Jasper Ridge Biological Preserve

'Ootchamin 'Ooyakma

2023-2024 Annual Report

Cover: Acorn woodpecker *(Melanerpes formicivorus)* with a beakful of insects. **Photo by Dan Quinn**

Inside cover: Wildflowers blooming on fire road in the serpentine areas. **Photo by Robert Siegel**

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Bald eagle *(Haliaeetus leucocephalus)* in flight over Searsville reservoir. **Photo by Robert Siegel**

Mission, Vision, and Pledge

Land Acknowledgment

We recognize that Jasper Ridge Biological Preserve ('Ootchamin 'Ooyakma) 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 Acknowledgment 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.

From the Directors

Tadashi Fukami, Faculty Director

It leaves us with a sense of awe to reflect on the last fifty years of research and education at Jasper Ridge Biological Preserve ('Ootchamin 'Ooyakma). One defining feature of many projects at JRBP ('O'O) is that they uncover fundamental, place-independent principles that apply not just at the preserve, but generally across the world. A common reason why these projects yield novel insights is that they are conducted over a long period of time by the same individuals. Basic concepts developed here, like coevolution, metapopulation, carbon balance, etc., come to mind as examples.

Over the next fifty years, a key question we will need to confront is how to make our efforts more relevant not only as curiosity-driven work but also as meaningful contributions toward land stewardship for environmental sustainability. Despite important work being done, the worsening environmental crisis makes it clear that efforts made thus far are inadequate.

This is where Indigenous science comes in as the largely neglected intellectual twin of Western science. Rather than always prioritizing globally applicable principles, as we do as Western scientists, we need to also value local, place-based knowledge, seeing humans as humble members of the local ecological community. Similarly, instead of always viewing individuals as the primary agents of research and education, communal learning across many generations over millennia must be recognized for its time-tested wisdom. These are both central to Indigenous science.

Indigenous science provides the intellectual scaffold that guides Western science, whereas Western science can help Indigenous science as a tool for new discovery. This is why “two-eyed seeing,” caring for the land using both Indigenous and Western science, is stronger than either alone.

JRBP ('O'O) will continue to foster Western science. Simultaneously, we are also committed to promoting wider and deeper appreciation and implementation of Indigenous science. This requires seeking guidance from local Indigenous groups and collaborating with mutual respect. The 'Ootchamin 'Ooyakma campout for tribal youth education, proposed by the Chairwoman of the Muwekma Ohlone Tribe, is one of the initial steps we took to embody this commitment in 2024.

The major challenges that we will face at JRBP ('O'O) over the next decade and beyond, such as wildfire risk mitigation, Searsville watershed restoration, and invasive species management, provide perfect opportunities for two-eyed seeing.

We invite everyone to work together in this endeavor.

Chalcedon checkerspot (*Euphydryas chalcedona*), on the flower of the California yerba santa (*Eriodictyon californicum*). **Photo by Alice Cummings**

Jorge Ramos, Executive Director

The 2023-2024 academic year has been a landmark period for Jasper Ridge Biological Preserve (JRBP), now honored with the translation 'Ootchamin 'Ooyakma in the Muwekma Ohlone Chochenyo dialect. This transformative year celebrates our 50th Anniversary as we join our new faculty director, Professor Tad Fukami, in his invitation to adopt a two-eyed seeing approach, using both Indigenous and Western sciences, to strengthen our research, education, and stewardship activities. We celebrated Nona Chiariello's retirement and welcomed new staff, Adriana Hernández (Spring 2024) and Elise DeBuysser (Fall 2024) to our team!

The fall and spring activities were anchored by the anniversary events. The fall event celebrated notable contributions from Nona Chiariello, Rodolfo Dirzo, Cindy Wilber, Bill Gomez, Hal Mooney, and Paul Ehrlich; all emphasizing the preserve's historical significance and future potential in research, education, and conservation. The spring research symposium showcased the breadth of research and five decades of continuous scientific inquiry and groundbreaking research, highlighting JRBP ('O'O)'s pivotal role in population biology, disturbance ecology, and Indigenous stewardship among others.

This year, we reduced wildfire risk through a significant fuel-reduction project, showcasing our dedication to mitigating climate-related risks through innovative practices. A pile burn project in March 2024 that weaved Indigenous practices, research, and education, spotlighted our commitment to proactive two-eyed seeing stewardship. This initiative aims to improve wildfire resilience for our neighboring community and provide a living laboratory for fire-related research, new educational opportunities, and partnerships with Tribes and local agencies.

The summer celebration recognized the graduates of the Ecology and Natural History of Jasper Ridge class, the new Stewardship Interns, and the winners of the Environmental Scholar Award reinforced our commitment to fostering the next wave of leaders in broad socio-ecological issues. Their enthusiasm and innovative projects are a testament to the enduring impact of hands-on education within natural preserves. This joyful event underscored community involvement and the celebration of new talent ready to contribute to the Preserve's ongoing mission.

Collectively, these milestones reflect a year of innovation, community engagement, and proactive stewardship. The journey at 'Ootchamin 'Ooyakma highlights the vital role of field stations and preserves in addressing global challenges. Jasper Ridge will continue undergoing changes to adapt to fuel reduction maintenance efforts and the Searsville watershed project which will bring unique opportunities for innovative research and education. We extend our heartfelt gratitude to our community for your unwavering support and look forward to building on these strong foundations for an exciting future together. I invite you to enjoy the annual report that captures the essence of our journey, celebrating achievements and laying the groundwork for future success.

Gracias and see you up here at the ridge!

Tidy tips *(Layia platyglossa)* and owl's clover *(Castilleja exserta)*. **Photo by Dan Quinn**

50th Anniversary

In celebration of the 50th anniversary of Jasper Ridge Biological Preserve ('Ootchamin 'Ooyakma), two major events were held, underscoring its mission to contribute to the understanding of Earth's natural systems through research, education, and stewardship. The first event, which took place on November 30, 2023, drew over 120 participants. Jorge Ramos opened the program by highlighting the preserve's significance for research and teaching within the department and the broader Stanford community. Faculty Director Tad Fukami introduced panelists Nona Chiariello, Rodolfo Dirzo, Cindy Wilber, and Bill Gomez, who shared their thoughts on Jasper Ridge's past, present, and future, emphasizing the pioneering research of Paul Ehrlich and Hal Mooney. Specifically, Nona reminisced about the early studies by Paul Ehrlich on the Bay checkerspot butterfly, and Hal Mooney's pioneering work in plant ecophysiology, which introduced concepts such as metapopulation, coevolution, and carbon balance. Paul Ehrlich and Hal Mooney, in conversations with Chris Field, shared messages that reinforced Jasper Ridge's unparalleled value as a research facility, attributing much of their scientific accomplishments to the unique opportunities Jasper Ridge affords.

← **Scan the QR code to learn more about the event and view the recording.**

The research symposium was held on April 15, 2024, where speakers from various disciplines gathered to listen to cutting-edge research and discuss the future of Jasper Ridge against the backdrop of environmental challenges. Researchers highlighted the critical role of field stations like Jasper Ridge in advancing research, education, conservation, and outreach. The symposium included insights from Indigenous community members on restoring cultural preservation through ecological restoration efforts. There was an overlap in presentations that discussed the lasting impacts of historical land use and the importance of learning from past disturbances to guide future stewardship practices. Speakers included: Laura Jones, Esak Ordoñez, David Freyberg, Adriana Hernández, Lauren Hallett, Nona Chiariello, Erin Mordecai, Johannah Farner, Lydia Villa, Amaury Payelleville, Mary Beth Mudgett, Deborah Gordon, Rodolfo Dirzo, Philippe Cohen, Elizabeth Hadly, and Sheena Sidhu. The event concluded with a forward-looking panel that reaffirmed Jasper Ridge's role in tackling environmental challenges through collaborative efforts and community engagement. Together, these events illustrated Jasper Ridge's enduring legacy, strength in its community, and its continuing mission to foster a deeper understanding of Earth's natural systems. Visit our website to read the full story and watch a recording of the event.

← **Scan the QR code to learn more about the event and view the recording.**

Small images, clockwise: David Freyberg, Tad Fukami, Jorge Ramos, Hal Mooney, Deanna Messinger, Philippe Cohen, Samantha Faul, Sheena Sidhu, and Adriana Hernández. **Photos by Herschell Taghap**

Middle: Panelists Bill Gomez, Cindy Wilber, Rodolfo Dirzo, Nona Chiariello, and Tad Fukami with speaker Chris Field. **Photo by LiPo Ching**


Stanford | Jasper Ridge Biological Preserve
SCHOOL OF HUMANITIES & SCIENCES

Education and Outreach

We've had another successful year bringing Stanford classes, units, and regional schools to Jasper Ridge. Lead faculty Rodolfo Dirzo, Associate Director of Environmental Education Katie Glover, and TAs Sydney Schmitter and Diego Perez taught the 49th iteration of "Ecology and Natural History of Jasper Ridge Biological Preserve." Nearly 50 years of student projects were compiled in a new course alumni directory, available on the website for Jasper Ridge affiliates. Class "Introduction to Research in Ecology and Evolutionary Biology" continues its long-standing field component at Jasper Ridge with our local flora and fauna as study systems. Dr. Yingtong Amanda Wu, Lecturer in Biology, brings her expertise in local oak and microbial populations and has innovated an exciting data-driven, hands-on curriculum.

In November 2023, Jasper Ridge hosted the first in-person All-Hands Symposium for students and partners in the NSF-funded SOAR network fostering discussions on brainstorming, goal-setting, and evaluation feedback for the years ahead. By the end of the 2024 semester, our student survey showed success in building fieldwork skills, content knowledge, and a sense of belonging among students.

High school visits more than doubled in 2023-2024. Environmental AP courses at Menlo-Atherton High School and Woodside High School continue their winter watershed activities and inspired Sequoia High School to visit. Biology PhD student, Billie Goolsby, and the Diversity and Access Office were instrumental in bringing California School of the Deaf students to Jasper Ridge for interpretive tours. Bioengineering hosted Emery High and June Jordan High for Foldscope workshops, featured in the *Stanford Report.* The Stanford SEEDS chapter founded in 2007, continues its outreach efforts and went to Redwood High School to provide programs on geologic time, ecological interactions, and fungi for students in the Redwood Environmental Academy of Leadership program.

Jasper Ridge's Continuing Education group offered programming on a diverse range of topics. The year kicked off with the revival of an Astronomy Night program, which was attended by over 40 docents and local astronomers who set up their telescopes. The session "Animal Venoms and Toxins" fascinated our community, and docent Deanna Messinger brought art to the program with a three-part en plein air painting series. The spring Wildflower Walk, assisted by the Oakmead Herbarium crew members, continues to be an annual favorite.

Front row, left to right: Rodolfo Dirzo, TA Diego Perez, TA Sydney Schmitter, Kat Lai, Eva Yu Shen, Kiara Fufunan, Isabella Cruz-Krahn. Middle row: Kelley Langhans, Calvin Probst, Katie Savage, Laney Conger, Tina Trung. Back row, left to right: Rodrigo Bello Carvalho, Marty Freeland, John Lowndes, Varun Shirhatti, Kim Beil, Derek Knowles, AJ Naddaff, Pearl Shing-Roth, Sue Schmitt, Katie Glover. **Photo by Robert Siegel**

New Research

Hilary Bayer, Tad Fukami (UCSB, Biology) Changes to Flying Insect Populations Accompanying Modification of Searsville Dam
Nona Chiariello (JRBP ('O'O)) Planting Western Leatherwood *(Dirca occidentalis)* on Stanford lands
AyoOluwateso Coker, Devaki Bhaya, Scott Fendorf (Earth System Science, Carnegie Biosphere Sciences & Engineering) Prescribed Burn in Jasper Ridge: A Watershed Investigation
Jeff Dukes (Carnegie, Global Ecology) An array of microclimate sensors around the vegetation in the pile burns
Chrystanthe Frangos, Rodolfo Dirzo (Earth System Science, Biology) The impact of granivorous small mammals on acorn distribution beneath nurse plants
Marty Freeland, Trevor Hébert, Rodolfo Dirzo (Biology, JRBP ('O'O), Earth System Science) Trends in avian community composition at Jasper Ridge Biological Preserve ('Ootchamin 'Ooyakma): short-term vs. long-term change
Bill Gomez (JRBP ('O'O)) A camera trap study on how fuel reduction treatment affects nesting behavior in San Francisco dusky-footed woodrats
Tanvi Gupta, Manu Prakash (Biology, Bioengineering) Prototyping GoPro imaging for crayfish monitoring
Dena Grossenbacher, Magdalene Lo, Kathleen Kay (Cal Poly SLO, UCSC) The genetic basis of edaphic adaptation and the maintenance of flower color variation in variable linanthus, *Leptosiphon parviflorus*
Trevor Hébert, Jorge Ramos, Tad Fukami (JRBP ('O'O), Biology) Long-distance and long-term avian research at the preserve and around the world through the Motus Wildlife Tracking System
Hugh Henry (University of Western Ontario) Legacy effects on soil carbon, carbon quality, and soil microbial community composition following a 25-year-old study on the response of California grasslands to environmental factors changing globally
Adriana Hernández (JRBP ('O'O)) Vegetation recovery, fire followers and seeds responding to fuel reduction treatments
Madeline Hodge, Barnabas Daru (Earth System Science, Biology) Investigating plant-microbe responses to climate change using fresh and preserved herbarium specimens
Lihan Huang, Esther Cole (Environmental Engineering, Stanford Conservation Program) Survey of redwood trees to estimate carbon storage
Katie Huy, Kiara Fufunan, Scott Fendorf (Earth System Science) Investigating the impacts of prescribed fire on microbially-mediated biogeochemical cycling
Samantha Levine, Richard Ree (University of Chicago) The genetic and ecological divergence of *Pedicularis densiflora* and *P. aurantiaca*
Alandra Lopez, Claudia Avila, Katie Huy, Scott Fendorf (Earth System Science, University of San Diego) Biogeochemical response of different ecosystems to prescribed fires
John Lowndes, Sheena Sidhu (Earth Systems Science, JRBP ('O'O)) Assessing population health of California black oaks *(Quercus kelloggii)*
Noah Macias, Adriana Hernández, Trevor Hébert, Rodolfo Dirzo (Earth System Science, JRBP ('O'O), Biology) Leveraging long-term avian data to explore variation in avian communities as a factor of biotic and abiotic variables

Julien Marty, Jonah Merritt, Greg Beroza (UC Berkeley Seismology Lab, Geophysics) Upgrading seismic instruments at Jasper Ridge to support earthquake safety for the state
Rosa McGuire, Tad Fukami (Biology) Temperature effects on community assembly using nectar microbes of sticky monkeyflower
Alex Mondragon, Chrysanthe Frangos, Rodolfo Dirzo (Biology, Earth System Science) Using camera traps to investigate how the density of coyote brush impacts small mammal behavior
Avaneesh Narla, Daniel Fisher, Benjamin Good (Applied Physics) Social caterpillar behavior changes in response to various auditory signals and substrates
Daniel Neamati, Grace Gao (Aeronautics and Astronautics) 3D Reconstruction of Ecosystem Response at the Wildland-Urban Interface
Andrea Nebhut, Jeff Dukes, Tad Fukami (Biology, Carnegie Global Ecology) How trait differentiation and climatic stress moderate competition and coexistence between native and invasive plants
Autumn Parrott, Katherine Xue, David Relman, KC Huang (Engineering & Medicine, Bioengineering) The effects of seasonal rainfall on leaf microbial communities in coast live oaks, *Quercus agrifolia*
Amaury Payelleville, Tad Fukami (Biology) The effect of prescribed burns on the diversity and abundance of nematodes, fungi, bacteria, and other microorganisms
Amaury Payelleville, Tad Fukami (Biology) Oaks as microbiotic islands or 'lonely oaks'
Manu Prakash, Ethan Li (Bioengineering) Developing a framework for mapping how aquatic ecosystems evolve over time
Nicholas Rodriguez, Sheena Sidhu (Biology, JRBP ('O'O)) Measuring the effect of fuel reduction treatments on arthropod abundance and diversity in the coast live oak *(Quercus agrifolia)* understory
Maria Nguyen, Flora Rutaganira (Biochemistry) Isolating putative colonial choanoflagellates to study complex life cycles and phylogenetic relationships
Lydia Villa, Chris Field (Biology, Earth System Science) The effects of prescribed fires and other fuel reduction management strategies on vegetation regeneration
Adrian Wackett, Jane Willenbring (Earth and Planetary Sciences) Alterations to soil geomorphology in response to prescribed fires and interpreting past soil erosion using isotopes
Maya Xu, Rodolfo Dirzo (Biology, Earth System Science) Walking on eggshells: the dietary composition of the Hoover Tower's peregrine falcons, golden eagles at Jasper Ridge Biological Preserve ('Ootchamin 'Ooyakma) and connections to west coast raptor ecology
Maya Xu, Marty Freeland, Rodolfo Dirzo (Biology, Earth System Science) Bird Survey Methodologies at Jasper Ridge Biological Preserve ('Ootchamin 'Ooyakma) and TomKat Ranch
Ao Yu, Giculio De Leo (Earth System Science) The effect of plastic on aquatic snail abundance and potential interactive effects between molluscicides and microplastics
Jessica Yu, Michael Wara (Woods) Quantifying and characterizing particulate matter from prescribed fire smoke: Towards developing a standardized monitoring protocol

Stewardship

At the preserve, fuel reduction goals are combined with goals of maintaining ecological integrity in order to fulfill the Jasper Ridge mission of research, education, and conservation. JRBP ('O'O) guidelines are detailed in the preserve's white paper titled Recommendations for Merging Fire Fuel Mitigation with Stewardship Practices. The highlight of this year's stewardship activities was certainly the prescribed pile burn that occurred in Spring 2024 as a part of our efforts to increase wildfire resilience and community safety. Although prescribed fire is not new to the Ridge, this event scaled up from previous burns and opened the door to consider using "good fire" as a regular tool in fuel reduction and ecosystem restoration. Along the Westridge perimeter, vegetation that was cut and piled the previous fall was burned covering 3 acres (1.2 ha) of chaparral and 3 acres (1.2 ha) of oak woodland. The event provided a unique opportunity to connect research, education, stewardship, and community simultaneously. Researchers utilized the burn to examine the effects of fire and smoke in a controlled environment. Students gained firsthand experience in observing active stewardship, while the Jasper Ridge staff fostered meaningful relationships with the local community and the Muwekma Ohlone Tribe during the preparation for the burn.

Other stewardship activities included maintaining a partnership with our LBRE main-campus partners to work on maintenance of our 2023-2024 fuel reduction areas. As the Searsville Watershed Restoration Project (SWRP) progressed we pursued new research opportunities that were highlighted at the Watershed Restoration Conference in December 2023. The event was hosted by Faculty Director Tad Fukami and organized by the Stanford Graduate School of Business and the Doerr School of Sustainability.

In Summer 2024, John Lowndes and Nick Rodriguez were selected to be the second cohort of the Jasper Ridge Stewardship Interns. Nick and John worked with Sheena Sidhu in the field to collect data to measure the outcomes of vegetative fuel reduction and help develop materials for the upcoming comprehensive invasive plant species management plan. The Jasper Ridge Stewardship Intern program is funded by the Maxwell/Hanrahan Foundation.

Top: Charlene Nijmeh, Chairwoman of the Muwekma Ohlone Tribe of the San Francisco Bay Area and Joey Iyolopixtli Torres, member of the Tribe, provide a blessing in the native Chochenyo language for firefighters shortly before the pile burn at Jasper Ridge Biological Preserve ('Ootchamin 'Ooyakma). **Photo by Staff**

Middle: Firefighters ignite a pile with drip torches at Jasper Ridge Biological Preserve ('Ootchamin 'Ooyakma). **Photo by Harry Gregory**

Bottom: Pile burning and Fremont star lily *(Toxicoscordion fremontii)* growing near a pile burn scar. **Photo by Staff**



2023-2024 Jasper Ridge Environmental Education Scholar Awardees, Chrysanthe Frangos, Diego Perez and Shreya Garg. **Photos provided by students**

Education: Featured Students

The **Jasper Ridge Environmental Education Scholar Award** recognizes students who have engaged in meaningful environmental education activities at or related to Jasper Ridge Biological Preserve ('Ootchamin 'Ooyakma). Recipients are Stanford undergraduate or coterm students who demonstrate leadership in education and commitment to an inclusive learning community. The 2023 award was given to Chrysanthe Frangos for her coordination of biology and environmental programs at the Redwood Environmental Academy of Leadership with the SEEDS student chapter. Chrysanthe has been a leader within SEEDS and is now president of the chapter. In addition, she recently completed a study that used camera traps at Jasper Ridge to study small mammal activity and herbivory on native plants. She served as a mentor to other students and included docents of Jasper Ridge as research assistants.

The 2024 award was shared by Shreya Garg and Diego Perez. Diego, a co-term student in Biology, has led numerous tours for local high school and community groups and was a key member of the BIO/ESYS 105 teaching team. His commitment to community outreach has been integral to the preserve's educational efforts. Shreya, a Bioengineering undergraduate and JRBP('O'O) Ranger, enhanced social media outreach for Jasper Ridge and helped organize workshops for Title 1 high school students in Spring 2024. She has been recognized for her work in fostering an inclusive learning environment and her dedication to science education.

Join us in congratulating these outstanding recipients!

Research: Featured Student

Featured Student Research – Maya Xu

My research life at the preserve has been nested within its charismatic collective of avian life. I started my ecology journey by lime-squeezing 450 green plasticine caterpillars for my BIO/ESYS105 project on bird-insect predation across an urbanization gradient. My first foray into ornithological work taught me that field research is always filled with the unexpected (who would have guessed that sweet-toothed honeybees would completely wreck my study design?), at times decidedly unglamorous, but simultaneously filled with incredible joy. It was also the first of my collaborations with my advisor, Rodolfo Dirzo, who along with the Dirzo lab has become a critical anchor and influence on my life.

Some of my most cherished memories at the preserve come from my avian survey days - learning warbler songs at my monthly Transect C's, piloting AudioMoth recording devices and kayaking with breeding soras *(Porzana carolina)* at Upper Lake, and getting to extract and hold songbirds at the banding station.

Now in my senior year, I've been extremely fortunate to study Jasper Ridge's beautiful golden eagles as part of my honors thesis, which investigates the impacts of toxicants on west coast raptor communities. Scrambling down the ridge with Rodolfo and my other Jasper Ridge mentors to retrieve all kinds of wacky dietary materials (including but not limited to a whole rabbit's foot, an opossum skull, and detritivore-encrusted pellets of all shapes and sizes) is definitely a highlight of my ecology career and one that keeps me going as I continue the long process of analyzing those samples in an underground lab.

My time at Jasper Ridge has taught me how to interpret the natural world around me, and I'm so excited to continue studying the stunning biodiversity that calls Jasper Ridge home under the wings of my incredible mentors.

Stewardship: Featured Student

Featured Student - Zander Opperman

Jasper Ridge has been a wonderful laboratory for over half a century now. I was honored to help contribute to one of its newest stewardship initiatives, prescribed burning as a tool for fuel reduction and wildfire risk mitigation, as a 2023-2024 Living Lab Fellowship. Jasper Ridge has recognized the need for sustainable, ecologically informed, and community-engaged fire and fuel management. As a Living Lab Fellow, I assisted staff scientist Sheena Sidhu and other JRBP ('O'O) staff in preparing permitting and logistical plans, reviewing the burn plan, and interviewing stakeholders from across Stanford before and after the prescribed pile burns in March 2024. In the case study report "Fire on the Ridge," I highlighted the enormous collaboration that allowed the project to be a great success while also documenting lessons for future projects to learn from. However, the most fun was being able to help light piles as a certified wildland firefighter.

The experience gave me a hands-on opportunity to help steward this piece of land that so many of us love. I also learned more about practical, on-the-ground, engaged land management. I have continued my involvement with the prescribed burn project through my undergraduate honors thesis investigating the presence of metals in the ash and soil after the burns.

Technology: Project

In May of 2024, Trevor Hébert set up Jasper Ridge's first Motus station near Searsville Reservoir. The station consists of a receiver unit, which connects to the preserve's wireless network, and specialized antennas that detect radio signals from the Motus transmitter tags. The debut of the Motus station generated immediate interest and excitement, similar to the introduction of camera traps back in the mid-2000s. Motus technology at Jasper Ridge will be especially useful for building a baseline of migratory animals prior to the Searsville Watershed project and contribute to our knowledge of bird migration routes along the Pacific Flyway.

Founded by Birds Canada, Motus is an international collaborative network of radio telemetry tracking stations run by research partners and organizations that automatically record the movements of migratory animals. The Motus automated radio telemetry system is a cost-effective way to accurately track a wide range of organisms - from birds to butterflies – at both local and international scales. Currently, there are over 2,000 Motus stations in 34 countries, with over 50,000 animals radio-tagged.

Motus opens new possibilities for scientific data gathering, allowing us to record phenomena that were previously impossible or impractical to study. Each Motus radio tag broadcasts a unique ID associated with the individual animal. Detections from each station are uploaded to the Motus database where they are combined with data from other stations to create timelines and maps. An animal's migration route can then be inferred by the line formed by sequential detections at Motus receivers.

From late June through mid-August, eight Swainson's thrushes (*Catharus ustulatus*) were captured by mist nets at the Jasper Ridge bird banding station and fitted with Motus radio transmitter tags by licensed bird bander, Julian Tattoni. In September, the first Swainson's thrush was detected in Baja California, Mexico. Subsequently, four more of the eight tagged birds have been detected at Motus stations along their southward migration route, including two that have recently made it as far as the state of Sinaloa in mainland Mexico. Motus has the capacity to show us the connections between Jasper Ridge and other locations and how these amazing creatures connect ecosystems across great distances.

← **Scan the QR code to visit our website for more information.**

Leslie Shao-ming Sun Field Station exterior upgrades. **Photo by Staff**

Operations: Project

The 2023-2024 academic year continued the process of upgrading the exterior of the Leslie Shao-ming Sun Field Station. Originally completed in 2002, this upgrade focused on removing the old redwood siding and replacing it with a faux wood polymer that is both fire-resistant and impervious to woodpeckers and rodents. Additional efforts were made to improve the exterior moisture barrier by incorporating fiberglass-coated gypsum board covered with an advanced polymer fabric.

By December, the girt system that holds the new siding in place had been installed and construction was on hold due to material delays. The new siding is expected to be in place by the late spring of 2025.

In collaboration with the School of Humanities and Sciences and Stanford Land, Buildings & Real Estate, the past year saw further efforts to clean up the old corporation yard. Old dilapidated structures were demolished and several trailers were cut up and recycled. Working with university surplus and H&S, many old derelict pieces of heavy equipment were also hauled away for recycling.

Aria Cazares, a youth member of the Muwekma Ohlone Tribe, examines a Swainson's thrush *(Catharus ustulatus)* as Julian Tattoni shows how to band a bird during the 'Ootchamin 'Ooyakma campout in July 2024. **Photo by Marina Luccioni**

By the Numbers: Education and Outreach

Educational Visits by Stanford Affiliates

2275 Student Visits
35 Classes
54 Departments And Programs
8 Schools And SLAC

Educational Visitors from Other Organizations

161 College Students
361 High School Students
885 Members of the Public
8 Colleges And Universities
8 High Schools
45 Partner Organizations

Total Educational Visits

3882 Stanford Visitors
1407 Other Organization Visits
938 Visits For Events
6227 Total Visits

By the Numbers: Research

4 **Stanford Schools**
12 **Academic Departments And Units**
97 **Academic Researchers**

27 **Stanford Faculty**
11 **Postdocs And Visiting Scholars**
20 **Graduate Students**
21 **Undergraduates**
18 **University Staff**

Totals

107 **Researchers**
86 **Projects**
31 **Publications**
3 **Countries Represented**

By the Numbers: Stewardship

Stewardship at Jasper Ridge is a team effort with partners from the Wildfire Resilience team, SLAC and other local and stage agencies.

Complete and shaded fuel breaks along fence lines

38.1 **acres (15.4 ha)** Westridge area
22.4 **acres (9 ha)** Sand Hill Road area

Prescribed pile burning

6 **acres (2.4 ha)** Westridge area

Building defensible space

1 **acre (0.4 ha)** Sun Field Station

Annual maintenance

40 **acres (16.2 ha)** Fire roads and staging areas
11.5 **acres (4.6 ha)** Grazing
23 **acres (9.3 ha)** SLAC corridor with SLAC partners

4 **N5 sensors installed to detect wildfire in partnership with Stanford Wildfire Resilience team**

Congratulations

Master's Thesis
Awosiji Victor (2024) Exploration and analysis of a blind hydrogen system in western California, USA. Master's Thesis, Earth and Planetary Sciences, Stanford University. https://doi.org/10.25740/rd605cr6236

2024 Stanford School of Humanities and Sciences

Stanford/A.W. Mellon grant for student research at Jasper Ridge
In 1986, the A.W. Mellon Foundation provided endowment funding to Professor Harold A. Mooney to establish a grant program for independent research at Jasper Ridge by Stanford students.

Chrysanthe Frangos
The impact of granivorous small mammals on acorn distribution under coyote brush

Mel Guo
Riparian Tree Species Classification Using Convolutional Neural Networks (CNNs) and High-Resolution Remote Sensing

Katie Huy
The impacts of prescribed fire on microbially-mediated biogeochemical cycling

Philippe Cohen Graduate Fellowship

Lydia Villa The effects of prescribed fires and other fuel reduction management strategies on vegetation regeneration. Lydia has leveraged fuel reduction treatments at Jasper Ridge, including pile burning (March 2024), mastication (Fall 2023), and mowing (ongoing), to understand the impacts of these practices on vegetation recovery and seed viability in chaparral and oak woodland habitats. Lydia is a member of the Field lab in the Department of Biology.

Rodrigo Carvalho Mammal Diversity in Jasper Ridge Biological Preserve Amidst Fire. Rodrigo used camera trap data from the preserve to explore how fuel reduction impacts midsize mammals. Rodrigo's other research investigates animal-ecosystem/ plant-frugivore interactions between Brazilian and African savannahs and the ecological effects of megafauna defaunation in those systems. Rodrigo is a member of the Dirzo lab in the Department of Biology.

2024 Stanford Doerr School of Sustainability Awards

Award for Outstanding Service to the Earth Systems Program: Calvin Probst
William W. Whitley Citizen-Scholar Prize: Tanvi Dutta Gupta
Earth Systems Justice, Equity, Diversity, and Inclusion Scholars Award: Aiyana Washington
Julie Kennedy Public Service Scholars: Laney Conger, Alan, Cuevas, Xavier Gomez, Calvin Probst, Varun Shirhatti

Publications

* co-first authors
** non-peer reviewed publications

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Mule deer *(Odocoileus hemionus)* walking through oak woodland. **Photo by Dan Quinn**

Financials

Expenditures $1,479,208

Education and Outreach	$40,058
Research	$37,690
Stewardship	$12,948
Operations	$76,530
Administration	$21,380
50th Anniversary Events*	$52,703
Salary	$1,237,899

Revenue $1,541,042

General Income	$27,381
Gifts	$37,722
University Support	$405,823
Endowment Payouts	$1,070,116
Grants**	$88,366

Expenditures and revenues only include funds controlled by JRBP ('O'O), the majority of which are for maintaining the preserve for users

** With generous support from the Dean's Office*
*** Year 2 of National Science Foundation Research Coordination Network SOAR Grant to Professor Rodolfo Dirzo and Jasper Ridge Biological Preserve ('Ootchamin 'Ooyakma)*

2023-2024 Staff

(From left to right)

Katherine Glover, Assoc. Director for Environmental Education

Sheena Sidhu, Staff Scientist

Steven Gomez, Operations Manager

Jorge Ramos, Executive Director

Trevor Hébert, Academic Technology Specialist

Elise DeBuysser, Program Manager

Brooke Fabricant, Resident Ranger

Adriana Hernández, Assoc. Director for Research

Tadashi Fukami, Faculty Director

Yellow-rumped warbler *(Setophaga coronata)* feasting on berries of poison oak *(Toxicodendron pubescens)*. **Photo by Dan Quinn**

Rainbow and valley oak (*Quercus lobata*) up at the ridge. **Photo by Alice Cummings**

Inside back cover: Crab spider *(Diaea livens)* climbs down Hayfield tarweed *(Hemizonia congesta ssp luzulifolia)*. **Photo by Dan Quinn**

Back cover: Great egret *(Ardea alba)* near Searsville reservoir. **Photo by Dan Quinn**

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For more opportunities to support Jasper Ridge

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