$10.00 (free to members)

VOL. 45, NO.3 • November 2017

FREMONTIA

JOURNAL OF THE CALIFORNIA NATIVE PLANT SOCIETY

SPECIAL ISSUE:
Islands of the Californias

California Native Plant Society
2707 K Street, Suite 1
Sacramento, CA 95816-5130

Nonprofit Org.
U.S. Postage
PAID
MLP

MIX
Paper from responsible sources
FSC® C021872
www.fsc.org

Printed on sustainably harvested paper containing 50% recycled and 10% post-consumer content, processed chlorine-free.

Lead Authors

Alfonso Aguirre-Muñoz is an oceanographer with an interdisciplinary Ph.D. in Regional Studies and Sustainable Development. He has forty years of professional trajectory in the conservation and sustainable development of coastal, marine and island ecosystems and was the former Director General of GECI (2002 to 2017).

Matt Guilliams is the Tucker Plant Systematist at the Santa Barbara Botanic Garden. A native Californian, Matt has worked with the plants of the state since 1998. At the Garden he focuses on biodiversity of the Central Coast and Channel Islands, as well as on studies of the Boraginaceae and Montiaceae.

Steve Junak has been exploring the California Islands and studying their plants for almost 50 years. He worked as a botanist at the Santa Barbara Botanic Garden for 37 years, has retired from that job, and is currently a Research Associate there. He co-authored the Flora of Santa Cruz Island (1995), wrote the Flora of San Nicolas Island (2008), and is currently working with several other authors on a flora for Catalina Island.

Denise Knapp has a Ph.D. in Ecology from the University of California, Santa Barbara and an M.A. degree in Geography from the University of California, Los Angeles. She has worked on vegetation, fire ecology, invasive species, rare plant, and habitat restoration projects; her current focus is plant-insect interactions, especially pollinators. She has worked as an ecologist in California, particularly the Channel Islands, for two decades.

John Knapp's love-affair with the California Islands started when, at two years old, his father would leave him to play on Tin Can Beach (now Bolsa Chica) while he went for a run, and John would look across the Catalina Channel at the mountain in the sea wondering what awaited him out there. What he found was great beauty and the need for dramatic conservation intervention, and after working on the islands for the past two decades he now serves as the California Islands Ecologist with The Nature Conservancy. His goal is to develop strategies, methodologies, and tools to more effectively and efficiently address the conservation challenges facing the islands, which is best summarized by Willis Linn Jepson who wrote in 1907, "*In the long run protection must come by the devices and resources of united effort, high intelligence, and careful handling.*"

David Merzurkewicz is a Wildlife Biologist for Channel Islands National Park focused on seabirds and habitat restoration. He has been working on the California Islands for the past decade. The scope of his work within the Park encompasses ecological restoration for seabird nesting habitat and associated plant communities as well as spearheading the Park's Inventory and Monitoring program for seabirds.

Kathryn McEachern is interested in exploring how changes in the environment affect populations of rare and endangered plants. She is a Research Plant Ecologist with the U.S. Geological Survey - Western Ecological Research Center's Channel Islands Field Station, in Ventura, California. She has been studying the distribution, abundance and demography of rare plants on the northern Channel Islands for nearly 20 years, providing research to inform and test restoration and recovery actions.

Bryan Munson is the Botany program manager for Naval Base Coronado, which includes San Clemente Island and 7 properties in San Diego County. Bryan has worked in environmental compliance for the Navy for 10 years. Bryan graduated from the University of Wisconsin-Madison with a B.S. in Biology and a minor in Environmental Studies.

Tom Oberbauer has had a lifelong interest in islands and has had the opportunity to visit most of the California and Baja California Pacific Coast Islands as well as many in the Sea of Cortez. He has written a number of articles describing the botany of the islands including for *Fremontia.*

Federico Méndez-Sánchez is an oceanographer with a MSc in Environmental Management from The University of Auckland, New Zealand. He also has twelve years of experience working on conservation, restoration, and sustainable development of the islands and has been the Director General of GECI since March 2017.

John Randall is a Lead Scientist for The Nature Conservancy's California Chapter. He supervises a team of four other scientists working to conserve and manage protected areas and corridors with the aim of linking them into a statewide network. His own work is currently focused on the conservation and management of the biodiversity of the Islands of the Californias, and on contributing to an urban conservation program for Greater Los Angeles by assessing the distribution of biodiversity and opportunities for enhancing it across the region.

INTRODUCTION TO THIS SPECIAL ISSUE ON THE FLORA AND VEGETATION OF THE ISLANDS OF THE CALIFORNIAS

John J Knapp & John M. Randall

The islands off the Pacific coast of the states of California and Baja California Peninsula, from the Farallones in the north to Isla Natividad in the south (see map), are within the California Floristic Province. Their shared flora is distinctive and rich in endemic genera, species, subspecies, and varieties not found on the mainland. Together these 18 islands are home to 1,239 native plant taxa. Island vegetation types resemble those on the mainland, but island endemic taxa are prominent in most of them.

Unfortunately, these islands were severely damaged by human use within the past two centuries, and particularly by introduced animals—against which many island endemic plants were poorly defended. As a result, many endemic plants are now thought to be extinct, have been reduced to the brink of extinction, or are extirpated from one or more islands. Fortunately, botanists who recognized the extraordinary nature of the island flora collected specimens, described the vegetation, and identified endemic taxa starting in the mid-1800s. In some cases, they lost their lives doing it, but their explorations provided early records of what the islands looked like.

Above: Old-growth lemonade berry shrubs (*Rhus integrifolia*) which escaped nearly a century of overgrazing by sheep, dot the hillsides of East Santa Cruz Island, along with recovering coastal scrub. West Anacapa in the background. Photo by Morgan Ball.

Today most of the islands are managed for conservation or include large areas that are protected. The Farallones are a National Wildlife Refuge, five of California's eight Channel Islands are within Channel Island National Park, two others are managed by the U.S. Navy, 48 percent of Santa Catalina Island is managed the Catalina Island Conservancy, and 76 percent of Santa Cruz Island is owned and managed by The Nature Conservancy. In December, 2016 the Mexican government announced the establishment of the Reserva de la Biosfera Islas del Pacifico (Baja California Peninsula Pacific Islands Biosphere Reserve) encompassing 21 islands, including all of those within the California Floristic Province (see Aguirre-Muñoz and Méndez-Sánchez article).

The agencies and organizations responsible for these islands have had remarkable success in eliminating the most damaging introduced animals, many invasive plants and invertebrates. Plans are still in the works to remove several of the most damaging

remaining invaders. Land uses that threatened native plants have also been eliminated or curtailed. Some of these successes involved remarkable cooperation among government agencies and non-government organizations, great feats by individuals and teams, and advanced technology. Some have become justly famous in conservation circles worldwide and are examples taught in conservation biology courses. In 2016, the Secretariat of the Convention on Biological Diversity and the Aeon Environmental Foundation awarded the MIDORI Prize for Biodiversity to the leader of Grupo de Ecología y Conservación de Islas which spearheaded eradications of damaging invasive animals on 39 islands in Mexico.

Better yet, the vegetation of the islands has made an astounding recovery. On Santa Cruz Island where feral sheep were eliminated roughly 30 years ago, and feral pigs were eradicated in the mid-2000s, scrublands dominated by native species have increased from 5% in 1985 to over 50% in 2015, while Mediterranean annual grasslands have decreased by similar proportions. On Guadalupe Island, where feral goats were eliminated in the mid-2000s, large areas that were barren or completely dominated by invasive grasses just a decade ago are now cloaked with beautiful island endemic shrubs including some never-before recorded there. Seedlings are now abundant in endemic Guadalupe Island pine and Guadalupe Island cypress groves where reproduction was unknown for decades until the goats were removed. Similar successes can be found on almost all of the islands.

The flora and vegetation of the islands aren't out of the woods yet, however. Many taxa have yet to recover, over 20 endemic taxa have fewer than 10 populations left, and large areas stripped of soil by erosion during the grazing era, or other anthropogenic disturbances, remain barren.

Roughly 30 botanists representing island owners and managers, conservationists, and mainland partners have formed the Islands of the Californias: Botanical Collaborative or Islas de las Californias: Colaboración Botánica to advance shared conservation priorities for the botanical resources of the Archipelago. Each year partners meet on one of the California Islands during the "Extravaganza." Pictured is the 2015 Extravaganza held on San Clemente Island. Photo by Morgan Ball.

Fortunately, interest in protecting and restoring the flora has gained strength recently. Island managers and mainland partners are working formally together on a variety of invasive and native plant projects and, in 2016, formed the binational Islands of the Californias Botanical Collaborative. Through this program we expect to achieve our island plant conservation objectives more rapidly, at less expense, and on more islands.

Each island differs from the others, sometimes wildly. Human presence on some extends back at least 13,000 years and many have been sites of rich archaeological finds of complex, long-lived cultures. Their history over the past 200 years is also full of interest and sometimes intrigue. They have proven to be ideal sites for field research and demonstration projects on subjects ranging from animal behavior to invasive species ecology and control, to geological fault movement and more. They have served as settings for memoirs, novels, TV shows, and movies. In short the islands have mystique combined with a fascinating and ecologically valuable flora, fauna, and natural history.

The other chapters in this volume provide far greater detail on key points we have made here. Guilliams et al. focus on just how remarkable and distinctive the flora of these islands is and the evolutionary processes taking place. Junak et al. offer a sampling of the unique personalities who botanized the islands, from early botanical explorers to recent times. Oberbauer et al. share personal stories of witnessing the remarkable recovery of the vegetation of the islands, while Munson et al. celebrate the recovery of rare and island-endemic taxa. Aguirre-Muñoz and Méndez-Sánchez highlight the recent protections of the Mexican islands and the power of binational collaboration. McEachern et al. remind us some taxa have not yet recovered and remain at risk of extinction. Mazurkiewicz et al. discuss efforts to restore and protect the flora, and D. Knapp et al. divine what is being learned about climate change on the islands and the influence it will have on the future of the flora.

As you read this issue, you may notice that the list of authors is long and representative of a broad partnership. All of them share a passion for the flora of the islands and its ongoing recovery. There are many others in the US, Mexico, and beyond who share this passion. If you aren't already, we hope you will become one of them.

-John Knapp: John J. Knapp: jknapp@tnc.org