters such as yearly twig growth, core samples for stem growth, xylem water potential, and leaf water stress (through use of IR imagery).

This information is being integrated into a series of overlay maps that can be used to identify areas where indigenous riparian revegetation plantings will have a high probability of success.

RUSSELL, C. Arizona Department of Environmental Quality, Phoenix, AZ 85034. Arizona's Nonpoint Source Assessment Report.

The Nonpoint Source Assessment Report describes the nature and extent of nonpoint source (NPS) pollution and the preliminary program plans for controlling this pollution. Based on this assessment over 90 percent of the State's surface waters are not meeting designated protected uses as required by State Water Quality Standards.

Twenty-five years worth of data was assembled by watershed and stream segment to describe the current environmental conditions at each site. A computerized geographic information system was used to evaluate the potential impacts and to prioritize further environmental management actions. Nonpoint Sources to be regulated include: Agriculture, Forestry, Mining, Urban Runoff, Construction, Land Modification. The Habitat Modification aspect of this developing program is the key in preserving our riparian areas in Arizona.

LINKSWILER, J. Professional Engineer, 6064 N. 10th Place, Phoenix, AZ 85014. A 1973 Water Fable and 1988 Observations.

In June of 1854, Col. Mansfield inspected Fort Yuma and wrote, "The Gila is not at all seasons a running stream...." All of the runoff from 58,000 mi² was not sufficient to sustain perennial flow. The Gila is a "desert river" and surface flow is a rare and precious thing. In 1893, Col. John Wesley Powell wrote, "you are piling up a heritage of conflict and litigation of water rights for there is not sufficient water to supply the land." The people of Arizona did not heed these warnings.

In 1953 in the case known as Bristor v. Cheatham II, the dissenting judges wrote "We predict that the mad race to 'mine' percolating waters...will continue unabated until such time as these waters are declared to be public in character...." The legal and institution conditions put the riparian habitats in danger.

A water fable written in 1973 which shows how water "conservation" measures can do great harm is presented. Various actions since 1973 are presented. Another water fable and projections into the future show how the riparian habitats are doomed.

MOORE, S., and S. BRICKLER. University of Arizona,
Tucson, AZ 85721. Visitor Management in a Riparian
Wilderness.

Desiring to protect critical riparian habitats and associated species from disturbance by humans, managers often impose restrictions on recreational use. To be effective, restrictions must be received well by users and not greatly impact the quality of their recreational experience.

Numerous authors propose that techniques used to manage visitors in wilderness areas fall on a continuum ranging from intrusive to non-intrusive. (Intrusiveness is a measure of how much the techniques influence recreational experiences.) We use a hierarchy proposed by David Lime to evaluate visitors' attitudes toward management techniques employed by the Bureau of Land Management at Aravaipa Canyon Wilderness in Arizona. We present results of a questionnaire survey of 800 permit holders conducted during 1987 and 1988.

Most results of our survey agree with those obtained in other wilderness areas -- strong support for use restriction is associated with areas facing crowding or resource impacts. Even highly intrusive restrictions were favored. Aravaipa Canyon users were unique, however, in their endorsement of a use fee. Whereas use fees are often seen as unacceptable or inappropriate, at Aravaipa they were well received. Many visitors suggested a higher fee than the current one.

We conclude that extensive restrictions can be imposed on recreation in a riparian wilderness area and receive substantial support from users. Furthermore, many restrictions can be imposed without impacting users' perceptions of freedom. Implications for management of recreation in riparian areas are discussed and some cautions about our research are offered.

RUSSELL, C. Arizona Department of Environmental Quality,
Tucson, AZ 85724. Arizona's Nonpoint Source
Management Report.

MOORE, S., and S. BRICKLER. University of Arizona,
Tucson, AZ 85721. Visitor Management in a Riparian
Wilderness.

Desiring to protect critical riparian habitats and associated species from disturbance by humans, managers often impose restrictions on recreational use. To be effective, restrictions must be received well by users and not greatly impact the quality of their recreational experience.

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MUNSON, B. Arizona Department of Environmental Quality,
Phoenix, AZ 85034. Agricultural Pesticide Contamin-
ation of Riparian Areas -- An Overview.

Contamination of riparian areas by agricultural pesticides is of increasing concern related to recently discovered trends in contamination of surface and groundwater systems. Pesticide pollution of water resources is a function of certain chemical characteristics of the physical and chemical environment. These characteristics will differ within surface water versus groundwater systems.

The actual impact to specific riparian areas will be dependent on the hydraulic communication of the riparian areas with polluted water systems and the proximity of these areas to agricultural land where pesticides are used. The Pesticide Contamination Prevention Program of the Arizona Department of Environmental Quality will develop extremely useful data toward the further definition of this problem.

PATTEN, D. T., and J. C. STROMBERG. Center for Environmental Studies, Arizona State University, Tempe, AZ 85287-1201. Riparian Vegetation Response to Stream Diversion: Clues for Instream Flow Requirements.

Much effort has gone into establishing methodologies for determining instream flow requirements for riparian vegetation but, to date, none have been tested and proven successful. At Rush Creek, one of the primary eastern Sierra streams feeding Mono Lake, diversion has occurred, all or in part, since 1941. Since the mid-1980s, a minimum flow release of 19 cfs has been required. The riparian vegetation which was lush prior to 1940, gradually lost vigor and mostly died out over the next 40 years, especially during the 1970s when most years had total diversion. Since instream flow has been renewed, surviving cottonwoods (Populus trichocarpa) have root sprouted, willows (Salix spp.) have grown new shoots and produced seedlings, and the floodplain Jeffrey pine (Pinus jeffreyi) and aspen (Populus tremuloides) have produced new growth. Because there were survivors of the stream diversion, it may be possible to relate water release patterns from the diversion period 1941-1983, as well as pre- and post-diversion periods, with tree ring growth of riparian species. This will determine the stream flow patterns that produced "normal" growth and abnormally low growth. These relationships may be used to estimate the stream flows required to maintain healthy, woody riparian vegetation. Post-diversion studies on riparian regeneration may also indicate stream flow requirements to create a dynamic vegetational community rather than only a rejuvenated, mature riparian forest stand.

KEPNER, W. G., D. B. RADTKE, and W. C. HUNTER. U.S. Fish and Wildlife Service, Phoenix, AZ 85019; U.S. Geological Survey, Tucson, AZ 85701; U.S. Fish and Wildlife Service, Phoenix, AZ 85019. Presence of Trace Metals and Pesticides in Selected Biota from the Lower Colorado River.

Water, bottom sediments, and biota were sampled at selected sites along the lower Colorado River (Davis Dam to Imperial Dam) to determine whether irrigation drainage has adversely influenced the riparian and aquatic ecosystem. Samples were analyzed for selecting trace inorganic and synthetic organic constituents that are likely to be present at toxic concentrations. Selenium was the only constituent to exceed any existing standard or criteria for protection of fish and wildlife resources. Its source appears to be derived from the upper Colorado River Basin rather than the local irrigation delivery system. Fishes are extremely susceptible to environmental selenium due to their propensity to accumulate and biologically magnify selenium. Carp (Cyprinus carpio) samples had a high incidence of elevated selenium concentration with most ranging from 1.2 to 4.0 ppm wet-weight.

Egg and liver samples from Yuma clapper rails (Rallus longirostris yumanensis), a Federal-listed Endangered Species, were found to contain elevated concentrations of selenium. Means of 12.5 ppm dry-weight for eggs and 25 ppm dry-weight for livers were comparable to concentrations found in waterbirds at Kesterson National Wildlife Refuge, an area of extreme contamination with massive reproductive failure among the affected waterbirds. Crayfish (Procambrus clarki), a major rail prey item, also were found to contain elevated levels of selenium (mean of 4.2 ppm dry-weight) which might be high enough to cause health problems for rails through bioaccumulation processes. There continues to be a need to better determine the extent of reproductive and health problems within Yuma clapper rails on the lower Colorado River. There is also a need to definitely pinpoint the source or sources of selenium and work towards minimizing influx of this contaminant into the lower Colorado River's riparian and aquatic ecosystem.

LaFAYETTE, R., and P. LUEHRING. USDA Forest Service, 517 Gold Avenue, S.W., Albuquerque, NM 87102. Riparian Area Survey and Evaluation System -- Southwestern Region, USDA Forest Service.

The Riparian Area Survey and Evaluation System (RASES) developed for the Southwestern Region of the USDA Forest Service has evolved over a three-year period with the help of many interested parties both in and out of the Forest Service. This paper discusses the purposes of the system, a brief overview of its developmental history, key definitions, survey structure, mapping and field survey procedures, evaluation methods, and integration into Forest planning and management.

The paper also discusses current levels of activity in applying the method on several Southwestern National Forests and discusses cooperative efforts with various agencies and entities outside the Forest Service.

SCHUHARDT, S. Arizona Game and Fish Department, 310 Lake Mary Road, Flagstaff, AZ 86001. Use of the General Aquatic Wildlife System in Conjunction with Fish Surveys on Three Northern Arizona Streams.

The Forest Service has implemented a stream inventory and evaluation system known as the General Aquatic Wildlife System (GAWS). Its purpose is to provide baseline information on aquatic habitat. During the summer of 1988 the Coconino National Forest and Arizona Game and Fish Department performed GAWS surveys on West Clear Creek and its tributaries on the Mogollon Rim. We also did fish surveys using the quantitative electroshocking techniques at the GAWS stations on three of the tributaries. Fish biomass was recorded and population sizes were calculated. Various sets of fish data, including biomass and population size, were compared by regression analysis to various GAWS outputs; there was no correlation (r values range from $-.11$ to $.45$). Possible reasons for this are discussed. GAWS is still felt to be useful for providing a comparison of relative stream conditions.

STROMBERG, J. C., and D. T. PATTEN. Center for Environmental Studies, Arizona State University, Tempe, AZ 85287-1201. A Season at the Hassayampa River. 1132

Descriptive work on Southwestern riparian systems in recent years has led to better understanding of plant community structure, but functions and processes of these systems remain poorly understood. A 5-mile reach of the Hassayampa River near Wickenburg, AZ (owned by the Nature Conservancy) is providing the opportunity to study vegetation dynamics of a Fremont cottonwood (Populus fremontii)/Goodding willow (Salix gooddingii)/seepwillow (Baccharis salicifolia)/mesquite (Prosopis spp.) association, under conditions that are as close to "natural" as any in Arizona.

Many riparian associations are nonequilibrium systems, with flood events maintaining a mosaic of species assemblages of different ages. Assemblages at the Hassayampa, for example, range from stands of willow poles to mixed cottonwood/willow/mesquite forests. The mechanisms producing these mosaics are often inferred from point-in-time studies of vegetation. Research at the Hassayampa River is taking a different approach, monitoring recruitment of riparian species over time.

Results from one season at the Hassayampa reveal that flooding just prior to seed dispersal is not essential for cottonwood germination. Seeds germinated successfully along the high flow channel and edges of overflow channels, on soil wetted by capillary action. However, the timing of spring floods is an important determinant of relative species survivorship, given the nonoverlapping dispersal and germination periods of cottonwood and willow. The spring flood in 1988 at the Hassayampa occurred in late April, just after cottonwood germination, but just prior to willow germination. As a result, willows had high survivorship, outnumbering cottonwood seedlings nearly 100 to 1 by midsummer. Annual differences in timing of floods are thus one factor contributing to differential species success among years.

SWANSON, E. K., and D. M. HAINS. Arizona Department of Environmental Quality, Phoenix, AZ 85034. Dredge and Fill Permitting and the State Water Pollution Control Program.

The Federal Clean Water Act provides for the nationwide water pollution control program which includes planning, standards, permits, grants, enforcement, and research. Programs are implemented primarily by the U.S. Environmental Protection Agency, State water pollution control agencies, and the U.S. Army Corps of Engineers.

The objective of this program is "to restore and maintain the chemical, physical and biological integrity of the Nation's waters." Protection is provided for multiple uses of water, both consumptive and nonconsumptive. The presentation will focus on the Section 404 program in Arizona and current activities related to the review of permits by the Arizona Department of Environmental Quality.

WEGRZYN, J. G. Arizona Department of Environmental Quality, Phoenix, AZ 85034. Water Quality Standard Issues and Arizona Riparian and Wetlands Areas.

The U.S. Environmental Protection Agency (USEPA) is mandating that states provide an increased level of effort to protect riparian areas and wetlands through Sections 305, 401, and 404 of the Federal Clean Water Act (CWA). The Arizona Legislature has designated the Arizona Department of Environmental Quality (ADEQ) as the State agency responsible for implementing provisions of the CWA through the State Environmental Quality Act (EQA). ADEQ intends to acquire input from public, professional, and technical organizations for specific information on riparian areas and wetlands. This information will serve as a basis for recommending water quality standards assigned to water body segments throughout the State. Wetlands and riparian areas must also be protected for their intrinsic water quality values and other irreplaceable functions such as storage areas for flood waters and erosion control. Wetlands and riparian areas may vary and contribute significantly to background levels of certain water quality parameters. The standards must protect sensitive food webs and communities of plant and animal life that are represented in riparian areas and wetlands ecosystems. ADEQ through the Water Quality Standards Unit is committed to developing numeric and narrative biologically based water quality standards to achieve the CWA and EQA objectives.