



# Arizona Riparian Council

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## DATE CREEK: PAST AND PRESENT

by Matt Peirce, Arizona Game and Fish Department, Phil Knight, Date Creek Ranch, and Tom Hildebrandt, Tim Flood, and Kathleen Tucker, RSRA Team

*Editor's Note: This article is written in three parts. Matt Peirce, who worked in the area for sometime, provides the introduction. Phil Knight is now deceased, but we have permission from his daughter Kim to republish a report he wrote to Arizona Game and Fish Department (in 1993), and finally the article is wrapped up by the RSRA Team based on observations at the fall meeting.*

I first met Phil Knight in October 1989. Phil was the owner and manager of the Date Creek Ranch northwest of Wickenburg. As the Wildlife Manager for the area I was there to investigate two calves killed by a mountain lion. I was about to learn two remarkable things about Phil. It turned out that the kills had occurred about a month prior, but what surprised me was that Phil's solution to the problem was to move the livestock from the pasture where the kills had occurred rather than attempt to remove the mountain lion. That was my first clue Phil was different.

The second discovery occurred when Phil said that there were fresh lion tracks in the creek. I said, "let's go take a look." What I saw upon stepping from the mesquites onto the banks of Date Creek changed my perception of riparian areas forever. I immediately forgot about mountain lions and began asking Phil questions about what I was observing – stream banks covered by sedges, rushes and grasses, cottonwood and willow trees of varying sizes

and the only exposed sand was in the main channel that had a shallow flow of water. Phil in a calm, matter-of-fact way answered my questions about the creek. Bottom line was that Phil, for more than 20 years, had grazed the pasture containing Date Creek only between the months of mid-October to mid-March.

I learned that this pasture was only about 7 square miles and yet Phil pastured his entire herd of more than 300 for the 5 months between October and March. Date Creek within this pasture is about 2 miles long. Over the years I encouraged many different folks to tour Date Creek. I did this to not only better educate myself as to just how significant Phil's effort was but to learn more about riparian habitats. Phil was always open to these visits and frequently participated. My work with Bureau of Land Management people indicates that they, where ever possible, now attempt to implement riparian habitat restoration following Phil's strategy of only grazing during the "dormant" season. I hear secondhand that the U.S. Forest Service has also adapted the same strategy.

In the summer of 1993, two beaver were introduced to this portion of Date Creek. The upstream ranch, OX (pronounced Oh X) Ranch, and Phil Knight both requested and agreed to work with the Arizona Game and Fish Department in this endeavor. From that transplant

a population was established. Several additional beaver have been introduced to supplement the original pair. I monitored the beaver for 5 years and produced reports quantifying as well as explaining their activities and movements.

The OX Ranch has attempted to duplicate Phil's model with fencing and some early success. I learned that attempting to fence cattle out of the creek during the summer is very difficult and requires constant attention by the rancher. Phil's allotment is arranged such that when his cattle are not in Date Creek they are miles away and not just separated from the creek by a fence.

The future management of this stretch of Date Creek is unfortunately up in the air with the death of Phil last year. It is not known if Phil's wife will sell the ranch or allow it to remain under the stewardship of Phil's daughter and husband who would continue Phil's legacy.

*Continued pg. 3 . . . . . Creek*

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## PRESIDENT'S MESSAGE

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Greetings. If you are thinking that it has been awhile since the last newsletter came out you would be right. We try to get a newsletter out every 4 months. However, as things are changing and budgets are getting tighter and everyone is asked to do more with less – putting the newsletter together was delayed. It is not because we did not have information to share – as you can see ARC has had several events – but our professional and personnel lives just got a little more hectic. We will make a bigger effort to be more punctual. For now I ask for your indulgence.

I want to recap some of the key events ARC has conducted over the last several months. We had our fall campout last October at Date Creek. The weather and camp site was perfect. Matt Peirce from the Arizona Game and Fish Department (now retired) coordinated with the Knight family and lead the discussion on the various management activities that have been undertaken on this working ranch to improve the riparian habitat and maintain the cattle ranch. In this issue of the newsletter, there is an article on Date Creek. Matt gives an overview of the ranching history at Date Creek, and a report that was written by the late Phil Knight, ranch owner who originally brought the idea of making the ranch compatible with sustaining a viable healthy riparian ecosystem. A summary, written by Tom Hildebrandt, of the Riparian Stream Rapid Assessment conducted by Tom, Tim Flood and Kathleen Tucker on this reach of Date Creek is also included.

November was the national election and a new Democratic President was elected. Mr. Obama spoke of change during his campaign and each American is currently seeing and feeling that change in a big way. I am hopeful that some of the economic stimulus funds that are to be directed for

habitat restoration are used to protect and enhance riparian and wetland areas and that Arizona's riparian areas receive some of those funds. Since everything is transparent, let's keep an eye on this.

Many of you may be experiencing the changes that are occurring with our economy particularly hard. Perhaps you have been asked to take furlough, or your salary has been reduced, or you are doing your work as well as someone who has been laid-off. Programs and staffs are being cut. I hope this situation is remedied soon. One program that many of you are familiar with is the Heritage Alliance. The Alliance oversees the funding for the Heritage program that is used by the Arizona Game and Fish Department and the Arizona State Parks to fund habitat projects and fund personnel. A message was sent out by the Alliance in April asking for conservation organizations to sign on to the letter they were sending to the state legislators requesting that Arizona's Heritage Fund program be kept intact and not used to offset the budget shortfall. The Arizona Riparian Council was one of forty-one organizations that signed on to the letter. We are hopeful the budget for this program is maintained.

In April we had our 23rd Annual Meeting of the Council which was held in Camp Verde at the Cliff Castle Lodge. We had our usual meeting format on Thursday and then a classroom workshop on Friday with a field trip on Saturday. Our theme for the meeting was invasive species in riparian areas. We had five excellent speakers in the morning who presented information ranging from considering the economics of treating invasive species and actual work that is being done in Fossil Creek to examining whether treatments of an exotic species such as salt cedar should be done.

The discussion between the speakers and the members was lively and continued in the afternoon with our technical papers presenters. Our Friday workshop instructors were top-notch. We want to thank Drs. John Brock, Ed Northam, and Kelly Steele, and Mr. Doug Greene for the information they gave us on identifying non-native plants. This information will be helpful in doing the RSRA as well as other assessment work.

Also, at our Annual Meeting we elected Diane Laush, Treasurer; Alicyn Gitlin, Board Member At Large; and Cindy Zisner, Secretary. I want to thank Cory Helton and Nicole Brown for their work on the Board. Please know that you can participate in the Board meetings – just let one of the Board Members know so we can have enough handouts. You can also participate via phone conference.

Please mark October 3 and 4 on your calendars to attend our fall campout. It will be at the Audubon Research Ranch near Elgin, Arizona. Our host will be Linda Kennedy, Director of the Ranch. We are planning on hiking to Turkey Creek, O'Donnell Creek and the Babocamari River. More information can be found in this issue of the newsletter. As we get closer to October, we will send out more information via the listserve. Check your emails.

Diana Stuart has continued to organize our evening social meetings by arranging to have speakers present current research or discussion of timely issues. The meeting in Tucson in January with Julio Betancourt was very well attended with over 30 people. After taking the summer off, Diana will start up the meetings again in the fall. Please contact her if you know of a speaker that would be of interest to ARC members.

*Cont. pg. 8 . President's Message*

**Creek . . . . . From pg. 1**

Even with this uncertainty it is my opinion that it should be conventional wisdom that cattle and quality riparian habitats are possible. As Phil Knight would tell you it's a matter of timing not exclusion. I never did see those mountain lion tracks that first day. There were more important things to learn.

## PHIL KNIGHT'S REPORT

### Introduction

In the past 25 years I have, according to experts, created one of the finest riparian areas in the State of Arizona by using planned grazing.<sup>1</sup> In the creek bottom of Date Creek, where almost no regeneration of trees had previously occurred, the population has now increased to thousands of trees per mile. What once was a wide, unstable sandy creek with very little vegetation is now a much narrower, deeper stream with thickets of trees, perennial grasses, and reeds. The needs of the rancher and the needs of the environmentally aware public are both being met. The riparian area upstream which had no planned grazing is a highly eroded, nearly grass-free area which lost most of its trees during this year's floods.

I would like to comment on how I got the opportunity to improve Date Creek. I was neither born nor raised on a ranch but spent my first 17 years in Phoenix. I received a Bachelor of Science degree in Geology and Engineering from the University of Arizona and also obtained some training as a naturalist. For several years I worked as a mining engineer in southern Arizona and at that time bought my first small ranch. In

1966 I bought Date Creek Ranch with a creek that was in as bad a condition as any I have seen. I realized that I had to make a change.

Date Creek 25 years ago was up to 200 feet wide and mainly consisted of flat sand with no vegetation. The banks had a few 50 to 75-year-old willow and cottonwood trees and only very few younger trees.

The shape of the stream bed after 25 years of planned grazing has now changed from a flat U to a deep V-shape. There are now thousands of trees per mile of creek. Most of the trees are under 25 years old. The width of the stream has narrowed to as little as 2 feet with grass and trees growing where once was sand. The highly eroded banks have been smoothed off. I have used not herbicides on the creek and I have not planted any trees during the restoration period.

During the extremely heavy floods of this winter, I lost only a few trees. Because of the trees, grasses and reeds, which have developed during the past 25 years, the banks hardly eroded, whereas in areas with continuous grazing above and below my ranching operation most of the trees were washed away and the creek bed was badly damaged.

### Description

Date Creek Ranch is located 22 miles northwest of Wickenburg at an elevation from 2500 to 3,000 feet on the border between the Sonoran and Mojave Deserts, which allows Joshua trees and Saguaros to grow in a unique mixture. Geologically it is on the border between the Basin and Range and the Transitional provinces; the soils are a combination of plutonic and volcanic. Topography varies from flat to mountainous.

In this desert setting, rainfall comes primarily in the winter and spring months, though August is another wet month. A large proportion of the original perennial grasses gave way in the 1890's to annuals due to drought and extreme grazing.

### History

In the 1860's Date Creek was on the main route from Prescott, the territorial capitol of Arizona, to California. There was a small army fort in the area and malaria was a problem. Soldiers at the fort noted the presence of wild turkey. It is thought that beavers were present when the first trappers arrived. Cattle and sheep were introduced in the 1880's when Date Creek became part of a sheep driveway. At that time, pronghorn antelope grazed the gentler country of what was then a fine grass land. Large herds of continuously grazing animals and droughts in the 1890's reduced this flat country from perennial grasses to mainly annuals and creosote bush.

### Management

Management of a riparian area is basically a simple process. In order to bring back a creek to its natural state, the timing of the grazing must be controlled. Time is more of essence than numbers. Being uncontrolled, a wild burro is very hard on the land while a well-managed grazing cow can actually improve the ecosystem. Yet, there are areas in Arizona where cattle are excluded and burros are allowed to run with no restrictions. Cottonwood trees on the Santa Maria River have been stripped of their bark until they died.<sup>2</sup>

I graze cattle on Date Creek from October to March. Grazing shortens the grasses and reeds

<sup>1</sup>Bob Ohmart, Professor of Zoology, Center for Environmental Studies, ASU.

<sup>2</sup>Matt Peirce, Arizona Game and Fish Dept., Santa Maria River

enough to revitalize them for the coming growing season. There are 4,500 acres of grazing land in the creek pasture which leaves adequate room for the cattle to spread out.

The creek pasture has shown considerable improvement over the years, so that it will now carry four times as many cattle as the same area on the surrounding ranches. Just as the vegetation has improved, so has the wildlife. I discovered turtles where I never saw them before. The numbers and kinds of birds in this area have increased considerably. (See Attachment A: Birds observed by members of the Prescott Audubon Society, 10/17/92 [not available]). For the past four years I have been engaged in reintroducing wild turkeys to Date Creek and the Game and Fish Department and I am working toward reintroducing the beaver in this area.

## Topography

The shape of the creek has changed drastically since 1966. Where before the cross section of the creek was a flat-bottom U, it is now V-shaped. The eroded banks with their sharp drop-offs have disappeared. These banks are now rounded and grassed over and even the big floods of this winter did not destroy them.

Many of the new trees grow in rows following the creek. The oldest of the "new generation" i.e., under 25 years of age, are the farthest from the stream, while the youngest are closest to the water. They are growing where 25 years ago there was barren sand.

The stream banks have increased in height. When floods occur, the soil is now retained by the grass on the banks. Each flood increases the height of the banks. This is a reversal of the former scouring and erosion process.

The stream itself was once up to 200 feet wide, before this winter's massive floods the width of the stream had decreased to 2 feet in some areas and the banks were covered with grass. Those

narrow areas have increased to 6 feet due to the recent floods. The damage in the areas above and below my ranching operation has been quite drastic. Trees were washed out and the banks eroded badly.

The creek is perennial for at least three miles. The water in the stream used to be very shallow and meandering. In the area I manage it is now deeper and more confined.

The perennial part of Date Creek on this ranch has improved to about 90% of its potential. It would now be possible to occasionally run grazing animals during the growing season and, in fact, it would be healthy to do so.

It is actually easy to improve a riparian area, because there is water and improvement comes quickly because of the water. However, grazing must be planned and the timing of grazing is much more significant than the numbers of grazing animals. Domestic animals can be managed accordingly. However, if we don't manage the wild animals they may do more harm than cattle.

## Holistic Resource Management

The non-riparian acreage of my ranch (33,000 acres) also deserves special management care. In a brittle desert environment as this, the ecological cycle is interrupted and management must be implied to assure the natural cycles ensue. As a result of careful management, improvements similar to those in the riparian area, especially the comeback of the perennial grasses and the ecology which supports them can, be achieved.

I have been applying Holistic Resource Management (HRM) for the past 11 years. Before becoming involved in this management style I had increased fencing so that I could use a rotational grazing system.

The reason for adopting HRM was the wish to achieve the following goals:

- Improve the range to the condition it was in 110 years ago while increasing productivity.
- Achieve a stable economic base enabling me to sustain my family and improve the quality of life, e.g., to be able to take a vacation once a year, not work more than six days per week and to have full-time electricity.

HRM guided me to make the necessary changes. I now have six cells broken up into 40 paddocks. They are used for grazing about seven months during the growing season. Many of the paddocks are as large as 1,000 acres. About 20,000 acres are flat and covered with creosote bush. They have swales of tobosa running through them. The other 13,000 acres are hilly to mountainous and are a mixture of grass and browse.

Depending on whether the grass is growing or not, the cattle stay in a paddock as little as two days. The paddocks have a minimum rest period of 30 days, which is plenty of time for grass regrowth during the growing season.

Under the HRM program I have improved water distribution to cattle and wildlife by installing pipelines in addition to existing dirt tanks. Also, I have constructed about 70 miles of electric fence to control grazing. Although my experiments with imprinting and seeding were not successful, the low successional perennial grasses, such as fluff grass, are making a surprising comeback. Cow manure is being quickly incorporated into the soil. There is an abundance of small animals and insects. The most surprising observation, however, is the fact that moisture penetration of the soil has increased two to three times.

Also, under HRM, I am getting use from the unpalatable grasses, so that they have no advantage over the palatable species.

In the 1980's I had eight years of drought. As a result, I had little

improvement in grasses, but there was no loss of plants nor cattle during that period. The big change during this time was an increase of low-successional grasses and plants such as fluff grass and desert holly, which are preparing the way for the high-successional species such as tobosa and galleta.

Up to a few years ago I sprayed my cattle to control flies and grubs as most of my colleagues still do. Under HRM I ceased this practice and as a result manure patties are now disappearing into the soil at a rapid rate. They are enriching the ground where before they just laid there. Now the manure becomes full of worms and other insects. Small animals tear the patties apart to get the insects and the patties disappear. The quality of the soil is therefore increasing.

The most significant improvement resulting from the Holistic Resource Management style lies in the moisture penetration of the soil. One of my grazing cells is being used 50% of the seven months of usage and has been used that way for about six years. This use creates a high-herd effect and it has produced moisture penetration up to three times the rate in other cells. The penetration varies depending upon the amount of use by cattle. The highest use area has the greatest moisture penetration and the cell with the least use (although it has a more permeable soil structure) has the least penetration.

It is therefore clear that there is a correlation between the degree of usage and the moisture penetration – which is so essential for plant restoration.

### Conclusion

In closing I would like to emphasize that if ranchers realized that they could improve their economic base by applying the above described management practices they would be more likely to improve their riparian and desert grazing areas.

If environmentalists realized that the process I am using works, we could all have beautiful creeks and healthy deserts and we could work towards that goal together.

After all, as Val Little, the head of the Hassayampa Preserve recently stated, when the question was raised how Date Creek would look without cattle: “I think this question misses the point. For one thing, we really don't know how Date Creek would look without cows, but we do know it looks pretty darned good with them. For another, if we got rid of the cows, we'd get rid of Phil Knight. Then, who's going to take such good care of the place?”

### DATE CREEK AND ARC'S RSRA PROJECT

Our RSRA (Rapid Stream Riparian Assessment) project team conducted an assessment of Date Creek prior to and in anticipation of our Fall Meeting. As you've read above, Date Creek has a well-deserved reputation as a riparian area of outstanding qualities, something that any of us who have visited can say they saw for themselves. Our mission was to try and measure those qualities and determine how they differ from the other systems we've assessed so far.

We don't have a lot of data to which to compare Date Creek, we've only completed a total of

four full-fledged assessments so far, along with several partial assessments and training exercises. It has been a busy year for the project, and a fun one, but there is only a limited amount of information accumulated so far.

The RSRA protocol ranks a total of 25 separate indicators in 5 categories. These are 1) Water Quality; 2) Hydrogeomorphology (Stream Form); 3) Fish/Aquatic Habitat; 4) Riparian Vegetation; and 5) Terrestrial Wildlife Habitat. A constant perspective on the indicator measurements is that in most cases what we're trying to evaluate is the indicator's contribution to enhanced habitat for aquatic or terrestrial wildlife.

So, what did we find at Date Creek? First of all, let's get it out right now that our overall score at Date Creek was the highest among all of our data sets so far. But it wasn't that much higher, and in one of our categories, it had the lowest overall score. See the chart below.

Although it's very early in our experience, there are a number of things that comparison of our indicators across sites can tell us. Let's start with the low score for Fish/Aquatic Habitat. This one is pretty simple. Date Creek was the smallest of our sites in surface water volume. There simply wasn't much water, so the water only did a few very simple things. There were no pool/riffle combinations and other features that the workings of a more substantial volume of water could produce.

Another factor here is that for most of our mid-elevation streams, the watershed above the assessment reach is extremely damaged. This results in a system

Site Name	Date of Assessment	Overall Score	Water Quality	Hydro-Geomorphology	Fish/Aquatic Habitat	Riparian Habitat	Terrestrial Wildlife Habitat
Date Creek	9/20/2008	3.1	4.0	2.8	1.8	3.0	3.5
Agua Fria Below Big Bug Creek	8/23/2008	2.8	3.5	2.4	2.0	2.9	3.0
Agua Fria Below Horseshoe Ranch	7/19/2008	2.9	3.0	2.6	2.2	3.6	3.0
Tangle Creek Exclosure	11/22/2008	2.9	3.0	2.8	2.3	3.6	3.0

that is disposed to flashy, high-volume runoff events, washing vast quantities of sediment down the channel, obscuring features and often wiping out aquatic life. In the case of Date Creek, recent (monsoon) high volume flows had choked the channel with sandy sediment. It had similarly scoured the aquatic invertebrates from the remaining rocks, leading to one of our low individual scores in the Fish/Aquatic Habitat area. On the other hand, these same flows contributed to a high water-quality score, since they also had scoured away nearly all aquatic algae, a measure within the Water Quality category. Since there were many cattle in the riparian zone just upstream from the Date Creek Ranch boundary, it is almost inconceivable that algae shouldn't be present in a system that had been more recently stable. A final poor score that again is tied to the watershed condition and the flashy storm events that occur here is in the Hydrogeomorphology category, where a high level of entrenchment was measured for the stream channel morphology.

Countering all these problems is the remarkable ability of riparian plant communities to heal themselves and to slowly heal the stream channels they reside in. Our vegetation indicators and their pattern of demography and arrangement led to very good scores (for most indicators) in the Riparian Vegetation and Terrestrial Wildlife Habitat categories. We did have low individual scores in Riparian Vegetation for the high proportion of non-native herbaceous plant species (Bermuda grass) and in the Terrestrial Wildlife Habitat category for a measure that again relates to the low volume of water in the stream channel.

Overall, we have to say that our assessments at Date Creek and the other areas completed so far have given us a clearer picture of the forces that affect at least this subset of mid-elevation, small and intermittent streams. They all seem

to suffer from damaged watersheds and the associated impacts of flashy run-off events. All four systems seem to have a lot of non-native herbaceous plant species, but not much non-native woody plants (saltcedar). Where livestock are absent or at least not abundant, the plant communities are pretty resilient and show quite a bit of healing potential and where the time since livestock utilization is lengthier, already some good progress towards healing. The typical low water volume in these systems is always going to limit their scores in the RSRA system for the measures of aquatic habitat and stream-form complexity. We'll have to find some larger systems if we want to improve those scores.

Finally, the experience at Date Creek and the other sites has been really enjoyable this year! Getting out with colleagues whose skills and experiences complement your own and discussing these measures and your other observations has been a very positive experience and we're confident many of the others who have joined us feel the same. Please join us if you think you might be interested!



See page 10 for  
information about  
our 2009 Fall  
Meeting!



Field trip at fall meeting along Date Creek.



## SPECIES PROFILE

**BALD EAGLE (*HALIAEETUS LEUCOCEPHALUS*)**

by Carol Birks, Arizona Department of Water Resources

Historically, the bald eagle was found throughout the Southwest in New Mexico, California, Texas and Arizona. Bald eagles have resided in Arizona for a long time. Eagle sightings, near Prescott, were first mentioned in the literature by Coues in 1866. The first breeding record is from Stoneman Lake in 1890. Several reports from 1930 to 1960 mention nesting eagles along the rivers in the state and pictures exist of an eagle nest below Stewart Mountain Dam by the Salt River Project housing area that were taken during the 1930's. However, as the state developed, eagle sightings decreased and in 1970 only three breeding pairs were known. Fortunately, that number increased to 43 pairs by 2006 due to the elimination of DDT, habitat awareness and protection, increased survey efforts, and a nest watch program.

The bald eagle is a large raptor with a wingspan of 6 to 7 feet and can weigh up to 14 pounds. Females are slightly bigger than the males, and both adults are dark brown with a white tail and head and have yellow beaks. Juveniles are dark brown but have some mottling on their body; as the bird ages the belly and head lighten. By the fourth year the head and tail are usually white, though some may retain mottling on the head and tail for several more years.

Bald eagles primarily eat fish, but they will also eat other birds, amphibians, reptiles, small mammals, and carrion. The most common fish taken are suckers, catfish, carp, bass, and black crappie. They generally hunt from a perch but they have been known to pirate fish from other birds.

Bald eagles reach maturity around 4 or 5 and can live 20 years or more in the wild but can live much longer in captivity. One captive bird reached the ripe old age of 50.

These birds will construct a nest within a mile of a good water source such as a lake, river or creek. Nests in the desert are usually located on cliff ledges or rock pinnacles high along the water's edge but may also be in nearby cottonwood trees. Breeding adults do not migrate and will use the same nest site year after year creating breeding areas that are used for generations. An excellent time to observe, but not disturb, the birds is in December and January in such areas as Lake Mary and Lake Pleasant. One to three eggs are laid from December to



*Bald eagle on a nest along Verde River.*

March and the eggs hatch in 35 days – some time in January to April. Eaglets take 10 to 12 weeks to grow large enough to leave the nest, however, will remain dependent on the parents for food until they migrate north several weeks after fledging.

About six weeks after fledglings leave the nest, other juveniles and subadult eagles migrate north to areas with more abundant food resources for the summer. Some Arizona eagles have been tracked as far north as the Klamath River in northern California, Yellowstone Lake in Wyoming and in Manitoba, Canada. It is not known where nonbreeding adults travel in the late spring and summer. Resident adults however, stay close to their nest sites though they may visit Arizona's high country briefly in the summer.

Many consider the bald eagles nesting in the Sonoran Desert a distinct population segment because they are geographically isolated from the larger eagle population in the country. They also exhibit a collection of different adaptations and behaviors than other eagles due to the desert's high heat and low humidity including a smaller size, winter breeding, and frequent cliff nesting. The harsh desert climate also contributes to a higher juvenile and adult mortality rate than the general population which may slow the population's recovery.

Currently, the bird's status is complex. In 1978 the bald eagle was listed on the Endangered Species list in the lower 48 states. Over the years the population increased; it was reclassified as threatened in 1995 and eventually removed from the list in 2007. However, the bird still receives protection under the Bald and Golden Eagle Protection Act (currently under revision), the Migratory Bird Act, the Airborne Hunting Act and the Lacey Act. Habitat destruction and predatory exotic fish impacting native fish populations are still major threats.

Unintentional harassment of the birds also threaten them especially during the breeding season.

In March 2008, the U.S. Fish and Wildlife Service received a court order to determine if the bald eagle in the Sonoran Desert area of Arizona and Mexico is indeed a distinct population and, if so, should it receive the extra protection of the Endangered Species Act (ESA). The U.S. Fish and Wildlife Service's status review of the bald eagle in the Sonoran Desert area of central Arizona and northwest Mexico is being extended and the agency continues to seek information regarding the status of, and any potential threats to, the Sonoran Desert area bald eagle. The information will be assessed to determine whether continued Endangered Species Act protection is warranted for the eagle. To allow adequate time to consider and incorporate submitted information into the status review – due for publication in October 2009 – information should be submitted on or before July 10, 2009.

ESA legal protection or not, the bald eagle is a magnificent creature and more understanding will create additional appreciation for the bird.

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## President's Message . From pg. 2

We have had a lot going on. Sometimes we all get so busy that we forget to stop and appreciate what we have and the people who make life worth living. Don't get too busy that you forget to stop and smell the roses. I want to reflect for a moment on the loss that we had in January when our very dear friend Tom Moody was taken from us. Tom was an active member of ARC who loved the outdoors, was passionate about stream restoration, enthusiastic about life, and treasured every person he met. Tom was involved in several stream restoration projects in Arizona, New Mexico, Colorado, and many other places. He lived his life to the fullest and always had a positive attitude

which made him a joy to be in his company. He will truly be missed. In memory of Tom, ARC is planning on recognizing an individual at our annual meetings who embraces the restoration ethic and humanitarian qualities that Tom embraced. I will send out a message on the listserv on how to nominate someone.

ARC is your organization. Our meetings are planned based on someone's request for hearing more about an issue or learning more about a technique. We are planning our next annual meeting. What do you want to know? I encourage you to get involved.

Thanks

Kris Randall, President



Tom Moody, July 14, 1951-January 23, 2009.



## PHOTOS FROM OUR SPRING MEETING WORKSHOP FIELD TRIP

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*Off to find the invaders!*



*Ed Northam (center) and John Brock (right) teaching workshop.*



*Looking for invasives in the water.*



*Carex nebrascensis Dewey, a native, along the Verde.*

## ARIZONA RIPARIAN COUNCIL FALL MEETING AT AUDUBON RESEARCH RANCH

October 3 & 4, 2009 - Saturday & Sunday

**P**lease join us at the Arizona Riparian Council's Fall Campout and Get Together. This year's Campout will be at the Appleton-Whittell Research Ranch of the National Audubon Society, located about an hour south of Tucson near Elgin, Arizona. On Saturday afternoon, we will learn about the restoration techniques that have been implemented on the Ranch. Sunday morning we will learn about some of the monitoring projects that are occurring on Turkey Creek, O'Donnell Creek and the Babacomari River during a hike through these riparian systems.

We will hear about the monitoring that is being conducted; Linda Kennedy, Director of the Research Ranch will give us a history of the ranch as well as an overview of some of the research and restoration projects that have been done. After the speakers we will have some free time to explore. The Council will provide dinner which will be a cookout. Please provide your own lunches (Sat/Sun) and breakfast Sunday morning.

The Research Ranch is a sanctuary for native plants and animals encompasses nearly 7,000 acres of



*O'Donnell Canyon.*

semi-arid grassland and related ecosystems, which support 22 species of conservation concern. Partially owned by the National Audubon Society and recognized as an Important Bird Area, the sanctuary has remained ungrazed by domestic livestock since 1969 and has been protected from continued growth of the human population.

### Time to Meet

1:00 pm at the Appleton-Whittell Research Ranch. Registration and maps to Appleton-Whittell Research Ranch will be on our website as the date draws nearer.

### What to Bring

Camping gear (tent, sleeping bag), folding chair, river shoes (if you wade into the river), water to drink. There is water available for washing. Bring food for breakfast and lunch for Sunday. We anticipate the day-time and night-time temperatures at this time to still be potentially warm. Bring plenty of water to drink. ARC will provide dinner and drinks for dinner Saturday night. Restroom facilities will be available near the camp site.

Watch the website later this summer for registration information.



*Sacaton grassland.*



## LEGAL ISSUES OF CONCERN

Richard Tiburcio Campbell, U.S. Environmental Protection Agency\*

### NINTH CIRCUIT COURT OF APPEALS PULLS CLEAN WATER ACT PERMIT AUTHORIZATION FOR 10,000-ACRE FESTIVAL RANCH PROJECT ALONG HASSAYAMPA RIVER IN BUCKEYE

*\*Editor's Note: This article does not represent the position of the USEPA, and represents only the opinion of the author. The author was an environmental attorney in Arizona before joining USEPA Region 9 in San Francisco, California.*

On April 29, 2009, the U.S. Court of Appeals for the Ninth Circuit held that the Army Corps of Engineers (Corps) improperly confined its environmental review under the National Environmental Policy Act (NEPA) in the course of issuing a Section 404 permit under the Clean Water Act (CWA) to the developers of the Festival Ranch master-planned subdivision in Arizona to fill waters of the United States within the project area. *White Tanks Concerned Citizens, Inc. v. Strock*, 563 F.3d 1033 (9th Cir. April 29, 2009) (“*White Tanks* decision”). The Court reversed a lower court decision<sup>1</sup> upholding the Corps’ permit decision, affirmed an injunction barring any further development of Festival Ranch, and enjoined the Corps’ issuance of a Section 404 permit until it performs an expanded scope of analysis over the entire 10,100-acre project area in accordance with the Ninth Circuit’s opinion.

#### SOME BACKGROUND

The Court’s decision is heavily dependent on the background facts – particularly the geographic facts

– of this case. The project area encompasses 787 acres of jurisdictional waters: 643 acres of Hassayampa River floodplain, and 144 acres of ephemeral tributaries to the River. The 144 acres of ephemeral washes are dispersed throughout the project area. The 404 permit would have authorized the fill of 26.8 acres to accomplish the developers’ (Pulte Homes and 10,000 West LLC) project purpose of developing a master-planned residential golf-course oriented community for 60,000 people.

In early 2005, the Corps gave public notice of its 404 permit for Festival Ranch. In response, White Tanks Concerned Citizens (WTCC), a local citizens group, as well as EPA and U.S. Fish and Wildlife (USFWS), urged the Corps to expand its scope of analysis over the entire project area to better consider the impacts of the project on traffic, air (the project is located in a nonattainment area for ozone), and water quality, and conduct an environmental Impact Statement (EIS) pursuant to its NEPA obligations.

Just prior to the Corp’s decision to issue the permit, the Ninth Circuit had decided *Save Our Sonoran v. Flowers*, 408 F.3d 1113 (9th Cir. 2005) (“*SOS*”). In *SOS* the Court held that before the Corps could grant a permit to fill washes within the Lone Mountain project area to the north of Phoenix (and east of the Festival Ranch project area), the Corps had to consider the entire scope of that development in its environmental analysis. The Court so held because the pattern of washes in the area made any development avoiding the washes impossible, particularly because they flowed through the property “like capil-

laries through tissue.” In its comments on the Festival Ranch permit, EPA and USFWS urged the Corps to expand its scope of analysis over Festival Ranch in light of this decision because of the factual similarities between the washes at issue in *SOS* and those present at Festival Ranch.

Notwithstanding the comments from WTCC, and the recent *SOS* decision, the Corps analyzed the environmental effects of the project in an Environmental Assessment (EA), followed by a Finding of No Significant Impact (FONSI). In the EA/FONSI, the Corps limited its scope of analysis to the direct impacts to the washes that would be filled, and 83.6 acres of immediately adjacent uplands. The Corps proceeded to issue the 404 permit in July 2005.

The Festival Ranch EA/FONSI made clear that the Corps’ permit decision relied heavily on the Ninth Circuit’s decision in *Wetland Action Network v. U.S. Army Corps of Engineers*, 222 F.3d 1105 (9th Cir. 2000). In *Wetlands Action Network*, the Court held the Corps properly confined its NEPA review to the saltwater wetlands in a proposed commercial/residential development in southern California and was not required to study the environmental effects on the upland areas, principally because the development of the upland area could proceed independent of the wetlands impacts. The Corps believed that the Festival Ranch facts were more like those at issue in *Wetlands Action Network* than *SOS*.

After the Corps issued the Festival Ranch permit, WTCC retained Arizona Center for Law in the Public Interest to bring an action against the Corps in federal district court in Phoenix to compel

<sup>1</sup>The lower court decision by District Court Judge Susan Bolton was not submitted for official publication and cannot be found on LEXIS.

it to perform an expanded environmental analysis and an EIS. Pulte Homes and 10,000 West LLC, intervened as *amicus curiae* (“friend of the court,” i.e., parties that have no appeal rights, but that are allowed to introduce arguments to protect their interests).

### THE DECISION

In *White Tanks*, the Court concluded that the nature of the jurisdictional waters at issue were more like those in *SOS* than those in *Wetlands Action Network*. The

court found that the washes at Festival Ranch “were dispersed throughout the project area in such a way that, as a practical matter, no large-scale development could take place without filling the washes.” Thus, the Court held that the Corps’ FONSI was made on the basis of too narrow a NEPA scope of analysis (*White Tanks*, 563 F.3d at 1033-1034).

### WHAT THIS MEANS

Unless appealed by the Corps, the Corps must re-analyze the

impacts of this project taking into account the developer’s activities in the uplands. In light of the size of this development (10,000 acres) and its location (within an ozone non-attainment area), this decision could conceivably result in the Corps performing its first EIS for a residential development of any size in Arizona.



## APRIL 2009 RSRA TRAINING HELD NEAR CAMP VERDE

On April 26-30 the ARC sponsored a training course on the techniques used in Rapid Stream-Riparian Assessment (RSRA). Nine new trainees attended, and three previous trainees assisted and obtained refresher instruction from Prof. Peter Stacey (University of New Mexico) and Allison Jones (Wild Utah Project). The instruction consisted of short training sessions in the mornings followed by field work for the rest of the days. Support for the training was given by ARC, Wild Utah Project, and the Friends of the Agua Fria National Monument.

The training was held on a variety of streams: Verde River at the SRP property in Camp Verde; Agua Fria River downstream of the Horseshoe Ranch; Little Ash Creek off the Dugas Road; and West Clear Creek north of Highway 260. The group benefitted greatly from the ARC Workshop on the identification of non-native riparian plants held at the ARC annual spring meeting two weeks earlier. Now with a core group of persons from Phoenix and Tucson trained in the RSRA technique we plan to initiate assessments of streams in the southern part of the state. Further information about the schedule for RSRA outings in Arizona will be sent to members via the ARC listserv.



RSRA trainees measure the bankfull level and riparian characteristics of Little Ash Creek.



RSRA trainees assess a channel with a well connected floodplain on the Agua Fria River.



## NOTEWORTHY PUBLICATIONS

by Elizabeth Ridgely, One Green World, LLC

**Glenn, E., R. Tanner, S. Mendez, T. Kehret, D. Moore, J. Garcia, and C. Valdes. November 1998. Growth rates, salt tolerance and water use characteristics of native and invasive riparian plants from the Delta of the Colorado River, Mexico. *Journal of Arid Environments* 40(3):282-294.**

Six riparian plant species representing native and invasive species from the Colorado River Delta, Sonoran Desert, Mexico, were tested for salt tolerance and water-use characteristics in a greenhouse study in Tucson, AZ. Negative linear regression equations relating relative growth rates (RGR), of each species to mean root zone salinity had high coefficients of determination. Salt tolerance levels, expressed as a percent reduction in RGR per  $\text{g l}^{-1}\text{NaCl}$  in soil solution, varied widely among the species. The species were *Allenrolfea occidentalis* at 0% reduction; *Tamarix ramosissima* at 1.058% reduction; *Pluchea sericea* at 3.055% reduction; and *Baccharis salicifolia*, *Salix gooddingii* and *Populus fremontii* all at 7-9% reduction. Transpiration was proportional to RGR for all species. Contrary to some previous reports, *Tamarix* did not have unusually high water use compared to the other species. Differences in salt tolerance among species determined in this study supported field observations that soil salinity, which can reach high values along channelized and flow-regulated stretches of southwestern United States rivers due to lack of overbank flooding, is a major factor in the

replacement of native riparian species by invasive species.

**Hernández-Ayón, J. M., M. S. Galindo-Bect, B. P. Flores-Báez, and S. Alvarez-Borrego. 1993. Nutrient concentrations are high in the turbid waters of the Colorado River Delta. *Estuarine, Coastal and Shelf Science* 37(6):593-602**

The seasonal changes of the spatial distribution of nitrite ( $\text{NO}_2^-$ ), nitrate ( $\text{NO}_3^-$ ), reactive phosphate ( $\text{PO}_4^{3-}$ ), and silicate ( $\text{SiO}_2$ ) were measured in the Colorado River Delta. A 24-hour time series was generated at one location to study their short-period variability. The Delta is a negative estuary. During summer, salinity may be as high as 40. The amplitude of spring tides is as large as 9 m, and this causes great water turbidity by sediment "resuspension." Nutrient concentrations were high throughout the whole year, with lower values in the areas closest to the ocean. Maximum nutrient values in the river delta were 15, 53, 11.5 and 92  $\mu\text{M}$ , for  $\text{NO}_2^-$ ,  $\text{NO}_3^-$ ,  $\text{PO}_4^{3-}$ , and  $\text{SiO}_2$ , respectively. The nutrient data show no seasonal pattern. Possibly, high  $\text{NO}_3^-$  values in the Delta were due to groundwater input, mostly at the internal extreme, and high  $\text{NO}_2^-$ ,  $\text{PO}_4^{3-}$ , and  $\text{SiO}_2$  values are due to resuspension of sediments and mixing of porewaters with the water column, occurring mainly during spring tides. In the case of  $\text{NO}_2^-$ , oxidation of  $\text{NH}_4^+$  in the water column would be part of the mechanism. This might explain the high negative correlation between  $\text{NO}_3^-$  and sea-level, and the relatively low correlation between the other nutrients and sea-level, for the time series generated at a single location.

**Hinojosa-Huerta, O., S. DeStefano, and W. W. Shaw. 2001. Distribution and abundance of the Yuma clapper rail (*Rallus longirostris* sp. *yumanensis*) in the Colorado River delta, México. *Journal of Arid Environments* 49(1):171-182.**

The abundance of Yuma clapper rails (*Rallus longirostris* sp. *yumanensis*) was estimated in the Ciénega de Santa Clara. In addition, the distribution of the subspecies in the Colorado River delta region in México was determined. The maximum estimate of abundance was 6,629 individuals, assuming a response rate by rails to taped calls of 60%. Rails were widely distributed in the delta, occupying almost all marshlands dominated by cattail. This is an endangered subspecies shared by México and the U.S. Therefore, the conservation of the Delta ecosystem should be of interest to both countries, especially when water management decisions upstream in the U.S. have an impact over natural areas downstream in México.

**García-Hernández, J., E. P. Glenn, J. Artiola, and D. J. Baumgartner. 2000. Bioaccumulation of Selenium (Se) in the Cienega de Santa Clara wetland, Sonora, Mexico. *Ecotoxicology and Environmental Safety* 46(3):298-304.**

The Cienega de Santa Clara is located on the east side of the Colorado River Delta. It is a brackish wetland supported by agricultural drainage water from the United States that provides habitat for endangered fish and bird species. Bioaccumulation of selenium has created toxicity problems for wildlife in similar

wetlands in the United States. This is the first selenium survey in the Cienega de Santa Clara. Ten sites were selected to collect dissolved water, total sediments, plants, invertebrates, and fish. Samples were collected from October 1996 to March 1997. The result was that selenium was detected in all samples. Concentrations in water ranged from 5 to 19  $\mu\text{g/L}$  and increased along a salinity gradient. Although water levels of selenium exceeded the Environmental Protection Agency criterion for protection of wildlife, levels in sediments (0.8-1.8 mg/kg), aquatic plants (0.03-0.17 mg/kg), and fish (2.5-5.1 mg/kg whole body, dry wt), they did not exceed the United States Fish and Wildlife Service recommended levels. It is concluded from this study that the levels of selenium in water did not affect the overall health of the fish sampled. The conclusion is that it is important to maintain or improve the water quality entering this wetland to continue to have normal levels of Se in the food chain.

**Glenn, E., T. L. Thompson, R. Frye, J. Riley, and D. Baumgartner. 1995. Effects of salinity on growth and evapotranspiration of *Typha domingensis* Pers. *Aquatic Botany* 52:75-91.**

The interactions between salinity, growth and evapotranspiration were investigated for *Typha domingensis* Pers. in a greenhouse growth experiment and in Cienega de Santa Clara, a coastal desert marsh in the Colorado River Delta in Mexico. Although *Typha* is often found in brackish as well as fresh water marshes, salinity causes severe constraints to its growth and distribution. In this 68-day greenhouse experiment, growth was maximal at 1.1 ppt (control solution), half-maximal at 3.5 ppt and negligible above 6 ppt; 75% mortality occurred at 15 ppt. Evapotranspiration decreased with salinity in proportion to growth reduction. In the Cienega, *T. domingensis* was only found in water of 5-8 ppt or less. When inflow water was 1.0 ppt, *Typha* evapotranspiration was estimated to be 1.3 times pan evaporation, whereas when inflow water was

3.2 ppt., estimated evapotranspiration/evaporation was only 0.7. An estimated half of the inflow water to the Cienega exited the vegetated portion of the Cienega unused, owing to the salt tolerance limit of *Typha*. An objective of the study was to predict the effect of brine placement from the Yuma Desalting Plant into the Cienega; it was concluded that the resulting inflow salinity of 7-10 ppt. would result in deterioration of the *Typha* stands owing to excess salinity.



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

The purpose of the Council is to provide for the exchange of information on the status, protection, and management of riparian systems in Arizona. The term “riparian” is intended to include vegetation, habitats, or ecosystems that are associated with bodies of water (streams or lakes) or are dependent on the existence of perennial or ephemeral surface or subsurface water drainage. Any person or organization interested in the management, protection, or scientific study of riparian systems, or some related phase of riparian conservation is eligible for membership. Annual dues (January-December) are \$20. Additional contributions are gratefully accepted.

This newsletter is published three times a year to communicate current events, issues, problems, and progress involving riparian systems, to inform members about Council business, and to provide a forum for you to express your views or news about riparian topics. The next issue will be mailed in September, the deadline for submittal of articles is August 15, 2009. Please call or write with suggestions, publications for review, announcements, articles, and/or illustrations.

Cindy D. Zisner  
Arizona Riparian Council  
Global Institute of Sustainability  
Arizona State University  
PO Box 875402  
Tempe AZ 85287-5402  
(480) 965-2490; FAX (480) 965-8087  
Cindy.Zisner@asu.edu

web site: <http://azriparian.org>

**The Arizona Riparian Council**

**Officers**

- Kris Randall, President . . (602) 242-0210 X250  
kris\_randall@fws.gov
- Diana Stuart, Vice President . . . (602) 506-4766  
(602) 525.3151 (Cell)  
dms@mail.maricopa.gov
- Cindy Zisner, Secretary . . . . . (480) 965-2490  
Cindy.Zisner@asu.edu
- Diane Laush, Treasurer . . . . . (623) 773-6255  
dlaush@usbr.gov

**At-Large Board Members**

- Alicyn Gitlin . . . . velvet.mesquite@gmail.com
- Collis Lovely . . . . . (928) 310-6665  
clovely2@msn.com
- Ron Tiller . . . . . rl\_tiller@msn.com

**Committee Chairs**

- Activities* . . . . . Vacant
- Conservation*
- Tim Flood . . . . . tjflood@att.net
- Bill Werner . . . . . (602) 771-8412  
bwerner@azwater.gov
- Education*
- Cindy Zisner . . . . . (480) 965-2490
- Policy*
- Kris Randall . . . . . (602) 242-0210 X250  
kris\_randall@fws.gov
- Tom Hildebrandt . . . . . tomarc@cox.net



BT5 1005  
Arizona Riparian Council  
Global Institute of Sustainability  
Arizona State University  
PO Box 875402  
Tempe, AZ 85287-5402



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## CALENDAR

**Arizona Riparian Council Board Meetings.** The Board of Directors holds monthly meetings the third Wednesday of each month and all members are encouraged to participate. Please contact Cindy Zisner at (480) 965-2490 or [Cindy.Zisner@asu.edu](mailto:Cindy.Zisner@asu.edu) for time and location.

**The 16<sup>th</sup> Annual Wildlife Society Conference,** Monterey Bay Aquarium, Monterey, CA, September 20-24, 2009. For more information visit the conference website at <http://wildlife.org/conference>.

**Arizona Riparian Council Fall Meeting and Get Together,** October 3-4, 2009. Appleton-Whittell Research Ranch. See inside for information and watch website for registration as the date gets closer.

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