

# THE ACORN

American River Natural History Association Members' Newsletter  
Fall 2017



California Ground Squirrels • Rattlesnakes • Naturefest • Birding Class



# from the president

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The Acorn is published quarterly on partly-recycled paper by ARNHA, a 501(c)(3) nonprofit organization. Letters to the editor should be sent to the address above.

By the time this issue is in your hands or inbox, another summer will be winding down. I hope it was a great summer for everyone. It certainly was here at the Effie Yeaw Nature Center. Camps were full and weekends were full of visitors. I know that people become members of ARNHA for different reasons, but if you have not had the thrill of seeing the excitement of young people in our programs, please try to come by the nature center when a program is in session.

Fall brings new opportunities to experience the wonders of the season along the American River Parkway. At the Nature Center, school programs will be starting up again. NatureFest is Sunday, October 8. This is a fun event, especially for families. Lots of hands-on activities for kids or all ages.

I invite you all to attend the ARNHA General Meeting on Wednesday, September 13, from 5:00 – 8:00 pm at the Effie Yeaw Nature Center. This is your chance to meet board members, nature center staff, and fellow ARNHA members.

On a more serious note, you know how wonderful the nature center is, how great the ARNHA publications are, and how amazing the nature education programs are. What you probably don't know is how much this all costs to make happen. For the past few years, we have been managing to pay the bills, with the help of some very generous donors. As costs rise, our ability to continue offering the quality experience that we currently do, will not be possible. The fund development department is working hard, but we need your help. One thing that you all can do to make sure ARNHA and the Nature Center are able to provide experiences that create stewards of our fragile environment is to turn your membership renewal into a monthly pledge. If every member gave \$10-\$15 per month, the impact would be amazing.

I look forward to seeing you all at the general meeting and, I hope, at the Nature Center. As I write this, speckled fawns are staying close to their moms. Turkeys are herding clutches of youngsters, and our Red-shouldered Hawks have fledged and are out and about. Fall is a beautiful time to be out on the trails. The leaves are changing or falling, the summer crop of young animals are growing, and there is a feeling of calm as the intensity of summer begins to relax into the quiet time of winter.



ARNHA President Joey Johnson

*Autumn is a second spring when every leaf is a flower.* Albert Camus

*Joey Johnson*

Cover Photo: Ground squirrel with mouthful of wild oats  
Photo settings: 1/250th second, F 3.5, 180mm macro  
Photographer: James F Scott

# The Arms Race between Ground Squirrels and Rattlesnakes

story and photo by Michael Cardwell

Northern Pacific Rattlesnakes were killing and eating California Ground Squirrels long before there were people here to give them those names. And for just as long, the ground squirrels have been adapting behaviorally and physiologically to defend themselves against rattlesnake predation. During my four-year radiotelemetry study of the rattlesnakes in the Effie Yeaw Nature Center Preserve, my wife and I have seen the results of this arms race first-hand. But we are certainly not the first to notice it.

Scientists now know that rattlesnake venoms are highly complex substances, sometimes containing a hundred or more different kinds of molecules that can affect a bitten animal. And the composition varies, not only among rattlesnake species but among populations of the same species. Researchers have also shown that snake

venoms are adapted to the snakes' prey, with different combinations of venom components associated with certain kinds of prey animals. At the same time, prey animals have adapted to better survive the predation attempts of venomous snakes in their area.

I was fortunate enough to be a co-host of the Biology of the Rattlesnakes Symposium held at Loma Linda University in January 2005, where I first met Donald Owings and Richard Coss, both researchers at UC Davis. My Southern California colleagues and I were surprised to learn that they had been studying the adaptations of California Ground Squirrels to predation by Northern Pacific Rattlesnakes for more than two decades, from the squirrels' perspective. But now, they had come to our conference to present their research from

the rattlesnakes' perspective for the first time.

Professors Owings and Coss, along with various grad students, had already established that the blood of California Ground Squirrels, in populations where rattlesnakes are abundant, contains components that neutralize the primary toxic components of the rattlesnake venom. Interestingly, they had also discovered that the blood of ground squirrels

in Northern California more effectively neutralizes the venom of our local Northern Pacific Rattlesnakes than the venom of other closely related rattlesnakes – indicating that the squirrels' adaptation is specific to the local snakes. They had also found that, while adult ground squirrels were largely resistant to the rattlesnakes' venom, their pups were not. They attributed this to the smaller body size of the pups just

not being able to neutralize the amount of venom delivered by a rattlesnake bite.

But the UC Davis folks had also documented some previously unknown anti-snake behavior by California Ground Squirrels, where adult squirrels – particularly mothers with pups nearby – aggressively harassed rattlesnakes when they found them. This included throwing dirt and grass in the snakes' faces, "flagging" at close range with their tails – made larger by erecting all the hair, and deftly avoiding most strikes by the snakes. From the rattlesnakes' perspective, Owings and Coss suggested that this behavior by the ground squirrels probably provides both predatory constraints and opportuni-

*continued next page*

*Arms Race, continued from previous page*  
ties for the rattlesnakes.

In terms of constraints, the rattlesnakes are largely restricted to hunting ground squirrel pups because adult squirrels usually survive their bites. As sit-and-wait predators, rattlesnakes hide and ambush their prey, so the defensive



Photo by James F Scott

antics of a squirrel that discovers a hiding rattlesnake alerts other nearby squirrels and usually causes the rattlesnake to move on in search of a different ambush site. Finally, the squirrels learn where and how the rattlesnakes tend to hide and routinely patrol squirrel colonies in search of them.

On the other hand, confrontational behavior toward rattlesnakes tends to develop in pups before they are large enough to survive bites, often making them easy meals for the snakes. Additionally, the rattlesnakes may use the exaggerated defensive behavior of mother squirrels as evidence of nearby pups and then search for the pups. Finally, ground squirrels living in areas inhospitable to rattlesnakes (e.g., high elevations with harsh winters) lose their venom resistance over time because there is no longer any selective advantage to keep it, making squirrels with less venom resistance as likely to survive and pass on those genes as highly resistant squirrels. Then, in the future, if the environment changes in some way and rattlesnakes move into the formerly inhospitable area, such squirrel popula-

tions are susceptible to predation by the newly arrived rattlesnakes.

In July 2014, my wife Denise and I first witnessed this life-and-death struggle, shaped by the evolution of both species, play out at Effie Yeaw Nature Center. We found one of our telemetered male rattlesnakes scent-trailing a

ground squirrel pup he had already bitten. To avoid leading the snake to her pup, the mother squirrel initially sat a few feet above the scene on an elderberry branch, incessantly chirping the squirrels' alarm call. Interestingly, an inch-wide scab was visible on her hip — likely where she had survived the tissue-destroying effects of

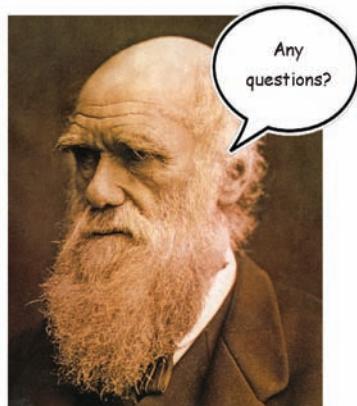
a recent rattlesnake bite.

As the rattlesnake neared her motionless pup in the grass, the adult squirrel took up a position not much more than a foot in front of the three-foot rattlesnake, pushing dry grass toward the snake's face and flagging — vigorously waving her tail back and forth with the hairs erected like a bottlebrush. After being only briefly deterred, the snake found the young ground squirrel and swallowed it. What happened next amazed Denise and me. The mother's behavior changed abruptly once the rattlesnake began to swallow the squirrel pup. Her seemingly frantic defensive antics that had continued for more than half an hour simply ceased, and she walked calmly away from the scene. She had, undoubtedly, been through this scenario many times.

As wildlife biologists know, in stable populations most offspring of any species will not survive to reach adulthood and reproduce. Over time, if adults do more than simply replace themselves, the population explodes. Predators like rattlesnakes are Nature's primary means of population control. And, as I am

fond of pointing out, Nature is a cruel mother: the lives of most wild creatures end in the jaws of another.

*Mike Cardwell is a wildlife biologist with an adjunct faculty appointment at San Diego State University. He and his wife Denise are volunteers at Effie Yeaw Nature Center, where Mike also teaches the UC California Naturalist certification course. Additional information and photos from his current rattlesnake study can be found at [www.EYNCRattlesnakes.com](http://www.EYNCRattlesnakes.com).* ■



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Effie Yeaw Nature Preserve  
Images by Thom Parrish  
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Wild Birds and Garden

# Art Where Wild Things Are Best Weather and Best Menu Ever!

On June 10, the weather cooperated! The American River Natural History Association's eighth annual Art Where Wild Things Are Spring Gala and Art Auction took place in weather that was not too hot, not too cold, and not at all windy or rainy. In short, it was perfect weather under the oaks at Effie Yeaw Nature Center to enjoy art, food and drink, music and mingling – and all for a good cause.



The annual collaboration between ARNHA and the Carmichael Fine Arts Center brought out 350 people to the sold-out event. This year, for the first-time, photographers participated in the show. Their works were well received, including a photograph of a Great Blue Heron by Susan Maxwell Skinner that sold for well over the stated value.



Honorary Chairperson Cecily Hastings and Edie Lambert of KCRA emceed the event; Auctioneer Yve Rojas kept the live auction moving along, and an army of enthusiastic EYNC volunteers helped make the evening a success. The event generated roughly \$78,000 in net revenue. *Photos by Kari Bauer.* ■



# Under the Oaks

by Pete the Parkway Coyote

Even during a hot dry summer when the Preserve seems very quiet, nature lovers find a lot to watch. This season, a pair of Acorn Woodpeckers that nested in a snag right by the pond out front, provided the show. It seems that the snag was rotten, and one afternoon the entire top half, including the nest, fell to the ground. Naturalists Heather and Rachael hauled that snag to a safe place, propped it upright, and as of this writing the parents are still feeding a young bird who is almost ready to fledge.

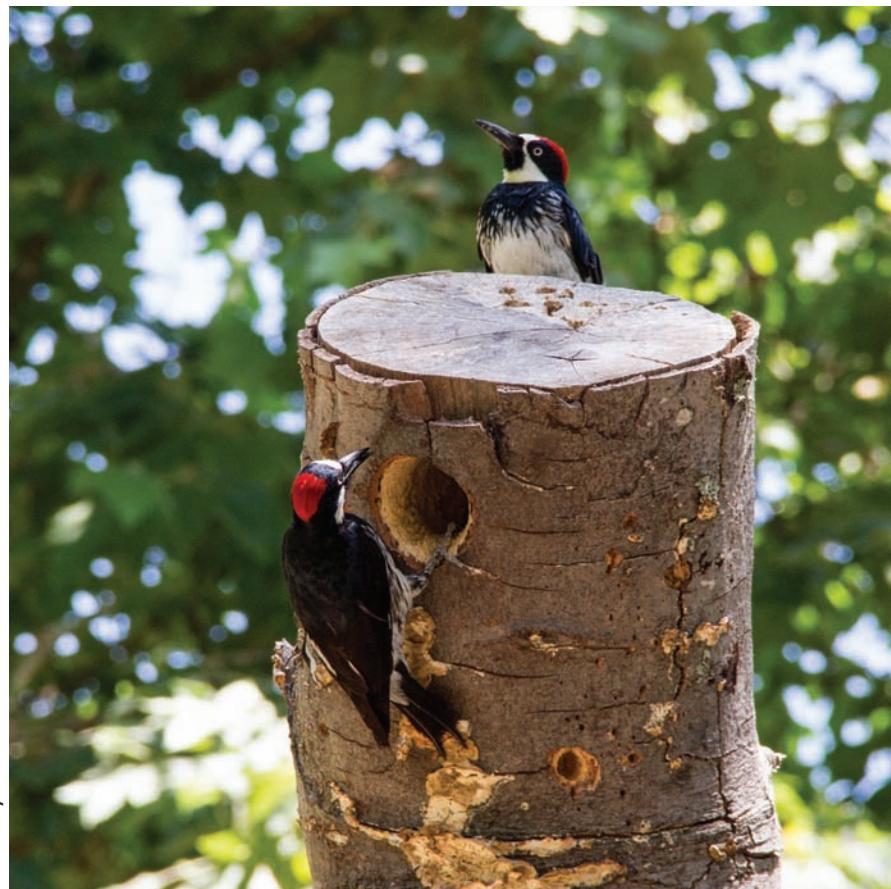


Photo by Kari Bauer

**Volunteers Margaret Leavitt, Renee Covey, and David Peterson**, who each have volunteered over 1,000 hours for ARNHA and EYNC, now have their names inscribed on the plaque on the exhibit room door. They and other volunteers who reached significant milestones were recognized at the **Volunteer Luncheon** on August 9 at EYNC.

In June, local teachers attended a three-day **Project Learning Tree** seminar to learn how to create, maintain, and use wildlife habitats at their schools. Activities over three days included hikes, games, native plant uses, and discussions about bird language, native plant uses, and pollinator habitat design. You can read more about the seminar at [SacNatureCenter.org](http://SacNatureCenter.org)

Beginning August 1, local educators have been reserving classroom programs and **Nature Area Tours** for the upcoming school year. Use [SacNatureCenter.org](http://SacNatureCenter.org) to learn more about the programs, policies, and price lists. At the Nature Center, Students can learn about Maidu culture, tour the nature preserve, and investigate life under the water's surface. In their own classroom, they can learn about nature and our place in the natural world.

Join other ARNHA members and friends on a fund raiser trip to **Belize in 2018**. For more information please call or email Danilo Bonilla at 510-213-1194 or [danilo@stuffedduffel.com](mailto:danilo@stuffedduffel.com)



Mike Cardwell, photo by Kari Bauer

### Snakes and Birds and Coyotes, Oh My!

The Nature of Things Fall Speaker Series features several fascinating presentations, including “Living in Rattlesnake Country,” by Mike Cardwell; Rich Howard’s class, “Beginning Birding, Fall Edition”; and “Coyote Stories,” by Guy Galante. Full details are on our website: [SacNatureCenter.net/education/adult-programs/nature-of-things/](http://SacNatureCenter.net/education/adult-programs/nature-of-things/)



Photo by Kari Bauer

*Pete's curious nature, sharp eyes, and keen sense of smell make him a great ambassador for the American River Natural History Association.*

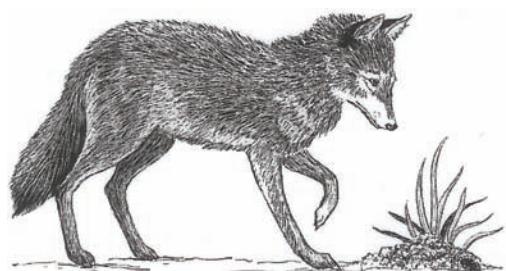
ARNHA membership is a great gift. Spread the joy of nature

All ARNHA members and Effie Yeaw stakeholders are invited to the beautiful 100-acre Nature Preserve at Effie Yeaw Nature Center (EYNC) for the **ARNHA Annual Meeting** on September 13, 5:00 PM. Following light refreshments, Executive Co-Directors Paul Tebbel and Betty Cooper and ARNHA Board President Joey Johnson will review new directions for ARNHA and EYNC, upcoming programs, and volunteer opportunities. During the popular “Question and Answer” session, they will further detail plans for the future at EYNC. Outstanding volunteers will receive special recognition. Come and enjoy an autumn evening with deer, Acorn Woodpeckers, and migrating Sandhill Cranes, and friends of nature. <http://www.arnha.org>

### NatureFest October 8

This annual community event includes live animal shows, hands-on activities, guided walks, and many exhibits. Nature lovers, families, scouting troops, other youth groups, and all attendees have a rare opportunity to see some of our native and non-native critters up close and personal and mingle as they learn more about the outdoor world.

Check out our website at [SacNatureCenter.org](http://SacNatureCenter.org) for further information about the event. Call Betty Cooper, 489-4198, or email [BettyC@SacNatureCenter.net](mailto:BettyC@SacNatureCenter.net) if you or your business would like to become a sponsor.



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- Yan Zhang

# Summer Camps Again

## Fun and Informative

Over 200 children attended the Effie Yeaw Nature Center summer camps this summer, spending time under the oaks, on the trail, on the river, at and in –WOW!– the pond, learning about nature in many forms and having a great time. Art, crafts, stories, science, hiking, games, water play, fishing, nature journaling – there was something for everyone, in age groups spanning ages 5 to 15.



As always, camps sold out quickly this year. Don't miss out on camps during Fall and Winter school breaks! Check back on the EYNC website, [sacnaturecenter.net](http://sacnaturecenter.net), in early October for information and registration materials. ■

Photos by Kari Bauer

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- Cindy Smith  
in memory of Jo &  
George Smith
- Dennis & Diane Smith
- Diane Smith
- Steve & Janet Smith
- SMUD
- Society for the Blind
- Susan Solarz
- Lily Soley
- Joseph Soots
- Jo & Rod Souvignier
- Bill & Anne Spaller
- Karen Steentofte
- Teresa Steinback-Garcia
- Morna Stephens
- Ellen Stillman
- Patricia Stock
- Joe Strickland
- Linda & Harry Struthers
- Mary Summers
- Cheryl Sutherland
- Linda Sweetman
- Jacquie Taber
- Veronique Tache
- Angela Tannehill
- Paul Tebbel
- Jaclyn & Jon Teofil
- Diane Tharp
- Laura Thompson
- Barbara Tincher
- Dee Todd  
in memory of Betty Nelson
- Susan Torguson
- Julie Trail
- Warren & Mary Truitt
- Del & Alta Tura
- Gina Viani
- Fern Waddell
- David & Connie Wade
- Patrick & Dorothy Wagner
- Linda Wall
- Jian Wang
- Mary Wang-Steele
- Tom & Cheryl Ward
- Dee Warenycia
- Kristi Warren
- Larry & Jamie Washington
- A. J. Watson
- Eric Webb
- Alana Webre
- Betsy & Fred Weiland
- Sally Weinland

In Memory of Bill Dillinger  
• Ellen & Richard Dillinger  
• Pete Hayes  
• Peggy & Bruce Kennedy  
• Ruth Rezos

Thank  
you!

## Photographer: Guy Galante

Description: In the afternoon the EYNC pond in the village is alive with blue skimmer dragonflies.

Camera settings: 1/800 sec; f/6.3;  
ISO 1600; 600 mm



# Remembering Bill Dillinger

by Peter J. Hayes



The seeds were planted early for local writer and environmentalist William Clarke (Bill) Dillinger, who died on April 19 at age 93. "I was a word-monger from the start, pacing the kitchen floor almost as soon as I could walk and reciting imaginary tales while my mother and sister washed the dishes," he wrote in a 65-page memoir.

A few years later he was climbing trees in the forested hill behind his Placerville home and, while pursuing a Boy Scouts bird study merit badge (He became an Eagle Scout.), he was turned on to bird watching by Mr. Zuegar, the merit badge counselor.

Before launching his 31-year career with State Fish and Game and State Parks and Recreation departments, Bill worked for the CIA, monitoring foreign broadcasts of economic information and served in France and Germany in World War II with the 89th Infantry division.

Recording a combat episode in his memoir, he wrote: "Lt. White marched at the head of the column, and as platoon messenger I was right behind him. A light machine gun opened fire from the woods. White was hit and fell to the ground, and I hit the ground right behind him. 'I'm going to die,' he said quietly. And die he did."

Bill, a Phi Beta Kappa, attended and graduated from Stanford University before and after the war and was an intern with the Coro Foundation, a San Francisco organization that prepares students for working in State government. Following

his work as chief of public information with Fish and Game, in which he was involved with environmental issues, and with Parks and Recreation, he did part time news information work with the California Tahoe Conservancy.

He became increasingly interested in birding and was elected president of the Sacramento Audubon Society and helped lead Christmas bird counts.

His book *James Marshall and the Discovery of Gold in California* won the Sacramento County Historical Society's Award of Merit for Publications. He also edited *A History of the Lower American River* for the American River Natural History Association in 1991. He wrote numerous lead articles for the American River Natural History Association's *Acorn* newsletter.

He free-lanced for *The Sacramento Union*, *Sacramento Bee*, and magazines, with such articles as "How animals, plants can be saved," "There's no equal housing that's available for ducks," and "The owl developers just hate."

Born in Placerville on January 1, 1924, he was the son of State Senator H.E. Dillinger. He married Carol Ellen Renius of Manhattan Beach, California, whom he had met at Stanford. They were married 56 years until her death in 2003. He is survived by four children: Ellen A. Dillinger and Carla C. Dillinger of Sacramento; Anne F Lemieux of Galt, and William R. Dillinger of Great Falls, Virginia, and by six grandchildren: Tyson, Jessie, Ian and Madeline of Galt, and Karl and Emily Dillinger of Great Falls, Virginia.

*Peter J. Hayes is a career journalist, author of The American River Almanac and An American River Journal and editor of several ARNHA publications. In 2009, he was named county parks Outstanding Volunteer by the Board of Supervisors.* ■

## Ask a Naturalist

**Q.** With fall approaching, what new bird species can we see?

**A.** Naturalist Rachael Cowan replies: One of the perks of being a naturalist is being surrounded by people who are connected to the natural world in different ways. On that note, I am not a birder, but I know people who are! So for this question I referred to one of the Nature Center's seasoned birders, Rich Howard.

Rich had this to say; "Get ready, here they come! One category of migrants that is special for the valley is elevational migrants - birds that spend the winter with us and move up to higher elevations of the Sierra Nevada to breed rather than migrating north, e.g., Ruby-crowned Kinglet, the American Robin, Northern Flicker, White-crowned Sparrow, and Yellow-rumped Warbler.

Shorebirds are moving now, warblers, vireos, and flycatchers will pick up in August and peak in September, our winter waterfowl, gulls, and cranes return in October, and winter visitors like coots and siskins may not show up until November or December. We should probably make a distinction between migrants who breed elsewhere and return here in fall to spend the winter, such as Cedar Waxwing, Yellow-rumped Warbler, vs. passage migrants, who breed to the north of us, winter to the south of us, and are only seen as they pass through on migration, such as Rufous Hummingbird and Swainson's Thrush."

*Melanie DuBoe is a naturalist at the Effie Yeaw Nature Center and manages the Discovery Shop in the Center, as well. She loves sharing nature with others, whether on the trail or in the Shop.* ■

American River Natural History Association  
P.O. Box 579  
Carmichael, CA 95609-0241  
(916) 489-4918 • [www.arnha.org](http://www.arnha.org)



## ARNHA Calendar of Events

- **Living in Rattlesnake Country with Mike Cardwell**

Wednesday, August 23, 6:30 p.m. to 8 p.m.

Saturday, August 26, 10 a.m. to noon,

Effie Yeaw Nature Center

- **Beginning Birding with Rich Howard**

Fridays – August 25, September 1, 8, and 15, 6:30 p.m. to 8 p.m.

Saturdays – September 9 and 16, 8 a.m. to 11 a.m.,

Effie Yeaw Nature Center

- **ARNHA Annual Meeting**

Wednesday, September 13, 5:00 p.m. to dusk

Effie Yeaw Nature Center (see "Under the Oaks" page 7)

- **NatureFest**

Sunday, October 8, 10 a.m. to 3 p.m.

Effie Yeaw Nature Center (see "Under the Oaks" page 7)

- **Coyote Stories with Guy Galante**

Friday, October 27, 6:30 p.m. to 8:30 p.m.

Saturday, October 28, 7:30 a.m. to 10:30 a.m.,

Effie Yeaw Nature Center

See [SacNatureCenter.org](http://SacNatureCenter.org) for more information.

## A Song for the Season

by JoLynn Jarrett

As you enter the lobby of the Effie Yeaw Nature Center in the morning, or perhaps in the late afternoon, you might hear the sounds of a songbird singing away. It could be a single, quiet chirp, or it might explode into a wonderful melody that fills the entire building. You may think it is a recording, or one of our musical stuffed animals, but it is actually Tango, our Western Tanager!

In August of 2015, this young bird with a broken wing was taken in by the Wildlife Rehabilitation and Release in Penn Valley. Unable to fly, he was kept in a rehabber's home where, for two years, he helped raise other young and orphaned birds of his size.

The Western Tanager (*Piranga ludoviciana*) is classified as part of the cardinal family due to its plumage and vocalization. Preferring coniferous wooded areas, it can be found all over the western United States. Its territory stretches as far north as Canada, and it migrates all the way down to Mexico in the winter.

The Tanager arrived without a name. So with careful consideration, the staff picked out five options and then asked the public to vote on them. Tango was, by far, the favorite. As such, Tango the Tanager has become the newest member of our animal family.

JoLynn Jarrett is the EYNC Animal Care Supervisor. She grew up on a ranch and has loved animals for as long as she can remember. ■



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