2024–2025

PROJECT PROPOSALS

SOUTHERN Wings

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Protection of Wintering and Stop-Over sites in the Conservation Coast Birdscape, Guatemala

Partners: American Bird Conservancy, Fundación para el Ecodesarollo y la Conservación (FUNDAECO), Izabal Agro-forest

States that have participated: Missouri, Tennessee, Arkansas, Iowa, Texas

Overview: The Izabal region of Caribbean Guatemala is home to over 150 species of Neotropical migratory birds. American Bird Conservancy (ABC) and its partners are implementing a long-term conservation strategy of preserving stopover and wintering habitats along Guatemala's Caribbean migratory funnel. ABC includes this region in ABC's BirdScape initiative: the Guatemala Conservation Coast BirdScape (Map 1). Our conservation goals include acquiring and managing a series of reserves that protect key habitat for priority migratory birds, such as Golden-winged Warbler, Kentucky Warbler and Wood Thrush, and promoting and implementing regenerative agriculture, such as agroforestry, throughout the BirdScape.

Threats: Forests in the Izabal region are rapidly disappearing due to agricultural expansion (mostly cattle ranching). Land use change is an ongoing process accelerated by poverty and the lack of alternative income opportunities for the communities. Cattle ranching and illegal logging, slash-and-burn, and climate change in the area continue to threaten bird habitats.

Birds: 150 Neotropical migratory bird species have been identified in the Izabal region of Guatemala, including Wood Thrush, Kentucky Warbler, Worm-eating Warbler, Hooded Warbler, Black-throated Green Warbler, and Painted Bunting. Past ABC-funded research identified the region's Caribbean mountain tops as important spring stopover sites for the Cerulean Warbler—a priority Watchlist bird. Other Watchlist species that use reserves in the region include Golden-winged Warbler, Canada Warbler, and Olive-sided Flycatcher. The coastline of Punta de Manabique has been used by Buff-breasted Sandpiper, Sanderling, Stilt Sandpiper, Western Sandpiper, Red Knot, and Wilson's Plover during the winter migration.

Overall project goal: ABC, Izabal Agro-forest, and FUNDAECO will continue to focus on habitat protection, restoration, and management in accordance with the 10-year Conservation Coast BirdScape Conservation Plan developed in 2020. Goals for the Plan include:

- Acquire an additional 9,980 acres for protection.
- Protect at least 83% of existing forest in the BirdScape (~284,000 acres).
- Restore 14,600 acres of forest within core zones of designated national protected areas.
- Establish 19,750 acres of additional agroforestry and silvopasture systems

Map 1. *ABC's Guatemala Conservation Coast BirdScape*

Our more recent partnership with Izabal Agro-forest will be important in helping us advance with these goals. Work with Izabal Agro-forest will focus on restoration with native trees as well as with organic cacao agroforestry systems.

Previous Southern Wings Successes: Since 2012, Southern Wings has supported the creation and expansion of a network of private reserves through land acquisition. In total, these lands account for over 43,000 acres of habit for migratory birds. FUNDAECO has now established protections for core areas within all priority locations of the Conservation Coast. Funds from Missouri Department of Conservation (MDC) have been complementary to other funds used by FUNDAECO to restore and enhance 120 acres of agroforestry farms with 20,150 native trees of five native species and 7,222 cardamom plants.

In the period 2020-2021, 53 community members received training on why, when, and how to fertilize their crops by visiting demonstration sites with the facilitator. Also, the training included information on pest management and what types of supplies are required for fertilization, including types of fertilizer, and types of composting.

In FY 2023, with support from MDC, the US Fish and Wildlife Service, and additional funds secured by ABC, we supported the acquisition of 1,112 acres of forested habitat on two parcels known together as Tameja Mountain within the Cerro San Gil Protected Area. We were also able to help FUNDAECO pay one out of several payments to acquire 164 acres of coastal forest in a property called Guaira-Cocolí, located to the northeast of the Cerro San Gil Protected Area. These land acquisitions will effectively expand the protection of the Cerro San Gil Protected Area, creating an important corridor across the altitudinal gradients between the higher altitudes (4,156 feet above sea level) and the Tameja River lower watershed and coastal forests.

New Activities: In FY 2025, ABC will be focusing our work with Izabal Agro-forest and FUNDAECO to:

- Restore 50 acres of degraded lands with 26,000 cacao, native, and fruit trees.
- Complete payments for the Guaira-Cocolí Reserve.

Budget: $762,503 (For more details email Deb Hahn)

Matching funds: Matching funds will come from FUNDAECO, Izabal Agro-forest and ABC investments in these properties, related management costs and other associated activities within the BirdScape.

Protection of Desert Grasslands Migratory Bird Habitat in the El Tokio Grassland Priority Conservation Area (in the Saltillo BirdScape)

Partners: ABC, Pronatura Noreste (PNE)

States that have participated: Oklahoma, South Dakota, Nebraska, Iowa, Kansas, Pacific Flyway Council

Overview: The desert grasslands in El Tokio located south of the town of Saltillo in northern Mexico are high elevation (6,000 to 7,000 feet) grasslands important to numerous wintering migratory birds as well as threatened resident bird species and a threatened endemic mammal, the Mexican Prairie Dog. ABC is working with PNE to ensure the protection and management of 325,000 acres, and to the improve protection, management, and restoration of grasslands in the El Tokio Grassland Priority Conservation Area (GPCA), which ABC has incorporated into our El Tokio BirdScape. Within this GPCA, the goal is to ensure habitat sufficient to support 30 percent of the global Long-billed Curlew population and 12 percent of the Mountain Plover global population, as well as to maintain the population of the globally endangered Worthen's Sparrow.

Within El Tokio, PNE and ABC have supported conservation efforts on more than 140,000 acres of habitat through the creation of private reserves, ejido (community-owned) reserves, and conservation agreements that advance more sustainable cattle ranching and agriculture practices. We have also supported the installation of erosion control measures and ranching infrastructure, as well as implemented ranching best management practices. The ejidos currently involved include: La Hediondilla, Matehuapil, Tanque Nuevo, Puerto México, El Cercado, La India, Los Arrieros, San José del Alamito, La Carbonera, La Esperanza, Las Vegas, San Juan del Prado, Nuevo Gómez Farías, and San Francisco. PNE also manage two formal protected areas, Cuatro Gorriones and Loma del Gorrión, which are focused on the conservation of migratory grassland birds and the endangered resident Worthen's Sparrow.

Threats: One of the most significant threats to grassland habitat in El Tokio is overgrazing by cattle and goats. The loss of vegetative cover, in a region with naturally arid soil, has exacerbated drought conditions and is leading to desertification of this ecosystem. Erosion and a proliferation of invasive plant species are also side effects of overgrazing and contribute to an overall loss of grassland and declines in the populations of migratory birds that depend on this habitat.

Birds: More than 250 bird species are found in El Tokio. Here, high concentrations of grassland wintering birds occur, including significant numbers of Long-billed Curlews (up to 2,000 individuals have been seen in a single flock). This region is also one of the most important wintering areas for Mountain Plover and Sprague's Pipit. Other Species of Conservation Concern include Loggerhead Shrike, Lark Bunting, Eastern and Western Meadowlarks, Chipping, Brewer's and Baird's Sparrows, and Ferruginous Hawk. Also wintering in the area are Grasshopper, Lark, and Vesper Sparrows. Passage migrants include the Upland Sandpiper and Swainson's Hawk. The endemic Worthen's Sparrow is IUCN Endangered and considered an Alliance for Zero Extinction (AZE) species, as it is restricted to this region.

Project goals: With ABC's BirdScape approach, we want to scale up implementation of sustainable land use practices for grassland birds throughout the 2.5 million-acre El Tokio BirdScape. Our long-term goal is to directly impact at least 285,500 acres of grasslands through improved grassland management and erosion control.

Previous Southern Wings Successes: With Southern Wings funding, ABC and PNE have helped restore grasslands on a dozen properties in El Tokio. This includes the protection and management of two reserves owned and managed by PNE: *Loma del Gorrión* and *Cuatro Gorriones* (Sparrow Hill and Four Sparrows). Here support has gone to maintaining a guard for the two reserves, which has been crucial for deterring illegal activity and carrying out management tasks such as monitoring and repairing the fence that prevents the ingress of goats from neighboring properties and allows for sustainable grazing practices. In addition, we have installed erosion control devices, removed invasive plant species, developed sustainable cattle grazing plans with ejidos, and trained local ranchers on best cattle ranching practices.

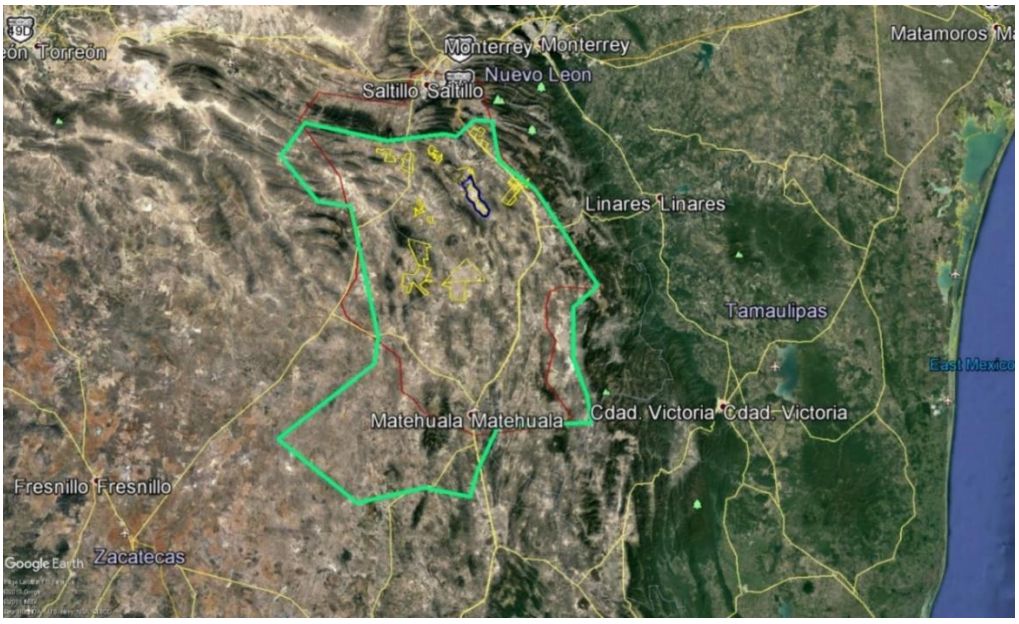
In the last five years, five livestock management plans were developed for ejidos La Carbonera, Puerto México, La Esperanza, San José del Alamito, and San Francisco, which will help reduce the number of livestock grazing in some ejidos and improve the grazing practices. Additionally, PNE updated the cattle ranching conservation plan for the Loma del Gorrión protected area. Monitoring has been conducted across multiple ejidos to better understand the distribution of migratory birds and their presence and abundance on different properties.

New Project Activities: ABC and PNE would like to continue collaborating with ejidos already in the program to conduct habitat improvement activities and to expand this project to new properties in the region.

Our activities include:

- Continue installing and restoring ranching and water infrastructure, erosion control measures, and the removal of invasive plants.
- Work with new ejidos to restore degraded grasslands and enhance livestock grazing practices.
- Build ejidos' knowledge on grasslands birds and their importance.

Budget: $122,487 (For more details email Deb Hahn), **Matching Funds:** ABC and PNE are in the process of securing funds from the Canadian government. ABC and PNE have secured funding from Neotropical Migratory Birds Conservation Act (NMBCA). Ejidos are contributing in-kind match for installation of infrastructure.



Map 2**:** El Tokio BirdScape (green), El Tokio GPCA (red) and location of properties PNE is involved with (yellow), and the Llano de Soledad State Protected Area (blue)

A Sustainable Grazing Network to Protect and Restore Grasslands on Private and Communal Lands in Mexico's Chihuahuan Desert

Funding Partners: U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service International Programs (US-IP), Canadian Wildlife Service (CWS), Bobolink Foundation, Knobloch Family Foundation, Fundación Carlos Slim, AFWA-Southern Wings, Bureau of Land Management, Commission for Environmental Cooperation, Comisión Nacional de Areas Naturales Protegidas (CONANP), City of Fort Collins, Larimer County Department of Natural Resources. **Implementation partners:** Evaluación Integral y Restauración de Hábitat, A.C. (EIRHA), Pronatura Noreste, A.C., Universidad Autónoma de Chihuahua, Universidad Autónoma de Nuevo León, Universidad Estatal de Sonora.

States that have participated to date: Arizona, Colorado, Montana, New Mexico, Pacific Flyway Council, Minnesota

Overview: Grassland birds that overwinter in the Chihuahuan Desert are declining twice as fast as other North American grassland birds, having lost over 70% of their population since 1970. The Chihuahuan Desert is a continentally-important wintering area for North American grassland birds that supports 90% of migratory species breeding in the western Great Plains. These include 28 species recognized as high priorities for conservation, such as Baird's sparrow and chestnut-collared longspur, which winter nowhere else. These birds are sentinels for unsustainable practices that are degrading grasslands and aquifers across the Central Grasslands, particularly in Mexico, which encompasses more than two-thirds of the Chihuahuan Desert. Conservation and restoration of winter habitat in this region is essential to stabilize and recover migratory grassland bird populations in the United States and Canada and prevent the need for future listings under the Endangered Species Act. Our collaborative, non-regulatory approach to conserving grassland bird wintering habitat provides mid-term protection for grasslands (15 years) while addressing the root cause of grassland loss – desertification due to unsustainable grazing practices. Using the best available science and peer-to-peer learning, the Sustainable Grazing Network brings together ranchers and conservationists to collaborate on grazing and grassland restoration to maintain and improve habitat for grassland birds while also improving the productivity and resiliency of private rangelands to withstand both economic and ecological challenges, and ultimately remain in grassland forever. Less farming also conserves critical ground water that sustains pastoral economies, rural communities, and a shared cultural heritage and way of life spanning generations and nations.

Birds: Scaled quail, aplomado falcon, prairie falcon, American kestrel, golden eagle, ferruginous hawk, northern harrier, white-tailed kite, burrowing owl, short-eared owl, mountain plover, long-billed curlew, Say's phoebe, loggerhead shrike, Sprague's pipit, horned lark, mountain bluebird, chestnut-collared longspur, Baird's sparrow, grasshopper sparrow, Cassin's sparrow, lark bunting, vesper sparrow, Brewer's sparrow, clay-colored sparrow, savannah sparrow, Chihuahuan meadowlark and western meadowlark. **States with strong biological connections:** Seven to 28 Species of Greatest Conservation Need (SGCN) in each WAFWA state have a biological connection to the species in the Chihuahuan Desert.

Threats: Intensive cropland agriculture is rapidly expanding in northern Chihuahua, particularly in the Janos and the Valles Centrales Grassland Priority Conservation Areas (GPCAs), threatening to eliminate some of the most important grasslands in Mexico for grassland birds. Between 2000 and 2020, more than 200,000 ha of grasslands in these areas were converted to croplands. This threat is ongoing and accelerating. Meanwhile, long-term unsustainable grazing has also greatly reduced the extent and condition of Chihuahuan Desert grasslands due to soil erosion, shrub encroachment, loss of perennial grasses and invasive species, degrading habitat and reducing economic security, forcing many ranchers to sell their land. This phenomenon is widespread across northern

Mexico. Based on our long-term monitoring in this region, we estimate that Janos and Valles Centrales together support 43% of the estimated wintering habitat capacity within the Chihuahuan Desert GPCAs for Sprague's Pipit, 60% of the GPCA capacity for wintering Baird's Sparrows, and 80% of the GPCA habitat capacity for wintering Chestnut-collared Longspurs. These areas are therefore critical to the conservation of these species.

Success to Date: Since 2013, we have enrolled 31 ranches, encompassing 612, 874 acres, into the Sustainable Grazing Network (SGN), protecting them for at least 15 years while we work with the landowners to improve range management and grassland habitat on the properties. We have identified three additional properties to enroll in 2024, and have dozens of other properties for potential future enrollment. In total we have impacted 665,680 acres of Chihuahuan Desert grasslands and shrublands to date through improved habitat and/or range management on 35 ranches in northern Mexico. We have developed integrated range and wildlife management plans for 22 SGN ranches that include objectives for both grassland birds and range management. We have improved over 350,000 acres of grasslands through 348 range and habitat projects, and we are monitoring the response of birds and vegetation annually to assess progress and inform next steps. From 2014-2020, Sprague's pipits increased across the SGN by an average of 16%/year. This collaborative, win-win, science-based approach has significant proof-of-concept and is ready to be scaled up.

Goals: In 2024, we aim to:

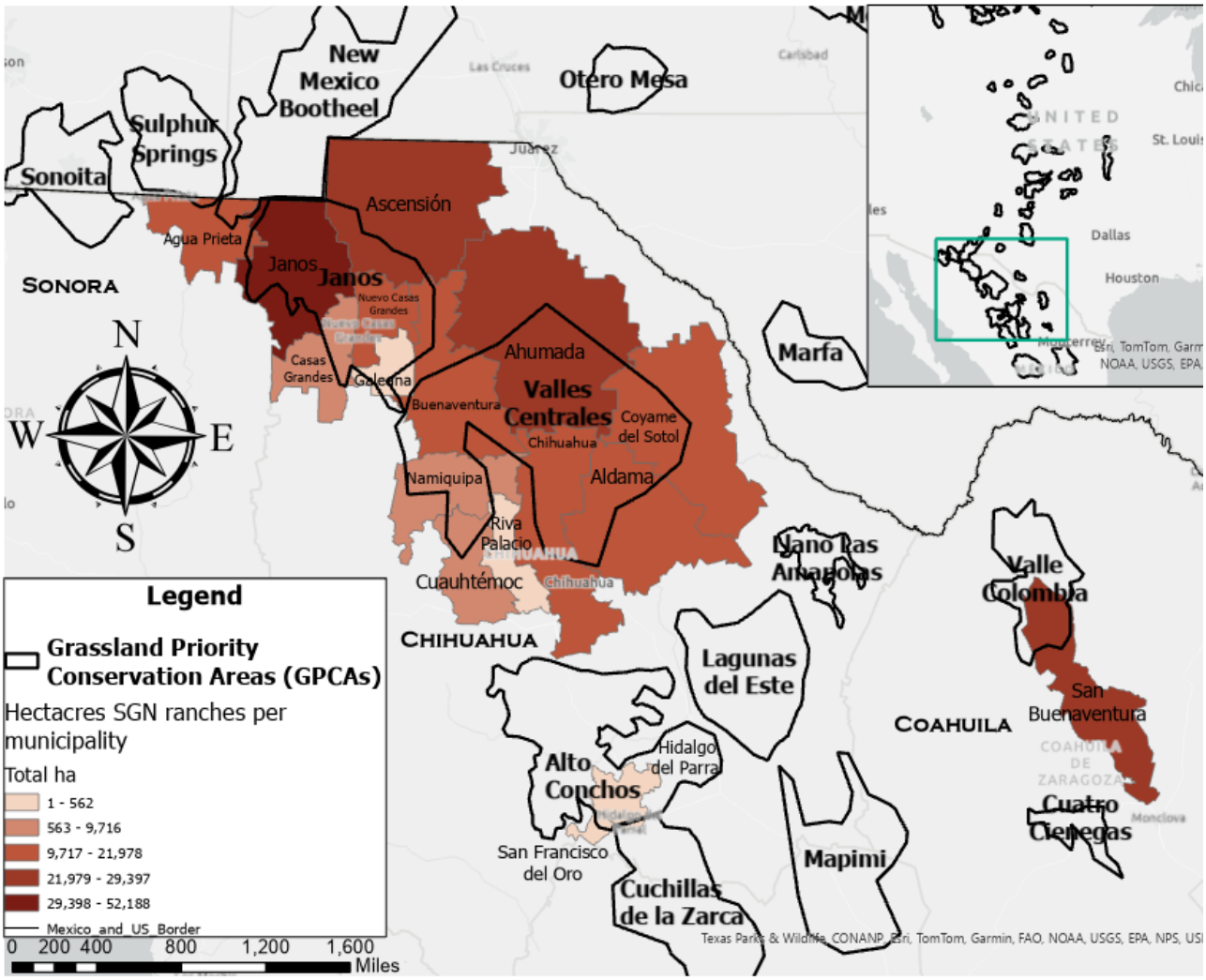
1. Enroll an additional 20,000 acres with high conservation value for grassland birds in the Chihuahuan Desert into the SGN.
2. Improve range management on at least 25,000 acres of desert grasslands.
3. Monitor grassland birds on SGN ranches to measure impact/effectiveness of the SGN.
4. Evaluate effectiveness of shrub control practices and develop guidelines for future projects.
5. Conduct environment education with Mexican and Mennonite communities and schools on grassland conservation and birds.
6. Engage ranchers in bird and wildlife conservation on their lands through outreach and education, installation of stock tank ladders and protective nest cribs for aplomado falcons, capping open pipes, and retrofitting fences for Pronghorn and other wildlife.
7. Continue building momentum for grasslands conservation in northern Mexico through the 3rd annual "Encuentro Ganadero", a live forum dedicated to increasing communication, engagement and collaboration among sectors working in grasslands conservation and management in Mexico.

Current Capacity and Needs: Engaging conservation-minded ranchers and helping them stay on the land through improved management and profitability, while simultaneously improving critical wintering habitat, is the most immediate and cost-effective way to halt the decline in grassland birds. BCR collaborates with Evaluación Integral y Restauración de Habitat, A.C. (EIRHA), PNE, and other organizations with expertise in landowner engagement and land management to implement to accomplish this goal.

Thanks to ongoing support from key partners, we currently support four full-time private lands wildlife biologists (PLWBs) with EIRHA in Chihuahua who operate all aspects of the SGN program. Funding is needed to cost-share on SGN infrastructure projects (i.e., cross-fencing, water lines and storage, etc.) to facilitate rest-rotational grazing and reach our grassland management goals. Funding is also needed to construct stock tank ladders ($40-$80/each, depending on size) to prevent accidental drowning of birds and Aplomado falcon nest platforms ($250/each) to improve reproductive success. Funding is also needed to help maintain and increase our on-the-ground capacity in this region, including operational support for vehicles, supplies and travel, and support for PLWB training and landowner outreach and engagement.

Matching Funds: This project leverages significant additional investment from Mexican landowners (typically 1:1 for range and habitat projects), the Bobolink Foundation, CWS, NMBCA, US-IP, and municipal governments in Colorado. Every dollar invested leverages at least one additional dollar from other sources.

Figure 1: Distribution of SGN lands by municipality as of February 2024



Conservation of Wintering Habitats in the Yoro-Pico Bonito and Agalta-Lost City Birdscapes, Honduras

Partners: ABC, Tropical Agricultural Research and Higher Education Center (CATIE), Cacao Miskito

States that have participated: Missouri, Indiana

Overview: The Golden-winged Warbler Non-Breeding Ground Conservation Plan identified as priority wintering habitats the Sierra de Agalta National Park, and the Tawahka and Río Plátano Biosphere Reserve. All of which are included in ABC's Sierra de Agalta-Lost City BirdScape.

Renewed support from Southern Wings in FY 2025 would help ABC and our partners advance the implementation of conservation strategies within the Sierra de Agalta-Lost City BirdScape in Honduras. Our primary focus is creating silvopastures systems and promoting the use of best management practices in pasturelands to reduce erosion and protect existing forests. Additionally, ABC is working in this BirdScape with cacao farmers to provide better quality habitat for Neotropical migratory birds.

Threats: The most significant threat to bird habitats in the Sierra de Agalta-Lost City BirdScape is the loss of forest cover due to conversion to cattle production and monocultures.

Birds: Nearly 200 migrant species winter in or migrate through Honduras every year. Target wintering migratory species include: Wood Thrush, Golden-winged Warbler, Kentucky Warbler, Worm-eating Warbler, and Louisiana Waterthrush. More than 15 other species also use this area as a stop-over on their annual migratory cycle, including Canada Warbler, Bay-breasted Warbler, and Yellow-billed Cuckoo.

Overall Project Goal: Our long-term goal is to slow the rate of deforestation in Honduras. We aim to do this by working with landowners and communities to adopt land use practices compatible with forest preservation and by implementing silvopastures in existing cattle ranches to increase the number of trees in the matrix of forests and agriculture and ranching lands surrounding protected areas.

Southern Wings Successes to Date: ABC and partners have facilitated habitat restoration in the Sierra de Agalta-Lost City BirdScape, including the improvement of 335 acres of cacao and coffee plantations by planting 10,617 native trees, 38,530 coffee and cacao plants, and 777 fruit trees. In addition, we worked with 17 cattle ranchers to plant 2,000 native trees as living fences and installed nearly three miles of fencing to allow ranchers to practice rotational grazing with their cattle, which helps reduce the amount of land needed for cattle and allows natural regeneration to occur where cows previously fed.

Proposed Activities for FY25 - *Sierra de Agalta-Lost City BirdScape:* In this BirdScape, ABC and our partners will continue to focus on best land use practices—primarily ranching through silvopastures —to benefit migratory birds. Funds are needed to continue working with our partner CATIE to enhance over 120 acres of pasturelands with at least 2,000 native trees. In addition, we want to continue to implement best cattle ranching practices, such as the use of living fences and rotational grazing, and work with ranchers on knowledge exchange programs to promote the benefits of these practices for both their cattle and for birds.

Budget: $50.945 (For more details email Deb Hahn), **Matching Funds:** Matching funds will come from our project partner and additional ABC investments in these and complementary activities. CATIE and the local ranchers will also provide in-kind investment into this project, including providing the tools, land, expertise, and workforce to plant, protect, and maintain the planted tree.

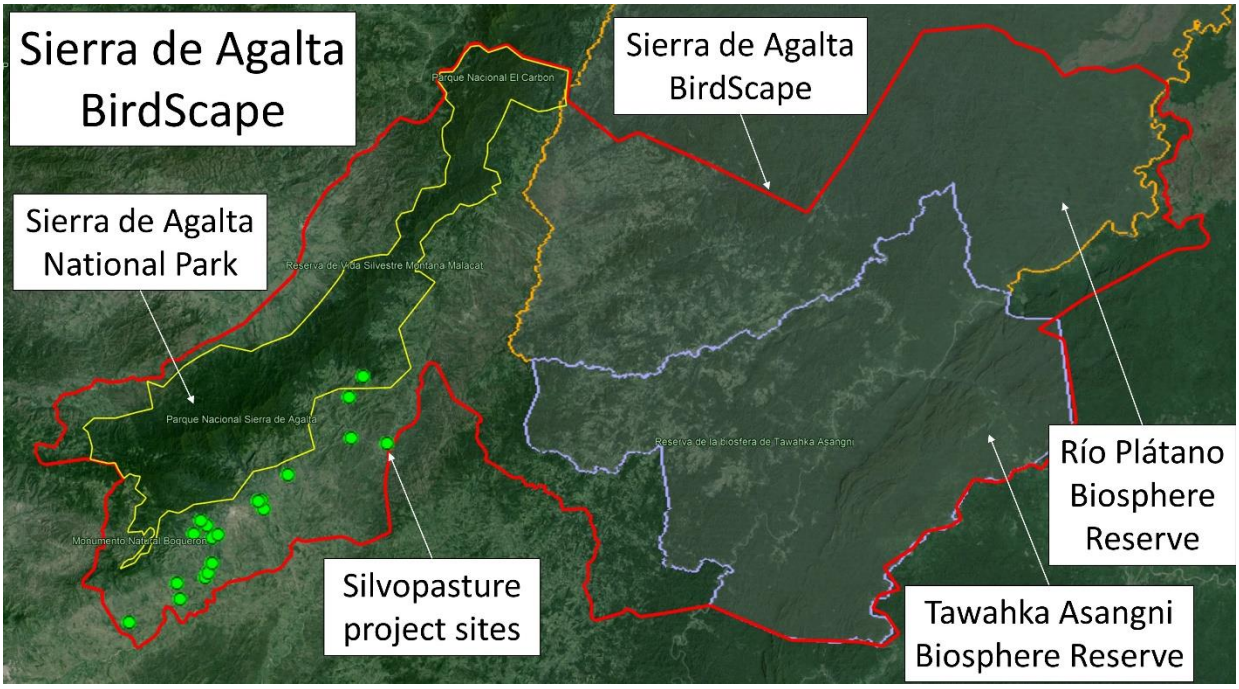


Figure 2: Sierra de Agalta BirdScape (red outline), which encompasses the Sierra de Agalta National Park (yellow), Río Plátano and Tawahka Asangni Biosphere Reserves (violet and orange) and part of our network of silvopasture project sites (green circles)

Neotropical Flyway Project: 2023-2024 Season

Partners: SELVA: Investigación para la Conservación en el Neotropico, Colombia; Cornell Lab of Ornithology; Environment and Climate Change Canada; Bird Studies Canada; Parques Naturales Nacionales de Colombia; Fundación Julia Marquez, Colombia; Fundación Iguaraya, Colombia; ADOPTA: Panama Rainforest, Panama; Canopy Family, Panama, Costa Rica Bird Observatories; Proyecto Cerulea-CR; Las Brisas Nature Reserve; Reserva El Jaguar, Nicaragua; Quetzalii, Nicaragua, WCS Guatemala, Belize Bird Conservancy, TIDE.

States that have participated: Missouri, Wisconsin, Minnesot,a and the Mississippi Flyway Council

States with a biological connection: All states in eastern U.S. have a significant biological connection through migratory species that use northern Colombia and Central America for critical stopovers; many western states also have connections through long-distance migrants such as Olive-sided Flycatcher and Western Wood-pewee. See attached list of species highlighted in this project, with specific ties to key states.

Overview: Close to 300 species of landbirds, whose combined populations represent billions of birds, migrate between the Neotropics and North America. For many species, migration is the greatest source of mortality during their annual cycle, such that even successive delayed arrivals or degradation at a single major stopover site can lead to significant declines, threatening the viability of populations across the Western Hemisphere. To successfully migrate between their breeding and wintering grounds, Nearctic-Neotropical migrants typically depend on a series of (stopover) sites along the length of their migratory route, which provide critical resources such as the fuel for migratory flights, safe roosting sites, and refuges where birds can make emergency stops.

Outside of North America, the funnel-shaped geography of Central America and the biogeography of northern Colombia, act as bottlenecks, concentrating millions of migratory landbirds into a tiny area (relative to their breeding grounds), magnifying the importance of Neotropical stopover sites. Further, birds migrating through this region face major barriers in the form of both the Caribbean Sea and the Gulf of Mexico, giving rise to vital stopover regions where birds attain sufficient fuel to cross these barriers safely. Recent work on thrushes, vireos, and warblers on stopover in northern Colombia has shown that the energy reserves acquired there, may enable birds to not only cross the Caribbean Sea but also cover up to 40% of their total migration distance – highlighting an urgent need to identify major Neotropical stopover regions and assess the needs of birds within them.

To address this urgent need, the Neotropical Flyways Project (NFP) has been operating since 2016 with the goals of (1) rapidly discover and map new stopovers sites; (2) determine habitat quality and stopover behavior at these sites; (3) develop conservation strategies at key stopover sites; and (4) train and build capacity among in-country biologists and managers to protect sites and continue long-term monitoring.

Threats: Research to date indicates that the majority of birds stopping over in northern South and Central America rely on native forests, especially pre-montane forests on Caribbean-facing slopes as well as lowland tropical wet and dry forests. These tropical forests are under severe threat from expanding agriculture, agroforestry, and development – for example, we have lost over 600,000 hectares of pre-montane forest in this region in the last 20 years. Although some agroforestry systems, such as shade coffee, provide habitat for overwintering migrants, preliminary results from this study indicate that these habitats may not support adequate fueling conditions for several species on migration. The almost complete lack of knowledge of migratory stopovers in this region constitutes a threat, hampering full life-cycle bird conservation.

NFP: AT A GLANCE

- Over **one billion migratory landbirds** migrate to the Neotropics from N. America.
- Despite this massive movement of birds, the routes and strategies that migratory landbirds adopt in the Neotropics are almost completely unknown.
- Only by identifying **stopover sites and habitats** where birds lay down the energy reserves for migration can we identify the needs of migratory birds at all stages of their life cycle.
- The **NFP** is discovering critical stopover regions and habitats across six Central American countries and northern Colombia.
- **Intensive surveys** are used to identify previously **unknown** stopover sites.
- Constant effort **mist-netting stations,** combined with cutting-edge **radio-tracking** technology, determine how birds use stopover regions and to what degree a site contributes to the migration of each species.
- **Regional capacity for avian research** is enhanced by training biologists and students from six countries in research techniques for studying and monitoring migratory birds.
- The combined results will be used to develop a **conservation business plan** for stopover sites along the western Caribbean flyway.
- **Major discoveries to date:** (1) Sierra Nevada de Santa Marta, N. Colombia critical for Gray-cheeked Thrush and other migrants in spring; (2) N. Colombian dry forests critical for Yellow-billed Cuckoo in spring, and Blackpoll Warblers arriving after trans-oceanic crossing in fall; (3) major fall stopover by Cerulean Warblers in Caribbean foothills of Costa Rica; (4) global populations of most aerial insectivore species funnel through the Darien in spring and fall. (5) The highlands of Honduras provide stopover and winter habitat for several steeply declining migratory warblers.
- **Conservation applications:** >20,000 native trees planted to enhance stopover habitat along Colombia's Caribbean coast; the Corredor Azul initiative was launched to enhance and connect stopover habitat for Cerulean Warblers in Costa Rica; environmental education campaigns have reached hundreds of children in a major migratory bottleneck in NW Colombia.

Project objectives

1. Identify previously unknown stopover/staging sites ("Delaware Bays for songbirds");
2. Determine habitat quality and needs for key species within stopover sites;
3. Determine migratory connectivity and migration strategies with tracking technologies;
4. Engage and train local biologists, conservationists, and communities;
5. Incorporate migration-stopover needs into full life-cycle bird conservation plans;
6. Develop and implement conservation strategies at newly discovered stopovers through local partners

Birds: More than 50 species of landbirds regularly migrate through northern Colombia and Central America on their way to and from South American wintering grounds, and many more both winter and use Central America for stopovers. These are primarily species from eastern and boreal forests of the U.S. and Canada, including

species of high conservation concern, such as Canada, Cerulean, Blackpoll and Golden-winged Warblers, as well as common species central to ecosystem function, such as Red-eyed Vireo, Scarlet Tanager, and Swainson's Thrush.

All eastern states have connections to this project due to the migration routes of many species (see Table 1). Western migrants, such as Western Wood-pewee, Olive-sided Flycatcher, and Yellow-billed Cuckoo, connect the project to western states.

Table 1. Species targeted by the NFP and their PIF and Road to Recovery (R2R) status. These species migrate primarily to South American wintering grounds and use sites within northern Colombia and/or Central America for stopover. PIF continental status: XX = Red Watch List, XX = Yellow Watch List, XX = Common Bird in Steep Decline (2016 PIF Landbird Plan). * Conservation actions are underway to enhance or conserve stopover sites.

Species	PIF Status	R2R	Species	PIF Status	R2R
Mississippi Kite			Yellow-throated Vireo		
Broad-winged Hawk			Red-eyed Vireo*		
Swainson's Hawk			Bobolink	XX	R2R
Black-billed Cuckoo	XX	R2R	Golden-winged Warbler	XX	R2R
Yellow-billed Cuckoo*	XX		Tennessee Warbler		
Common Nighthawk	XX		Yellow Warbler		
Chimney Swift	XX	R2R	Cerulean Warbler*	XX	R2R
Olive-sided Flycatcher*	XX	R2R	Blackburnian Warbler*		
Eastern Wood-Pewee*			Blackpoll Warbler*	XX	
Western Wood-Pewee	XX		Bay-breasted Warbler*		
Acadian Flycatcher			American Redstart*		
Willow Flycatcher			Northern Waterthrush		
Alder Flycatcher			Prothonotary Warbler	XX	
Great-crested Flycatcher			Connecticut Warbler		
Eastern Kingbird			Mourning Warbler*		R2R
Bank Swallow	XX		Canada Warbler	XX	R2R
Barn Swallow*			Summer Tanager		
Cliff Swallow			Scarlet Tanager		
Veery*			Dickcissel		
Gray-cheeked Thrush*			Rose-breasted Grosbeak		
Swainson's Thrush*					

Previous Successes and history:
Generating novel information: During the initial phases of the NFP in 2016-2018, more than 10,000 transect surveys were conducted along 450 transects at 32 sites across northern Colombia, Panama, and Costa Rica. The surveys have produced over *150,000 records* during passive transects and migration counts, recording a total of over *3 million birds*. Surveys were designed to cover a range of elevations, climatic conditions and habitats, thereby facilitating the development of spatial predictions of stopover use at the regional level (see Figure 3). Analysis of spring data, for example, revealed the previously unknown importance of dry forest stopover sites for species such as Yellow-billed Cuckoo and Barn Swallow in northern Colombia, while highlighting the importance of pre-montane forests for species like the Canada Warbler.

During Fall 2017 and 2018, we studied the use of tropical thorn scrub on the Guajira Peninsula, NE Colombia, by Blackpoll Warblers arriving after trans-oceanic crossings from North America. Our results revealed the critical importance of this habitat for Blackpolls to recover body fat and refuel for the remaining 1,000 km+ journey to

wintering grounds in the Orinoco and Amazon basins. During Fall 2019 and 2020, a mist-netting station was established in the Caribbean foothills of Costa Rica and has described stopovers up to 12 days long by Cerulean Warblers, as well as significant fuel gains in abundant species like Red-eyed Vireos, Swainson's Thrush and Bay-breasted Warbler.

From 2020 through 2023, surveys were expanded to Nicaragua, Honduras, Guatemala and Belize, and spring and fall surveys revealed important concentrations of Canada Warblers in the highlands, as well as high wintering densities of Golden-winged Warblers and both fall and spring records of Cerulean Warbler. Surveys also provided novel information on wintering Golden-cheeked Warblers, with up to 20 individuals recorded in the Cerros de Yali, Nicaragua, and >100 records from La Tigra National Park, Honduras.

Outreach: Outreach activities have included working alongside National Parks authorities in Colombia and Honduras; education activities in at least 10 schools in project areas (see photo of mural from Sapzurro, Colombia, below); the organization of a migration stopover symposium and presentation of results at PIF VI in Costa Rica (Nov 2017); the publication of a review of major stopover regions in the Neotropics (PDF) and five additional peer-reviewed publications; presentation of results at the Colombian Ornithology Congress (Nov 2016), American Ornithological Society (April 2018), and International Ornithological Congress (August, 2018), and NAOC (2020).

Capacity building: A major objective of the project is to build local capacity across the region and working with local partners in each country we have trained 12 Colombian, 6 Panamanian, 5 Costa Rican, 7 Nicaraguan, 8 Honduran, 8 Guatemalan and 6 Belizean biologists. In 2021, a workshop on advanced ornithological techniques was held in Costa Rica and individuals from Panama (2), Costa Rica (4) and Nicaragua (3) were trained in the use of nano-tags, manual telemetry, installation and maintenance of Motus automated telemetry stations, installation of canopy nets, ageing and sexing migratory birds, and the use of occupancy models to map stopover areas.

Translating research into action: Parallel to research activities, restoration and protection activities are underway in some of the critical stopover regions discovered to date, including the Guajira peninsula (Colombia), Caribbean dry forest (Cordoba, Colombia), and on the Caribbean slope of Costa Rica. To date >25,000 trees have been propagated in nurseries and planted through agreements with private land owners to enhance stopover habitats, with a special focus on native tree species that provide food resources to migratory landbirds (trees were identified through foraging observations of focal species).

Proposed Activities/Actions for 2024: Activities will focus on completing surveys in the final two countries earmarked in the corridor, Guatemala and Belize, and setting up a banding station in Honduras to monitor fall migration in La Tigra National Park. Parallel to these research activities, there will be an increased focus on data analysis and dissemination, and on conservation activities in Costa Rica and Colombia. In the current proposal, we are seeking funding to expand data analyses and conservation actions in Colombia.

January-December 2024 – Carry out occupancy analyses to map *major stopover regions* across Colombia, Panama and Costa Rica and describe how migrants are distributed across an elevation gradient in Honduras.

March-May 2024 – Undertake occupancy surveys in Belize during spring migration to identify regionwide concentrations of migratory birds.

August-October 2024 – Establish and run a constant-effort mist netting station/s in La Tigra National Park in Honduras to understand how this region is used by 80 different species of migratory landbirds recorded during surveys in 2022. Includes the training of local biologists in scientific banding.

January-December 2024 – Continue and expand tree planting and protected area establishment in critical stopover regions on the Guajira Peninsula of Colombia, the seasonal dry forests in Cordoba, Colombia, and on the Caribbean slope of Costa Rica.

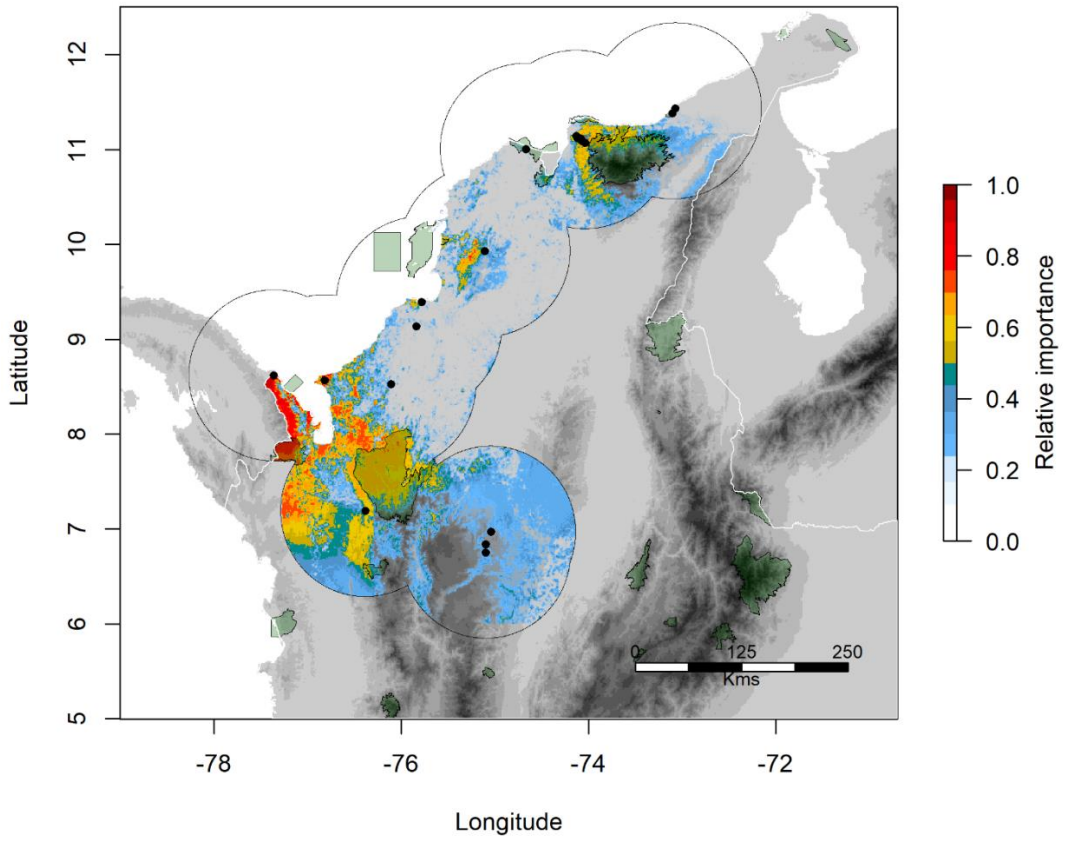


Figure 3: Priority spring stopover areas in northern Colombia based on the results of occupancy surveys and a subsequent modeling exercise for 20 species of migratory landbirds. Priority areas are limited to areas where natural forest remains and the presence of protected areas is indicated by transparent green shapes. The area outlined by a thin black line, is the area within which spatial predictions from occupancy models can be assumed to be appropriate, while black symbols represent survey sites. Critical stopover habitat in need of protection remains in north-west Colombia in the Darien and Uraba regions and on the northern and western flanks for the Santa Marta mountains in the north east.

Budget:

YEAR	COUNTRY	REGION	ACTIVITY	TOTAL	Match
2024					
Spring	Belize	3 regions (country-wide)	Occupancy Surveys	$15,000	$15,000
Fall	Honduras	La Tigra NP	Banding station	$18,000	$10,000
General	All	Multiple	Analysis & priority setting	$15,000	$10,000
General	Colombia/Costa Rica	Multiple	Conservation activities	$50,000	$25,000
General	All	Multiple	Coordination	$10,000	-
			TOTALS	**$108,000**	**$55,000**

Note: because the project is built on modular activities in each country and region, with new modules being phased in through time, smaller amounts of funding can go towards specific components in each season.

Matching funds: a 1 to 1 match is required. Funding has been provided by Cornell Lab of Ornithology -- $10,000 for 2018, $15,000 for 2019, $10,000 for 2020 and $10,000 for 2022. The CWS has provided $33,000 for 2018/2019, Southern Wings ($120K from 2 states), and a private donor ($20K). Smaller contributions from SELVA, Acadia University, Guelph University and Saskatchewan University total $30,000. Equipment, namely 100 radio transmitters, represent a further $20,000. From 2019 through 2022 Environment Canada provided $60,000 towards conservation activities in key stopover regions identified in Colombia.

Figure 4: A mural showcasing migratory birds under construction in the village of Sapzurro, Colombia, as part of education activities focused on a major migratory bottleneck.

Restoration of Migratory Bird Habitat in Ecuador

Partners: ABC, Fundación Aliados, Fundación Jocotoco, and Fundación Reserva Tesoro Escondido Reserve

States that have participated to date: Missouri

Overview: Ecuador provides wintering habitat to 105 species of Neotropical migratory birds. Ecuador has had the highest deforestation rate in South America over the last 50 years. The annual loss of forests ranges from 148,000 to 495,000 acres because of expanding human development. Forest loss is highest in the Andes and the Chocó Rainforest (Chocó), prompting our partners, Fundación Jocotoco (Jocotoco) and Fundación Reserva Tesoro Escondido (Tesoro Escondido), to establish bird reserves in these regions. Furthermore, ABC is partnering with Fundación Aliados (Aliados), an NGO promoting regenerative agriculture practices, such as agroforestry, with local Indigenous communities to scale up bird habitat conservation as well as sustainable and improved livelihoods. In FY 2025, ABC will work with Aliados in the Chocó-Canandé BirdScape, located in northwest Ecuador.

The Ecuadorian Chocó is characterized by high species endemism and accelerated habitat loss; only 2 percent of the original forest in the area remains. Nevertheless, the Chocó rainforest is important to numerous wintering migratory birds, including Cerulean Warbler, Canada Warbler, and Olive-sided Flycatcher. In this region, as part of ABC's BirdScape Initiative, ABC has established the Chocó-Canandé BirdScape, which encompasses Jocotoco's 21,000-acre Río Canandé Reserve and Tesoro Escondido's 4,560-acre reserve.

Our goal in this BirdScape is to transform existing monocultures, pastures, and fallow lands into silvopastures and agroforestry systems to provide additional habitat and corridors for Neotropical migratory birds. Building the communities' capacity to manage nurseries, diversify their income sources, and value wildlife will be key to the long-term success of our conservation efforts.

ABC and Aliados have been working with some members of four Chachi Indigenous communities to develop a business plan to expand shade-grown cacao cultivation. Cacao is a common crop in this part of Ecuador, but enhancements are needed to increase yields and secure a buyer willing to pay above-market prices for shade-grown cacao. By improving the cacao supply chain, we will conserve at least 5,000 acres of one of the most threatened rainforest ecosystems in the world.

Threats: Forests in the Chocó are rapidly disappearing due to local timber extraction and agricultural expansion (mostly oil palm and, more recently, balsa plantations). Land use change is an ongoing process accelerated by poverty and the lack of alternative income opportunities for the communities. From 2001 to 2017, the Chocó lost 883,352 acres of forests. Deforestation is likely to keep increasing, given the construction of new roads and bridges to cross rivers that historically were only crossed by boat. In addition, industrial development, particularly from oil palm production, is polluting the waterways, and after many years of deforestation, water sources are drying up.

Birds: Species that will benefit include Cerulean Warbler, Canada Warbler, Olive-sided Flycatcher, Blackburnian Warbler, Black-and-white Warbler, Swainson's Thrush, Summer Tanager, Western Wood-pewee, Southern Rough-winged Swallow, Acadian Flycatcher, and Broad-winged Hawk.

Previous Southern Wings Successes: With Southern Wings funding in FY 2020, ABC and Tesoro Escondido worked with eight communities in and around the Chocó-Canandé BirdScape. Funds helped Tesoro Escondido build six nurseries in five communities, each with the capacity to produce 5,000 seedlings. Twenty thousand seedlings were planted in 75 acres of cacao monocultures, pastures, and fallow lands. In addition, Tesoro Escondido's staff gave a series of workshops about tree nurseries, seed collection, bird identification, and wildlife conservation.

Between 2021 and 2023, ABC and Aliados restored 180 acres with nearly 5,000 cacao and fruit trees and trained over 100 farmers in three Indigenous communities on regenerative agriculture practices, such as agroforestry and cover crops. With Tesoro Escondido and Jocotoco, we conducted reforestation work planting 19,700 native trees over 150 acres.

Project goal: The goal of this project is to slow the rate of deforestation and work with landowners to improve land use practices and create better habitat connectivity in the buffer zones of existing protected areas in the Chocó-Canandé BirdScape. In FY 2025, our objective is to restore another 100 acres of cacao monocultures and degraded lands. In addition, we will start to identify and engage other communities. The project will contribute to three of the nine strategies included in the recently launched *Chocó-Conservation Investment Strategy*. These strategies include strengthening small-scale sustainable agriculture, designing and managing business models for sustainable products, influencing local people's behaviors to have a positive relationship with nature, and restoring key areas.

Project Activities:
In the Chocó-Canandé BirdScape, we will:

- Identify and engage 40 new farmers in at least two communities.
- Conduct community workshops to strengthen local capacity, particularly around cacao production.
- Produce and plant at least 10,000 cacao, native, and fruit trees on 100 acres to enhance monocultures and pastures and restore degraded lands.

Budget: $60,000 (For more details email Deb Hahn), **Matching Funds:** ABC and Aliados have secured funds for work in Canandé from private donors. Aliados and the local farmers will provide in-kind investment into this project, including providing the tools, land, expertise, and workforce to plant tree seedlings.

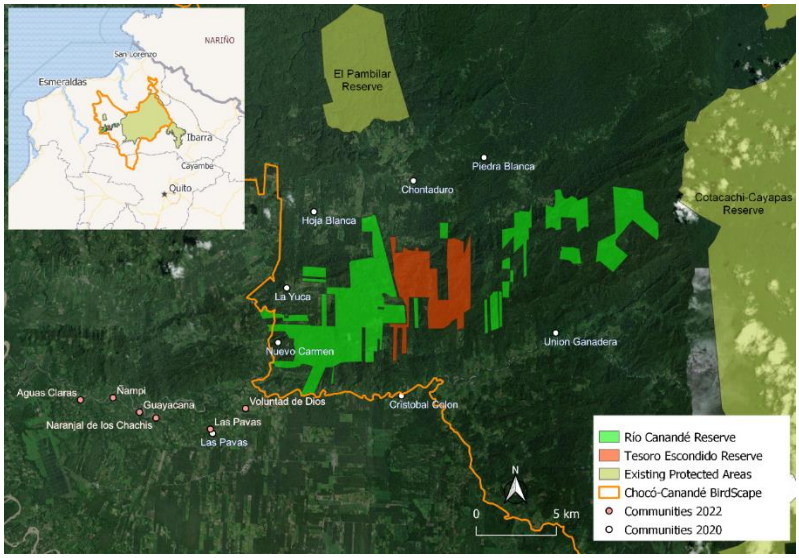


Figure 5. Location of the eight communities engaged in 2020 and the six communities engaged in 2021-2023.

Improving Migratory Bird Habitat in Colombia

Partners: ABC, Corporación VivoCuenca, Fundación Ecológica Cafetera (FEC), Comité de Cafeteros de Caldas (CCC), and Central Hidroeléctrica de Caldas (CHEC).

States that have participated to date: Missouri, Indiana, Tennessee, Virginia, North Carolina, Kentucky, Michigan

Overview: The country of Colombia is an integral part of the lifecycle of more than 170 Neotropical migratory bird species. ABC has been working in Colombia for more than 20 years to support the creation and management of bird reserves and ecological easements; develop and promote bird tourism opportunities; restore degraded lands; and promote bird-friendly agriculture. As part of ABC's Migratory Bird Program, we have identified large landscapes that we call BirdScapes, to target conservation action for Neotropical migratory birds of conservation concern. In Colombia, we have identified seven BirdScapes for developing and implementing conservation projects.

In 2019, ABC began to take action in the Central Andes BirdScape, one of the highest coffee producing regions in the country, where native vegetation is being replaced with agriculture and pasture lands. The Central Andes provides critical habitat for Golden-winged, Cerulean, and Canada warblers. We started working with our partner VivoCuenca and have prioritized the Caldas Department. Here, we have engaged with multiple agencies and groups already working successfully in the region to restore watersheds, implement best management practices for coffee farming and processing, and conduct outreach to involve the local communities in conservation activities. This partnership is locally known as Proyecto PaSos - Paisajes Sostenibles (PaSos Project - Sustainable Landscapes).

Threats: More than 70 percent of Colombia's population lives in the Andes, resulting in high rates of deforestation for cattle pastures and agriculture. In Colombia, it is estimated that 87 percent of Neotropical migratory birds occur in agroecosystems and more than 70 species have been registered in coffee farms. It is imperative that we target these kinds of landscapes in our migratory bird conservation strategy in Colombia.

Birds: 75 migrant bird species have been registered, including: Golden-winged, Cerulean, Canada, Black-and-White, Tennessee, Blackburnian, Yellow and Blackpoll warblers; American Redstart; Broad-winged Hawk; Yellow-billed Cuckoo; Acadian and Olive-sided Flycatchers; Eastern Wood-pewee; Summer Tanager; Rose-breasted grosbeak; Northern Waterthrush; Spotted Sandpiper; Red-eyed Vireo; and Swainson's Thrush.

Project goals: Our goal is to conserve 3,000 acres of habitat for Neotropical migratory birds and to improve connectivity throughout the Central Andes BirdScape. Specific objectives include planting at least 30,000 native trees and engaging 80 producers in conservation activities.

Previous Southern Wings Success: ABC and partner ProAves worked in the Eastern Andes specifically the Cerulean Warbler Corridor, with cacao and coffee farmers in the buffer zones of two ProAves reserves, Cerulean Warbler and Pauxi. Southern Wings funds contributed to the creation of habitat corridors through the planting of more than 500,000 trees on 2,835 acres across 200 private farms. More than 5,000 people throughout the corridor received information about birds and biodiversity through radio programs, International Migratory Bird Day events and activities, training workshops on reforestation and sustainable coffee farming, and the distribution of educational materials.

In recent years, funding through Southern Wings has supported engagement with coffee producers in the departments (equivalent to states) of Caldas and Tolima in the Central Andes BirdScape, facilitating the planting of more than 185,000 trees and the installation of 10.5 miles of fencing to conserve over 2,000 acres. Since

2021, the project in Caldas has been expanding to lower elevations and new watersheds. Maintaining our partner's staff including forestry technicians and professionals is a priority to ensure the project success.

States participating in Southern Wings have also provided funding for specific Golden-winged Warbler surveys in Colombia and neighboring Venezuela. We are currently working with SELVA to conduct a fifth year of surveys in Colombia.

New Project Activities: We will continue to plant native trees to increase habitat and connectivity between forest patches. Our goal is to plant at least 30,000 trees this year in the Caldas department, as well as provide maintenance to the trees planted thus far. Funds are needed to maintain employment of our forestry technicians to meet the demand created by the project. The forestry technicians play a critical role serving as the main point of contact with the farmers, working to develop planting agreements, delivering trees, monitoring tree survival, and providing technical assistance throughout the reforestation process and the propagation process in the nurseries.

We are planning to start an internship program to engage young adults from the local communities to support various project activities. This will allow them to have a source of income and be involved in conservation, instead of having to leave the area or work in extractive activities. Finally, we will hire a consultant to develop a fundraising plan for the project seeking the project's long-term sustainability.

Budget: $49,000 (For more details email Deb Hahn), **Matching Funds:** ABC has funding support from Amos Butler Audubon Society and the USFWS via the NMBCA. In addition, VivoCuenca, FEC and CCC have significant matching funds available for related activities in this proposal.

Map 3: Central Andes BirdScape (in brown) and the Chinchiná and Tapias-Tareas watersheds (white polygons) in the Caldas Department.

Protecting Stopover and Wintering Habitat for Shorebirds in Laguna Madre, Mexico

Partners: Pronatura Noreste (PNE), National Commission of Protected Areas (CONANP), Rio Grande Joint Venture (RGJV)

States that have participated to date: Texas.

Overview: Shorebirds are a biological group of great interest to science and conservation, facing a serious problem related to a drastic decline in their populations, due to the loss and degradation of breeding and wintering habitats, making it urgent to implement conservation efforts in priority sites. Laguna Madre in México is composed of a wide variety of ecosystems, among which are lagoons, estuaries, deltas, marshes, intertidal swamps, sea grasses, coastal dunes, and mangroves, representing a substantial role in the survival of shorebirds during their migratory cycles. That is why this region has international distinctions such as Ramsar wetland site 123, Western Hemisphere Shorebird Reserve Network (WHSRN) sit, Area of Importance for Bird Conservation (IBA), and CONANP.

PNE, ABC, and Rio Grande Joint Venture (RGJV) led crucial projects that identified Laguna Madre as a priority site for migratory birds in Mexico. Conservation of this complex mix of wetlands and other ecosystems is identified as a priority in the Rio Grande Joint Venture Implementation Plan and also supports priorities identified in the United States Shorebird Conservation Plan (Brown et al, 2001) and The North American Waterbird Conservation Plan, Version 1 (Kushlan et al, 2002). Our focus in the Laguna Madre has been on habitat restoration, biological monitoring, community engagement and surveillance, and land protection.

We intend to propose conservation and restoration strategies linked to local and international initiatives, as well as to promote the benefit of the largest number of ecosystems and species at risk. In this proposal, shorebirds have the function of an umbrella biological group. We included necessary activities based on conservation plans that will benefit this group of birds and complex ecological interactions in the Laguna Madre.

Because of the habitat compatibility between shorebirds and other bird guilds, this proposal is compatible with the Midcontinent Shorebird Conservation Initiative and other initiatives like the International Reddish Egret Working Group, which recently updated the range-wide conservation action plan for this specie and developed a conservation business plan for the U.S. Implementation of priority, on-the-ground conservation and restoration actions is now one of the key next steps.

Threats: Laguna Madre in Tamaulipas holds several threats due to anthropogenic activities that directly affect the prevalence of migratory shorebirds, such as the following: disturbances due to unregulated tourist and recreational activities, inappropriate use of motorized and all-terrain vehicles, abandonment of domestic animals that become feral, and pollution by solid waste and agrochemicals. In addition, other problematic situations include shoreline and wetland modification, poor water management policies and enforcement, and erosion of barrier and interior islands causing sedimentation. There are information gaps about shorebirds in Laguna Madre due to a lack of monitoring continuity and coverage. It is necessary to fill the lack of knowledge about migratory populations and their relationship with their ecosystems and threats, to implement conservation actions based on updated data, and to develop continuous monitoring efforts.

Birds: The focal species include Wilson's Plover, Snowy Plover, Piping plover, Long-billed Curlew, Marbled Godwit, Red Knot, Western Sandpiper, Sanderling, American Golden-Plover, Ruddy Turnstone, American Oystercatcher, and Lesser Yellowlegs, with complementary benefits for other priority species such as Reddish Egret, Black Skimmer, Least Tern, Redhead, Pintail, Blue-winged Teal, and American Wigeon.

Project goals:

- Update knowledge of migratory shorebird populations in Laguna Madre, Tamaulipas.
- Improve knowledge and current status of habitat use and threats.
- Implement anthropogenic threat management activities focused on solid waste management, pollution, and disturbances.
- Implement restoration activities to reverse the loss of soil in interior islands and coastlines.
- Increase local partner's and stakeholders' capacity.

Previous Southern Wings Successes: In 2013 and 2017, Southern Wings invested in the Laguna Madre project, funding mangrove reforestation that resulted in the planting of nearly 21,000 mangrove saplings over 75.6 acres. Previously, with funding from the National Fish and Wildlife Foundation (NFWF), ABC and PNE created two new conservation agreements on private lands totaling over 10,000 acres, began a program to control feral animals on islands, improved fencing to reduce cattle and other agricultural animals from entering sensitive areas of Laguna Madre, conducted focal species monitoring, began mangrove restoration, and protected key nesting and wintering sites. In 2020, 222 acres of islands within Laguna Madre were restored with black and red mangroves.

Conservation Action: In Laguna Madre, Tamaulipas, our conservation priorities for shorebirds include:

- restoration of priority sites of nesting and wintering such as islands and coastal line (dunes restoration) with native species,
- implementation of a monitoring protocol for migratory shorebirds in Matamoros and Soto La Marina, Tamaulipas;
- conduct shorebird monitoring training workshops for community monitors to implement the monitoring protocol;
- management of priority habitats through solid waste cleaning campaigns in Matamoros and Soto La Marina;
- implementation of an outreach and education strategy that includes an education campaign focused on human disturbances for shorebirds; implementation of surveys to evaluate the impact of visitors in tourist seasons; development and dissemination of graphic material (guides and pamphlets of best practices for visitors); and development of a media campaign for shorebird conservation using social networks; and
- develop training workshops focused on solid waste management workshops for local fishermen.

Budget: $109,500 (For more details email Deb Hahn), **Matching Funds –** In-kind support from ABC and PNE, PNE Administrative support ($20,000), PNE Laguna Madre Shorebird Monitoring Program ($31,000).

Map 4: Laguna Madre, Mexico

Restoration and Environmental Education in San Vito de Coto Brus, Costa Rico

Partners: Dr. Rebecca Cole (Crowther Lab, ETH Zurich, as well Loma Linda Field Station, Coto Brus), Osa Conservation, Osa Birds, communities of San Vito and Agua Buena, AmistOsa Biological Corridor Committee
States that have participated to date: None (new project)

Overview: Finca Cántaros Environmental Association (FCEA) is a nonprofit organization dedicated to environmental education (EE). Forest restoration and birds serve as our two main pillars, or the "vehicles," for creating hands-on EE experiences for multiple sectors of the local community, including children and their families, women, or other underserved audiences such as young men recovering from drug and alcohol addiction (fincacantaros.org/about). Based in San Vito de Coto Brus, Costa Rica, which is in the mountains of the southwestern corner of the country, FCEA has had legal nonprofit and association status in Canada and Costa Rica, respectively, since 2020 and 2021. In 2023, we acquired 501(c)3 status in the United States.

One of the main activities of FCEA is acquiring degraded land that can be converted into critical habitat through forest restoration projects that actively engage the community on an ongoing basis to promote knowledge- and skill-building over time. This habitat benefits threatened and/or shared bird species of interest such as the Golden-winged Warbler (*Vermivora chrysoptera)*, Canada Warbler (*Cardellina canadensis*), Chestnut-sided Warbler (*Setophaga pensylvanica)*, Baltimore Oriole (*Icterus galbula),* Summer Tanager (*Piranga rubra)* and more (all of which have been detected through our 2020-2021 monitoring project using the PROALAS—or *Programa de América Latina para las Aves Silvestres*—protocol). We refer to our forest restoration as "tree-growing" rather than "tree-planting" projects, given that the term "tree-planting" acknowledges but one step in a long process of tree-*growing* that must incorporate strategic planning in the cultivation or acquisition of the appropriate native species to plant, as well as in the maintenance and stewardship of planted trees to ensure their success over the long-term. We seek to create multiple environmental education experiences for the community throughout the tree-growing timeline; for example, by inviting children and their family back time and again to steward their "Children's Forest of Coto Brus" (one of our many restoration projects) through organic compost application and forest enrichment activities that involve planting additional species once the necessary shade cover has grown. In just four years, FCEA has restored 60 ha of degraded pasture while protecting 20 hectares of secondary forest and has engaged the local community—including local schools, community organizations, and businesses, among other local actors—in ongoing stewardship activities of the restored forest, through its prioritization of environmental education.

In 2024 FCEA seeks to acquire 20 additional hectares. This project is the organization's own initiative but meaningfully connected to regional goals as the land is situated within the larger context of the AmistOsa Biological Corridor efforts, which is a landscape-scale, multi-organization democratized project (which aims to connect Amistad National Park to the Osa Peninsula) started many years ago by the government agency SINAC, involving a large network of regional actors. FCEA has created multiple mutually beneficial partnerships. For example, since 2020, we have granted Osa Conservation (OC) space on our land to run a tree nursery, where their staff can come and go freely and without cost, and FCEA benefits greatly from the arrangement because we can acquire native trees from the nursery to plant in our restoration projects. For the proposed project we would have access to trees through not only the OC nursery but also through Loma Linda and Osa Birds.

Threats: Land conversion in the area is driven by coffee production and cattle grazing, two of the main agricultural activities. The area is also sought after for human settlement due to the amenable climate at this elevation, although inhabitants are experiencing the effects of climate change in terms of increasingly hotter weather than in the past, and at times erratic and unpredictable rainfall.

Birds: Golden-winged Warbler, Canada Warbler, Chestnut-sided Warbler, Baltimore Oriole, Summer Tanager

Project Goal: FCEA aims to work with experienced restoration ecologists such as Dr. Rebecca Cole and Dr. Rakan "Zak" Zahawi (Executive Director and Chief Executive Officer of the Charles Darwin Foundation), along with other local actors in the AmistOsa Biological Corridor context to acquire multiple connected patches of up to 300 hectares of degraded cattle pasture that can be restored into habitat for birds and other species over the following years. We aim to combine strengths by bridging the research expertise of restoration ecologists with the EE expertise of FCEA, to achieve multiple objectives that are beneficial to birds, the planet, people, science and more.

Southern Wings Successes: Not Applicable

Proposed Activities: Acquire multiple connected patches of up to 300 hectares of degraded cattle pasture that can be restored into habitat for birds and other species over the following years.

Budget:

Item	Cost (4 years)	Cost (FY24)	Partner Funds
Acquisition of 40ha property	$200,000	$50,000	Private donors
Tree nursery	$81,220	$20,305	In-kind
Tree planting	$14,240	$4,460	$10,000
Tree growing	$8,304	$2,076	$10,000
Environmental education	$4,000	$1,000	In-kind
Administration fees and taxes	$16,176	$4,134	$5,000
Project Total Cost	***$323,940***	***$81,975***	***$25,000 + In-kind***

Matching Funds: In-kind contributions of 86,420 (trees acquired from Loma Linda Field Station and Osa Conservation is an-kind contribution, In-kind from Finca Cántaros of $1200 in the tree planting item for weed whacking equipment, plus $4000 for ongoing environmental education) and private donors.

Figure 6: 40ha property in Agua Buena, Coto Brus county, outlined in yellow, connected to Drs. Rebecca Cole and Zak Zahawi's property Loma Gavilán, outlined in red, currently undergoing restoration efforts.

The Pacific Flyway Shorebird Survey: Identifying Threats and Conservation Actions in Northwest Mexico

Partners: Terra Peninsular, Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE), Centro de Investigación en Alimentación y Desarrollo, A.C. (CIAD Guaymas, Sonora), Point Blue Conservation Science, Universidad Nacional Autónoma de México (UNAM), Centro de Investigaciones Biológicas del Noroeste (CIBNOR), Universidad Autónoma de Baja California Sur (UABCS), Grupo Aves del Noroeste De México (GANO), US Forest Service International Program

States that have participated to date: Arizona, California, Pacific Flyway Council.

Overview: Nearctic-neotropical migratory shorebirds (Order: Charadriiformes; Families: Charadriidae, Recurvirostridae, Scolopacidae) are highly mobile animals that traverse thousands of kilometers across the Western Hemisphere bi-annually and are reliant upon a network of coastal and interior wetland ecosystems. The Pacific Coast of the Americas (Figure 7) supports entire populations of neotropical migratory shorebird species during winter (November-February). Wetlands stretching from western Alaska to southern Chile are critical for the survival of these birds; including 13 Western Hemisphere Shorebird Reserve Network (WHSRN) sites in NW Mexico. Mexico is particularly important because globally significant populations of shorebird species spend the winter at numerous sites along the Pacific Coast of that country. Primary species recorded during winter surveys in Mexico include: western sandpiper, dunlin, marbled godwit, willet, black- bellied plover, sanderling, greater yellowlegs, dowitcher spp., snowy plover, black-necked stilt, and American avocet. The main conservation concerns for shorebirds in the region are human disturbance and habitat loss or degradation.

The health of these sites is critical to supporting shorebird populations during their annual migrations. Current research indicates populations of shorebirds are declining (Andres et al. 2012) but the causes of these changes are not well understood (Butler et al. 2004).

Figure 7: The Western Hemisphere with stylized migration route of shorebirds along the Pacific Coast of the Americas and important wetland sites (black dots) as designated by the WHSRN.

The lack of broad-scale coordinated monitoring for Pacific Flyway shorebirds has limited our ability to effectively manage their populations particularly in light of the predictions of climate change, which will likely alter habitat conditions (e.g. sea-level rise, reduced wetlands due to drought). In 2011, in collaboration with the Copper River International Migratory Bird Initiative and >100 individual and organizational partners throughout the Pacific Flyway, we initiated the Pacific Flyway Shorebird Survey (PFSS) and then the Migratory Shorebird Project (MSP) to fill gaps in Pacific Flyway population status and trends and then to assess hypothesized threats to shorebirds and identify priority conservation locations, respectively. Specifically, the objectives of the PFSS and then the MSP are to: (1) quantify spatial and temporal trends in distribution and abundance of shorebirds and other waterbirds both at the individual site level and across their wintering ranges; (2) provide science-based guidance for managers to inform actions and measure the response; (3) develop an "iterative learning" analytical framework to critically evaluate specific hypotheses about the factors influencing population changes and to identify priority wetlands; and (4) educate individuals, communities, and governments about the importance of their wetland resources and their connectivity with people, via shorebirds, throughout the Americas. These programs now collect standardized bird and habitat condition data on over 2.5 million non-breeding waterbirds from 13 countries annually.

Threats: The primary threats to shorebirds in the Pacific Flyway include 1) changes in habitat availability; 2) exposure to contaminants and pollutants; 3) human disturbance; 4) climate change; and 5) increasing predator populations. Human disturbance is thought to particularly be a problem in beach habitats (important for populations of threatened or endangered species such as the snowy plover and red knot), which get a lot of use by humans compared to intertidal mudflats and rocky areas commonly used by other shorebird species.

Birds: Shorebirds (Families: Charadriidae, Haematopodidae, Recurvirostridae, Scolopacidae); waterfowl (Pacific brant and ducks); raptors; and waterbirds (terns, egrets, etc.). See Table 2 for a complete list of species SGCN in the project area, listed by state of U.S. The wetland habitats and sites used by shorebirds during the non-breeding season and monitored as part of this program are important for other migratory waterbirds. All 13 sites of importance for wintering Pacific brant in northwest Mexico are surveyed, and brant as well as other waterfowl are counted as part of the MSP (Table 3).

Project Goal(s): The overall goal is to improve the efficiency of conservation and management for coastal wetlands, shorebirds, waterbirds and waterfowl in Mexico through the integration of data and prioritization in decision-making. This will be achieved by conducting the following actions.

1. Complete annual non-breeding bird surveys at 21 sites across Mexico (Figure 2) and compile these survey data in to the PFSS node of the Avian Knowledge Network (AKN). Data collected includes the number of birds (shorebirds, waterbirds and waterfowl), measures of bird disturbance, and assessment of habitat condition. The number of avian predators (raptors) of shorebirds and other waterbirds are also recorded.

2. Expand survey efforts on sandy beaches to improve sampling for snowy plover, red knot, willet, and sanderling, and improve our understanding of human impacts which primarily occur on beaches.

3. Integrate survey data from new and existing sites, along with spatial data on the distribution of shorebird habitat across Mexico, into models to determine drivers of shorebird distribution and abundance, and the prevalence of different threats. Distribution models developed with these data for Pacific Flyway SGCNs species will be used to highlight priority areas for non-breeding shorebird conservation.

Southern Wings Successes in 2023: Funds have helped to conduct mid-winter Pacific brant surveys in all major wintering sites in northwest Mexico, nonbreeding shorebird and waterfowl surveys as part of the MSP, breeding shorebird surveys at coastal wetlands and sandy beaches (targeting breeding snowy plover, Wilson´s plover and American oystercatchers), identify key wintering sites and develop conservation strategies (as data becomes available and analyzed). Also, these funds have strengthened conservation and management of specific sites, disseminated information to land managers, and conducted education/outreach to the public.

Nonbreeding Surveys

- Nonbreeding Shorebirds Monitoring: During January-February of 2023 we completed the annual non-breeding mid-winter shorebird surveys at 21 sites across northwest Mexico (Figure 2). These sites included 250 sampling units that are surveyed by about 50 volunteers in northwest Mexico.
- Pacific Brant Surveys: We conducted the 2023 mid-winter Pacific brant surveys in Mexico and provided a summary report to The Pacific Flyway Council for their annual meeting. Palacios, E. and A. Heredia. 2023. Pacific brant mid-winter ground surveys in Mexico (2023). Unpubl. Progress Report to U.S. Fish and Wildlife Service. La Paz, Baja California Sur. 12 pp. *Available upon request*

- Collaboration with Local Hunting Organization: We collaborated with the hunting organization "Los Volcanes" to monitor wintering Pacific brant in Bahia San Quintin and conserve wetland habitat through protection of loafing and gritting sites, and surveillance to avoid illegal hunting and human disturbance.
- Snowy Plover Nonbreeding Surveys: During January 2023 we coordinated with the snowy plover mid-winter survey in the United States to conduct nonbreeding snowy plover surveys in five sites in northwest Mexico (Estero de Punta Banda, Bahía San Quintin, Laguna Atotonilco, Marismas Nacionales and Bahía Ceuta).

Breeding Surveys

- In 2023 we conducted three breeding waterbirds surveys at Tobari Bay (southern Sonora) and documented 12 species of waterbirds breeding on 11 dredge-spoil islands.

Education/Outreach/Training

- Application of MSP data: We continued mentoring graduate students on data analysis and interpretation for use in conservation and management. Tania Bravo, from University of Guadalajara did an internship at CICESE, focusing on the relationship between aquaculture of oysters and shorebirds. Tania used MSP shorebird data from Bahía Magdalena collected during the last 12 years. Daniela Michelle Valdez Gámez is working on a manuscript on the ecology of Wilson's plover in Ensenada de La Paz (Baja California). By using MSP data. Jonathan Vargas, a member of the Coastal Solutions Fellows Program is still working on a project to reduce human disturbance on the western snowy plovers in Ensenada, Baja California. We also advised one student from Panamá (Christian Torres) and another student from Ecuador (Vanessa Margarita González de la Cruz), both working on their thesis focusing on impact of human disturbance on shorebird abundance.
- Publications: We published a paper on shorebird population status and trends in the journal *Global Conservation and Ecology*: Winter population trends and environmental drivers for three species of temperate shorebirds.
  We submitted a manuscript on human disturbance and nonbreeding shorebirds in Bahía Todos Santos, B.C. using the data from MSP.
  We published a paper titled: Colonial and Non-colonial birds Breeding on Dredge-spoil Islands in a Tropical Wetland in México, in *Waterbirds*.

Data Entry:

- We entered all 2023 mid-winter shorebird survey data into the project's online data entry portal hosted by California Avian Data Center (CADC), a node of the AKN. Data includes the number of shorebirds, waterbirds and waterfowl, raptors, measures of human disturbance, and assessment of habitat condition.
  Habitat Protection and Conservation
- Estero de Punta Banda: To protect the nests of snowy plovers and California least tern in early April 2023 we installed a temporary fence on three nesting beaches of Estero de Punta Banda, northwest Baja California. This action also includes monitoring of the two species breeding season. The fence remained installed until August.
- Guerrero Negro: To protect the nesting ground for the snowy plover, California least tern, and American oystercatcher in 2023 we installed a temporary fence in Guerrero Negro, Baja California Sur. The protected area is about 40 ha. Our partners for this activity include CONANP, Exportadora de Sal, Pro Esteros, CICESE, and Laura Ibarra, a fellow of the Coastal Solutions Program.
- Secondary and unused trails have been closed for dune restoration in the Punta Mazo nature reserve. These efforts have resulted in the re-population of native plants of sand dunes, such as sand verbena (*Abronia maritima*). Signs and visitor loggers have also been installed.
- Terra Peninsular continued restoring hiking trails in the natural reserves by conducting soil restoration, delimitation and trail enhancement, plastic garbage cleanup, and infrastructure improvements. Local people from Ejido Chapala have been participating in restoring trails and cleanup activities in Monte Ceniza and Punta Mazo nature reserves. These reserves provide important habitat for a suite of migrants including thousands of Pacific brant, surf scoter, western sandpiper, marbled godwit, willet, and dozens of long-billed curlew, snowy plover, and sanderling.

Actions: Terra Peninsular and partners will implement the following conservation actions in the coming year.

- Conduct standardized annual non-breeding bird surveys of 21 wetland sites across NW Mexico (Figure 8), and compile these survey data into the AKN node. Data collected in the field includes the number of birds (shorebirds, waterbirds and waterfowl), measures of bird disturbance, and assessment of habitat condition. The number of avian predators (raptors) of shorebirds and other waterbird are also recorded.
- We will use MSP database for assessing population status, winter population trends and environmental drivers (temperature and precipitation) for priority shorebird species such as snowy plover, Wilson's plover, and Western sandpiper in northwest Mexico. Graduate students will work on their theses to complete these analyses.
- Analyze the impact of human disturbance on wintering shorebirds in Bahía San Quintín and Ensenada, northwest Baja California.
- In collaboration with local hunting organizations, we will strengthen conservation and management of designated wildlife conservation units (UMAs) in San Quintín, Baja California and El Tóbari, Sonora:
    - Continue restoring wetland habitat by removing abandoned structures used for oyster farming in Bahia San Quintin.
    - Monitor wintering population of Pacific brant and work to maintain/enhance habitat.
    - Improve capture of harvest information (sex and age) for hunted Pacific brant.
    - Implement a beach and wetland plastic cleanup campaign
- Work with an irrigation district (Yaqui River watershed, Sonora) to implement management practices that allow for vegetation to be maintained on one side of each canal to serve as loafing and foraging areas for waterfowl. Irrigation districts in Sonora traditionally work to keep canals free of any vegetation, but these vegetated areas provide important habitat for wintering populations of waterfowl as well as breeding Mexican duck and other species.
    - Organize workshops (and meetings) with the irrigation district to adopt the management of vegetation and dredged sediment.
    - Design and supervise the removal of vegetation in a channel slope or drainage ditch (water conveyance network).
    - Monitor the response of birds to the management of the vegetation of the water conveyance network.
- Conduct monitoring of breeding snowy plover at six sites across Northwest Mexico (Estero de Punta Banda and Bahía San Quintin, Baja California; Ensenada de La Paz, Baja California Sur; Laguna Atotonilco, Jalisco; Bahía Ceuta, Sinaloa; and Marismas Nacionales, Nayarit). Breeding least tern colonies will also be monitored at three of these sites (Ensenada de La Paz, Punta Banda and San Quintin). Protect nesting habitat (through perimeter fencing) and implement public outreach/education activities at three sites (Guerrero Negro, Bahía San Quintín and Estero de Punta Banda) to mitigate the effects of human disturbance on breeding snowy plover and least tern.
- Implement or support education/outreach and training activities such as 1) outreach campaign "Share the Beach" focused on nesting snowy plover and least tern, 2) other activities that disseminate conservation information to land managers, new professionals, and the general public.

Budget: Contributions of $5,000 to $10,000 each will significantly advance implementation of these shorebird/waterbirds/waterfowl conservation actions.

Activities	**Total Cost**	**Southern Wings Request**	**In-kind** (CICESE, GANO, Terra Peninsular)	**USFS-IP**
Conduct standardized midwinter waterbird surveys (waterfowl and shorebirds) at 21 wetland sites in NW Mexico	$20,000	$2,000	$8,000	$10,000
Protect nesting habitat, public outreach and monitoring of breeding snowy plover and least tern at Guerrero Negro, San Quintín and Punta Banda	$4,000	$1,000	$3,000	
Wetland habitat restoration: removing abandoned structures used for oyster farming in Bahia San Quintin	$10,000	$3,000		$7,000
Strengthen conservation and management of key areas	$22,000	$4,000	$8,000	$10,000
Workshop on sustainable and responsible hunting practices at UMAs of Baja California and Sonora.	$7,500	$2,500		$5,000
Manage irrigation canal to benefit waterfowl in the Yaqui River watershed, Sonora	$5,000	5,000		
Signing at interpretive trails in the Terra nature reserves	$2,500	$2,500		
Total	$71,000	$20,000	$19,000	$32,000

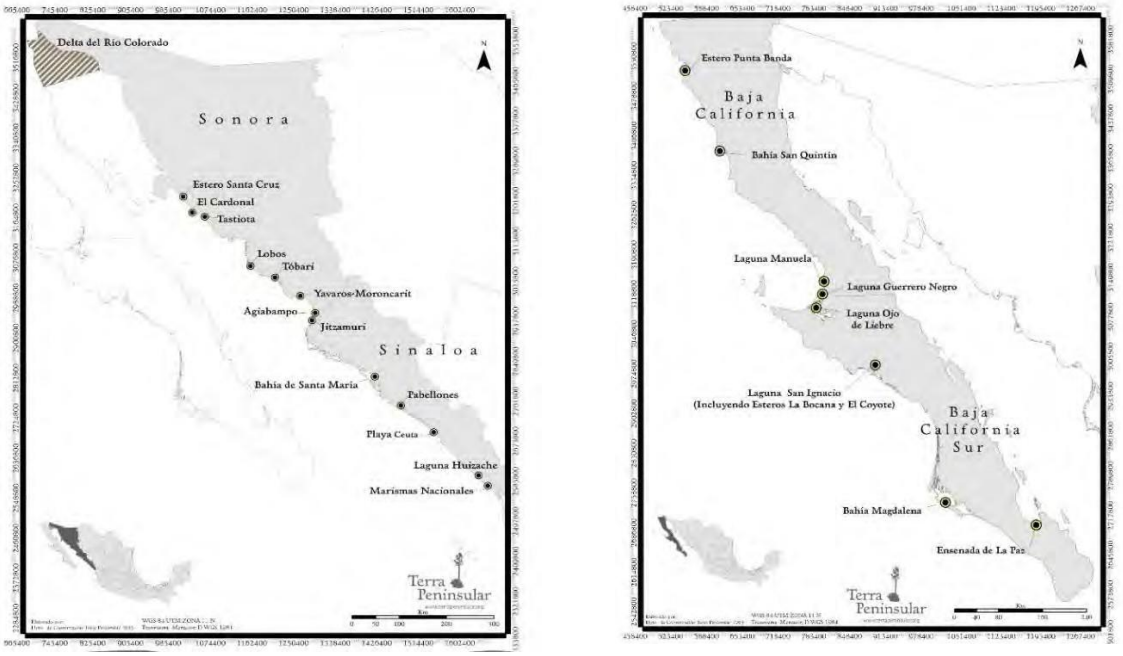


Figure 8: Location of 21 coastal wetland sites which are part of the PFSS in NW Mexico.

Table 2: SGCN in the project area, listed by state.

Species (SGCN)	AK	AZ	CA	CO	ID	MT	NV	NM	OR	UT	WA	WY
spotted sandpiper	X											
western grebe		X			X						X	
northern pintail							X					X
cinnamon teal											X	
greater white-fronted goose	X											
great egret		X										
ruddy turnstone			X									
black turnstone	X		X									
lesser scaup	X											X
brant goose			X								X	
Pacific black brant	X								X			
sanderling	X		X									
red knot			X								X	
western sandpiper	X						X					
semipalmated sandpiper	X											
mountain plover		X	X	X		X		X				X
snowy plover			X					X		X	X	
western snowy plover		X		X			X		X			
killdeer	X											
black tern			X	X	X		X					X
black-bellied whistling duck		X										
fulvous whistling duck			X									
snowy egret		X							X			X
common loon			X		X		X				X	X
gull-billed tern			X									
black oystercatcher	X		X						X			
black-necked stilt									X			
Caspian tern					X	X			X	X		X
loggerhead shrike			X	X			X	X	X		X	
California gull					X							
ring-billed gull					X							
short-billed dowitcher	X											
long-billed dowitcher	X						X					
marbled godwit												
belted kingfisher	X											
surf scoter											X	
wood stork			X									
long-billed curlew				X	X		X	X	X			X
whimbrel	X											
black-crowned night heron												X
American white pelican			X	X	X		X		X	X	X	
brown pelican (California)			X						X		X	
neotropic cormorant								X				

Species (SGCN)	AK	AZ	CA	CO	ID	MT	NV	NM	OR	UT	WA	WY
Brandt's cormorant			X									
red phalarope	X											
red-necked phalarope							X					
Wilson's phalarope							X					
white-faced ibis				X	X		X			X		X
black-bellied plover	X											
eared grebe								X				
American avocet							X					
black skimmer			X									
Forster's tern												X
least tern				X		X		X				
California least tern		X	X									
elegant tern			X									
royal tern			X									
lesser yellowlegs	X											
Total species	**18**	**7**	**21**	**8**	**9**	**3**	**13**	**7**	**10**	**4**	**10**	**11**

Table 3: Waterfowl abundance and distribution at sampling units of 30 Migratory Shorebird Project sites in Northwest Mexico, during midwinter surveys.

Common name	Abundance	Percent of sites (%)	Number of sites
northern shoveler	23140	30	9
green-winged teal	19654	23	7
brant	4100	30	9
redhead	3258	7	2
northern pintail	3254	33	10
gadwall	2962	7	2
blue-winged teal	2516	30	9
cinnamon teal	1177	23	7
ruddy duck	1143	13	4
American wigeon	595	13	4
surf scoter	557	13	4
red-breasted merganser	215	20	6
mallard	191	3	1
lesser scaup	113	13	4
bufflehead	71	27	8
black-bellied whistling-duck	12	3	1

Conservation of Neotropical Migratory Birds in the Dry Tropical Forests of El Salvador: Assessing and Addressing Threats to Overwintering Habitat and Bird Populations

Partners: Paso Pacífico, Zoological Foundation of El Salvador (FUNZEL), Fundación Enrique Figueroa Lemus, Ministerio de Medio Ambiente y Recursos Naturales (MARN), Arizona Game and Fish Department (AGFD), Sociedad Salvaje, Asociación de Desarrollo Turístico de la Costa Oriental De *El* Salvador (ADETCO), Compañía Azucarera Salvadoreña (CASSA), Southern Sierra Research Station (SSRS), Mujeres y Naturaleza (MUNAT), Zoo Boise

State(s) Participating: Arizona, Pacific Flyway Council

Overview: Continued declines in populations of NMBs have demonstrated the need to take a full life-cycle approach to NMB conservation. Actions taken only within the U.S. may not be adequate for the long-term conservation of migratory birds that spend much of their life south of the U.S. Paso Pacifico proposes to work with U.S. states, Federal agencies and in-country partners to protect overwintering and stopover habitat areas in Central America, specifically El Salvador.

Numerous NMBs from throughout the Pacific Flyway use Central America's Pacific coast during migration and overwintering periods. Most of this geography was once dominated by seasonally dry tropical forests (Figure 9). However, large scale conversion to agriculture and pasture has made the dry tropical forest one of the world's most endangered ecosystems, with less than 2% of the original forest remaining intact. Only 5% of remaining dry forest in Mexico and Central America receive some degree of protection.

Figure 9: Map of El Salvador showing the distribution of dry tropical forests (yellow).

Threats: The primary threats to NMBs overwintering birds in lowland El Salvador are: 1) habitat conversion from forest to intensive agriculture, 2) habitat degradation through timber and firewood extraction and wildfires, and 3) direct mortality from unregulated hunting (e.g., sling shots). Intensive agriculture is perhaps the largest threat in the tropical dry forest lowlands, and export crops such as melons and sugar cane continue to replace dry tropical forest with monoculture crops every year. Meanwhile more traditional farming (maize, beans) operate in a landscape matrix that often includes small patches of dry tropical forests and thus can provide some habitat to western migratory birds.

Birds: El Salvador hosts high avian biodiversity with 585 species, despite its relatively small size. For example, in the lowlands portion of the dry tropical forest 364 bird species have been recorded, including 38 species that

are considered SGCN from across 12 western states. Some SGCN species using these dry tropical forests include willow flycatcher (potentially the southwestern subspecies), yellow-billed cuckoo, Mississippi kite, peregrine falcon, Swainson's hawk, brown-crested flycatcher, Macgillivray's warbler, summer tanager, and Bell's vireo, among others (Table 4).

The project aims to protect overwintering birds and their dry tropical forest habitats in the eastern region of El Salvador (Figure 10). The eastern region has high conservation potential for birds due to its relatively low human population density and high cover of tropical forest and because it is located near the coast and the border of the Gulf of Fonseca, a recognized passageway for migratory birds. The challenge in the eastern region is that it is poorly studied due to its history of the civil war and more recent insecurity concerns. Currently the security situation has significantly improved, and so it is urgent that conservation efforts accelerate here before commercial agriculture and threats displace forests.

Figure 10: General project area in eastern El Salvador with specific sites of importance to overwintering birds noted (consisting of dry tropical forest habitats and adjacent wetland areas).

Two priority species in this region are the willow flycatcher (WIFL) and yellow-billed cuckoo (YBCU). Both southwestern willow flycatchers and YBCUs have experienced substantial population declines across their U.S. ranges. These trends are mirrored in data from capture stations in North and Central America; an overall view of demographic trends of survival and recruitment strongly infer that factors acting on migrating and overwintering populations play an important role in these declines. The WIFL and YBCU use Central America's Pacific coast during stopover migration and overwintering respectively. Project activities focus on sites that maintain suitable willow flycatcher habitat (Figure 19) and their neighboring upland forests that host a diversity of migratory and resident birds.

In addition to NMBs, the tropical dry forests of eastern El Salvador host other priority species such as the endemics white-bellied chachalaca and blue-tailed hummingbird. The endangered yellow-naped Amazon (parrot) nests in this region and the Federally endangered cyanoptera macaws cross the gulf of Fonseca from Nicaragua to forage in the dry forests that border the gulf. The project activities will compliment Paso Pacifico's yellow-naped Amazon and Cyanoptera Macaw Conservation Programs which operate in the same geography.

Project Goals: This project seeks to restore tropical dry forests and to protect forest-dependent migratory and resident bird populations in El Salvador, including for the WIFL and YBCU. To reach this goal, the project will use a three-pronged strategy: 1) restore and protect dry tropical forest habitat, 3) carry out targeted monitoring and research of species of special concern, and 4) build capacity amongst local people, private sector partners, and governments for improved habitat management and awareness of migratory birds.

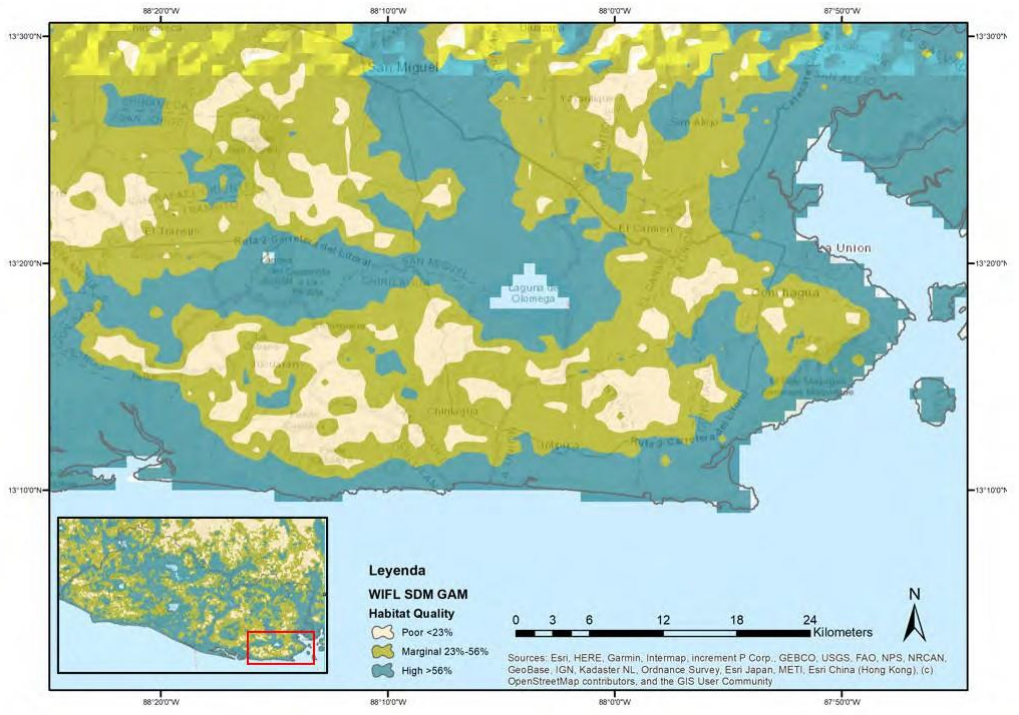


Figure 11: Distribution of potential suitable willow flycatcher (WIFL) habitat in eastern El Salvador with dark blue representing good potential habitat. Based on a model by Lauren Phillips and Tom Albright, University of Nevada Reno in partnership with Paso Pacifico, 2020.

Southern Wings Success 2023:

1. Conserve dry tropical forest habitats

- We maintained a team of ten part-time community rangers and supported their efforts to protect dry tropical forests from fires (7,413 acres under their protection) and promoted sustainable agricultural techniques through a water harvesting irrigation system at a demonstration farm.
- The ranger team visited schools and neighbors working with them to plant 500 native tree seedlings and several fruit trees provided by the municipal government Intipucá. The rangers will help monitor their growth over the coming year, especially during the dry season when they will likely need supplemental watering.
- Negotiated the down payment and purchase of 62-acre property with the support of Zoo Boise and private donors. This property hosts a dry tropical forest and could be expanded upon due to a sizeable adjoining property. The property could also host ornithological researchers.
- We helped to remove 1,400 lbs. of plastic pollution in the ocean and on beaches, wetlands, and roadsides, reducing potential impacts on birds, especially shorebirds. This work was carried out by the ranger team that regularly removes trash from the Olomega and mangrove wetlands and roadsides, and through our river intercept program funded by the World Surf League – One Ocean.

Figure 12: Native tree planting in the dry tropical forest of El Salvador.

- We helped to remove 1400 lbs. of plastic pollution in the ocean and on beaches, wetlands, and roadsides, reducing potential impacts on birds, especially shorebirds. This work was carried out by the ranger team that regularly removes trash from the Olomega and mangrove wetlands and roadsides, and through our river intercept program funded by the World Surf League – One Ocean.

Figure 11: River intercept system at work to remove plastics on the El Tunco River.

- Together with our community partner, Asociacion de Turismo de la Costa Oriental de El Salvador and Sociedad Salvaje Salvadoreña, we met with communities to discuss a shared vision for establishing a World Surfing Reserve called Oriente Salvaje with a 25,469 acre area. With this vision, we would work together to expand an existing public forest reserve "Caballito" of 507 acre, and to strengthen management across the western portion of the Xirihualtique-Jiquilisco Biosphere Reserve which includes vital mangrove forests. Sustainable tourism is a central tenet of this proposal. Together with local partners, we prepared and submitted a proposal to the nonprofit Save the Waves for this declaration. If granted this recognition could help us leverage funding to further invest in tropical dry forest and mangrove conservation.

2. Promote bird monitoring as a tool to inform management and build capacity

- Promoted the opportunity for bird-focused projects for college student interns at national universities in El Salvador in partnership with local nonprofits MUNAT and FUNZEL.
- Together with partners at MUNAT we gave a presentation to the Ministry of the Environment about MOTUS in December 2023. Additionally, with our encouragement, MUNAT attended the MOTUS sessions during the spring Partners in Flight – Western Working Group meetings.

3. Build local awareness and appreciation for birds and their habitats

Figure 12: Rural tourism in the dry tropical forest of Eastern El Salvador

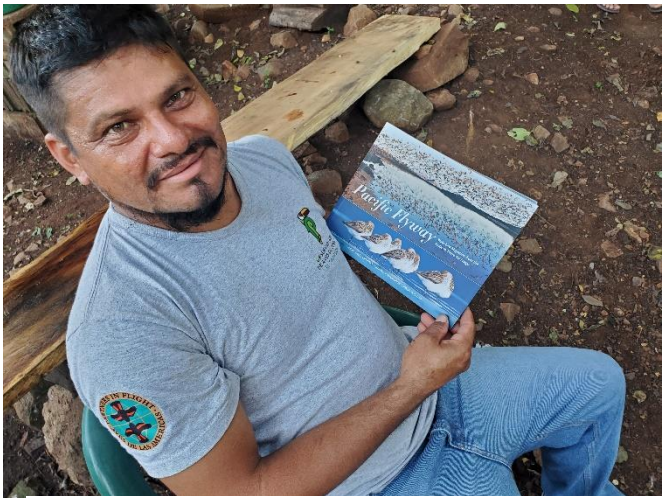


Figure 15: Victor Romero receiving Pacific Flyways book at the conclusion of the migratory bird lecture.

- In May, ornithologist Estania Muñoz imparted a migratory bird lecture with the community rangers. There was a lively discussion about birds that winter in the area. Each community ranger was gifted a copy of Pacific Flyway: Waterbird Migration from the Arctic to the Tierra del Fuego courtesy of the Benedict Family Foundation.

- We supported logistics for two US-based volunteers to visit the Tierra Blanca community near the Olomega Lagoon and meet with Paso Pacifico community rangers and farmers to discuss opportunities for rural tourism. After a second visit, the group has designed a single-day tour, and guide training will soon begin for five young people. This training will include bird watching and using Merlin Bird ID and field guides. The tour will be promoted as part of the Oriente Salvaje tourism circuit.

4. Develop science-based conservation tools for two endangered migratory birds: SWIFL and YBCU

- We prioritized a thesis project on the history of harvest and consumption of the YBCU and its perceived overwintering spatial and temporal distribution in El Salvador. This research will provide conservationists with additional information on the status and distribution.

- Consultant Nestor Herrera surveyed potential WIFL wintering sites. In late March of 2023, the survey covered eighty-seven locations mapped as WIFL habitats by our habitat map model built by researchers at UNR with support from NMBCA. WIFL were observed at twelve of the eighty-seven sites; WIFL encountered were found in dry tropical forest habitats bordering wetlands or rivers. At the twelve sites where WIFL were observed, 75 other bird species were identified including the following 11 priority species: American redstart; barn swallow; brown-crested, sulphur-bellied, and dusky-capped flycatcher; common yellowthroat; dickcissel; northern beardless-Tyrannulet; rose-throated becard and ; summer and western tanager. Sand extraction from rivers and road and housing construction were all significant disturbances at several targeted survey sites where WIFLs were expected but not found.

Figure 13: WIFL habitat in Usulutan, El Salvador. Photo by Nestor Herrera.

Proposed Activities 2024:

Conserve dry tropical forest habitats

- Finalize purchase (with other funding) of 62-acre private dry tropical forest near the Olomega Lagoon. Sustain ten community rangers who work to extinguish wildfires, prevent hunting and timber poaching, and support garbage cleanups.

- Design a stewardship council in coordination with the ADETCO, the Ministry of the Environment, and Save the Waves to develop a governance system for the proposed World Surfing Reserve (WSR). Share the conservation goals with community and tourism stakeholders.

- Provide two birding training workshops for the five local tour guides at the rural tour. Launch marketing of dry tropical forest hiking and birding tours to the tourism sector in Eastern El Salvador, also known as the Oriente Salvaje.

- Assist in coordinating tasks needed to finalize the Partners in Flight Tropical Dry Forest Conservation Strategy. The document identifies threats, conservation strategies, and actions to conserve permanent resident and Neotropical migrant bird Species of Pacific slope tropical deciduous forests of Mexico and Central America (including El Salvador).

Promote bird monitoring as a tool to inform management

- Support bird surveys in two new dry tropical forest protected areas: 1) a 62-acre private reserve under the purchase contract and 2) the new proposed Oriente Salvaje World Surfing Reserve (24,711 acre).

- Launch one MOTUS station and have two more in the permitting or construction process in the eastern region of El Salvador.

Build local awareness and appreciation for birds and their habitats

- Carry out community workshops with farmers near to long-term monitoring areas for the WIFL to build awareness of the bird, support citizen science monitoring, and to limit habitat removal for farming until after northward migration begins.

- Coordinate outreach for riparian habitat conservation with CASSA sugar cane mill and the 500+ farmers in their network.

Develop science-based conservation tools for two endangered migratory birds: SWIFL and YBCU

- Establish three long-term permanent monitoring transects for the WIFL to be monitored November through March.

- Support logistics for volunteer birders to conduct YBCU searches where there are historical.

- Contract a cultural anthropologist to conduct a study on the historical food consumption of the YBCU.

Budget: Proposed 2024 budget to support completion of some of the project's objectives and activities.

Activity	Total Cost	PP	Southern Wings Need	AGFD*
Conserve Dry Forest Habitats	$206,000	$199,000	$5,500	$1,500
Promote bird monitoring to inform management	$11,000	$1,000	$5,500	$4,500
Build local awareness and appreciation for birds	$7,500	$3,500	$3,000	$1,000
Develop science-based conservation tools	$8,000	$3,000	$3,000	$2,000
TOTAL (USD)	**$232,500**	**$206,500**	**$17,000**	**$9,000**

Table 4. SGCN (considered Neotropical Migrants*) in the project area, listed by state.

Species	AK	AZ	CA	CO	ID	MT	NV	NM	OR	UT	WA	WY
Grasshopper Sparrow			X	X	X							X
Swainson's Hawk		X	X	X					X			X
Northern Beardless-Tyrannulet								X				
Swainson's Thrush	X	X										
Vaux's Swift			X									
Yellow-billed Cuckoo		X	X	X	X		X	X		X	X	X
Olive-sided Flycatcher	X	X	X	X	X		X	X	X	X		
Western Wood-Pewee	X											
Black Swift			X	X	X	X		X		X		
Alder Flycatcher	X											
Willow Flycatcher			X						X			X
Merlin												X
Peregrine Falcon	X						X	X		X	X	X
American Kestrel	X											
MacGillivray's Warbler	X	X										
Common Yellowthroat	X											
Barn Swallow	X											
Yellow-breasted Chat		X	X									
Mississippi Kite		X										
Belted Kingfisher	X											
Acorn Woodpecker		X							X			
Dusky-capped Flycatcher		X										
Brown-crested Flycatcher		X	X									
Sulphur-bellied Flycatcher		X										
Rose-throated Becard		X										
Harris' Hawk		X										
Savannah Sparrow	X	X										
Band-tailed Pigeon		X		X						X	X	
Summer Tanager		X	X									
Blue-gray Gnatcatcher						X						
American Redstart	X											
Townsend's Warbler	X											
Dickcissel												X
Chipping Sparrow	X								X			
Eastern Meadowlark		X										
Tree Swallow	X											
Elegant Trogon		X						X				
Bell's Vireo							X	X				
Total	**15**	**18**	**10**	**6**	**4**	**2**	**4**	**7**	**5**	**5**	**3**	**7**

*SGCN Neotropical Migrants as defined by the Neotropical Migratory Bird Conservation Act Program.

Restoration of Wetland Hydrology in the Marismas Nacionales of Nayarit, Mexico to benefit migratory waterfowl and shoredbirds

Partners: communal landowners (ejidos), farmers and ranchers, fisheries cooperatives, Marismas Nacionales Biopsphere Reserve, CONANP, Comisión Nacional Forestal (CONAFOR), Municipality of Tecuala and Organización Vida Silvestre A.C (OVIS).

Overview: Marismas Nacionales (Figure 17) is a complex of wetlands that form a mixture of marine waters and 11 powerful rivers, creating a very varied mosaic of ecosystems such as meanders, river deltas, marshes, freshwater lagoons, estuaries, coastal lagoons, intertidal wetlands and coastal dunes. It supports the largest mangrove area on the Pacific coast. The "Functional Diagnosis of Marismas Nacionales" document drafted in 2011 provides interdisciplinary information which is spatially explicit, enabling the systematic and integral analysis of the current state of the Marismas Nacionales wetlands. That year began the design of the first pilot projects for the restoration of wetlands in the area. Ongoing work since the initial pilot projects has provided us with extensive experience in developing and implementing effective techniques for hydrological restoration.

Threats: Marismas Nacionales is affected by the cumulative impact of multiple threats to the hydrological pattern. The hydrological pattern has been altered by the retention and excessive use of water for agricultural and livestock purposes, establishment of shrimp farms, poorly planned communications infrastructure networks and sewage systems that impede and reduce the natural hydrological flow. More recently the emergence and establishment of invasive plants has become a concern. All these threats have resulted in drastic mangrove mortality, higher lagoon salinity and reduced habitat for wetland-dependent bird species. Restoring the habitat depends to a great extent on the maintenance of fresh water flows from rivers, streams and springs and on a functional network of natural channels within the mangrove systems. Therefore, urgent restoration measures need to be implemented that includes cleaning and dredging (e.g., removal of dead mangroves), such as the hydrological rehabilitation of 17 miles of natural tidal channels that will restore the hydrological flow and contribute to the restoration of 4,200 acres of mangroves.

Birds: Marismas Nacionales is one of the most important energy resupply sites for waterfowl on the Mexican Pacific Flyway, providing high quality foraging and resting sites for 15 migratory species (> 250,000). The area is notable for its concentration of: northern shoveler (130,000), green-winged teal (25,000), pintail (12,000), lesser scaup (4,450) and mallard (1,200). It also provides habitat for more than 427,000 wintering shorebirds of 28 species, including: American avocet (137,000-20% of its total population), and western sandpiper (145,000). Other priority species include marbled godwit (13,000), long-billed curlew (400), Wilson's plover and short and long-billed dowitcher (72,000) and black-necked stilt (26,000). Also, notably over 1,300 red knot feed in the area during their summer stay on their way to the Arctic and the area also has migratory (200) and resident populations of snowy plover (93 pairs). A list of SGCN species occurring in the area is provided in Table 5.

General Strategies: The project focuses on restoring hydrological flows for the recovery and conservation of mangrove ecosystems, which provide foraging sites and energy resupply for thousands of waterfowl and shorebirds that migrate along the Pacific Flyway. The project includes different sites, which together benefit the Agua Brava tidal watershed (210,039 acres) and comprises 11 tidal systems.

Phase 1 of the project focuses on the restoration of two degraded wetland systems. The first is the Las Garzas Lagoon of the Chagüín-Chuiga sub-tidal basin (12,429 acres), located within the Agua Brava Tidal Basin. This wetland was impacted and transformed by agricultural activity and hurricanes. This is observed in terms of low water volume, low water permanence (hydroperiod), hypersalinity, and no productivity. The proposal is to rehabilitate the 8.7-mile Río Viejo (8.75 yd base by 2.19 yd height) channel, which is a branch in the delta of the Río Acaponeta. The expected outcome is to harvest surplus water from agricultural activities, pluvial and hurricanes and transport this excess water to the wetland (Las Garzas Lagoon), to recover a large part of the

hydrological pattern and increase habitat for waterfowl and other wetland-dependent wildlife. The Río Viejo channel was functional until the 1980s and is currently filled with sediment and with a collapsed bridge, which does not allow water to flow into the wetland.

The second wetland is the San Cristóbal Basin (11,080 acres), which includes 5 sub-basins that make up freshwater wetlands such as La Tobara, La Chayota, Singayta, San Blas and Chacalilla, fed by streams and springs. The wetland complex is beginning to experience the establishment of several invasive species such as *Typha* sp, *Eichhornia crassipes*, *Pistia stratiotes* and *Ludwigia peploids,* leading to the reduction and loss of available habitat. Therefore, there is a need to establish an early detection and response strategy for invasive species at the basin level and implement control actions in 494 acres of Ejido La Libertad.

Southern Wings Successes in 2023: OVIS in coordination with CONANP, CONAFOR, ejidos, fisheries cooperatives and other partners accomplished the following:

- Engaged in outreach/education with 60 residents of the ejidos Valle de la Urraca and Río Viejo and conducted training to implement hydrological rehabilitation works.
- Implemented hydrological rehabilitation work on 494 acres in Valle de la Urraca, generating a direct benefit of fresh water flows to a 1,236 acre lagoon (Figure 18).
- Established collaborative agreements with landowners (ejidos and communities), CONANP's Reserva de la Biosfera Marismas Nacionales Nayarit office; and with experts in biological and physicochemical monitoring of restoration sites (Figure 19).
- Conducted environmental education/outreach related to wetlands and charismatic species (Figure 20). Outreach consisted of three interactive workshops in the communities of La Puntilla, Morillos and San Andrés de las Haciendas, targeting various audiences.
- Updated and finalized two 10,000-acre Wildlife Management and Conservation Units (9,884 acres in Valle de la Urraca and 123 acres in Paso Hondo) which included an option to increase the conservation area foot print in the future.
- Conducted seasonal bird monitoring (October-March) at two sites: Laguna Las Garzas and Valle de la Urraca (Figure 21). Survey results to date indicate a cumulative richness of 66 species (35 migratory, 22 resident, and 9 both) from nine orders and 17 families. The majority of the species richness (32%) consisted of shorebirds such as plovers, sandpipers and avocets. Additionally, ten species of ducks were recorded.
- Performed vegetation sampling in fixed plots at reference sites to compare and analyze mangrove vegetation structure in the restoration sites.
- Monitored physicochemical parameters of water quality at restoration sites to analyze changes in water quality following the hydrological rehabilitation work.
- Project results were presented at working meetings of the Marismas Nacionales Advisory Council and more broadly disseminated across OVIS's social media platforms and that of other partners.

Specific activities planned for 2024: Project efforts will focus on improving habitat quality for wetland dependent bird species (e.g., waterfowl, shorebirds, waterbirds) in two tidal basins through hydrological rehabilitation works. We will also work to design and implement conservation strategies to increase wetland areas with some level of protection, either at the local scale (ejido reserves) or at the Natural Protected Area level (Areas voluntarily Destined for Conservation). These strategies will involve community engagement through participatory workshops.

Actions:

- Conduct hydrological rehabilitation works with local labor and through manual cleaning and clearing of natural tidal channels.
- Continue surveys of wetland dependent bird species at two restoration sites. Compile available data and produce a comprehensive five-year regional bird monitoring report for Marismas Nacionales that is available to partners and the general public.

- Organize and implement participatory workshops in two communities to determine community needs and levels of interest at adopting conservation mechanisms at restoration sites.
- Conduct technical outreach focused on beneficial fishing practices (manual) with fishermen's cooperatives to reduce impacts on Laguna Las Garzas.
- Draft management recommendations based on technical information accumulated from six years of restoration work and biological and physicochemical monitoring.
- Implement environmental education/outreach activities in communities near Laguna Las Garzas targeting different audiences and age groups.

Table 5: SGCN (considered Neotropical Migrants*) in the project area, listed by state.

Species	**AK**	**AZ**	**CA**	**CO**	**ID**	**MT**	**NV**	**NM**	**OR**	**UT**	**WA**	**WY**
cinnamon teal											X	
northern pintail							X					X
eared grebe								X				
sora		X										
American avocet							X					
snowy plover			X					X		X	X	
whimbrel	X											
long-billed curlew				X	X		X	X	X			X
marbled godwit											X	
ruddy turnstone			X									
red knot	X		X								X	
stilt sandpiper												
dunlin	X											
western sandpiper	X						X					
lesser yellowlegs	X											
Wilson's phalarope							X					
ring-billed gull					X							
least tern				X		X		X				
gull-billed tern												
caspian tern					X	X			X	X		X
Forster's tern												X
wood stork			X									
neotropic cormorant								X				
American white pelican				X	X		X		X	X	X	
brown pelican											X	
great egret		X										
snowy egret		X							X			X
Total	**5**	**3**	**4**	**3**	**4**	**2**	**6**	**5**	**4**	**3**	**6**	**5**

*SGCN Neotropical Migrants as defined by the North American Wetlands Conservation Act Program.

Budget:

Conservation action	Cost
Hydrological rehabilitation	$2,000
Bird monitoring	$2,000
Participatory workshop	$2,000
Manual of beneficial fishing practices	$1,000
Physicochemical monitoring (water quality)	$1,000
Environmental education/outreach	$2,000
Total	$10,000

Figure 17: Macrolocation of the project, Marismas Nacionales Ramsar Site and Marismas Nacionales Biosphere Reserve, Nayarit, Mexico

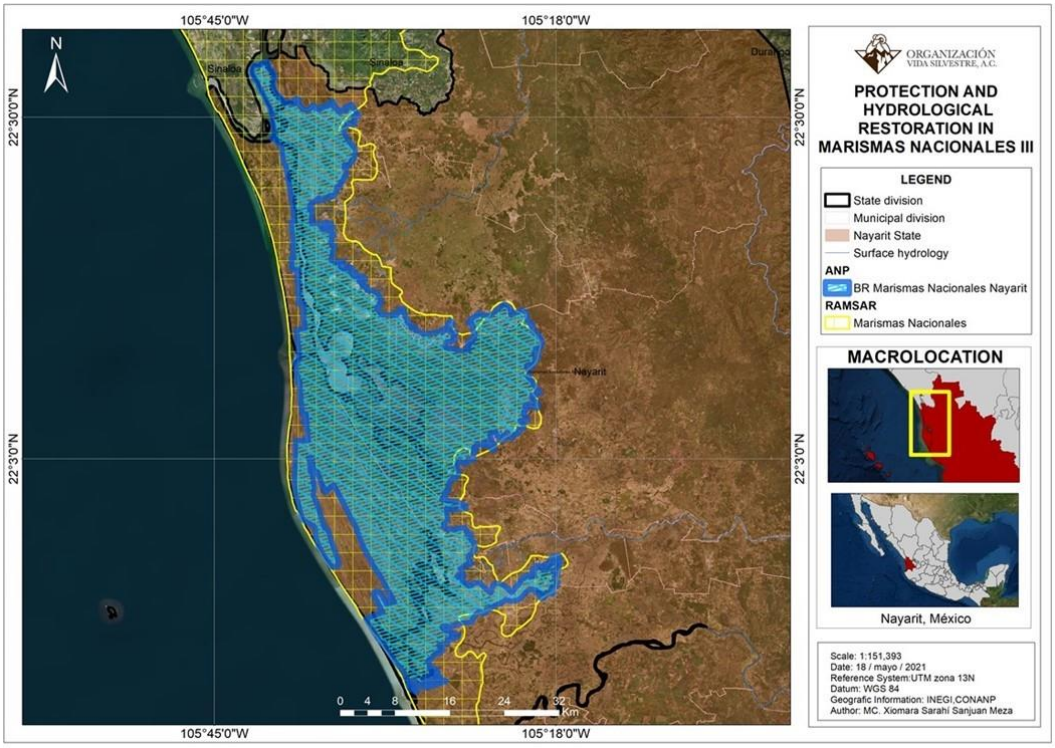


Figure 18: Rio Viejo and Valle de la Urraca wetland hydrology restoration sites in Marismas Nacionales, Nayarit, México.


Figure 19: Conducting coordination activities with partners in preparation for habitat restoration work and monitoring


Figure 20: Environmental education/outreach workshops focused on wetlands and charismatic species


Figure 21: Wetland bird species observed during standard bird monitoring surveys

Table 5: Number of individuals recorded by species during monthly surveys (October 2021 to March 2022) in the Las Garzas Lagoon of the Chagüín-Chuiga sub-tidal basin.

Species	October	November	December	January	February	March	Total
spotted sandpiper	1	5	11	5	2	3	27
northern pintail	172	887	878	2	0	0	1,939
cinnamon teal	135	1,882	3,423	212	166	41	5,859
great egret	10	27	36	39	7	15	134
great blue heron	26	31	56	37	30	21	201
ruddy turnstone	0	1	8	0	0	0	9
lesser scaup	19	0	0	0	0	0	19
gray hawk	0	0	0	1	0	0	1
common black hawk	0	0	0	1	0	0	1
green heron	1	0	0	0	0	1	2
dunlin	2	12	35	2	0	0	51
red knot	67	20	0	0	0	0	87
stilt sandpiper	778	1,057	1,779	895	446	301	5,256
western sandpiper	1,867	6,143	8,412	9,300	2,410	1,139	29,271
least sandpiper	247	404	364	778	267	186	2,246
semipalmated sandpiper	0	0	4	0	0	0	4
crested caracara	1	0	0	0	0	0	1
turkey vulture	2	3	10	3	0	0	18
snowy plover	6	87	57	211	71	50	482
semipalmated plover	385	356	929	338	24	8	2,040
killdeer	0	45	113	57	2	0	217
Wilson plover	87	26	234	60	30	54	491
northern harrier	0	2	2	2	0	0	6
black vulture	0	1	10	0	0	0	11
black-bellied whistling duck	0	0	25	0	0	0	25
little blue heron	11	7	38	20	7	8	91
reddish egret	3	4	9	6	9	1	32
snowy egret	14	7	5	5	8	7	46
tricolored heron	5	5	6	3	11	5	35
white ibis	1	8	0	5	4	8	26
peregrine falcon	2	2	2	2	2	0	10
magnificent frigatebird	0	1	3	0	2	2	8
American coot	4	305	4	0	0	0	313
gull-billed tern	0	6	0	4	4	8	22
black-necked stilt	464	486	695	340	230	173	2,388
caspian tern	28	17	8	3	1	0	57
ring-billed gull	6	38	25	29	21	11	130
laughing gull	14	13	8	5	9	9	58
short & long-billed dowitcher	1,408	4,886	3,480	2,165	662	360	12,961
marbled godwit	315	37	367	68	11	0	798
American wigeon	27	430	0	0	0	4	461
gadwall	308	92	64	0	13	0	477
wood stork	6	0	0	0	0	0	6
neotropic cormorant	66	305	94	55	65	51	636
long-billed curlew	0	31	24	80	13	14	162
whimbrel	1	9	8	5	7	4	34
yellow-crowned night-heron	0	2	1	0	0	0	3
black-crowned night-heron	0	0	0	1	0	2	3
ruddy duck	94	0	0	0	0	0	94

Species	October	November	December	January	February	March	Total
osprey	0	0	1	4	2	2	9
American white pelican	133	142	64	84	135	15	573
brown pelican	1	0	0	1	0	0	2
roseate spoonbill	4	17	53	12	4	8	98
white-faced ibis	0	0	0	1	0	0	1
black-bellied plover	344	185	81	249	10	9	878
American avocet	219	700	1,089	717	159	12	2,896
black skimmer	424	450	223	0	0	0	1,097
northern shoveler	2,988	3,015	2,826	2,023	468	105	11,425
cinnamon teal	315	76	104	15	6	8	524
blue-winged teal	2,400	316	1,764	352	46	0	4,878
Forster's tern	17	77	32	6	5	0	137
least tern	0	0	0	0	11	20	31
royal tern	0	10	6	0	0	0	16
lesser yellowlegs	24	32	65	19	12	3	155
greater yellowlegs	15	15	57	28	12	4	131
willet	97	66	118	160	73	43	557

Conservation and Management of Neotropical Migratory Birds and Thick- billed Parrots in old-growth forests of the Sierra Madre Occidental, Mexico

Partners: OVIS, Ejidos, CONANP, CONAFOR, AGFD, Foresta S.A. de C.V. Tecnicos Forestals de Ejido El largo S.A. de C.V., Unidad Forestal Galván, Asociación de Silvicultores de Guadalupe y Calvo, San Diego Zoo Wildlife Alliance (SDZWA), USFWS (NMBCA), Universidad Autónoma de Nuevo León.

Overview: Mexico's national forest management policy, which now considers the management of biodiversity, presents an opportunity to work at reducing significant threats (e.g., destructive fires, over-harvesting of timber) to maintain or restore populations of birds in remaining forests of the Sierra Madre Occidental (SMO). Timber harvesting for the past 70 years has been implemented through Forest Management Units. These units cover vast territories where various timber harvesting treatments have been applied, sometimes including destructive clear-cutting and high-intensity timbering. Through new partnerships, forest managers are adopting and implementing practices that promote sustainable forest production and productivity and explicitly integrate biodiversity conservation objectives and indicators.

This project focuses on establishing and maintaining a network of forests under conservation schemes and integrating the best management into forest management plans in the Sierra Madre Occidental (Figure 22). The project is implemented with a wide network of Forest Associations, for the generation of agreements, standardize methodologies and coordination for the conservation and monitoring of biodiversity in properties under different forest management and conservation schemes. The project area encompasses the high elevation forests found in the mountainous regions of Chihuahua and Durango (1,000,000 ha) where threats are severe and ongoing. Continued loss of old-growth forests will inevitably lead to loss and/or significant population declines of species associated with these old-growth forests. One of the most dramatic examples is the almost complete loss of remnant old-growth forests in northern Durango and Cerro Mohinora in southern Chihuahua and with it the loss of locally-nesting populations of thick-billed parrots (TBPA).

This project implements strategies outlined in the Partners in Flight (PIF) *an Integrated Conservation Strategy for Western Temperate, Mexican Pine-Oak, and Tropical Cloud Forest Birds: North America to Central America*. The project addresses threats identified in the species recovery plan for the TBPA.

Threats: TBPA is endemic to the pine and oak forests of the Sierra Madre Occidental, at elevations >2000 m in northwestern Mexico. It depends on forests with an abundance of old and dead pines, a habitat highly threatened by the felling of large pines and the extraction of logs for pulp and papermaking. This type of forest has been used immoderately in the last 100 years, and currently there are some remnants in the State of Chihuahua, where this parrot nests. In the early 1900s, this parrot was hunted by humans but habitat loss is the main cause of the abrupt decline of their populations.

Therefore, the birds of the SMO are currently seriously threatened by habitat loss and degradation as a result of poor forest management policies for more than a hundred years, as well as by fire suppression and an increased incidence of catastrophic fires. Large-scale logging has been practiced for many decades without considering the need to manage biodiversity. Major threats have caused the imperial woodpecker to be considered extinct and two other endemic species to be critically

endangered (Sierra Madre sparrow and TBPA). Logging has eliminated primary forests (estimated less than 1% of their original range remains) affecting entire groups of birds that depend on mature forests to provide nesting and shelter cavities, such as trogons, woodpeckers and owls.

There is an urgency to advance the conservation of the TBPA, a species listed as endangered by both the U.S. and Mexico. This parrot historically occurred in Arizona but is now only found in the mountain ranges of the SMO (in mix conifer forest habitats). TBPA are seriously threatened from the loss and degradation of habitat as a result of poor forest management policies, as well as from fire suppression and a higher incidence of catastrophic fires. Actions addressing these and other threats to the species will significantly contribute to its overall management and conservation.

Additionally, in the last two decades' various threats have been detected in TBPA and its habitat, among which prolonged droughts that cause different problems, including frequent fires, lack of food, depredations and outbreaks of ectoparasites, stand out. In 2021 and 2022, the lowest recruitment rate in 28 years of 0.63 chicks per nest occurred, and in 2022, this recruitment rate was sharply lower in 2022. Likewise, dead trees used for nesting are being lost due to natural factors. and anthropogenic.

Birds: The rugged Sierra Madre harbors a system of canyons dominated by temperate forests in the higher areas and jungles in the lower areas. As a result, the footprint of the project can be felt over an extensive area of critical habitat for more than 300 bird species, 45% of which are Neotropical. At least 19 species in the region are considered species of common concern (USFWS 2008) and more than 30 species are listed as high priority by PIF, including band-tailed pigeon, Bell's vireo, calliope and rufous hummingbird, elegant trogon, flammulated and short-eared owl, Grace's, hermit, and Lucy's warbler, loggerhead shrike, purple martin, and yellow-billed cuckoo. Other species of note include dusky and Hammond's flycatcher, and painted bunting. Other resident bird species of high conservation priority also benefit, such as eared quetzal, Mexican spotted owl and Apache northern goshawk.

Project Goals: The project focuses on conserving habitat and implementing sustainable forest management practices that benefit the SMO. This will be accomplished by integrating habitat needs of (Neotropical Migratory Birds (NMBs) (Table 6) and the TBPAs into forest management plans using the national forest management policy framework. The policy incorporates biodiversity management and environmental education to preserve wildlife populations and habitats. Also, in partnership with AGFD, the project will implement management of breeding populations of TBPAs in the protected natural areas of Tutuaca, Papigochi, Campo Verde, Mesa de Guacamayas and Madera (Figure 22). The project will also use new information on TBPA wintering areas (obtained from new satellite tracking of migrating TBPAs) to begin conservation planning of wintering habitats for TBPAS and NMBs.

Southern Wings Successes 2023: In coordination with CONANP, CONAFOR, Forestry Units and Ejidos of the Sierra Tarahumara, the following achievements were accomplished.

Implement habitat conservation measures to protect, restore, and manage mixed coniferous forests (Chihuahua and Durango).

- Signing of a general collaboration agreement with Forestal Tarahumara Consultores S. de R.L. de C.V (FORESTA) to implement sustainable forest management practices in 7 ejidos where TBPA is distributed with a total area of 100,000 ha in Chihuahua.
- We continue to collaborate with Ejido el Largo y anexos, Technical Forestry Services of Ejido el Largo in support of biodiversity monitoring to recommend sustainable forestry practices and

maintain forest certification in an area of 256,000 ha.

- Dissemination of results at the Congress for the Study and Conservation of Birds in Mexico held in 2022 in San Luis Potosí, where two papers were presented:
- Reproductive biology of the Long-eared Quetzal in SMO in the State of Chihuahua
- Events of Predation in TBPA Nests.
- Installation of 4 transmitters in the species, in three adults and one chick, in the areas of RB Janos, area of influence of APFF Campo Verde, APFF Tutuaca and Madera.
- With the information generated from the transmitters and the field observations, the start of migration to the south was recorded earlier than previous years, we consider that it may be due to the lack of food in the breeding sites.
- Only 5 out of 24 satellite radio transmitters are in operation. We know that at least 3 transmitters were destroyed or eliminated by the TBPA and at least 4 transmitters did not transmit information, have been sending information intermittently or non-systematically.

Monitor breeding populations of TBPA, NMB and other biological groups in the state of Chihuahua.

Monitor breeding populations of TBPA

- For the 2022 season, 90 active nests were located, of which it was possible to monitor 21, a reproductive success of 0.61 ± 0.66 fledglings per nest was recorded, recruiting 13 fledglings for the season in 21 nests.
- In the case of the APFF Tutuaca, it was found that the nests were abandoned before reaching the fledglings. For this area only one nest achieved its recruitment.
- In the new nesting area in Yahuirachi that was located in 2019 in APPF Tutuaca, no records of reproductive activity were obtained in the 2022 season.
- In the APFF Papigochic, no reproductive activity was reported in the 2022 season.
- The causes of mortality for the season were
- Nest destruction due to natural causes (rain with strong wind in Madera)
- Predation of adults in Papigochic and
- Death by starvation in chicks in Tutuaca (Figure 24)
- In total, 5 adults and 5 chicks were lost.
- We observed the extraction of ocote (wood used as fire starter) in the APFF Tutuaca. The ocote is extracted from dead trees (Figure 25).
- In the APFF Papigochic, trails for tourism were created at the beginning of the season, very close to the TBPA nests, for which we consider that they had a negative impact on annual productivity.
- We protected 16 nest trees, including adjacent trees, with anti-predator systems (metal barriers on the trunks of nest trees) (Figure 26).
- We documented the use of 10 artificial nests in APFF Tutuaca.
- We located a new nesting area adjacent to Cinco Millas, Madera in Aspens and a feeding flock of 90, with the habitat consisting of Fir and Pine.

Monitor NMB and other sensitive wildlife.

- We recorded 46 species' 717 vocalization records using an acoustic recorder (Figure 27).
- Identification of 19 species of wildlife using camera traps, in a monitoring period of 57 days, including jaguar & margay.
- In 2022, we completed 5 consecutive years evaluating the reproductive biology of the Northern Goshawk. Obtaining an average annual productivity of 2.8 eggs per nest and a reproductive success of 2.5 fledglings.

- Assess winter habitat use and winter flock counts.
- Delimitation of priority wintering areas for the TBPA in Durango (172,000 ha), based on the georeferenced records of the satellite transmitters installed in the TBPA (n = 24). In order to address threats to the areas (e.g., fire) in coordination with CONANP and CONAFOR.
- Evaluate habitat use and movements of the Eared Quetzal.
- Tracked several breeding pairs of eared quetzals in Madera and Mesa de las Guacamayas and deployed two satellite transmitters on juveniles (at Madera).

Project Activities Planned for 2024:

Implement habitat conservation measures to protect, restore, and manage mixed coniferous forests (Chihuahua and Durango).

- Provide technical information from the transmitters research study to CONANP to inform the technical assessment for designation of a private TBPA protected area in El Ejido El Largo (450 ha) and a sustainable forest certification process (250,000 ha).
- Provide technical information from the transmitters research study to CONANP to inform the technical assessment for designation of an Area Voluntarily Destined for Conservation (+6,000 ha) in TBPA wintering habitat in the State of Durango.
- Support workshops to facilitate community participation and other stakeholders to decree an area in El Ejido El Largo Madera (Madera, Chihuahua), as a TBPA protected area.
- Train decision makers and tourism service providers of the Municipality of Madera to reduce visitation impacts at two TBPA nesting sites. Impacts include increased fire risk, accumulation of solid waste, disturbance to nesting sites, soil erosion, opening of new roads, etc.
- Implement effective support mechanisms for community brigades to reduce the impact of destructive wildfires in priority TBPA wintering areas in 127,000 ha in the State of Durango.
- Continue training forestry service providers and technicians to implement best forest management practices in the State of Chihuahua and Durango.
- Promote formal conservation mechanisms for priority sites, such the Wildlife Habitat Council's (WHC) Conservation Certification® program, which enables businesses and corporations to advance biodiversity, sustainability, employee engagement and community relations goals.

Monitor breeding populations of TBPA, NMB and other species in the state of Chihuahua

Monitor breeding populations of TBPA

This landcape-scale work will be done in coordination with Forestal S.A. de C.V and forestry technicians from Ejido El Largo, which jointly administer and manage more than 300,000 ha of forests in the Municipality of Madera. This area constitutes one of the most important reproductive areas for the TBPA.

- Continue to monitor the reproductive ecology of TBPAs: Locate and monitor the annual productivity of the main breeding sites (Chihuahua).
- Install 5 satellite transmitters in TBPAs, provided by SDZWA and continue collecting information on home range, migratory routes and wintering areas.
- Also install camera traps to determine the presence and abundance of threatened species.
- Continue deploying anti-predation metal barriers in nest trees, as appropriate.
- Provide maintenance to 30 artificial nests, prior to the reproductive season.
- Disseminate results and management recommendations to local partners and national or international biodiversity platforms such as CONABIO and other key stakeholders.

Monitor NMB and other sensitive wildlife

- Monitor migratory and resident species, through point surveys along transects, to determine

presence and abundance.

- Monitor wildlife populations through camera traps, to identify populations of TBPA predators and other sensitive species (figure 24).
- Monitor natural forest regeneration and restoration actions carried out in previous years.

Assess TBPA winter habitat use and winter flock counts.

- Carry out at least two flock counts in the wintering area to determine the population of the different passage or wintering sites.
- Train community members in monitoring wintering populations of TBPAs (State of Durango)

Evaluate habitat use and movements of the Eared Quetzal.

- Revisit and monitor previously identified Eared Quetzal nests
- Monitor diet through direct observation of food deliveries at nests.
- Document sightings with the support of community members and forestry technicians.

Budget: Arizona will provide USD **$10,000**. The SDZWA is providing satellite transmitters and the signal for an estimated cost of **$39,600** (in-kind), and additional funds requested from Southern Wings ($12,347).

Activity	**AZFD** (USD)	**SDZWA** (in-kind)	**Southern Wings Request** (USD)	**TOTAL**
1. Implement habitat conservation measures to protect, restore, and manage mixed coniferous forests (Chihuahua and Durango).				
Personnel –$5,400 (Payment to 3 local guides 90 days at $20 day)	$900		$4,500	$5,400
Per-diem-$5,400 (90 days at $20/day X 3 local guides)	$1,100		$4,300	$5,400
Communication radios to support equipment of destructive fire control brigades (4 X $300)	$1,200			$1,200
Travel - $1,021 (7,500 miles at $0.5 mile)	$1,341		$2,409	$3,750
Indirect Cost (10%) - $1,600	$454		$1,138	$1,592
Total- Implement habitat conservation measures to protect, restore, and manage mixed coniferous forests	**$4,995**		**$12,347**	**$17,342**
2. Monitor and Research of TBPA & NMB				
Personnel –$600 (Payment to local guides 15 days at $40 day)	$600			$600
2.1. Investigate migration patterns of TBPA (deployment of satellite transmitters)				
Per-diem-$400 (10 days at $40/day)	$400			$400
Travel - $500 (1,000 miles X $0.5 mile)	$500			$500
2.2. Monitor NMB and threatened wildlife				
Per-diem-$400 (10 days at $40/day)	$400			$400
Travel - $200 (400 miles at $0.5 mile)	$200			$200
Pick up minor maintenance service	$500			$500
Install satellite radio transmitters (5 units X $6,000 each =$30,000 ,000 and 5 X$600 annual signal cost) $36,000		$39,600		$39,600

Audio, video and photo storage equipment (2 x $250)	$500			$500
2.3. Assess winter habitat use and winter flock counts of TBPA				
Per-diem-$400 (10 days at $40/day)	$400			$400
Travel - $250 (500 miles at $0.5 mile)	$250			$250
Indirect Cost (10%) - $691	$375			$375
Total: Monitoring and Research	**$4,125**	**$39,600**		**$43,725**
3. Evaluate habitat use & movements of eared quetzal				
Per-diem-$600 (15 days at $40/day)	$450			$450
Travel - $400 (800 miles at $0.5 mile)	$350			$350
Indirect Cost (10%) $100	$80			$80
Total annual productivity and mortality	**$880**			**$880**
Total Project Cost	**$10,000**	**$39,600**	**$12,347**	**$61,947**

Table 6: SGCN (considered Neotropical Migrants*) in the project area, listed by state.

Species	**AK**	**AZ**	**CA**	**CO**	**ID**	**MT**	**NV**	**NM**	**OR**	**UT**	**WA**	**WY**
Sharp-shinned Hawk	X		X									
Spotted Sandpiper	X											
White-throated Swift		X										
Violet-crowned Hummingbird		X						X				
Golden Eagle		X		X	X		X			X	X	
Great Egret												
Short-eared Owl	X		X	X	X		X		X		X	X
Lesser Scaup	X											X
Red-tailed Hawk	X											
Swainson's Hawk			X	X					X			X
Common Black-Hawk								X				
Lark Bunting												X
Wilson's Warbler	X											
Red-faced Warbler		X										
Killdeer	X											
Common Nighthawk							X	X	X			
Northern Harrier	X		X	X								
Yellow-billed Cuckoo		X	X	X	X		X	X		X	X	X
Western Wood-Pewee	X											
Broad-billed Hummingbird		X						X				
Black Swift				X	X	X		X		X		
Gray Flycatcher		X										
Pacific-slope Flycatcher	X											
Cordilleran Flycatcher		X										
Magnificent Hummingbird		X										
Merlin												X
Peregrine Falcon	X	X		X			X	X	X	X	X	X
American Kestrel	X											
Common Yellowthroat	X		x									
Barn Swallow	X											

Species	AK	AZ	CA	CO	ID	MT	NV	NM	OR	UT	WA	WY
Yellow-breasted Chat		X										
Bullock's Oriole		X										
Hooded Oriole		X										
Scott's Oriole		X	x				X					
Dark-eyed Junco			x									
Blue-throated Hummingbird		X										
Loggerhead Shrike				X					X			
Belted Kingfisher	X											
Lincoln's Sparrow	X	X										
Elf Owl		X	x					X				
Ash-throated Flycatcher												X
Brown-crested Flycatcher			x									
Painted Redstart								X				
Sulphur-bellied Flycatcher		X										
Black-crowned Night-Heron												X
Rose-throated Becard		X										
Osprey		X										
Savannah Sparrow	X	X	x									
Varied Bunting		X						X				
Band-tailed Pigeon				X						X	X	
Spotted Towhee			x									
Summer Tanager		X	x									
Blue-gray Gnatcatcher						X						
Vesper Sparrow								X	X		X	
Purple Martin				X							X	
Vermilion Flycatcher			x									
Ruby-crowned Kinglet	X											
Rufous Hummingbird	X			X			X					
Grace's Warbler		x		X				X				
Black-throated Gray Warbler								X				
Yellow Warbler	X	x	x									
Townsend's Warbler	X											
Mountain Bluebird		x						X				
Western Bluebird								X			X	
Eastern Bluebird		x										
Red-naped Sapsucker		x										
Williamson's Sapsucker		x						X				
Chipping Sparrow	X								X			
Tree Swallow	X											
Elegant Trogon		X						X				
Thick-billed Kingbird								X				
Bell's Vireo		X	X				X	X				
White-crowned Sparrow	X	X										
Total	**24**	**32**	**16**	**12**	**4**	**2**	**8**	**19**	**7**	**5**	**8**	**9**

*SGCN Neotropical Migrants as defined by the NMBCA Program.

Figure 22: Breeding sites of TBPA; (1) Mesa de Guacamayas (Reserva de la Biosfera de Janos), Áreas de Protección de Flora y Fauna (2) Tutuca, (3) Papigochic, (4) La Gloria and (5) Madera.

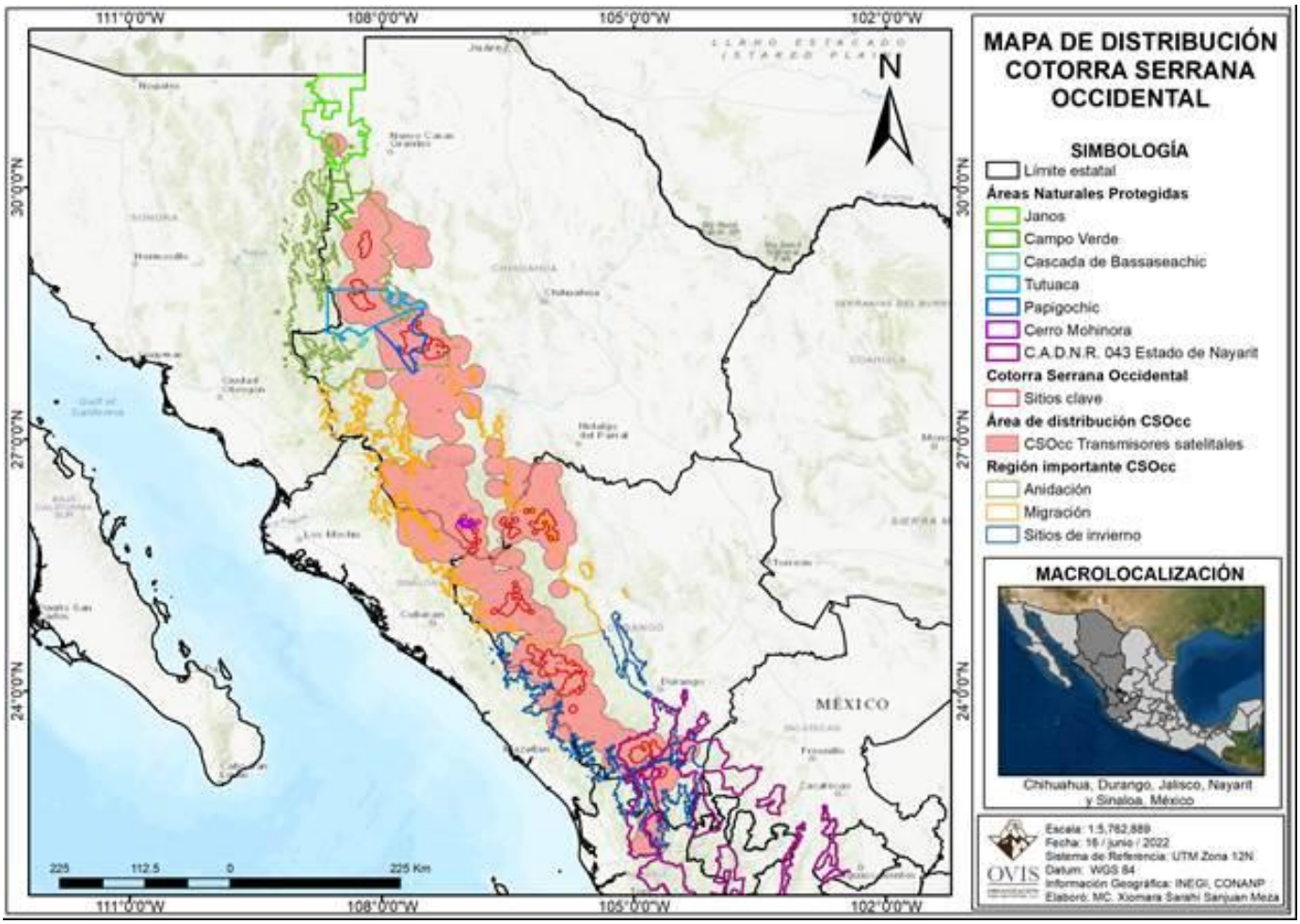


Figure 23: TBPA records in northern Durango, obtained from satellite transmitters, where conservation activities are carried out through a combination of legal mechanisms such as forest segregation and the integration of best management practices.

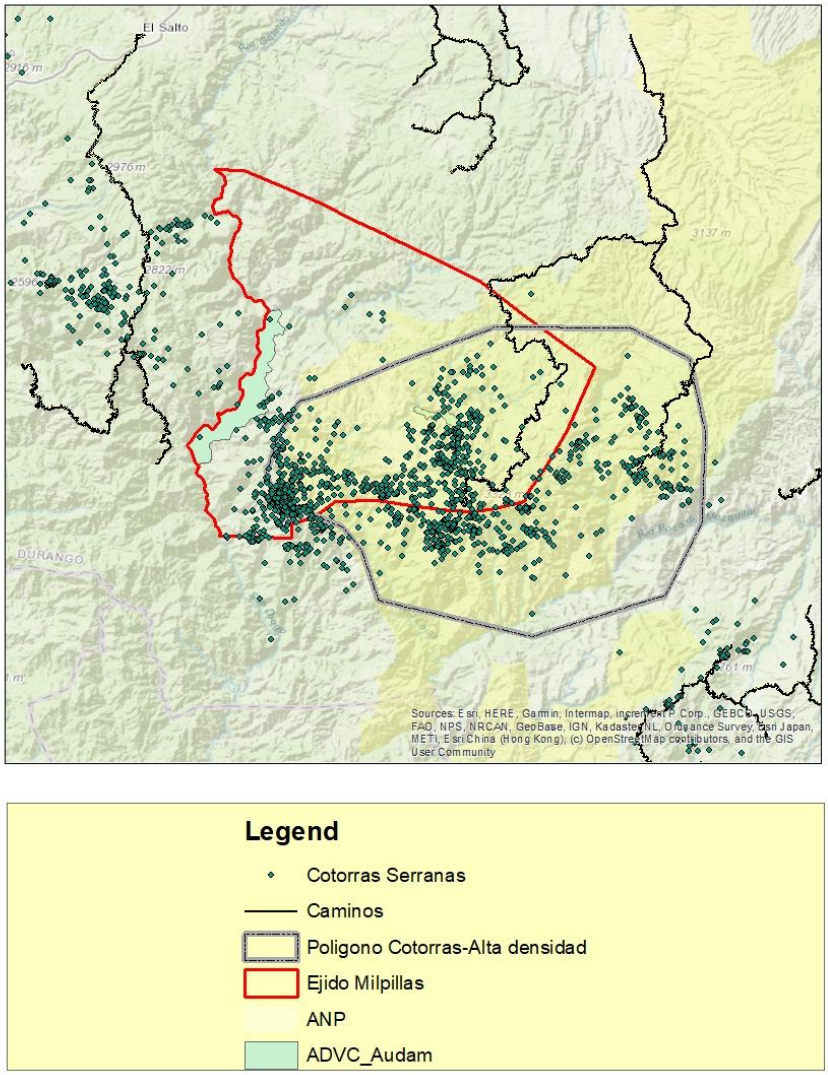
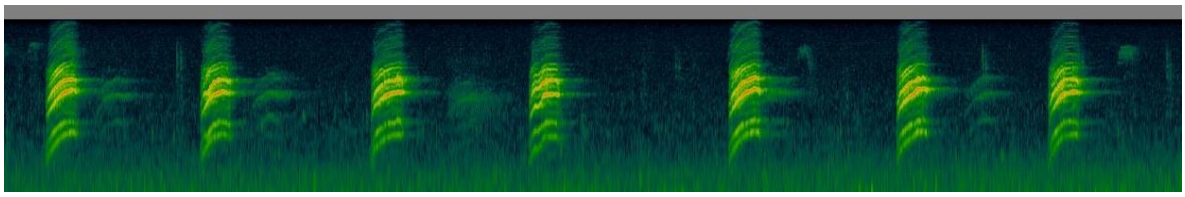


Figure 24: Photos of TBPA chick which died by starvation at APFF Tutuaca.

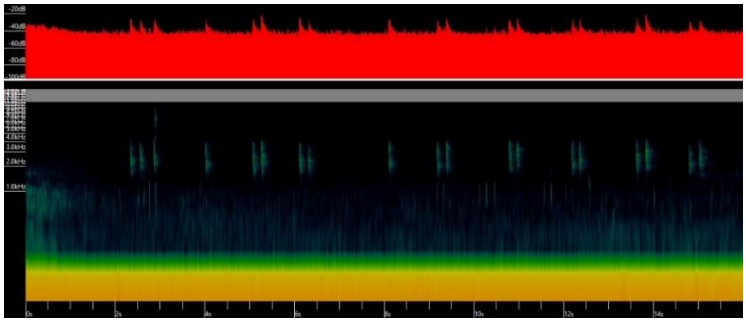
Figure 25: Pine trees logged for ocote extraction in APFF Tutuaca.

Figure 26: Antipredator metal bands placed in APFF Papigochi this season. On the right you can see the trail that was made next to one of the TBPA nests.

Figure 27: Bird monitoring with acoustic recorders.
A song acoustic for bird monitoring SM4 was installed and programmed from October 2022 to January 2023, in total the recording time was 60 days. A total of 717 audio recordings of 46 bird species were recorded.

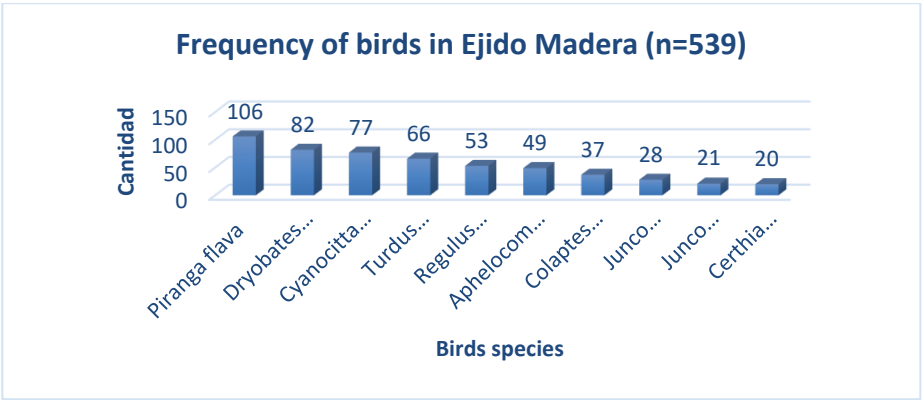


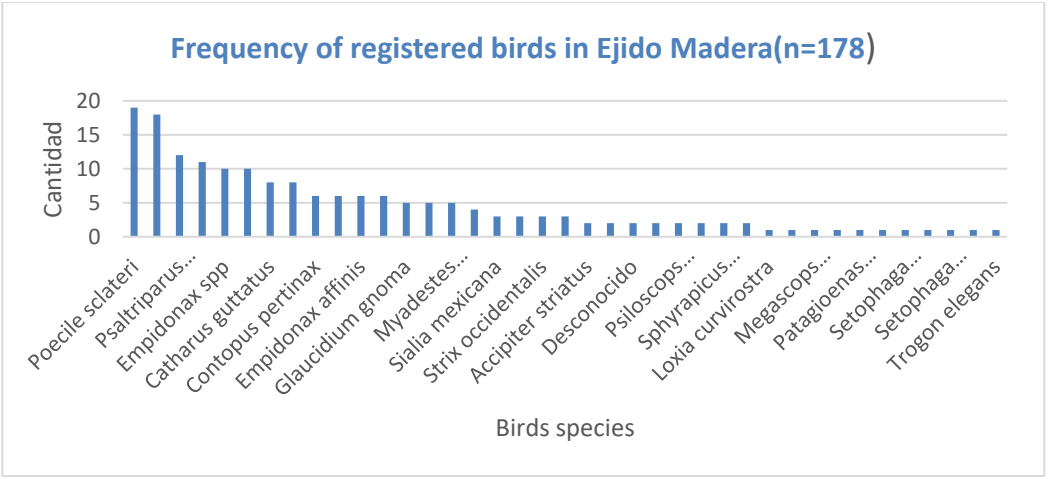
Sonogram of hermit thrush (*Catharus guttatus*)



Sonogram of hepactic tanager (*Piranga flava)*

Figure 28: Diversity of bird species in Ejido Madera





Conserving Critical Piping Plover and other Shorebirds Wintering Sites in the Bahamas

Partners: National Audubon Society, Bahamas National Trust (BNT), Bahamas Ministry of Tourism, the Bahamas Agriculture and Marine Science Institute (BAMSI), Royal Society for the Protection of Birds (RSPB), Environment and Climate Change Canada, Foundations, Private Donors

States that have participated to date: NEAFWA, Virginia, North Carolina

States with strong biological connections: CT, DE, MD, ME, MA, NH, NY, NC, RI, VT, GA, SC and VA

Overview: More than thirty-three species of shorebirds that breed along the Atlantic coast of the United States, Canada and the Artic complete a perilous migratory journey each fall to reach remote islands of the Bahamas where they spend up to ten months each year. These include around half of the Atlantic population of the endangered Piping Plover Audubon, in partnership with Bahamas National Trust, the Bahamas Ministry of Tourism, and the Bahamas Agriculture and Marine Science Institute, has been working to protect critical coastal habitats that wintering plovers and other declining shorebird species depend on. Shorebirds worldwide are in precipitous decline. The piping plover, with an estimated global population of only 8,024 individuals, is the most endangered shorebird breeding in the United States and Canada. Concern about the species has triggered widespread, intensive conservation action throughout its breeding range, but protecting its wintering grounds —where it can spend up to ten months of the year—has received little attention until recently.

Figure 29:Scott Johnson (right), science officer at Bahamas National Trust, and Shontes Hall (left), student at the University of The Bahamas, in the Blue Holes National Forest, Andros, Bahamas. Photo: Camilla Cerea/Audubon

The importance of The Bahamas for wintering piping plovers and other declining shorebirds was first understood in 2006, when Audubon scientists and local partners discovered high numbers of the Atlantic breeding population spending the winter months in remote parts of the archipelago. Now, Audubon, BNT and other partners are taking ambitious steps to conserve and protect several of the highest priority sites across the Bahamas archipelago that are necessary to ensure the survival of these wintering shorebirds.

By protecting these habitats, we are also helping other vulnerable species, including Red Knot (rufa), Semipalmated Sandpiper, Reddish Egret—and supporting important commercial and sport fish nurseries, coral reefs, eel grass beds and mangroves necessary for sustainable fisheries and traditional economic opportunities for local communities.

Red Knot (Calidris canutus)

Alongside BNT, we were able to identify three new Key Biodiversity Areas (KBAs) to further solidify knowledge on crucial sites for Piping Plover across the Bahamas. With these insights, we are now shifting gears to strengthening community support for conservation by sharing our research data and training community members on the importance of birds and conservation practices.

Project goals: Each goal is an essential step toward long-term protection and conservation for piping plovers and other shorebirds along the Atlantic Flyway, from their summer nesting sites on the beaches of the U.S. and Canada to their wintering grounds in the Caribbean and South America.

Activities over the next year

To line up future land protection and drive forward on the ground, community- led habitat management actions, we will conduct the following activities:

Research:

- Build capacity of student nature-tour guide trainees by promoting participation in field and research activities across the Bahamas and Turks and Caicos.
- In collaboration with Royal Society for Protection of Birds (RSPB) in Turks and Caicos (TCI), support the development of an exchange program between The Bahamas and Turks and Caicos to build bird-guide trainees' field and research capacities.
- Compile and harmonize shorebird data collected by collaborators to publish it in Global Biodiversity Information Facility (GBIF). This will feed into IBA and KBA inventories and future nominations.
- Provide support for updates on inventory and nominations of new IBAs/KBAs in Turks and Caicos.

Education and Outreach Activities:

- With support from Bahamas Agriculture and Marine Science Institute (BAMSI) develop alliances with key stakeholders in The Bahamas and the Caribbean bird-based tourism and conservation sector, such as Bahamas Ministry of Tourism, Berry Islands Association, Bahamas National Trust and Birds Caribbean to strengthen economic opportunities for trained guides within the region.
- Support BAMSI in the finalization of the accreditation process of a Nature Tour - guide training program (highly focused in Bird-Guide training), establishing it as part of the official education offerings by BAMSI and in The Bahamas, as well as support BAMSI in the administration of Nature Tour Guide courses.
- Replicate trainings developed by Audubon and BNT and administered in 2018 in other countries.

- With support from the Ministry of Tourism and by utilizing Audubon's communications tools, we will work to increase demand for tourists to visit the Bahamas as an eco-tourism destination to improve the income for the trained guides and build a constituency of conservation advocates.

Budget: (Match: Environment and Climate Change Canada $61,420 USD)

Activities	**Costs**
Project Coordination and Management	$14,000
Alliance with key stakeholders for community awareness (flights, staff time and transportation)	$3,000
Nature-Tour Guide Trainings	$10,000
Research + Exchange Bird-Research Program (Turks and Caicos & The Bahamas)	$7,400
Design marketing materials to support the promotion of BBT businesses in the region	$800
BAMSI Coordination	$18,450
International for Site visits and meetings	$4,440
Subtotal	
Overhead (10%)	$3,330
Total	**$61,420**

Migratory Bird Wintering Grounds Conservation in Nicaragua

Partners: ABC, Doselva

States that have participated to date: Pennsylvania, Missouri

Overview: Nicaragua is home to a total of 706 bird species, of which 190 are migratory. The highland cloud-forest ecosystems and lowland rainforests of Nicaragua provide important wintering areas for several species of migratory birds, including the Golden-winged Warbler, and stopover areas for many species like Bay-breasted Warbler and Canada Warbler. Nearly all the Golden-winged Warbler Focal Areas identified for Nicaragua are in this region. Unfortunately, these forests are fragmented by logging and agriculture, including sun-coffee production. In Nicaragua, ABC established three BirdScapes: Nicaraguan Highlands, Bosawas, and Indio Maíz (Map 1). Our conservation strategy here is to add shade to coffee and spice plantations and use native species reforestation to create habitat availability and connectivity and protect water sources. Renewed support from Southern Wings would help ABC and our partners advance the implementation of conservation strategies within these BirdScapes, which include promoting and implementing regenerative agriculture practices, such as agroforestry, to provide better quality habitat for Neotropical migratory birds.

Threats: Unsustainable land uses have resulted in habitat degradation, loss of forest cover, and watershed contamination caused by fertilizer and/or other chemicals.

Birds: Wood Thrush, Golden-winged Warbler, Golden-cheeked Warbler, Magnolia Warbler, Blue-winged Warbler, Kentucky Warbler, Worm-eating Warbler, Louisiana Waterthrush, Black-and-white Warbler, Black-throated Green Warbler, Chestnut-sided Warbler, Eastern Wood-Pewee, Yellow-bellied Flycatcher.

Overall Project goal: Our long-term goal is to increase forest availability and connectivity in Nicaragua. We aim to do this by working with landowners and communities to implement regenerative agriculture practices, such as agroforestry, that are compatible with forest preservation. Our goal for the next ten years is to restore 3,500 acres with regenerative agriculture and bird-friendly practices.

Our projects in Nicaragua will contribute to two of the five strategies in the Conservation Investment Strategy for the Mid-Elevation Forests of Central and South America: strengthening small-scale sustainable agriculture and influencing local people's behaviors to have a positive relationship with nature.

Southern Wings Successes to Date: In Nicaragua, ABC's work has resulted in the planting of over 100,000 trees since 2011. With matching funds, 43 silvipasture systems covering 222 acres were implemented, and 350 acres were left for natural regeneration. Additionally, 25 producers committed to conservation agreements across 1,035 acres in the buffer zone of Saslaya National Park in our Bosawas BirdScape. In 2022, patrol operations conducted with national and indigenous authorities in indigenous regions of Bosawas led to the expulsion of squatters and were successful in stopping illegal settlements. These patrols resulted in the voluntary abandonment of at least eight illegal settlements, leading to the recovery of over 2,500 acres that were being converted to cattle ranching by the settlers.

Proposed activities: In Nicaragua we will:

- Produce and plant 30,000 native and fruit trees in agroforestry systems on 500 acres of farmland
- Conduct community workshops to strengthen capacity of 300 farmers, particularly around tree planting and regenerative agriculture.

- Production of organic fertilizer tree survival on 500 acres of farmland.

Budget: : $58,350 (For more details email Deb Hahn), Matching funds will come from additional ABC and partner investments in these and complementary activities.

Map 5: BirdScapes in Nicaragua. ABC is aiming to reactivate work in the Nicaraguan Highlands BirdScape (represented in violet) and to start new projects in the Indio Maíz BirdScape (represented