Chapter 9
The Conservation and Restoration of the Mexican Islands, a Successful Comprehensive and Collaborative Approach Relevant for Global Biodiversity

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Abstract Islands are biodiversity hotspots that offer unique opportunities for applied restoration techniques that have proven to bring inspiring outcomes. The trajectory of island restoration in Mexico is full of positive results that include (1) the removal of 60 invasive mammal populations from 39 islands, (2) the identification of conservation and restoration priorities, (3) the active restoration of seabird breeding colonies through avant-garde social attraction techniques, (4) the active restoration of integrated plant communities focusing on a landscape level, (5) applied research and science-based decision-making for the management of invasive alien species, (6) the legal protection of all Mexican islands, and (7) biosecurity and environmental learning programs to ensure outcomes are long lasting. Still, there are many complex challenges to face in order to achieve the goal of having all Mexican islands free of invasive mammals by 2030.

Keywords Islands · Mexico · Restoration · Eradication · Biosecurity · Seabirds

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A. Ortega-Rubio (ed.), *Mexican Natural Resources Management and Biodiversity Conservation*, https://doi.org/10.1007/978-3-319-90584-6_9

9.1 Islands: Hotspots for Global Biodiversity

Islands worldwide are strongholds of our shared natural heritage. Despite comprising only 5.5% of the world's land surface, they are home to one fifth of all plant, reptile, and bird species (Whittaker and Fernández-Palacios 2007). Due to their isolation, they have allowed evolution to develop unusual characteristics, such as flightless birds, gigantism, or dwarfism (Mulongoy et al. 2006). Therefore, these ecosystems have particularly high endemism richness, harboring 9.5 and 8.1 times more endemic plants and vertebrate species, respectively, than their continental counterparts (Kier et al. 2009). They are particularly important for seabirds as 17% of all bird species are confined to oceanic islands (Croxall et al. 2012).

These make island ecosystems vital for biodiversity conservation. They are crucial spaces for many species that depend on them for refuge, breeding, and rearing their young (Cushman 1995). They also perform complex ecosystem services, such as supporting nutrient cycling, soil and sand formation, as the water that surrounds them are rich in biological productivity, thus supplying great economic and social worth (Aguirre-Muñoz et al. 2011a).

9.2 The Islands of Mexico: Both Spectacular and Fragile

Distributed throughout all of the Mexican seas, there are 4,111 islands, islets, and keys, comprising a landmass of 8,025.2 km^2. Due to Mexico's location, their islands are extraordinarily diverse, ranging from the Nearctic to the Neotropical biogeographic zones. Islands can be divided into semiarid in the Eastern Pacific Ocean influenced by the California Current; desertic in the *sui generis* Gulf of California; and semitropical and tropical in the tropical Pacific Ocean, the Gulf of Mexico, and the Caribbean (Aguirre-Muñoz et al. 2016).

Out of these thousands of insular elements, the 65 "biggest" islands that include Tiburón, Ángel de la Guarda, Cozumel, Cedros, and Guadalupe—all over 1,000 ha—contribute to 87.6% of the country's total insular surface. These ecosystems harbor a disproportionate amount of biodiversity. They hold, at least, 8% of all Mexican vertebrate species. The islands with higher species richness are Clarión (646 marine and 343 terrestrial), Cozumel (487 and 437), Cayo Centro in Banco Chinchorro (574 and 174), Arrecife Alacranes (695 and 162), and Espíritu Santo (428 and 241) (CONABIO 2007).

As for endemism, 3.7% of the country's unique species live on islands, which harbor 9 times more endemic species per square kilometer than mainland (Aguirre-Muñoz et al. 2016). The islands with the highest strict endemism richness are Guadalupe (36 species), Tiburón (19), Espíritu Santo (14), Cerralvo (13), and Santa Catalina or Catalana (11) (CONABIO 2007).

Moreover, islands are crucial to migratory species being part of ecoregions. They are stepping stones that transcend national borders. For example, the islands in the

Pacific off the Baja California Peninsula harbor key breeding populations of widely distributed seabirds—from the Aleutians and the Bering Sea to the Mexican Pacific. One third of all known seabird species (115 out of 346) are found in the Mexican islands, ranking Mexico as the third most diverse country for this fragile group, as well as for the number of endemic seabirds (Croxall et al. 2012).

Due to the location of its outlying islands, such as Guadalupe and the Revillagigedo Archipelago, Mexico has a vast exclusive economic zone of 3.1 million square kilometers, ranking 13th in the world (INEGI 2015). Therefore, islands are key to exercise Mexico's national sovereignty, with their natural resources providing a great wealth to the country. Regarding human population, 73 islands are home to 294,710 people. In the Gulf of Mexico and the Caribbean, Del Carmen (169,725 inhabitants), Cozumel (79,522), and Mujeres (12,646) gather 89% of all the island human population. These islands shelter a high population density, even higher than the average for the country of 61 inhabitants per square kilometer (INEGI 2013, 2016; Aguirre-Muñoz et al. 2016).

The Mexican government has acknowledged the importance of the country's islands by protecting them. Setting a benchmark for island conservation in Mexico, after 13 years of lobbying, in 2016 the "Baja California Pacific Islands Biosphere Reserve" was created (DOF 2016; Box 9.1). Now, all of the Mexican islands are part of the protected area system, under management by the National Commission for Natural Protected Areas (CONANP) (Aguirre-Muñoz and Méndez-Sánchez 2017).

Box 9.1: "The Baja California Pacific Islands Biosphere Reserve: Far Beyond a Paper Park"

The roots for this Biosphere Reserve come from the organized civil society; both the productive and environmental sector worked together with CONANP on its design, promotion, and establishment. For 13 years, the Mexican nonprofit conservation organization Grupo de Ecología y Conservación de Islas, A.C. (GECI), together with artisanal fishing cooperatives—particularly the Pescadores Nacionales de Abulón (PNA)—represented by their regional federation FEDECOOP and backed by the Senate and the Congress, requested the country's federal government to protect the islands off the Baja California Peninsula and their surrounding waters. Finally, during the United Nations Biodiversity Conference held in Cancun, Quintana Roo, in December 2016, Mexico's President announced its creation (Dibble 2016). The Biosphere Reserve consists of 21 islands and 92 islets located within the California Current. It comprises 68,796 ha of land surface and 1,092,651.23 ha of ocean waters.

The overarching rationale behind this Reserve has always been the protection of the extraordinary biodiversity of these islands, as well as securing the livelihoods of local communities (i.e., fishing cooperatives) that rely on sustainable artisanal fisheries, particularly of lobster and abalone. This internationally recognized category of protected area seeks to harmonize the

sustainable use of resources by local communities with the effective conservation of biodiversity. This decree validates and embraces the trajectory and ongoing comprehensive conservation and tangible restoration actions that have been implemented on these islands for the past 15 years. Throughout this time, GECI has been 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 in Coronado Sur Island (Aguirre-Muñoz et al. 2011a). Almost all of the islands within the Reserve are free of invasive mammals due to GECI's ongoing restoration program. Therefore, other important projects can be implemented. GECI, in partnership with NOAA, USFWS, Cornell Lab of Ornithology, the Audubon Society and support from the Alianza World Wildlife Fund Mexico – Fundacion Carlos Slim and the Mexican Fund for the Conservation of Nature (FMCN) from Mexico, is implementing a long-term seabird restoration program that includes habitat restoration and seabird colonies restoration using social attraction techniques.

Consolidating the ongoing tangible results is of vital importance. Accumulating more conservation and sustainable management results is important to reinforce the continuation of long-term funding for restoration projects and strengthening the relationship between GECI, local communities, and authorities. By working hand in hand, we will ensure an island legacy for generations to enjoy.

Unfortunately, islands worldwide are suffering a disproportionate rate of extinctions (Groombridge and Jenkins 2002; Boyd et al. 2008). Eighty-eight percent of the vertebrate species that have gone extinct in Mexico are island endemics (Aguirre-Muñoz et al. 2016). Invasive alien species (IAS) are by far the main driver of extinction on islands (Simberloff et al. 2013; Reaser et al. 2007); and Mexican Islands are not the exception, where 17 subspecies have become extinct, meaning 76% of the extinctions have been caused by invasive mammals on islands (Aguirre-Muñoz et al. 2011b). Invasive mammals such as rodents, cats, and herbivores are the most harmful and widespread species (Doherty et al. 2016; Russell 2011). Direct impacts are predation, competition, habitat destruction, physical and chemical damage to soils, and erosion. Indirect impacts are introduction of seeds, seedlings, diseases, parasites, and general unbalance of the trophic web. They cause dramatic impacts on communities and ecosystems (Clout and Williams 2009; Lovei and Lewinsohn 2012). Invasive alien species affect negatively on an ecological level but also on the economic, health, and well-being aspects of local communities (Early et al. 2016; Reaser et al. 2007).

Fortunately, islands have also proven to provide amazing opportunities for restoration and biodiversity conservation (Veitch and Clout 2002). The Grupo de

Ecología y Conservación de Islas, A.C. (GECI), is a Mexican nonprofit, devoted to the comprehensive restoration of islands, through a transdisciplinary approach and science-based management. With a successful 20-year trajectory on island restoration, GECI, in close collaboration with the Mexican government, has developed a National Island Restoration Program, which now boasts tangible results.

9.3 A National Program for Island Restoration

9.3.1 Science-Based Management

When an ecosystem has been altered and has lost its capacity to bounce back through its own resilience mechanisms, thoughtful intervention and ecological restoration are needed (Jorgensen 2013). There are several instruments for restoration; however, the management of IAS—either control or eradication—is recognized as the most efficient, particularly when endangered species are involved (Mulder et al. 2011; Veitch et al. 2011). Controlling a population of an IAS implies keeping the target population with a low density through a sustained effort over a long period. On the other hand, eradicating means the complete removal of an IAS population and concentrates all efforts over a defined period of time (Veitch and Clout 2002). The concept of eradicating mammals from islands was born and developed in New Zealand, a country that is a worldwide leader in island restoration (Towns et al. 2013).

For the past two decades, GECI has been steadily working toward the conservation of the Mexican islands through restoration actions. The first step is the eradication of IAS. All projects have been executed in close collaboration with the federal government, particularly CONANP, the National Commission for the Knowledge and Use of Biodiversity (CONABIO), the National Institute for Ecology and Climate Change (INECC), the Secretary of the Environment and Natural Resources (SEMARNAT), and the Secretariat of the Interior (SEGOB). Of great importance is the support given by the Mexican Navy (SEMAR), which continually allocates the use of specialized vessels, equipped with helicopter pads, and lodging, for use during eradication campaigns or movements to remote islands. Also significant has been the participation of academic institutions, research centers, local communities, fishing cooperatives, other civil society organizations, and national and international donors from the public and private sector (Aguirre-Muñoz et al. 2011a).

For two decades, GECI has gathered experience and scaled up from relatively simple and straightforward eradications to complex scenarios that have required state-of-the-art techniques and innovation. According to Aguirre-Muñoz et al. (2016), there are four stages vital for successful restoration actions:

1. Diagnosis–prognosis: Developing baseline information to identify restoration priorities and plan actions according to priorities, biodiversity values, and the feasibility of successful intervention.

2. Systematic monitoring: Once the areas of research opportunity have been recognized, systematic monitoring of indicator species must be performed to make informed decisions on which restoration actions to implement, whether control or eradication of one or several IAS, as well as other actions such as habitat improvement or social attraction techniques for restoring seabird colonies.
3. Project execution: Fieldwork is the core of tangible restoration actions. However, for conservation gains to endure, they must be accompanied by an environmental learning strategy, where local community involvement and island biosecurity are key components.
4. Ecosystem recovery assessment: After removing the threat, systematic monitoring of indicator species must continue in order to document changes in the island's native species and identify if there is need for other restoration actions.

9.3.2 Advances on Island Restoration

Up to April 2018, 60 populations of invasive mammals have been removed from 39 islands (Table 9.1). Out of these 39 islands, 30 are now completely free of invasive mammals (Fig. 9.1). Eradication techniques have evolved from traditional (e.g., trapping and hunting) to state of the art, such as aerial dispersal of ad hoc designed bait, aerial hunting, and telemetry. Size and complexity of the islands have also increased (Fig. 9.2).

Table 9.1 Successful invasive mammal populations eradicated from the Mexican islands up to 2018

Island	Area (ha)	Invasive mammal removed	Eradication date	Eradication technique	Invasive mammal still present
Pacific Ocean					
Asunción	41	Cat	1995	Trapping	None
Clarión	1,958	Sheep, pig	2002	Hunting	Rabbit
Coronado Norte	37	Cat	1995–1996	Trapping	None
Coronado Sur	126	Cat, goat, donkey	2003	Trapping, hunting	House mouse
Guadalupe	24,171	Rabbit, donkey	2002	Live removal	Cat[a] and House mouse
		Horse	2004	Live removal	
		Goat	2003–2006	Live removal, trapping, hunting, telemetry	
		Dog	2007	Live removal, trapping, hunting	

(continued)

Table 9.1 (continued)

Island	Area (ha)	Invasive mammal removed	Eradication date	Eradication technique	Invasive mammal still present
Natividad	736	Goat, sheep	1997	Live removal	Antelope squirrel
		Cat	1998–2000	Trapping, hunting, live removal	
		Dog	2001	Live removal	
San Benito Este	146	Rabbit	1999	Trapping, hunting	None
San Benito Medio	45	Rabbit	1998	Trapping, hunting	None
San Benito Oeste	400	Rabbit, goat	1998	Trapping, hunting	None
		Donkey	2005	Live removal	
		Cactus mouse	2013	Aerial bait dispersal	
San Jerónimo	48	Cat	1999	Trapping, hunting	None
San Martín	265	Cat	1999	Trapping, hunting	None
San Roque	35	Cat	1995	Trapping	None
		Black rat	1995	Bait stations	
Socorro	13,033	Sheep	2009–2010	Hunting, telemetry	Cat[a]
Todos Santos Norte	34	Cat, rabbit	1999–2000	Trapping, hunting	None
		Donkey	2004	Live removal	
Todos Santos Sur	89	Cat	1997–1998/1999/2004	Trapping, hunting	None
		Rabbit	1997	Trapping, hunting	
Gulf of California					
Coronados	715	Cat	1998–1999	Trapping	None
Danzante	412	Cat	2000	Trapping	None
Espíritu Santo	7991	Cat	2016	Trapping, hunting	Goat[a]
Estanque	82	Cat	1999	Trapping, hunting	None
Farallón de San Ignacio	17	Black rat	2007	Aerial bait dispersal	None
Isabel	82	Cat[b]	1995–1998	Trapping, hunting, bait stations	None
		Black rat	2009	Aerial bait dispersal	
Mejía	245	Cat	1999–2001	Trapping, hunting	Black rat, house mouse
Montserrat	1886	Cat	2000–2001/2003	Trapping, hunting	None
Partida Sur	1533	Cat	2000	Live removal	None
Rasa[b]	57	Black rat, house mouse	1995–1996	Bait stations	None
Redonda	23	Cat	2012–2014	Trapping, hunting	None
San Jorge Este	9	Black rat	2000–2002	Bait stations	None

(continued)

Table 9.1 (continued)

Island	Area (ha)	Invasive mammal removed	Eradication date	Eradication technique	Invasive mammal still present
San Jorge Medio	41	Black rat	2000–2002	Bait stations	None
San Jorge Oeste	7	Black rat	2000–2002	Bait stations	None
San Francisquito	374	Cat	2000	Trapping, hunting	None
		Goat	1999	Hunting	
San Pedro Mártir	267	Black rat	2007	Aerial bait dispersal	None
Santa Catalina (Catalana)	3890	Cat	2000–2004	Trapping, hunting	Deer mouse
Venados	54	Goat	2016	Trapping	Coatimundi
Gulf of Mexico and Caribbean					
Cayo Norte Mayor	29	Black rat	2012	Aerial bait dispersal	None
Cayo Norte Menor	15	Black rat	2012	Aerial bait dispersal	None
Cayo Centro	539	Cat	2014	Trapping	None
		Black rat	2015	Aerial and manual bait dispersal	
Muertos	16	House mouse	2011	Manual bait dispersal	None
Pérez	11	Black rat	2011	Manual bait dispersal	None
Pájaros	2	House mouse	2011	Manual bait dispersal	None
Total	59,422				

Source: Updated from Aguirre-Muñoz et al. (2016)
[a]Eradication in progress
[b]Eradication executed by UNAM

Particularly for invasive rodents, experience has allowed us to learn from treating small desert islands (<50 ha) to tropical and wet archipelagos (>500 ha) (Aguirre-Muñoz et al. 2016). In 2015, the successful black rat (*Rattus rattus*) eradication from Cayo Centro (539 ha), a mangrove-dominated island part of the Banco Chinchorro Biosphere Reserve, was a worldwide benchmark for tropical island eradication projects (Samaniego-Herrera et al. 2017). Experience has also led to innovation, such as improving the efficiency of aerial rodent eradication through the development of a mathematically founded new tool, the *Numerical Estimation of Rodenticide Dispersal* (NERD), which performs calculations with increased accuracy, displaying results almost in real time, allowing instant identification of bait gaps that could cause failure of eradication (Rojas-Mayoral et al. in press).

As for feral cats, two ambitious ongoing eradication projects will provide lessons to move forward to even bigger islands. The eradication of feral cats from Socorro Island (13,033 ha), in the remote Revillagigedo Archipelago, currently on the removal

Fig. 9.1 Successful, in progress, and pending invasive mammal population eradications in the Mexican islands, up to April 2018

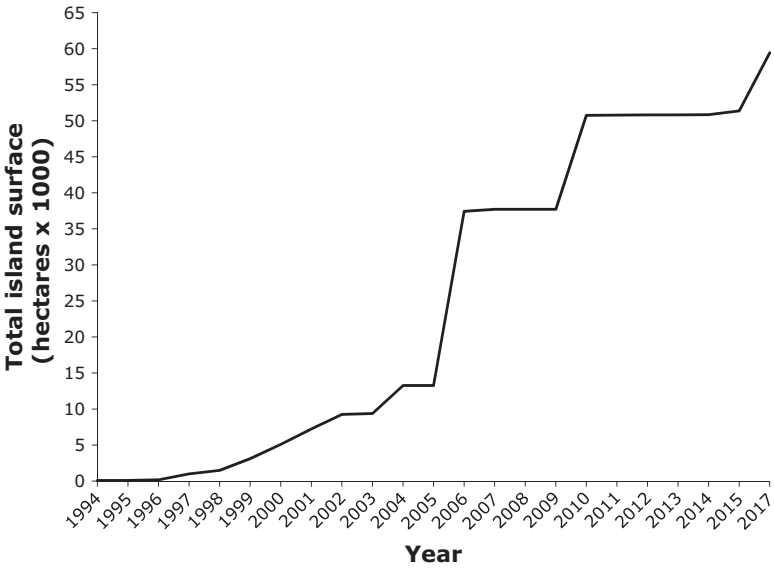

Fig. 9.2 Time series of total insular surface in way of restoration from 1994 to 2017 (Updated from Aguirre-Muñoz et al. 2016)

of the last remaining cats, will be the biggest island in the world where cats have been eradicated by trapping and hunting, without the use of any toxicant (Ortiz-Alcaraz et al. 2017). Moreover, in 2017 the eradication of cats on Guadalupe Island (24,171 ha) started, with the goal to completely remove them from the island by 2020.

9.3.3 Commitments of Future Eradications

Mexico's trajectory on island restoration moves forward at a steady pace. Mexico's goal is to have all islands free of invasive mammals by 2030, as pledged to the IUCN's Honolulu Challenge on Invasive Alien Species, which called for bold action on the most prominent driver of extinctions (IUCN 2018).

The eradication of the remaining 83 invasive mammal populations from 34 islands is in various stages. According to a multicriteria decision analysis (Latofski-Robles et al. 2014), the islands ranked as priority where eradication is feasible are Socorro, Espíritu Santo, María Cleofas, and María Magdalena. By eradicating these 11 invasive mammal populations, a further 35,813 ha would be treated thus reducing risk of extinction of 80 endemic species (Aguirre-Muñoz et al. 2016).

In order to protect restored islands, as well as the millionaire investment on conservation projects, island biosecurity—the measures and actions to prevent IAS introductions—has become a transversal topic on all restoration projects to ensure long-lasting outcomes. Island biosecurity has three components: (1) prevention, creating awareness and involving local communities to become active participants so that islands remain free of IAS; (2) early detection, keeping active and passive surveillance systems in order to detect any incursion before it can become established; and (3) rapid response, swiftly eliminating any individual detected and assessing the status of an IAS on an area (Russell et al. 2008).

Therefore, a National Island Biosecurity Program is currently being developed. In close collaboration with CONABIO and CONANP and with funding from the Global Environment Facility (GEF) through the United Nations Development Program (UNDP), GECI is formulating—through a participative process—site-specific ad hoc biosecurity protocols. This bottom-up approach has led to more involvement, understanding, and vigilance from local communities and island users (Latofski-Robles et al. in press). Biosecurity and environmental learning campaigns with local communities have already proven to be vital for islands to remain free of invasive mammals. In Perez Island, part of the Arrecife Alacranes National Park, the incursion of a black rat was detected right on time and eliminated, thanks to the biosecurity protocol established with the local CONANP office. Thanks to a permanent specific biosecurity protocol and to communication with authorities the island was protected against reinvasion (Latofski-Robles et al. 2017).

Prevention is the cornerstone of island biosecurity. It is by far the most cost-effective method toward long-term conservation gains. It is mostly done in the continent at docks, marinas, warehouses, etc. All stakeholders must be involved, from the authorities who divulge prevention measures and enforces them, to local communities who must adopt preventive practices whenever they move between islands and mainland. Everyone must comply if we are to keep islands free from IAS forever.

9.4 Tangible Outcomes from Restoration Actions

The island ecosystem's recovery has been remarkable. The documented results from applied restoration actions are noticeable and relevant. Due to the removal of invasive mammals, at least 147 endemic taxa of mammal, reptile, birds, and plant species have been protected. Furthermore, 227 seabird breeding colonies, highly vulnerable to rats and cats, are recovering (Aguirre-Muñoz et al. 2016). Systematic post-eradication monitoring has revealed positive outcomes, such as new record of plants believed to be extinct, like the *Satureja palmeri* on Guadalupe Island which reappeared after goat eradication (Junak et al. 2005). On Isabel Island, invertebrates from the intertidal zone show positive effects after black rat eradication (Samaniego-Herrera and Bedolla-Guzman 2012). On Socorro Island, recovery of plant communities and soil resulted on 11% increase in plant coverage after sheep eradication (Ortiz-Alcaraz et al. 2016). On San Pedro Mártir Island, red-billed tropic bird nests increased by 60%, as well as their reproductive success (Aguirre-Muñoz et al. 2011b).

9.5 A National Seabird Restoration Program

On the Baja California Pacific Islands, at least 28 seabird populations were extirpated, and several were diminished by invasive mammals, human disturbance, and contaminants (Bedolla-Guzmán et al. in press). As a following step after removing invasive mammals, since 2008 GECI began a seabird restoration program. The program focuses on eight groups of islands and includes monitoring the natural recovery of seabird populations post-eradication of invasive mammals, removal of introduced vegetation for habitat enhancement, reducing human disturbance, interdisciplinary research, environmental learning and biosecurity with local communities. Furthermore, the program also implements avant-garde social attraction techniques systematically, for the first time in Latin America (Aguirre-Muñoz et al. 2016). Social attraction consists on recreating artificial colonies. Using decoys, building artificial nest boxes, and playing vocalizations on sound systems, seabirds are lured to visit the island. Eventually, birds recognize the island as a safe place to nest and start building new colonies (Jones and Kress 2012).

The program has already achieved valuable results. In total, 22 recolonizations have been recorded, for some of which social attraction techniques were key. For example, the royal tern (*Thalasseus maximus*) was last recorded in San Roque Island 90 years ago. After 8 years of implementing social attraction techniques, in 2017, 736 breeding pairs were recorded within an artificial colony. Furthermore, we have recorded 12 new colonies of several species established on these islands, which recolonized naturally. One remarkable example is the Ashy Storm-Petrel (*Oceanodroma homochroa*), which was recorded nesting in Todos Santos Sur Island. This new colony represents the southernmost breeding range of this species to date (Bedolla-Guzmán et al. in press).

9.6 A Comprehensive Reforestation Project

Guadalupe Island is now on the front line of a state-of-the-art, integrative, in situ reforestation project. In close collaboration with the federal government through the National Forestry Commission (CONAFOR) and CONANP, as well as support from SEMAR, the project includes production of native and endemic plants, such as the endangered Guadalupe cypress (*Cupressus guadalupensis*), the endemic *Pinus radiata* var. *binata*, and the island oak (*Quercus tomentella*) on a nursery on the island. The project seeks to bring an integrated vision to restore the vegetation communities as an alternative to traditional reforestation schemes focusing only in one tree species. It also includes soil restoration, removing fuel material, and maintaining firebreaks (Aguirre-Muñoz et al. 2017).

9.7 A Need for Island Conservation Public Policies

Mexico has two National Strategies that pave the way and set the course for island restoration. The first is the National Strategy on Invasive Alien Species, published in 2010, which is currently being implemented through funds from the Global Environment Facility. The second is the National Strategy for the Conservation and Sustainable Development of the Mexican Islands (2012), which establishes a route and long-term objectives, incorporating a vision for a future where all island-related activities are executed sustainably and with best practices, including fishing, using alternative energies, and alternative tourism (Aguirre-Muñoz et al. 2017).

One of the greatest obstacles of managing IAS is the lack of regulations on animal sacrifice as ecological contingency measure. There are no specific norms for the sacrifice of feral species as restoration methods, or norms that consider eradication of IAS as priority actions for conservation, which they unequivocally are. However, despite this lack of regulation, Mexico applies the highest standards for eradication activities (Aguirre-Muñoz et al. 2017).

Also urgent is the regulation and implementation of island biosecurity measures to ensure long-term results. Adding the concept of island biosecurity in the existing legal framework is crucial in order for each corresponding authority to regulate and assess that people comply with designated biosecurity measures and estipulate and apply sanctions if it is needed (Aguirre-Muñoz et al. 2017).

9.8 Conclusion

The Mexican islands give us an exceptional opportunity, where conservation and restoration efforts result in significant benefits for our shared natural heritage, with a high return on investment. However, to overcome the restoration challenges and

complexities that we have, we must continue to build local capacities and consolidate the now very specialized human resources in order to achieve the goal of removing all invasive mammals from islands by 2030.

Several elements have been crucial to the successful trajectory of island restoration in Mexico:

- Collaborative work and building trust: restoration projects are complex and must involve a wide array of stakeholders. National and international collaboration has been important, both for scientific research as for sustained funding. Close partnership with the federal government has helped shape the island conservation agenda, as well as promote governance and participation in creating public policies that will benefit biodiversity and local communities. Finally, working closely with fishing cooperatives and local communities is of the utmost importance to implement island biosecurity measures and achieve long-lasting conservation goals.
- Applied research: there are plenty of knowledge gaps when it comes to island ecology and biodiversity, which translates to opportunities for scientific research of great value, especially because this knowledge will be used for science-based decision-making and management, and guides long-term conservation strategies.
- Systematic planning: setting priorities is fundamental to maximize the efficiency of limited conservation funding. An interdisciplinary perspective is needed to strengthen restoration work on islands.

9.9 Recommendations

- The National Island Biosecurity Program must be institutionally strengthened and further developed in order to prevent reintroductions or new introductions on islands free of invasive alien species.
- The National Strategy on Conservation and Sustainable Development of the Mexican Islands should be revised and updated, in the same participative manner as it was formulated.
- Sustained and long-term funding is vital to keep the current trajectory on island conservation, as well as the positive outcomes.

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