Abstracts

1. Species delimitation within the *Zeltnera* "California group" (Gentianaceae)

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Zeltnera includes approximately 25 species transferred from *Centaurium*. It is distributed throughout the Americas and occupies a variety of habitats. While species are traditionally delimited by morphological traits such as corolla size and pedicel length, these features are often variable and overlapping, creating ambiguity in dichotomous keys. Here, we present a phylogenetic and morphometric study of the *Zeltnera* "California group." Using ddRADseq data, we evaluated phylogenetic relationships among species within this group. Morphometric measurements—including corolla length, corolla diameter, pedicel length, leaf length, leaf width, and leaf ratio—were taken from herbarium specimens of all recognized species, including three unidentified *Zeltnera*. Our results revealed multiple taxonomic challenges in the California group and underscore the need for integrative approaches to robust species delimitation. To address these challenges, future work will include complete sampling of species across the entire genus to provide a strong phylogenetic framework for a comprehensive taxonomic revision.

2. Palisades Fire effects on *Cakile maritima* physiological, growth, and reproductive traits

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Recent increases in wildland–urban interface (WUI) fires have burned thousands of acres, threatening people and ecosystems. Burning infrastructure releases chemicals into the environment that degrade air and soil quality and threaten human health. Little research has investigated the long-term impacts of WUI fire pollution on plant physiology and reproduction. The Palisades Fire (January 2025) burned more than 23,000 acres and 6,800 structures across the Malibu–Santa Monica Mountains gradient. Occurring on the coast, this wildfire provides an opportunity to study how fire-produced pollutants affect the long-term health of coastal dune plants. We studied the halophyte European searocket (*Cakile maritima*) to test the hypothesis that increased pollutant exposure and decreased distance from the fire edge would decrease plant photosynthesis, growth, and reproduction. To do this, we used Heal the Bay pollution data from nine beach sites across Santa Monica Bay. We also measured chlorophyll, leaf surface area, and seed pod production in 50 *C. maritima* individuals at these sites. Using linear mixed-effects models, we found that distance from the fire affected chlorophyll and seed pod production, but our multivariate pollution measure was not associated with any measured trait. This suggests that wildfire-associated conditions may persist beyond the immediate burned area and that WUI fires may negatively affect plant physiology and reproduction. Although we found no association between pollution and plant traits, future work should use a larger sample size to investigate the effects of specific pollutants and fire characteristics, such as burn severity, ash deposition, and soil pH, on halophyte health.

3. Dispute not with her; she is the *Phlox* genus: The evolutionary history of two western *Phlox* complexes (*P. pungens* and *P. speciosa*)

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Historically, the genus *Phlox* has been taxonomically difficult, and our understanding of its relationships is still developing. Before genetic methods were used, our understanding of these evolutionary relationships was based on morphological traits. Our project examines two distinct *Phlox* species complexes, *P.*

pungens and *P. speciosa*, both of which show morphological variation across their geographic ranges. *Phlox pungens* is endemic to the Wind River and Green River basins of Wyoming. The Ross Butte morph is a variety of *P. pungens* found exclusively in the Green River Basin, and a previous study found distinct genetic variation between the two morphs. *Phlox speciosa* is a perennial wildflower that exhibits substantial morphological and habitat variation across its large range, from central California to British Columbia. A previous unpublished study using microsatellites found that *P. speciosa* contains fairly low genetic diversity overall compared with other *Phlox* species. Using reduced-representation whole-genome sequencing (ddRADseq), this study examines the evolutionary relationships within the *P. pungens* and *P. speciosa* systems. Our preliminary data from the *P. pungens* project reinforce the finding that the two morphs are genetically distinct, suggesting they may represent separate taxa. Using a similar methodological approach, we will investigate the *P. speciosa* complex and determine whether its morphological variation reflects phenotypic plasticity or more complex genetic patterns that microsatellites did not capture.

4. Morphometric and phylogenomic analyses of *Lomatium insulare* (Eastw.) Munz reveal novel biogeographic patterns with implications for taxonomy and conservation

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Lomatium insulare (Eastw.) Munz (Apiaceae) is an island-endemic perennial herb with a global distribution limited to San Nicolas Island, United States, and Guadalupe Island, Mexico. On San Nicolas Island, the species is a relatively common component of the island scrub community, while on Guadalupe Island it is known from three low-elevation locations in the extreme south (Punta Sur, Islote Toro, and Islote Zapato) and one higher-elevation location in the extreme north (North Ridge). Plants from San Nicolas Island and the southern stations of Guadalupe Island appear morphologically similar, while plants from North Ridge on Guadalupe Island appear to differ in having much less-divided ultimate leaf divisions. Here, we use morphometrics and phylogenomics to investigate patterns among samples from throughout the species' range, with phylogenetic outgroups drawn from closely related species. In our phylogenetic analyses, *L. insulare* is monophyletic with strong support (maximum-likelihood bootstrap [ML BS] = 100). Within *L. insulare*, we recover samples in two clades that correspond to island of origin (each ML BS = 100). Within the Guadalupe Island clade, the earliest divergence corresponds to a north–south split, with samples from each region forming reciprocally monophyletic groups with maximum support (ML BS = 100). While morphometric analyses show some significant leaf and mericarp differences between islands, the largest differences are between samples from North Ridge and all remaining samples, irrespective of island. We discuss the taxonomic implications of these patterns under an integrative species concept, as well as their conservation implications.

5. Don't look so far: Uncovering rare plants right in our own backyards

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California is a global biodiversity hotspot, home to more than 2,000 rare plant species, about 1,000 of which occur nowhere else in the world. This is not surprising given the geographic extent and diversity of the state. What may be more surprising is where some of these rare plants occur. Work by the Santa Barbara Botanic Garden (SBBG) Rare Plant Team shows that not all rare plants occur in secluded, inaccessible forests or on mountaintops; some can be found in our own backyards. SBBG is a member of California Plant Rescue, a network aimed at conserving California's flora in ex situ collections. Through this partnership, the Rare Plant Team targeted 26 rare species (21 CRPR 1B and 5 CRPR 2B) for seed collection and storage in the Conservation Seed Bank in 2026. While many were found in wilderness

areas removed from development and human activity, our work confirmed populations of nine rare plant species in urban settings. From roadsides in the center of town to natural spaces residents can bike through and agricultural sites, this work exemplifies how exceptional flora is often found right under our noses. Esri ArcGIS products allow the data our team collects to be visualized and used as a tool to remind the public that biodiversity can thrive in urban settings and should be protected.

6. The Santa Rosa Island Torrey pine: An update on population status following the unprecedented 2026 Santa Rosa Island Fire

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The Santa Rosa Island Fire (SRIF) started on May 15, 2026, when a sailboat and its captain wrecked on the south side of the island, sparking the largest wildfire in the island's recorded history. The SRIF burned 18,379 acres of vegetation (approximately 34% of the island) before being contained on June 4, 2026. It burned through unique plant communities composed primarily of island-endemic shrub and tree species, including *Pinus torreyana* subsp. *insularis* (Santa Rosa Island Torrey pine). It is widely considered one of North America's rarest pines, with fewer than 25,000 individuals recorded as of 2014. As the fire progressed, Santa Barbara Botanic Garden, the National Park Service, and The Seaver Institute developed an emergency initiative to re-census the Torrey pine population after the SRIF. Garden staff devoted 112 person-days to the re-census over six multiday trips. The effort documented more than 15,500 individuals and recorded the height, DBH, and reproductive status of each. Fire impacts to the canopy and bole, post-fire resprouting, and insect damage were also noted. Approximately 8,500 fewer trees were documented in 2026 than in 2014, but the geographic extent of Torrey pine and the area it occupied both increased substantially. The 2026 Torrey pine re-census is an example of a successful, collaborative, taxon-specific emergency response following a major wildfire. The data gathered will inform current interventions and serve as a conservation baseline for planned work in 2028 to assess both mortality and natural recruitment following the forecast 2026–2027 El Niño event.

7. Expanding plant–pollinator relationships with metabarcoding: Under-observed floral visitors and residents in three rare plant systems on San Clemente Island

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San Clemente Island is the southernmost member of the California Channel Islands archipelago and is owned by the U.S. Navy. It has 47 multi-island and 15 single-island endemic plant species. After the recent delisting of five plants, only *Lithophragma maximum* and *Sibara filifolia* remain federally endangered. The California Native Plant Society (CNPS) maintains rare-plant rankings for 63 taxa that occur on San Clemente Island, including *Dendromecon harfordii*, *Cryptantha clementina*, and *C. kinkiensis*. Managing rare plants is challenging because baseline information, including pollinator ecology, remains limited for many taxa. Traditional pollinator observations often have selection bias against small floral residents and other under-observed pollinators. As a pilot study, we evaluated whether pollen metabarcoding can complement observations that are difficult to quantify in three systems: (1) floral residents within a very small population of the obligate-outcrossing species *Dendromecon harfordii*; (2) potential pollinators associated with *Sibara filifolia*, which has no documented pollinators on San Clemente Island; and (3) *Monomorium* ants visiting *Cryptantha kinkiensis* and *C. clementina*, where incidental observations suggest a potential role for ants as island pollinators. Detection of target pollen on the abundant *Dendromecon* floral resident *Thrips* hints at their potential to pollinate and warrants future

investigation. No *Sibara* pollen was detected on insects visiting flowers of neighboring species, supporting observations that this species receives few, if any, floral visitors. Detection of *Cryptantha* pollen on *Monomorium* ants demonstrates that flightless floral visitors can transport pollen. Although pollen metabarcoding cannot replace behavioral observation or detect pollen deposition, it can uncover novel ecological information and relationships across different plant–pollinator networks.

8. Leveraging the power of herbaria to assess species extinction risk: A case study using the genus *Tropidocarpum*

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As extinction threats rise, traditional approaches to evaluating species extinction risk are costly and labor-intensive. This study evaluates the utility of herbarium records for assessing species extinction risk. Using georeferenced specimens for three closely related California native plant species, we calculated two metrics of geographic distribution: Area of Occurrence (AOO), a proxy for range size, and Extent of Occurrence (EOO), a proxy for niche specificity. We also generated species distribution models to quantify environmental suitability under alternative future climate scenarios. We selected the genus *Tropidocarpum* because it includes three native species in California: two rare species (*T. capparidum* and *T. californicum*) and one widespread species (*T. gracile*). Records for each species were downloaded from CCH2, then cleaned and filtered. AOO and EOO were calculated using the IUCN Red List tool GeoCAT, and MaxEnt was used to generate species distribution models for historical and future climate conditions. Models were compared to quantify the potential impact of environmental change on species distributions. With automation, this approach has the potential to use herbarium records to rapidly identify species at risk of extinction that may warrant prioritization for in-depth evaluation. It could help streamline threat assessments for rare, threatened, and endangered species at a global scale.

9. Morphometric analysis reveals differences in Humboldt County coastal marsh milkvetch (*Astragalus pycnostachyus* var. *pycnostachyus*)

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California's coastal salt marsh habitats are threatened by expanding development, land-use changes, agriculture, and rising sea levels (Zedler 2004; Stein et al. 2014). *Astragalus pycnostachyus* A. Gray (Fabaceae) is a short-lived herbaceous perennial found primarily in these habitats. There are two described varieties: coastal marsh milkvetch, var. *pycnostachyus*, and Ventura marsh milkvetch, var. *lanosissimus* (Rydb.) Munz & McBurney. Coastal marsh milkvetch is designated Rare (1B.2) by the California Native Plant Society (CNPS) and occurs in coastal pockets of the Bay Area and Humboldt County. Ventura marsh milkvetch is listed as Endangered by California and the federal government, is designated a 1B.1 plant by CNPS, and is now limited to a few highly managed sites in Ventura and Santa Barbara counties. A recent genomic study of *A. pycnostachyus* supported the distinction between the two varieties and found that samples of var. *pycnostachyus* from Humboldt County and the Bay Area form distinctly separate clades (Roberts et al. 2025). In this study, we explored whether morphological features support recognizing the Humboldt County *pycnostachyus* group as a new taxon. Morphometric data were collected from 64 herbarium specimens representing *A. pycnostachyus* from Humboldt County, the Bay Area, and Southern California. We summarize the key morphological differences among the three geographic groupings and present novel morphological differences that align with the genomic split. These findings provide further support for the distinctiveness of the Humboldt County clade and highlight the need for additional study to clarify its taxonomic status and inform conservation efforts for this small, geographically restricted population.

10. Morphological evidence of hybridization between *Encelia californica* and *Encelia farinosa* in a San Diego County urban canyon

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San Diego County's urban canyons support substantial native plant diversity but are vulnerable to the introduction of species from outside their local region. At Chollas Radio System Open Space, the coastal native *Encelia californica* occurs with *E. farinosa*, a desert species native to eastern San Diego County and northern Mexico. Morphological intermediates at this site also suggest potential hybridization between the two species. We evaluated morphological structures and variation among the parental taxa (*E. californica* and *E. farinosa*) and putative hybrids using 21 newly collected field specimens and 44 older specimens from the San Diego Natural History Museum Herbarium. Traits examined included leaf glandularity, color, and shape; type of pubescence; and pubescence density. Statistical analyses in R, including ANOVA and Tukey HSD tests, showed significant differences between parental taxa across multiple traits, while hybrids generally displayed intermediate morphology ($p < 0.05$). Principal component analysis (PCA) showed distinct separation between parental taxa and intermediates, with the first two components accounting for 66.4% of observed variation. Discriminant function analysis and k-means clustering further supported the observed morphological differentiation among the collected *Encelia*. Putative hybrids were consistently associated with locations where *E. farinosa* was present, while sites lacking *E. farinosa* were dominated by *E. californica*. The results provide morphological evidence of potential hybridization while highlighting how native species moving beyond their natural ecological range can potentially alter the genetic and morphological diversity of locally native populations.

11. The Great Lichen Merge: Integrating the University of California, Riverside, and Santa Barbara Botanic Garden lichen collections

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Natural history collections provide invaluable records of biodiversity and are essential resources for taxonomy, biogeography, and conservation. In 2022, Santa Barbara Botanic Garden (SBBG) acquired approximately 17,000 lichen specimens from the University of California, Riverside (UCR), bringing its combined collection to more than 53,000 specimens and establishing it as the second-largest lichen collection in California. Assembled primarily by Shirley Tucker, Cherie Bratt, and Kerry Knudsen, these collections represent an extraordinary record of California's lichen diversity and are especially representative of Southern California and the Channel Islands. Integrating two major collections presents logistical and curatorial challenges, but also creates opportunities to improve specimen accessibility, organization, and data quality. Here, we describe our ongoing efforts to physically integrate the SBBG and UCR collections while improving their digital records in the Consortium of Lichen Herbaria. Our workflow includes specimen sorting, taxonomic updates, label transcription, barcoding, duplicate identification, and physical intercalation. We compare two approaches to collection integration, highlighting trade-offs among efficiency, quality control, and effective volunteer involvement. With approximately half of the collection processed, this project has already improved the organization, consistency, and accessibility of tens of thousands of specimens. Future efforts will include specimen imaging and georeferencing. By uniting two

regionally significant collections and improving their associated data, this project strengthens infrastructure supporting lichen biodiversity research and conservation in California while offering practical lessons for other herbaria undertaking large-scale collection integration projects.

12. From collection to connection: Creating the Sherwin Carlquist Extended Specimen Network exhibit for community engagement

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Dr. Sherwin J. Carlquist (1930–2021) was a visionary botanist whose interdisciplinary approach to island biogeography, wood anatomy, and evolutionary ecology resulted in a legacy of more than 190,000 collection objects. Carlquist's views and methodology align with the concept of the Extended Specimen Network (ESN). Through a five-year collaborative effort funded by the National Science Foundation, California Botanic Garden's Herbarium and the Botanical Research Institute of Texas Library, where Carlquist's collections are held, are creating an ESN. This project aims to curate and digitize his work, then link it to ensure long-term preservation and accessibility and facilitate future research.

As part of this project's broader impacts, a physical and digital museum exhibit was developed to translate the complex ESN framework into an accessible narrative for a general audience. Graduate students and herbarium staff curated a library-based exhibit that conveys Carlquist's philosophy of interdisciplinary discovery. The ESN embodies a holistic approach to engaging with physical specimens by supplementing them with digitized photo slides, microscope slides, field notebook entries, and personal correspondence. The exhibit highlights Carlquist's life and botanical legacy while encouraging visitors to make their own botanical observations and understand the importance of collections.

This poster provides a behind-the-scenes look at how the ESN framework was used to curate and digitize disparate materials into a cohesive narrative, highlighting the project's collaborative success and the museum exhibit's role as a bridge connecting technical research with broader public engagement.