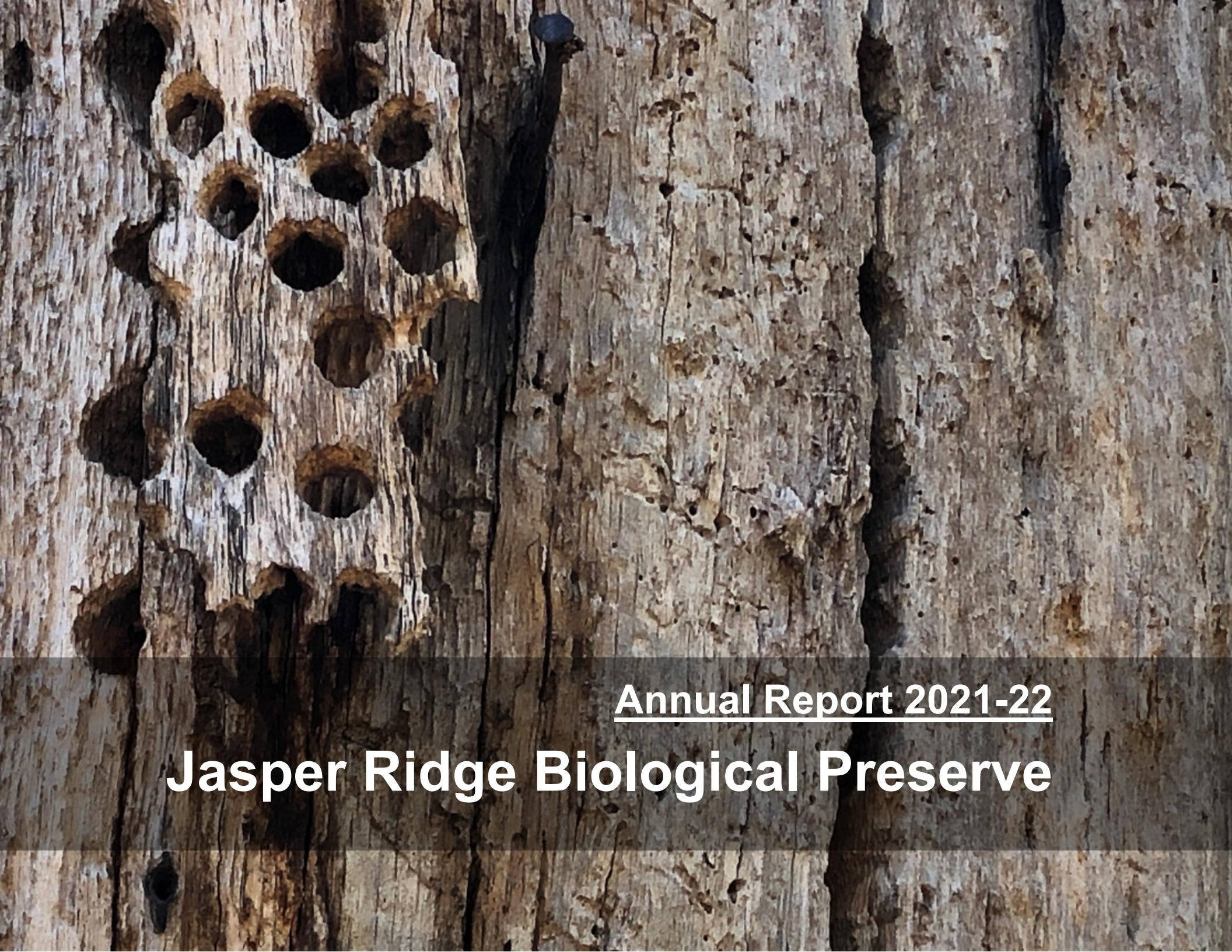


Annual Report 2021-22

Jasper Ridge Biological Preserve

MISSION AND VALUES

Coast redwoods (Sequoia sempervirens)

Land Acknowledgement

We recognize that Jasper Ridge Biological Preserve sits on the ancestral land of the Muwekma Ohlone Tribe. This land was and continues to be of great importance to the Ohlone people. Consistent with our values of community and inclusion, we have a responsibility to acknowledge, honor, and make visible the University's relationship to Native peoples.

This acknowledgment has been developed in collaboration with the Muwekma Ohlone Tribe. A full version of the Land Acknowledgement for Stanford University authored by the Muwekma Ohlone tribe is posted inside the Leslie Shao-ming Sun Field Station.

Mission

To contribute to the understanding of the Earth's natural systems through research, education, and the protection of the preserve's resources.

Vision

To be a leader for innovation in research, education, and communication on natural systems, through providing an interdisciplinary, cross-cultural, and place-based training ground for effective Earth stewardship by our community and the next generations of global leaders.

Pledge

To be a safe and welcoming place for discovery, discussion, and community for people of all cultures and identities.

CONTENTS

Students on their way to learn how to measure biodiversity using the transect method.

All photographs are by Jasper Ridge Biological Preserve staff unless otherwise credited.

Great Egret (Ardea alba) on Searsville dam. Credit: Dan Quinn

FROM THE DIRECTORS

Elizabeth Hadly, Faculty Director

It has been fantastic to get back in person at Jasper Ridge! The year just flew by, partly because so much was happening, including all our efforts at defining our 'stewardship' mission at Jasper Ridge. Stewardship means research and teaching targeted toward action for our collective future. Stewarding nature is becoming more and more necessary these days because we cannot go back to the past. Because of human-induced global changes, we cannot 'restore' native ecosystems at Jasper Ridge Biological Preserve or, indeed, anywhere else in the world. In that context, what does it mean to 'preserve'? What are we preserving, and is that even the right word for what we are trying to do? That's a question that has been on my mind since before I took the position as Faculty Director at Jasper Ridge. Answering it is where stewardship comes in.

Our most optimistic view of the future is one that humans help to craft with deliberate, optimistic intention: that is stewardship. To get there will require sharing our vision, partnering with our communities, and interacting with local to international groups to create an Anthropocene we all want. It will require welcoming a diversity of people, skills, and ideas to solve problems and guide nature at particular places. We do this well at Jasper Ridge, which exemplifies how we can productively steward the Anthropocene. It's not just acquiring knowledge; it's disseminating and acting on that knowledge. The challenges are certainly there—at Jasper Ridge currently in the form of melding major land-management mandates such as fire fuels reduction and the Searsville Watershed Restoration Project with our academic and conservation missions. But it is the challenges that propel us to think and do in new ways that can benefit both Jasper Ridge and the world if we keep intentional stewardship in mind. I am looking forward to enriching our present communities, building new networks, and continuing to listen and learning from all of you!

Wildflowers on serpentine soils.

Anthony D. Barnosky, Outgoing Executive Director

Fungi on tree

As I reflect back on the years I've been privileged work at Jasper Ridge, the first word that comes to mind is gratitude. Gratitude for our staff who taught me so much with their commitment and competence. This is the staff, by the way, who pulled off an open house for more than 2500 people with less than six weeks lead time. The staff who always rises to the occasion, no matter how tough the job. Gratitude also for having the chance to learn from the amazing students, faculty, and outside researchers who come through Jasper Ridge. And for the sage advice of our Community Coordinating Council, our Faculty Director, our LBRE partners, our Deans, and others who occasionally took me aside and saved me from more than one faux pas. I'm especially grateful to our docent and affiliate community for pitching in so wholeheartedly, in so many ways, to make it possible for Jasper Ridge to serve so many people, both locally and around the world. It's that community effort that has made it possible to accomplish so much in the way of making Jasper Ridge a place that not only does cutting edge science, education, and environmental stewardship, but also makes it such a delightful place to work.

The past few years have been a wild ride through strategic plans, new initiatives, budgetary ups and downs, a pandemic, regional wildfires, droughts, and planning for the future of the special place we call Jasper Ridge, a ride I'd take again in a heartbeat. As I hand off the ED reins to Jorge, I know that with him and the rest of the staff and faculty steering the ship, the place is in good hands. I'll be watching closely to see what good things the future brings. Meanwhile, I'll remember you all fondly, and the many happy strolls along our Jasper Ridge trails—one of which precipitated a poem I'll leave you with. Thank you, friends, and take care of the place!

California poppies (Eschscholzia californica).

Ecotones

Emerging from
deep
redwood shade
where
water music
sings with
owls and
cool breezes
riffle spots
of newborn blue
forget-me-nots
creamy milkmaids
and butter yellow
Dirca
then
uphill
into the
world of
greening grass
invaders
but even so
waving at
crystal blue sky
clear and sharp
under warm
winter sun.

Jasper Ridge Biological Preserve
February 17, 2021

Jorge Ramos, Incoming Executive Director

What an amazing academic 2021-22 year has been! All of us here at Jasper Ridge Biological Preserve are very excited with the return of all our in-person research, education, and conservation!

Throughout my career as an ecologist, I have always been involved in various field stations. But when I joined the Jasper Ridge Biological Preserve back in 2019, I knew I was joining something more than just a field station experience, I was joining a community. The immediate sense of belonging with you all, the people, and the landscape was impressive! Some of my most vivid memories from my first months include Cindy Wilber and Alan Launer immediately putting me to work on a rainy day setting up the fish traps for BIO/ESYS 105, the summer graduation celebration of the new Jasper Ridge docents, Laura Jones introducing me to the Chairwomen of the Muwekma Ohlone Tribe, exploring Mapache gate area with the Oakmead Herbarium crew, crawling through poison oak (luckily without a reaction!) with Rodolfo Dirzo to find all of his oak seedlings, our Jasper Ridge team field trips led by our "Anthropocene Rancher in Chief" Tony Barnosky, and many more! Though the pandemic put a pause to many of these in-person activities, it does not surprise me that all of us in the Jasper Ridge community were able to maintain a sense of belonging through one of our most challenging times.

Searsville Reservoir

As I take on the Executive Director role, I will continue our mission to contribute to the understanding of the Earth's natural systems through research, education, and protection of the preserve's resources. New projects have allowed us to start challenging the protection section of our mission and we are now exploring innovative ways to include the exciting concepts of conservation and stewardship in two restoration efforts: fire fuel reduction work and the Searsville Watershed Restoration Project. Fortunately, because we have always been a safe and welcoming place for everyone, we are not alone in this new journey. We have built a diverse and multi-disciplinary community that will help us explore the opportunities in this new challenges. I invite you all to continue joining me in building and maintaining the unique Jasper Ridge sense of belonging in our research, education and stewardship activities. And please, I remind you of some of the first words I wrote back in 2019 when I joined Jasper Ridge: *come visit, mis puertas están abiertas, nos vemos pronto!*

ACHIEVING THE VISION

Update on the Jasper Ridge Strategic Plan

The 10-year plan released in 2018 laid out a pathway to success for Jasper Ridge that highlighted the milestones indicated on the illustration on the next page. At the time of the plan's release, the journey to success was already underway with three baseline milestones essentially already achieved: 1) a strong and long-standing base of talented and enthusiastic faculty, staff, students, and community; 2) baseline funding by Stanford, endowments with payouts that covered most of the yearly operating expenses, and yearly giving by engaged supporters; 3) and strong collaborations with many partners.

Leonard's bridge in winter. Credit: Alice Cummings

In the ensuing four years, each of these initial three milestones have been revisited and enhanced. The number of researchers using Jasper Ridge has increased from 78 in 2017 to 113 this year. The number of new projects per year has increased from 14 to 21 over the same time period. Publications per year in 2017 numbered 31; over the past three years, the average has been 37. Yearly revenues have increased from about $1.05M in 2017 to about $1.42M in 2022, in part funded by increases in the allotments from the School of Humanities and Sciences, and in part by outside grants awarded directly to Jasper Ridge. Annual gift-giving by our community has remained fairly constant, with the exception of a dip during the pandemic-shutdown year. Enhanced collaborations with other programs and partners have included new international collaborations in the context of the plan's Out-of-the-Box-and-Into-the-Cloud and Anthropocene Biodiversity Initiatives, regional collaborations in the context of the Science for Land Stewardship Initiative, and developing education and research programs that involve artists, writers, and musicians. New education partners include development of a research coordination network (the SOAR project) that includes other universities, community colleges, and NGOs in the San Francisco Bay region. Educational visits increased from about 5100 visits in 2017 to more than 8100 just before the pandemic shutdown in 2019, and now are once again growing.

Four milestones that were just getting underway in 2018 have now been largely completed. Communication has been enhanced through the development of our social media sites (@stanfordjrbp) on Twitter and Instagram, through news articles and blogs posted on our website, through community updates via our listservs, and through a variety of regular seminars and social events. Staff and financial resources have been re-apportioned to develop the three initiatives noted above that were deemed priorities in the strategic planning process. And, critically important, staffing has been increased to adequate

California quail (Callipepla californica). Credit: Peter and Diane Hart

(although still stretched thin) levels through the upgrading of our administrative support, operations manager, and education director positions, the addition of a second staff scientist, and when funds allow, bringing on postdocs and special projects personnel. Closer partnering with other Stanford field and stewardship programs now includes coordinated planning with Land, Buildings, and Real Estate (LBRE) to integrate academic needs and programs into the two major land management projects Stanford has embarked upon, the Searsville Watershed Restoration Project and the Fire Fuels Reduction Project.

The other milestones and identified priorities have seen progress, but will require more funding and focused effort over the next few years. Collaborations with Hopkins Marine Station have been initiated with discussions between the directors of Jasper Ridge and Hopkins and have highlighted rich potentials for education and research opportunities. More attention to the importance of surrounding buffer lands to Jasper Ridge's ecological integrity will be helpful.

On the infrastructure front, the key progress has been in beginning to replace aging equipment and developing plans to replace the Corp Yard with an Academic Support Complex (ASC). The former includes the recent purchase of a new tractor essential for road upkeep and mowing, and the latter includes working with project planners in LBRE and architects to design the new facility, made possible by substantial H&S funding out of the Capital Planning office.

While one-time institutional and grant funding have increased substantially to jumpstart progress on the key priorities identified in the plan, we are now at the stage where raising additional funds will be required to fully achieve the vision. Opportunities include three research and stewardship focused funds: Anthropocene Fund, Student Research Internship Fund, and Stewardship Fund; two opportunities for scholars: the Novel Socio-Ecological, Adaptation and Synthesis Postdoctoral Fellowship; and Distinguished Visiting Scholar Program; and two to support and maintain our infrastructure and facilities: Sun Field Station Updates and Visiting Scholar Residence. We currently are working with H&S leadership and development officers to define the best way forward, as we continue the momentum towards the goals so many of you helped us to define in many discussions and working sessions five short years ago!

Achieving the Vision: The Path to Success

- Collaborating with Hopkins Marine Station
- Integrating SWRP with academic programs
- Long-term land-use planning recognizing JRBP as Stanford's premier ecological preserve that can be maintained only with adequate buffer zones.

In 2022 relative to 2018

- Significant Progress
- Partly Accomplished
- Accomplished
- \+ Enhanced

In 2018

- Anticipated
- Underway
- Already in place

Renovating Infrastructure

Increasing funding

Closer partnering with other Stanford field and stewardship programs

Ensuring adequate staffing

Reapportioning existing resources to jumpstart development

Enhancing communication

\+ Collaborations with other Stanford programs and beyond

\+ Commitments & baseline funding by Stanford University & outside community

\+ Talented and enthusiastic faculty, staff, students, and community

Photo: Alice Cummings

EDUCATION AND OUTREACH

Updates from the Associate Director for Environmental Education

Welcome back everyone! All of our education and outreach activities are now fully in-person! We hope that with each step you took at Jasper Ridge, you not only learned something new, but you also were able to share your experience with others. Remember that each season at Jasper Ridge is different, so we look forward to seeing you throughout the year!

Stanford Classes came back to Jasper Ridge following appropriate safety and health guidelines. We hosted over 30 classes from more than 30 Stanford affiliated departments, programs, and student organizations. This year we hosted members of the Stanford community from its seven schools: Business, Education, Engineering, Humanities and Sciences, Law, Medicine, and the new Stanford Doerr School of Sustainability.

BIO/ESYS 105 Ecology and Natural History of Jasper Ridge

Rodolfo Dirzo and Jorge Ramos, with TAs Julien Ueda and Jamie Leonard welcomed back a completely in-person docent training class during the Winter and Spring quarters of 2022. Each of the teaching days included the theoretical background which followed was followed by hands-on and experiential learning activity out in the field. We are very grateful to all the contributors to this unique class in its 47th year: Steve Gomez, Alan Launer, Laura Jones, Richard Nevle, Scott Fendorf, Nona Chiariello, Katherine Preston, Stuart Koretz, Trevor Hébert, Tyler McFadden, Jesse Miller, and Jack Owicki! Thank you!

Our new Jasper Ridge docents include Cheryl Gold, Sonoo Thadaney Israni, Jackie Magno, Adelaide Nye, Ana Carolina Queiroz, Lizzie Avila, Nancy Chang, Kimberly Cheung, Erin Cole, Alan Cuevas, Lindsay Filgas, Andy Huynh, Brandon Lieu, Lizbeth Luevano, Chinmay Sonawane, Vrinda Suresh, Esther Tok, Natalie Ward, Aiyana Washington, and Maya Xu.

Professor Dirzo leads a session on plant diversity and ecology on the ecotone between the preserve's oak woodland and grassland ecosystems.

The Jasper Ridge Docent class of 2022 after participating in the Searsville reenactment

Collaborations with Colleges and Universities

Collaborations with Colleges and Universities included concluding the one-year incubator National Science Foundation grant "San Francisco Bay Research Coordination Network for Student Opportunities in Avian Research to Enhance STEM Education (SOAR)". The 2020-2021 Incubator SOAR grant strengthened the collaboration among the SOAR network and paved the way to further our science education program focused on the study of birds and their habitats in the Bay Area.

The SOAR team, led by Tony Barnosky and Rodolfo Dirzo, was awarded a new NSF five-year grant to continue building the SOAR network and start introducing undergraduate students, especially those from underserved communities, to STEM and ornithology-focused activities in both the field and laboratory. The SOAR project will promote an appreciation of birds and their significance for ecological and human wellbeing, enhance career opportunities for participants, advance biological science education, and above all, reveal how humans are influencing natural ecological systems and how society can respond to that challenge.

The SOAR community is composed of faculty, students, and volunteers from Stanford, San Jose State University, Santa Clara University, UC Santa Cruz Doris Duke Program, Mission College, West Valley College, San Francisco Bay Bird Observatory, California Academy of Scientists, iNaturalist, and eBird. In addition to the schools mentioned above, we also provided virtual and hands-on learning opportunities for students and faculty from Foothill College, Ohlone College, and Purdue University.

Steller's jay (Cyanocitta stelleri). Credit: Peter and Diane Hart

K-12 Partnerships

In the 17th year of the REAL-SEEDS partnership, the Stanford SEEDS chapter, led by Sriram R. Narasimhan and Sydney Lee Schmitter, worked with Redwood High School's Redwood Environmental Academy of Leadership (REAL) teacher Chris Beetley-Hagler and hosted high school students on a Plant Communities of Jasper Ridge hike. Thanks to Andy, Chrysanthe, Erin, and Kate for participating with the SEEDS-REAL class! Menlo-Atherton High School teachers Lance Powell and Erika Woll developed a new lesson plan to teach water quality in the Jasper Ridge watershed using hands-on experiences with a Secchi tube. Other high schools and programs that continue to visit include Palo Alto High School, Woodside High School, and Menlo-Atherton Ecology Research Outdoors (MERO).

Additionally, many organizations and partners continued to participate and engage with Jasper Ridge in our research, education, outreach, and conservation actions. These include Avarna, BayNature, Ecological Society of America, Foldscope, Integrated Digitized Biocollections, Canopy, Carnegie Institution, California Naturalist Program, Genentech, GeoCAFES, Green Foothills, Golden Gate Biosphere Network, Grassroots Ecology, Latino Outdoors, Organization of Biological Field Stations, Saved by Nature, Sequoia Audubon, Santa Cruz Mountains Stewardship Network, Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS), and US Fish and Wildlife Service.

Evening Lectures

Evening Lectures enriched knowledge, partnerships, and sense of belonging amongst our community. Deborah Gordon presented on the long-term ant survey and how the data show how changes in climate, especially drought, affect both invasive and native ants. Tom W. Zigterman and Karla T. Smith presented updates on the Searsville Watershed Restoration Project. Rebecca Miller presented on historic and current prescribed burn policies in California. Emily Polk, Sibyl Diver, Richard Nevle, and Tanvi Dutta Gupta discussed the actions of the Environmental Justice Working Group at Stanford. Stepfanie Aguillon, Jordana Meyer, Kate Lagerstrom and Jessica Castillo Vardaro, presented on important biodiversity and conservation topics: genomics in northern flickers, *Escherichia coli* in wildlife, Jasper Ridge food web dynamics, and threats to a California native squirrel, respectively. To close the academic year, we hosted Dr. Robin Wall Kimmerer to share her presentation on her latest book: *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants*. The event was co-organized in collaboration with the School of Humanities and Sciences, Department of Biology, Hadly Lab, Native American Cultural Center, Native American Studies, and Stanford American Indian Organization.

Banana slug (Ariolimax sp.).
Credit: Alice Cummings

Continuing Education and Other Educational Activities

Gary Nielsen continues to lead the Continuing Education efforts and this past year arranged a variety of important refresher activities for Jasper Ridge docents related to our ecosystem and our research practices. Additionally, two Stanford graduate students, Vicky Chan and Eugene Tang collaborated with members of the herbarium to build an educational and interactive virtual field trip of the Jasper Ridge Oakmead Herbarium and Collections. Make sure you visit our website to read both Gary Nielsen's blog on the history of continuing education and Vicky Chan's blog on the virtual Oakmead Herbarium and Collections field trip!

Continuing education class on Trees and Shrubs of Jasper Ridge led by docents Diane Renshaw and Carl Cheney

Learners out in the field.

Carpenter ants (Camponotus sp.). Credit: Dan Quinn

Ben Hodder surveying mistletoe (Phoradendron leucarpum ssp. tomentosum) distribution and seed production on blue oaks (Quercus douglasii).

NEW RESEARCH

Hope Christine Adhanom-Shipman, Will Tarpeh, Kate Maher (Undergraduate; Professors, Chemical Engineering, Earth System Science) Nitrate and ammonium in Searsville Reservoir and its tributaries and outflow creeks.

Claudia Christine Avila, Scott Fendorf (Postdoctoral scholar; Professor, Earth System Science) Combustion products of vegetation and soil from serpentine and non-serpentine habitats.

Victor Awosiji, Stephan Graham (MS student; Professor, Earth and Planetary Sciences) Geological hydrogen in western California.

Alec Chiono (PhD student, Univ. Colorado) Life history of *Erythranthe microphylla* (formerly *Mimulus guttatus*) from serpentine and non-serpentine substrates.

Cherie DeVore, Scott Fendorf (Postdoctoral Scholar; Professor, Earth System Science) Fungal and microbial post-fire ecological recovery on different geological substrates.

Phillip Dibner, Diane Renshaw (JRBP) Reprise of 1979 vegetation studies at Jasper Ridge by J. R. Griffin.

Ben Hodder (MS student, Earth Systems) Blue Oak host characteristics and mistletoe distribution.

Bryan Juarez, Elizabeth Hadly, Lauren O'Connell (Postdoctoral scholar; Professors, Biology) Gene expression responses to temperature and water availability in bullfrogs, Sierran treefrog, and Western toad.

Al Keuter (Herbarium, UC Santa Cruz) Taxonomic re-evaluation of the red oak group within Jasper Ridge Biological Preserve.

Ethan Lopes, Sonia Tikoo-Schantz (PhD student; Professor, Geophysics) Quantifying modes of failure for varying nanostructure assemblages.

Kelsey Lyberger, Erin Mordecai (Postdoctoral scholar; Professor, Biology) Monitoring of tree holes for mosquitoes infected by *Lambornella*.

Jackie Magno, Anthony Barnosky, Elizabeth Hadly (JRBP; Professors, Biology) Soil environmental DNA pre- and post-grazing by goats and sheep for fuel reduction.

Angie Nakano (San Mateo County Mosquito and Vector Control District) Disease surveillance in fleas and ticks associated with ground squirrel burrows.

Andrea Nebhut, Jeff Dukes (PhD student, Biology; Senior Staff Scientist, Carnegie Institution for Science) California serpentine grassland climate gradients and invasion.

Evan Paris (Carnegie Institution for Science) Survey for the cyanobacterium *Microcystis* in Searsville Reservoir.

Marta Peláez; Ramón Perea, Rodolfo Dirzo (Postdoctoral scholar; Visiting faculty; Professor, Biology) Demography of oaks in savanna habitats based on a century of aerial photographs.

Jorge Ramos (JRBP) Photospheres pre- and post-grazing to assess changes in vegetation and fuel load.

John Rawlings, James Beck (JRBP; Professor, Wichita State Univ.) Mapping a biogeographic dead end: floral bud collection from *Pickeringia montana* (Chaparral Pea) to test for meiotic failure.

Top: Hope Adhanom-Shipman and Robert Matthew Wood sampling reservoir water for studies of nitrogen dynamics.

Bottom: Dr. Bryan Juarez holding a bullfrog (Lithobates (Rana) catesbeianus) found beneath a small boulder below the dam.

Richard Ree, Qin Li, Samantha Kish-Levine (Faculty; Postdoctoral Scholar; PhD student, Univ. of Chicago) Phylogeography, host associations, and heterotrophism in *Pedicularis densiflora*.

Brody Sandel (Professor, Santa Clara Univ.) Functional traits of California's grasses.

Morgan Stickrod (PhD student, San Francisco State) Floral bud collection for genomic identification of an atypical *Arctostaphylos manzanita* ssp. *manzanita*.

Summer Vance, Liz Hadly (Wildlife biologist; Professor, Biology) eDNA analysis of water and sediment from a year-round spring.

Kirsten Verster, Elizabeth Hadly (Postdoctoral scholar; Professor, Biology) The impact of anthropogenic disturbance on insect diversity over time using sedimentary ancient DNA (sedaDNA) from Searsville Reservoir.

Featured Student Research

Over many decades, the band of serpentine diagonally bisecting Jasper Ridge has been a model system for discoveries ranging from coevolution to carbon cycling. New research by students is creating a resurgence focused on seismic hazards, energy sources, climate change and wildfire smoke. Their studies examine properties of the rock serpentinite, as well as the minerals, soil, and vegetation that are termed "serpentine."

Doctoral student **Ethan Lopes** is studying the mode and extent to which mineral fiber entanglement is related to the brittleness of the bulk rock, and whether that relationship has consequences for earthquake severity. Ethan removed cores from exposed serpentinite to use in lab studies of the rock's failure mode and the degree to which minerals are entangled versus in plates. If a relationship exists, the degree to which minerals are entangled could help predict how a nearby earthquake will rupture—fast or slow slip. It may also suggest designs for safer and more durable concrete and other geomaterials.

MS student **Victor Awosiji** is sampling soil gases across Jasper Ridge to see whether rock shearing or other plate-boundary processes produce hydrogen gas. If a serpentine-hydrogen relationship exists, it might help locate new sources of hydrogen and also improve fault maps. The research team includes doctoral student **Yashee Mathur**, specialist **Dalton Balentine**, and faculty advisers **Stephan Graham** and **Ken Peters**.

Doctoral student **Andrea Nebhut**, working with professor **Jeff Dukes**, is in the early stages of creating a climate-change experiment to see how the Jasper Ridge serpentine flora may fare in different thermal environments. Andrea and her field assistants are collecting seeds and evaluating sites for setting up three replicate serpentine plant assemblages.

Postdoctoral scholar **Alandra Marie Lopez** is expanding her doctoral research on the fate of heavy metals in serpentine during wildfires. She and other members of professor **Scott Fendorf**'s lab are burning plant tissues and soil, and analyzing airborne particulates that are produced. They are finding that serpentine wildfires can catalyze formation of hexavalent chromium, a carcinogen that can be carried in smoke, potentially with other metal(loid)s. This year's team included postdocs **Claudia Christine Avila** and **Cherie DeVore**, and summer interns **Tamara Jeffries, Cruz Ibarra Jr., Rebecca Monge,** and **Michelle Curiel.**

Facing page: Geophysics professor Sonia Tikoo-Schantz holding cores removed from the serpentinite exposure on Jasper Ridge.

Above: Professor Tikoo-Schantz and doctoral students Thom Chaffee, Ethan Lopes, and Ji-In Jung coring serpentinite rock with a water-cooled drill.

Below: Victor Awosiji transferring soil gas to a sample vial from a probe driven into the ground with a slide hammer.

STEWARDSHIP

Over the past year, we have continued to expand the scope and scale of stewardship activities at Jasper Ridge. In the near-term, the growing need for managing fire risk in our human communities has necessitated a thorough examination of the trade-offs and opportunities among techniques to reduce fuel loads at Jasper Ridge. But ultimately, the need for increased ecologically-sensitive land management (e.g., stewardship) extends beyond the increased fire risk as we confront the emerging challenges of caring for natural landscapes in the Anthropocene.

Fire Fuel Vegetation Management

This year we began fuel reduction vegetation management treatments identified through the 2021 Stanford Wildfire Management Plan (SWMP). 160 goats and 40 sheep were used for fuel reduction along the southern boundary near Mapache, Goya, and Escobar gates, covering a total of 35.4 acres. This was the first step in developing ecologically-compatible fire-fuels treatments. The intent is to monitor the impacts of a variety of treatments that will be put in place over the next few years. We are presently monitoring the impacts of the mixed or single-species herbivores that have browsed and grazed on subunits ranging from 0.4 - 3.4 acres, to understand the impacts of such treatments on soil, woodrat nests, and floral communities.

Overall, in working with the SWMP we intend to employ an "Adaptive Management" approach to fuel reduction, where sites will be assessed pre- and post-treatment to adjust stewardship activities to maximize ecological health and sustainability. We are simultaneously working with LBRE and the Woodside Fire Protection District to identify fuel reduction priorities for the near term.

Apart from the SWMP, Jasper Ridge contracted with a vendor to graze 11 acres on the old Boething nursery site to reduce flashy fuels. Mowing along roads and staging areas continued to increase, an activity that will be made more efficient by the acquisition (finally!) of a new John Deere tractor.

Black-tailed jackrabbits (Lepus californicus). Credit: Dan Quinn

Pacific dotted-blue (Euphilotes enoptes). Credit Alice Cummings

Fire Fuels Ecology Workshop

Jasper Ridge is located in the Wildland Urban Interface (WUI) next to residential areas, agricultural and open-space lands. We are working to mitigate wildfire risk in a way that also maintains biodiversity and ecosystem health to meet our key missions of research, education, and conservation.

To inform best practices, we hosted a Fire Fuels Ecology Workshop June 9 – 10, 2022. Twenty-five experts in the areas of wildfire modeling, fire emergency response, land management, risk management, Indigenous practices, research, policy making, law, and ecology gathered to review Stanford's 2021 Wildfire Management Plan for fire-fuel reduction at the preserve.

The workshop included a symposium of presentations by experts, followed by a tour of current fuel reduction activities at Jasper Ridge, and intensive breakout discussions. Topics included: risk to Jasper Ridge beyond life and property; vegetation management strategies and treatment options with ecological sensitivity in mind; and collaboration opportunities with Indigenous partners, neighboring communities, and regional organizations.

The result is a white paper intended to help guide future fuel reduction work and contribute to ecologically sensitive stewardship in the Santa Cruz Mountain region. The document, titled *Recommendations for merging fire fuel mitigation with stewardship practices to maintain biodiversity and ecosystem function at Jasper Ridge Biological Preserve* summarizes consensus of the participants' discussions and recommendations, and is available on the Jasper Ridge website.

Left: before goat treatment to reduce fire-fuels near Mapache Gate; right: after goat treatment.

Goats. Credit: Dan Quinn

Monarch Butterfly Habitat

We experimented with improving habitat for western Monarch butterflies (*Danaus plexippus*) by planting an experimental patch of three California species of milkweeds (*Asclepias californica, A. eriocarpa,* and *A. fascicularis*). In 2022 the IUCN recognized the plight of Monarchs by designating the species Endangered on the IUCN Red List. Coordinated by Trevor Hébert, the Milkweed Demonstration Garden was established through direct seeding on New Year's Eve 2021, and soon boasted several flowering Narrowleaf (*A. fascicularis*) individuals.

A. fascicularis currently grows naturally in parts of the preserve whereas the other two species are found in drier areas of the greater Bay Area. One of the goals of the experiment is to provide comparative data on phenology, drought tolerance, and monarch breeding preferences for the three species of native milkweed, in hopes of providing valuable insights to aid in conservation efforts throughout the region. We are grateful to the many people, including docents, who helped as thought partners for this project, and supported planting and weeding.

Stewardship Sundays

Kelly Chauvin led several "Stewardship Sunday" events in Spring 2022, removing invasive French broom (*Genista monspessulana*) from various locations around the preserve.

Thank you to everyone who came out to volunteer and actively practice stewardship!

Top: Flowering A. fascicularis in the new milkweed plot.

Bottom: Stewardship Sunday crew gets ready to pull French broom (Genista monspessulana).

Featured Student Project: Gretchen Guimarin

Undergraduate student Gretchen Guimarin spent her summer chasing butterflies and looking at flowers, or you could also say she was chasing flowers and looking for butterflies! Her stewardship-action-oriented research project was designed to better understand the extent to which the JRBP landscape is currently able to support the threatened western Monarch butterfly.

Gretchen traversed Jasper Ridge to map populations of narrow-leaf milkweed (*Asclepias fascicularis*), looking in swales off of trails and in locations known by docents and indicated by historical records to previously contain milkweed within Jasper Ridge. She found populations in four regions within and near Jasper Ridge: along Trails 10 and 15, near Goya Gate, and an especially important patch adjacent to Jasper Ridge on the old "Christmas Tree Farm" near the SLAC-Jasper Ridge boundary.

Each population found was mapped, and individuals were geolocated and identified by size and phenological state. The population found at Trail 10 is the most abundant on the preserve, though invasive star-thistle and teasel are also abundant. She found no evidence of monarch herbivory on any of the plants she observed, but the hope is that by enhancing and protecting Monarch habitat, the butterflies will find a refuge here.

The project helped in developing a good baseline for occurrence of milkweed populations and conditions, and in exploring what "stewardship science" means at Jasper Ridge! During her time in the Biology Summer Undergraduate Research Program (BSURP), Gretchen was co-advised by Kelly Chauvin, Trevor Hébert, and Elizabeth Hadly.

Gretchen Guimarin displays one of her six-legged discoveries as she mapped milkweed patches in and around Jasper Ridge.

A Jasper Ridge stewardship crew managing stinkwort (Dittrichia graveolens).

Wildflowers

Sprouting California buckeye (Aesculus californica) seeds. Credit: Alice Cummings

Lichens. Credit: Alice Cummings

BY THE NUMBERS
EDUCATION

WITHIN STANFORD

2764 STUDENT VISITS

33 CLASSES

33 DEPARTMENTS AND PROGRAMS

7 SCHOOLS AND SLAC

OUTSIDE STANFORD

218 COLLEGE STUDENT VISITS

662 K-12 VISITS

8 COLLEGES AND UNIVERSITIES

6 HIGH SCHOOLS AND MIDDLE SCHOOLS

21 PARTNER ORGANIZATIONS

TOTALS

WITHIN STANFORD: 4654 VISITS

OUTSIDE STANFORD: 2017 VISITS

OVERALL: 6671 VISITS

Looking at lichens through an eyepiece.

Academic Technology Specialist, Trevor Hébert, maintains a Wi-Fi station.

BY THE NUMBERS
RESEARCH

3 STANFORD SCHOOLS
7 ACADEMIC DEPARTMENTS AND UNITS
82 ACADEMIC RESEARCHERS

21 STANFORD FACULTY
12 POSTDOCS AND VISITING SCHOLARS
17 GRADUATE STUDENTS
8 UNDERGRADUATES
24 UNIVERSITY STAFF

TOTALS

INCLUDING NON-STANFORD ACADEMIC INVESTIGATORS

113 RESEARCHERS
64 PROJECTS
37 PUBLICATIONS
4 COUNTRIES

CONGRATULATIONS

Jasper Ridge Environmental Scholar Award

Bianca S. Santos (right), is the 2022 recipient of the Jasper Ridge Biological Preserve Environmental Scholar Award. The award recognizes commitment to education, outreach, and inclusivity to build and sustain a dynamic community for learning at Jasper Ridge and beyond. Bianca's leadership efforts with the Environmental Justice Working Group and Stanford's Earth Summer Undergraduate Research Program (SESUR) always connected the activities with Jasper Ridge and the docent community to expand research and educational opportunities to broader audiences including groups historically marginalized in STEM.

Bianca's nominators lauded her impact at Jasper Ridge and throughout Stanford by noting "in all instances, Bianca has demonstrated herself to be a highly creative individual and sensitive human being, guided by a deep sense of compassion, with a strong motivation to make a positive change in the world."

Among the many contributions Bianca has made in the environmental education arena are leading outreach with the Environmental Justice Working Group at Stanford, organizing at Jasper Ridge the educational visits of the Stanford Earth Summer Undergraduate Research Program, acting as the Stanford Earth DEI Liaison, and partnering with Jasper Ridge staff and docent Aiyana Washington to invite and host author and environmental activist Leah Thomas to speak with students during the 2022 Earthtones event. Bianca's research focus also is relevant to environmental education: her work revolves around science and policy, especially as it applies to managing human impacts on migratory marine animals in the Pacific.

Philippe Cohen Graduate Fellowship

Lisa Couper (left) is the recipient of the Philippe Cohen Graduate Fellowship for a second year (academic year 2022-23), continuing work on projects related to Jasper Ridge that form the core of her PhD work on the effects of vector adaptation to disease transmission under climate change. She is a member of the Mordecai Lab in the Department of Biology.

Research Awards

Congratulations to these students who were recognized at Stanford for their research focused at Jasper Ridge!

Undergraduates **Allan Feng** and **Jacob Greene** received a Hoefer Prize for their paper, "Ecological factors that modulate microbial richness in *Mimulus aurantiacus* nectar" submitted for BIO47.

Vrinda Madabushi Suresh received the 2022 Angela Lee Undergraduate Research Award for the most outstanding poster presented at the Achauer Undergraduate Honors Symposium.

Julien Minoru Wright-Ueda was awarded a Firestone Medals for Excellence in Undergraduate Research for his honors thesis, "Long-term avian responses to drought and urbanization in Northern California."

Biology Summer Undergraduate Research Program (B-SURP)

Congratulations to this year's awardees of B-SURP grants awarded to them by the Biology Department to conduct work at Jasper Ridge.

Gretchen Guimarin. Mapping milkweed populations on Stanford lands to support the Western Monarch butterfly (advised by Trevor Hébert, Kelly McManus Chauvin, Elizabeth Hadly)

Esther Tok. Basal buddies: characterizing the diversity and life cycle dynamics of chytrid fungi (advised by Alex Long and Tim Stearns)

Acorn woodpeckers (Melanerpes formicivorus). Credit: Peter and Diane Hart

STEM Fellowship

This fellowship was awarded by Foothill College Science Learning Institute

Michelle Curiel. (Undergraduate, Foothill College) Wildfire-generated toxins and ecosystem recovery (advised by Claudia Avila, Postdoctoral scholar, Stanford Earth System Science)

SURGE and SESUR Awardees

These two programs are funded and administered through the Stanford Doerr School of Sustainability. SURGE provides funding for projects that support diverse perspectives in sustainability, energy, engineering, and the Earth sciences. SESUR is the Sustainability and Earth Summer Undergraduate Research Program which provides support for Stanford undergraduates from any area of study who want to learn more about environmental science and the planet on which we live.

Congratulations to the students who received SURGE and SESUR grants to undertake work at Jasper Ridge!

Tamara Jeffries. Wildfire-generated toxins (with Claudia Christine Avila, Alandra Marie Lopez, Cherie DeVore, Scott Fendorf)

Cruz Ibarra, Jr. Aerosolization of soil and ash during wind turbulent conditions in post-fire environments: implications for ecosystem and human health (with Alandra Marie Lopez, Claudia Christine Avila, Cherie DeVore, Scott Fendorf)

Rebecca Monge. Wildfire generated toxins and the role of microorganisms on ecosystem recovery (with Cherie DeVore, Claudia Christine Avila, Alandra Marie Lopez, Scott Fendorf)

Trumpet cup lichens. Credit: Alice Cummings

Julie Kennedy Public Service Scholars

The Julie Kennedy Public Service Scholar Award recognizes students who have engaged in meaningful public service activities, either on their own or through established organizations, related to their Earth Systems studies.

Congratulations to **Jamie Leonard** and **Lizzie Avila** for receiving the Stanford Earth Julie Kennedy Public Service Scholars award for their outstanding scholarship and public service. This award recognized their ecological scholarship while serving as docents at Jasper Ridge Biological Preserve.

Western bluebird (Sialia mexicana). Credit: Peter and Diane Hart

PUBLICATIONS

1. Alvarez-Perez S, Baker LJ, Morris MM, Tsuji K, Sanchez VA, Fukami T, Vannette RL, et al (2021) *Acinetobacter pollinis* sp. *nov., Acinetobacter baretiae* sp. *nov*. and *Acinetobacter rathckeae* sp. *nov.*, isolated from floral nectar and honey bees. International Journal of Systematic and Evolutionary Microbiology 71(5):004783. https://doi.org/10.1099/ijsem.0.004783

2. Biondi BL, Yuan S, Martin ER, Huot F, Clapp RG (2021) Using telecommunication fiber infrastructure for earthquake monitoring and near-surface characterization. Distributed Acoustic Sensing in Geophysics: Methods and Applications, ch 10.

3. Chappell CR, Dhami MK, Bitter MC, Czech L, Paredes SH, Eritano K, Golden LA, Hsu V, Kieschnick C, Rush N, Fukami T (2022) pH as an eco-evolutionary driver of priority effects. https://www.biorxiv.org/content/10.1101/2022.04.19.487947v1.abstract

4. Couper LI, Sanders NJ, Heller NE, Gordon DM (2021) Multiyear drought exacerbates long-term effects of climate on an invasive ant species. Ecology: e03476. https://esajournals.onlinelibrary.wiley.com/doi/10.1002/ecy.3476

5. Croll D, Crous P, Pereira D, Mordecai E, McDonald B, Brunner P (2021) Genome-scale phylogenies reveal relationships among *Parastagonospora* species infecting domesticated and wild grasses. Persoonia—Molecular Phylogeny and Evolution of Fungi 46: 116-128. https://doi.org/10.3767/persoonia.2021.46.04

6. Decker LE, San Juan PA, Warren ML, Duckworth CE, Gao C, Fukami T (2022) Higher variability in fungi compared to bacteria in the foraging honey bee gut. Microbial Ecology. https://doi.org/10.1007/s00248-021-01922-5

7. Gao Y, Ding J, Yuan M, Chiariello N, Docherty K, Field C, et al (2021) Long-term warming in a Mediterranean-type grassland affects soil bacterial functional potential but not bacterial taxonomic composition. npj Biofilms and Microbiomes 7(1):1. https://doi.org/10.1038/s41522-021-00187-7

8. Graves WR, Gimondo A (2021) Phenology of annual dormancy release and its association with fruit set of *Dirca occidentalis* (Thymelaeaceae). Madroño 68(4):416-24. https://doi.org/10.3120/0024-9637-68.4.416

9. Gupta TD (2022) What pesticides showed me about protecting our future. Voices for Biodiversity: Aug 28, 2022. https://voicesforbiodiversity.org/

10. Huot F, Biondi BL, Clapp RG (2022) Detecting local earthquakes via fiber-optic cables in telecommunication conduits under Stanford University campus using deep learning. arXiv preprint https://doi.org/10.48550/arXiv.2203.05932

11. Kendig AE, Spear ER, Daws SC, Flory SL, Mordecai EA (2021) Native perennial and non-native annual grasses shape pathogen community composition and disease severity in a California grassland. Journal of Ecology 109(2):900-12. https://doi.org/10.1111/1365-2745.13515

12. Koenig WD, Knops JM (2022) Drivers of winter population cycles in the Varied Thrush *(Ixoreus naevius)*. Canadian Journal of Zoology. https://doi.org/10.1139/cjz-2022-0028

13. Lagerstrom KM, Hadly EA (2021) The under-investigated wild side of *Escherichia coli*: genetic diversity, pathogenicity and antimicrobial resistance in wild animals. Proceedings of the Royal Society B 288: 20210399. https://royalsocietypublishing.org/doi/full/10.1098/rspb.2021.0399

14. Langley JA, Grman E, Wilcox KR, Avolio ML, Komatsu KJ, Collins SL, Koerner SE, Smith MD, Baldwin AH, Bowman W, Chiariello N, et al (2021) Do trade-offs govern plant species' responses to different global change treatments? Ecology 103: e3626. https://doi.org/10.1002/ecy.3626

15. Li X, Sun Z, Lu S, Omasa K (2021) A multi-angular invariant spectral index for the estimation of leaf water content across a wide range of plant species in different growth stages. Remote Sensing of Environment 253:112230. https://doi.org/10.1016/j.rse.2020.112230

16. López-Sánchez A, Johnson I, Dirzo R, Perea R (2021) Matching species traits and microsites improves regeneration in mixed oak woodlands. Applied Vegetation Science 24(1):e12536. https://doi.org/10.1111/avsc.12536

17. Ma X, Wang T, Shi Z, Chiariello NR, Docherty K, Field CB, Gutknecht J, et al (2022) Long-term nitrogen deposition enhances microbial capacities in soil carbon stabilization but reduces network complexity. Microbiome 10:112. https://doi.org/10.1186/s40168-022-01309-9

18. Perea R, Dirzo R, Bieler S, Wilson Fernandes G (2021) Incidence of galls on sympatric California oaks: Ecological and physiological perspectives. Diversity 13(1):20. https://doi.org/10.3390/d13010020

19. Rao K, Ulloa YJ, Bienert N, Chiariello NR, Holtzman NM, Quetin GR, Peters ST, Winstein K, Castelletti D, Schroeder DM, Konings AG (2022) Side-facing UHF-band radar system to monitor tree water status. Proc. of the 2022 IEEE International Geoscience and Remote Sensing Symposium IGARSS. https://ieeexplore.ieee.org/document/9883620

20. Shoemaker LG, Hallett LM, Zhao L, Reuman DC, Wang S, Cottingham KL, Hobbs RJ, Castorani MC, Downing AL, Dudney JC, Fey SB (2022) The long and the short of it: mechanisms of synchronous and compensatory dynamics across temporal scales. Ecology 103(4):e3650. https://esajournals.onlinelibrary.wiley.com/doi/10.1002/ecy.3650

21. Sikes K, Buck-Diaz J, Evens JM (2021) Vegetation classification of alliances and associations in San Mateo County, California. California Native Plant Society. https://www.cnps.org/wp-content/uploads/2022/02/veg-sanmateo_county-classification- 2021.pdf

22. Song C, Uricchio LH, Mordecai EA, Saavedra S (2021) Understanding the emergence of contingent and deterministic exclusion in multispecies communities. Ecology Letters 24: 2155-68. https://doi.org/10.1111/ele.13846

23. Torres-Martínez L, Porter SS, Wendlandt C, Purcell J, Ortiz-Barbosa G, Rothschild J, et al (2021) Evolution of specialization in a plant-microbial mutualism is explained by the oscillation theory of speciation. Evolution 75(5):1070-86. https://doi.org/10.1111/evo.14222

24. Viteri M and Hadly E (2021) Bothersome burrowers: tracking gopher *(Thomomys bottae)* time-averaging in a late-Holocene site in California. https://ecoevorxiv.org/repository/view/3883/

25. Viteri MC and Hadly EA (2022) Spatiotemporal impacts of the Anthropocene on small mammal communities, and the role of small biological preserves in maintaining biodiversity. Frontiers in Ecology and Evolution. Aug 15:748.

26. Walter JA, Hallett LM, Sheppard LW, Anderson TL, Zhao L, Hobbs RJ, Suding KN, Reuman DC (2021) Micro-scale geography of synchrony in a serpentine plant community. Journal of Ecology 109(2):750-62. https://doi.org/10.1111/1365-2745.13503

27. Walter JA, Shoemaker LG, Lany NK, Castorani MCN, Fey SB, et al (2021) The spatial synchrony of species richness and its relationship to ecosystem stability. Ecology 102(11): e03486. https://doi.org/10.1002/ecy.3486

28. Wang C, Christman LE, Klemperer SL, Glen JM, McPhee DK, Chen B (2022) Assessment of a claimed ultra-low frequency electromagnetic (ULFEM) earthquake precursor. Geophysical Journal International 229(3):2081-95. https://doi.org/10.1093/gji/ggab530

29. Yang J, Zhang Y, Du L, Liu X, Shi S, Chen B (2021) Improving the selection of vegetation index characteristic wavelengths by using the PROSPECT model for leaf water content estimation. Remote Sensing 13(4): 821. https://doi.org/10.3390/rs13040821

30. Zalasiewicz J, Waters CN, Ellis EC, Head MJ, Vidas D, Steffen W, Thomas JA, Horn E, Summerhayes CP, Leinfelder R, McNeill JR, Gałuszka A, Williams M, Barnosky AD, et al (2021) The Anthropocene: Comparing its meaning in geology (Chronostratigraphy) with conceptual approaches arising in other disciplines. Earth's Future 9: e2020EF001896. https://doi.org/10.1029/2020EF001896

DISSERTATIONS & THESES

1. **Dlott GA** (2021) A morphology framework for understanding fungal-bacterial interactions in soil. PhD Dissertation, Biology, Stanford University.

2. **Gharehaghaji M** (2021) Connectivity and change in oak-dominated forests. PhD dissertation, Biological Sciences, Univ. of Illinois at Chicago.

3. **Meyer JM** (2022) Rewiring of food webs in the Anthropocene: measuring the effects of novel species interactions with environmental DNA. PhD Dissertation, Biology, Stanford University.

4. **Rao KK** (2022) Parched plants to flaming forests: understanding tree mortality and wildfires with microwave remote sensing of vegetation water stress. PhD Dissertation, Earth System Science, Stanford University.

5. **Redondo SA** (2022) Signals of an insidious pollutant: temporal, spatial, and biotic interplay of mercury in a terrestrial ecosystem. PhD Dissertation, Biology, Stanford University.

6. **Ueda JMW** (2022) Long-term avian responses to drought and urbanization in Northern California. Undergraduate Honors Thesis, Biology, Stanford University.

7. **Viteri MC** (2022) Exhuming the dead to save the living: fingerprints of the Anthropocene on California's faunal communities. PhD Dissertation, Biology, Stanford University.

The collapsed limb of a Valley Oak in 2018 exposed a cavity midden that Maria Viteri studied early in her dissertation research.

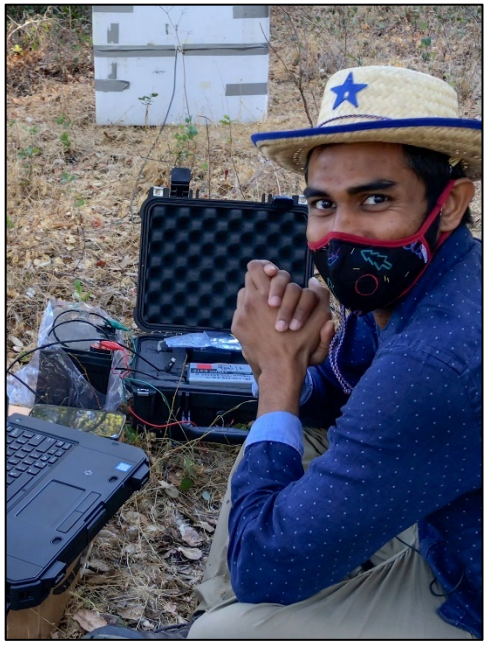
Water over the Searsville dam. Credit: Dan Quinn

Featured Dissertations

The following synopses feature the four dissertations from the preceding list that were filed during the 2021-22 academic year. The others were filed earlier in 2021.

Jordana Meyer (*top left, photo credit: Simon Morgan*) developed and evaluated methods to analyze ecological interactions at Jasper Ridge using diet DNA (dDNA), and then demonstrated their global application by analyzing diets of forest and savanna elephants—and their hybrids—in the Democratic Republic of Congo. At JRBP, Jordana found that network theory crystallized a food web faster and more accurately when based on dDNA than on camera-trapping or soil environmental DNA (soil eDNA). The food web pointed to diet overlap as a driver of competition, and identified tri-trophic chains in which a trophic cascade was regulated by a top predator. An example of her findings in the DRC is that habitat and resource use by forest elephants expanded when the population also included hybrid individuals. Jordana's tools provide a rapid, non-invasive, globally applicable way of analyzing how the loss or gain of new species can unravel and reweave a food web.

Krishna Rao (*top right*) identified new methods for measuring water stress in vegetation and predicting the chain of consequences for drought-driven forest mortality and wildfire hazard across California. He applied microwave radar technology to measure water stress at the hectare scale within Jasper Ridge, and derived a new index of water stress at larger scales based on satellite measurements; he found that those tools accounted for forest mortality in California better than all existing metrics. Krishna also derived a way to map live fuel moisture from satellite data. Krishna's new methods provide a predictive understanding of the extent of burned area across the western United States and how it is expanding in a warming climate.



Sergio Redondo (*bottom left, facing page, photo credit: Jessica Delgado*) examined the input and fate of mercury in and around Jasper Ridge by tracking a timeline of mercury in Searsville Reservoir sediments, mapping its concentration across vegetation types, and tracing food web distribution in soil arthropods. In the reservoir sediments, Sergio found that mercury levels roughly doubled during the last century, relative to the preindustrial baseline, and then declined in recent decades. Comparing across habitats, mercury levels in soil were highest in closed-canopy forest, suggesting that the amount, height, and evergreen-ness of vegetation may play a role in the uptake or deposition of mercury. Once in the soil, retention of mercury is regulated in part by soil chemistry. Sergio's research is one of the first sub-annual records of mercury in lake sediments.

Maria Viteri (*bottom right, facing page, photo credit: Maria Viteri*) examined diverse animal assemblages across Jasper Ridge and the Bay area to characterize anthropogenic impacts over multiple time scales. She examined changes in small mammal communities over several thousand years by comparing skeletal remains in archaeological deposits versus those from recent raptor pellets. She found that small mammal communities in urban areas are fundamentally different from those several thousand years ago, but in protected areas like Jasper Ridge, the differences are much smaller. Using radiocarbon dating, Maria also found that the burrowing activity of pocket gophers can scramble the stratified timeline within an archaeological site, a result that may apply broadly across the American West. By contrast, the stratification of sediments in Searsville Reservoir is well conserved, and Maria found changes in microcrustacean communities across strata that aligned with inputs of toxins. Her results add to the significance of Searsville Reservoir as a record of the Anthropocene.

Black-tailed deer (Odocoileus hemionus) in Searsville Reservoir. Credit: Dan Quinn

FINANCIALS

Expenditures - $1,404,648.05

Administration	$20,201.03
Operations	$78,949.07
Land Management	$30,942.40
Education and Outreach	$47,188.86
Research*	$122,755.91
Salary and Fringe	$1,104,610.78

Revenues - $1,421.472.50

General Income	$38,392.04
University H&S	$232,418.32
Gifts	$128,871.99
Grants	$60,414.05
Endowment Income**	$961,376.10

Rainbow on the horizon.

Expenditures and revenues only include funds controlled by JRBP, the vast majority of which are for direct support of maintaining the preserve for users. Most users fund their work from non-JRBP sources.

** Includes $83,325.79 post-doctoral salary and fringe.*

*** Includes $83,000.00 from an endowment administered by the Biology Department but restricted for use by JRBP. Revenues and expenditures do not include student support provided by the Philippe Cohen Graduate Student Fellowship, which is administered out of Biology.*

Operations Manager, Steve Gomez, with the Jasper Ridge tractor.

ADVISORY GROUPS

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RICK DEBENEDETTI - Woodside Trail Club

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DON BULLARD - Woodside Fire Protection District

MARY ELLEN HANNIBAL - Citizen science, nature writer

JERRY HEARN – Grassroots Ecology, Jasper Ridge docent

LAURA JONES - Stanford Land Buildings and Real Estate, Department of Archaeology

KELLY KLINE - Associate Vice President, Local Government Affairs

JACKIE MAGNO - Stanford University Distinguished Career Institute, Jasper Ridge docent, Neighbor

BETSY MORGENTHALER - Jasper Ridge docent

TRISH MULVEY - Palo Alto Community Volunteer

HELEN NUCKOLLS - SLAC National Accelerator Laboratory

DIANE RENSHAW - Jasper Ridge docent

HEYWARD ROBINSON - Vice President, Oakbio, former mayor, Menlo Park, former Chairman, San Francisquito Creek Joint Powers Authority

JEANNE SEDGWICK – Neighbor, Jasper Ridge docent

ANNE SCHULOCK - Assistant Vice President for the Arts, Stanford University

DAVID SMERNOFF - Grassroots Ecology

LYNN STEGNER - Stanford Continuing Studies Program, author, editor, literary consultant

KARINE TOKATLIAN - Midpeninsula Regional Open Space District

SUSAN WITEBSKY - SLAC National Accelerator Laboratory

ERIC WRIGHT - Senior University Counsel, Stanford University

JONATHAN YOUNG - Presidio Trust

TOM ZIGTERMAN – Stanford University Water Resources and Civil Infrastructure

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BEN MORAN - Graduate Student Representative, Biology

ELIZABETH HADLY - JRBP Faculty Director, Biology

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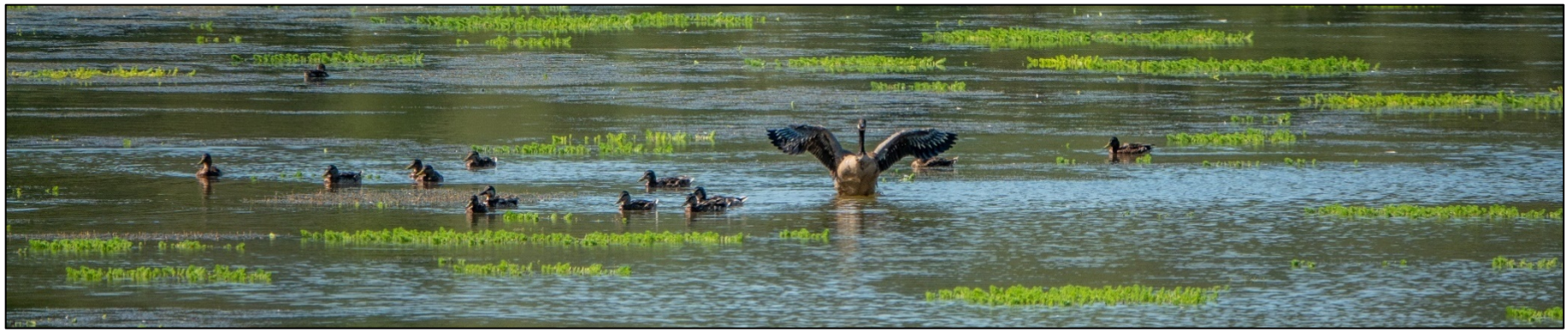

Canada geese (Branta canadensis). Credit: Dan Quinn

2021-22 STAFF

From left to right:

Seth Tanen
Administrative Program Manager

Brooke Fabricant
Resident Ranger

Kabir Peay
Acting Faculty Director, Fall 2022

Elizabeth Hadly
Faculty Director

Jorge Ramos
Incoming Executive Director

Allison Stegner
Postdoctoral Scholar

Nona Chiariello
Staff Scientist

Steve Gomez
Operations Manager

Tony Barnosky
Outgoing Executive Director

Sheena Sidhu
Staff Scientist

Kelly Chauvin
Special Projects

Trevor Hébert
Academic Technology Specialist

STAFF CHANGES

New to Jasper Ridge are Seth Tanen and Sheena Sidhu. Seth has stepped in as Administrative Program Manager for Dorian Golan, who retired in June. Previously, Seth provided administrative support to the chair of the Department of Biology, the Cyert Lab, and the Kopito lab.

Sheena filled a new Staff Scientist position focusing on stewardship. She will be working closely with the wide variety of students, faculty, other Stanford staff, agencies, and consulting firms to ensure that two major projects underway at Jasper Ridge—the Searsville Watershed Restoration Project and the Fire Fuels Reduction Project—dovetail with our many academic programs and inform best practices applicable far beyond Jasper Ridge. Before joining Jasper Ridge, Sheena managed a forest health and fuel reduction program for the San Mateo County Resource Conservation District.

Congratulations to Jorge Ramos who assumed the role of Jasper Ridge Executive Director on October 1, replacing Tony Barnosky who has been in the position for the past 6-and-a-half years. Jorge previously was Jasper Ridge's Associate Director for Environmental Education, a position which will be filled this fiscal year.

Steven Gomez was promoted from Facilities Specialist 2 to Facilities Specialist 3 in recognition of the multi-faceted and complex tasks associated with managing the operations of 1193 acres, ten miles of roads and 10 miles of trails, multiple buildings and vehicles. Congratulations, Steve!

"Jasper" the newborn lamb was an unexpected result of browsing and grazing fire treatments near Mapache Gate.

Late summer on Road F. Credit: Alice Cummings

A flock of red-winged blackbirds (Agelaius phoeniceus). Credit: Dan Quinn

To support our work

https://jrbp.stanford.edu/donate

For more opportunities to support Jasper Ridge

Contact David Tozer, Office of Development

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