2025 Bloom-Hays Ecological Research Grant and Zembal Wetland Research Grant: Sea & Sage Audubon increased the amount of funding available in 2025, increased our outreach, and received almost triple the amount of applications compared to previous years! Applicants requested a total of $117,380 of funding in 2025. Six excellent student proposals were selected for funding by the Sea and Sage Student Grants Committee.

Bloom-Hays Ecological Research Grant: The objective of the Bloom-Hays Ecological Research Grant is to advance ecological research, particularly research related to avian species and the natural communities upon which they depend, by providing funds or supplies to support research activities benefitting native species and habitats in Southern California.

- ***Aiyana Reissman, University of San*** *Diego (MS), $5,000, Exploring the Use of an Endangered Flagship Species as an Ecological Indicator and Icon in Southern California Wetlands.* Aiyana is examining temporal and spatial patterns of light-footed Ridgway's rail and its relationship with climate drivers through linear modeling and multivariate analyses. This analysis will provide an understanding of additional suitable release sites for rails and potential restoration projects like invasive species removal or tidal connectivity. Aiyana is also developing a curricula for the "Teachers on the Estuary" program and organizing a community workshop for the Tijuana River National Estuarine Research Reserve that will include the release of captive-bred rails to bring together community members and land managers to unite them under this flagship species to help habitat recovery and protection.

- ***Mary Tucker, University of California, Riverside*** *(PhD), $5,000, Following the Flowers: Migration and Movement Patterns in Costa's Hummingbird Through Advanced Tracking Technology.* Mary will use new ultralight tracking technology to track the movements of Costa's hummingbirds to understand their annual cycle, include their migration and local movements within Deep Canyon and eventually across their entire range (detection at MOTUS towers). These new tags are powered by solar energy, weigh a mere 60 milligrams, and emit individual signals every second when exposed to sunlight, allowing for uninterrupted tracking indefinitely. Mary's study is expected to yield new insights into the migration and population structure of Costa's Hummingbird. The findings may inform conservation strategies by clarifying seasonal habitat use, population stability, and the species' reliance on desert flora.

- ***Jill Carpenter, University of California, Los Angeles*** *(PhD), $4,100, Is Prey Availability a Factor in the Decline of a Bat Species in Southern California that is Synanthropic in the Rest of its Range?* Jill is researching whether prey availability is a factor in the decline of big brown bats in Southern California. Although this species is considered to be urban-adapted, in Southern California this species is not found in urban areas and populations have been declining for over two decades. Jill's study explores the diet of big brown bats roosting at the urban-wildland interface in Southern California using DNA metabarcoding of guano. If big brown bats roosting in the urban-wildland interface are primarily consuming insect prey that are associated with undeveloped habitats, this research may shift the conservation approach for bats to include more of an emphasis on prey source habitats.

- ***George Vetushko, University of California, Los Angeles*** *(MS), $2,175, Nitrate Remediation Potential of Anaerobic Methane Oxidation in a Southern Californian Coastal Wetland.* Anthropogenic activity, including agricultural runoff, may feed high concentrations of nitrate into wetlands and spark harmful eutrophication events, leading to potentially toxic algal blooms. George is exploring nitrogen pathways, specifically, anaerobic oxidation of methane by wetland soil microbes. Methane oxidation may consume nitrate leaching from the overlying water column and convert it into inert N2 gas, effectively removing nitrate from the wetland. Methane oxidation is also a significant sink to the emission of methane (a potent greenhouse gas) from the wetland and thus, is an important buffer to the global greenhouse effect, a long-term threat for wetland habitat stability. Geoge's research is assessing the role of methane oxidation in alleviating anthropogenic nitrate input to coastal wetlands.

- ***Vince Rivas, San Diego State University*** *(MS), $2,175, Determining the Presence of a Potential Novel Pathogen in Coast Live Oak (Quercus agrifolia).* Vince is researching a new pathogen discovered in coast live oak acorns. His research would determine the spatial distribution of symptomatic acorns; whether the black acorns are associated with a specific fungal or bacterial species in symptomatic individuals; how the acorn microbiomes differ between symptomatic and asymptomatic trees; whether the pathogen is transmitted horizontally through the soil; and the effects on seedling germination. Vince's research seeks to understanding how this pathogen is affecting coast live oak, a keystone plant species.

Zembal Wetland Research Grant: The objective of the Zembal Wetland Research Grant is to advance ecological research related to coastal wetland habitats of Southern California, including habitats that support shorebirds and seabirds.

- ***Nicole Vanelli, California State University, Long Beach*** *(MS), $3,600, Testing Vegetation Effects on Sedimentation as a Measure of Resilience to Sea-Level Rise.* Nicole is researching how the percent cover of vegetation, elevation within the marsh, and sediment supply in the estuary affect sedimentation rate, which influences overall marsh resilience to sea level rise. She has a beautifully designed experiment to manipulatively test relationships between sedimentation rate and vegetation assemblages (clumped or sparse vegetation of the same percent cover) at two levels of tidal inundation (high and low ends of the middle marsh elevation) in differing sediment regimes (high vs. low sediment supply). Her work is occurring at the Seal Beach National Wildlife Refuge and at the Tijuana River National Estuarine Research Reserve. She will incorporate the experimentally determined relationship between vegetation and sedimentation into monitoring frameworks that land managers use to estimate resilience to sea level rise and to prioritize restoration measures.