

The State of the Preserve Assessment

Introduction

The Jasper Ridge “state of the preserve” assessment is an effort to summarize the status and trends of resources and ecosystem processes within Stanford’s 1189-acre biological preserve. The assessment grew out of the 2004 Jasper Ridge strategic plan and external review, which were authored by committees charged with charting a course for the preserve over the next quarter century. The strategic plan called for an assessment that would “determine and document what is present in the Preserve” in order to provide “a basis for future research, a baseline for future assessments, and a guidepost for management activities.”¹

With over a century of scientific study and three decades as a formally designated academic preserve, JRBP is well suited to this undertaking. Research at Jasper Ridge has been reported in more than a thousand written documents, including PhD dissertations, master’s theses, scientific publications, and student papers.² The goal of the state of the preserve assessment is to organize the existing knowledge on a series of topics in order to help guide the management of JRBP, identify critical research needs, and pinpoint historical data sources that should be made available. The strategic plan advocated these combined outcomes as a means of forging increased integration among the research, education, and conservation missions of the preserve.

The assessment is envisioned as an evolving document, with chapters being made available at this website as they are completed. Each chapter is authored by members of the Jasper Ridge community who bring experience and expertise to their topic, including faculty, other academic scientists, PhD students, and volunteers from several monitoring programs. Currently three categories of chapters are underway: natural and cultural resources, ecosystem processes, and long-term studies of focal species.

Nearly all authors who were asked to contribute to this effort responded affirmatively and with a remarkable degree of enthusiasm about sharing their knowledge and reviewing historical material. Some authors reviewed dozens of papers from Jasper Ridge files; others conducted the first rigorous analysis of an important database. Findings from several chapters have already stimulated new studies.

Jasper Ridge is a remarkable resource, which Stanford’s board of trustees viewed with foresight as a biological and academic treasure of incalculable value. In establishing an academic reserve in 1956, and then a formal preserve in 1973, the university’s trustees demonstrated an exceptional commitment to sustaining the endowment from the university’s founders. Jasper Ridge is an unambiguous demonstration of stewardship, at a scale that is rarely undertaken by universities.³

Some key issues

Jasper Ridge is an “island of preservation.” Situated in the eastern foothills of the Santa Cruz Mountains, Jasper Ridge lies near an extensive greenbelt in one of the most environmentally conscious areas of the country, but it is indeed insular. Most of the region’s protected land is located higher in the coast range, where there is more moisture and forests tend to dominate. Jasper Ridge contains habitats that are underrepresented in

protection at the scale of the ecoregion,⁴ while its immediate surroundings have undergone varying degrees of development.

Whether viewed as “an oasis of natural history”⁵ or “an island in a semisuburban sea,”⁶ Jasper Ridge presents a whole host of questions on the consequences of insularity, now and in the future. Will the remarkable degree of biodiversity within the preserve be maintained over the long term? Would biological corridors help sustain biodiversity or would they be used more efficiently by invasive species than by native species? These questions require an understanding of the status and trends in biotic resources and invasive species.

When Jasper Ridge became a biological preserve, one of the primary management goals was to “assure the natural continuity of the biota,”⁷ but there was little published discussion of what that might require. Cattle grazing had already been removed from most of the preserve, slightly more than a decade earlier. The clearest need was to eliminate trespass and reverse the rapid growth in recreational use, without alienating the local community. That goal was approached with a vigorous, coordinated, and very successful strategy. At the same time, scientists recognized that relief from development pressure, grazing, and recreation was no guarantee of long-term integrity of natural processes. As early as the 1960s, the long history of scientific observations was considered a baseline against which environmental change could be measured.⁸

JRBP developed a management philosophy that acknowledged some major land management challenges but focused more heavily on general operations. One could view this philosophy as one of maximizing options for studying natural processes and opportunistically resisting anthropogenic changes. This is reflected in a combination of policies that prohibited the introduction of foreign genotypes and use of biocides but sanctioned the removal of certain exotic plants. Thus, although the management philosophy has been called hands-off, a more accurate term might be hands-only, as most policies were essentially rules to insure that individual research projects would have minimal and reversible impacts. There was a clear recognition of daunting management challenges on the horizon due to wildfire and sedimentation of Searsville Lake, but these were simply beyond the capacity of the preserve, financially, jurisdictionally, and otherwise.

Time has increased the urgency of these larger challenges as well as their number. A particularly pressing new challenge is the extensive invasion of exotic grasses into formerly native-dominated serpentine habitat, coupled with local extinction of the Bay checkerspot butterfly from the same habitat. The loss of JRBP’s most intensively studied native species has raised new questions about whether a more hands-on management policy is warranted. Any effort to reestablish the butterfly or restore the grassland necessitates a rethinking of current policies because the intent would be to set in motion a change that persists. The strategic plan intended this kind of reevaluation when it established the conservation mission as one that “recognizes that species and biotic communities that are globally rare or diminished in distribution provide opportunities that are both scientifically important and critical to the University's commitment to responsible stewardship.”⁹ The long history and enormous significance of Bay checkerspot research make this an unparalleled test case for whether to revise Jasper Ridge policy.

Chapters of the assessment

The productive and influential history of Jasper Ridge reflects the capacity of Stanford scientists and students to envision, conduct, and interpret groundbreaking research. The results from those investigator-initiated studies provide the raw material for much of the state of the preserve assessment. Some topics have been studied in excruciating detail, and others have been approached by various people in different ways or at different times. There are also areas that have received little or no study. Alongside the research are several monitoring programs and databases, developed and operated by volunteers, focusing on birds, plants, and bats. The scientific literature and the monitoring databases, with their complementary strengths and weaknesses, shaped what the current chapters of the assessment could cover.

The chapters in progress address topics that met three criteria: general importance, availability of recent and/or historical data, and availability of a knowledgeable author. The chapters avoid topics that would duplicate other recent summaries, such as a recent overview of geology,¹⁰ an analysis of plant community change on serpentine soils,¹¹ and a comprehensive synthesis of checkerspot research.¹² The assessment does include a chapter on the Bay checkerspot focused specifically on the butterfly's recovery potential.

The charge to authors was to provide an overview of status and trends in resources or processes and to highlight conclusions that relate to conservation issues and the management of Jasper Ridge. Chapters approach these components differently based on the nature of the topic and the perspectives of the authors. To illustrate the breadth of community participation and to help foster future involvement and discussion, chapters conclude with a section about the authors.

Beginning in December 2008, chapters will be posted as they become available, and will be accessible from links in the Table of Chapters. Chapters should be cited using the header information provided with each document. When updates are added to this website, older versions will be archived and remain available. Documents should be cited by version and date.

Table of Chapters

Topic	Authors	Status, expected posting
Biotic and cultural resources		
Vascular plants	Toni Corelli, Ann Lambrecht, John Rawlings, Elizabeth Schwerer, Carol Zabel	Draft 2, early 2009
Butterflies	J�r�me Pellet	Draft 2, Dec 2008
Amphibians	Alan Launer	Draft
Reptiles	Sarah McMenamin	Draft 2, possibly add recent data
Birds	Tim Bonebrake, Boyce Burge, Zoe Chandik, Bill Clark, Marion Smith, Paul R. Ehrlich	Draft 1, draft 2 revision awaiting database additions
San Francisquito Creek aquatic fauna	Alan Launer	Draft
Bats	Tom Mudd	Draft 1, will be revised by others
Small mammals	Hillary Young, Rachel Adams	Draft 2, early 2009
Large and medium-sized mammals	Rodolfo Dirzo, Eduardo Mendoza, Yolanda Cach�, Bill Gomez	Draft 2, early 2009
Cultural resources	Laura Jones	Draft 1

Ecosystem processes		
Primary production	Claire Lunch	Draft 2, early 2009
Nutrient cycling	Ben Houlton, Chris Field	Final, Dec 2008
Herbivory	Rodolfo Dirzo, Yolanda Cachú, Eduardo Mendoza	Draft
Surface- and ground-water interactions	David Freyberg	Draft
Long-term studies of focal species		
Argentine ant: invasion dynamics and impacts	Jessica Shors, Katherine Fitzgerald, Deborah Gordon, Nicole Heller, Nathan Sanders	Draft 2
Bay checkerspot butterfly: status and recovery potential	Carol Boggs, Tim Bonebrake	Draft 1

Future steps

One of the benefits of publishing online is the possibility of expanding and updating this project over time. The list of chapter topics is missing some important areas, but authors and material will hopefully become available to make the coverage more complete. To encourage this, one outgrowth of the assessment just getting underway is an effort to improve access to historical data and reports. This will focus initially on notebooks and data from a few individuals, and on reports of particular significance.

The state of the preserve assessment opens many doors for renewing the value of previous research. A very positive outcome of this effort would be to begin encouraging students to examine, repeat, and evaluate previous studies, some of which might be suited to particular repeat intervals. The chapters of the assessment can provide a starting point for identifying studies to repeat, but they contribute more broadly by emphasizing opportunities for ecological and environmental research that are grounded in historical observations. Designating a set of legacy studies that should be resumed or periodically repeated would provide a unique and important new linkage between JRBP's research and education missions.

A third outcome of the assessment will be its impact on Jasper Ridge policies. Future policy decisions will include whether, and how, to mitigate the preserve's insularity, permit experimental restoration or reintroductions, maintain open water in Searsville Lake, and reestablish fire or other disturbance regimes in the chaparral. The policies on each of these issues will have consequences for the resources and ecosystem processes of the preserve. Reinforcing the preserve's capacity to assess those consequences is at the heart of the integrated research and conservation mission established in the strategic plan.

¹JRBP Strategic Plan, <http://jrbp.stanford.edu/stratplan.php>

²JRBP Research Publications List, <http://jrbp.stanford.edu/db/pubs/pubslst.php>

³Muller RN, Maehr DS (2000) Are universities leaders in the stewardship of conservation lands? *Bioscience* 50: 707 -712.

⁴The Nature Conservancy (2003) Jasper Ridge Biological Preserve Conservation Significance.

⁵ Grundmann A (1975) "Jasper Ridge: Stanford's Biological Preserve," in *The Stanford Magazine* 3: 19-34. This has been referred to in Jasper Ridge literature as the "green book".

⁶ McGarahan E (1997) Ecology: much studied butterfly winks out on Stanford preserve. *Science* 24: 479-480.

⁷ Department of Biological Sciences, Stanford University (1974) Policy statement and management program for the Jasper Ridge Biological Preserve.

⁸ Stanford University (1968) Jasper Ridge at Stanford University. This has been referred to in Jasper Ridge literature as the "grey book".

⁹ JRBP Strategic Plan, <http://jrpbp.stanford.edu/stratplan.php>

¹⁰ Coleman RG (2004) Geologic nature of the Jasper Ridge Biological Preserve, San Francisco Peninsula, California. *International Geology Review* 46: 629-637.

¹¹ Hobbs RJ, Yates SA, Mooney HA (2007) Long-term data reveal complex dynamics in grassland in relation to climate and disturbance. *Ecological Monographs* 77: 545-568.

¹² Ehrlich PR, Hanski I. editors. (2004) *On the Wings of Checkerspots: a Model System for Population Biology*. Oxford University Press.