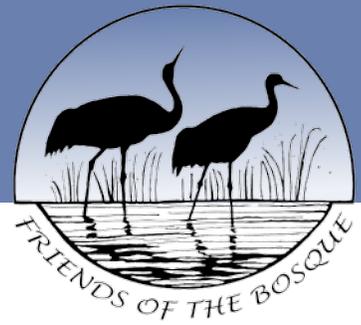


BOSQUE WATCH



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Memorial Trail embodies John Taylor's work

The John P. Taylor Memorial Trail is an easy walk through open stands of cottonwoods and Goodding's willows. Between tree stands is a lush growth of screwbean mesquite, fourwing saltbush, wolfberry, giant sacaton, seep willows, amorpha (false indigo bush), and salt grass. If not for John Taylor's vision and many who, in his honor, took on the work to make it happen, this would still be an impenetrable salt cedar (tamarisk) thicket.

John Taylor was Senior Wildlife Biologist at Bosque del Apache from 1985 until his untimely death in 2004. During his tenure he did important research on salt cedar removal and riparian restoration. A high energy person, there was nothing at BdA that did not excite his interest. In 2003 John was awarded National Wildlife Refuge Employee of the Year by the National Wildlife Refuge Association.

John Taylor is known for his work with Kirk McDaniel from NMSU on ways to remove salt cedar from large tracts of land. These methods were used to rid salt cedar from the area where the Taylor Memorial trail now meanders.

First this area was sprayed with an herbicide and left alone for several years to allow the herbicide to work. Then the dead salt cedar was burned. Finally the roots were plowed up, raked and burned. This method has been refined where living salt cedar is first bulldozed down, root plowed, then raked and burned. Herbicide would only be applied if re-sprouting occurs.

John was a very inclusive "people" person. He would have appreciated the many people who came together to establish the trail: refuge staff, Friends, Boy Scouts, and community volunteers who joined together under the direction of Bosque Ecologist Gina Dello Russo (developer of the restoration plan).



Cottonwood and willow poles were planted where the soil was appropriate. Watering tubes were inserted next to screwbean mesquite and wolfberry bushes and then watered by truck until they were established. Two grass seed mixtures were spread—a sandy mix for the



west side and a clay mix for the east side of the trail. On the east side the salt grass has re-sprouted from rhizomes that were dormant under the salt cedar.

The trail ends at a scenic overlook where the Chupadera Mountains and the Point of Lands lookout can be seen off in the distance. Directly in front of this overlook is an old Rio Grande river bed adjacent to fields of corn. Taylor believed that water is best moved by letting it go where it naturally wants to flow and he used old river beds to move water whenever possible. The corn fields exemplify Taylor's work with farmer Dennis Harris, who gave him much insight into the growing of corn. Corn is one of the grains that is used to feed over-wintering birds at the refuge.

Now, as you walk the trail through the restored bosque enjoying the native plants that are home to many wildlife species, the influence of biologist John Taylor surrounds you.

--Mary Ruff



Festival Update

Registration for the 2015 Festival of the Cranes is off to a good start this year with record numbers of registrations for the 162 workshops and tours offered during the six-day event. The Festival brochure has received many positive comments and online registration is working smoothly. The Expo Tent has reached full capacity with vendors. The Friends has a corner area to display information about our projects and to feature some of our volunteers. Our annual Friends dinner will be on Thursday at the Bodega Restaurant in Socorro with the social also at Bodega on Friday night. The Festival runs from November 17-22.

Board of Directors

Many of you know Cheryl Learn-Hill. Among her many talents and gifts of service to the Friends, she has been the indefatigable driving force behind the annual Silent Auction at the Friends Dinner during Festival. For personal reasons, including health and other obligations, she has requested to step down from the Board. We have honored that request, but still expect to see Cheryl at Festival and other Friends events in the future. Please, join us in wishing her all good things.

Annual Meeting

The Friends will hold their Annual Meeting on Saturday, October 17, at 10:00 AM in the refuge Visitor Center. All Members are invited. There will be presentations on the

current State of the Refuge, and the State of the Friends, as well as the election of new Officers and Directors. After the Business Meeting, everyone is invited to stay for lunch and for one of two afternoon activities – a refuge work party or a visit to the John P. Taylor, Jr., Memorial Trail. A sign-up sheet will be available the morning of the meeting.

As for the Board elections, Paul White and Sonja Mendoza will be entering the second year of their current terms as President and Secretary, respectively. Jill Buckley has been nominated for a second two-year term as Treasurer, and Ed MacKerrow, a current At-Large member of the Board has been nominated for Vice President. Four other At-Large members will continue in office, leaving six vacancies for At-Large positions. One current Board member, Matt Mitchell, is eligible for re-election.

There are seven very qualified individuals who have expressed interest in serving on the Board as At-Large members. Those not elected to the Board will be invited to help with some of the many volunteer opportunities, including serving on a Friends committee (Finance, Development, Education or IT). Brief bios, submitted by Board candidates, follow.

Board Election Candidates

Officers:

Jill Buckley

Jill is standing for a second term as Treasurer. She has served on the Board for four years, two years as a Board member-at-Large and these past two years as Treasurer. She is a long-time Socorro resident, retired

from a research career at New Mexico Tech. She is an enthusiastic birder; for the past few years she has organized volunteers to greet visitors on the observation decks during the Festival of the Cranes.

Ed MacKerrow

Ed has been an At-Large Director on the Friends Board since October 2014, and was just appointed by the Board as Acting Vice President. He retired in 2014 after 23 years at Los Alamos National Lab. He is now a professional wildlife photographer, applying his expertise in modeling complex adaptive systems to study boreal owl and Mexican spotted owl populations in the Southwestern US. The focus of this research is to predict where local populations of these owls are most likely to move in reaction to climate impacts (fire and beetle kill). Ed has conducted population surveys of boreal owls and peregrine falcons in New Mexico for the NMDGF and USFWS. As a wildlife photographer Ed has been published in magazines and calendars in the US and Europe. His focus is on photographing raptors in flight. He has given invited photography shows with the Audubon Society of California. Ed has won awards for his photographs, including very competitive contests for The Peregrine Fund's annual calendar. Ed and his wife Melinda have been proactive in developing a barn owl nest box program for the Nambe and Pojoaque agricultural area for gopher control. He has been photographing wildlife at Bosque del Apache for many years, and is a regular contributor to *Bosque Watch*.

At-Large Directors

Jim Lommen

My wife Penny and I first came to Socorro to visit Bosque del Apache while returning to Denver from a trip to Ruidoso. We had been hearing about the Bosque for years and decided that we needed to visit and see what the commotion was all about. We quickly learned that not only did we enjoy visiting the Bosque but that Socorro was a great little community. We moved to Socorro in 2007 while our house was being built and attended our first Festival that fall. Shortly after, we were asked to "help a little" with next year's Festival. We're now in our seventh year of organizing what is now known as the Wildlife Zone for the Festival.

I'm a Chemical Engineer specializing in extractive metallurgy. I have worked for several mining companies and later moved into engineering and construction. My work involves recovery of metals and other valuable minerals from mined ore. I'm "mostly retired," still doing some consulting on occasion. I'm an avid birder and wildlife watcher. I currently serve as President of the Socorro Amateur Radio Association and President of the Socorro Tennis Association.

Matthew Mitchell

Matt is ending a two-year term as an At-Large Member of the Board, and is standing for re-election. He previously served as Vice President of the Friends. Matt is a native New Mexican holding a bachelor's degree in biology from the University of New Mexico. He has operated a small jewelry business for forty years. With a lifelong love of wildlife and wild places,

Matthew is currently serving on the boards of the Save Our Bosque Task Force and the Rio Grande Agricultural Land Trust. These non-profit groups protect threatened land from development and implement important habitat restoration projects in the middle Rio Grande. Matthew also rehabilitates injured wildlife as a member of Wildlife Rescue of New Mexico. He is a master falconer and serves as an officer for the New Mexico Falconer's Association.

Jon Morrison

My wife and I first came to Bosque del Apache in 1992, on a birding trip to Arizona. We stopped for lunch at the Visitor Center, and saw many migrants new to us. Inside we saw the film on the refuge, and decided we needed to come to the Festival that fall and see "the birds". We joined the Friends at that time. I joined the board as a member at large in 1995, and worked with Mary Nutt and Tom Harper on the Festival committee. I was editor of the Friends newsletter from 2000 to 2005, expanding it to sixteen pages with most articles coming from the refuge on research being done at the time.

I was elected Vice President in 2002, and became President in 2005. That year I shared with Patrick Lannan my vision of building a Visitor Center education wing for students of all ages to come and learn. Several weeks later, he said the Lannan Foundation would commit \$400,000 to the project. His daughter had loved the Bosque and the gift was in her memory. Later I hired Leigh Ann Vrandenburg as our new Executive Director. In

2006, I negotiated the purchase of 140 acres on the west boundary of the refuge that included Chupadera Peak. Since 2008, I have organized fund raiser birding trips for the Friends to Costa Rica, Belize, Ecuador, Galapagos, Peru. Next year we're going to Cuba.

Sigfredo Maestas

Sigfredo Maestas is President Emeritus of Northern New Mexico College. Since his retirement in 2005, he writes historical and fictional accounts about life in northern New Mexico.

His first book is *Children of the Normal School*, which tells about the Northern New Mexico Normal School at El Rito, the school that has become Northern New Mexico College. The Normal School at El Rito was for many years operated as a high school, which Sigfredo attended in the mid-1950s.

Sigfredo went on to attend New Mexico Institute of Mining & Technology in Socorro from which he obtained a Bachelor of Science degree in chemistry. He earned his Masters and Ph.D. degrees in physical chemistry while attending New Mexico State University. He did post-doctoral studies at the University of Vermont. Sigfredo was a Fulbright scholar in Honduras in Central America. He taught chemistry at New Mexico Highlands University in the early 1970s, before becoming Academic Dean at that institution. In 1979 Sigfredo left Highlands to take a similar job at Northern New Mexico Community College. In 1984 he became president of Northern.

In 1989 Sigfredo and his family moved to Albuquerque where

he served in various capacities at (then) TVI, including that of Executive Vice President, until 1996 when he returned to Northern New Mexico Community College as President. During the 2008 school year, Sigfredo served a full year appointment as Interim President of Luna Community College in Las Vegas.

Sigfredo is married to the former Angela Fernández of Socorro. He and Angela reside in Española.

David Policansky

David was born in South Africa and has lived in the United States for fifty years. A lifelong interest in natural history and wildlife photography led him to an increasing appreciation for the U.S. Fish and Wildlife Service's National Wildlife Refuge System. In agreement with Dr. Benjamin Tuggle, Southwest Region Director for FWS, he regards Bosque del Apache NWR as one of the jewels of the system. As a result, he spends as much time there as he can, mostly in winter but also in summer.

David has a PhD in biology and his work experience includes assessing natural resource management and review of large federal programs, including FWS activities. He has worked at the National Academies of Science, Engineering, and Medicine for more than thirty years, where he was intimately involved in the publication of more than 35 reports. His work, including academic research, has given him experience working collaboratively with committees and other groups as well as insights into

environmental problem solving. It also has provided experience in dealing with federal and state governments, private industry, and other stakeholders. David would be pleased to apply his expertise to helping the Friends of the Bosque make the Bosque del Apache NWR the best that it can be.

Lesley Urquhart

My professional history and expertise are primarily in healthcare administration (both risk management and quality, in the private and public sectors), with early years as an air traffic controller. I currently work with the Medicaid program through the New Mexico Human Services Department.

Although this may be an unusual background to bring to the Friends, my skill set seems like a good fit. I have experience in policy, programs, education, and group process, as well as training and experience in workplace mediation. From past volunteer work with several organizations including Literacy Volunteers and Santa Fe Cares, I bring some experience in event planning and fund-raising. I've lived in Northern New Mexico most of my life and I'm blessed with two grown children, their spouses and extended families, and two grandsons, as well as a rich network of friends and colleagues. Over the years I've visited the refuge, and I've watched the cranes flying overhead each Winter -- I look forward to working with the Friends in support of this New Mexico treasure that enriches us all!

Ben Wilson

Ben Wilson is founder and president of Gas Corporation of America. GCA sells and operates equipment that processes vented natural gas produced from oil wells to make propane and other liquids. This equipment reduces the carbon footprint and at the same time makes a valuable product.

Ben is an avid outdoorsman. Raised in North Texas, he has hunted upland game and water fowl all of his life. While sitting in a duck blind on cold wintry mornings he would dream of ways to build better decoys. He invented an RC Duck which is a radio controlled model boat that he took apart and positioned into a duck decoy. The propeller action makes the decoy look lifelike. Then he took to the sky. He invented the first Flying Goose Decoy and received a U.S. Patent on it. Field and Stream Magazine did a feature on his hunting experiences and his decoy expertise in 1980.

Although a lifelong hunter, he has always been a guardian of the environment and the wildlife he loves. He founded the Wichita Falls Chapter of Ducks Unlimited in 1980 to raise funds for wildlife conservation. He currently serves on the board of the Northwest Texas Chapter of Boy Scouts of America. Ben has enjoyed the Festival of the Cranes for the past several years and looks forward to serving on the board of the Friends of the Bosque del Apache National Wildlife Refuge.



FROM THE PRESIDENT

What are friends for?

The Mission of the Friends of the Bosque del Apache is, briefly, to support the refuge and to promote appreciation of wildlife and habitat. The statement sounds simple enough, almost as barren as many a New Mexico landscape. Yet it is fertile with possibility. These pages have sprouted many a story of things we've done together to help the refuge – from Langemann gates to research projects, from the Lannan Annex to Chupadera Peak. But, too often, we haven't spread the word about the seeds sown in the field of education, for that's what 'promoting appreciation' really is: education in all its many dimensions!

I think of education as almost any activity that adds understanding, broadens the mind, deepens insight, or inspires wonder. One often thinks first of the Friends' work with San Antonio Elementary, through which we collaborate with classroom teachers and help students enjoy learning experiences on the refuge. With the departure of Andrea Brophy, our Educator, our classroom involvement is at least temporarily limited, but we still encourage student visits to the refuge and offer tools to enhance their learning experience. It is these visits that truly inspire and have lasting impact. Earth Day and Field Day were other such, high-impact events. More than a hundred students came to the refuge for outdoor learning: photography, observing, archery, art, nature walks, and many other activities.

Yet the Friends' investment in education goes well beyond such youth-focused programs. Think of the Friends Nature Store as a 'do-it-yourself learning center,' filled with mind-stretching opportunities, from books and guides, to CDs and art. Patrons can be walking advocates by wearing or carrying their passion on their shirts or hats, on pins or totes. Yes, advocacy is another form of education. We also work through letters and face-to-face encounters to make others aware of the value of wild places like the Bosque del Apache. We offer this newsletter, *Bosque Watch*, and help the refuge publish the *Habitat!* visitor guide. Pictures and articles enhance visitor experiences at the refuge and spread awareness of wildlife and habitat. We will soon celebrate the Festival of the Cranes and, yes, this event is another consummate educational experience. Thousands of visitors have experienced and will experience workshops, seminars, nature walks, and fly-ins – up close and personal. They will hear, smell, touch and absorb a refuge experience that will last a lifetime, and make them partners with us in helping preserve and protect this magical place. By whatever name, it's all education, and it's a major part of what Friends do.

--Paul White



D Longenbaugh

Western tanager



FROM THE DIRECTOR

READY TO FLY!

I am elated to be the new Executive Director of the Friends of the Bosque del Apache National Wildlife Refuge (NWR). More than any leadership position I've ever held, this role aligns with my personal values and interests. While the role is huge and I have much to learn, I am fortunate that I'll have the opportunity to employ my skills and efforts toward a cause for which I have great passion. As evidenced by the recent recognition of the 2015 Molly Krival Friends Group of the Year Award, the Friends of the Bosque del Apache is a shining example of what a committed group of caring people can accomplish on many levels.

With six weeks on the job, I've discovered many angles and challenges in my new job. Luckily, I've also met and learned from many talented refuge staff members, and members of the Friends' board, staff, and volunteers who are graciously contributing toward my getting on board quickly. I'll employ my skills and background in strategic planning, management, partnering, and coaching; and I'm excited to enhance my skills in development, fund raising, marketing, and advocacy in my next few months on the job. Plans in the near future for me are: contributing toward another highly successful Festival of the Cranes in November; attending the National Friends' Training at the National Conservation Training Center in Shepherdstown, West Virginia, in January; working closely with refuge staff and Friends board and staff in development and education efforts that enhance refuge support; and partnering with Ding Darling NWR (Florida) to assist the National Wildlife Refuge Association in creating workshops to prepare groups to successfully take on challenging political issues and build support for wilderness protection, specifically for the Arctic National Wildlife Refuge.

On a local level, I am taking an active role for our organization in the Middle Rio Grande Economic Development Association, as Bosque Del Apache NWR is a strong driver of tourism and economic benefits to our region. I will also continue to build strong bridges with New Mexico Tech, the City and County of Socorro, Valle del Oro and Sevilleta National Wildlife Refuges, and other refuges and counties along the I-25 flyway.

I hope to meet many of you in coming months. When you visit the refuge, please stop by my office at the Friends House for a chat, historic building tour, and a cup of tea or coffee.

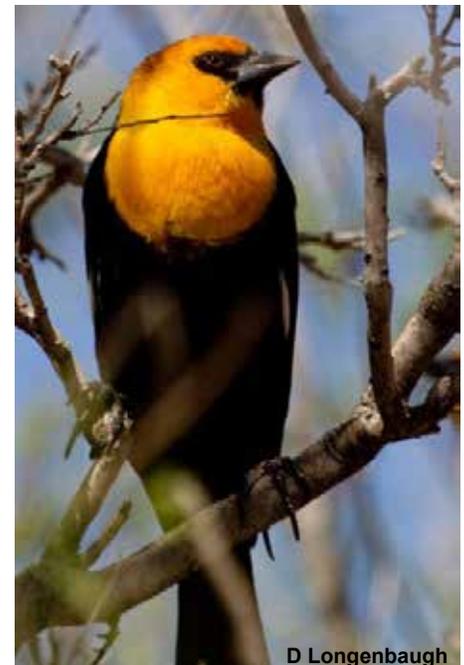
--Deb Caldwell



D Longenbaugh

Phainopepla

Yellow-headed blackbird



D Longenbaugh

Red Crossbills and Other Birds to Look For Now in Santa Fe! (and elsewhere!)*

I've heard some say that they think summertime birding can be a bit dull. The thrill of seeing Western Tanagers is a distant May memory and our summer nesters have been here for a while. Not much new happens until fall migration. One might think that happens, well.....in the fall, but actually some birds start to move now. Some of the birds that have long migrations begin their journey in August. Birds like Rose-breasted grosbeaks, Lazuli buntings, orioles and Western tanagers will travel to Mexico and beyond so don't be surprised to see them pass through your yard this week and early September. Some rose-breasted grosbeaks go as far as northern South America for the winter so they need to get an early start. We've had a very recent sighting of yellow-headed and red-winged blackbirds in Pojoaque. They too are on their way south to Mexico.

Some other birds you might notice late August include lots of lesser goldfinches. They have been here all summer but they've had a couple broods of young so you should be seeing more of them now. They also love to feed on flowers like branching sunflower, which are in abundance late summer. Feed nyger/thistle seed to attract goldfinches to your backyard.

We've had a couple reports of red crossbills in the area. Crossbills

sometimes show up unexpectedly. They are nomadic birds that roam in search of food. We are within their year-round range but because they move around they can be very rare or very numerous, depending upon the pinecone crop near you.



Red crossbills are quite dependent upon pinecone seeds, even feeding them to their young. Typically crossbills wait to nest until they find a good source of pinecones, sometimes even waiting to nest until fall or winter. Their unusual bills are specially designed to pry open pine cones. Count yourself lucky if you spot crossbills.

You'll also start to notice pinyon jays in big numbers. They tend to flock this time of year to harvest pinyon seeds. They sometimes extend their harvest to your birdfeeders, emptying them in no time. Placing cages around your feeders or using a feeder with a dome that lowers to exclude large birds will usually keep pinyon jays out of your bird food.

Attract some of the birds on the move to your backyard by offering a steady source of fresh water. If you make that water move with a dripper or bubbler, even better. The sight and sound of moving water is a bird magnet. Keep seed and suet feeders filled and watch for orioles at your hummingbird feeders as they come through. Remember that hummingbirds will be regular visitors through October, so keep your nectar feeders loaded with fresh sugar water.

Anne Schmauss is the co-owner of Wild Birds Unlimited in Santa Fe and she loves to hear your bird stories. She is the author of *For the Birds: A Month by Month Guide to Attracting Birds to Your Backyard* and *Birdhouses of the World*.

**Reprinted with permission from the Santa Fe New Mexican*

Back to the Future...

Over the past few years the Desert Arboretum at the Bosque del Apache NWR has been the topic of several *Bosque Watch* articles. Readers will remember that the garden has suffered from unseasonably cold temperatures, heavy winter snows and prolonged drought. Climate change has taken its toll, but with the help of a small cadre of volunteers, the garden has been slowly brought back to life. With current rains, the cactus garden has become more-or-less stable. Damaged and diseased plants have been removed, invasive plants have been weeded out and the pack rat population has been given an eviction notice.

At this point we, the Friends and other volunteers, can lean on our shovels for a moment and contemplate the final restoration of the garden. We do this with the understanding that, given current climate change, the vision that shaped the original arboretum as created by its benefactor Percy Deal will have to be modified. Percy is

no longer with us, but I think he would have no problem with what we have in mind. On one of his last visits to the garden he paused to pass on a bit of wisdom: things change and sometimes you just have to take a shovel and clear out the old and start over.

So, here's the plan. The removal of damaged plants in the last few years has left bare areas that will be repopulated with Northern Chihuahuan species. Though there are still a number of 'exotics' in the garden imported from other bio zones, many have not survived recent changes in their environment and it makes no sense to import more of the same given current climate fluctuations.

Some native plants, like desert willow, four-wing saltbush and an abundance of common grasses, will be removed. They are largely volunteers in the garden and compete with cactus and other more rare plants. With the addition of selected native grasses

and wild flowers, the hope is that the increase in species diversity will not only provide a broader representation of the Northern Chihuahuan biome but also attract more birds, butterflies and wildlife.

By definition an arboretum is not a natural environment. It is a highly managed collection of plant species designed to engage and educate visitors to the garden. The garden paths will soon be added to the list of refuge trails and the paths will be maintained and widened where necessary to provide access to all.

In order to "interpret" the garden in a meaningful way for visitors, explanatory guides will be developed in the next year and will be made available at the Visitor Center and at the entrance to the garden. Old species markers that have succumbed to the elements will be replaced. In the long term, and as part of the Friends wider education program, we hope to have packages of background information that can be provided to school and other tour groups prior to their visit.

So that's the plan. The message is the same. In this desert environment native, xeric plants are beautiful, adaptive and a logical alternative to water-hungry non-native species. This is the message the rehabilitated garden will return to and hopefully sustain as we face new challenges in a changing desert environment.

--Lise Spargo





What a summer!

One time zone, four construction zones and 786 miles later, I finally arrived at Bosque del Apache National Wildlife Refuge in San Antonio, New Mexico, as a Student Conservation Association (SCA) Career Discovery Internship Program (CDIP) intern. I had no idea what to expect as this was my first internship as a CDIP student.

I was warmly greeted by the refuge staff and knew it was going to be an incredible summer. Most of the CDIP internships are specifically visitor services or specifically biology; however, I was fortunate enough to experience both! For visitor services, I helped put together the activities for Pollinator Week 2015 in June, created a summer's worth of Facebook posts for the Bosque del Apache National Wildlife Refuge Facebook page, staffed the Visitor Center, and participated in outreach events. For biology, I assisted with southwestern willow flycatcher, yellow-billed cuckoo, and New Mexico meadow jumping mouse surveys. In June, I was able to help band resident Canada geese, which was the highlight of my summer. I also got to band white-winged and mourning doves.

My biology experience wasn't just limited to Bosque del Apache NWR! I was lucky enough to go to Sevilleta NWR to help their interns with prairie dog and small mammal trapping.

In coming to Bosque del Apache NWR, I expected to learn a lot about wildlife biology and visitor services. What I didn't expect, however, was to learn so much about myself. I am more confident in myself and have grown tremendously as a person. I have been encouraged, challenged, and pushed out of my comfort zone. I've made new friendships that I hope will last a lifetime. I have discovered a new passion – photography. I've tried new things (green chile cheeseburgers are quite tasty). I've fallen down (literally, I tripped over a stick), I've laughed, cried, and I've laughed until I cried. I've seen what it takes to be a wildlife biologist and my time here has confirmed that becoming a wildlife biologist for the US Fish & Wildlife Service is what I want to do as a career. Most importantly, the staff at Bosque del Apache NWR has become my second family and I am so incredibly blessed to have been able to spend my summer working with such great people.

--Evi Rader

Oklahoma State University



E Rader



E Rader

The Versatile Harrier

One of the most visible raptors encountered on the Bosque Del Apache is the Northern Harrier. With the slightest breeze, these fascinating birds become airborne, putting their large wings to use by masterfully working the air currents, moving back and forth over the grasslands and marshes. Their deadly purpose is seeking out small birds, rodents, and insects on which they make a living. Many a visitor to the refuge has thrilled at their aerial acrobatics as they twist and turn with great agility to snatch up their elusive prey.



The bright yellow eyes of male Northern Harrier (*Circus cyaneus*) intensely look for movement on the ground. (Photo: Ed MacKerrow)

Northern Harriers have not always been known by their current name. In the early days of this country, raptors were commonly referred to by more descriptive names. For example, peregrines were known as “duck hawks”, merlins were “pigeon hawks”, kestrels were “sparrow hawks”, and Cooper’s hawks were known as “blue darters”. Likewise, Northern Harriers were often seen on the wing near the numerous marshlands of the day and became known as “marsh hawks”. In reality, harriers worldwide are most often found over grassland habitat. The more accurate name Northern Harrier replaced the outdated name in the mid-1960s in most publications.

Harriers have a number of fascinating adaptations to watch for when out in the field. When seen at close range, a harrier’s face has a very “owlish” appearance. Ornithologists believe that this owl-like ocular disc was evolved by harriers for the same reason owls evolved them. The ocular disc functions to focus sound to the ear opening at the side of the head much as external ears do in the case of mammals. Sound is very important to harriers, serving to alert the hawks when their prey flushes beneath them at close range.

Harriers have a very long tail and comparatively large wings in proportion to their body weight. While these large wings are a burden to them when it comes to horizontal speed, the wings are very efficient at turning, swooping, or diving in a microsecond when prey flushes out of the grass. Like sails, the large wings are also extremely important in allowing harriers to stay aloft, even in the slightest breeze, and not burn valuable energy by flapping to stay in the air.

Another interesting adaptation seen in harriers is in their breeding strategy. Harriers are ground nesting birds, and even though they purposely seek out nest sites in very thick cover for protection, their nests are still vulnerable to predation by any passing mammalian carnivore. Harriers incubate their eggs as soon as they are laid and lay five or more eggs roughly two days apart. At the end of incubation, an egg will hatch every two days resulting in the youngest and oldest being ten or more days apart. Ten days separation in these fast growing raptors makes for a huge difference in size. Should a carnivore happen upon the nest, the older birds promptly scurry off into the underbrush to safety while their younger siblings are quickly devoured. Using this strategy, nesting harriers have a much better chance of some young surviving a fox attack than if all the young were of the same age.

Years ago I witnessed a Northern Harrier and a prairie falcon that shared the same territory and who



A female Northern Harrier (*Circus cyaneus*) takes a break in the afternoon sun. Her owl like facial disk helps to hear noises from prey buried deep in tall grass. (Photo: Ed MacKerrow)

actually depended on each other to increase their hunting success. Small birds flush out ahead of a hunting harrier because they instinctively know that allowing a harrier directly above them is very dangerous. Conversely, small birds will dive into cover to avoid a prairie falcon attacking at high speed. Large falcons generally do not dive into cover after prey. Instead they prefer the safer strategy of picking prey out of the air. Watching this pair, the harrier would fly out over the grassland flushing birds ahead of her while the falcon would watch from a power pole and attack the flushing birds when they got up. Birds flushing from the harrier were easily caught by the falcon. Birds diving for cover under the falcon were caught by the harrier. It was definitely a win-win situation, at least for the predators!

On your visits to the refuge this fall, be sure and take a second look at the versatile harrier. These supremely adapted birds seldom disappoint the persistent viewer and will often show us behaviors and acrobatics that are sure to thrill the novice as well as the veteran birder.

--Matt Mitchell



An image sequence of a single juvenile male Northern Harrier (*Circus cyaneus*) performing the harrier's sky dance in front of the moon is shown here. The "sky dance" is a spring-time ritual aimed at attracting females by males flying in continuous undulating loops like this. Juvenile male Northern Harriers look similar to adult females (except for slightly darker and warmer coloring). (Photo: Ed MacKerrow)



PHOTO OPS

Fall Photography at the Bosque del Apache NWR

Fall in New Mexico is a favorite season for most who live here. The summer monsoons and hot afternoons transition into cooler, crisp days. Aspens in the higher mountains shine bright yellow, followed by the cottonwoods along the rivers. Fields of sunflowers display their colors one last time before the first hard frost. It is this time of the year when the refuge provides a pastel canvas for both wildlife and landscape photography.

The fall arrival of sandhill cranes, snow geese, and migratory raptors is a bonus to a world famous photography setting. Beautiful landscape images await those who pay attention to the sun angles, water reflections, foliage colors, and dramatic storms in the distance. Birds do not always have to be in your composition to achieve beautiful images.

The majority of sunrise photographers at the refuge compose their photos looking to the east, towards the rising sun. This view provides a deep red sky background – especially if you under expose one full stop to emphasize the reds. When fall and winter temperatures drop below freezing the iconic Bosque del Apache “fire in the mist” rises from refuge ponds, which can provide ethereal beauty to your images.

When the “fire in the mist” phenomenon is not happening I like to photograph the dawn light looking to the west. Look for ponds and flooded fields that will reflect colorful fall foliage on the water at sunrise. The east side of the north loop is a good place for this. Since the slightest wind can degrade the quality of water reflections check the morning winds first. Ideally you will have a quiet morning with some dark clouds over the Magdalena Mountains to the west of the refuge. Compositions with reflective water in the foreground, bright yellow, orange, and red trees in the middle ground, and dark indigo storm clouds to the west result in vivid images. Try to compose your images by juxtaposing complimentary colors (blues and purples next to yellows and oranges).

Fall photography at the refuge can also be timed with the Festival of the Cranes (November 17-22, 2015). Although this is probably the most crowded week of the year, the Festival attracts international photographers, offers workshops, and valuable services provided by camera manufacturers.

The Festival is a great time to try out that lens or camera body you have been considering, before buying, through loaner programs.

Camera company representatives frequently offer cleaning and adjustments for your camera. I like to drop off my equipment for professional micro-focus adjustments and cleaning while I am out on the refuge creating images. This bypasses the risks and costs of shipping camera equipment, and gives you quick feedback on any adjustments that were just made. Each year I promise myself to not buy any new camera equipment at the Festival. We all know how well that works. Great deals and the ability to try something in the field, before buying, always help me justify yet another new required piece of camera gear.

Photography opportunities during the Festival of the Cranes can be fruitful, even when many refuge visitors are present. The wildlife at the refuge is habituated to vehicles driving the refuge roads. Stay in your vehicle and use it as you would a photo-blind. If you are turned-off by the higher number of refuge visitors during the festival you can still find quiet places to photograph. It is a big place!

I like to follow my “twenty-minute” rule – park in a spot that looks promising, has a good background, and is situated so the sun is at an angle behind you and not directly illuminating the subject. Give it an honest twenty minutes (set a timer on your smart phone). Something interesting will show up. A bobcat family, javelina, Harlan’s hawk, or maybe

even a mountain lion may surprise you. If you are ready to go with your camera before hand, then a fleeting glimpse might turn into a once-in-a-lifetime image. While patiently waiting, you can setup your camera for the correct exposure and be ready when a wildlife sighting occurs. At first the twenty minutes will seem like eternity. Other refuge visitors may drive up next to you and wonder what the heck you are looking at. I just smile and wave, or pretend like I am sleeping.

I find this exercise relaxes me and makes for a more enjoyable trip to the refuge. Sitting quietly, listening, and absorbing what nature is showing me leads to better images. Images that convey emotion and what you experienced are winners!

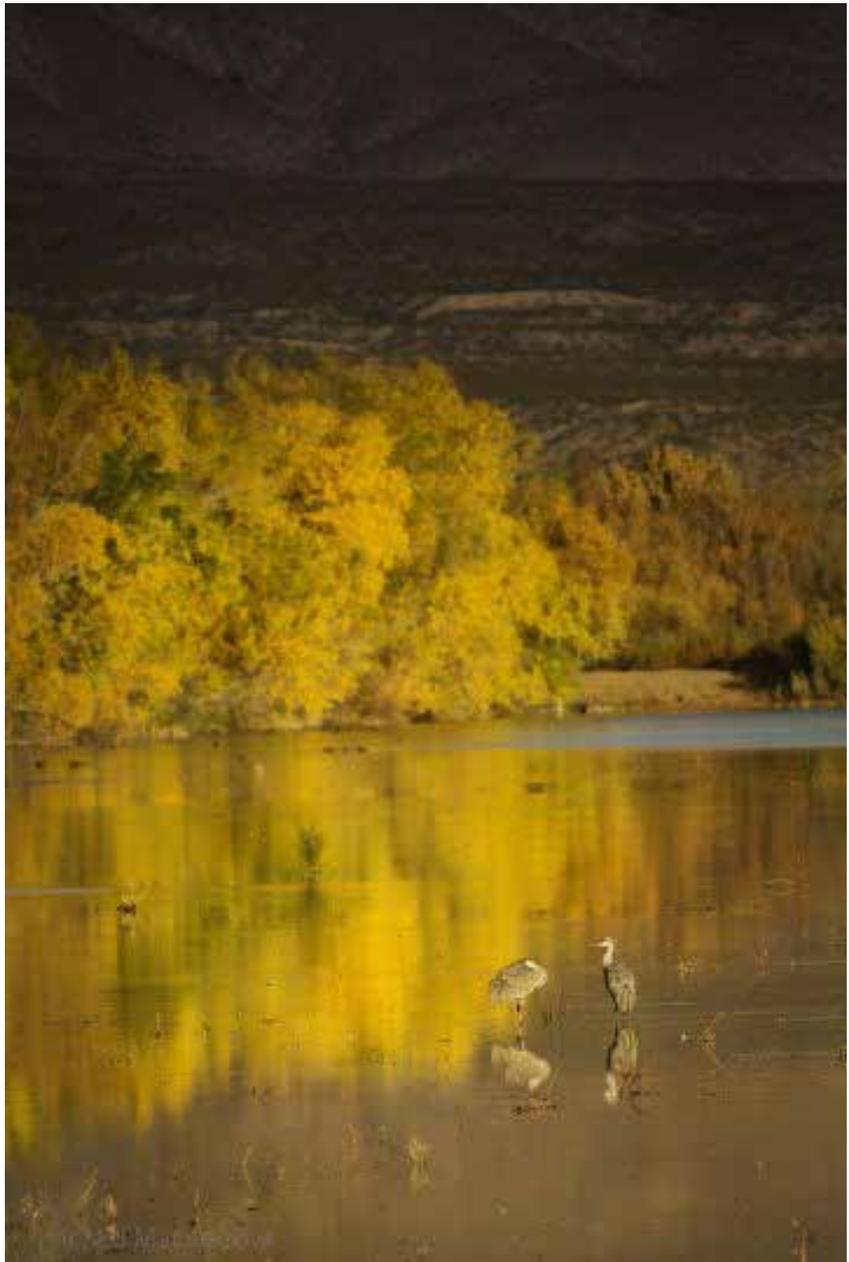
The days of anxiously driving laps around the refuge hoping something cool jumps out so I get a quick photo of it running away are not missed. I would come home from the refuge more stressed than before I got there. Now, each morning before I get to the refuge, I ask myself what message I would like my image captures to convey. I then translate that purpose into a plan for the day. That plan always includes sun angles, background scenery and colors to set the stage, and the behavior of wildlife I hope to see play out on that particular stage.

The fall landscape at the refuge changes quickly and dramatically. Timing your visit is key. Most years the trees start to turn color in the last week of September. Depending on fall storms, the brightly colored leaves can stay

on the trees well into November, or be blown off in mid-to-late October. Your best bet is to pay close attention to the refuge's Facebook page and recent images posted there, or simply call the refuge Visitor Center for the latest conditions of fall colors and recent wildlife sightings.

When I used to think about the Bosque del Apache NWR, sandhill cranes and snow geese came to mind. That changed many years ago for me. Now I associate the refuge with magical light, at all times of the year. Having wildlife as part of an image that captures this light is icing on the cake.

--Ed MacKerrow



Fall colors welcome the arrival of the sandhill cranes at the Bosque del Apache NWR. (Photo: Ed MacKerrow) To see the full glory of the fall colors, see this photo online at www.friendsofthebosque.com

The Friends of the Bosque del Apache National Wildlife Refuge is a registered 501 (c) (3) nonprofit corporation incorporated in New Mexico. The Friends promotes appreciation and conservation of wildlife and habitat through environmental education and natural history experiences at Bosque del Apache National Wildlife Refuge.

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