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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.

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

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.

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,



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.

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.

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. Guillems 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.

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