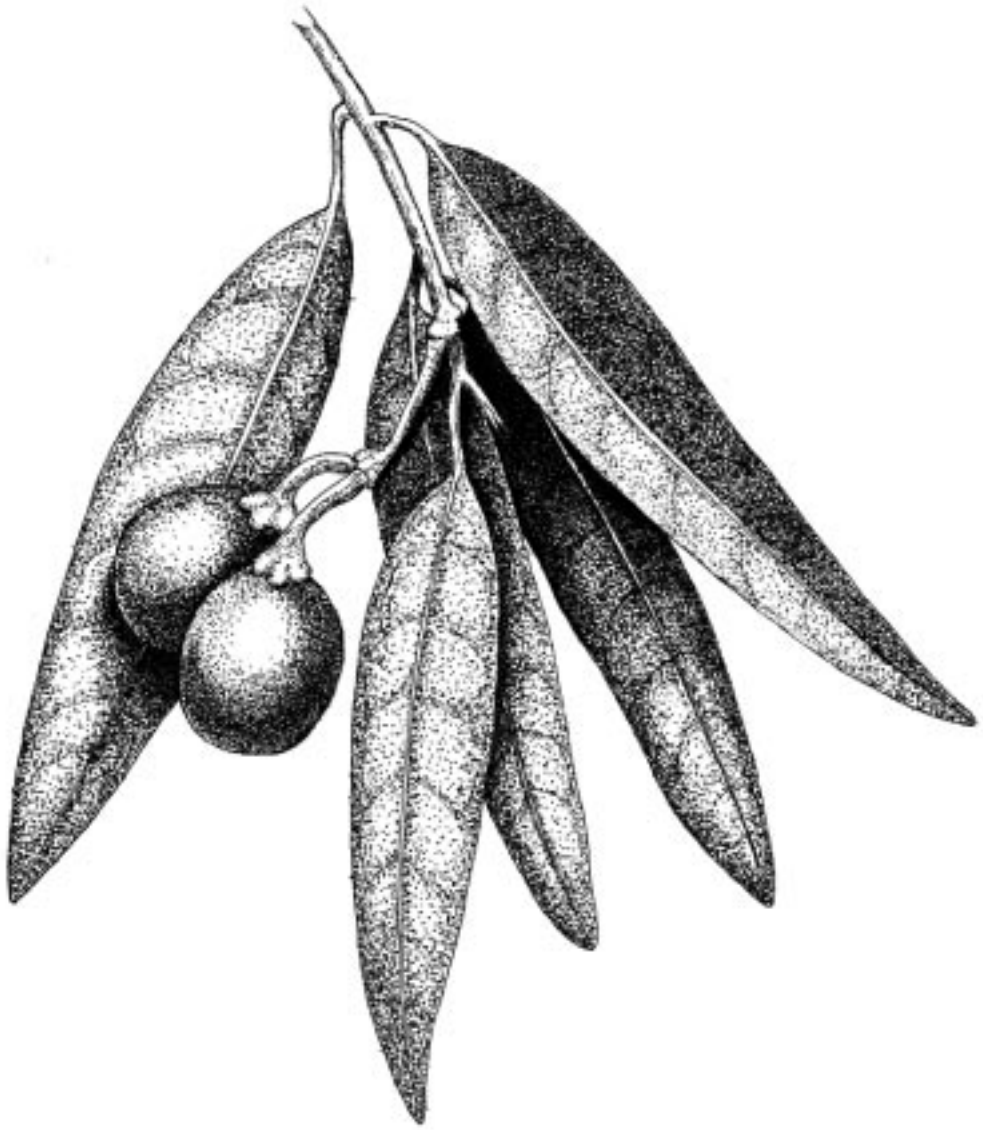
Jasper Ridge Biological Preserve

Annual Report 2001-02 · Stanford University

Those who contemplate the beauty of the earth find reserves of strength that will endure as long as life lasts.

-Rachel Carson,
The Sense of Wonder, 1956



From the Director

As our population increases and the human imprint on the world deepens, it is increasingly obvious that one of the great challenges of this century will be learning to live with deliberate and careful regard for our world and each other. Much of what transpires at Jasper Ridge Biological Preserve reflects and is inspired by such concerns. In many respects the Preserve is a microcosm that embodies the challenge of how to maintain native biological diversity and ecosystem integrity within an increasingly anthropogenic landscape while still fulfilling its mission of research and education. Even though this patch of land is preserved, it still faces the issue of how to contain and limit impacts from outside its borders, while at the same time exploiting opportunities for outreach with the surrounding communities. Often, one of my most important roles is facilitating the interaction and exchange between "inside and outside" so that both are better off. To use an ecological metaphor, the real challenge is to encourage development of a symbiotic relationship between the Preserve and the world at large.

In some respects, land protection is the easiest step towards living up to our highest ideals. Just as significant is incorporating a measure of that 'conservative' impulse into daily activities. So when the Preserve embarked on its campaign for a new building, we naturally considered how the design and construction of this facility reflected our ideals and could best facilitate and nurture a mutually beneficial relationship between the Preserve and the world outside its borders. The building project became an important opportunity for the Preserve to show that its activities would "do no harm" and contribute to addressing some of the most vexing problems facing our world. To put it simply, we wanted our actions to speak louder than our words. To that end, it is with no small measure of pride that I can point to the completion of the Leslie Shaoming Sun Field Station as a significant step in that direction. The completion of this building is a tangible demonstration of how we can improve our programs and operations while reducing our "footprint" and the resulting demands on the world's resources, both near and far.

As we become accustomed to our new base of operations, I am reminded of the missive from Winston Churchill: "We shape our buildings; thereafter they shape us." The Sun Field Station is now shaping what we do and how we do it. With the continued support of the University, the Jasper Ridge community, and many generous people, I can confidently state that this facility has already begun to help improve our programs and operations.

There have been many memorable moments to this point, including a June 2 ceremony honoring the donors and supporters who made the Sun Field Station possible. From Bill and Jean Lane's lead gift to the naming gift from Tony Sun, from the David and Lucile Packard Foundation's closing gift to all the other gifts large and small

and in between, it was a great honor to lift a glass of champagne and thank them all.

Another memorable moment came in early July, when temperatures broke 100° F and late in the afternoon, temperatures inside the building were in the mid-70s—without any air conditioning. Add this to my irregular treks to see the electric meter running backwards, and I can assure you that a satisfied grin consistently creeps across my face. To top it off, everyone involved in this project can smile knowing that it was completed while meeting our cost projections. This means that Stanford's first sustainable building was near the low end of construction costs for the University. In other words, building green does not necessarily mean paying more.

Serendipity, in addition to good planning, also played a role in our project. One such example was the hiring of our new Operations Steward, Cary Tronson, who was the site supervisor for the Sun Field Station general contractor, W. L. Butler, Inc. Cary's responsibilities include building and equipment maintenance, fabricating items for researchers, and equipment health and safety. Cary has already proved himself to be a valuable and unexpected gift from the Sun Field Station construction effort.

As I catch my breath from the past year, the question lurking just around the corner is, "What's next on the horizon?" This brings me back to the beginning of this report—the opportunities and difficulties associated with managing a biological field station in an increasingly urban and suburban landscape.

The challenges that this urban/nature interface presents are varied and complex. They include topical issues such as the threats to native biodiversity posed by invasive species and managing fire adapted communities with nearby residential communities. The immediacy of the connection between the Preserve and nearby communities is also highlighted by watershed issues associated with increasing siltation of Searsville Lake as well as the long-term viability of habitats and species on a mere 1,200 acre patch of land that is isolated from other native populations and habitats. Together, these issues present themselves within both an ecologically fragmented landscape and overlapping jurisdictions. In the coming years, therefore, developing strategies for addressing these issues so that the Preserve's mission is enhanced, rather than compromised, will take most of my attention.

A quick survey of the research and educational activities contained in this report highlights our continuing efforts to make a difference and the unique contributions that Jasper Ridge Biological Preserve makes to Stanford University. This past year, with the ongoing support from the Jasper Ridge community, donors, docents, and the University, we have begun a great demon-

stration of how humans can sustainably interact with this particular 1,200 acre patch of land.

As the future unfolds, the issues facing the Preserve will speak directly to the challenge of how we can maintain ecosystem integrity and native biodiversity with an increasingly visible human presence. With the ongoing support of this remarkable and inspired community of people, I am confident that the Preserve will continue to be successful in its mission of research and education.

Thanks to all!

Amid the flurry of construction on the Sun Field Station during the past year, research at Jasper Ridge progressed essentially unfettered, with full access to field sites and the limited facilities of Searsville Lab. The docent program was relocated to a temporary building adjacent to Searsville Lab, and researchers enjoyed the good company of their new neighbors. It was wonderful to experience the proximity among programs that the new facility has now made permanent.

Research activity during the year was marked by the initiation of 19 new studies, a growing participation by undergraduates, the completion of six doctoral dissertations and one masters thesis, and significant advances by ongoing programs. New studies addressed questions in remote sensing, hydrology, community ecology, atmospheric chemistry, and conservation biology. In addition, 14 undergraduates carried out projects or internships either as part of their academic program or through the summer Field Studies Program in Stanford's Department of Biological Sciences. Appendix 1 lists all 66 research projects for 2001-02, and Appendix 2 lists all 35 publications and dissertations.

Long-term studies also made important strides this year. In June, the National Science Foundation awarded Professors Chris Field, Hal Mooney, Brendan Bohannan, Peter Vitousek, and Jim Tiedje a five-year grant to continue the Jasper Ridge Global Change Experiment. It is one of the most ambitious global change experiments conducted in a natural environment—studying the response of an ecosystem to simultaneous changes in atmospheric carbon dioxide concentration, air temperature, nitrogen deposition, and precipitation. The new grant will support a suite of studies looking at the causes and consequences of changes in plant and microbial communities, which are expected to drive long-term responses to the treatments. Continuing studies address a broad range of responses from gene expression to primary production and nutrient cycling.

Professor Deborah Gordon's studies of the invasion of JRBP by Argentine ants ended their tenth year with new analyses made possible by the long record of ant distribution within the Preserve. These maps enabled postdoctoral fellow Krista Ingram and Prof. Gordon to sample nests in areas where the duration of invasion is known and to test their degree of genetic relatedness. The genetic evidence shows that the Argentine ant population at JRBP is part of a large supercolony that extends beyond the Preserve's borders, and that the invasion was a stepwise process dominated by rapid budding and mixing of nests, mainly by walking queens and workers, together with some degree of long-distance dispersal by flying male reproductives. By combining preserve-wide surveys of ant distribution with small-scale monitoring of nests, Ph.D. student Nicole Heller has found that the invasion also includes a seasonal oscillation driven by ants locally consolidating nests each winter and dispersing them in spring.

Professor David Ackerly's ongoing studies of the chaparral community have led to a more quantitative and comprehensive means of defining ecological strategies in chaparral plants. He has found that across 20 species he has studied at JRBP, many of the physiological traits he has surveyed correlate with either the average lifespan of a species' leaves or the species' maximum water deficit during the summer. These two "anchor traits" form the basis of a new conceptual model that links ecophysiology and regeneration ecology in the chaparral.

JRBP's longest running research program, studies of the Bay checkerspot butterfly launched by Professor Paul Ehrlich in 1959, made yet another discovery this year, despite the butterfly's disappearance from Jasper Ridge. The research team has linked the butterfly's local extinction to regional climate change during the past 80 years—specifically, a significant increase since 1970 in the frequencies of extremely wet and extremely dry years, both of which increase mortality during the butterfly's larval stages.

Across these and dozens of other studies at JRBP, there is a considerable breadth of inquiry, but there are also common themes that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1. *Undergraduate Rachel Freund arranges leaves on a light table to measure their surface area with a video system and software for analyzing images. Her Field Studies Program internship provided assistance to Will Cornwell's studies of woody communities.*

2. *Docents Rig Currie, Ted Chandik, and Bob Buell record all birds seen and/or heard as part of the JRBP bird census. Volunteers have been surveying birds at JRBP since 1979.*

3. *Heather Cooley sets up portable CO_2 detectors for simultaneously measuring the rate of soil respiration in 3 quadrants within the global change experiment, as part of her work with Dr. Margaret Torn (Lawrence Berkeley National Lab).*

4. *Docents Laura Jones, Nancy Lund, and Bob and Mary Dodge take a break from dry-sorting shell, rock, and bone to learn flotation techniques from Prof. Julia Hammett (Truckee Meadows Community College) for recovering fragments of charred plants from archaeological midden soils.*

5. *Co-term Masters student Marisha Bannister checks thermocouples she has just soldered for use in monitoring soil temperature in the global change experiment.*

6. *Ph.D. student Will Cornwell sorts and measures leaves as part of a preserve-wide survey of factors determining the species diversity of woody communities.*

7. *Ph.D. student Radika Bhaskar and Dr. Katherine Preston demonstrate their research with a hands-on experiment on the mechanics of water flow in plants during Stanford's 2002 Community Day.*

8. *On leave from her work conducting hydrologic surveys of Ukraine, Antonina Chebanova monitors an infiltrometer as part of Dr. Alexander Chebanov's studies of infiltration and surface runoff, sponsored by the U.S. National Research Council and the USGS.*

9. *Docent, researcher, and instructor Dr. Irene Brown catches the curiosity of a boy during Stanford's 2002 Community Day with a display of pictures, diagrams, specimens, and data from her studies of checkerspot butterflies.*

10. *Todd Tobeck assembles new heaters he designed for the global change experiment.*

11. *Sponsored by the summer Field Studies Program, Stanford undergrad Anna Hare records plant height of a summer-active species in the global change experiment.*

give coherence to the Preserve's research as a whole. This coherence is an important dimension of field stations, whose value goes beyond a collection of independent projects to a bigger picture built of related inquiries and insights. The following discussion looks at JRBP studies from one theme, the soil environment. In many ways, the soil is a great hidden frontier now being explored with new technologies and a growing appreciation for its role as a controller of ecosystem function.

Researchers studying JRBP's serpentine soils have long appreciated the ecological irony that the Preserve's most pristine grassland occurs on soils that are potentially toxic due to the natural occurrence of heavy metals such as chromium. Ph.D. student Chris Oze realized these soils might shed light on a global environmental problem. When chromium is only partially oxidized, it is either benign or beneficial, but it can react with other ions in the soil to produce hexavalent chromium, a potential carcinogen that increased in public awareness with the film *Erin Brokovich*. Oze has found that while chromium is mobile in serpentine soils and comparatively enriched with respect to the bedrock from which it comes, none of the chromium occurs in the toxic form. Oze is hoping these results will provide a model for what to expect in soils contaminated by chromium-laden industrial waste.

Among the most actively studied issues at JRBP are the dynamics and consequences of soil transport in both the history and future of the Searsville Lake watershed. This year, Alexander Chebanov, a visiting scholar to the USGS from Ukraine, studied the controls on soil erosion within JRBP. He has found that some ridgetop soils have a high infiltration capacity in their surface layers, but less permeable deeper layers, leading to subsurface runoff following heavy rain. Other ridgetop soils have less permeable surface soils, and runoff tends to collect in numerous local depressions. Chebanov concludes that sediment retention and release are governed by a combination of rainfall pattern, soil structure, and microtopography; this last factor makes sediment release very sensitive to land management.

Ph.D. student Asmeret Asefaw Berhe is studying what happens to sediments that wind up at the bottom of Searsville Lake and similar bodies of water. Working with Dr. Jennifer Harden and other USGS scientists who extracted several 40-foot long vertical cores of sediment from the lake, Berhe is tracking the fate of the carbon that was present in root tissue, microbes, and soil organic matter. The record reflected in the cores suggests that when sediments settle and become buried by rapidly accumulating influxes, most of the soil carbon is preserved, rather than being chemically broken down and respired. The importance of this carbon storage is its ubiquity—tens of thousands of lakes and reservoirs are collectively storing up to five percent of the carbon dioxide released each year to the atmosphere through human activities such as fossil fuel combustion. Many of these bodies of water are so filled with sediment that they are near the end of their useful lifespan.

The potential for future carbon storage is an equally important issue on land. New results from the global change experiment reduce the likelihood that grassland soils will increase carbon storage as atmospheric CO_2 continues to rise. An analysis led by Dr. Becky Shaw has concluded that in at least some years, elevated CO_2 tends to suppress net primary production when warming, nitrogen, and/or precipitation are also elevated, contrary to the effect of CO_2 as a single treatment in this study and many others. Work by Ph.D. student Lisa Moore may help explain this result. Moore is studying rooting depth and the release of carbon from respiring roots and microbes in plots receiving elevated CO_2, with and without the other treatments. Because the CO_2 added to the plots has less of the stable isotope ^{13}C than the ambient air, Moore is using the abundance of this isotope in soil gases as an index of how much added versus ambient carbon is being released be-

lowground. The isotopic signal indicates that all plots under elevated CO_2, both with and without other treatments, have some added carbon (and hence, roots) down to half a meter, but the strength of the isotopic signal varies. This suggests that the amount or sources of respired carbon differ when water, nitrogen, or heat is applied to a plot with elevated CO_2.

Another dimension of global change is landcover change, such as shifts resulting from invasion by both native and exotic species. The pervasiveness of landcover change makes it a potentially critical factor in global carbon storage. Ph.D. student Laurie Koteen is testing its importance by comparing invaded and native-dominated areas of grassland and shrubland at eight sites in central and northern California, including JRBP. Thus far she has found that native grasslands at JRBP store more soil carbon than their exotic counterparts, and also more than both native and exotic shrublands.

Changes in plant communities can be mirrored, or even amplified, in the soil's microbial community. Postdoctoral fellow Peter Horz and Professor Brendan Bohannan have studied two groups of soil bacteria that are important to ecosystem processes—ammonia oxidizers and methane oxidizers—in soils of the global change experiment to determine if environmental changes affect total population size or diversity of these groups. They have observed several important responses, such as the presence of new types of methane oxidizers in some treatments, and divergent responses to elevated CO_2 and nitrogen addition in the community of ammonia oxidizers. A major goal of the experiment is to understand how such changes in the soil bacterial community affect long-term responses of vegetation to anticipated climate change.

The soil environment at JRBP also harbors a record of the prehistoric past. For millennia before dam construction created a sediment trap for the Searsville watershed, sediments from this and the greater San Francisquito watershed were deposited on natural floodplains or carried to San Francisco Bay. Prehistoric human activity added a cultural component to this soil formation process in village sites along Bear and San Francisquito Creeks. This year, Drs. Matt Bandy and Laura Jones led an excavation within a creek-side archaeological site in JRBP as part of a large study relating diet breadth and climate variability. The dig recovered cooking midden features that are up to two thousand years old, including bone, shell, fish remains, and seeds, all of which are being sorted to species. The results will fill a chronological gap in a large dataset of excavations from the San Francisquito drainage. To relate diet to climate, the researchers have relied primarily on radiocarbon dating, but they hope to obtain more precise climate relationships by analyzing shellfish from this year's dig for the abundance of stable isotopes that indicate seawater temperature.

These and other studies of soil environments at JRBP illustrate the complexity of processes hidden belowground and confirm their importance to questions facing the world. Perhaps most strikingly, they paint a bigger picture in which aspects of soil chemistry, physics, and microbiology collectively bear on topics such as landscape dynamics and ecosystem health. With the growing awareness that the soil environment is a controller of ecosystem functions from carbon storage to biological diversity, it is clear that such studies play a crucial role in understanding past, present, and future environments.

The soil environment is just one of many scientific themes being explored at JRBP. The combination of the Preserve's natural diversity, the breadth of scientific disciplines involved in its programs, and its infrastructure, including the new building, provide an excellent foundation for gaining insights to many important scientific questions.

Docent / Educational Highlights

From the beginning of the Jasper Ridge docent program in 1975, docents have played a vital role in community education through tours and trail-side teaching. Observation and inquiry are the driving forces in this type of learning experience and Preserve docents have developed an impressive array of teaching techniques and observation-based teaching models. In recent years, many docents have expanded their roles at the Preserve and teach in more formal classes. During academic year 2001-02 docents helped teach Jasper Ridge Docent Training (Biology 96) and Core Experimental Laboratory for Ecology (Biology 44Y), and taught two Stanford Continuing Studies classes, Wildflower Families of the Bay Area and Historical Archaeological Field Methods. Docents also participated in a summer teacher education workshop in collaboration with the Stanford Teacher Education Program (STEP) and mentored students from Eastside College Preparatory School's Ecology Field Studies class.

In addition to expanding teaching roles, docents continue to contribute in a myriad of other ways to the JRBP mission of research and education. In the past year, this included the 2001-02 bird census (both point count and walking transect), the installation, organization, and maintenance of the new Oakmead Herbarium at the Sun Field Station, bat research, water quality testing, organization of the new library, assisting with a host of research projects, art and graphics production, social history projects, publications, office assistance, and even designing and installing the telecommunications wiring in the building.

Jasper Ridge not only utilizes the extensive talents of our volunteers, but programmatically depends on their contributions and participation. Many of these contributions are initiated as well as carried out by docents.

The docent class of 2002, walking to a field site.

In the academic year 2001-02, educational opportunities at the Preserve included a broad array of inquiry-based ecology and environmental education classes serving both formal academic populations and informal public education and mentoring programs. JRBP provided opportunities for field instruction in both introductory and advanced classes, undergraduate and graduate research, for Stanford University as well as other colleges and universities, and for high schools and collaborative local schools. Students participated in field methods classes in the environmental sciences, archaeology, and earth sciences to learn basic field techniques, gain an understanding of new technologies, and to acquire valuable hands-on research experience. A complete list of university and non-university instructional use at the Preserve can be found in Appendix 3.

Although lectures are a traditional way to quickly convey a large amount of information to a group of people, student-based, original learning experiences are extremely effective in the development of critical thinking and scientific investigation. Direct field experience is an essential element in inquiry-based hands-on education and JRBP is fortunate to attract and have access to instructors who are willing to teach in the field under variable and sometimes unpredictable conditions. Instructors lead their classes crawling through chaparral, digging soil profiles, and excavating archaeological sites. These inspiring educators work together with students and create a teacher-student collaboration that cannot be found in a traditional classroom experience.


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1. *Students in the Field Studies in Earth Systems class (Earth Systems 189) run a sampling transect on the ridge top grassland, recording presence and absence of indicator species for soil type. The sampling transect crosses the contact between chert and serpentine soils.*

2. *Biology 44Y student Pilar Abascal sorts macroinvertebrates using a dissecting microscope.*

3. *Docent trainees Ed Ehmke, Carol Hake, Irene Brown (instructor), Patrick Hsieh, Britt Sandler, and Laura McLendon collect data for the docent training terrestrial invertebrate class.*

4. *Assistant Professor Scott Fendorf gets his hands dirty demonstrating how to analyze a soil profile for students in the Earth Systems 189 class.*

5. *Gary Smith, Biology 96 teaching assistant and docent, leads the class in the "Each One Teach One" plant identification exercise.*

6. *Docent Bill Gomez gives an overview of the global change experiment to local science teachers participating in a field methods workshop sponsored by JRBP and the Stanford Teacher Education Program (STEP).*

7. *Two Eastside College Preparatory School students delight in interacting first-hand with a banana slug* (Ariolimax sp.).

8. *Docent and mentor Scott Loarie captivates students from Eastside College Preparatory School during riparian discovery class along San Francisquito Creek.*

9. *Patrick Hsieh, 2002 docent trainee and field assistant to Stanford biology graduate student Nicole Heller, studies an insect.*

10. *Docent Tom Mudd installs the new Anabat Zero Crossings Analysis Interface Module (ZCAIM) for the permanent bat acoustical monitoring station next to Searsville Lake. The new ZCAIM uses compact flash memory cards to store bat call data, and is a significant improvement over the previous time-intensive data storage system.*

Interest in and use of global positioning systems (GPS) and geographic information systems (GIS) are on the rise at Jasper Ridge Biological Preserve. Over 20% of the research projects in 2001-02 utilized GPS technology to some extent, and several involve further GIS analysis.

Nicole Heller is a Ph.D. student with Professor Deborah Gordon who studies Argentine ant behavior. In addition to her surveys of the long-term invasion at JRBP, Nicole has been studying Argentine ant and native ant nest density, size, turnover and growth, in nine plots for the past two years. She surveys for ant nests every 20 centimeters in each 400 square meter plot, and records the center of every nest with the GPS, along with information about its size. She can then use these points in the GIS to map the seasonal and annual changes in the nests. Nicole recently returned from a trip to Argentina to collect data on the Argentine ant in its native range and compare nest density and colony structure between native and invaded habitats.

Will Cornwell, Ph.D. student with David Ackerly, is also using GPS and GIS in his doctoral research. In the research planning phase, Will knew he wanted a total of 50 plots spread evenly among vegetation community types. Using the JRBP vegetation communities map, he was able to generate random points in the GIS, then load these points into a GPS unit and locate the plots in the field. With this technology, Will can maintain and study permanent plots without actually marking them. Anytime he needs to return to the plot, he can navigate to his survey point using the GPS unit.

The academic year 2001-02 marked the third year in a row of a successful GPS/GIS class in the docent training course (Biology 96), and the first time an intermediate GPS training class was offered, in May of 2002. Carol Zabel, docent, participated in this new class. She and fellow botanist and docent Ann Lambrecht have spent the months following the intermediate GPS training recording the locations of plants which are rare at JRBP and of special interest to members of our community. They have also used their GPS and botanical skills, along with the help of docent and botanist Toni Corelli, to document locations of several plants found this past year that may be new additions to the JRBP vascular plant list. One of these possible new species is a gooseberry found by Will Cornwell in the course of his research this past summer.

Now that we have moved into the Sun Field Station, GIS and GPS activities at the Preserve have a new home in the west side of the research space. The Preserve recently purchased a new computer to serve an updated database and GIS system, and once that system is in place, the current server will become a second dedicated GPS/GIS computer for researchers, students, and docents. The Preserve was also able to purchase a large-format plotter for map production, and with Carol and Art Graham's generous gift of two additional GPS units, we are on our way to having a fully functioning GIS and GPS lab.

Coordinator Assistant Justin Holl uses the Trimble GeoExplorer III, one of the two units donated by Carol and Art Graham, to map old trail beds at JRBP.

With any ambitious project, there are always many players, large and small, who contribute in ways that are often unsung. The building of the Leslie Shao-ming Sun Field Station was no different in this regard. The photos on the following pages are just a small sampling of the dedicated and joyful contributions of the many people who made the Sun Field Station a reality. Docents, staff, family, and friends all participated in the process. Many members of the JRBP community contributed time, effort, expertise, and financial support to make the new facility a reality. How many organizations boast volunteers who are not only suberb naturalists, but also talented designers, network and telecommunications experts, and photographers?

The latest visitor to the Sun Field Station: a great egret, seen from below the east trellis.

Our community was extremely patient throughout the building process, putting up with construction, decreased tour access, and temporary quarters. Staff in particular remained flexible and good-natured throughout, and all have now settled into our new home. Even the wildlife have begun to return to the site!

For all of the other people involved who do not appear in these photos, thank you for your support and enthusiasm. We all look forward to seeing you at Jasper Ridge.

A photo mosaic showing the entire length of the south side of the Leslie Shao-ming Sun Field Station.


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1. *One of the most visible and attractive elements of the building is the exterior siding, which is composed of salvaged redwood primarily from two buildings—Escondido Village on the Stanford campus and a home in Woodside. In this photo you can see some of the volunteers (including Ben Cohen-Stead, the administrative director's son) who helped remove nails from redwood at the home in Woodside.*

2. *This view of the north face of the Sun Field Station displays the redwood. One of the achievements of the construction process was not losing any of the mature oaks near the site. These oaks are all taller than the building, thus giving the Sun Field Station the feeling that its scale is appropriate to the site.*

3. *The building could not have been done without the skills of the project architect, Catherine Herbst from Rob Wellington Quigley. In this photo, early in construction, Catherine and site supervisor Cary Tronson review some of the framing details.*

4. *One of the goals of the Sun Field Station was to construct a building efficient enough that its reliance on renewable energy would provide all of its electrical energy needs annually. In this photo, we see the installed Apollo modules provided by BP Solar as it appears from the east end of the roof. If you look closely, to the left, you will see Ted Giesing, the project engineer from Stanford's Capital Management & Planning Office.*

5. *On June 2nd, we celebrated the completion of the Sun Field Station by honoring the many donors and supporters. In this photo, from left to right are some of the major donors standing near the main entrance of the new building: Eff and Patty Martin, Bill and Jean Lane, and Tony and Rosina Sun.*

6. *Even the sign was carved from a large piece of salvage redwood. The design was thanks to Deanna Messinger, one of the resident rangers at Jasper Ridge.*

7. *Deanna Messinger puts the finishing touches on the Jean Lane Environmental Education Classroom sign.*

8. *All of the cable for the building network was installed with almost 500 hours of volunteer help and coordinated by volunteer Sunia Yang, Jasper Ridge docent and networking guru extraordinaire. She designed the network and telecommunications system, ordered the equipment, and organized a team of docents, volunteers, and staff to install the system. In keeping with the spirit of the Sun Field Station, Sunia also salvaged switches for the system.*

Appendix 1: Research Projects

Project	Principal Investigator(s)	Department or Division	Institution
Chaparral species distributions at local and regional scales	Ackerly, David	Biological Sciences	Stanford University
Diurnal gas exchange and water relations of chaparral plants	Ackerly, David; Bhaskar, Radika	Biological Sciences	Stanford University
Phylogenetic structure of communities: a basis in trait evolution	Cornwell, Will	Biological Sciences	Stanford University
Comparative ecophysiology of heat shock protein expression	Knight, Charles	Biological Sciences	Stanford University
Stem-allometry and hydraulic conductivity in chaparral plants	Preston, Katherine	Biological Sciences	Stanford University
Reference surveys for Stanford Foothills Restoration Project	Anderson, Sean; Kluse, Jennie	Center for Conservation Biology	Stanford University
Biosystematics of *Hilara*, *Medetera*, and parasitoids of Tachinidae	Arnaud, Paul	Entomology	Cal. Academy of Sciences
Carbon burial and preservation in Searsville and other lake environments	Berhe, Asmeret Asefaw	Environ. Science, Policy & Mgmt.	Univ. of California, Berkeley
Variation in heavy metal tolerance in *Lasthenia californica*	Rajakaruna, Nishanta	Botany	Univ. of British Columbia
Population biology of the butterfly *Euphydryas chalcedona*	Brown, Irene		JRBP
Survey of bee diversity and distribution in woodland habitats	Chan, Sheila	Center for Conservation Biology	Stanford University
Runoff and sediment modeling for upper San Francisquito Creek within JRBP	Chebanov, Alexander		U.S. Geological Survey
San Francisquito watershed mapping	Cohen, Brian		GreenInfo Network
Geologic studies of Jasper Ridge Biological Preserve	Coleman, Robert	Geological & Environmental Sciences	Stanford University
Mammalian herbivores as mediators of community structure and soil fertility	Cushman, Hall	Biology	Sonoma State University
Mountain building in the San Francisco Bay Area	Dumitru, Trevor	Geological & Environmental Sciences	Stanford University
Long-term studies of *Euphydryas editha bayensis*	Ehrlich, Paul; Launer, Alan	Biological Sciences	Stanford University
Inventory of the bats of Jasper Ridge	Evelyn, Michelle; Stiles, David	Biological Sciences	Stanford University
Experimental studies of the feeding patterns of the western scrub jay	Fedak, Matthew	Biological Sciences	Stanford University
Jasper Ridge Global Change Experiment	Field, Christopher	Global Ecology	Carnegie Instit. of Washington
	Bohannan, Brendan; Mooney, Harold; Vitousek, Peter	Biological Sciences	Stanford University
	Somerville, Shauna	Plant Biology	Carnegie Instit. of Washington
Spectral measurement of biomass and vegetation structure	Asner, Greg	Global Ecology	Carnegie Instit. of Washington
Population and species effects on biogeochemistry	Cleland, Elsa	Biological Sciences & Global Ecology	Stanford Univ. & Carnegie Inst.
Spectral measurement of aboveground vegetation dynamics	Chiariello, Nona	Biological Sciences	Stanford University
Response of soil bacterial communities to elevated CO_2	Horz, Peter	Biological Sciences	Stanford University
Isotopic analysis of nitrogen cycling	Hungate, Bruce	Biological Sciences	Northern Arizona University
Dynamics of slug populations	Hsu, Grace		Saratoga High School
Seasonal course of soil nitrogen dynamics under simulated global change	Kerr, Amber	Biological Sciences & Global Ecology	Stanford Univ. & Carnegie Inst.
Phosphorus limitation under global change manipulations	Menge, Duncan	Biological Sciences & Global Ecology	Stanford Univ. & Carnegie Inst.
Seasonal course of plant root development under global change	Moore, Lisa	Biological Sciences & Global Ecology	Stanford Univ. & Carnegie Inst.
Belowground dynamics of carbon, nitrogen, and biomass	Shaw, Rebecca		The Nature Conservancy
Changes in gene expression in *Geranium dissectum* and *Avena fatua*	Thayer, Susan	Plant Biology	Carnegie Instit. of Washington
Herbivore regulation of symbiotic nitrogen fixation	Thomas, Brian	Biological Sciences & Global Ecology	Stanford Univ. & Carnegie Inst.
Isotopic analysis of respiratory carbon dynamics	Torn, Margaret	Center for Isotope Geochemistry	Lawrence Berkeley Nat'l. Lab.
Plant community biodiversity and productivity	Zavaleta, Erika	Biological Sciences & Global Ecology	Stanford Univ. & Carnegie Inst.
Videorecording of seasonal changes for remote sensing course development	Fleishman, Erica	Center for Conservation Biology	Stanford University
	Seto, Karen	Ctr. for Environ. Science & Policy	Stanford University

Project	Principal Investigator(s)	Department or Division	Institution
Ground water flow in Searsville Lake sediments & lake-ground water exchange	Freyberg, David; Kim, Dongkyun	Civil & Environmental Engineering	Stanford University
Surveys for the presence of *Phytophthora ramorum*	Garbelotto, Matteo	Environ. Science, Policy & Mgmt.	Univ. of California, Berkeley
Argentine ant *(Linepithema humile)* invasion and the response of native ants	Gordon, Deborah	Biological Sciences	Stanford University
Chemical ecology of the Argentine ant	Greene, Michael	Biological Sciences	Stanford University
Population dynamics of the Argentine ant in JRBP	Heller, Nicole	Biological Sciences	Stanford University
Gene flow and sex-biased dispersal in Argentine ant invasions	Ingram, Krista	Biological Sciences	Stanford University
Mammals of JRBP	Hadly, Elizabeth	Biological Sciences	Stanford University
Applied paleoethnoecology of the San Francisco Bay peninsula	Hammett, Julia	Social Science	Truckee Meadows Comm. Coll.
Simulation of hydrologic response and sediment transport after dam removal	Heppner, Christopher	Geological & Environmental Sciences	Stanford University
Effects of rainfall variability and gopher removal on serpentine grassland	Hobbs, Richard	Environmental Science	Murdoch University, Australia
GPS mapping for the San Francisquito Archaeological Research Project GIS	Jones, Laura	Campus Archaeology	Stanford University
Earthquake prediction from precursory electromagnetic anomalies	Karakelian, Darcy; Klemperer, Simon	Geophysics	Stanford University
Natural barriers to Argentine ant invasion: the role of transitional environments	Kark, Salit; Heller, Nicole	Biological Sciences	Stanford University
	Young, Rebecca	JRBP	Stanford University
Regional surveys of annual acorn production	Koenig, Walter	Hastings Natural History Reservation	Univ. of California, Berkeley
Carbon cycling in shrub and grassland landscapes invaded by exotics	Koteen, Laurie	Energy and Resources Group	Univ. of California, Berkeley
Broad band seismic monitoring	Kovach, Robert	Geophysics	Stanford University
		Berkeley Digital Seismic Network	Univ. of California, Berkeley
			U.S. Geological Survey
Survey of San Francisquito Creek and removal of exotics	Launer, Alan	Center for Conservation Biology	Stanford University
Long-term monitoring of ecosystem processes by eddy flux	Merchant, George; Field, Christopher	Global Ecology	Carnegie Instit. of Washington
	Kaduk, Joerg		University of Leicester
Photochemistry of organic chemicals in Searsville Lake	Mill, Theodore	Atmos. Chem. & Space Physics	SRI International
Flow monitoring at Searsville Dam	Hecht, Barry; Owens, Jonathan		Balance Hydrologics, Inc.
Stability of chromium(III) in the soil environment	Oze, Christopher	Geological & Environmental Sciences	Stanford University
Mapping of four invasive plant species along Santa Clara County creeks	Peritz, Jennifer		Santa Clara Valley Audubon Soc.
The role of herbivores in structuring plant community composition	Peters, Halton	Biological Sciences & Global Ecology	Stanford Univ. & Carnegie Inst.
Testing GIS & remote sensing for malaria epidemic early warning system	Robinson, Sarah	Biological Sciences	Stanford University
Evolutionary dynamics of flower color polymorphism in *Linanthus parviflorus*	Schemske, Douglas	Plant Biology	Michigan State University
Assessment of *Brachypodium distachyon* for studies of cereal genomics	Somerville, Christopher	Plant Biology	Carnegie Instit. of Washington
Fire management and prescribed burning	Stephens, Scott	Environ. Science, Policy, & Mgmt.	Univ. of California, Berkeley
	Cohen, Philippe	JRBP	Stanford University
Passive cumulative monitoring of nitrogenous atmospheric pollutants & ozone	Weiss, Stuart		
	Luth, David		
Long-term acoustical monitoring of bat activity	Young, Rebecca	JRBP	Stanford University
	Mudd, Thomas	JRBP	
Biodiversity and grassland invasions	Zavaleta, Erika; Hulvey, Kris	Integrative Biology	Univ. of California, Berkeley

Appendix 2: Publications

Ackerly, D.D. Functional strategies of chaparral shrubs in relation to seasonal water deficit and disturbance. Ecology (in press).

Ackerly, D.D., Knight, C.A., Weiss, S.B., Barton, K., and Starmer, K.P. (2002) Leaf size, specific leaf area and microhabitat distribution of woody plants in a California chaparral: contrasting patterns in species level and community level analyses. Oecologia 130: 440-457.

Battaglia, R.E. and Patterson, R. (2001) A morphometric analysis of the *Leptosiphon androsaceus* complex (Polemoniaceae) in the Central and South Coast Ranges. Madroño 48: 62-78.

Cardon, Z.G., Hungate, B.A., Cambardella, C.A., Chapin, F.S., III, Field, C.B., Holland, E.A., and Mooney, H.A. (2001) Contrasting effects of elevated CO_2 on old and new soil carbon pools. Soil Biology and Biochemistry 33: 365-373.

Dukes, J.S. (2001) Biodiversity and invasibility in grassland microcosms. Oecologia 126: 563-568.

Dukes, J.S. (2002) Comparison of the effect of elevated CO_2 on an invasive species *(Centaurea solstitialis)* in monoculture and community settings. Plant Ecology 160: 225-234.

Dukes, J.S. (2001) Productivity and complementarity in grassland microcosms of varying diversity. Oikos 94: 468-480.

Dukes, J.S. (2002) Species composition and diversity affect grassland susceptibility and response to invasion. Ecological Applications 12: 602-617.

Dukes, J.S. and Hungate, B.A. (2002) Elevated CO_2 and litter decomposition in California annual grasslands: which mechanisms matter? Ecosystems 5: 171-183.

Dukes, J.S. and Mooney, H.A. Biological invaders disrupt ecosystem processes in western North America. In: G. Bradshaw, et al. (eds) How Landscapes Change: Human Disturbance and Ecosystem Disruptions in the Americas, Springer-Verlag (Berlin) (in press).

Evelyn, Michelle Jean (2002) Ecological consequences of forest fragmentation: Bats and birds in human-dominated landscapes. Ph.D. Dissertation, Department of Biological Sciences, Stanford University.

Evelyn, M., Stiles, D., and Young, R. Conservation of bats in urban landscapes: roost selection by *Myotis yumanensis* in a residential area in California. Biological Conservation (in press).

Frey, Caroline (2001) Geomorphic Study of Searsville Lake Watershed, Portola Valley, California. Masters Thesis, Department of Geology, San Jose State University.

Garcia, M. and Ustin, S.L. (2001) Detection of interannual vegetation responses to climatic variability using AVIRIS data in a coastal savanna in California. IEEE Transactions on Geoscience and Remote Sensing 39: 1480-1490.

Gee, L., Neuhauser, D., Dreger, D., Pasyanos, M., Uhrhammer, R., and Romanowicz, B. The Rapid Earthquake Data Integration Project. In: W. Lee (ed) Handbook of Earthquake and Engineering Seismology, IASPEI (in press).

Higgins, P.A.T., Jackson, R.B., des Rosiers, J.M., and Field, C.B. (2002) Root production and demography in a California annual grassland under elevated atmospheric carbon dioxide. Global Change Biology 8: 841-850.

Holtgrieve, Gordon W. (2001) Distribution and Abundance of Native and Non-native Fishes in San Francisquito Creek, California. Masters Thesis, Earth Systems Program, Stanford University.

Hu, S., Chapin, F.S., III, Firestone, M.K., Field, C.B., and Chiariello, N.R. (2001) Nitrogen limitation of microbial decomposition in a grassland under elevated CO_2. Nature 409: 188-191.

Joel, G., Chapin, F.S., III, Chiariello, N.R., Thayer, S.S., and Field, C.B. (2001) Species-specific responses of plant communities to altered carbon and nutrient availability. Global Change Biology 7: 435-450.

Karakelian, Darcy (2002) Ultra-low frequency electromagnetic signals associated with earthquakes and fault creep in California. Ph.D. Dissertation, Department of Geophysics, Stanford University.

Kerr, Amber C. (2002) Soil nitrogen dynamics under simulated global changes in a California annual grassland. Masters Thesis, Earth Systems Program, Stanford University.

Knight, Charles Alexander (2002) The evolutionary and ecological physiology of plant thermal tolerance. Ph.D. Dissertation, Department of Biological Sciences, Stanford University.

Knight, C.A. and Ackerly, D.D. (2002) An ecological and evolutionary analysis of photosynthetic thermotolerance using the temperature dependent increase in steady-state fluorescence. Oecologia 130: 505-514.

Lund, Christopher Paul (2002) Ecosystem carbon and water budgets under elevated atmospheric carbon dioxide concentration in two California grasslands. Ph.D. Dissertation, Department of Biological Sciences, Stanford University.

Markos, S. and Baldwin, B.G. (2001) Higher-level relationships and major lineages of *Lessingia* (Compositae, Astereae) based on nuclear rDNA internal and external transcribed spacer (ITS and ETS) sequences. Systematic Botany 26: 168-183.

McLaughlin, J.F., Hellmann, J.J., Boggs, C.L., and Ehrlich, P.R. (2002) Climate change hastens population extinctions. Proceedings of the National Academy of Sciences 99: 6070-6074.

McLaughlin, J.F., Hellmann, J.J., Boggs, C.L., and Ehrlich, P.R. (2002) The route to extinction: population dynamics of a threatened butterfly. Oecologia 132: 538-548.

Rajakaruna, N., Siddiqi, M.Y., Whitton, J., Bohm, B.A., and Glass, A.D.M. Differential responses to Na+/K+ and Ca2+/Mg2+ in two edaphic races of the *Lasthenia californica* (Asteraceae) complex: A case for parallel evolution of physiological traits. New Phytologist (in press).

Rillig, M.C., Wright, S.F., Shaw, M.R., and Field, C.B. (2002) Artificial ecosystem warming positively affects arbuscular mycorrhizae but decreases soil aggregation. Oikos 97: 52-58.

Sanders, N.J., Barton, K.E., and Gordon, D.M. (2001) Long-term dynamics of the distribution of the invasive Argentine ant, *Linepithema humile*, and native ant taxa in northern California. Oecologia 127: 123-130.

Shaw, M.R., Zavaleta, E.S., Chiariello, N.R., Cleland, E.E., Mooney, H.A., and Field, C.B. (2002) Increased primary production under multiple global changes suppressed by elevated CO_2. Science 298: 1987-1990.

Tajima, F., Megnin, C., Dreger, D., and Romanowicz, B. (2002) Feasibility of real-time broadband waveform inversion for simultaneous moment tensor and centroid location determination. Bulletin of the Seismological Society of America 92: 739-750.

Thomas, Brian D. (2002) Legumes and nitrogen fixation in an annual grassland: responses to herbivory and climate change. Ph.D. Dissertation, Department of Biological Sciences, Stanford University.

Zavaleta, Erika Simone (2001) Influences of climate and atmospheric changes on diversity and ecosystem function in a California grassland. Ph.D. Dissertation, Department of Biological Sciences, Stanford University.

Zavaleta, E.S., Shaw, M.R., Chiariello, N.R., Thomas, B.D., Cleland, E.E., Field, C.B., and Mooney, H.A. Responses of a California grassland community to experimental climate change, elevated CO_2 and N deposition. Ecology (in press).

Appendix 3: Docent Tours & Instructional Use

Stanford University Classes (2,449)

Anth Sci 3	Introduction to Prehistoric Archaeological Sites (Rick)
Anth Sci 149	Archaeological Field Methods (Rick)
Anth Sci 169A	Conservation Anthropology, Stanford Discovery Institutes (Stronza)
Anth Sci 169B	Conservation Biology, Stanford Discovery Institutes (Stronza)
Arch 19	Historical Archaeological Field Methods, Continuing Studies (Jones, Bandy)
AppPhys 79Q	Energy Options in the 21st Century (Fox)
Bio 35	Wildflower Families of the Bay Area, Continuing Studies (Corelli, Mason)
Bio 44Y	Core Experimental Lab (Malladi, Yelton)
Bio 96A/B	JRBP Docent Training Program (Vitousek)
Bio 120	Botany (Ray)
Bio 124	Plant Physiological Ecology: From Leaf to Globe (Mooney, Berry, Field)
Bio 125	Ecosystems of California (Mooney)
Bio 138	Ecology and Evolution of Plants (Ackerly)
Bio 139	Biology of Birds (Ehrlich)
CEE 162	Hydrology and Water Resources (Freyberg)
CEE 261	Watershed and Wetlands Hydrology Class (Freyberg)
Engineering 1	Nature of Engineering (Freyberg)
English 187D	Modern British & American Poetry (Felstiner)
Esys 10	Introduction to Earth Systems (Ernst)
Esys 189	Field Studies in Earth Systems (Fendorf, Ackerly, Chiariello, Matson, Miller)
Phi 74Q	Ethical Aspects of Risk (Føllesdal)
Urb 181	Environmentally Sustainable Cities (Cushing)
-	Ecology of Invasions, Sophomore College (Gordon)
-	Constitutionalism, Sophomore College (Casper)
-	Quest Scholars Program (Ackerly)
-	Sunflower Identification: The Family Asteraceae (Corelli)

Non-Stanford University Classes (278)

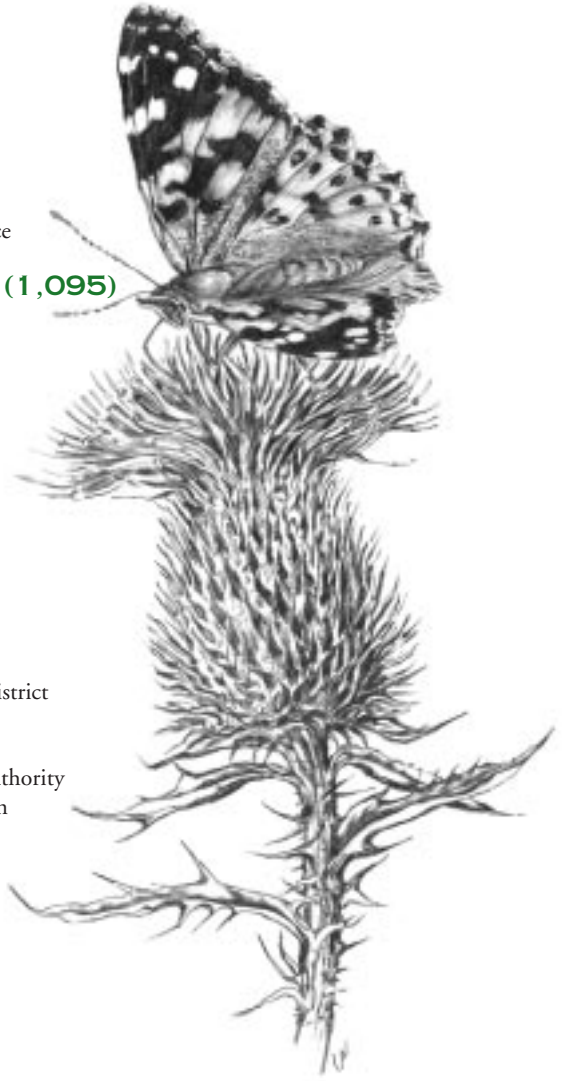
Bio 13	Santa Clara University, Ecology and Evolution (Edgerly-Rooks)
Bio 103	Cañada College, Native Plants and Wildflowers (Steiner)
Bio 111	College of San Mateo, Natural History (Fark)
CE 140	Santa Clara University, Water Resources Engineering (Perry)

Stanford Organizations (1,120)

Bechtel International Center
Center for the Advanced Study in the Behavioral Sciences
Cantor Center for Visual Arts
Capital Planning and Management
Department of Biological Sciences
Department of Geological and Environmental Science
Department of Philosophy
Department of Radiation Oncology
Faculty Women's Club
Goldman Honors Program, Institute for International Studies
Graduate School of Business
Haas Center for Public Service
Medical School Alums
Robinson House
Roble Dorm
School of Education
Stanford Libraries Staff Association
Stanford Linear Accelerator Center
Stanford Management Company
Stanford Teacher Education Program
Studio 3&4, Escondido Village
University Architect and Planning Office

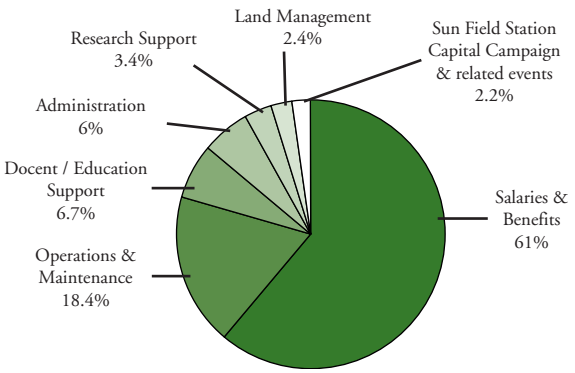
Other Organizations (1,095)

Affymetrix
Alaska Sierra Club
Canopy
Carnegie Institution of Washington
Castilleja School
Coyote Point Summer School
David and Lucile Packard Foundation
Eastside College Preparatory School
Environmental Volunteers
The Forum
Gunn High School
Lucile Packard Children's Hospital
Menopausal Men's Marching Group
Mid-Peninsula Regional Open Space District
The Peninsula School
Piedmont Middle School
San Francisquito Creek Joint Powers Authority
San Mateo County Parks and Recreation
Santa Clara Valley Audubon Society
The Sequoias
Strybing Arboretum
Surface Optics
Westridge Garden Club
Woodside High School
Yerba Buena High School



Appendix 4: Financial Summary: 2001-02 Fiscal Year

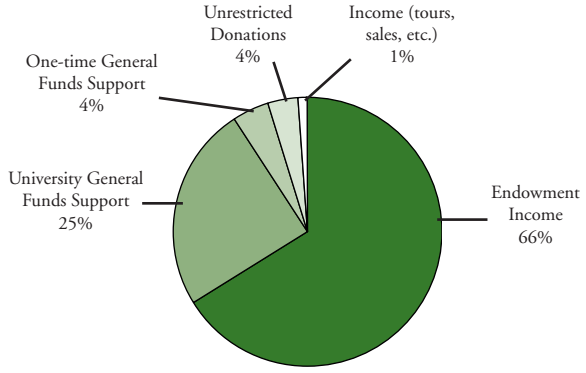
Expense Summary - $681,102



Salaries & Benefits	415,395
Operations & Maintenance	125,283
Docent / Education Support	45,355
Administration	40,657
Research Support	22,931
Land Management	16,634
Capital Campaign / Sun Field Station	14,847

Expenses exceeded revenue as several one-time costs were incurred that were indirectly related to the Sun Field Station, including a digital projector ($4,200) and a large format plotter ($9,700). This shortfall was covered by unrestricted donor accounts. The base operating budget without one-time Sun Field Station expenses was $672,333.

Revenue Summary - $678,773



Endowment Income	448,313
University General Funds Support	168,537
One-time General Funds Support	29,137
Unrestricted Donations	25,758
Income (tours, sales, etc.)	7,328

Unrestricted donations do not include $197,802 in gifts and pledges toward completion of the Leslie Shao-ming Sun Field Station capital campaign.

Appendix 5: Donors

Unrestricted Gifts, September 1, 2001 –August 31, 2002

Anonymous
Earl F. and Patricia C. Schmidt, Jr.
Paul H. and Madeline M. Arnaud, Jr.
Richard K. Arnold
Leonie F. Batkin
Irene L. and Robert W. Brown
Ms. Nancy and Mrs. Bruce Carlson
Susan Moths Carpenter
Toni Corelli
Bob and Mary Dodge
Edward M. and Virginia Fryer
Mary C. Henry and the Rajpal Sandhu Foundation
Mary P. Hufty and Daniel Alegria
Carol C. Jacobs
Richard Jeffers
Johnson and Johnson, Inc.
Dirk and Charlene Kabcenell
Donnell E. and Rose Mary C. Kaufman
Bill and Jean Lane
Eff and Patricia Martin
Arthur and Audrey Matula
Polly C. McCaslin
Elizabeth Morganthaler
John R. Page, Jr.
Lenore L. Roberts
Ruth Hicks Stewart
Donald E. and Anne W. Vermeil
Melissa Wibom
Richard J. and Louise Wiesner
Woodside Atherton Garden Club
John W. Working
Lowrie B. Yankwich

Bill and Jean Lane show Herb Dengler the entrance to the Jean Lane Environmental Education Classrooms at the June 2nd, 2002, Leslie Shao-ming Sun Field Station donor thank-you event. The classroom sign was designed by Deanna Messinger.

John Working, 12/6/01

Dear Philippe ~

Why do I feel so well after making my annual tithe to you. A perversity of nature? I don't think so.

It's simply that JR means so much to me. It's a place apart. It's an indispensable force for research. It's a venue to test my skills. And perhaps most important for me, it's feeling a part of a group of very special people.

So, many thanks to you ~

/s/ John

Appendix 6: The JRBP Community

Rami Aburomia
David Ackerly
Molly Aeck
Pedro Alejandro
Sean Anderson
Chris Andrews
Michael Anthony
Tori Arch
Paul Arnaud
Ron Arps
Marianne Austin
Jennifer Ayers
Sallie Bailey
Monya Baker
Matthew Bandy
Mary Baron
Nancy Bavor
Kathleen Bennett
Joseph Berry
Radika Bhaskar
Monika Björkman
Kindel Blau
Carol Boggs
Brendan Bohannon
Zoe Bradbury
Bill Brown
Irene Brown
Bob Buell
Gene Bulf
Ruth Buneman
W. L. Butler Construction
Al Butner
Thea Carlson
Karen Carney
Sally Casey
Jeanine Cavender-Bares
Angela Chabot
Sheila Chan
Ted Chandik
Audrey Chang
Aleksendr Chebanov
Nona Chiariello
Jack Chin
Jean Clark
William Clark
Betsy Clebsch
Elsa Cleland
Philippe Cohen
Robert Coleman
Heather Cooley

Mackenzie Cooper
Toni Corelli
Will Cornwell
Jenny Creelman
Mabel Crittenden
Rig Currie
Hall Cushman
Gretchen Daily
Yvonne Daley
Marge De Staebler
Fran Delagi
Herb Dengler
Polly Diffenbaugh
Sibyl Diver
Bob Dodge
Janet Doell
Ted Dolton
Jeff Dukes
Janice Edgerly-Rooks
Edwin Ehmke
Paul Ehrlich
Lisa Ehrlich
Linda Elkind
Claire Elliot
Irene Estelle
Michelle Evelyn
Brooke Fabricant
Natasha Fabricant
Deana Fabbro-Johnston
Ron Fark
John Fay
Scott Fendorf
Joan Ferguson
Christopher Field
Helen Fields
Gustavo Figueroa
Forrest Fleischman
Erica Fleishman
Ellen Foxman
Tony Fraser-Smith
Rachel Freund
David Freyberg
Chris Friedel
Zoë Friedman-Cohen
Edward Fryer
Dania Gamble
Matteo Garbelotto
Jihan Gearon
Susan Gere
John Glathe

Laurel Godley
Bill Gomez
Deborah Gordon
Carol Graham
Ted Grantham
Leda Beth Gray
Margaret Green
Michael Greene
Alan Grundmann
Elizabeth Hadly
Carol Hake
Dexter Hake
Becca Hall
Brad Hall
Tim Hall
Julia Hammett
Anna Hare
Stephen Hass
Chip Haven
Craig Heller
Nicole Heller
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Christopher Heppner
Paul Higgins
Richard Hobbs
Justin Holl
Gordon Holtgrieve
Leo Holub
Whitney Hopkins
Shelley Hou
Patrick Hsieh
Grace Hsu
Mary Hufty
Lia Hull
Krista Ingram
Peter Jacke
Steve Jaffe
Debi Jamison
Richard Jeffers
Gerry Jennings
Eliza Jewett
Laura Jones
John Juarez
Tamara Juarez
Jörg Kaduk
Darcy Karakelian
Bill Karavas
Salit Kark
Emily Keenan
Marcia Keimer

Donald Kennedy
Amber Kerr
Laura Kindsvater
Bill Kirsher
Gary Kittleson
Simon Klemperer
Jennifer Kluse
Charles Knight
Walter Koenig
Diana Koin
Laurie Koteen
Robert Kovach
Margaret Krebs
Claire Kremen
John Kriewall
Ann Lambrecht
Jean Lane
Aranzazu Lascurain
Peter LaTourrette
Alan Launer
Philip Leighton
Cynthia Bradford Lencioni
Tom Lindsay
Scott Loarie
Flora Lu
Will Ludington
Chris Lund
Nancy Lund
JJ Markman
David Martinez
Judy Mason
Don Mason
Pamela Matson
Margaret Mayfield
Laura McLendon
Ann McMillan
Laura McVittie
Ethel Meece
Duncan Menge
George Merchant
Tom Merigan
Deanna Messinger
Ted Mill
Elizabeth Miller
Lawrence Miller
Linda Bea Miller
Michael Milne
Stephanie Monzon
Harold Mooney
Lisa Moore

Betsy Morgenthaler
Lincoln Moses
Tom Mudd
Muwekma Tribe
Rosa Navarro
John-O Niles
Tamsin Orion
Jonathan Owens
Christopher Oze
Bryan Palmintier
George Parks
Jennifer Peritz
Halton Peters
Greg Peterson
Claire Phillips
Zach Pincus
Patti Poindexter
Jim Pollock
Ruth Porter
Jacqueline Pratt
Katherine Preston
Charles Preuss
Andrew Prober
Rob Wellington Quigley
Charles Quinn
Simha Reddy
Alice Reeves
Matt Reidenbach
John Rick
Donna Riley
Lennie Roberts
Martha Roberts
Nina Robertson
Judy Robertson
Andy Robinson
Leonard Robinson
Sarah Robinson
Terry Root
Anne Rosenthal
Ramón Roullard
Elizabeth Rush
Leonard Rush
Britt Sandler
Misty Sato
Douglas Schemske
Jessie Schilling
Vivian Schoung
Joan Schwan
Dylan Schwilk
Jeanne Sedgwick

Çagan Sekercîoglu
Richard Seymour
Becky Shaw
Dave Siebert
Joel Simon
Geoffrey Skinner
Gary Smith
Marion Smith
Jay Smolik
Shauna Somerville
Jay Stamps
Kathleen Starmer
Cindy Stead
Scott Stephens
Susan Thayer
Brian Thomas
Victor Thompson
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Todd Tobeck
Margaret Torn
Ruth Troetschler
Cary Tronson
Douglas Turner
Craig Uhrich
Parker Van Valkenburgh
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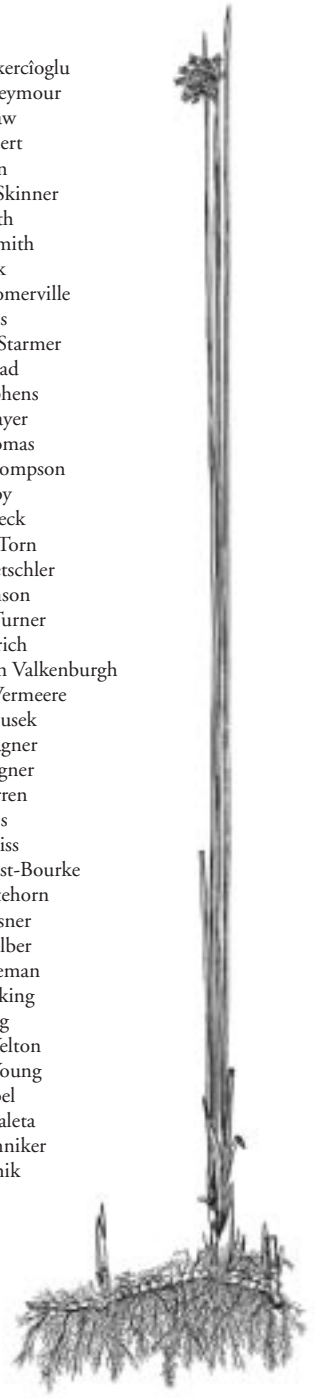
Peter Vitousek
Judith Wagner
Linda Wagner
Anne Warren
Alan Weiss
Stuart Weiss
Diane West-Bourke
Erik Whitehorn
Dick Wiesner
Cindy Wilber
Paul Wineman
John Working
Sunia Yang
Melanie Yelton
Rebecca Young
Carol Zabel
Erika Zavaleta
David Zinniker
Dan Zlatnik



JRBP Committee

David Ackerly, Assistant Professor and Chair
Harold Mooney, Professor
Paul Ehrlich, Professor
Chris Field, Professor
David Freyberg, Professor
Philippe Cohen, Administrative Director
Elsa Cleland, Graduate Student
Nicole Heller, Graduate Student

JRBP Staff

Philippe Cohen, Ph.D., Administrative Director
Nona Chiariello, Ph.D., Research Coordinator
Cindy Wilber, Program Coordinator
Justin Holl, Coordinator Assistant
Rebecca Young, GIS and Database Analyst
Joan Ferguson, Administrative Associate
Cary Tronson, Operations Steward
Leonard Robinson, Resident Caretaker
Brooke Fabricant and Deanna Messinger, Resident Rangers

Photographs

Steve Castillo, 18 (5), 26
Nona Chiariello, 6 (1, 3-8), 7, 12 (1 & 4), 15, 19 (8)
Philippe Cohen, 12 (5), 18 (1-4), 19 (7)
Charles Comfort, 10, 14
Justin Holl, 12 (2), 13 (10)
Leo Holub, 2, 3, 4, 16, 17 (bottom), 18 (6), 21, 23, 25
Cindy Wilber, 11, 12 (3, 6, & 7), 13 (8 & 9)
Rebecca Young, 1, 6 (2), 17 (top), 29

Illustrations

Chris Andrews, 9, 24, 28
Herb Dengler, front cover, inside front cover, 26, 27, back cover
Deanna Messinger, 20, 21

Graphic design and layout by Rebecca Young

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If you would like to make a gift of support to Jasper Ridge Biological Preserve, please call Stanford's Office of Planned Giving: (650) 725-4358 or visit the following URL: http://givingtostanford.stanford.edu/homeG.html.

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In Memoriam

Herbert Dengler - Long-time JRBP naturalist, docent, teacher, and friend, died on September 19, 2002. Docent Sunia Yang contributed the following poem in Herb's memory:

Walk with this man
who knows where he belongs.
Seventy-eight years,
ten thousand walks,
with this place–
in its greatest change
from hunting lands and cattle range
to island of wildness called Jasper Ridge.

Listen and hear a man
marked by the presence of a place–
a love for all its creatures,
the gracious hospitality
of one deeply at home.

Follow him down a trail of tales–
the comings and goings
of Holey Oak and Tidy Tips,
the march of Albert the newt,
the passing of clouds and larks
across the grassland,
the arrival of Dirca's golden drops,
the bloom of this year and last
and scores of blooms before.

Butterfly catcher, Indian runner,
cabin builder, trail maker,
land walker, plant watcher,
story keeper, beloved teacher.

Mabel Crittenden - Docent since 1976, died on July 1, 2002. Mabel Crittenden was a talented naturalist, botanist, teacher, illustrator, and author. A long-time resident of Portola Valley, Mabel brought her passion for wildflowers to everything she did. In her 15 years as librarian for the Portola Valley School District, she developed a popular and successful system for teaching children about wildflowers, and later, with her colleague Dorothy Telfer, turned that system into a book, *Wildflowers of the West*. Mabel went on to write several more books on wildflowers, trees, and ferns. She will be missed not only for her passion for teaching, but for her energy, sense of humor, and generosity.