

Conservation in Action

Fall 2024



Page 4 | Connecting with nature
and each other after Conservation
Science Intensive →

Carlos Porrata

Issue
71

Page 6

Watching for signs of survival
among North Bay's youngest
mountain lions

Page 8

When is the right time to use good
fire? Making use of seasonal
sweet spots for peak benefit

Page 10

Network of air sensors aim to
improve community health in
the Alexander Valley

What it takes to be resilient in a complex and challenging world

It takes **collaboration** and together with our many friends and partners, Audubon Canyon Ranch is making this world a better place, step by step, kid by kid, burn by burn, and bird by bird. It takes **gratitude** and it feels good to acknowledge our collaborative progress, makes me proud to work at Audubon Canyon Ranch, and thankful for your support.

It takes **time** and we are aware that progress can go slow and that it is not linear. We simultaneously feel a sense of urgency and have the patience to play the long game — and this organizational mindset is what makes us effective.

It takes living our **values** and hence to be successful and stay healthy along the way, we are grounding ourselves in our values of heart and boldness to achieve impact towards our vision of a world where the diversity of life thrives and nature benefits all. We use these values for decisions big and small, and they have become powerful guides, especially in complex and challenging times.

It takes **people who care**, so thank you for supporting Audubon Canyon Ranch.

Sincerely,



Tom Gardali, CEO

egret.org

Connect more deeply:
Sign up for hikes,
tours, and volunteer
opportunities!

[Egret.org/event-calendar](https://egret.org/event-calendar) →





A Cooper's Hawk surveys the changed conditions after a prescribed burn to restore coastal prairie at Cypress Grove Preserve. Photo: by Nils Warnock.

Empowered and Inclusive Communities: Activated Youth

Finding purpose among the watersheds of West Marin and Petaluma

Since attending Audubon Canyon Ranch's week-long Conservation Science Intensive program this past summer, Phoenix Strasen, who uses the pronouns she or they, has been busy at Casa Grande High School in Petaluma. Their school hosts a state-of-the-art conservation hatchery to raise threatened steelhead trout to help restore populations of native fish within the Petaluma Watershed.

Late last spring, the class collected young fish from Adobe Creek, a tributary of the Petaluma River, to rear in tanks at school. Students take leadership roles in feeding and caring for the fish with the hope of releasing healthy fish back into the local stream the following year.

Phoenix has been closely involved with caring for the fish while in the hatchery and will soon start making trips to the Petaluma River to catch and collect data from salmon.

Next up, a different kind of data collection

Phoenix was also recently selected for a paid internship with Climate Action Pathways for Schools (CAPS), a Bay Area non-profit that works with schools to advance climate literacy and prepare students for climate-smart careers. Phoenix will help to develop a climate action plan for Petaluma City Schools.

The first step is auditing the schools' climate footprint, Phoenix explained. "We will be finding information about how much energy the schools are using; for

example, what types of light bulbs we have, or how often the air conditioning runs, and quantifying the data," they said. "Then we will develop a plan to reduce emissions and overall energy usage in our district."

"It's exciting. This is my first real paid job!"

Pursuing further education in environmental science

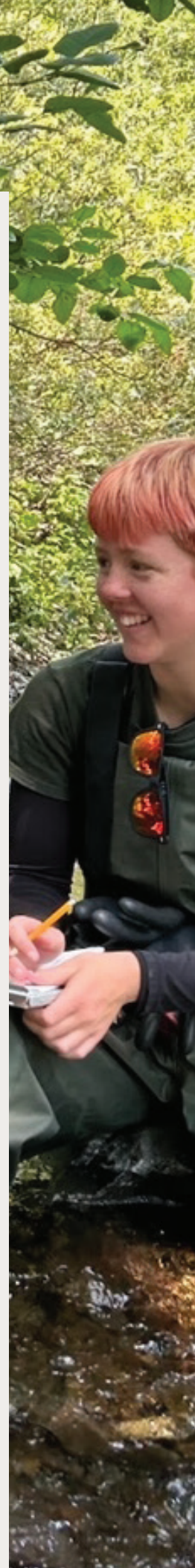
We asked Phoenix what longer-term goals they have, "University of Washington, Oregon State, and Cal Poly SLO are my top three schools. They all have big environmental sciences programs. I am interested in anything relating to conservation ecology. It doesn't have to be fish, any field interests me: birds, trees, anything."

"Our goal in offering the Conservation Science Intensive is to support pathways for youth with a passion for nature into jobs and careers in conservation," said Director of Education Catie Clune, who reached out to Phoenix in the fall. "It was a joy to learn more about their growing interest in conservation and current work to help steward the Petaluma Watershed."

Learn more about the fish hatchery managed by United Anglers of Casa Grande at uacg.org →

Learn more about Climate Action Pathways for Schools (CAPS) at climateactionpathways.org →

At right: Phoenix Strasen collecting data from Adobe Creek in eastern Petaluma.





Connecting with nature and with each other after Conservation Science Intensive

"Going to Conservation Science Intensive really helped to change my perspective on the world. Surrounded by like-minded people really helped me to break out of my shell and realize how much difference I can make in the world. Since the program has ended, I have joined my school's Green Club and now want to study Environmental Science in college."

– Ijeoma Egwim, Maryland

Clockwise from top: Ijeoma Egwim (left) reconnected with another CSI participant, Ali Pesina-Garcia from Idaho (right), who was on a trip with her local mayor to Washington, D.C.; tidepooling at Duxbury Reef in Bolinas; taking in the flora and fauna of a redwood grove at Martin Griffin Preserve in Stinson Beach.



Watching for signs of survival among North Bay’s youngest mountain lions

Readers of our monthly online newsletter will recall the photo of a fluffy, dewy-eyed mountain lion kitten discovered mewling vociferously in a west Sonoma County den in August by Dr. Quinton Martins, who tracks and collars North Bay mountain lions for the Living with Lions study. The weeks-old kitten of collared mountain lion P39 was thought to be a singleton, and the eleventh kitten Martins has monitored while tracking the movements of the 5-year-old cat since 2022.

But that wasn’t the end of the story. In early October, a local resident’s trail camera picked up P39 moving through the area with not just one but at least three kittens!

Mountain lions have a 50/50 chance of surviving past the age of two – in the North Bay, the numbers are even lower

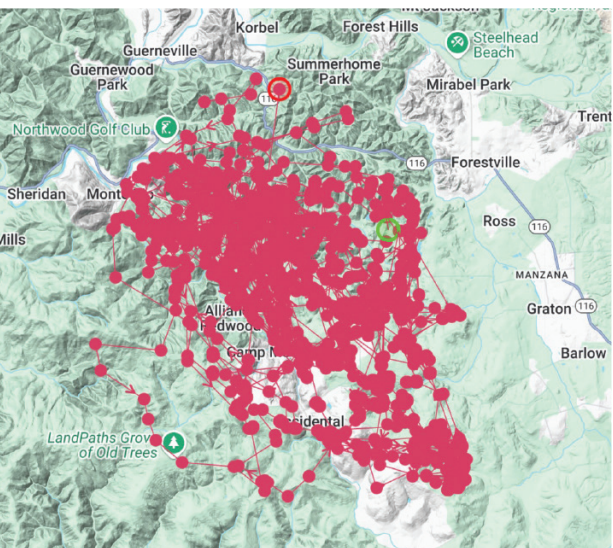
Spotting the trio of kittens is especially hopeful news because none of P39’s prior offspring have survived to dispersal age, roughly 18 months old. Of the previous

litters, four of the deaths were attributed to predators and illness. The new litter gives us a chance to discover additional factors that may be contributing to survival rates.

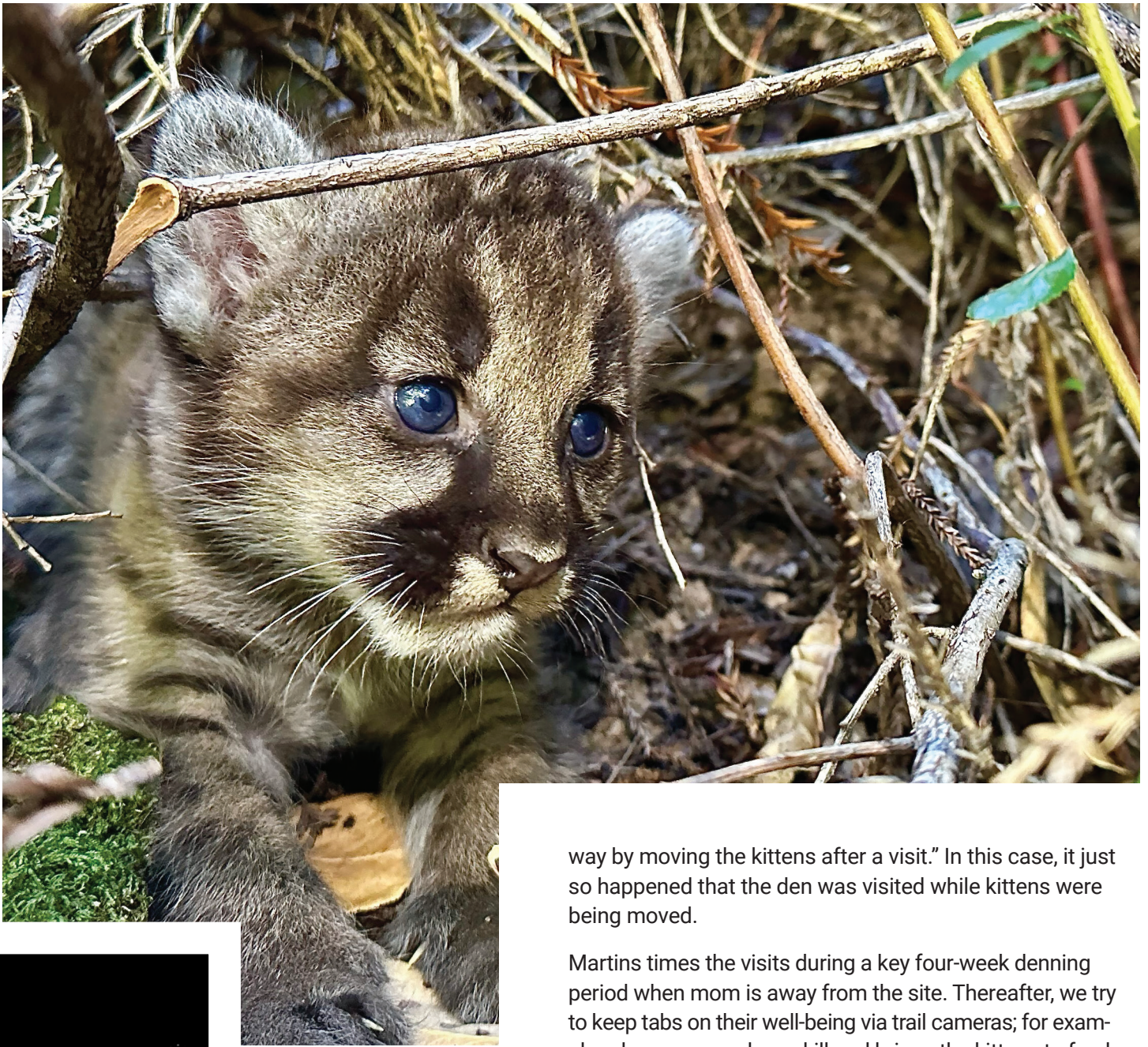
GPS-collared female lions provide otherwise unattainable insights for the study

How could it be that P39 now has three kittens, when they weren’t seen in the den in August? Martins wondered that as well. He went back to the August data and concluded that when he visited the den, P39 was in the process of moving the other kittens to a new site. The single kitten vocalizing in the den was an additional clue as the kitten was likely expecting mama back at any moment.

“Den visits are incredibly important to understand what the survival rates and threats to mountain lions in our region are,” said Martins. “In our study we do not handle the kittens, and we have sufficient evidence to demonstrate that females do not respond in a negative



Left: GPS-recorded movements of female mountain lion P39 over a 12-month span (Nov. 2023–Nov. 2024) in west Sonoma County. Center: By October 2024, P39’s three kittens are old enough to travel with mom and are picked up by a resident’s trail camera. Right: P39’s kitten shares a meal with mom near Taylor Mountain Regional Park, Santa Rosa. All images courtesy Quinton Martins / True Wild.



Above: Just weeks old, P39's tiny kitten awaits mom's return to the den, August 2024.

way by moving the kittens after a visit." In this case, it just so happened that the den was visited while kittens were being moved.

Martins times the visits during a key four-week denning period when mom is away from the site. Thereafter, we try to keep tabs on their well-being via trail cameras; for example, when mom makes a kill and brings the kittens to feed.

Region's woodlands shelter and nourish the young

Across the county, another mountain lion, P33, is caring for her single kitten near Taylor Mountain Regional Park on the outskirts of Santa Rosa. Noticing the tell-tale signs of prey being cached, Martins placed cameras at the site and was able to capture footage of the pair feeding on a black-tailed deer. This kitten is also in a high-stakes game of survival as its father, P13, recently died, putting it at risk of infanticide by a new male lion intent on dominating the territory.

Watching these young lives unfold surely tugs at the heart-strings, but their stories and data also contribute to greater understanding of the health of the local lion population.

Making use of seasonal sweet spots for prescribed burning

by Sasha Berleman, former Director of Fire Forward, and Erika Lutz, Prescribed Fire Information Coordinator

“When is the right time to burn?” – a question we hear often. The Bay Area’s rich diversity of ecosystems – oak woodlands, redwood and evergreen forests, coastal and inland grasslands – benefit most from good fire when the timing is right. Reducing wildfire risk is an added benefit anytime of time of the year.

FALL

Oak woodlands (October – November)

Oak ecosystems foster tremendous biodiversity and are a hallmark of California landscapes. Oaks are dependent on frequent, low-intensity fire, and in its absence, succumb to encroachment by other tree species, pests wipe out acorn crops, and health declines precipitously to pathogens and stress from lack of available water and light.

Benefits of this treatment timing include:

- Reduce the number of acorn pests, making acorns available to germinate into future trees or serve as key resource for wildlife and people
- Open the understory for new growth

WINTER

Redwood and mixed evergreen forests (November – January)

One important window for burning in redwood and mixed evergreen forests is the winter rainy season during periods with at least 2-3 weeks of drying between rains. The timing allows for moderation of fire intensity without risking damage to the forest canopy. Surface layers are dry enough to burn while the lower layers still hold enough moisture to avoid being consumed.

Benefits of this treatment timing include:

- Avoid bird nesting season
- Reduce heavy fuels to minimize risk of catastrophic wildfire



Left: An Acorn Woodpecker sorts and stores acorns in an oak woodland, where good fire can help improve crop quality. Photo: Flickr/Lorraine B. Below: A winter-season prescribed burn in a mixed evergreen forest in coastal Sonoma County. Photo: Sashwa Burrous



Prescribed fire managers factor in air temperature, wind, humidity, and more before issuing a green light for good fire. See the “Goldilocks” prescription at egret.org/blog

Right: A coastal grassland gains more ground after a prescribed fire. Photo: Adahlia Cole



SPRING

Critical wildfire threat (January – April)

In the North Bay, mid-January to mid-April is wildflower and songbird nesting season, when we limit the use of good fire to areas where winter rains have been constant and wildfire threat is so high that reducing fuels prior to wildfire season is worthwhile.

SUMMER

Invasive species reduction (May – July)

Medusahead is a nonnative winter annual grass with bristly seed heads. Because of its high silica content, livestock avoid grazing medusahead. Thatch accumulation of this invasive weed does not decompose, leading to dense fuel loads. Prescribed burning is 99.6% effective at reducing medusahead by killing next year's seeds when seedheads are ripe and green.

Benefits of treatment in May – June include:

- Reduce highly flammable invasive species
- Improve biodiversity in grasslands
- Improve forage for animals

Yellow starthistle, a highly invasive and noxious weed, forms dense stands that outcompete native plants. Sharp long spines on flowerheads degrade wildlife habitat and livestock grazing. The plant can cause neurological disorder when eaten, especially in horses. Yellow starthistle must be burned when the plant is bolting.

Benefits of treatment in June – July include:

- Improve wildlife habitat, working lands, and recreational areas
- Reduce threat to livestock and grazing animals

Coastal prairies (August – October)

Without disturbance, coyote brush and young Douglas fir take over California's native prairies, the most species-rich grassland in North America, also one of the most threatened. Today, less than one percent of undisturbed coastal prairie remains. Burning during this time allows grass to be dry enough to carry fire and live fuel moisture in coyote brush low enough that it can burn.

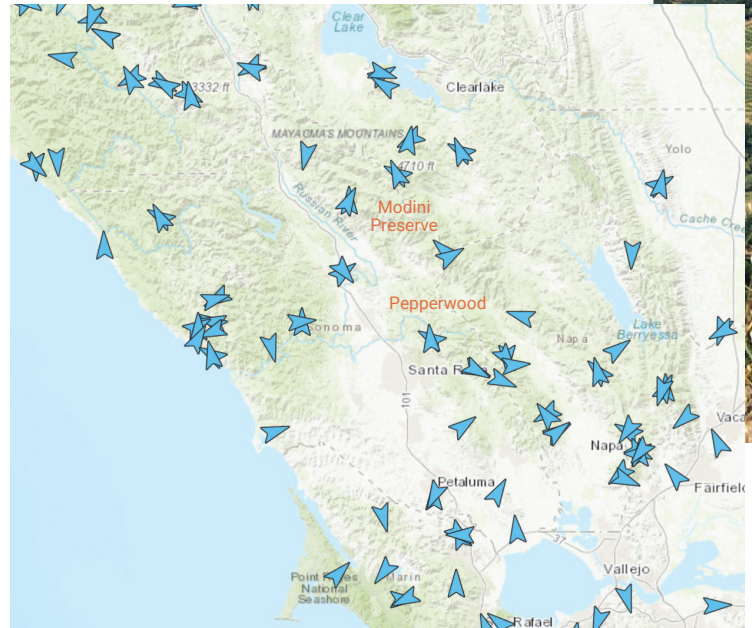
Benefits of this treatment timing:

- Reduce coyote brush encroachment
- Rejuvenate native grasses



Network of air quality and wildfire sensors aim to improve community health and preparedness

Adapted from Pepperwood Field Notes by Wendy Coy, Director of Communications



Left: A Clarity Node air quality sensor (bottom) and a N5 sensor for wildfire detection (top) at Modini Preserve. Photo: Ryan Ferrell. Right: Arrows show locations and viewscape for the ALERTCalifornia network, which more than doubled its number of camera sensors between 2019 and 2023.

When wildfire and its related smoke and ash occur, it can upend routines and threaten our sense of wellbeing. If you work in an outdoor occupation, wildfire and poor air quality can pose additional health risks and economic disruptions. Knowing in real-time how air quality conditions in the field are changing can mean the difference between being prepared or vulnerable.

Until now most air quality sensors in our region have been limited to areas with internet connectivity and line power. Under a new pilot project being launched by Pepperwood, with funding from the EPA, researchers have installed 20 plus sensors throughout the Alexander Valley. These new sensors are solar-powered and connected over cellular, allowing the units to be sited in previously unmonitored areas such as vineyards, wildlands, and many of the outdoor spaces where members of our community work and recreate. Audubon Canyon Ranch's Modini Preserve is one such site.

Improving early detection systems

Several sites hosting fire cameras on the state-wide ALERTCalifornia network also now host the new sensors. While the ALERTCalifornia network works well for line-of-sight monitoring of developing wildfires, what's been missing is an automated system for notifying affected communities of changes in air quality.

"The installation at Modini Preserve is a critical addition to this network as it represents a combination of both an N5 Sensor for wildfire detection and a Clarity Node for air quality monitoring," reports Ryan Ferrell, sentinel site manager with Pepperwood. The sensor's location straddles a ridge between the Sausal and McDonnell Creek drainages and provides coverage for the often drier east side of the Alexander Valley. "This is exciting because this particular installation sits between our forested uplands, where wildfire typically occurs, and the Alexander Valley below, where vulnerable community



The Alexander Valley seen from Modini Preserve. Photo: Wendy Coy

members often live and work,” adds Ferrell.

Making the science accessible and meaningful to people who live and work in the area

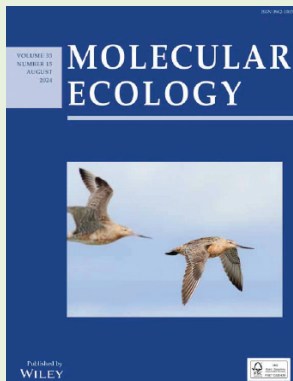
Key to the success of this pilot program, Pepperwood and its partners are working on practical solutions to circulate real-time information to community members. Ferrell is hopeful that the data will allow individuals to make informed decisions about their exposure to smoke and other airborne pollutants.

Additional partners in this effort include the Universities Space Research Association, Soluna Outreach Solutions, Bay Area Environmental Research Institute, Communities Organized to Prepare for Emergencies, North Bay Jobs with Justice, Northern Sonoma County Air Pollution Control District, and Nuestra Comunidad.

Staff science: testing, modeling, and sharing insights

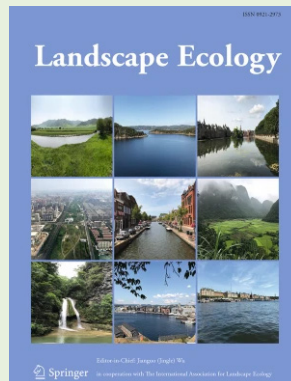
Audubon Canyon Ranch staff members have recently authored and contributed to journal articles ranging on topics from factors influencing the nesting abundance of North Bay herons and egrets to using AI to predict preferred habitat across the country where mountain lions are likely to thrive.

Visit egret.org/publications to read the articles and recommended actions to boost conservation →



Molecular Ecology 33:e17452 | High dispersal ability versus migratory traditions: Fine-scale population structure and post-glacial colonisation in bar-tailed godwits

Landscape Ecology 39:106 | Machine learning allows for large-scale habitat prediction of a wide-ranging carnivore across diverse ecoregions



Waterbirds 46 | Do Ocean Productivity and Freshwater Inflow Affect Decadal Trends of Wintering Waterbirds at a California Estuary?

San Francisco Estuary and Waterbird Science 22:3 | Status and Trends of Breeding Ardeidae in the San Francisco Bay Region





Audubon Canyon Ranch

4900 Shoreline Highway 1
Stinson Beach, CA 94970
egret.org • 415-868-9244

NONPROFIT
U.S. POSTAGE
PAID
PETALUMA, CA
PERMIT NO. 201



Resilient Lands & Waters: Modini Preserve

Diverse habitats of the Mayacamas provide lifeline for wildlife

The 3,125-acre Modini Preserve is core to 12,000 acres of contiguous habitat in the Mayacamas Mountains that are protected under Sonoma County Ag + Open Space conservation easements. The lands are rich in wildlife, plants and a diversity of habitats and water resources.

"I think it's really hopeful that we live in a place where we are still able to have a top predator like a mountain lion living along side us – they play a really important role in the health of the ecosystem."

— Liz Martins, School Programs Manager

Watch the video at sonomaopenspace.org/nature-wildlife →



Gifts with lasting impact

Looking for a unique gift for a fellow nature enthusiast?

With the holiday season on the horizon, consider a gift of annual membership with Audubon Canyon Ranch. Your new member will receive their very own subscription to *Bay Nature* magazine, the next two editions of this publication, as well as a welcome packet from us.

See all benefits at egret.org/membership →

Conservation in Action is published twice yearly as a benefit to our members, supporters, and volunteers.

Managing Editor Wendy Coy
Edited by Anne Mitchell
Printed by Almaden Printing

© Audubon Canyon Ranch
2024 egret.org