

THE ACORN

American River Natural History Association Quarterly Magazine – Winter 2023



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Welcome Our New Executive Director Rachael Greve



Rachael Greve

September 5 was the first day on the job for our new Executive Director, Rachael Greve, and she has hit the road running!

Rachael notes that she set her heart on a career working in a museum when she was 6 years old. At that time her first grade class visited a pioneer museum in rural Pike County, Alabama where she grew up. She remembers vividly the thrill of being able to see and even touch artifacts and participate in hands-on activities that helped her imagine the past. Ever since, she has dedicated herself to creating learning experiences that can captivate both children and adults.

She studied archaeology at Troy University in Alabama, creating a museum outreach program about Alabama's indigenous people for 4th graders as her senior project. After graduating, she worked in several history museums in many capacities in Arkansas, Texas, and Alabama—even becoming Director of that Pioneer Museum of Alabama that so captivated her as a first grader. With each post she grew her skills and experiences, learned how to win funding to carry out a vision, and created exhibits and programs that drew crowds. In 2017 she moved to California to become Director of the Sierra College Natural History Museum in Rocklin. There she started a digital newsletter, created virtual museum tours during the Covid epidemic, and opened the museum to families in a Free First Saturdays program that has drawn over 16,000 people.

Several factors converged to convince Rachael to take the job at Effie Yeaw Nature Center (EYNC). With its outdoor Maidu village, indoor natural history museum, and acres of natural landscape, it reminded her of the Pioneer Museum in Alabama that inspired her so long ago. It seemed like the perfect place for the kind of hands-on education that she feels so passionate about. Although EYNC already has great programs, she could see the potential to make it even better. At Sierra College, she was the only paid staff member; EYNC has more than 20 talented staff members that she could support and collaborate with. She says her introductory meeting with the staff really sealed the deal. She felt connected.

What are her short-term goals? Right now, Rachael is focused on completing numerous ongoing projects. These include the Raptor of the Day metal enclosure for the courtyard, expected to be completed in Spring 2024. Also on the docket for Summer 2024 is the transformation of the outdoor back deck into an indoor-outdoor space with folding patio doors, new flooring and electrical upgrades. This year EYNC received a large grant for improving the museum, bringing it up to ADA standards with new lighting, flooring, and bathrooms, as well as technology upgrades to improve accessibility. End of year 2025 is the target date for completing the museum upgrade. Another major project is a large Aviary building for which plans are being drawn up.

Rachael is also focused on improving the efficiency and effectiveness of staff time. She has found grant funds to purchase project management and scheduling software that will allow staff to work smarter rather than harder. And, of course, finding funding will be a priority. Finally, she would like to have a review of the EYNC Master Plan and involve the board, staff, volunteers, and ARNHA members.

When asked for a final comment, Rachael provided this quote: "What's one of my favorite aspects of Effie Yeaw Nature Center's programming? School field trips. My absolute favorite part of my vocation is witnessing the moment when a child discovers their passion...ignites this burning love for the natural world. A field trip to a museum/nature center/wildlife area can change a person's life. It happened to me."



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Cover: Yellow-billed magpie.
by Katherine Roberts.

Birds and Climate Change in the Sacramento Region

By Eric Ross

This year has blessed Sacramento with drought-dispelling winter rains, mild weather, thriving gardens, abundant wildflowers, and beautiful days to savor. For those who enjoy seeing birds on neighborhood walks or at home feeders, it is a comfort to see familiar birds return from afar to greet us every season. To the wise, however, all is not as it appears.

Climate change is defined as long-term shifts in Earth's temperatures and average weather patterns. Since the mid-20th century, human activities have driven significant changes in the Earth's climate. Of special note is the burning of fossil fuels, which has increased heat-trapping greenhouse gas (GHG) levels in Earth's atmosphere and raised Earth's average surface temperature.

If anyone had any lingering doubts about the reality of climate change, the news in 2023 surely must have ended them. This year brought record-breaking, unrelenting hot temperatures across the planet causing suffering and disruption. "Megafires" burned forests around the globe, endangering human health and threatening destruction of cities and livelihoods on many continents. Many world regions experienced severe drought, while torrential rains and

destructive flooding occurred in numerous countries. For wildlife in many areas of the world, the negative impacts of climate change compound habitat losses already occurring due to other human activities. For instance, the Sacramento Valley historically contained vast grasslands and seasonal wetlands that provided critical habitat for huge numbers of wintering birds. But massive human migration into California in the 19th and 20th centuries, urban development, and the creation of a statewide network of extensive waterways for agricultural irrigation destroyed much of that habitat. The Central Valley lost over 95% of its native grasslands, riparian habitat, wetlands, and vernal pools, greatly reducing populations of indigenous birds and wintering waterbirds.

Today, because of climate change, the Central Valley has drier and hotter weather with more drought and less water for agricultural use and for wildlife than ever before. As a result, the survival of large numbers of grass-



Figure 1. Samples from a 2019 University of Michigan study of 70,000 specimens of 52 North American migratory bird species collected 1978-2016. The study found all 52 species shrank in size with climate change while their wingspans grew, suggesting an adaption for more flight efficiency. Weeks et al. (2020) Ecology Letters 23(2):316-325.

Tallying the losses

Annual surveys show that since 1970, North American birds have dwindled in all habitats except wetlands (top). Whereas most groups have declined (bottom), ducks and geese have flourished, as have raptors since the 1972 ban on DDT.

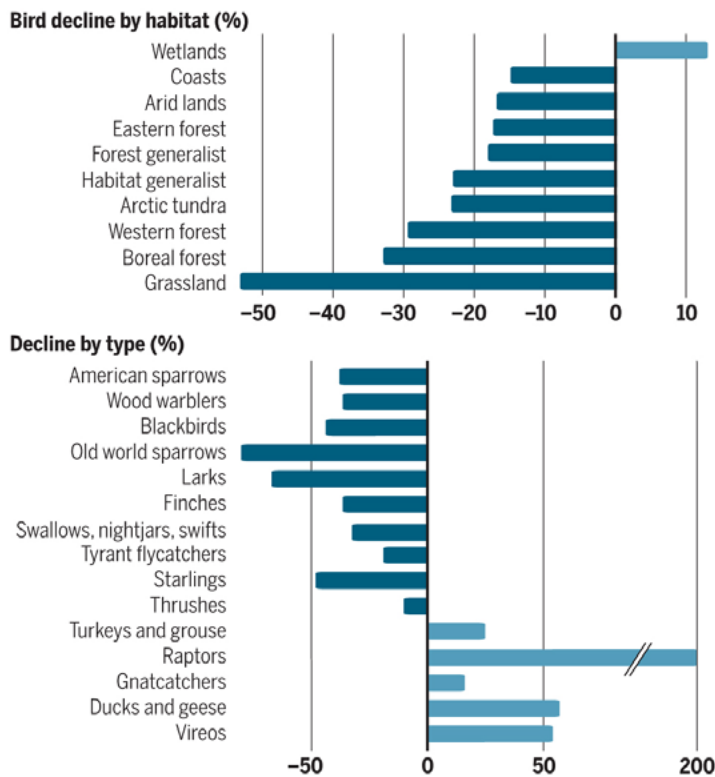
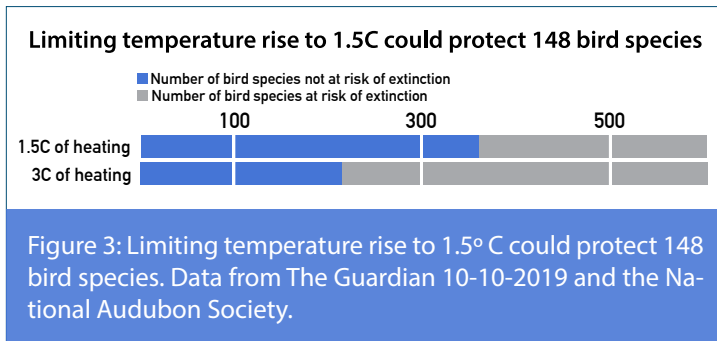


Figure 2: A review of annual losses of North American birds over 48 years signals an urgent need to address threats. Rosenberg et al. (2019) Science 04, October 2019:120-124.



land bird species is threatened. Birds from the south that can thrive in drier lands are moving in and taking the niches of native birds that can no longer adapt.

In 2019, the National Audubon Society released a peer-reviewed report, *Survival by Degrees: 389 Bird Species on the Brink*. Audubon scientists reviewed data sets for 140 million birds and the latest climate science modeling and came to the conclusion that almost two-thirds (389 of 604) of North American bird species are at risk of extinction if global warming increases by 3.0°C/5.4°F by 2050. This is the minimum temperature rise expected if the world takes no action to limit climate change. Encouragingly, Audubon scientists believe concerted, immediate actions can significantly lessen the risk of extinction for over three-quarters of those species (296 out of 389) if global warming is held to an increase of only 1.5°C/2.7°F, which is the goal set by the 2016 Paris Agreement.



The Audubon models correlated bird observations with environmental conditions within each of the 604 species' current ranges, including climate, vegetation type, land use, and topography; and then mapped the expected future range of each species by substituting projected future climate and vegetation conditions as inputs into the models.

The study then estimated the percent of projected range loss and gain under future climate change scenarios (i.e. increases in global mean temperature of 1.5°C vs. 3.0°C) to assess each species' vulnerability to climate change. Highly vulnerable species were those projected to experience the highest percent of current range loss with limited opportunity for future range gains.

Audubon came to some sobering conclusions: Since the 1970s, the North American continent has already lost 3 billion birds or nearly 30% of the estimated total population in 1970. Birds are known to respond to climate change by shifting their ranges, but climate change is occurring 20 times faster today than it has during any historical period over the past 2 million years.

The 2019 report documents persistent threats to birds from growing human populations creating more urbanization and cropland expansion. It describes various intermittent threats from global warming up to 1.5°C and up to 3.0°C, some directly pertaining to our Sacramento region: extreme spring heat, fire weather, and spring droughts.

In July, 2023, the National Academy of Sciences (NAS) published a climate research paper entitled "Demographic consequences of phenological asynchrony for North American songbirds". Phenology means the timings of cyclical or seasonal biological events, such as migration, egg laying, and flowering. Drawing on an 2001-2018 study of 41 species of North American migratory and resident bird species breeding in and around forests, the four NAS co-authors found plants are leafing out and insects emerging earlier in the year whereas timing of bird breeding has not similarly shifted. As a result, birds are less able to access food sources for their breeding needs. The NAS study concluded North American forest bird species' breeding

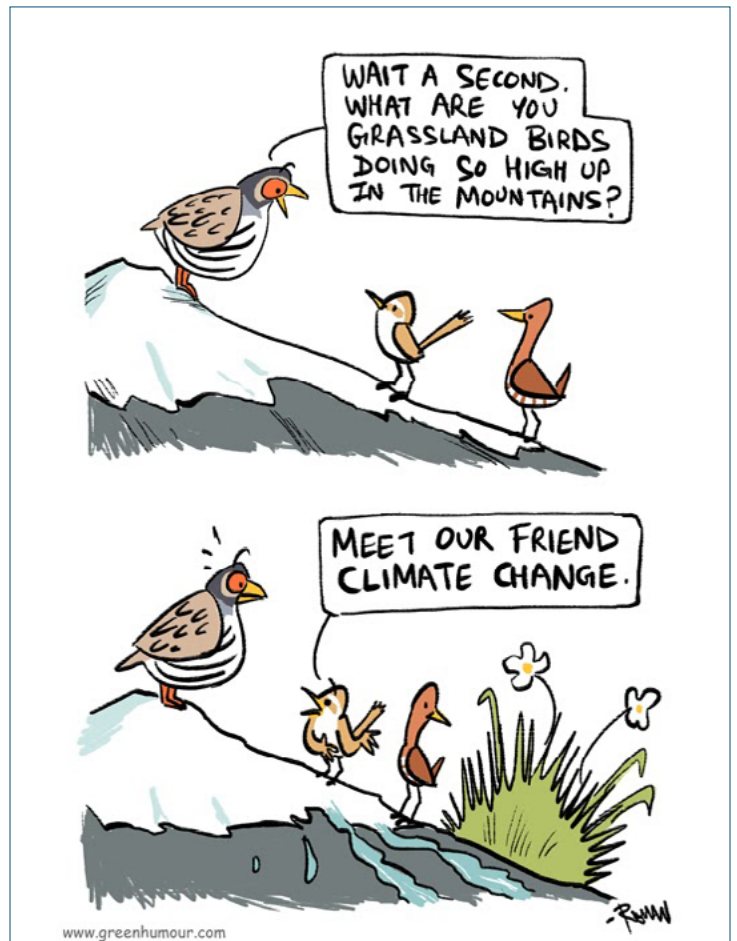


Figure 4. As global warming alters the vegetation in their lower elevation habitats, grassland birds have nowhere to go but up, and at some point, there is no more up to go, according to climate scientists. Roman/www.greenhumour.com



phenology will not keep pace to synchronize with necessary food sources and, therefore, will create declines in breeding productivity throughout the 21st century.

What potential changes in the make-up of the Sacramento region's birdlife can we foresee happening over the next 25 years? The Sacramento Audubon Society's 2021 book *Sacramento County Breeding Birds* combines data sets from the years 1988-1993 and 2016-2020 amounting to two separate county breeding bird atlases (BBAs), and compares them. In roughly three decades, the county's human population increased by 50% and its agriculture shifted to higher-value crops. These land use shifts have and continue to have significant impacts on bird habitats.

The changing environment for Sacramento area breeding bird species affects all local birds, but "winners" and "losers" have emerged. Winners appear to be turkeys, raptors (except American kestrels and northern harriers), ducks and geese, more recently-arriving generalists such as ravens, grackles, and Eurasian collared-doves, and adaptable smaller songbirds. Species taking a hit include smaller songbirds with narrow niches in habitat affected by increased urbanization and agriculture. Examples include sparrows, blackbirds, swallows, and warblers. In addition, contact with West Nile Virus has markedly decreased the numbers of yellow-billed magpies and loggerhead shrikes.

In turn, the 2019 Audubon report predicts what bird species in the Sacramento area are most vulnerable to global warming under two different temperature scenarios. If average temperatures rise by 3.0°C/5.4° F, we can expect unsuitable seasonal ranges leading to probable extinction for California quail, Clark's grebe, eared grebe, common goldeneye, western wood-pewee, bushtit, California thrasher, orange-crowned warbler, Lawrence's goldfinch, band-tailed pigeon, northern pygmy-owl, tricolored blackbird, western bluebird, California towhee, Nuttall's woodpecker, yellow-billed magpie, and acorn woodpecker. At 3.0°C around 70 additional species in the Sacramento area will lose portions of their ranges and risk extinction; and 114 other species will remain stable during the winter, while 62 will remain stable during the summer.

If average temperatures can be held at 1.5°C/2.7° F, Sacramento can expect diminished ranges leading to probable extinction for just two resident species, Tricolored blackbird and yellow-billed magpie. Seventy-plus bird species will lose parts of their ranges and have risks of extinction. More than 100 other bird species found locally during the summer or winter will remain stable and avoid extinction.

In its October 4, 2023 issue, WIRED Magazine reports September 2023 was on average 1.8 ° C hotter than preindustrial levels from verified scientific data well above the Paris Agreement's goal of keeping temperatures rising no more than 1.5 ° C. As the Audubon report notes, "we still have a window to act, but it is narrowing."



Figure 5. The tricolored blackbird (pictured here) and the yellow-billed magpie (on the cover) are two local bird species that could become extinct in the Sacramento region even if the rise in average temperatures can be held to 1.5° C by 2050 according to a 2019 National Audubon Society study. Photo: U.S. Fish & Wildlife Service.

Eric Ross is a Docent at Effie Yeaw and a Certified California Naturalist. Thanks to Melanie Loo for information regarding asynchronous phenology and to Karen Tarp for her insights. For further information about climate change, its causes, effects, and potential mitigation, read "Climate Change is All Around Us" in the [Fall 2023 issue of The Acorn](#). Also see the [National Audubon Society's report on climate change and birds](#).



Managing for the Effects of Climate Change on the American River Ecosystem

By Julie Zimmerman

I'm a river ecologist, which is an unusual profession and usually needs some explanation. When my daughters were young, I would tell them that I'm a doctor for rivers, diagnosing how to keep them healthy so they can support freshwater biodiversity, including salmon and all the other species that depend on them. My area of specialty is flow, the lifeblood of a river's circulatory system, or the flow of water that is needed at specific times of year to provide food and habitat, keep water temperatures cool, and trigger migration or reproduction of animals and plants. Flow is the "master variable" in river ecosystems, shaping physical habitat, influencing water quality and temperature, and affecting distribution, abundance, and behavior of species. A key concept in river ecology is that water flowing to the ocean is not wasted, it is the fundamental aspect of a river that supports biodiversity and keeps rivers healthy for people and nature.

Native species have adapted to natural flow regimes that are specific to individual rivers, but they share fundamental properties. River ecologists have spent decades trying to define and quantify those fundamental properties, or the key aspects of a flow regime that can support species and ecosystems while still allowing for human use of water. This is a key principle of river ecology, but the science is evolving.

I have been working with a collaborative team of scientists (ceff.ucdavis.edu) to define "functional flows" that are necessary to protect natural variability, activate habitat, and support freshwater biodiversity in rivers across California. These "functional flows" include a fall pulse to trigger adult salmon migration into streams, sustained high flows in fall and winter to support salmon spawning and egg development, higher pulse flows in winter and spring to create off-channel rearing habitat for young fish, a dependable spring recession to trigger movement to the ocean, and lower summer flows to concentrate prey for easier feeding for juveniles that stay in the river over the summer.

We are trying to manage rivers that allow for human water use but still maintain flow patterns that include natural variability – the functional flows – so that rivers work for salmon and other native species, not only for people. Ultimately, we want the environment to be considered a legitimate user of flow in a river, so that rivers remain... well, rivers.

Out of all the amazing rivers where I have worked, the American River is close to my heart because it's the river I know best and where I spend the most time. The American River



Figure 1. High flows along Sacramento Bar in 2017, the wettest year on record for the Northern Sierra. The American River has more natural flows in wet years than many other rivers with large dams, which helps to support river function and salmon populations. Photo by J. Zimmerman.

is one of the hardest working rivers in California, but it still provides a sense of wildness. It is a crucial part of California's water infrastructure, hosting one of the six dams that make up California's Central Valley Project, and provides water, electricity, and flood control to Sacramento, the Central Valley, and beyond. It is a key piece of our state history, where California's gold rush was born and left mine tailings in the form of gigantic piles of river rock along the shores that remind us of hydraulic mining's environmental legacy. And the river epitomizes so many of our environmental challenges in California, functioning as an important ecosystem for salmon and other native species, and a recreational oasis, but requiring intensive management of historical environmental damage, current water demands, and future climate change.

Climate change is a particularly tough problem because it is a threat multiplier, contributing to more frequent droughts, floods, longer dry seasons, and higher temperatures, thus making management needs more challenging and more crucial. Expected changes include reduced snowpack, more variable rainfall and river flow, and higher temperatures. Changes in river flow and temperature interact with water management and other human modifications in the American River, complicating restoration of the living ecosystem that supports our iconic salmon and steelhead. River ecologists use a combination of river flow, temperature management, and habitat restoration to protect and restore native species in regulated rivers. A changing climate only makes management of these key factors more challenging.



The American River needs active management in all these areas – flow, temperature, and habitat – if we want to have a functioning river ecosystem into the future. Dams, particularly Folsom, capture river flow during wet conditions – the winter and spring – and release water for downstream use in the summer, and so alter functional flows. Because our climate has typically hot, dry summers and increasingly hot, dry autumns, climate change is a particular threat. It has always been difficult to manage the river to achieve appropriate temperatures for fish, and that job is only getting more difficult. As conditions get drier and warmer, river flow downstream of dams becomes increasingly difficult to manage for functional flows, as the dam captures more of the wet season's high flows and releases that water in the dry season to meet water demand. This pattern is most striking during dry years like 2015, when the combination of altered river flow and high temperature led to high mortality of salmon eggs and juveniles (Figure 2).

Dams also block salmon from moving upstream to historic spawning habitat. Construction of Nimbus Dam in the early 1950s reduced salmon habitat from 125 to 23 miles, restricting salmon to the hot valley floor. Once salmon are forced to spawn in the hotter, lower reaches of the river, the dams are the only tools available to manage temperature conditions by releasing water to cool the river enough to allow fish to spawn and not kill eggs while they're developing.

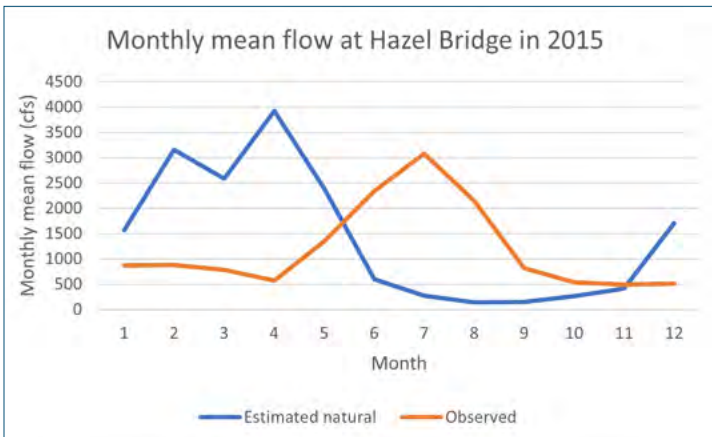


Figure 2. Estimated natural and observed monthly flow in the American River downstream from the Hazel Bridge in 2015, a critically dry year. Water management captured natural winter and spring flows, releasing the water during the summer for human use. This “inverted” hydrograph is common in very dry years and does not support ecological functions. Very dry years are expected to become more common with climate change. Source: rivers.codefornature.org/#/map.

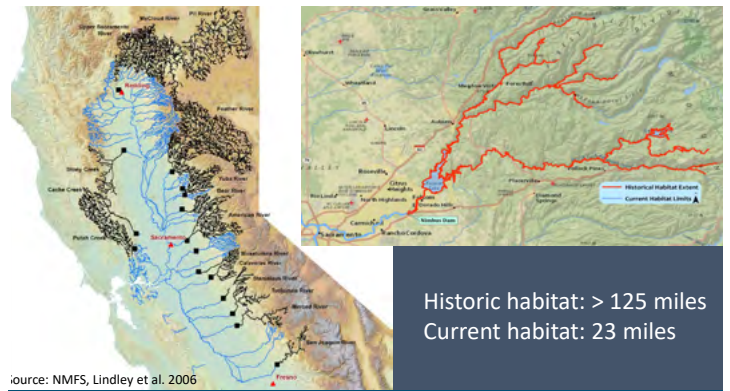


Figure 3. Salmon habitat has been blocked by dams across the Central Valley. For the American River, salmon habitat was reduced from 125 miles to 23 miles with the construction of Folsom and Nimbus dams. Salmon must now spawn on the hot valley floor, requiring more and colder water than if they could access historical habitat.

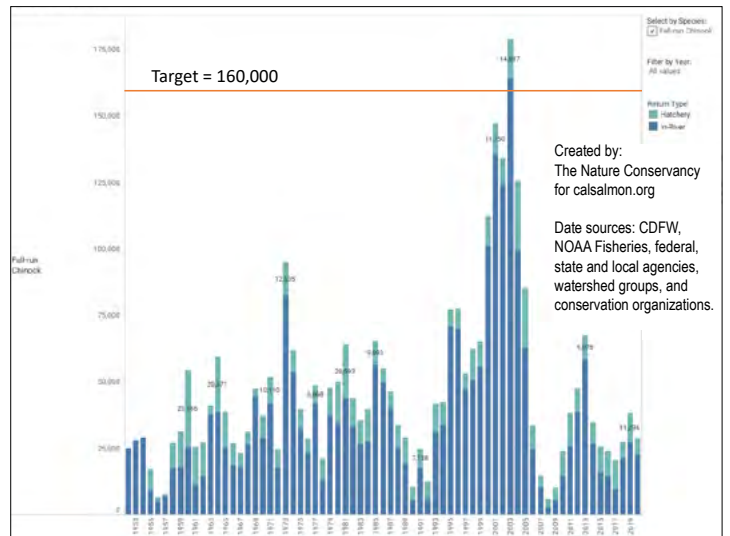


Figure 4. Salmon returns to the river from 1953-2020. Dark blue bars represent natural (in-river) production and light blue represents hatchery production. The population target for the American River is 160,000 for natural (in-river) production, as an average across years.



Ultimately, we still have a lot of work to do if we want to manage the American River to support salmon into the future, but the river provides a good model for collaborative solutions. Entities such as the Water Forum invest in collaboration and a suite of management actions, such as habitat restoration, that support managed river flow and allow for increased reproduction and survival of salmon and steelhead. The future of the American River depends on people in our community feeling connected to the health of the river, its salmon and other native species, and the refuge it can provide by offering access to nature. Climate change increases the challenge of managing our river to meet the needs of people and nature. However, river management that is designed to support the needs of freshwater biodiversity as well as the needs of our communities will give us the most resilient outcomes for the future.

Julie Zimmerman, Ph.D., is Director of Freshwater Science at The Nature Conservancy in California.



Figure 5. Chinook salmon. Photo by Thomas Dunklin.

Snapshots from NatureFest 2023

Effie Yeaw Nature Center's annual NatureFest event on Sunday, October 8 was a great success. Over 1000 people converged at the event to learn about nature, animals, and protecting our environment. There were guided nature walks, exhibits, and demonstrations of the Nature Center's own Animal Ambassadors as well as exotic animals from Wild Things and amazing rattlesnake acrobats from Save the Snakes. Almost 50 organizations focused on wildlife preservation, environmental protection, indigenous crafts, and more set up booths to share their knowledge. The photos below by Kimberly Steinmann capture some special moments.



A Wildlife Camera Trap Study at Effie Yeaw

By Alyssa St. John

Wildlife behavior is a common research topic in conservation studies. However, the relationship between wildlife behavior and human disturbance, especially in protected areas, has been poorly investigated. The few studies available have suggested that wildlife may respond to human disturbance events with avoidance behaviors, habituation, and physiological changes.

I decided to explore this question further for my Masters of Natural Resources degree at Oregon State University. My project had two aims. The first was to identify possible correlations between wildlife vigilance, tolerance, and human disturbance in protected wildlife areas. The second aim was to serve as an introductory study for a larger-scale camera trap study.

To understand these relationships, I placed three camera traps at protected areas and unprotected areas of various human disturbance levels in my study sites in Fair Oaks and Carmichael, California. Two camera traps were located within Effie Yeaw Nature Study Area, and one camera trap was located at Bannister Pond in Sacramento Bar Park. The locations were chosen based on foot traffic (high or low) and existing wildlife protections such as not allowing dogs or bikes. The camera observations were made between May and August 2022.

A total of 182 individual mammals were observed by the camera located at the Nature Study Pond along with 60 bird observations and 1 reptile observation. There was a total of 50 mammal observations by the camera located along the Meadow Trail, along with 16 bird observations. The most

common wildlife behaviors observed at the Nature Study Pond camera were walking, grazing, and hunting. Approximately 32% of the total recorded hours of wildlife behavior were vigilant behaviors indicating that the animal is surveying its environment for potential threats. Comparatively, the most common wildlife behaviors observed at the Meadow Trail camera were grazing, walking, and running. Vigilant behaviors made up approximately 13% of the wildlife behavior time recorded at this less disturbed location. California mule deer, coyote, brush rabbits, and red-shouldered hawks were the most common species observed.

My results show a possible correlation between time allocation for vigilance and human disturbance, as well as a possible correlation between predator and prey animals and vigilance time allocation. From a management perspective, this introductory study has highlighted areas of wildlife protection that should be prioritized to avoid changes to fitness and population viability; the study also points to the need for more extensive, larger-scale investigation.

Alyssa St. John is currently an Animal Care Assistant at EYNC. She graduated with a B.S. in Animal Science from UC Davis and then went on to study wildlife management at Oregon State University. She graduated from Oregon State with a Masters in Natural Resources in 2022, also obtaining a certification in Wildlife Management. Her research focus revolves around wildlife behavior among various animal species. She is most passionate about wildlife behavior and genetics and hopes to make a career out of studying population genetics of threatened and endangered wildlife populations. The photos below were all taken as part of her study with wildlife trap cameras.



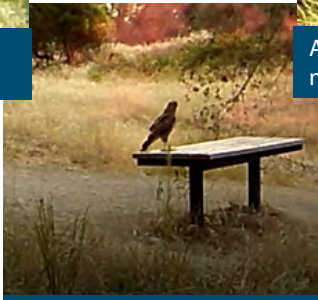
Red-shouldered hawk hunting.



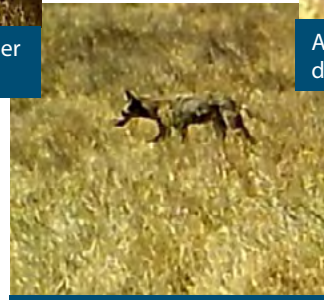
A mule deer mother and her new baby.



A California brush rabbit dashes away.



A red-shouldered hawk on the bench at the pond.



A coyote wanders through the meadow.



By EYNC Naturalist Kristen Angelini

Many people are aware that some warm-blooded mammals such as bears and bats will go into hibernation to survive cold winters. This process is important when weather conditions result in a smaller food supply and helps animals conserve energy when it is cold.

However, mammals are not the only critters that may experience a winter dormancy. Many cold-blooded animals such as reptiles go into a hibernation-like state called brumation when the weather is cold. During both hibernation and brumation an animal's activity, body temperature, heart rate, and respiratory rate drop. But warm-blooded and cold-blooded animals prepare for their winter dormancy periods differently. Prior to hibernation, mammals will feast to fill their stomachs and build up fat and then slowly digest the food for the duration of their slumber. In contrast, reptiles usually fast for weeks before finding a cozy underground spot and enter brumation with an empty stomach. This is because reptiles cannot digest food during brumation and any food left in their digestive tract will rot and could become fatal.

Another difference between hibernation and brumation is that hibernating animals don't move much during their long dormancy. Brumating animals wake up a few times during winter, perhaps once a month, and crawl out of their underground overwintering spots to hydrate. They do not eat at this time. After drinking or soaking up water, they will return underground to resume their brumation.

Whether brumation or hibernation, these cold weather survival strategies are fascinating adaptations that many animals have evolved to survive harsh conditions. And brumation is the reason you will rarely see snakes on the trails at Effie Yeaw Nature Center (EYNC) between December and February.

Kristen Angelini has been a Naturalist at EYNC since 2018. Kristen has always loved animals. She grew up in a household packed with different species—not just dogs and cats but reptiles, amphibians, fish, and all kinds of invertebrates. She started out as a preschool teacher but decided to see if she could pursue her love of animals as a career and landed her job at Effie Yeaw. She says it is a dream job. She loves teaching children and sharing her passion for animals. Asked about her favorite animals, Kristen pauses. It's a difficult choice. She really likes dinosaurs. Around the Nature Center she is known for her interest in all kinds of insects, spiders and other invertebrates. She looks after EYNC's range of invertebrate Animal Ambassadors including walking sticks, cockroaches, termites, beetles, millipedes, scorpions, and spiders.



EYNC Naturalist Kristen Angelini holds Petey, a California kingsnake. The EYNC snakes living in captivity are kept warm all winter and do not brumate.



EYNC's resident pond turtle, Clem, digs a hole every year in a special soil-filled box to brumate in a cool place, usually from November through February. He wakes up monthly for a soak and drink of water and then goes back underground.



Welcome Einstein!

By Carrie Sessarego

Our newest non-releasable Animal Ambassador, Einstein, was welcomed into a new enclosure with a ribbon-cutting ceremony on August 27 at the Nature Center. Einstein is a Mojave Desert tortoise (*Gopherus agassizii*), also known as Agassiz's desert tortoise.

Einstein came to us by way of Dr. Lisa Tell, a veterinarian at the University of California Davis School of Veterinary Medicine Teaching Hospital. She thought that his gregarious temperament would make him a natural fit for Effie Yeaw Nature Center. We agreed, but there was one problem – we didn't have any place to keep him.

We reached out to the Rotary Club of Carmichael, who partnered with the Rotary Club of Arden-Arcade to fund, design, and build a beautiful outdoor enclosure for Einstein just behind the back porch of the Nature Center. Special thanks to Berco Redwood for assisting with materials, Perfect-It Powder Coating for treating the enclosure cover so it will remain safe from the elements, and the Boy Scouts of America Troop 328 for clearing the space for installation.

Einstein is an unusual tortoise in that he LOVES interacting with people. Before his enclosure was ready, Einstein spent



Einstein, the Nature Center's Mojave Desert tortoise.

time roaming our office, following staff from cubicle to cubicle. When he wanted attention, he would stand on our feet until we scratched his head and shell to his satisfaction! He eats grasses, dandelion greens, and native desert plants, and adores getting banana as a special treat. While living at Effie Yeaw Nature Center, he will be getting daily enrichment and affection from Animal Care staff.

At 47 years old, Einstein is a middle-aged tortoise. In the wild, these animals can live for about 50 years, but in captivity, when given proper care, they can live to be over 80 years old. Mojave Desert tortoises brumate (a process similar to hibernation) from around late October through February and again during the hottest weeks of summer.

We hope that the public will enjoy meeting our new Animal Ambassador, but be aware that he will be brumating and out-of-sight until spring returns in March.

Carrie Sessarego is a Development Associate at Effie Yeaw Nature Center. Photos by Susan Maxwell Skinner.



Tortoise Einstein takes part in a ribbon cutting at the reptile's new habitat. Rotarians are Greg Cotta (left) Richard Gore and Steve Turner. Effie Yeaw staffers are Renee Covey (with tortoise) and Rachael Greve. Young visitors are Cameron (left) and Owen Love.



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- Zima Creason
- Tom Currier
- Billy Curtiss
- Gayle & Daniel Dameron
- Gretchen Dariotis
- Michael Darnell
- Sue Darst
- Kathy Davalos
- Dwight & Carole Davenport
- Nita Davidson
- William Davis
- Craig De Martini
- Jackie DeLu & Michael Covey
- Jeremy DeMartini
- Mirlita Dennis
- Ann Doersch & Stephanie Monzon
- Michael Donnoe
- John & Marlys Donohue
- Lily Douglas
- Krystin & David Dozier
- Colleen & Rich Draffin
- Beth & Joel Dubois
- Danielle Dykes
- Kelly Dziuba
- Aria East
- Dennis & Terese Eckhart – in memory of Liz Downs
- Tim Ellingson
- Nathan Fairman & Katherine Elliot
- Anna Farnsworth
- Peter & Christine Fickenscher
- Adele Fife
- Carolyn Fisher
- Janice Fleming
- Mary Lou Flint
- Robert Ford
- Rebecca Frederickson
- Larry Fritz
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- Corrie Galvan
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- Barbara Gardner
- Sarah Gardner-Kerss
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- Wanda & Mark Guess
- Aditya Gune
- Dona Hall
- Gary & Mildred Hanson
- Linda Hatch
- Elizabeth Henry
- Teri Hofstetter
- Jesse & Megan Holdaway
- Diane Holland- in honor of Teresa Krahl
- Rich & Mary Howard
- Elaine Hujambojoie
- A Hung
- Jeffrey Hunting
- Gregg Hutchison & Bev Lewis
- Marti Ikehara
- Marlene Ishihara
- Deborah Jane
- Johnny Javaniford
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- Johnson Controls
- Richard Jones
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- Linda Rose Jones
- Roxalie Jones
- Jan Jones
- Teresa Kahl
- Virginia & Eli Kaser
- Mark Kates
- Simran Kaur
- Herbert & Elizabeth Kelly
- Ann Kempees
- Peggy & Bruce Kennedy – in memory of Dick Laursen
- Peggy & Bruce Kennedy – in memory of Bernard Cody, Mary Jane Barclay
- Michelle Kerr
- Saskia Kim
- Jong Choon Kim
- Jane Kirkland
- Kit Kirkpatrick
- Sheila Kleats Adams
- Larry & Donna Klink
- Justin and Stephanie Kohl
- Ross Kolesnikov
- Suzanne Krale
- Michael Kwong
- Greta Lacin
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- Karon Larson
- Jennifer Larson
- Janet Lavenda
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- Christina Lewis
- Norm Leyte
- Barbara & Chris Lezon
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- Jason Lindo
- Thomas Louis
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- Michael Lozano
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- Emily Moulton
- Mark Nemmers
- M.A. Nunes
- Heidi Nurse
- Mallory O'Connor
- Rose O'Grady
- Kai Parks
- Carol Passovoy
- Gerald & Barbara Pauly
- Jill & Michael Pease
- Gwen Pelletier
- Anka Petricevic
- Ben Poh & Yoon Chi
- Point West Rotary Club
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- Marsha Prillwitz
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- Karin & Eric Richardson
- Andra Rieden



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- Randy & Cheryl Roesser
- Rogaski Family
- Cindy & Tom Rogers
- Ryan Rose
- Letitia Ruiz
- Chad Russell
- Sacramento Audubon Society
- Sacramento Natural Foods Co-op
- Sacramento Water Forum
- Lorraine Saiz
- Ted Samson
- Amy San
- Caroline Sanderson
- Mary Ann Santiago
- Save the American River Assoc.
- Samuel & Mary Ellen Scarlett
- Renee Schaffer
- Linden & Carrie Sessarego
- Katharine Severson
- Christopher Shields
- Patricia Simms
- Kip & Illa Skidmore
- Felix & Elizabeth Smith – in memory of Dick Laursen
- Jennifer Smith
- SMUD
- Jean Snuggs
- Susan Solarz & Bruce Notareus
- Sharry Solomon – in memory of Dubois
- William & Anne Spaller
- Anne Spies
- Norma Springsteen
- St. Francis of Assisi Elementary School
- Carrie Stafford
- Jane Steele – in memory of Jo & George Smith
- Expendable Fund of the SRCF
- Steiner Family Foundation
- Morna Stephens
- Tricia Stinson
- Sarah Stoltz & Gregory Herrera
- Patrick Sutton
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- Harvey & Jane Swenson
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- Mary Ward
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- Ella & Roger Warloe
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- Richard Weisberg
- Blaine Welker
- Megan Welsh
- Lori White
- Jasmine Kaylee Wild
- Mary Wilkinson – In memory of Dick Laursen
- Liz Williamson
- Justin Willsey
- Mary Jess Wilson
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- Lucinda Woodward
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