

Conservation and ranching,
on common ground

Science that can guide
climate-smart practices

A day in the field, sampling
soils and biodiversity

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Conservation science for a healthy planet.

MONITORING RANGELAND HEALTH



Science on the Ra



Grazing and conservation have long been cast in adversarial roles, divided by fences built of mutual skepticism and mistrust. But today people interested in rangelands, in watersheds, in livestock, and in wildlife are recognizing common ground.

Ranchers are working to promote soil health through the use of planned grazing practices. Land-trust managers are trying out grazing as a way to encourage perennial native plants and control invasive ones. And innovative teams are seeking ways for livestock and wildlife (ultimately including top predators, such as coyotes and mountain lions) to not

only share the same land but also thrive on it.

How does conservation science fit within this growing network of interests, especially in light of an urgent need today to understand and restore rangelands? A vibrant mosaic of vegetation types, rangelands cover more than a third of California's area. Many of their important ecological and economic functions have been diminished, due to decades of degradation and loss.



Left: Rangeland and cattle at TomKat Ranch. Photo: Bill Milliot / Courtesy TomKat



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Monitoring California's vital rangelands for wildlife and for people

Point Blue, equipped with strong partnerships and scientific expertise, has begun an effort to measure and assess the ecological function of rangeland in California. The results can help inform managers on approaches that will benefit wildlife and people.

The larger context for this work is common to all human endeavors: people have altered the Earth's climate, lands, and waters; and present-day human populations are placing increasing pressures on natural resources. Rangelands influ-

ence the water and carbon cycles as well as wildlife, so their condition is important to climate as well as to biodiversity.

As we face a future that will be warmer, and where water will be increasingly limited, it's imperative to manage these lands in ways that are "climate-smart." This means using methods that capture and store more greenhouse gases and precipitation, priming ecological systems for a rapidly changing future. We also need to know if such methods

are working, and if not, how we might improve upon them.

A cooperative new project

Our Rangeland Monitoring Network, launched this year, is a coordinated effort to gather consistent data across many ranches and grassland areas. Point Blue provides tools, information, and people to help ranchers, researchers, and conservation partners gather information. This great undertaking draws on Point Blue's expertise, gained over the last

Cover: Teaming up to gather data are (from left to right) Point Blue biologists Mel Preston, Xeronimo Castañeda, and Corey Shake, and Rangeland Monitoring Network lead scientist Elizabeth (Libby) Porzig, PhD.

Left: Libby Porzig works in coastal-prairie rangeland at Jenner Headlands on the Sonoma coast.

Photos unless otherwise noted are by Ryan DiGaudio, an ecologist in Point Blue's Emerging Programs and Partnerships Group who assists in the Rangeland Monitoring Program.

“Ranchers are accustomed to using their eyes and also their cows’ eyes to make decisions about pasture and ranch management. Point Blue ecologists and birds bring two more sets of eyes to guide decision-making.” — Breanna Owens, who raises beef cattle and grass-finished sheep in Tehama County, California, coordinates Point Blue’s Rangeland Watershed Initiative pointblue.org/rwi.

Photo: Courtesy Breanna Owens



half-century, in designing and implementing large-scale ecological monitoring programs.

The Network is a voluntary program that depends on partners – private landowners, government agencies, non-profits, and land trusts. Together they are part of a land-steward community that recognizes the link between ranching and conservation. Ecological monitoring – data – provides a way for people to step beyond their fences and take an objective look at what’s on the land. To date, Point Blue ecologists have collected data on soil, plants, and birds from more than 150 locations on 30 ranches stretching from Jenner Head-

lands in coastal California to the Modoc Plateau and the foothills of the southern Sierra Nevada. We work in teams, with our partners – and the rewards are many.

Elizabeth (Libby) Porzig, PhD, is Point Blue’s lead scientist in our Rangeland Monitoring Network. She reports that “Many landowners have joined our field crews for a day of soil sampling. Talking with and learning from them has been one of the most rewarding aspects of my job. Our discussions concerning the history of the land, management goals, and indicators of ecological health have often led to new insights. We strongly share enthusiasm for ecology, conservation, and natural history.”

“I believe land stewardship and rangeland hand. The land speaks to your management. Climate change is upon us, and we have a tide simply by changing the way we think. I need a map I need to better understand if my impact the solution.” — Cindy Daley (at right, with Po Reid). On her Guidici Ranch, in Butte County, CA, cattle and pastures dairy heifers. Photo: Wendell C

A day in the field

A major focus of our rangeland monitoring field work is learning the condition of soils. We measure the soil’s dynamic features – ones that management practices can change. These include infiltration rate (how fast water soaks in); the soil’s bulk density (how compacted it is); and its carbon content. At the same time, we gather data on plants and on birds as measures of biodiversity.

A typical day starts with assembling equipment that we use for making measurements – shovels, soil probes, mallets, steel or PVC cylinders, and other field gear. We pack all this into our study sites by foot, truck, or all-terrain vehicle.

Water. When we arrive at a site, we first use a large ring, driven into the ground and filled with water, to measure



Left: Libby Porzig holds the tool used to obtain soil samples.

Above: In our lab, soils from varied sites are dried, precisely weighed, and prepared for chemical analysis.



Monitoring go hand in hand, for better or for worse. An opportunity to turn the monitoring data is the road on the land is part of Point Blue partner biologist Navit California, Cindy raises beef Gilgert



Land manager Kelly Mulville (left, in red cap) and Point Blue biologist Mel Preston (with clipboard) pore over data on birds and plants. Mel works alongside Point Blue's Carlie Henneman at TomKat Ranch in southern San Mateo County, south and west of San Francisco. Using monitoring that began at TomKat, Carlie and Mel are expanding the Rangeland Monitoring Network in Central California. This year they worked in San Benito County, inland from Monterey Bay. Mel says, "It's been great to connect with people like owner Sallie Calhoun and farm manager Kelly Mulville of Paicines Ranch, north of Pinnacles National Park. And with rancher Joe Morris whose cattle graze at one of the few state parks to allow grazing, Hollister Hills. We all share a strong interest in agricultural practices that improve the land's health and ranching success." **Photo:** Elaine Patarini

Land manager Kelly Mulville (left, in red cap) and Point Blue biologist Mel Preston (with clipboard) pore over data on birds and plants. Mel works alongside Point Blue's Carlie Henneman at TomKat Ranch in southern San Mateo County, south and west of San Francisco. Using monitoring that began at TomKat, Carlie and Mel are expanding the Rangeland Monitoring

the infiltration rate – how much water enters the soil and how fast. The more precipitation that absorbs into the soil profile, the less runs off the land surface. Storing water in the soil increases forage productivity and also the wildlife value of

streams by keeping them flowing longer into the summer and fall, when water is naturally scarce in California.

We then collect soil to analyze for compaction and carbon content. Using

a long cylindrical tool, we bore into the ground to gather soil samples. These we will later weigh precisely and also send separate samples to a lab for chemical analysis.

Soil compaction. Precisely measuring dry weights of our samples yields a measure of the soil's bulk density – an indicator of soil compaction. When soil becomes compacted, more rainfall runs off the surface instead of being absorbed into the ground. By measuring this feature, we can discuss with ranchers ways to start reducing soil compaction on their ranches. With data we gather in the future, we can show measurable changes that result from different management approaches.

Carbon. Carbon is a measure of the amount of crucial organic matter, such as decaying plant roots, in the soil. The more organic matter, the more water is





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Advancing nature-based solutions to climate change, habitat loss and other environmental threats through bird and ecosystem science, partnerships and outreach.

retained in the soil and available both to plants and to microorganisms, essential to the ecosystem. Ultimately, we want to use data on soil carbon along with infiltration and bulk density as a roadmap toward increasing groundwater and stream flows in California rangelands.

Carbon that stays in the soil is not released into the atmosphere; it is "sequestered." This essential property can offset other sources of greenhouse gas emissions. Given our growing human population and projections for a warmer and drier future, practices that increase the soil's capacities to absorb water and sequester carbon are vital today.

Biodiversity. Biodiversity is not only central to the beauty of California's iconic



"It's novel and very exciting to be gathering data on birds, vegetation, and soils on ranch lands. Once the baseline is known, we can provide information that enables cooperating ranchers to implement focused management and restoration actions on their land." — Wendell Gilgert (with binoculars, talking with Yolo County rancher Scott Stone) directs the Rangeland Watershed Initiative.

Photo: Phil Hogan / NRCS



landscapes: it's an important indicator of a healthy, functioning ecosystem. At each site where we gather data on soil, we also document the plants growing within a standardized sample area, and we conduct bird surveys.

By repeating these studies over time and at multiple locations, the Rangeland Monitoring Network will furnish invaluable scientific knowledge of whether, when, where, and how climate-smart ranching practices are improving rangeland function.

Adjusting grazing practices to improve the condition of the environment and also the

economic viability of ranching holds interest for growing numbers of rangeland managers. So far, data to support such interest has been limited. Over the last half-century, Point Blue has gained experience in exactly the type of large-scale monitoring that is needed to help tackle the questions involved.

The Rangeland Monitoring Network will be one way for both ranchers and conservationists to recognize the common ground of sustainable land, water, carbon, and wildlife management in our changing world. 🌍

Elizabeth (Libby) Porzig PhD, Tom Gardali, Wendell Gilgert, and Breanna Owens contributed to this article.