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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.

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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.



THE NEW BAJA CALIFORNIA PACIFIC ISLANDS BIOSPHERE RESERVE SETS A CONSERVATION BENCHMARK: ALL MEXICAN ISLANDS ARE NOW PROTECTED

Alfonso Aguirre-Muñoz and Federico Méndez-Sánchez

Mexico has 4,111 islands that host 8.3% of the country's vascular plants and land vertebrates, including 14 times more endemic species per square kilometer than the mainland. Setting a benchmark for island conservation in Mexico—with relevant benefits to global biodiversity—during the United Nations Biodiversity Conference held in Cancún, Quintana Roo, Mexico in December 2016, Mexico's President announced the creation of four new protected areas (Dibble 2016). Published in the Official Gazette of the Federation on December 7, 2016, President Enrique Peña-Nieto's Decree established the 1,161,447.79 ha "Baja California Pacific Islands Biosphere Reserve" [*Reserva de la Biosfera Islas del Pacífico de la Península de Baja California*] (DOF 2016).

THE RELEVANCE OF THE NEW RESERVE

This Decree comes 13 years after the Mexican non-profit conservation organization *Grupo de Ecología y Conservación de Islas, A.C.* (GECI), together with artisanal fishing cooperatives, particularly the Cedros Island-based *Pescadores Nacionales de Abulón* represented by their regional federation FEDECOOP, and backed by the Senate and the Congress of the Republic,

requested Mexico's federal government to protect these islands and their surrounding waters. This new Biosphere Reserve consists of 21 islands and 97 islets located within the California Current, including (from north to south): Coronado (four islands), Todos Santos (two islands), San Martín, San Jerónimo, Adelaida, Cedros, San Benito (three islands), Bahía Magdalena complex (four islands), and Los Alijos (three islands). It comprises 68,796.56 ha of land that correspond to the islands' surface, and 1,092,651.23 ha of ocean waters surrounding the islands, with the exception of the southernmost ones (i.e., Magdalena Bay). This new reserve adds to the region's islands that were already protected and have their own Biosphere Reserve decree: Natividad, Asunción, San Roque and Guadalupe, creating a comprehensive conservation management framework. The overall regional conservation approach includes active restoration of islands' vegetation communities—once the herbivores and most of the invasive rodents have been eradicated.

Above: Plants, including many endemic species such as the Cedros Island Monterey Pine (*Pinus radiata* var. *cedrosensis*) and the San Benito Islands Liveforever (*Dudleya linearis*), will greatly benefit from the protection conferred by the Decree of the Baja California Pacific Islands Biosphere Reserve. Photo © GECI Archive / J.A. Soriano.

BOTTOM-UP PARTICIPATORY GOVERNANCE

Organized civil society—fishing cooperatives from the productive sector and conservation organizations from the environmental sector—is at the roots of this new Biosphere Reserve. The cooperative *Pescadores Nacionales de Abulón*, the federation of cooperatives FEDECOOP, and GECI—working together with the National Commission of Natural Protected Areas (CONANP)—were instrumental in the design, promotion and establishment of the Baja California Pacific Islands Biosphere Reserve. The formulation of the Technical Justificatory Study for the Reserve's creation was done by GECI and presented in 2005 to the CONANP. Backing the initiative, the Senate of the Republic—attending a request posted by GECI in 2003—made a formal call asking CONANP to initiate the legal process to create the Reserve. As a result, in 2005 the Ministry of Environment and Natural Resources (SEMARNAT) published its intention to create this protected area in the Official Gazette of the Federation (*Diario Oficial de la Federación*). Since the beginning, the overarching rationale behind this Reserve has been the effective protection of the extraordinary biodiversity of these islands while securing the livelihoods of local communities (i.e., fishing cooperatives) that rely on sustainable artisanal fisheries, particularly of lobster and abalone.

Since its inception, the cooperatives—which retain fishing rights from 80 years ago—understand that the new protected area will benefit them because it will be an additional legal measure to further secure its access rights to their leased-resources. This is especially true given that a Biosphere Reserve—an internationally recognized category of natural protected area—explicitly seeks to harmonize the sustainable use of natural resources by local communities with the effective conservation of biological diversity. Therefore, the decree recognizes the historic exclusive rights that local communities have over the natural resources. As expressed by Mario Ramade-Villanueva (personal communication, 14 October, 2011), a member from FEDECOOP:

“The protected area will give us an additional insurance (...). This is because one of the benefits from a protected area is that the natural resources are to be used only by the local communities. Therefore, I believe that in conjunction with our concession titles, the protected area will strengthen the community development on the islands. I believe it will have that extra benefit.”



With the creation of the Baja California Pacific Islands Biosphere Reserve, all islands in Mexico are now protected areas. This is a decision that greatly contributes to both the Convention on Biological Diversity's Aichi Biodiversity Targets, particularly target 11, and the goals and objectives of the Programme of Work on Island Biodiversity. Image © GECI Archive / J.A. Soriano.

FAR BEYOND A PAPER PARK

Far from the common concern of having one more “paper park,” this new Reserve's decree validates and embraces the strong and ongoing comprehensive conservation and tangible restoration actions that have been implemented during the past 15 years. Throughout this time, and grounded on scientifically-based priorities, GECI has been systematically tackling threats that span from invasive mammals and guano mining to development projects such as the potential installation of a liquefied natural gas regasification plant near Coronado Sur Island (Aguirre-Muñoz et al. 2011a). Again, with a bottom-up approach, organized civil society achieved the cancellation of this project after a binational legal defense effort that reached international instances like the Commission for Environmental Cooperation. To date, GECI, in collaboration with the Mexican federal government, and with support from national and international donors, has removed 17 populations of invasive mammals from nine islands that are now

part of this Biosphere Reserve (Aguirre-Muñoz et al. 2011b). Therefore, almost all of the islands within the Reserve are free of invasive mammals.

The eradication of feral dogs and donkeys from Cedros Island is the next key priority to protect its flora and the endemic Cedros Island Mule Deer. Beyond attending the threats successfully, GECI is implementing an important long-term seabird restoration program in partnership with NOAA, FWS, Cornell Lab of Ornithology, the National Audubon Society from the USA, and the support of the Alianza World Wildlife Fund Mexico-Fundación Carlos Slim and the Mexican Fund for the Conservation of Nature from Mexico. This program includes habitat restoration like invasive plant removal, soil enhancement and planting native plants, and seabird colonies restoration using social attraction techniques. There is also progress being made by GECI in the implementation of a program on island biosecurity and environmental culture which aims to maintain the Baja California Pacific Islands pest-free by preventing the introduction of invasive alien species, particularly introduced mammals. This initiative is being supported by the National Commission on Knowledge and Use of Biodiversity (CONABIO) and the Global Environment Facility.

KEY PRIORITY ACTIONS AND OPPORTUNITIES

Strengthened by the new decree, maintenance and consolidation of ongoing tangible conservation actions is of utmost importance. Ideas include keep-

ing positive momentum by accumulating more conservation and sustainable management results. The ulterior objective is the unfolding— as a participatory social construction—of an exemplary model with a concerted integration of conservation and sustainable development. The implementation of formal governance of the new Reserve being a challenge in and of itself. In that regard, the recent recruitment (July 2017) of a capable and experienced director and professional staff of 12 specialists for the everyday operation of the reserve is a very promising fact. The coordination and collaboration schemes for participatory management, including the integration of the Advisory Board (Consejo Asesor) with the legitimate social actors, and stable funding to manage the reserve and to enforce the regulations are still pending tasks.

It will also be of utmost importance not only to recognize potential threats but to be prepared with successful strategies to tackle them, including: (1) Guano mining, with a direct negative impact to threatened marine birds (e.g. habitat destruction and disturbance to the colonies) and the ongoing restoration efforts; (2) Unsustainable aquaculture practices with derived negative impacts on the islands' surrounding waters due to the introduction of exotic species, high densities, intensive supplementary feeding, benthic deposition, and nutrient release; (3) Industrial fisheries (e.g. sardine, anchovy and shrimp) that use non-selective fishing methods thus harming the resource base of artisanal fishing cooperatives (e.g. abalone and lobster), and also impact the overall environmental health of the coastal ecosystems; and (4) unsustainable tourism.



Artisanal fishing cooperatives have been sustainably harvesting abalone and lobster on the waters surrounding the Baja California Pacific Islands for almost a century, thus exercising a form of sovereignty in these territories by means of protecting natural resources both on land and in the ocean. Photo © GECI Archive / J.A. Soriano.

A UNIQUE LIVE FOREVER THREATENED BY ILLEGAL EXTRACTION AND INTERNATIONAL TRADE

The Cedros Island Live Forever (*Dudleya pachyphytum*) is a rare plant found only in a small area on Cedros Island, Mexico. This plant forms groups of individuals and has wide and rounded farinose leaves. It is precisely this snow-white foliage which makes it special and valuable on the illegal horticultural market. Over the years, unlawful international trade done by poachers



The endemic Liveforever (*Dudleya linearis*) now thrives on San Benito Oeste Island thanks to the eradication of introduced donkeys and rabbits. Photo © GECI Archive / J.A. Soriano.

Another vital challenge is the continuation of the long-term funding for conservation and restoration projects that GECI executes, retaining experienced personnel, and reinforcing the relationship between GECI and local communities and authorities—particularly with CONANP and the Mexican Navy (SEMAR). Together, it is also important to create infrastructure, have the equipment to implement conservation projects, and facilitate the continuous presence of conservation biologists.

As it has already done, continued investment in applied and interdisciplinary research focused on ecology, biology, evolution, conservation, and resource

became a serious threat for this species, including the associated destruction of its habitat. Massive extraction—in the amount of thousands of individuals per shipment—started in 2010 and increased during 2016 and 2017. The plants are being sold mostly in South Korea. The extraction of Live Forever plants from Cedros Island is a criminal activity because: (1) it is an endemic species; and (2) it is distributed within a protected area, the recently created Baja California Pacific Islands Biosphere Reserve. According to Mexican regulations, poachers can be sentenced to nine years imprisonment for trafficking endemic flora.

Fortunately, in June 2017, on an intelligence operation from Mexican Federal Government Agencies—including the Environmental Protection Federal Agency (PROFEPA), the Secretariat of National Defense, and the Natural Protected Areas Commission (CONANP)—poachers were caught in the act transporting a shipment of nearly five thousand plants. A press release in Spanish can be found here*. The plants, in poor conditions, had to be rehabilitated on the mainland and are to be taken back to Cedros Island. A specific project to restore the *Dudleya* population on Cedros Island was developed as a coordinated effort between CONANP, PROFEPA, Grupo de Ecología y Conservación de Islas, A.C. (GECI), the local fishing cooperative Pescadores Nacionales de Abulón, and committed people from the local community. This ongoing project has three components: surveillance to avoid poaching; monitoring of the wild population; and in vitro propagation in an on-site nursery. The overall goals are to stop poaching and to fully restore the Live Forever wild population by creating awareness through participatory conservation activities.

*<https://tinyurl.com/Dudleya-pachyphytum>

management will pay high dividends. The creation—as a US-Mexico collaborative effort—of a binational World Heritage Site linking the Channel Islands and the Baja California Pacific Islands will be highly beneficial to better conserve all these closely related islands, interconnected beyond political boundaries by the California Current System. This vision builds upon the ongoing binational (US and Mexico) and trinational (Canada, US and Mexico) collaboration initiatives known as the Trilateral Islands Initiative (LOI 2014) and the Bering to Baja California Marine Conservation Initiative (Morgan et al. 2005), all this under the overall framing given by the North American Agreement



The eradication of feral dogs and donkeys is a priority conservation action to protect the endemic Cedros Island Mule Deer. This will have positive outcomes for the complex ecological interactions with native vegetation communities. Photo by John Knapp.

on Environmental Cooperation, a supplement of the Tri-national North America Free Trade Agreement (NAFTA). By working together, we will ensure an island legacy for generations to enjoy.

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