

A century and a half of plant observations

JOHN RAWLINGS

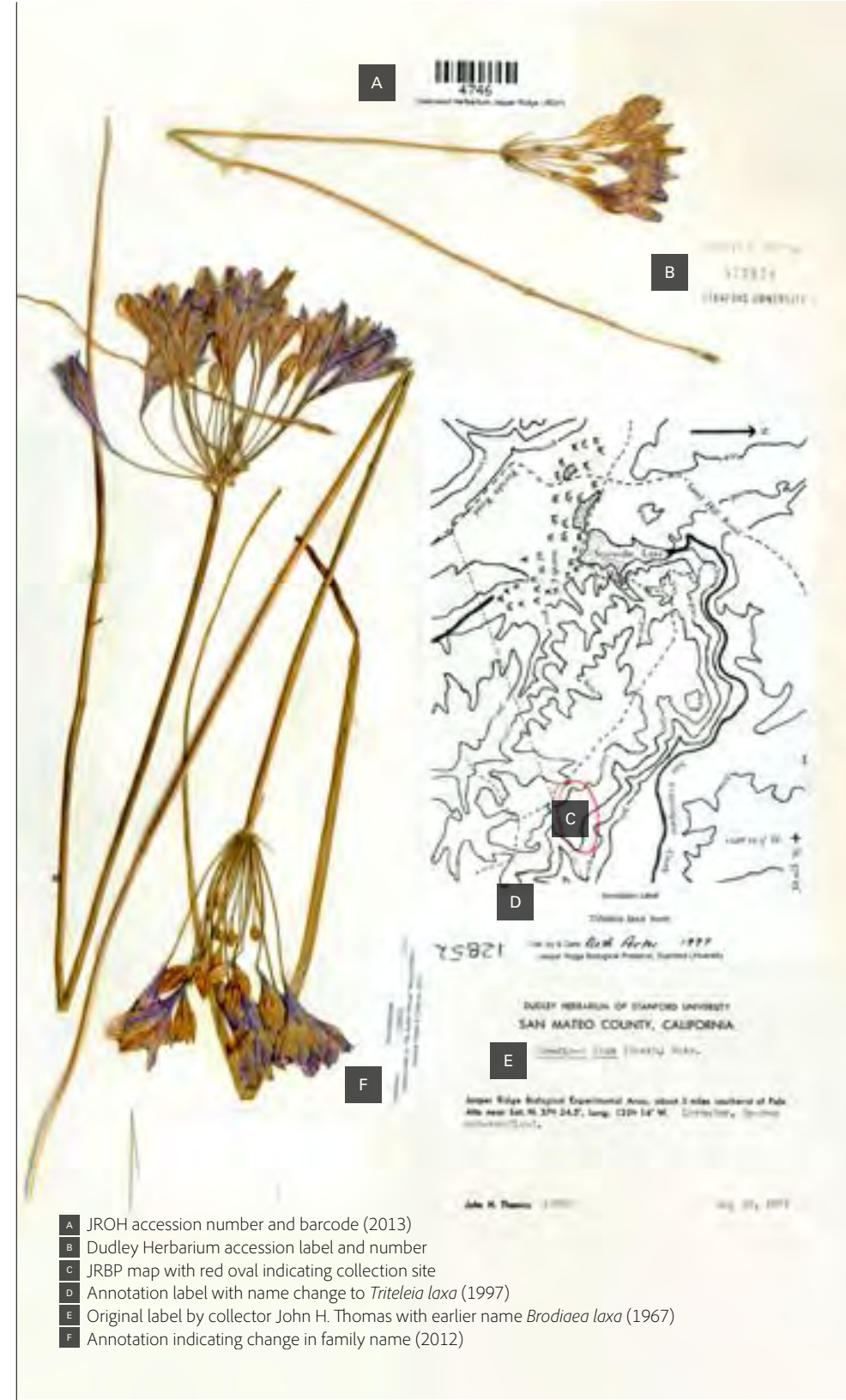
Walking over every hill and dale of the preserve during a year's course, one could be introduced to almost 10% of the vascular plants of California. Some of the state's most eminent botanists documented this diversity, and the Jasper Ridge Oakmead Herbarium and Collections (JROH) preserves that record from 1867 to the present.

In 1992 John Thomas, the most prodigious collector of the preserve's flora, estimated that it comprised about 600 species, subspecies, and varieties. At that time 400 Jasper Ridge plants were vouchered, i.e., documented by pressed specimens in organized herbaria. Twenty years on, the JROH has almost 6,000 specimen sheets of 794 vascular plants, plus collections of bryoflora and lichens.

Thanks to transcription by Zoe Chandik, the field notes of naturalist Herb Dengler are becoming more accessible. We have followed Herb's field notes and footsteps in search of plants he noted, such as paradoxical phalaris, congested plectritis, and miniature suncup. Our ongoing explorations result in new plant locations, vouchers, and discovery of plants never before recorded in the preserve.

Our goal is to compile, organize, and disseminate via the JROH webpage 150 years of floristic information: JROH specimens in the Consortium of California Herbaria; an annotated vascular plant list with links to thousands of georeferenced plant photos; a field observation database spanning 20 years of observations by Carol Zabel and Ann Lambrecht; special surveys and lists, including arrival dates of invasive exotics; a bibliography and links to historical documents.

My fellow herbarium volunteers in 2012-13 were Teri Barry, Toni Corelli, Alice Cummings, Karin Eckelmeyer ('62), Paul Heiple, Ann Lambrecht, and Diane Renshaw. ■



- A JROH accession number and barcode (2013)
- B Dudley Herbarium accession label and number
- C JRBP map with red oval indicating collection site
- D Annotation label with name change to *Triteleia laxa* (1997)
- E Original label by collector John H. Thomas with earlier name *Brodiaea laxa* (1967)
- F Annotation indicating change in family name (2012)



Long considered a single species, these yellow-flowered goldfields may be *Lasthenia gracilis*, or *L. californica*, or a mixture of the two in the narrow and imperceptible transition zone from one species to the other. Their purple-flowered companion, *Triteleia laxa*, has undergone taxonomic revision, too, as indicated on the herbarium sheet (opposite) together with ecological and curatorial information.

Upslope downslope—coexistence of two goldfields



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Imagine walking through a spring wildflower display at Jasper Ridge. Goldfields (*Lasthenia*) blanket the ground, and there are dashes of purple *Triteleia*, pink *Castilleja*, and hot pink *Leptosiphon*. The yellow of the goldfields is sometimes easy to ignore, as it provides the backdrop for other colorful spring blooms. Yet here at Jasper Ridge, the yellow is providing insights into how evolution works; it is a rare instance of two barely distinguishable, "cryptic" species coexisting.

For our graduate research we conducted separate but carefully integrated studies to unravel how two nearly identical species can grow together on the same hillside and not hybridize. This question is important for understanding how new species evolve and how species are maintained. In our studies of goldfields, we considered how soil chemistry affects different aspects of the plants' biology.

We found that fertile hybrids can be made when the two species, *L. californica* and *L. gracilis*, are crossed in the greenhouse. Surprisingly, the two species are adapted to different regions of the hillside crossed by trail 9, with *L. gracilis* occurring at the top (near fire road F) and *L. californica* occurring at the bottom. The two regions differ enough in soil chemistry to support differently adapted species and prevent them from growing intermixed.

Flowering time differences, seed set, and reduced viability or fertility of hybrids are additional factors that can prevent the two species from sharing genes. One question that everyone asked was whether pollen can move between the two species.