



THE ACORN

American River Natural History Association Members' Magazine
Winter 2018-2019

What's Not to Like About Lichen? • Oak Galls • Monarch Butterflies
Holiday Sale

from the president

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And the seasons, they go round and round... (thank you Joni Mitchell). It is winter again, and I am in my third year of being ARNHA president. I look back on past messages, partially so I don't repeat myself, and I keep commenting on changes and exciting things coming down the line. It is no different in this message. ARNHA and the Effie Yeaw Nature Center are dynamic; there is always something new.

I enjoyed seeing many of you at the ARNHA Annual Meeting. It was a beautiful evening, good food and great people. Our next big event is the Holiday Sale on December 1. I encourage everyone to come by to do your holiday shopping. Unique items that speak to your love of nature will be there for purchase. Plus, I always like to take a walk in the Nature Study Area as a part of my holiday kick off.

The staff and volunteers continue to improve the programs that we offer, building a foundation of young stewards of nature. One new program is the Nature Plus program, which takes students a little deeper into the study of natural systems in a hands-on interactive way. I recently had a conversation with a docent as she was getting familiar with the materials, and she shared that she must keep on her toes to learn this new program. Kudos to all of our docents who educate themselves so that they can educate others.

We continue to work closely with our county parks partners in planning improvements and upgrades to our facilities. We have learned how involved this project is, with many moving parts involving many agencies. One part that I can assure you will be crucial is stakeholder input. As our concepts become more realistic, we will be openly listening to the ideas and concerns of all who will benefit from this project.

Our Winter Appeal should be arriving in your mailboxes and inboxes as you read this. Please include ARNHA and Effie Yeaw Nature Center in your end-of-year giving plans. Everything this amazing place does is funded through your generosity. Without your support, we would not be able to provide nature education and experiences at little or no cost to participants. Your donations insure that we can achieve our vision to inspire and educate current and future generations to be informed stewards of the natural environment.



Come forth into the light of things, let nature be your teacher.
William Wordsworth



Photo by Kari Bauer

Cover Photo: Sunburst Lichen and Oak Moss Lichen, with Green Shield Lichen and Golden-eye Lichen at Cosumnes River Preserve in Galt, California, on January 14, 2018. **Camera:** Nikon Coolpix B700, 53.7 mm, f/5.5 at 1/80th of a second. **Photographer:** Mary K. Hanson.

What's Not to Like About Lichen?

by Rachael Cowan

One thing I look forward to every year is watching the Effie Yeaw Nature Study Area grounds morph from a dusty golden dry crunch to a softened moist host for sprouting green grass and emerging mushrooms after the first rain. One organism in particular, which has been present all summer long in a gray dormant state, is revived to its full alien-looking glory at this time and is suddenly noticeable everywhere. Many visitors might mistake this varied and unusual form for moss, but this peculiar life form lacks leaves and stems found in mosses and other bryophytes. With a crusty (*crustose*), leafy (*foliose*) or shrubby (*fruticose*) appearance, lichen can be found on rocks, trees, fallen branches, the ground, or human-made objects such as mailboxes, roofs, and flower pots. Lichen serve as wonderful subjects for investigation and connection to nature on the trails.

So what are lichen exactly? You may have heard the saying, “Alice Algae and Freddy Fungus took a lichen to each other and stuck around.” Sometimes the saying is extended to “I heard recently that their relationship is on the rocks.” While these playful scientific puns are fun for the interpreter, they only scratch the surface of understanding these weird composite organisms. It turns out that lichens are a complex combination of three life kingdoms, as some lichen species are composed of fungi, algae, and cyanobacteria. And like many living things, numerous species of bacteria can be found living on lichen, in general. So now we have to invite Betty Bacteria to the party!

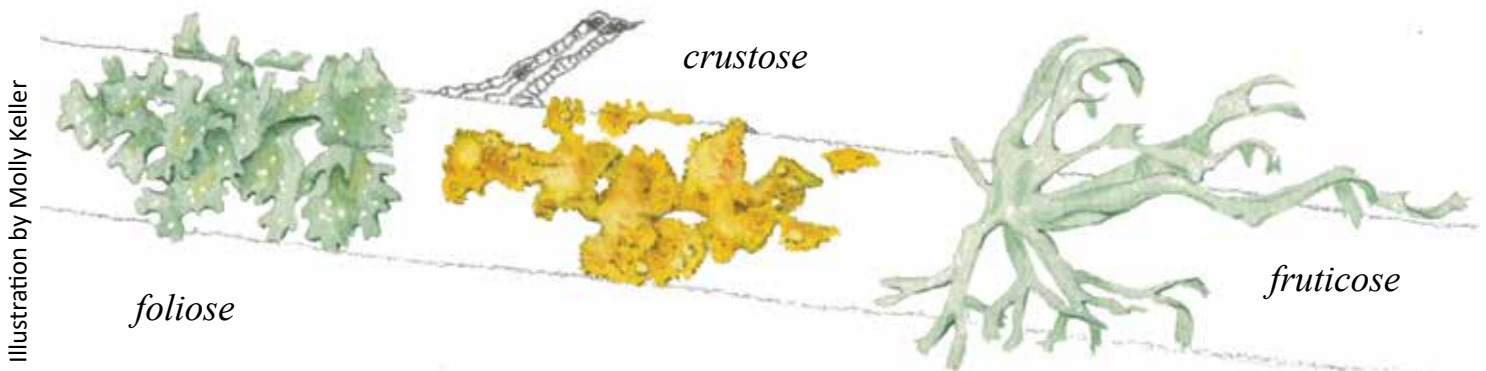
This amazing partnership is described as mutualistic

dust, and particles in water. You can often see the white appearance of the fungal partner by viewing the underside “leaf” of a *foliose* lichen. Scientists recently linked unique chemical compounds found in many lichen to two different types of yeast fungi, one from the sac fungi group (*ascomycetes*), and one from the club fungi group (*basidiomycetes*). Some of these chemicals provide protection from harmful UV rays, and others make the lichen distasteful to herbivorous animals. Other chemical compounds in lichen are being studied for their antibacterial properties and in cancer research.

The photosynthesizing partner, which can be one or two species of algae or cyanobacteria, or both, makes food to sustain growth and survival of all partners and can be observed in the green part of the lichen. Algae can survive without the fungus, but the fungus partner cannot survive without the energy provided by the algae.

Since the mysteries of lichen do not receive the same fanfare as do the mysteries of animals and larger plants, many of us do not notice this organism, or commonly mistake it for a type of moss. Some lichen species even have the word “moss” in their common name, such as Spanish Moss. Furthermore, lichen and moss often reside side by side, or even on top of one another, in a shared niche. So what is the difference between moss and lichen?

We describe moss to our young visitors as a simple plant. In fact, moss is one type of bryophyte, and bryophytes were among the first plants on land. They have a history that began long before dinosaurs roamed the earth, and they



symbiosis, which means all partners in the relationship benefit from each other without harming the others. Most of the lichen’s structure is made of fungus, which provides general protection, or a “home,” for the other partners.

The fungal partner provides the means to attach to a surface and is able to collect water from the air and rain, dew and fog, and absorb mineral nutrients from substrates,

share similar structures with plants, such as chlorophyll and tiny stems, branches, and leaves. However, they are lacking roots, flowers (therefore no seeds), and lignified vascular tissue, which provides a food and water transport system and a rigid structure needed to outgrow the millimeter scale. Moss grows on soil, rock, and trees and can

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attach with rhizoids, which look like tiny roots. The rhizoids are thread-like anchoring structures that don't absorb water or nutrients.

In contrast, lichen do not have stems, branches, or leaves.

Moss and lichen are both examples of epiphytes, which are organisms that attach and grow on plants, but do not tap into the plant host's food and water supply. Many people have wondered if lichen and moss are damaging to trees, as they are often found growing on dead or dying trees. If you think about it, dead trees are a great niche because dead trees have little or no leaves to compete for sunshine needed to photosynthesize. No trees in the forest are harmed by moss or lichen growing on them. Furthermore, even though lichen chemically alters rock surfaces leading to weathering, they are not considered to be decomposers, as rocks are inorganic material. When lichen die, they decompose, and minerals contained within them are released into the soil, which is very beneficial to the ecosystem.

Not only are lichen considered to be an important part of an ecosystem, they are also bio-indicators. The anchored structure will absorb all nutrients from the surrounding atmosphere, with no way to discriminate pollutants



Lichen at Effie Yeaw Nature Center

or means to excrete nutrients. Lichen have varying sensitivities to air pollution, with some that are very sensitive to pollution and elevated nitrogen. While the presence of lichen is an indicator of clean air, the absence should not be taken as a sign that the air is bad. Change in lichen species populations is what scientists track to determine air pollution and climate change. California's state lichen, Lace Lichen (*Ramalina menziesii*), is one of the more sensitive lichen species, due to its high ability to absorb with its filamentous structure. We have been able to locate this species in a few locations in the Nature Study Area.

I encourage you to bring a fresh eye to the trails the next time you visit the Nature Center and venture out for some lichen hikin'. Bring a magnifier to appreciate the unique structures within these fantastic organisms. Lichen are not only mysterious and cool, but they are the longest-lived organisms on earth, and they can be found in every land-based ecosystem on earth, including

deserts and Antarctica. Lichen have been consumed as foods by humans and animals and used as nesting materials, dyes, perfumes, air quality monitoring, and medical and climate research. Scientists are still discovering more about all the roles in the complex lichen relationships.



Photos by Rachael Cowan

Nature Campers examine lichen on a stick at Effie Yeaw Nature Center.

Rachael Cowan is the Education Coordinator at Effie Yeaw Nature Center and a certified UC Naturalist. Originally from Grass Valley, she has a lifelong passion for the natural world and science education.

Molly Keller, a prize-winning watercolor painter in Sacramento, is an active member of the Guild of Natural Science Illustrators and trained in scientific illustration. She is a volunteer at the Effie Yeaw Nature Center, where she designs, illustrates, and oversees production of field guides and other publications with the American River Natural History Association.



To receive a copy of our the 2017-18 Annual Report, email your request to info@SacNatureCenter.net or call us at (916) 489-4918.

Galls on the Valley Oaks of Effie Yeaw

by Mary Louis Flint, Ph.D.

Have you noticed odd, tumorlike growths on our oak trees as you walk the woodland trails? These growths are oak galls, and fall or winter is the perfect time to observe them.

Most oak galls are made by tiny Cynipid wasps that lay their eggs in stems or leaves. Gall growth by Cynipids is induced when hatching gall wasp larvae start to feed and begin to release an auxin-like plant growth hormone. The hormone causes rapid expansion of the tree's tissues into a gall, which provides food, protection and a stable microenvironment for larval development. By fall, the galls and the wasps that induced them have reached their maximum size, matured, changed color, and, in some cases, started to drop to the ground.

Although many species of trees and shrubs host insects that cause galling, oaks have by far the most gall-producing insects associated with them. Over 200 species of insects are known to cause oak galls, each inducing a unique shape. Specific gall makers are generally associated only with one of the three major oak groups (Black, White, Intermediate). Although several gall makers attack Black Oaks such as interior live oak (*Quercus wislizensii*), the most common and visible galls seen at Effie Yeaw occur on Valley Oak (*Quercus lobata*), a White Oak.

The California Gall Wasp, *Andricus quercuscalifornicus*, produces the large, round oak apple galls frequently observed on Valley Oak. These are the biggest insect galls found in the Western United States. The life cycle of this wasp and the galls it produces are illustrated below.

Several other types of galls are common on Valley Oak at Effie Yeaw. These include Red Cone Galls, Spined Turban Galls, Jumping Galls, Yellow Wig Galls, and Flat-topped Honeydew Galls. Examples of these and more information on the California Gall Wasp can be found in the Galls on the

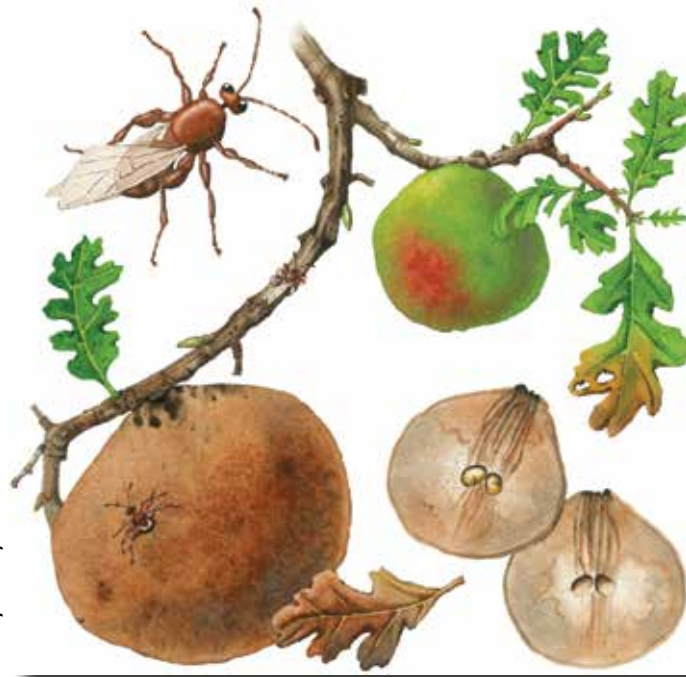


Illustration by Molly Keller

Valley Oaks of Effie Yeaw blog SacNatureCenter.net/visit-us/nature-blog/
Mary Louise Flint, Ph.D. retired after 34 years as an Extension Entomologist with the University of California, Davis. At Davis she focused on managing pests of farms, gardens and landscapes with ecologically sound IPM (integrated pest management) methods, especially beneficial insects, and has written over 100 papers and books on these subjects. As a docent at Effie Yeaw for more than a year, she has been enjoying learning more about the native animals and plants that live in the EYNC Nature Study Area.

New Members July thru September

- Barbara Angelini
- Mark and Lisbeth Armstrong
- F. Thomas Biglione
- Erin Carlson
- Kathleen-Anne Caro
- Laurie Clothier
- Robert Coates
- Bernard Cody
- Alexandra Condon
- Clarissa Cook
- Marie & Kenneth Corey
- Jordan Daligcon
- Ray DeGolia
- Robert Dittman
- Sadie Dunaway
- Carla Erkenbrecher
- Rose Fishler
- Michael Flaningam
- Karen Gary
- Anna Gleghorn
- Aditya Gune
- Ava Imotichey
- Kim Lloyd
- Wendy Lloyd
- Gail Lopes Cunha
- Michele Lozano
- Luliia Lytvynova
- Christina & John Maradik-Symkowick
- Lyndy May
- Sus Mazza
- Pamela Mullick
- Michael O'Hare
- Kharis Olsen
- Sherry Reed
- Julie Spezia
- Susan Stanley
- Alexis Stubbs
- Stephen Tighe
- Linda Vallin
- Emily Vona
- Charlene Wright

Welcome
new members!



Under the Oaks

by Pete the Parkway Coyote

Following a social time with hors d'oeuvres and beverages, ARNHA members relaxed in the Maidu Village for the Annual Meeting and enjoyed Director Torey Byington's presentation on the current happenings and future plans for the Nature Center. Christine Johnson recognized outstanding volunteers and the new Board of Directors was approved. SacNatureCenter.net/arnha/board-of-directors/

Seasonal bare branches showcase our winter birds. Yellow-rumped Warblers and Ruby-crowned Kinglets add splashes of color while sparrows sing cheerful songs. "See how they run!" sings the Golden-crowned Sparrow. Northern Flickers, California Scrub Jays and Wild Turkeys riffle through the carpet of leaf litter, searching for insects, grubs, acorns and whatever edibles they can find. Goldeneye and Bufflehead ducks swim the river and Sharp-shinned Hawks enjoy the sky. Winter is here.



Photos by Kari Bauer

Overnight winds calmed down just before NatureFest on Sunday, October 7, which was a great success this year with over 1,400 participants. Young and old enjoyed live animal presentations, local Native American crafts, nature walks, and other fun and informative environment-oriented activities.



Registration is open for Fall and Winter Nature Camps, which include Coyote Trackers, Aero-Bats, Fish Frenzy, and more. <https://www.sacnaturecenter.net/education/nature-camps/>. These camps are very popular and fill quickly.



Photo by Kari Bauer

Deer and Fawn Storytime is a special monthly program for 3 and 4 year olds, that features a story, a craft, and (time permitting) a resident animal visit. [SacNatureCenter.net/events/storytime/](https://www.sacnaturecenter.net/events/storytime/)

This year's Annual Holiday Sale is December 1 from 9am until 4pm. Enjoy festive food and drink, handmade goods from local artisans, and new items from the Discovery Shop, including Effie Yeaw water bottles which can be used with our brand new water dispenser. Two cash registers will expedite checkout. ARNHA members will enjoy a 20% discount on Discovery Shop items.



Photo by James Scott

Birds of Winter with Ed Harper begins in January and includes three lectures and three field trips. You can sign up on our website. [sacnaturecenter.net/education/adult-programs/](https://www.sacnaturecenter.net/education/adult-programs/)



Photos by Stephen Fischer



I hope to see you at the Nature Center soon.



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

Local Running/Walking Organization Supports Nature Center

On October 5, Sacfit Race Director Ken Press presented a check for \$3,000 to Torey Byington, Executive Director, at Effie Yeaw Nature Center. The funds were accrued through participation in Sacfit events, such as its marathon and half-marathon. The funds will be directed toward trail maintenance benefitting thousands of visitors to the nature preserve. Thank you, Sacfit!

Sacfit is the largest training group in the Sacramento region and has earned the distinction as the premier running and walking club in the area. More information is available at sacfit.com.



Photo by Kari Bauer

Calling Young Birders and Their Families!

Mark your calendars for January 5 and 6, the first weekend of 2019! Please join the Effie Yeaw Nature Center (EYNC) and Sacramento Audubon Society in the Seventh Annual Kids' Christmas Bird Count.

These family Bird Counts provide an exciting opportunity for kids, young adults, and their families to be outside looking at birds and enjoying nature. Participants will be joining citizen scientists all over the world and will gain practice finding, identifying, and counting all the birds they see. Day 1 for the younger birders aged 6 to 11 will be Saturday, January 5, from 9-12:30 and will be followed by a companionable lunch with other birder families at the Effie Yeaw Nature Center.

A second site for older birders 12 years and up and their families will occur on Sunday, January 6, with faster paced birding for more experienced young people at William Pond Park. It will be followed by a Compilation Gathering at a nearby restaurant. Questions can be sent to Wendy Money at wendydougmsn.com or calling/texting 916-205-3914.

Space is limited and children must be pre-registered to attend. Registration is first come, first served and opens on December 1, 2018. To register go to effieyeaw.eventbrite.com.



Photo by Kari Bauer

Q: What do snakes do during the winter time?

A: Naturalist Parker Stewart replies: Snakes do very little during the winter because they are coldblooded. They have no choice but to slow their metabolism during the colder months. A snake is known as an ectotherm, which means it is an animal that depends on external sources of body heat. An ectotherm's metabolism is determined by the temperature of their environment. When it is a warm summer day, a snake's metabolism will be high, but when the temperature drops in the winter, its metabolism will slow. This is why they go into hibernation.

Most people believe hibernation is when an animal sleeps underground until the spring arrives. But hibernation for reptiles (more appropriately referred to as brumation) is very different from hibernation for mammals. Reptiles do not sleep through the winter, nor do they live off their fat reserves. They are vigilant, yet lethargic, and if it's cold enough, they don't even lose weight. How does this happen? The reason is that the snake has slowed its metabolism to the point where it hardly uses any energy at all. It will not need to eat for months. If a snake did, in fact, eat something during the winter, its metabolism is so slow that it could not digest the prey. The prey would rot in its stomach and eventually kill the snake.

Parker has his BS in Environmental Studies from Humboldt State University. He came to Effie Yeaw Nature Center as a Naturalist after the 2018 Carr Fire destroyed Whiskeytown Environmental School near Redding, California, where he worked as a Naturalist. He has a passion for educating the public about all things wilderness. Some of his hobbies include backpacking, hiking, playing soccer, and traveling.



Photo by Kari Bauer

Ask a Naturalist

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Nature's Rhythm

It is a mint-fresh New Year for those inhabitants of the globe who use the 12-month calendar devised in the 1580s by Pope Gregory XIII. But for the flora and fauna it is just another day in the timeless rhythm of the seasons. It was winter yesterday and it will be winter tomorrow.

As nature's timekeepers – the sun, the moon and the stars – draw us closer to spring and summer, the western fence lizard hardly stirs as it hibernates under a rock in the Sacramento Valley. It will know enough to waken when the temperature starts to rise.

The mule deer that spent the summer in the high country is enjoying the hospitality of the Sacramento region until the snow recedes. There are no New Year's fresh starts for this long-eared mammal.

But our most visible wild animals, the birds, show the continuous quality of the seasons. Canary-like goldfinches flocked to the dried star thistle yesterday and you can be sure they'll be back tomorrow to glean its seeds. Kingfishers with their "punk rock" crests will continue to play tag along the river, calling raucously. Coveys of quail will hunker down in the blackberry patches, ready to burst forth and startle unwary hikers.

And so it goes. Grasses that were bright green in December are just as verdant in January. Buds continue to swell in willows and cottonwoods along the rivers, and even a few wildflowers are brightening the winter landscape with blossoms, such as the lanky telegraph plant's clusters of bright yellow daisies.

No, there was no need for blaring horns or clocks striking midnight to signal a fresh start for nature's world. The animals and plants keep their own seasonal schedule dictated by the sun, moon and stars. The five-year-old chinook salmon found its way back to its American River birthplace, spawned and died. In an oft-troubled world, we are thus assured that in nature there is a quality of life that is at once seamless and predictable.

From "An American River Almanac" published by the American River Natural History Association (ARNHA). It features nature essays by Peter J. Hayes, retired newspaper editor and ARNHA Associate Board member as well as photographs from friends of AHRNA. The book is available for sale at the Effie Yeaw Nature Center, ARNHA.org and selected bookstores. Visit ARNHA.org "Podcasts," to hear readings of the essays by the author.



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- Dorothy & Patrick Wagner
- Stephen Walker & Sabrina Schultz
- Frederick & Betsy Weiland
- Nancy Whitaker
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Your end-of-year donation helps ensure that Effie Yeaw Nature Center can continue providing our community with valuable environmental education through our visitor center, museum, resident animals, and nature preserve. To make a contribution online visit www.SacNatureCenter.net/support. Or mail your gift to the address listed on the back of this issue. On behalf of our board and staff, it is a sincere pleasure to serve you and our community. We are immensely proud of what we accomplish together. Thank you for your support!

Here Today, Gone Tomorrow?

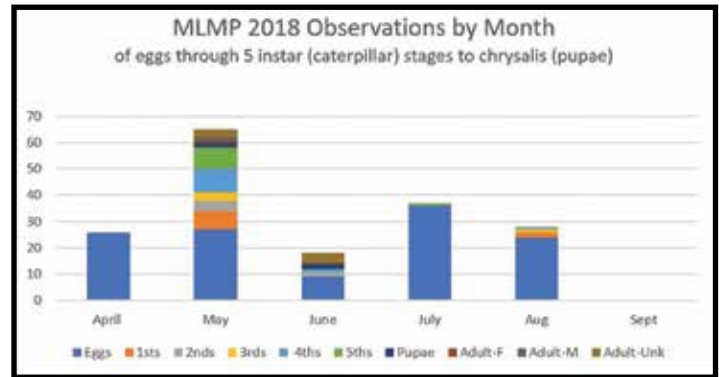
by Krystin Dozier

Will the Monarch Butterfly (*Danus plexippus*) be returning to the Sacramento Valley for future seasons during its breeding cycle? Our data from this year's observations of Showy Milkweed (*Asclepias speciosa*) in the gardens around the Effie Yeaw Nature Center has us concerned, and we are not alone.

From April through September, over 20 volunteers have been trained as citizen scientists to follow the University of Minnesota protocols to study milkweed at our site, looking for Monarch eggs, larvae, and caterpillars forming their chrysalises to complete their breeding cycle as emerging adult butterflies. This is our third year participating in the study at EYNC, but the first year to have data over the full breeding season, averaging 786 plants assessed each month. Even with all of those eyes dedicated to looking under every leaf, our findings were disappointing. We found very few eggs, and even fewer of the 5 stages of instars (caterpillars) this year, while identifying many of their predators, including oleander aphids, jumping spiders, and ladybug larvae, to mention just a few. We did see three developed chrysalises, and brought one inside to watch the metamorphosis process, yielding a healthy adult female, which was released to continue her journey.

Monarchs visiting Sacramento in the spring most often do not stay with us, but move on to breed and lay eggs on milkweed all over the West, as far north as Washington State and eastward to the Rockies. Monarchs we see towards the end of summer may be on their way back from farther regions and catching their last chance for breeding before going into diapause, stopping their reproductive cycle and preparing for migration to temperate zones along the California coast, for overwintering on Eucalyptus, Cypress, and other evergreens.

The Monarch Larvae Monitoring Project (MLMP)



tracks data from over 300 sites across the US to better understand the declining population of Monarchs, and to support what can be done through conservation efforts. Unfortunately, Monarchs have been declining nationwide over the past 20 years. Art Shapiro, Professor of Evolution and Ecology at UC Davis, who has been studying Monarchs across the Central Valley for more than 30 years, states that he has not seen any eggs this year, which has him quite concerned. Have the California wildfires disrupted the Monarch migration patterns? Has the temperature increase from climate impacted overwintering survival? Scientists across the world are watching, trying to define causes, and influence changes that will protect our natural world.

We extend our thanks and appreciation for our many MLMP citizen scientist volunteers that helped us study milkweed at EYNC. We plan to continue the project next year and hope that see more Monarchs in the future. All of us can support Monarch survival through planting showy milkweed and pollinator plants to attract and feed our Monarchs, as well as through overall planet conservation efforts.

Krystin Dozier is a volunteer at EYNC and a Certified California Naturalist.

Photographer's Corner

Photographer: James Scott



Fall Sunrise, on the American River, behind Rio Americano High School. Camera Settings: 1/800th sec at f7.1, ISO100 panorama of 6 photos.

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(916) 489-4918 • SacNatureCenter.net



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ARNHA Calendar of Events

Fall and Winter Nature Camps

Effie Yeaw Nature Center; sacnaturecenter.net for details and to register
November 19, 20, 21, and 22; December 27 and 28, January 2, 3, and 4

Holiday Sale at Discovery Shop

Effie Yeaw Nature Center Saturday, December 1, from 9 a.m. to 4 p.m.

Kids Christmas Bird Count

Saturday, January 5, for birders aged 6 to 11
Sunday, January 6, for birders aged 12 years and up
Registration required at effieyeaw.eventbrite.com

Birds of Winter in the Sacramento Valley With Ed Harper

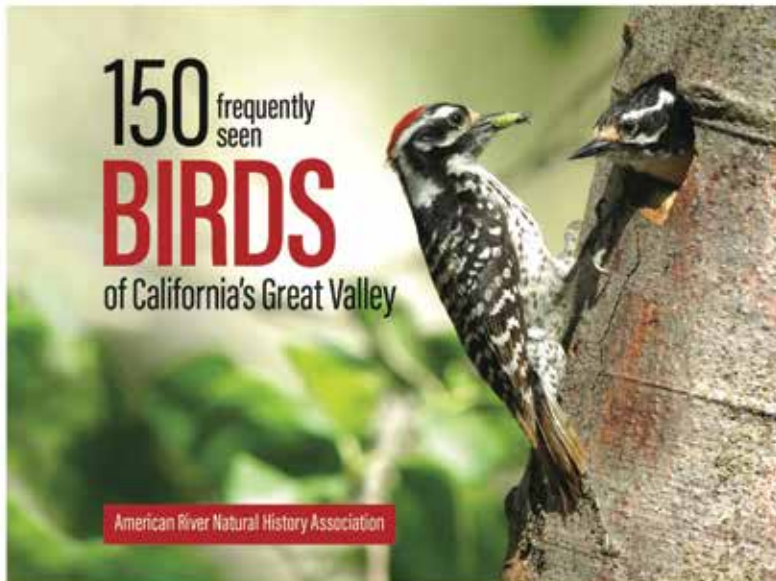
Effie Yeaw Nature Center; Details at SacNatureCenter.net
Seminars on January 23 and 30 and February 6
Field Trips on January 26 and February 2 and 6

Galt Winter Bird Festival

Chabolla Center, 660 Chabolla Avenue, Galt
Saturday, February 2, from 10 a.m. to 4 p.m.

California Duck Days

Yolo Bypass Wildlife Area Headquarters
Saturday, February 23
yolobasin.org/California-duck-days



New

from ARNHA Books

A local field guide to
150 birds of California's Great Valley

An authoritative handbook
for
families, students, visitors,
and neighborhood birders

320 pages • 322 color photographs

\$16.95

At the Discovery Shop inside the
Effie Yeaw Nature Center
or at sacnaturecenter.net/arnha