

NINETEENTH MEETING
OF THE
ARIZONA RIPARIAN COUNCIL

Blue Water Resort and Casino
Parker, Arizona
March 31-April 2, 2005

The Lower Colorado River
and the Multi-Species
Conservation Plan



PROGRAM AND ABSTRACTS
2005

**Nineteenth Annual Meeting
Arizona Riparian Council
Blue Water Resort and Casino
Parker, Arizona
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**THE LOWER COLORADO RIVER AND THE
MULTI-SPECIES CONSERVATION PLAN**

**THURSDAY, March 31
Riparian Restoration Workshop Lecture Session**

Sponsors: Arizona Riparian Council, Arizona Water Protection Fund, and Apache NRC

Instructors: Tom Moody, Natural Channel Design, Flagstaff, AZ; Chris Hoag, Natural Resource Conservation Service, Aberdeen, ID; and Fred Phillips, Fred Phillips Consulting, Flagstaff, AZ

- 7:30-10:00 **Registration**
- 9:00-9:15 **Greetings and Scope of Workshop**
- 9:15-9:45 **Riparian Ecology** – Chris Hoag
- 9:45-10:15 **Nature of Rivers** – Tom Moody
- 10:15-10:30 **BREAK**
- 10:30 -11:00 **Riparian Planting Zones** – Chris Hoag
- 11:00 -12:00 **Effective Removal of Exotic Plant Species** – Fred Phillips
- 12:00-1:00 **LUNCH**
- 1:00-1:45 **Riparian Plant Propagation** – Chris Hoag
- 1:45-2:00 **BREAK**
- 2:00-3:30 **Revegetation of Native Plant Communities** – Fred Phillips
- 3:30-5:30 **Streambank Erosion Control Measures** – Tom Moody/Chris Hoag
- 7:00-9:00 Welcome reception. Contact Cindy Zisner via the hotel front desk for location.

FRIDAY, April 1
Arizona Riparian Council Technical Session

- 7:30-10:00 **Registration**
- 8:30-8:45 **Welcome** – Jeff Inwood, President
- 8:45-9:15 **Overview of the LCR Multi-Species Conservation Plan** – Leslie Fitzpatrick, U.S. Fish and Wildlife Service
- 9:15-9:45 **Management of Wildlife and Habitat on the Lower Colorado River** – Barbara Raulston, U.S. Bureau of Reclamation
- 9:45-10:15 **BREAK (Poster Session)**
- 10:15-10:45 **Water Allocation and Management in the Lower Basin of the Colorado River** – Terry Fulp, U.S. Bureau of Reclamation
- 10:45-11:15 **Tribal Perspectives on the Multi-Species Conservation Plan** – Gary Hansen, Colorado River Indian Tribes
- 11:15-11:45 **Panel Discussion**
- 11:45-1:15 **LUNCH**
- 1:15-1:45 **ARC News and Announcements**
- 1:45-2:10 **Adaptive management program of wildlife and their habitat for the Lower Colorado River Multi-Species Conservation Program** – Matthew Voisine.
- 2:10-2:35 **Avian monitoring of non-restored habitat and post development monitoring of restored habitat along the lower Colorado River using constant effort mist netting** – Laura Beth Sabin, Matthew Voisine, G. Clune, Christopher Dodge, Joe Kahl, A. Miller, J. Swett, and T. Olson.
- 2:35-3:00 **Microclimatic nest-site selection by Southwestern Willow Flycatchers (*Empidonax traillii extimus*)** – Mary Anne McLeod, Tom J. Koronkiewicz, and Bryan T. Brown.
- 3:00-3:30 **BREAK (Poster Session)**
- 3:30-3:55 **Biomass of insects and spiders on tamarisk branches** – William Wiesenborn.
- 3:55-4:20 **Searching for Mexican and Narrow-headed Gartersnakes in central Arizona – a discouraging summer** – William P. Burger and Andrew T. Holycross.

4:20-4:30 **Closing Remarks**

5:30- **Caribbean Beach Party** (social hour and dinner)

POSTERS (Presenters please be at your posters at breaks)

Evaluation of restoration success in a semi-arid riparian system using multiple metrics –
Jenica Holt and Julie Stromberg.

Surveys for the Yuma Clapper Rail, Topock Gorge 1996-2004 – Joe Kahl and Chris Dodge.

SATURDAY, April 2

Restoration Workshop Hands-On Training (registered workshop participants only)

8:00-8:30 AM Riparian Project Planning – Chris Hoag/Tom Moody

9:00-3:00 AM Hands on activities. Participants will install a variety of bioengineering practices along streambanks. Bring warm clothes, rubber boots or waders. Lunch provided.

Bill Williams Field Trip

The Bill Williams River field trip will be constrained by recent heavy rains and ongoing water releases from Alamo Dam. The river is currently flowing at “above normal” levels and is expected to still be flowing at high rates during our meeting. Access to the river is limited and road conditions vary due to weather and flooding. The field trip route is limited to a 3-mile section of road accessible by passenger car. Lunch is on your own.

8:00 - 8:20 AM Leave Hotel and drive to Bill Williams NWR

8:30 - 8:45 AM Introduction/trip preview from Refuge Staff

8:45 -10:15 AM Look at habitat along Bill Williams River

~10:30 AM Return to Refuge HQ

After the official tour, participants can either visit the Breakwater Walk or travel to a different area on the Bill Williams River on their own. Note: There is no access to Parker Dam due to Security restrictions.

Breakwater Walk – This walk is located at the Refuge HQ. It is a 0.5-mile trail on top of the breakwater, built to protect the inlet to the Central Arizona Project Pumping Plant. Views of the lower Colorado River and heron rookery on an island in middle of the river.

Mineral Wash access Point (Bill Williams River) – This “back way” to the Bill Williams River is accessed by traveling east out of Parker. It takes 1 hr to reach the river and access is limited to high-clearance vehicles. Road conditions vary depending on maintenance. A map to the area will be provided by Refuge staff. This location offers more examples of riparian habitat, riparian and mesquite regeneration as well as signs of beaver activity.

ABSTRACTS

(Abstracts are ordered alphabetically by first author.)

BURGER, W. P.¹, and A. T. HOLYCROSS². ¹Arizona Game and Fish Department, 7200 E. University Dr, Mesa, AZ 85207; and ²School of Life Sciences, Arizona State University, PO Box 874501, Tempe, AZ 85287-4501. ***Searching for Mexican and Narrow-headed Gartersnakes in central Arizona – a discouraging summer.***

Both Mexican Gartersnakes (*Thamnophis eques*) and Narrow-headed Gartersnakes (*T. rufipunctatus*) are restricted to Arizona and New Mexico in the United States. All US populations of Narrow-headed Gartersnakes that have been evaluated have shown evidence of decline or extirpation. Mexican Gartersnakes have apparently been extirpated from New Mexico, and most Arizona populations that have been evaluated have shown evidence of decline or extirpation. During July-August 2004 we conducted surveys for these two gartersnake species within the Salt, Verde, and Agua Fria River drainages in central Arizona. Both species are highly aquatic so surveys were conducted in areas with perennial water, typically at locations with museum or other records of the target species. Comparing our work to a similar 1988 study shows introduction/expansion of crayfish, and a continued transition from native to exotic species at multiple sites since 1988. Our work suggests that Narrow-headed Gartersnakes have been substantially reduced or extirpated from the East Verde River since 1988. Cooperative work with the New Mexico Department of Game and Fish indicates a large decline of a population of Narrow-headed Gartersnakes in the San Francisco River within the past decade. We found Mexican Gartersnakes at sites on Oak Creek, Tonto Creek, and along the Verde River. Evaluating remaining historic localities is critical to accessing the status of these two species in Arizona. Further studies are also needed to help identify and contrast areas in which the snakes currently persist with areas where they have declined or been extirpated.



FULP, T. U.S. Bureau of Reclamation, Lower Colorado Regional Office, P.O. Box 61470, Boulder City, NV 89006-1470. ***Water allocation and management in the Lower Basin of the Colorado River.***

The allocation and management of Colorado River water is governed by a complex body of legislation, court decrees, an international treaty, and other agreements. In the Lower Basin, the Secretary of the Interior is the Water Master and Reclamation acts on her behalf to operate the system to ensure that multiple objectives are met.

A brief overview of the operation of the system will be provided, including current conditions resulting from the system-wide drought and the recent precipitation received in the Lower Basin. Administration of water entitlements will also be discussed. Although specific sources of water needed for the creation and maintenance of Multi-Species Conservation Plan habitat have not yet been identified, some possible programmatic approaches will be discussed.



HOLT, J., and J. STROMBERG. School of Life Sciences, Arizona State University, PO Box 874501, Tempe, AZ 85287-4501. *Evaluation of restoration success in a semi-arid riparian system using multiple metrics.* (Poster)

The Salt River riparian ecosystem has changed extensively over the past century. In the Phoenix metropolitan area, flood suppression, stream flow diversion, flood control, land urbanization, and ground-water pumping have reduced the abundance of riparian forests and narrowed the width of the flood plain. The Rio Salado Project is a multi-city, multi-agency project intended to restore some riparian functions to portions of the Rio Salado, or Salt River. The 7-acre restoration demonstration project east of Central Avenue on the north side of the Salt River in Phoenix was monitored from spring 2003 to fall 2004. Multiple metrics were used to monitor restoration success, including vigor and survivorship of woody plantings, herbaceous and woody recruitment, species richness, and vegetation volume; site changes also were photographically documented. 163 individual trees/shrubs were monitored, among four species: Fremont cottonwood (*Populus fremontii*), Goodding willow (*Salix gooddingii*), coyote willow (*Salix exigua*), and velvet mesquite (*Prosopis velutina*). The trees were in either in a deep tilled or untilled area, in several planting sizes, and either watered by drip or by a perched aquifer-flood overflow treatment. Trees were monitored monthly for height, vigor, and survivorship. Mortality was higher and vigor was lower in the flood overflow area than in the drip irrigated area, suggesting that the perched aquifer was not adequately recharged by the pumped water and that flood overflow rates were insufficient to sustain high survivorship over a broad area. However, growth rate of the surviving trees in the flood overflow area was higher than in the drip irrigated area. For all treatments combined, Fremont cottonwood mortality was 20%, Goodding willow was 10%, and mesquite had 0%.

We also established 16, 100m² quadrats in areas of drip irrigation, flood overflow, pond and delivery channel edges, unwatered terrace, and the low-flow Salt River channel fed by pumped groundwater. In each quadrat we measured species richness, herbaceous percent cover, vegetation volume, and tree density. Species richness differed among areas (ANOVA, $p=0.008$), with highest values for the pond edges, drip-irrigated cottonwood area, flood overflow area, and areas adjacent to the delivery channel. Herbaceous cover also differed significantly among areas (ANOVA, $p<0.01$), with values highest along the low flow channel (70%), followed by the pond edge (41%), delivery channel (31%), and flood overflow area (24%). The drip irrigated areas (mesquite and cottonwood areas) had about 7% to 8% cover, indicating that drip irrigation does not promote herbaceous plant growth to the same degree as does proximity to water bodies. Vegetative volume differed significantly between irrigation techniques (ANOVA, $p<0.001$), with values significantly greater along the Salt River low-flow channel than for other areas. In summary, the flood overflow treatment worked very well for herbaceous and woody plant growth, but in its existing configuration was not reliable as a watering system for survivorship of planted, mature obligate riparian trees. Overall, these results indicate the importance of using multiple metrics for gauging success of riparian restoration projects.



KAHL, J., and C. DODGE. U.S. Bureau of Reclamation, Lower Colorado Regional Office, Resources Management Office, Wildlife Resources Team, P.O. Box 61470, Boulder City, NV 89006-1470. *Surveys for the Yuma Clapper Rail, Topock Gorge 1996-2004*. (Poster)

The Yuma clapper rail (*Rallus longirostris yumanensis*) was listed endangered on 11 March 1967 by the Secretary of Interior pursuant to the Endangered Species Act of 1966. In 1971, the species was listed as rare by California and in 1978, Arizona classified the species as Group 3, similar to the federal status of endangered. The U. S. Bureau of Reclamation (Reclamation) has been conducting surveys for Yuma clapper rails in Topock Gorge since 1996 in accordance with the Biological and Conference Opinion on Lower Colorado River Operations and Maintenance - Lake Mead to the Southerly International Border. This requires that surveys be performed to continually track the population of Yuma clapper rails in order to maintain a minimum breeding population of 700-1000 on the lower Colorado River. Survey methods are done in accordance with protocol established by the U.S. Fish and Wildlife Service. Topock Gorge, a part of the Havasu National Wildlife Refuge, is in Reach 3 of the Lower Colorado River Multi-Species Conservation Plan (LCR MSCP). Surveys are conducted from March 15 through May 30. The number of rails detected has ranged from 17 in March 2002 to 72 in May 2005. Under the LCR MSCP, existing important Yuma clapper rail habitat areas will be maintained, 512 acres of habitat will be created and surveys will be conducted on both existing and created rail habitat.



MCLEOD, M. A.¹, T. J. KORONKIEWICZ¹, and B. T. BROWN². ¹SWCA Environmental Consultants, 114 N. San Francisco St., Ste 100, Flagstaff, AZ 86001; and ²SWCA Environmental Consultants, 230 South 500 East, Suite 380, Salt Lake City, UT 84102. *Microclimatic nest-site selection by Southwestern Willow Flycatchers (Empidonax traillii extimus)*.

Innate selection of beneficial nest-site microclimate by open-cup nesting passerines can moderate extreme environmental conditions, thus influencing energy expenditure and improving reproductive success and fitness. During the breeding seasons of 2003 and 2004, we measured temperature, humidity, and soil moisture at nest, within-territory, and non-use sites for nesting Southwestern Willow Flycatchers (*Empidonax traillii extimus*) at four breeding sites along the lower Colorado River and its tributaries. Nest locations were consistently cooler and more humid, had greater soil moisture, and were closer to surface water than non-use sites within the contiguous riparian zone. In addition, flycatchers placed their nests at locations within their territories that were cooler and exhibited smaller temperature fluctuations than randomly selected sites within 5-10 m of the nest. In desert riparian areas where maximum ambient temperatures reach or exceed the lethal tolerance of embryos, the availability of suitable microclimates may be essential to the reproductive success of late-arriving neotropical migrants such as the willow flycatcher. Microclimate studies are anticipated to continue through 2007, and future analyses will examine the correlation of vegetation characteristics with microclimate,

the effect of microclimate on willow flycatcher nesting success, and the relationship between microclimate at sites south of Parker Dam and that at known breeding sites. Any restoration efforts along the lower Colorado River intended to provide habitat for the willow flycatcher should consider microclimate as a necessary component for creating habitat that can attract and sustain breeding willow flycatchers and other neotropical migrant passerines.



RAULSTON, B. U.S. Bureau of Reclamation, P.O Box 61470, Boulder City, NV 89006.
Management of wildlife and habitat on the lower Colorado River.

Under the Lower Colorado River (LCR) Multi-Species Conservation Plan, 5,940 acres of cottonwood-willow, 1,320 acres of mesquite, 512 acres of marsh, and 360 acres of backwater will be created. These acreages will be within the historic floodplain of the LCR from upper Lake Mead to the Southerly International Boundary. Endangered species such as the Yuma Clapper Rail, Southwestern Willow Flycatcher, Bonytail Chub, and Razorback Sucker, as well as 16 other species, will benefit from this restoration. As the implementation agency for the plan, the Bureau of Reclamation has already started this process by partnering with various agencies on the LCR to test out methods and techniques of site preparation, irrigation, and planting that will be utilized over the next 50 years to accomplish these restoration goals. Some of the ongoing demonstration projects will be discussed.



SABIN, L. B., M. VOISINE, G. CLUNE, C. DODGE, J. KAHL, A. MILLER, J. SWETT, and T. OLSON.
Bureau of Reclamation, PO Box 61470, Boulder City, NV 89006. ***Avian monitoring of non-restored habitat and post development monitoring of restored habitat along the lower Colorado River using constant effort mist netting.***

Historical native habitat of the lower Colorado River (LCR) has declined dramatically due to urbanization, dams, channelization of the river, agricultural conversion and invasion of non native species. The ongoing and future operation of the LCR may have a negative effect on listed species and may contribute to new listings. In 2005, Reclamation will begin implementation of a Multi-Species Conservation Plan (MSCP) to comply with the Endangered Species Act in the continuing operation and maintenance of the LCR. The creation of 5,940 acres of cottonwood-willow habitat and 1,320 acres of honey mesquite will provide habitat for MSCP covered as well as non-covered species. Currently, Reclamation is conducting post development monitoring at two demonstration restoration sites (CIBO and PRAT) and monitoring at one non-restored site (HERO). Reclamation has implemented Monitoring Avian Productivity and Survivorship (MAPS) stations in non-restored habitat (HERO site) and restored habitat (CIBO site). Reclamation has implemented a winter and fall constant effort mist netting station on two restoration sites (CIBO and PRAT) to monitor their effectiveness in providing habitat for winter and stop over residents. Productivity, survivorship, over winter site persistence, annual return rate, age and sex ratios, bird condition, avian abundance, and species composition data has been

and will continue to be collected from these stations. The HERO site (non-restored) yielded 19.51 resident birds per 100 net hours comprising 31 species during the breeding seasons of 2000-2004. The CIBO site (restored) yielded 48.38 resident birds per 100 net hours comprising 29 species during the breeding seasons of 2003-2004. The Sonoran yellow warbler was the only MSCP covered avian species detected at either site. The CIBO site (restored) yielded 37.9 birds per 100 net hours comprising 31 species during the winters of 2002-2004. The PRAT site (restored) yielded 46.5 birds per 100 net hours comprising 19 species during the winters of 2002-2004. During the breeding season the restored site had a significantly higher capture rate per year ($p < .05$) than the non-restored site but was comprised mostly of habitat generalists rather than riparian obligate species. During the winter period, Ruby-crowned Kinglets had the highest over winter site persistence at both sites. Reclamation is expected to add a third winter constant effort mist netting station in non-restored habitat and add additional MAPS stations in restored and non-restored habitat for continual avian monitoring along the LCR.



VOISINE, M. Bureau of Reclamation, Lower Colorado Region, Resources Management Office, Biology Group, Wildlife Team, PO Box 61470, LC 2328, Boulder City, NV 89006. ***Adaptive management program of wildlife and their habitat for the Lower Colorado River Multi-Species Conservation Program.***

The US Bureau of Reclamation (Reclamation), Lower Colorado Region, Resources Management Office is responsible for implementing The Conservation Plan of the Lower Colorado River Multi-Species Conservation Program (LCR MSCP). The comprehensive plan is designed to conserve, monitor, and manage the 27 covered species and 4 evaluation species along with their associated habitat affected by all federal and non-federal activities associated with the LCR MSCP. Reclamation will address those activities associated with federal actions. The Wildlife Team of the Resources Management Office will be responsible for the 27 species of bird, reptile, mammal, plant, and butterfly. The Fisheries Team of the Resources Management Office will address the four fish species. To address the uncertainty of creating and managing habitat, the LCR MSCP stipulates that The Conservation Plan utilize the practice of adaptive management. The adaptive management process is an ever-evolving method of examining techniques to meet the biological goals and objectives and, if necessary, adjusting accordingly to the newly ascertained knowledge. The adaptive management process is separated into five management sections; system monitoring, species research, restoration research, post-development monitoring, and database management. Since the mid 1990's, The Wildlife Team has been performing system monitoring for Southwestern Willow Flycatcher and Yuma Clapper Rail in anticipation of implementation of the MSCP. Under the MSCP, this system monitoring will continue and will increase the collection of data on existing populations and habitats in order to determine their status, distribution, density, migration, productivity, and other ecological parameters. Species research will address gaps in life histories knowledge of the covered species. Restoration research will focus on habitat creation activities and will be the responsibility of the Restoration Group. Following habitat creation, post-development monitoring will evaluate the habitat based on use of the habitat by the covered species. Throughout this adaptive management

plan, the Biology Group will maintain data in a database to allow for continuity, access, and to identify gaps in the knowledge. The data gathered through the adaptive management process will direct Reclamation's actions for providing habitat for the covered species.



WIESENBORN, W. Bureau of Reclamation, Lower Colorado Regional Office, PO Box 61470, Boulder City NV 89006. ***Biomass of insects and spiders on tamarisk branches.***

I measured biomasses of different taxa of arthropods collected from tamarisk (*Tamarix ramosissima*) branches from three trees at each of three sites at Las Vegas Wash, Nevada, during 2002 and 2003. Sites varied in elevation and distance from perennial surface water. Arthropods were sampled by bagging, cutting, and fumigating branches and by examining side branches. Biomass was measured as arthropod dry mass per plant dry mass. Biomass of two taxa of herbivorous insects, tamarisk leafhoppers (*Opsius stactogalus*) and armored scales (*Chionaspis* spp.), comprised 97.7% of total arthropod biomass. Their biomass increased with increasing water content of branches and was most abundant (85% of herbivore-arthropod biomass) on trees adjacent to surface water. Biomass of tamarisk leafhoppers was strongly correlated with those of *Polynema saga*, a mymarid wasp that parasitizes their eggs, *Gonatopus* sp., a dryinid wasp that parasitizes their nymphs and adults, and web-spinning, predatory spiders in Dictynidae. Biomass of tamarisk leafhoppers was weakly correlated with those of *Attalus* spp., an omnivorous melyrid beetle, and the ant *Formica xerophila*. Biomass of armored scales was correlated only with those of *Cybocephalus californicus*, a predatory nitidulid beetle. Biomass of hunting, predatory spiders in Salticidae was not correlated with that of either taxon of herbivorous insects. Low percentage of biomass of arthropod predators and parasites, and large fluctuations in biomasses of tamarisk leafhoppers and armored scales between years, indicate populations of insects feeding on tamarisk branches are not controlled by predators and parasites. Tamarisk branches provide arthropod-eating birds prey with low diversity and erratic biomass.



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