2025–2026

PROJECT PROPOSALS

SOUTHERN Wings

https://southern-wings.fishwildlife.org/

Table of Contents

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

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

States that have participated to date: 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).

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

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.

Goal: The goal of this project is to 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

In FY 2026, our objective is to restore 55 acres of cacao monocultures and degraded lands and plant at least 18,000 trees. We will work with local communities to promote and implement regenerative, bird-friendly agricultural practices. In addition, we will start to identify and engage other communities. Our project in the

Conservation Coast BirdScape contributes to four of the nine strategies included in the recently launched Business Plan for the Conservation of the Caribbean Slope.

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 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 FY2023, with support from Missouri, the U.S. Fish and Wildlife Service (USFWS), 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.

In FY2024, we worked with the Q'eqchi' Indigenous community of Puntaneras successfully restoring 26 acres of degraded land within the buffer zone of Río Dulce National Park. This effort included planting nearly 11,000 cacao, fruit, and native trees. Fifteen local farmers will soon benefit from cacao harvests, while the growing trees will create vital corridors for Neotropical migratory birds, enhancing forest connectivity and benefiting both the community and local wildlife.

Budget: $97,603 (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: American Bird Conservancy, Pronatura Noreste (PNE)

States that have participated to date: 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 (Map 2). ABC is working in partnership with PNE to ensure the protection and management of 325,000 acres, and specifically for the improved protection, management, and restoration of grasslands within the El Tokio Grassland Priority Conservation Area (GPCA), which ABC has incorporated into our El Tokio BirdScape initiative. 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, Hedionda Grande, 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 the 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.

Goals: With ABC's BirdScape approach, we are looking 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

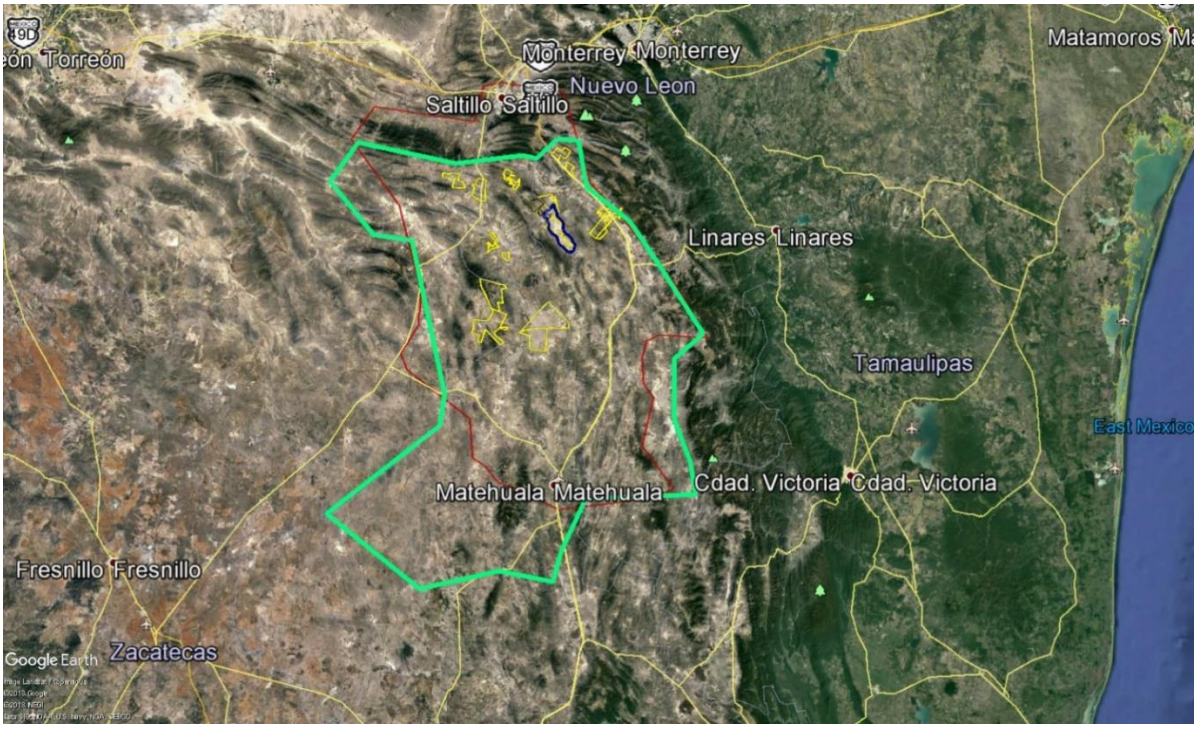
managed by PNE: *Loma del Gorrión* and *Cuatro Gorriones* (Sparrow Hill and Four Sparrows). Here support has gone to maintaining a guard for the two reserves, which has been crucial for deterring illegal activity and carrying out management tasks such as monitoring and repairing the fence that prevents 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.

Activities: ABC and PNE would like to continue collaborating with ejidos already in the program to conduct habitat improvement activities and to expand to new properties in the region. Our activities will include:

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

Budget: $44,090 (For more details email Deb Hahn) **Matching Funds:** ABC and PNE are in the process of securing funds from the Canadian government and have funds from the Neotropical Migratory Bird 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: USFWS/NMBCA, U.S. Forest Service International Programs, Canadian Wildlife Service (CWS), Bobolink Foundation, 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, Mexican Fund for the Conservation of Nature.

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

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.

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, supporting 90% of migratory species breeding in western North America. These include 28 species recognized as conservation priorities, such as Baird's sparrow and chestnut-collared longspur, both of which overwinter exclusively in this region. These birds are sentinels for unsustainable practices and land use across the Central Grasslands. Mexico encompasses more than two-thirds of the Chihuahuan Desert, and most of their non-breeding habitat. Conservation and restoration of grasslands in this region is essential to stabilize and recover breeding populations in the United States and Canada, and prevent future listings under the Endangered Species Act. Our collaborative, non-regulatory approach to conserving grassland bird wintering habitat provides near-term protection for grasslands (15 yrs) while addressing the root cause of grassland loss – desertification and loss of productivity due to long-term, unsustainable grazing practices. Using the best available science and peer-to-peer learning, the Sustainable Grazing Network (SGN) 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. This network of voluntarily protected land currently includes 34 partner ranches and ejidos encompassing 638,581 acres in four GPCAs in Chihuahua, Sonora and Coahuila, and continues to grow annually. Since 2013 we've implemented 357 range and habitat improvement projects on these and other grassland properties in the region, enhancing 521,476 acres. We've reduced shrub encroachment on 5,352 acres through mechanical control methods, and rehabilitated 1,990 acres of degraded soils through keyline plowing and contours to capture water and seeds. We installed 20 2-m tall, galvanized steel stock tank ladders in open water storage tanks in 2024 to reduce accidental drowning (bringing our total to 233 stock tank ladders installed), and to date we've capped 371 open pipes in fence and gate posts to avoid accidental entrapment/death and installed 70 artificial nest platforms/cribs for endangered Aplomado Falcons. We conducted our 10th year of winter grassland bird monitoring in 2024 to continue evaluating our progress, measuring our impact, and guiding our next steps.

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.

Threats: Intensive cropland agriculture is rapidly expanding in northern Chihuahua, particularly in the Janos and the

Valles Centrales 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 34 ranches encompassing 638,581 acres in northern Mexico 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 enrolled two new ranches into the SGN in 2024, El Parreño (1,729 acres) and Pozo Caliente (17,804 acres), located in the Janos and Valles Centrales GPCAs in Chihuahua, respectively. Both have young, enthusiastic and committed landowners who are excited to be working with us to improve the health of their grasslands and ranching operation. Already, our crews from EIRHA have made an exciting discovery, a pair of Aplomado Falcons on Pozo Caliente, possibly nesting in the area. We enhanced 83,652 acres in 2024 via six projects that improved capacity for grazing management on SGN lands, in part with support from Southern Wings partners, bringing the total area directly impacted by range and habitat projects up to 521,476 acres. We have completed integrated range and wildlife management plans for 22 SGN ranches and are working on several more; we also conducted outreach to SGN partners on grazing management in 2024 through site visits and one-on-one meetings. We also implemented the 2nd annual "Encuentro Ganadero" in Chihuahua in 2024, bringing together over 140 ranchers and conservation partners from NGOs, government, academia and the private sector. The goal of this event is to share experiences and information around grazing management and wildlife conservation, create bonds and form new partnerships, and build a constituency and movement for grasslands conservation in northern Mexico. We conducted environmental education programs in 2024 with Mennonite students and educators in the rural farming community of Buenavista, Chihuahua, the first-ever event of its kind, reaching over 90 people, mostly students, and getting them into the field to watch birds. Mennonite communities are the primary actors converting grasslands to croplands in the region. We also conducted our 10th year of winter grassland bird monitoring on SGN lands in 2024, albeit under severe drought conditions.

Goals: In 2025, we aim to:

1. Protect an additional 20,000 acres with high conservation value for grassland birds in the Chihuahuan Desert by enrolling them into the SGN,
2. Enhance at least 20,000 acres of SGN lands through improved grazing management,
3. Monitor grassland birds on SGN ranches, including in restoration areas, to measure impact and effectiveness,
4. Restore 100 acres of degraded grassland through shrub control treatments following our new guidelines,
5. Raise awareness among Mexican and/or Mennonite rural communities through environmental education on grasslands and birds reaching at least 50 students,
6. Enhance habitat for birds and wildlife through installation of stock tank ladders, protective nest cribs for aplomado falcons, capping open pipes, and retrofitting fences for Pronghorn and other wildlife,
7. Continue expanding support and cooperation for grasslands conservation in northern Mexico through the 3rd annual "Encuentro Ganadero del Desierto Chihuahuense", 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 habitat quality, 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), Pronatura Noreste 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 five full-time private lands wildlife biologists and range ecologists with EIRHA in Chihuahua who operate all aspects of the SGN program, from landowner outreach and enrollment, to education, monitoring, and ranch planning and management.

Budget: Roughly $170,000 is needed annually to maintain this on-the-ground capacity in northern Mexico, which has taken years to build, as well as operational support for their fleet of three vehicles, supplies, and travel. Funding is also needed to cost-share on SGN range and habitat improvement projects, which generally total around $60,000/year, which will include shrub control, and water infrastructure projects, among other projects in 2025. Funding is also needed to construct up to 15 stock tank ladders ($40-$80/each, depending on size) to prevent accidental drowning of birds and 2 Aplomado falcon nest platforms ($250/each) to improve reproductive success.

Matching Funds: This project leverages significant additional investment from other major funding partners mentioned above, as well as Mexican landowners, who typically provide at least 1:1 match for range and habitat projects. Every dollar invested leverages at least one additional dollar from other sources.

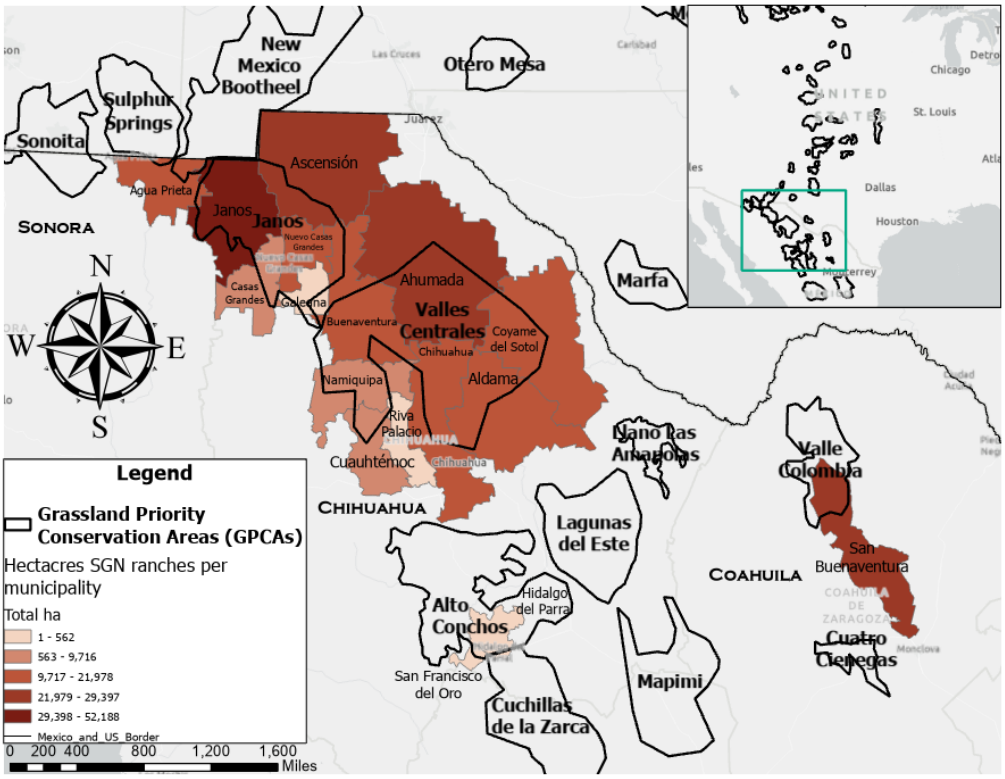


Figure 1: Distribution of SGN lands by municipality in 2024.

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 to date: 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.

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.

Activities: 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: $70,820 (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.

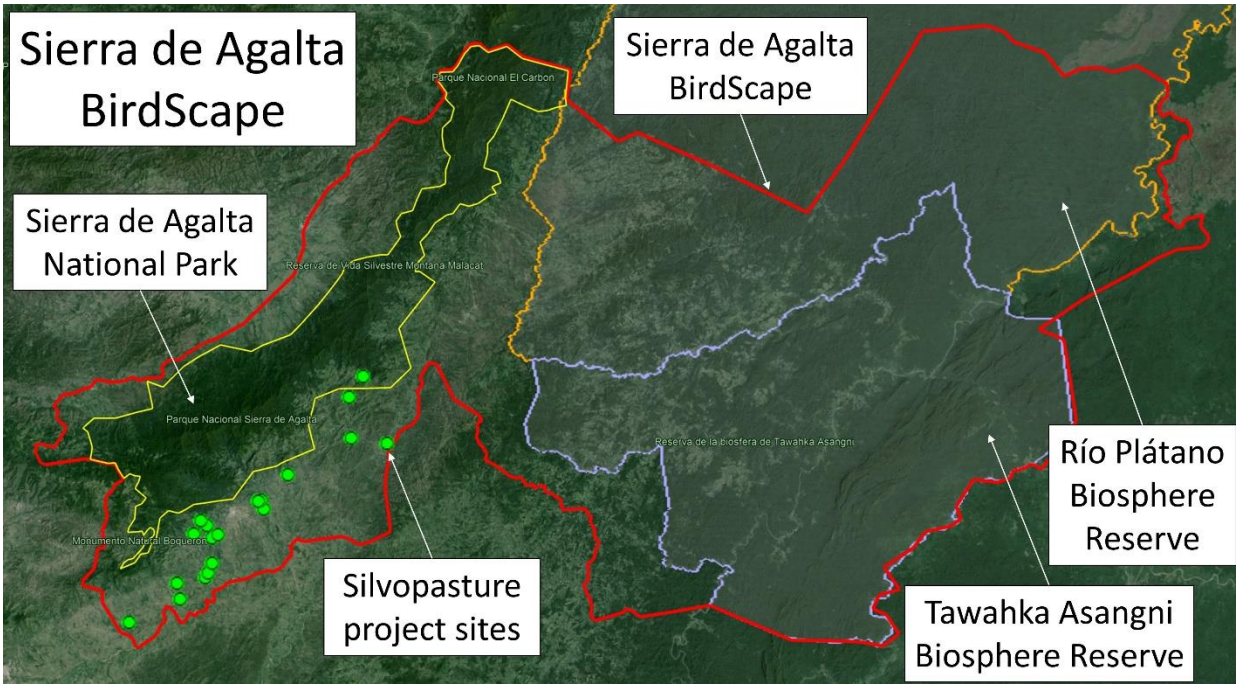


Figure 2: Sierra de Agalta BirdScape (red outline), which encompasses the Sierra de Agalta National Park (yellow), Río Plátano and Tawahka Asangni Biosphere Reserves (violet and orange) and part of our network of silvopasture project sites (green circles)

Neotropical Flyway Project: 2025-2026 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, Minnesota, 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.
- **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:** >30,000 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.

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 Partners in Flight (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 Fig. 1). 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 >30,000 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).

Activities: Activities will focus on data analysis and priority setting, and advancing restoration and habitat protection activities in priority stopover regions identified to date. In addition, a banding station will be run in north-west Colombia to explore in greater detail how birds use this heavily used region.

January-December 2025: Carry out occupancy analyses to map *major stopover regions* across Colombia, Panama, Costa Rica, Honduras, Nicaragua, Guatemala and Belize.

April-June 2025: Deliver an occupancy modeling course to individuals who have participated in the NFP across the study region.

March-May 2025 and 2026: Establish and run a constant-effort mist netting station in northwest Colombia to understand how this region is used by a community of 50 of migratory landbirds recorded during surveys.

January 2024 - June 2025: Continue and expand tree planting and protected area establishment in critical stopover regions including: the Guajira Peninsula of Colombia; the seasonal dry forests in Cordoba, Colombia; moist forest in northwest Colombia; and on the Caribbean slope of Costa Rica.

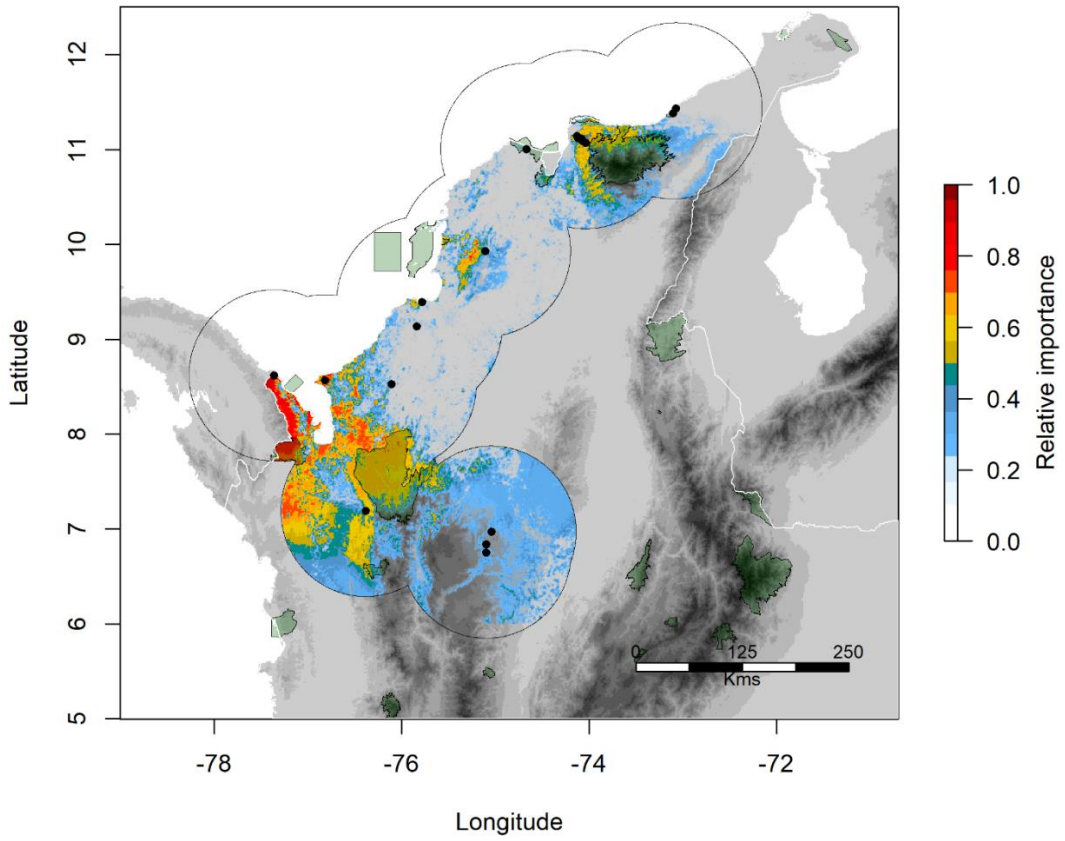


Figure 3: Priority spring stopover areas in northern Colombia based on the results of occupancy surveys and a subsequent modeling exercise for 20 species of migratory landbirds. Priority areas are limited to areas where natural forest remain and the presence of protected areas is indicated by transparent 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 northeast.

Budget: 102,000 (For more details email Deb Hahn), 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: Cornell Lab of Ornithology -- $10,000 for 2018, $15,000 for 2019, $10,000 for 2020, $10,000 for 2022 and $20,000 for 2025. The Canadian Wildlife Service has provided $33,000 for 2018/2019, Southern Wings ($160K 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, many of them included in the USFWS of Conservation Concern List. 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 2026, ABC will be focusing our work with Aliados and Tesoro Escondido 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 40,000-acre 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.

Most recently, ABC and Aliados have been working with members of six Chachi Indigenous communities to develop a business plan to expand shade-grown cacao cultivation in the Chocó. 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 be able to 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, balsa plantation and, more recently, sun-grown cacao 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 2024, ABC and Aliados restored over 1,020 acres with 20,000 cacao, native, and fruit trees and trained over 165 farmers in six 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.

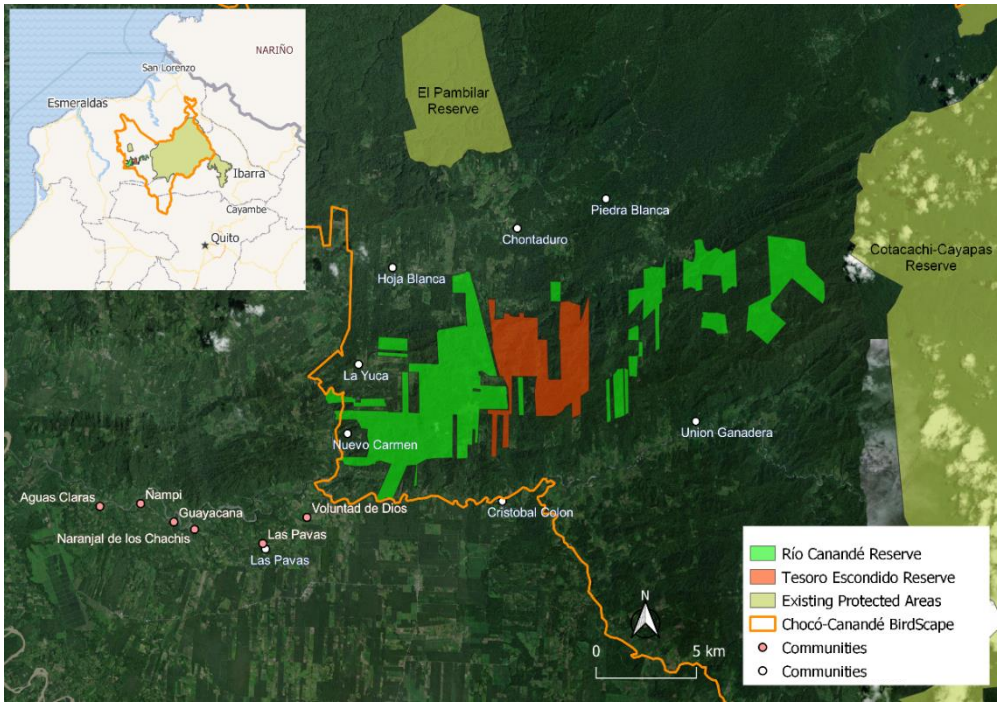
Goal: The goal of this project is to slow the rate of deforestation and work with small landowners to improve land use practices and create better habitat connectivity in the buffer zones of existing protected areas in the Chocó-Canandé BirdScape. In FY 2026, our objective is to restore another 86 acres of cacao monocultures and degraded lands and train 200 farmers. In addition, we will start to identify and engage other communities. Our project in the Ecuadorian Chocó 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.

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

- Identify and engage 100 new farmers in at least two communities.
- Conduct community workshops to strengthen local capacity, particularly around cacao production and environmental education.
- Produce and plant at least 17,000 cacao, native, and fruit trees on 86 acres to enhance monocultures and pastures and restore degraded lands.

Budget: $61,193 (For more details email Deb Hahn)

Matching Funds: ABC, Tesoro Escondido, and Aliados have secured funds for work in Canandé from private donors. Tesoro Escondido, 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.



Map 3. Location of the 13 communities engaged between 2020 and 2024.

Improving Migratory Bird Habitat in Colombia

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

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. Since 2008, ABC has been working in Colombia 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 (Map 4). 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: In the Central Andes BirdScape, 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 objectivesfor this year include:

- Planting at least 30,000 native trees.
- Engaging 50 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.

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 250,500 trees and the installation of 10.5 miles of fencing to conserve over 2,700 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 Golden-winged Warbler surveys and other conservation activities in Colombia with our partner SELVA, and neighboring Venezuela with Provita, also an ABC partner.

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, Risaralda and Quindío departments, as well as provide maintenance to the trees planted thus far. Funds are needed to maintain the employment of our staff, including a communications professional and the 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.

Budget: $52,218 (For more details email Deb Hahn), **Matching Funds:** ABC has funding support from Amos Butler Audubon Society and the NMBCA program. In addition, VivoCuenca, FEC and CCC have significant matching funds available for related activities in this proposal.

Map 4. Central Andes BirdScape (in brown) and the Chinchiná and Tapias-Tareas watersheds (white polygons) in the Caldas Department.

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 (Map 5) 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).

Map 5: 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 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 5) and compile these survey data into 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 2024: Funds have helped to conduct 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 sites, disseminated information to land managers, and conducted public education/outreach.

Surveys:

- Conducted breeding surveys of Mexican Duck in canals of the Yaqui River Irrigation District, Yaqui Valley.
- During January-February of 2024 we completed the annual non- breeding mid-winter shorebird surveys at 21 sites across northwest Mexico (Figure 5). These sites included 250 sampling units that are surveyed by about 50 volunteers in northwest Mexico.
- With support from the USFWS, we conducted the 2024 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. 2024. Pacific brant mid-winter ground surveys in Mexico (2024). Unpubl. Progress Report to U.S. Fish and Wildlife Service. La Paz, Baja California Sur. 13 pp.
- 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.
- During January 2024, 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, Salinas Lobos, Marismas Nacionales and Bahía Ceuta).

- In 2024 we conducted three breeding waterbirds surveys at Tobari Bay and Salina Lobos (southern Sonora) and documented 12 species of waterbirds breeding on 11 dredge-spoil islands.
- Breeding surveys (May-July) of least tern in the salt flat of Bahía de Lobos, and Bahía Tóbari.

Education/Outreach/Training:

- October 30. Organization of the 1st Tobari Bird Festival, in coordination with Comisión Nacional de Áreas Naturales Protegidas (CONANP)-Islas del Golfo de California and Pronatura Noroeste.
- February 2. Participation in the celebration of world wetlands day in the state protected area of Estero El Soldado, Guaymas (Sonora), by presenting bird monitoring results from the area.
- We mentored graduate students on data analysis and interpretation for use in conservation and management. Sheccid Chagoya, graduate student from CICESE, is using MSP for her MSc thesis on population trends of the Snowy plover in Bahía San Quintín. Daniela Michelle Valdez Gámez, PhD student at UABCS submitted a manuscript to *Waterbirds* on the Winter ecology of Wilson's plover in Ensenada de La Paz (Baja California Sur). By using MSP data, Jonathan Vargas, a member of the Coastal Solutions Fellows Program is working on a project to reduce human disturbance on the western snowy plovers in Ensenada, Baja California.
- We started developing the Northwest Mexico Shorebird Conservation Plan. A core planning group was established and then two planning workshops were held. 1) the first workshop was hybrid during the Sonoran Joint Venture Scientific Committee meeting, in Los Cabos, B.C.S., October 23, 2024, and 2) the second workshop was virtual, December 3 and 4, 2024. We conducted a threat analysis was conducted and reached consensus on conservation targets. Ninety-seven people participated.
- The Thirteenth Winter Monitoring of Migratory Birds in Mexico Successfully Concludes. 2024. News, WHSRN Bulletin
- Palacios, E., A. Heredia-Morales, L. Alfaro, M. A. Cosío, and M. E. Reiter. 2024. Disturbance hotspots and their impact on shorebird abundance for Mexico to Chile, 2016-2023. Unpubl, Summary Report to Point Blue Conservation Science. La Paz, Baja California Sur. Pp. 30.
- In *Waterbirds*, Evaluating the Response of Nonbreeding Shorebirds to Rate and Agents of Human Disturbance in Bahía Todos Santos, B.C. using the data from MSP.
- Along with partners, we submitted a manuscript to *Biodiversity and Conservation*, on Population genetic structure of the American Oystercatcher (*Haematopus palliatus frazari*) in northwest Mexico.
- Webinar: Sitios Focales de Disturbio en la Ruta Migratoria del Pacífico. 2024. Human disturbance toolkit.
- Participation in the 8th Meeting for the Exchange of Experiences: Wings that Unite the Californias. On June 20, 2024, we gave a seminar on the reproductive biology of the Wilson´s plover, impact of human disturbance on its population, as well as the needs for its conservation and protection.
- The Latin American Working Group for the Wilson´s Plover was established. Three meetings have been held with a total of 40 participants from several Latin American countries. The goal is to study and conserve this species throughout its range in Latin America, through the exchange of information and collaboration in monitoring. The species conservation plan was reviewed and it will be updated.
- Three workshops on human disturbance management were held with volunteers, NGOs, and park managers: for one site in Mexico, one site in Chile, and one site in Peru.

Data Entry:

- We entered 2024 mid-winter shorebird survey data into the 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 Conservation:

- To protect breeding areas of snowy plovers and California least tern, in early April 2024 we installed a temporary fence on three nesting beaches of Estero de Punta Banda, northwest Baja California. This includes monitoring of the two species during the breeding season. The fence remained installed until August.

- To protect the nesting ground for the snowy plover, California least tern, and American oystercatcher, we installed a fence in Guerrero Negro, Baja California Sur. The protected area is about 40 hectares. Our partners include CONANP, Exportadora de Sal, Pro Esteros, CICESE, and Laura Ibarra, and a fellow of the Coastal Solutions Program.
- On July 20, under the organization of the group "Vigías del Comitán" signs were developed with the aim of protecting the beaches, flora, fauna and nesting areas of the Comitán area.
- 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.

Habitat Enhancement:

- Laguna Figueroa is the most important nesting site for the snowy plover in the Baja California peninsula. This critical habitat is constantly impacted by human activities; therefore it is important to strengthen strategies to improve the nesting and resting habitat of the snowy plover at this site and to strengthen biological monitoring and surveillance in strategic areas. During the project period, 25.94 tons of oyster shell were dispersed in two plots of one hectare each, within Laguna Figueroa, to enhance its nesting habitat.

Activities: Terra Peninsular and partners will implement the following conservation actions in 2025.

- Obtain a total count of wintering Pacific brant at major coastal wetlands of Baja California peninsula and mainland Mexico. Record abundance and distribution of the Pacific brant flocks at each wintering site during winter of 2025-2026. Generate a distribution map with GPS locations of the Pacific brant flocks at each wintering site. And provide a summary report to the Pacific Flyway Council for their annual meeting.
- Conduct two workshops to develop the Northwest Mexico shorebird conservation plan. This will provide a scientific framework to determine species, sites, and habitats that most urgently need conservation action in northwest Mexico. We will use the Open Standards for the Practice of Conservation, which is an adaptive planning framework that is widely used to collaboratively and systematically conserve flora and fauna.
- Mitigate recreational human disturbance through signing projects, involving local community (children designing signs that are better adopted by local community and visitors), rope fencing of nesting areas, and training volunteers as docents to conduct outreach to visitors to mitigate human disturbance at nearby breeding and roosting shorebird sites.
- Conduct training on shorebirds identification and population monitoring for local community involvement in shorebird monitoring.
- Conduct standardized annual non-breeding bird surveys of 21 wetland sites across NW Mexico (Figure 5) 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 waterbirds are also recorded.
- Use MSP database for assessing population status, winter population trends and environmental drivers (temperatures and precipitation) for priority shorebird species such as snowy plover, Wilson's plover, willet and Western sandpiper in northwest Mexico. Graduate students will work on their theses to complete these analyses.
- Strengthen conservation and management of designated wildlife conservation units (UMAs) in San Quintín, Baja California and El Tóbari, Sonora in collaboration with local hunting organizations.
- 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

Budget: $25,000 (Total budget is $66,000. For more details email Deb Hahn), Contributions of $4,000 each will significantly advance implementation of these Pacific Brant/shorebird/waterbirds conservation actions.

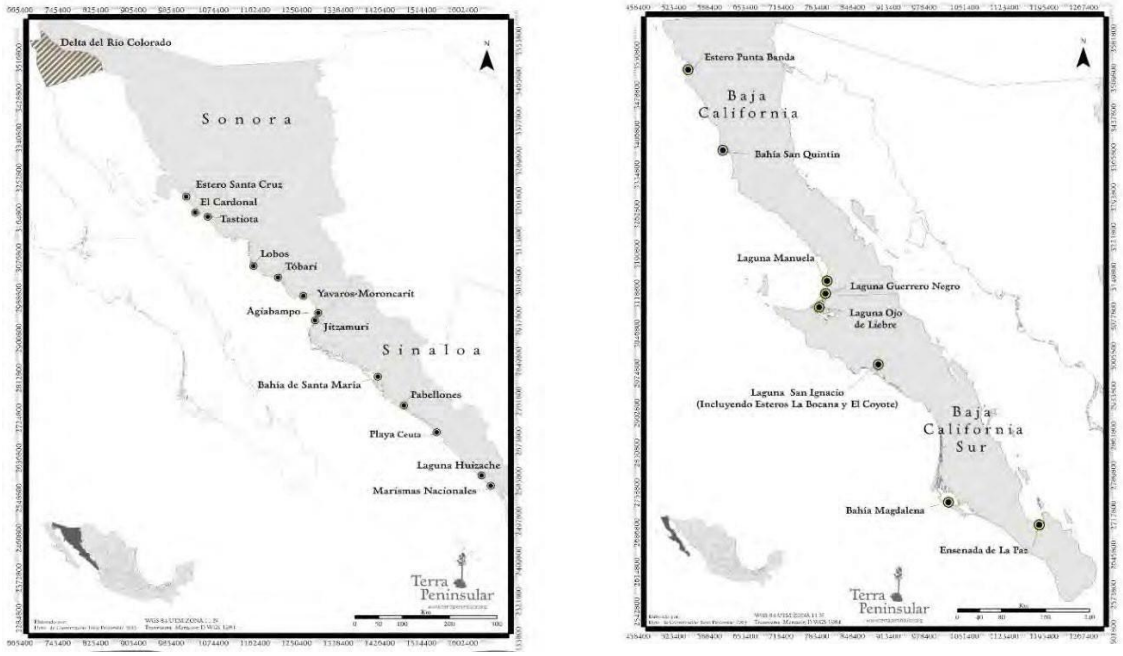


Figure 5: Location of 21 coastal wetland sites which are part of the PFSS in NW Mexico.

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				

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, 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 neotropical migratory birds (NMBs) have demonstrated the need to take a full annual 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 1). 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 6: 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 7). 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 7: 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 8) and their neighboring upland forests that host many 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.

Southern Wings Success 2024:

Conserve dry tropical forest habitats**:**

- We maintained a team of ten part-time community rangers and supported their efforts to protect the habitat of the region from fires (7,413 acres). The team has been on the frontlines, building fire breaks and battling five wildfires during dry season.

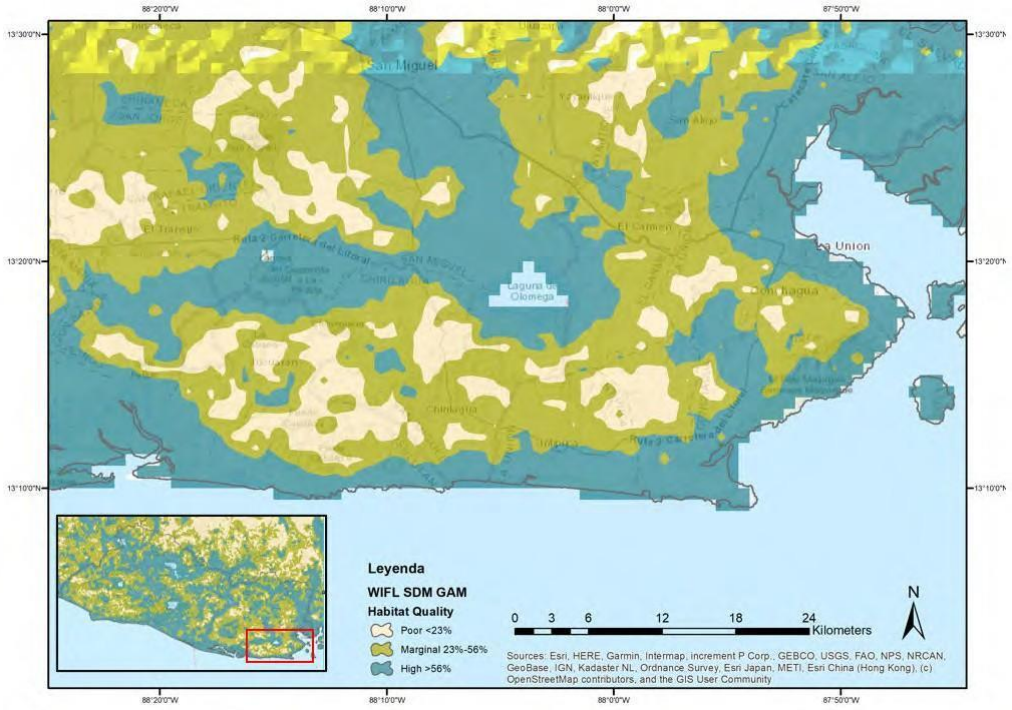


Figure 8: Distribution of potential suitable willow flycatcher (WIFL) habitat in eastern El Salvador with dark blue representing good potential habitat. Based on a model by Lauren Phillips and Tom Albright, University of Nevada Reno in partnership with Paso Pacifico, 2020.

- The ranger team also visited schools and farms to follow-up on maintenance of the 500+ trees planted over the past year, and assisted with watering.

Figure 9. Views from dry tropical forests on the new property.

- We completed the downpayment of a 62-acre property (Figure 9) in late 2023 with additional support from Zoo Boise and a private donor. The property is composed of disturbed dry tropical forest with mature, threatened tree species remnants. The property could serve as the core of a larger conservation footprint, as it could be expanded with a sizeable adjoining property. Priority species documented at the property, include Vaux's Swift, pale-billed woodpecker, Pacific parakeet, orange-chinned parakeet, flyovers from critically endangered yellow-naped Amazon parrots, and elegant trogon.

- We helped to remove 2,600 lbs. of plastic pollution in the ocean and on beaches, wetlands, and roadsides, reducing potential impacts on birds, especially shorebirds. The ranger team carried out roadside cleanup weekly in three communities, helping reduce plastic pollution entering the RAMSAR site, Laguna Olomega. In addition, through our

partnership with the World Surf League One Ocean and the organization ADETCO, we maintained four river intercepts throughout the rainy season and installed trash and recycling receptacles at two locations along the eastern coast.

- In 2024, significant progress was made in advancing the World Surfing Reserve Oriente Salvaje. In collaboration with the Ministry of Tourism and the Ministry of Environment of El Salvador, the reserve gained formal recognition, marked by a dedication event with participation from key stakeholders. The event brought together the local surfing women, the Stewardship Council, municipal government representatives from San Miguel and Usulután, FIAES (Fondo de Inversión Ambiental de El Salvador), Catholic Relief Services, and the Inter-American Development Bank. President Nayib Bukele highlighted the initiative on social media, garnering national attention. The establishment of a Stewardship Council will ensure oversight of conservation efforts, and funding is being sought to develop a comprehensive management plan for the El Caballito forest reserve. This plan aims to integrate the surfing reserve, promote sustainable management, and foster community engagement.

The unveiling of the commemorative plaque during the dedication event for the World Surfing Reserve Oriente Salvaje.

- Students from the United States supported a tourism guide training workshop with ten youths from communities near the Olomega Lagoon. It was led by naturalist Franklin Rivera. As a follow-up, Paso Pacifico visited a farm that is proposed for the locally-led tour and gave feedback on ways to improve the experience, namely the improvement of trail infrastructure and better natural history interpretation. A web page has been created to promote the launching of hiking and bird-watching excursions in the tropical dry forest aimed at the tourism sector in eastern El Salvador, also known as Oriente Salvaje (link: Mountain to Lake Adventures).

Figure 10. Community members from Olomeguita meet with WEFTA representatives to review assessment findings and collaborate on solutions to address water and sanitation

- In 2024, Paso Pacífico partnered with WEFTA to conduct a detailed assessment of water, sanitation, and hygiene (WASH) conditions in communities around Laguna Olomega and Ahuachapán. The evaluation revealed critical needs, including limited access to reliable water and safe sanitation, affecting nearly 50% of rural residents, as well as environmental pressures on Laguna Olomega's watershed. This multi-year initiative aims to modernize infrastructure, promote health and hygiene education, and integrate conservation practices such as reforestation to improve water quality and biodiversity. These efforts have strengthened community trust and partnerships, aligning local needs with Paso Pacífico's broader conservation goals in the region.

- Through our collaboration with the Enrique Figueroa Foundation, we achieved the protection of a yellow-naped Amazon parrot nest with the support of the property's rangers. This milestone builds on our shared commitment to conserving the tropical dry forest and its associated biodiversity, aligning with the foundation's long-term vision of transferring 400 hectares of dry forest for conservation purposes.

Promote bird monitoring as a tool to inform management and build capacity**:**

- We continued working on building the Motus network in El Salvador, by obtaining station components, coordinating with the Ministry of Environment (for permits), and outreach to cellular company (for potential data and infrastructure access).

- Our team of park rangers carried out bird surveys in the private reserve of Paso Pacifico, where 38 species were identified (the list is available here). We will work towards establishing periodic surveys, as this will provide a baseline of the birds in the reserve, helping to detect changes in the bird assemblages that use the reserve during the year.

Build local awareness and appreciation for birds and their habitats:

- We have strengthened collaborative efforts to protect the yellow-naped parrot and its habitat in Laguna del Jocotal. Through our partnership with the Environmental Division of the National Police, regular patrols are being conducted to safeguard nesting areas during the breeding season and combat illegal wildlife trafficking. Simultaneously, our ongoing collaboration with Avícola Campestre supports the protection of the tropical dry forest surrounding the lagoon through the distribution of informational materials to company employees and talks on bird conservation in nearby communities. These initiatives, supported by complementary funding from the USFWS, are integral to protecting critical habitats for migratory and resident bird species.

Figure 11. Flyer distributed to raise awareness about bird conservation and ecosystem services as part of the partnership with Avícola Campestre.

- We established a collaboration with three community members from Playa Icacal to monitor and protect local resources. Their efforts will focus on protecting pacific mangrove bird habitat and safeguarding species like the yellow-naped parrot. The engagement also facilitated the opportunity to organize workshops on migratory birds and endangered species at a local school, involving children in conservation activities.

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

- As a result of the willow flycatcher Identification Training Workshop held in February at the "Caserío Los Riitos, Cantón La Estrechura" School Center, we began monthly bird surveys led by biologist Ignacio Molina, who participated in the workshop. He is now conducting surveys during the non-breeding season across previously established transects in Laguna Jocotal, Olomega, and Embalse 15 de Septiembre. These pacific slope wetlands provide valuable wintering habitat for numerous neotropical migratory birds (see Table 7).

Figure 12. Biologist Ignacio Molina conducting monthly bird surveys for Willow Flycatchers and other species

- We began coordination for the "iNaturalist Challenge: Wild East Surf Reserve World Reserve" with the goal of documenting the biodiversity within the reserve. This initiative is being carried out in collaboration with several NGOs throughout the country. Through this challenge and training on the use of tools like eBird, Merlin, and others, we aim to enhance knowledge of bird biodiversity and promote the conservation of coastal ecosystems (details on the challenge are here Reto Naturalista: Reserva Mundial de Surf Oriente Salvaje).

Activities:

Conserve Dry Tropical Forest Habitats:

Forest Conservation: Through matching funds, we will finalize the purchase of a 100-acre private reserve composed of dry tropical forest near the Laguna de Olomega RAMSAR site. Southern Wings would support activities that protect the forest including fence repair, new signage around the reserve, and fire breaks.

Habitat Protection: In support of the new reserve and the greater dry tropical forest landscape, we also propose to sustain the team of ten community rangers who frequent a landscape that includes 8,000 acres of dry tropical forests, focusing on fire extinction, preventing illegal hunting and logging, promoting agroforestry, and removing sources of plastic pollution.

Willow Flycatcher Habitat Management: Through prior willow flycatcher surveys, we have identified the southern edge of the Olomega Lagoon as an active area for wintering habitat. Therefore, we will map farms and settlements in this area and engage landowners, community leaders, and municipal authorities. Additionally, workshops for farmers will be developed in collaboration with Paso Pacífico rangers, focusing on raising awareness about the importance of the WIFL, promoting the seasonal conservation of spiny shrubs, and limiting the removal of agricultural vegetation until after northward migration.

Riparian and Wetland Habitat Conservation: The Salvadorean sugar cane company CASSA operates a large sugar mill in eastern El Salvador, and contracts with individual small and medium farmers to purchase sugar. During the current project period, we propose to offer training to the CASSA agricultural extension agents on recommendations for conserving riparian and WIFL habitat. These agents will then disseminate these recommendations with the farmers they work with. Additionally, Water Engineers for the Americas will work alongside Paso Pacifico in the vicinity of the Olomega Lagoon to improve water sanitation in the area, thereby improving water quality at the Olomega Lagoon.

Bird Monitoring to Inform Conservation:

Willow flycatchers and Other Migratory Species**:** We plan to repeat monthly surveys in established transects during the non-breeding season to assess the presence of the willow flycatcher and other migratory species, providing key data to understand site use by the species during winter. This data will also be uploaded to eBird to enhance the information about birds in eastern El Salvador, where historically there have been few bird surveys.

Willow flycatcher habitat Assessment: We will carry out vegetation surveys to describe and map the forests and scrub habitats bordering the Olomega Lagoon. This will help to generate detailed description of bird habitats and enable us to determine measures to support good management of the wetlands. The assessment will also outline a long-term vegetation monitoring plan.

iNaturalist Biodiversity Challenge: In early 2025, we will carry out an iNaturalist Biodiversity Challenge in collaboration with NGOs, universities, and local communities to engage key stakeholders, including members of the Association of Ecotourism and Conservation of the Eastern Coast (ADETCO) and other collaborators. A workshop will be organized to teach participants how to use the iNaturalist app and record their observations effectively. This initiative will also be promoted through social media channels. The challenge will focus on documenting biodiversity within the Oriente Salvaje World Surfing Reserve, with particular attention to dry tropical forests and mangrove ecosystems. This community science activity aims to generate valuable data on the presence and abundance of various species, including migratory and resident birds.

Build Local Awareness and Appreciation for Birds and Their Habitats:

Capacity building: Following a successful training on willow-flycatcher ID in early 2024, we will repeat this training to additional students and birding audiences through at least one workshop in eastern El Salvador. We will also collaborate with local partner Mujeres y Naturaleza (MUNAT) to offer two workshops to students from the university in San Miguel focused on bird identification such as eBird and Merlin. As a follow-up, we will work with the university to support two student field trips to Laguna Olomega and the private reserve we manage.

Youth Birding: We will support local efforts to expand participation of birdwatching and ornithology in San Miguel by involving the Facultad Multidisciplinaria Oriental of the University of El Salvador. We will work with faculty to organize and support birding field trips in the vicinity of San Miguel for young birders to increase their birdwatching skill. The goal is to create a community of bird watchers who, in the future, can conduct regular outings for bird observation in various areas of the region, with a particular focus on bird interest areas. This initiative will be coordinated with "Observadores de Aves del Oriente".

Introduction to Bird Conservation Tools: We will organize a national in-person workshop on bird conservation tools such as eBird and distribution maps, Merlin and Audubon Migration Explorer. This workshop will focus on the relevance of these tools for supporting habitat conservation. The workshop goal is to build collaboration nationally and to increase use of these tools for future conservation actions and transboundary collaboration.

Budget: $20,000 (Total budget is $250,000. For more details email Deb Hahn)

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											
Species	**AK**	**AZ**	**CA**	**CO**	**ID**	**MT**	**NV**	**NM**	**OR**	**UT**	**WA**	**WY**
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.*

Table 5. Species of Conservation Concern observed at ~1km length willow flycatcher (WIFL) survey transects. Surveys were conducted monthly in February, March, and April of 2024 at 3 sites listed in Usulután and San Miguel, El Salvador.

Species of Conservation Concern (USWFS 2021) Observed at WIFL Survey Sites			
	13-Sep	**Jocotal**	**Olomega**
Western Birds of Concern			
American Redstart	x	x	x
Barn Swallow	x	x	x
Bell's Vireo			x
Brown-crested Flycatcher	x	x	x
Dickcissel	x		
Dusky-capped Flycatcher	x		x
Harris' Hawk		x	
Northern Beardless Tyrannulet	x		x
Rose-throated Becard	x	x	x
Sulphur-bellied Flycatcher	x		x
Summer Tanager	x		x
Vaux's Swift	x	x	x
Willow Flycatcher	x		x
Other Species of Concern			
Mangrove Cuckoo	x		x
American White Pelican	x	x	
Wood Thrush	x	x	
Orchard Oriole	x	x	x
Rose-breasted Grosbeak	x		x
Painted Bunting	x		x

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

Partners: Communal landowners (ejidos), farmers, ranchers, fisheries cooperatives, Marismas Nacionales Biosphere Reserve, Comisión Nacional de Áreas Naturales Protegidas (CONANP), Comisión Nacional Forestal (CONAFOR), Municipality of Tecuala, Organización Vida Silvestre A.C (OVIS), USFWS.

States that have participated to date: Pacific Flyway Council

Overview: Marismas Nacionales is a complex of wetlands that form a mixture of marine waters and 11 powerful rivers, creating a very varied mosaic of features 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 the design of the first pilot projects for the restoration of wetlands in the area began. 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 vegetation 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 habitat depends to a great extent on the maintenance of freshwater 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 portion of the Pacific Flyway, providing high quality foraging and resting sites for 15 migratory species (> 250,000). It is notable for its concentration of northern shoveler (130,000), green-winged teal (25,000), northern pintail (12,000), lesser scaup (4,450) and mallard (1,200) and habitat for more than 427,000 wintering shorebirds of 28 species, including: American avocet (137,000, which constitutes about 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, over 1,300 red knot, use the area during fall migration and it has migratory (200) and resident snowy plover (93 pairs).

Goals: The project focuses on restoring hydrological flows for the recovery and conservation of mangrove ecosystems. The project includes different sites, which together benefit the Agua Brava tidal watershed (210,039 acres) and comprises 11 tidal systems.

Phases 1 and 2 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.

For the third phase, work will continue in Valle de la Urraca and Laguna Las Garzas (Figures 13 and 14), in the northern extent of Marismas Nacionales, with implementation of activities (mangrove restoration and habitat conservation) to benefit 4,200 acres. Outreach and environmental education activities will also be implemented to reduce impacts from residents who make use of the natural areas within this mangrove ecosystem.

Southern Wings Successes in 2024: Ovis and its partners accomplished the following:

- Formation of brigades; training and outreach to 150 people, two community restoration brigades in Valle de la Urraca ejido and the community of Río Viejo and Paso Hondo.
- Hydrological rehabilitation through the cleaning and desilting of 18 miles of natural tidal channels in Valle de la Urraca and Laguna Las Garzas; which translates into direct benefit of freshwater flows in 4,200 acres.
- Establish collaboration agreements between OVIS and landowners (ejidos and communities), CONANP at the national level and with the local CONANP office of Reserva de la Biosfera Marismas Nacionales Nayarit.
- Establishment of a Wildlife Management and Conservation Unit (UMA) in the 6,916 acres Valle de la Urraca ejido and updating and expanding the UMA in Laguna Las Garzas (Paso Hondo) to 81,544 acres.
- Establish an Ejidal Reserve through a land protection agreement between the Valle de la Urraca ejido and OVIS with an area of 7,414 acres valid for 15 years with a renewal option.
- Seasonal bird monitoring (October 2023- March 2024); twenty points at two locations: Laguna Las Garzas and Valle de la Urraca. Survey effort documented 66 species, with the majority (38%) consisting of shorebirds such as plovers, sandpipers and avocets. A total of 118,895 individuals in Valle de la Urraca and 79,402 individuals in Las Garzas lagoon were estimated. American avocet was the most abundant species with 31,472 in the Valle de la Urraca and Western Sandpiper in Las Garzas with 42,956 individuals.
- Participatory workshop held in Rio Viejo with 30 fishermen from the cooperative who use the Laguna Las Garzas; a best practices manual was produced and presented at the workshop.
- Held outreach and Education events focused on wetlands and charismatic species in the region; Three participatory workshops in Valle de la Urraca (fishermen and farmers), La Puntilla (children and environmental educators) and Tecuala (children).
- Participation in the first jaguar environmental fair with outreach material on shorebirds and mangroves.

Activities: The project will improve habitat quality for wetland dependent bird species in the tidal basin through hydrological rehabilitation works and conduct seasonal bird monitoring in restored areas. Community participation and outreach to residents will be key in advancing conservation efforts for birds and their habitats.

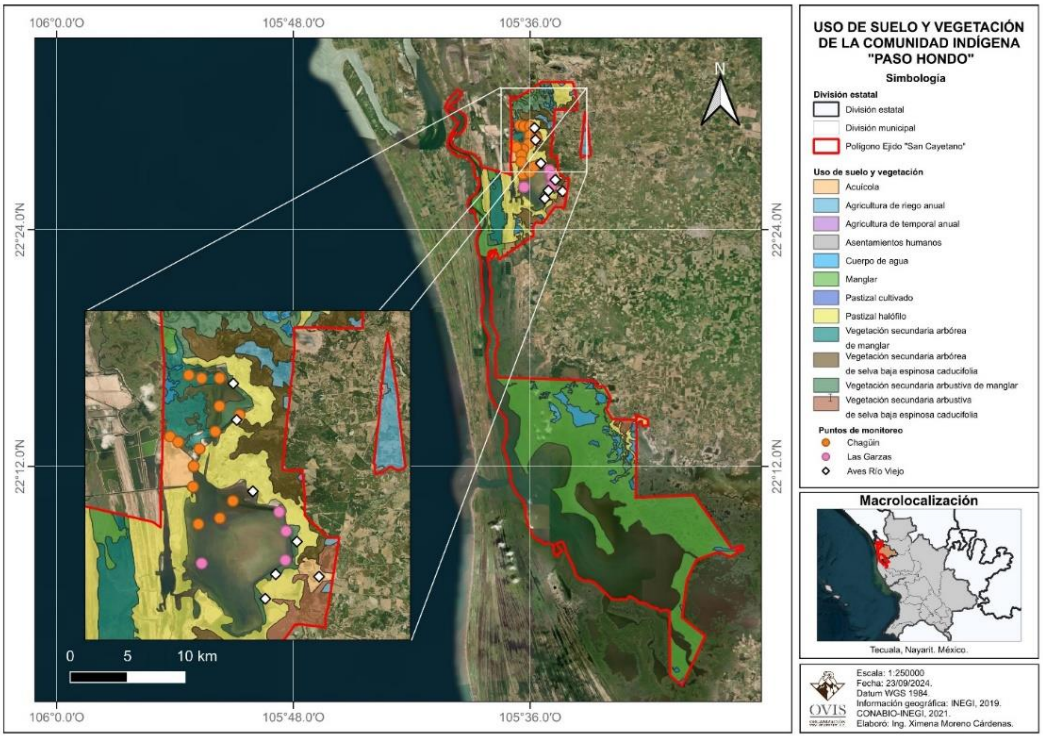
- Increase the habitat available for birds by improving the mangrove ecosystem through the hydrological rehabilitation of 3 linear kilometers of natural tidal channels.
- Conduct assisted reforestation with 10,000 propagules of two species of mangrove Laguncularia racemosa and

Avicennia germinans.

- Continue seasonal monitoring of shorebirds and waterbirds in Laguna Las Garzas during the winter season from October to December 2025.
- Manage UMA for the sustainable hunting of five key waterfowl species in Valle de la Urraca ejido; northern shoveler, ruddy duck, blue-winged teal, black-bellied whistling-duck and green-winged teal. Management will include monitoring to ensure sustainable harvest limits, and education and outreach to community members to reduce illegal hunting.
- Identify and geolocate snowy plover nests in Laguna Las Garzas.
- Design and implement three participatory environmental education and outreach workshops targeting 75 community members in the towns of Arenitas, Los Morillo and Tecuala, Nayarit.
- Disseminate environmental education/conservation messages via two audiovisual capsules published on OVIS social networks.
- Present findings and work conducted to the technical advisory council of the Reserva de la Biosfera Marismas Nacionales Nayarit, to guide management and conservation planning.

Budget: $10,000 (For more details email Deb Hahn)

Figure 13. Location of bird monitoring in the Laguna Las Garzas area



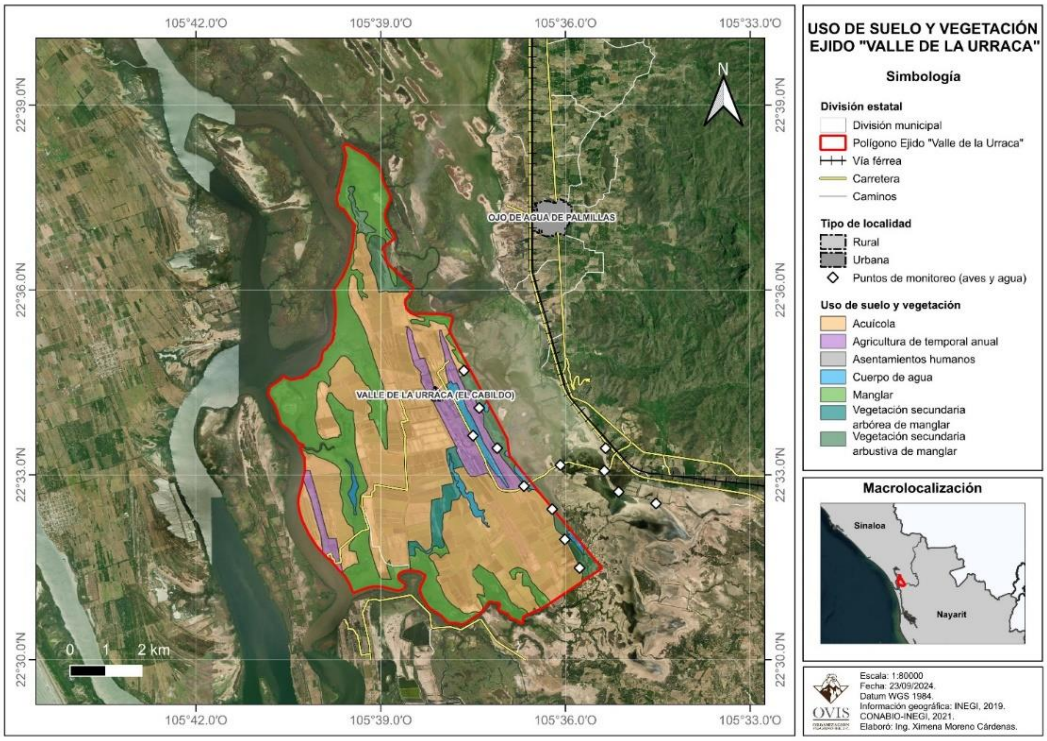


Figure 14. Location of bird monitoring in Ejido Valle de la Urraca

Table 6. Species of greatest conservation need (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					

Species	AK	AZ	CA	CO	ID	MT	NV	NM	OR	UT	WA	WY
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**

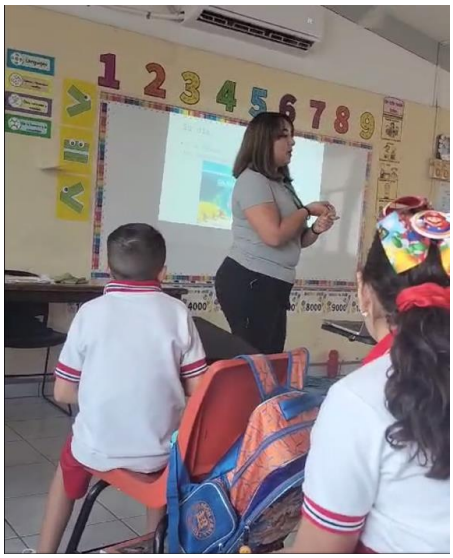
*SGCN Neotropical Migrants as defined by the North American Wetlands Conservation Act Program



Seasonal bird monitoring activities

Workshop in Valle de la Urraca on land protection and Community Territorial Planning


Participatory workshop and outreach for fishermen of Las Garzas



Environmental education in elementary school in Tecuala

Thick-billed Parrots as an Umbrella Species for Community-based Conservation of Mature Forests and Dependent Neotropical Migratory Birds in the Sierra Madre Occidental, Mexico

Partners: Organización Vida Silvestre A.C (OVIS), Ejidos (local communities), Comisión Nacional de Áreas Naturales Protegidas (CONANP), Comisión Nacional Forestal (CONAFOR), Arizona Game and Fish Department (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 (e.g. 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 SMO (Figure 15). Therefore, 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), neotropical migrant populations dependent on old-growth forests.

This project implements strategies outlined in the PIF *an Integrated Conservation Strategy for Western Temperate, Mexican Pine-Oak, and Tropical Cloud Forest Birds: North America to Central America*. Furthermore, 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 SMO, 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, primarily out of curiosity. But the loss of habitat has been 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 because 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. 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 NMBs (Table 7) 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 15). 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 2024:
In coordination with CONANP, CONAFOR, Forestry Consultants, 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):

- In collaboration with forestry consultants, OVIS and the Nicolás Bravo ejido we established a conservation and management agreement for 39,000 hectares covering different habitat types including temperate forests, intermountain grasslands, and wetlands. This agreement will protect important sites for the TBPAs and neotropical migratory birds.
- Made management recommendations to segregate an area for visitor access in the Madera Protected Area with the goal of reducing negative impacts to the site.
- Provided recommendations to forestry consultants in charge of forest management plans for the Madera, Socorro Rivera, Guadalupe Victoria, and Nicolás Bravo ejidos to establish buffer zones around sites with TBPA nests, as well as to protect springs with fencing.
- During the fire season, provided tools to a firefighting brigade organized by CONANP to protect forest resources in the Conoachi ejido (APFF Tutuaca).
- Received approval from the J. Rojo Gómez ejido (APFF Papigochic) for the construction of a biological

station.

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

Monitor breeding populations of TBPA

- a cluster of 5 nesting zones were monitored ranging from large to small landscapes; Janos, Madera, Papigochic, Tutuaca and Guadalupe y Calvo (totaling 17 discreet areas with 69 nesting sites).
- A total of 148 breeding pairs were identified, 41 of which were monitored periodically, and 12 intensively. Monitoring indicated 105 eggs laid (3.25 eggs per nest), 69 hatchlings (2.69 hatchlings per nest). Reproductive success from hatchling to fledgling was 73%.
- Five malnourished chicks were rescued and fed for approximately 7 days so that they could recover their optimum weight.
- Banded 58 parrots (young and adults) and deployed 18 radio transmitters to continue a movement study.
- Built sixty artificial nest boxes to increase availability of nesting cavities.
- Installed 36 metal sheets around nest trees to reduce bobcat predation. Also treated 41 nests to control for ectoparasites.
- Identified 22 new TBPA habitat sites (three nesting sites, three drinking sources, four foraging areas, and 12 roosts). The largest roost was discovered close to APFF Papigochic.

Monitor NMB and other sensitive wildlife.

- Over a four-year period (October 2020 - December 2024), numerous eBird checklists were generated from casual and structured surveys throughout the Sierra Madre Occidental. A total of 202 species were recorded, of which 52 % were neotropical and 48 % resident.
- Provided support to Ejido Tutuaca to reduce fire risks in 20 hectares by accumulating dead organic material.

Assess winter habitat use and winter flock counts.

- With the support of 20 observers, we conducted a TBPA population count along stopover sites during migration. Survey results conservatively indicated between 2,500 to 2,600 individuals, with a minimum population estimate of 2553 ± 183 individuals.
- Through photographic means, we also evaluated flock compositions at three sites with repeat visits. Approximately 800 individuals were counted, consisting of 31% juveniles, 64% adults and 5% that could not be assigned to an age group.
- Conducted field visits to key wintering areas in Durango to evaluate and identify potential monitoring strategies for these sites.

Environmental education

- Participated in CONANP's national conservation week events organized at the Madera Protected Area and APFF Campo Verde, where we presented information on the importance of TBPAs and other species of the SMO. Ten schools attended these events.
- Jointly organized a press release with CONANP, highlighting the documented increase in the TBPA population estimate, which resulted in several news articles in different local, national and international media.
- Designed and published a children's coloring booklet focused on charismatic wildlife of the Sierra Madre Occidental.

Activities: OVIS and partners will implement the following conservation actions.

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

- Continue working with forestry consultants to incorporate Best Forestry Practices into forest

management plans to benefit TBPAs and other wildlife.

- Continue working with Ejidos to voluntarily incorporate lands into conservation schemes, to allow for more sustainable management of forests.
- Continue to support Ejidos, Forest Management Units and CONANP in the prevention and control of wildfires in TBPA nesting areas and foraging habitat.
- Train and assist forest managers in conducting monitoring and data analysis of high priority wildlife species.
- Initiate the necessary steps and procedures for the construction of the biological station in the J. Rojo Gómez ejido.

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

Monitor breeding populations of TBPA

This work will be conducted at large landscapes in coordination with Forestal S.A. de C.V and forestry technicians from Ejido El Largo, which jointly administer and manage more than 300 thousand ha of forests in the Municipality of Madera. This area constitutes one of the most important reproductive areas for the TBPA and provides stopover and wintering habitat for a suite of migratory species.

- Management of breeding TBPAs:
  - monitor main breeding sites and identify any new breeding locations in Chihuahua.
  - Provide maintenance to artificial nests, prior to the reproductive season.
  - Sanitize nests to address any ectoparasite outbreaks.
- Disseminate results and management recommendations to local land management partners.

Monitor NMB and other sensitive wildlife

- Monitor migratory and resident species, through point counts along transects, to determine presence and abundance of species.
- Continue use of camera traps to identify and track TPBA predators as well as to document occurrence of sensitive wildlife species.

Assess TBPA winter habitat use and winter flock counts.

- Conduct population counts in the months of October or November to estimate numbers at stopover and wintering sites.
- Train community members in the monitoring of wintering populations of TBPA (State of Durango).

Environmental education

- Design and build a TBPA mascot outfit for use in raising awareness of the species and its ecosystem at school activities and outreach events.
- Conduct environmental education activities in at least 4 schools where the importance of bird and ecosystem conservation is discussed.

Budget: The total cost of the project is $89,000. Arizona may provide up to USD $8,600.00 for the completion of some of project's activities. The SDZWA is providing satellite transmitters and satellite services for an estimated cost of $68,035 (in-kind), and additional funds requested from Southern Wings ($12,330).

Table 7. SGCN (considered Neotropical Migrants*) in the project area, listed by state.

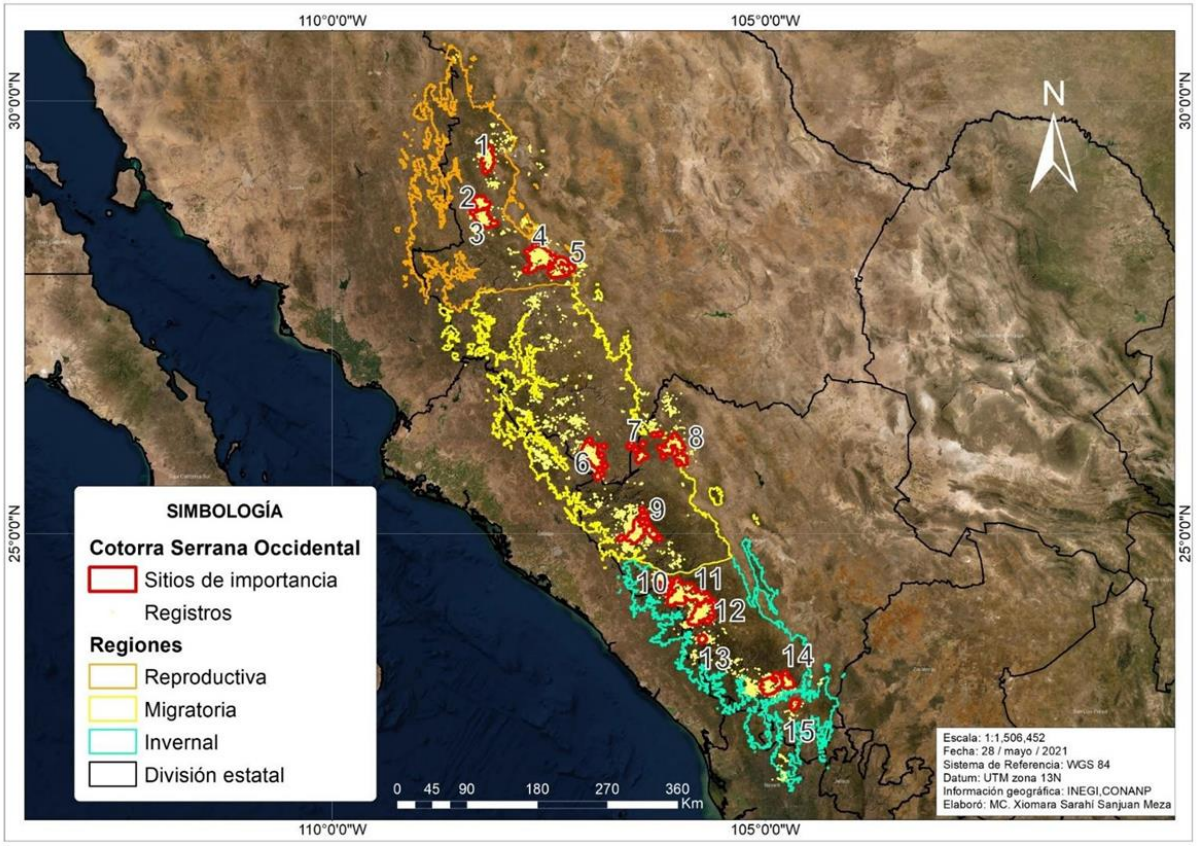
Species	AK	AZ	CA	CO	ID	MT	NV	NM	OR	UT	WA	WY
Sharp-shinned Hawk	X		X									
Spotted Sandpiper	X											
White-throated Swift		X										
Violet-crowned Hummingbird		X						X				
Short-eared Owl	X	X	X	X	X		X		X		X	X
Lesser Scaup	X											X
Red-tailed Hawk	X											
Swainson's Hawk			X	X					X			X
Common Black-Hawk								X				
Lark Bunting												X
Wilson's Warbler	X											
Red-faced Warbler		X										
Killdeer	X											
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				
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	X
Barn Swallow	X											
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										
Belted Kingfisher	X											
Elf Owl		X	X					X				
Ash-throated 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	X	X			X		X	X	X	
Summer Tanager		X	X				X					

Species	AK	AZ	CA	CO	ID	MT	NV	NM	OR	UT	WA	WY
Blue-gray Gnatcatcher						X						
Vesper Sparrow			X					X	X		X	
Vermilion Flycatcher		X	X				X					
Ruby-crowned Kinglet	X											
Rufous Hummingbird	X			X			X				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	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					X					X
Northern Goshawk	X	X	X	X		X	X		X			X
Flammulated Owl		X		X		X	X		X	X	X	X
Grasshopper Sparrow		X	X	X	X				X			X
Lincoln's Sparrow	X	X					X					
MacGillivray's Warbler	X	X										X
Lucy's Warbler		X	X				X					
Bank Swallow	X		X				X					
Black Swift	X		X	X	X	X		X	X	X		
Common Nighthawk		X			X		X	X	X			X
Brown-crested Flycatcher		X	X				X					
Purple Martin		X	X	X					X		X	X
Pinyon Jay		X		X	X	X	X			X		
Mexican Whip-poor-will		X										
Common Yellowthroat	X		X									X
Golden Eagle	X	X		X	X	X	X			X	X	X
Bald Eagle	X	X	X	X			X			X	X	X
American Kestrel	X						X					X
Lewis's Woodpecker		X		X	X	X	X		X	X	X	X
Grace's Warbler		X		X			X	X				
Loggerhead Shrike			X	X		X	X		X		X	X
Black Phoebe			X	X		X	X		X		X	X
Olive-sided Flycatcher	X	X	X	X	X		X		X	X		
Black-throated Gray Warbler		X					X	X				X
Clark's Nutcracker					X	X	X					X
Northern Pygmy-Owl		X					X			X		X
Species	**AK**	**AZ**	**CA**	**CO**	**ID**	**MT**	**NV**	**NM**	**OR**	**UT**	**WA**	**WY**

Species	AK	AZ	CA	CO	ID	MT	NV	NM	OR	UT	WA	WY
Prairie Falcon		X		X			X					
Swainson's Thrush	X	X					X					
Western Screech Owl	X	X									X	
TOTAL	**33**	**54**	**28**	**23**	**11**	**12**	**33**	**20**	**17**	**13**	**17**	**28**

*SGCN Neotropical Migrants as defined by the NMBCA Program.

Figure 15. Range map of the Thick-billed Parrot along the Sierra Madre Occidental, depicting from north to south, key priority sites, breeding, migrating, and wintering areas.



Migratory Bird Wintering Grounds Conservation in Nicaragua

Partners: ABC, Doselva, and Cosecha Partners

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, Canada Warbler, and Cerulean Warbler Focal Geographies identified in the Conservation Investment Strategy for the Mid-elevation Forests of Central and South America (González et al, 2023) for Nicaragua are in these regions. 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 7). 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, Cerulean Warbler, Canada 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.

Goal: Our long-term goal is to increase forest availability and connectivity in Nicaragua's Focal Geographies. 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.

Activities: In Nicaragua we will:

- Produce and plant 20,000 native and fruit trees in agroforestry systems on 380 acres of farmland
- Conduct community workshops to strengthen capacity of 200 farmers, particularly around tree planting and regenerative agriculture.

Budget: $93,239 (For more details email Deb Hahn), **Matching Funds:** Matching funds will come from additional ABC and partner investments in these and complementary activities.

Map 7. 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 in gray).

Restoration and Environmental Education in San Vito Coto Brus, Costa Rica

Partners: ABC, Doselva, and Cosecha Partners

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, Canada Warbler, and Cerulean Warbler Focal Geographies identified in the Conservation Investment Strategy for the Mid-elevation Forests of Central and South America (González et al, 2023) for Nicaragua are in these regions. Unfortunately, these forests are fragmented by logging and agriculture, including sun-coffee production.

Partners: Dr. Rebecca Cole (of Crowther Lab, ETH Zurich, as well Loma Linda Field Station, Coto Brus), Network of Community Tree Nurseries, members of the 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 landscape restoration, birds and gender serve as our three main pillars, or the "vehicles," for creating hands-on EE experiences for multiple sectors of the local communitydivers. Physically 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 our 501(c)3 status in the United States, and in 2024 we acquired our charitable status in Canada.

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, Canada Warbler, Chestnut-sided Warbler, Baltimore Oriole, Summer Tanager and more (all of which have been detected through our 2020-2021 monitoring project using the PROALAS (*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 acquired an additional 52 hectares, which it is committed to paying over the next ten years, during which time it will convert the land (primarily degraded cattle pasture) into premontane wet forest through restoration efforts that engage the community, as well as agroforestry systems that showcase sustainable models of agriculture that can support tree cover and wildlife. 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 to connect Amistad National Park to the Osa Peninsula.

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

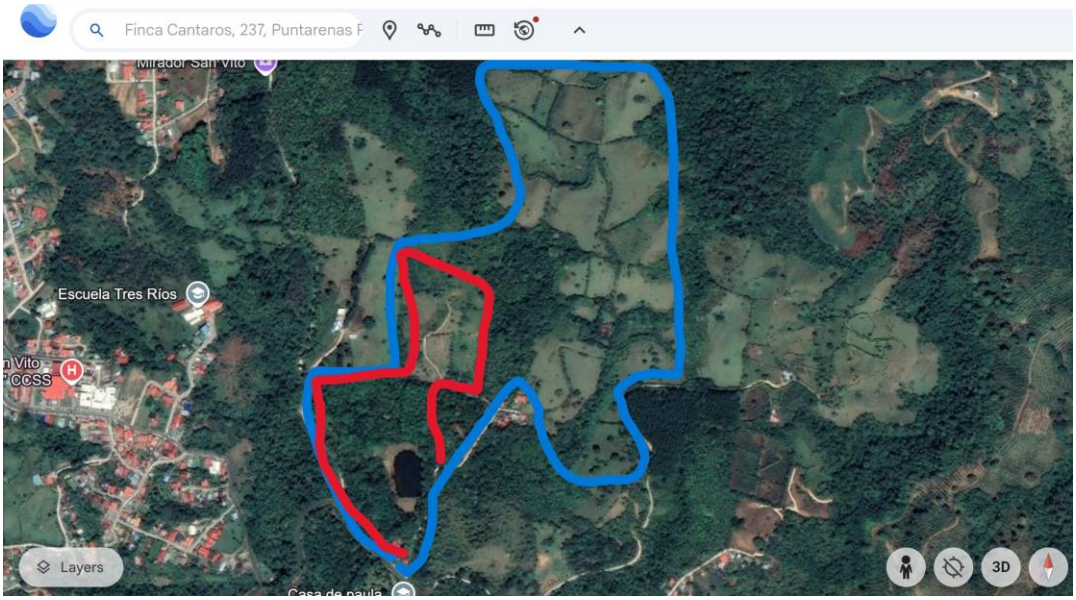
Project Goal: FCEA aims to work with experienced restoration ecologists along with other local actors in the AmistOsa Biological Corridor context, to restore degraded cattle pasture into habitat for birds and other species. We aim to combine strengths by bridging the research expertise of restoration ecologists with the EE expertise of FCEA, to achieve multiple objectives that are beneficial to birds and people.

Southern Wings Successes to Date: 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: $108,000 (Total cost over 10 years I $1,234,898, For more details email Deb Hahn), **Matching Funds:** In-kind and cash match is available.

Figure 16: Property Outline **(**Area outlined in red: **T**he original Finca Cántaros property of 7 hectares (1994) plus 7 hectares**.** Area outlined in blue**:** the recent FCEA acquisition of 52 hectares in 2024 plus original land.)



Upper Pacific Coast of Mexico Conservation Initiative

Partners: DUMAC, Ducks Unlimited, Inc. (DU), National Commission of Federal Protected Areas (CONANP), National Water Commission (CONAGUA), Secretary of Environment and Natural Resources (SEMARNAT), State and Municipal Governments agencies (Baja California, Baja California Sur, Sonora, Sinaloa and Nayarit), Outfitters, Sonora Joint Venture, other local Universities and other NGOs.

States that have participated to date: None (new project)

Overview: The Upper Pacific Coast of Mexico, which includes wetlands along the coastal states of Nayarit, Sinaloa, Sonora, Baja California and Baja California Sur, contains some of the most important coastal wetlands for migratory and resident waterfowl in Mexico. These wetlands are home to an average of 38% of waterfowl that winter in Mexico (U.S. Fish and Wildlife Service Mid-winter Waterfowl Surveys). Most of these wetlands are coastal lagoons with mangroves, emergent vegetation and seagrass, located along the coastline and connected to dams created for irrigating the most important agricultural area in Mexico.

Coastal wetlands are complex and dynamic environments where mangrove forests develop. These mangrove forests are one of the most productive and biodiverse ecosystems on the planet and have been called the kidneys of wetlands, but unfortunately this unique ecosystem is among the most threatened forests - Sonora has 163,000 acres of wetlands; Sinaloa 1.1 million acres, and Nayarit has Marismas Nacionales which by itself covers 494,000 acres. These wetlands are adjacent to 2.6 million acres of irrigated agriculture in Sinaloa (including the Los Mochis, Guasave, Guamuchil and Culiacan Agricultural Valleys) and approximately 1.1 million acres in Sonora (including Yaqui and Mayo Valleys). These coastal plains and highlands were converted to intensive agriculture use over the last 60 years. As a result, significant changes have occurred in Pacific Coast wetlands, as they have become less saline, more densely covered by cattail and subjected to pesticides and fertilizers from irrigation and runoff of agricultural lands.

Baja California: The Baja California peninsula is 30-150 miles wide and over 900 miles long. Most of the key waterfowl habitats consist of bays and estuaries along the Pacific Coast. Four major bays represent the most important habitat for the distribution of migratory waterfowl including San Quintin Bay, Guerrero Negro / Scammons Lagoon, San Ignacio Bay and Magdalena Bay. These sites are in near pristine condition and provide critical habitat for 85% of the Pacific Black Brant population. These bays are hypersaline, intertidal, shallow and are dominated by 145,000 acres of aquatic grass beds. In addition, there are over 85,000 acres of mangroves in the bays. However, these areas are vulnerable to development that can negatively impact the critical feeding areas for Black Brant. Potential development includes salt mining, tourism, and seaports. Only Laguna de Scammons is protected by a special concession from the federal government. In addition, these bays are also critical wintering and calving grounds for Pacific Gray Whales from Alaska.

Coast of Sonora, Sinaloa and Nayarit: The Colorado River Delta was a significant and reliable wintering area along the Pacific Flyway for wintering waterfowl. It has been reduced from over 2 million acres in size to about 250,000 acres at the present time. There are still opportunities for carefully targeted restoration and protection programs. DUMAC has worked on several of these areas, but more attention is needed to secure the remaining areas.

Sonora, Sinaloa and Nayarit still have some of the most pristine coastal wetlands in North America. About 500,000 acres remain essentially untouched and are used by North American waterfowl in the winter along with millions of shorebirds from the U.S. and Canada. A new threat has emerged of late

with the development of a major shrimp farming industry that consumes wetlands and impacts the hydrology on adjacent wetland areas. Tens of thousands of acres are affected, and the industry is growing.

Irrigated farmlands of Sonora and Sinaloa provided feeding areas for millions of waterfowl as recently as the early 1990s. For example, DUMAC research inventoried over 1 million pintails wintering in Sinaloa in some winters in the mid-1980s when there were 300,000 acres of irrigated rice fields. Today the main crop is tomatoes and much of the land is not farmed. There appear to be great opportunities to work on private lands to manage some of them for wintering waterfowl. The infrastructure is in place to irrigate all of it and water is abundant.

Threats: The primary threats include intensive agriculture, pollution, and shrimp farm development in the states of Nayarit, Sinaloa, and Sonora. In Baja California, wetland areas are vulnerable to development that can negatively impact the critical feeding areas for Black Brant. Potential development includes salt mining, tourism and seaports.

Birds: The list includes species of waterfowl, shorebirds, waterbirds and landbirds that are considered priority in conservation strategies and wildlife management plans in the states of Alaska, Washington, Oregon and California. In addition, these species that at some point in their life cycle are distributed, make use of or benefit from the wetlands of the northern Mexican Pacific coast are also priority for NAWCA.

This conservation initiative will promote projects focused on the restoration, management and conservation of wetlands in the North Pacific region; highlighting actions in subtidal and intertidal estuarine wetlands that will benefit various species of migratory waterfowl. Among the species, the Dusky Canada Goose and the Pacific Black Brant stand out, which use these wetlands as resting and feeding sites; species such as the Lesser Scaup, White-winged Scoter, Pacific Black Scoter and Redhead that spend the winter feeding in this region using shallow estuarine bays and wetlands will also benefit. Likewise, this initiative will favor the fulvous whistling-tree duck and cinnamon teal, priority species in the Washington and California action plan; priority species for NAWCA that depend on shallow freshwater wetlands with emergent vegetation along the Mexican Pacific coast.

As a regional initiative, it will benefit various species of Nearctic migratory shorebirds, such as the Whimbrel, Long-billed Curlew, Solitary Sandpiper, Wandering Tattler, Western Sandpiper, Short-billed Dowitcher, all of which are considered priorities by NAWCA. It will also favor species such as the Lesser Yellowlegs and the Western Snowy Plover, classified as vulnerable and threatened, respectively by the IUCN and Mexican legislation. Along the North Pacific Coast, there are 15 WHSRN sites, including Marismas Nacionales and Santa Maria Bay which have designations of International and Hemispheric Importance, respectively, where we are currently engaged in wetland restoration and public outreach efforts. The priority shorebird species that will benefit are listed in Table 8. These species will find food and shelter in the mangrove swamps, shallow intertidal zones with mudflats, sand flats, seagrasses and algae along the Mexican Pacific coast.

As a regional initiative, the priority shorebird species that will benefit are listed in Table 8. These species will find food and shelter in the shallow intertidal areas along the Mexican Pacific coast. Likewise, this initiative will benefit the terrestrial birds listed in Table 8, which are distributed on the edges of riverine, lake and mangrove wetlands or that depend on the highlands adjacent to the wetlands of the northern Mexican Pacific coast; highlighting the species Black Swift, Short-eared Owl, California Black Rail, Western Yellow-Billed Cuckoo, Least Bell's Vireo that use shrubby wetlands as refuge or feeding sites and that are listed in the U.S. Endangered Species Act (June, 2021) or in the U.S. Fish and Wildlife

Service's Birds of Conservation Concern (2021).

Project Goals:

1. Restoration / enhancement of 25,000 acres of coastal wetlands along the Northern Pacific coast
2. Protection of 60,000 acres of wetlands, using the legal instruments under the Mexican law
3. Implement the DUMAC´s Environmental Education Program "Teaching the Teachers", to train 200 professors from elementary and secondary school
4. Support the implementation of the Management and Conservation Plans of all Federal Protected Areas within the region
5. Use the information on the Digital Change Detection along the states of Sinaloa and Sonora, to influence management and conservation decisions, with the development of public policies to better regulate the growth of shrimp farms.

DUMAC has developed of a Shorebird Conservation Strategy in Mexico because shorebirds use the same wetlands as waterfowl. The Mexican government has an interest in taking a broader view to wildlife conservation beyond just waterfowl. The Strategy was adopted by the federal government and is being used to guide projects that will contribute very significantly to the protection of wetlands that are critical to North America's shorebirds and waterfowl. Within this strategy, the development of shrimp farms represents one of the most important threats for the maintenance of the natural coastal wetlands. This is the reason why DUMAC has advocated for the development of a manual that would guide shrimp farmers in the development and management of their farms in such a way that minimally impacts wetlands that are important to migratory and resident wildlife. This is critically needed as the industry is in its early stages of development and there is still time to prevent long-term damage to the wetland resources of Sinaloa and Sonora.

The threats to the bays and lagoons of the Baja can be significantly decreased by federal designation of protected areas that are most critical to wintering Black Brant. This has been accomplished at Laguna de Scammons where development of a salt mine that threatened the integrity of that system declined because it was a federally protected area. This Initiative seeks to strengthen alliances with municipal, state and federal government agencies, and other organizations that are interested in the conservation of wetland ecosystems in the region, to promote joint projects that support restoration, management and conservation of wetlands in the region. In addition, the Initiative will conduct research that will generate basic information that supports the conservation processes of these ecosystems. An important component for this initiative is to establish a program of public involvement and awareness regarding conservation issues, seeking to change people's attitudes regarding the environment and seeking their support and participation in the generation of a better ecological awareness that allows greater participation of local citizens in the conservation of natural resources.

Southern Wings Successes to Date: Not Applicable

Project Activities:

1. Conduct habitat change analyses to determine the effects of conservation activities on wetland areas.
2. Establish a permanent monitoring program for habitat quality and distribution of species.
3. Develop best management practices for shrimp farming to guide current and future developments and avoid negative impacts to coastal wetlands.
4. Evaluate the feasibility of habitat creation and restoration projects on wetland areas as well as on farmlands to compensate for natural habitat loss.

5. Provide technical assistance to farmers through the development and use of best management practices to reduce the impact from runoff on coastal wetlands.
6. Develop management plans for the conservation of coastal wetland systems.
7. Seek state, federal, and international recognition of important coastal wetland systems (state or federal refuges, Ramsar sites, WHSRN designation, etc).
8. Implement environmental education projects for fishermen, farmers, locals, hunters, and the general public to motivate changes in attitude towards the environment.
9. Promote the long-term conservation of historically important wetland areas for waterfowl using the legal instruments available in Mexico under the General Wildlife Law.
10. Work with local organizations, and state and federal government authorities to improve management decisions.

Budget: (June 1, 2025 – June 30, 2026): Total project cost is $701,245. Match from DUMAC and NAWCA is $656,245. Southern Wings request is $45,000. For a more detailed budget contact Deb Hahn.

Table 8: The following table lists bird species that are present in the Upper Pacific Coast Conservation Initiative Area, and which are priority species in the State Wildlife Action Plans for Alaska, Washington, Oregon, and California along with NAWCA priority species.

Scientific Name	**Common Name**	**State Wildlife Action Plans**				**NAWCA Priority Bird Species**
		AK	**WA**	**OR**	**CA**	
Waterfowl						
Branta canadensis occidentalis	Dusky Canada Goose	*				
Branta bernicula nigricans	Pacific Black Brant	*		*	*	MEDIUM
Aythya affinis	Lesser Scaup	*				HIGH
Melanitta deglandi	White-winged Scoter	*				
Melanitta americana	Pacific Black Scoter	*				
Aythya americana	Redhead				*	LOW
Dendrocygna bicolor	Fulvous whistling-duck				*	LOW
Spatula cyanoptera	Cinnamon Teal		*			High
Shorebirds						
Actitis macularius	Spotted Sandpiper	*				
Tringa flavipes	Lesser Yellowlegs	*				*
Charadrius nivosus nivosus	Western Snowy Plover			*	*	*
Arenaria melanocephala	Black Turnstone	*				
Calidris virgata	Surfbird	*				
Numenius phaeopus	Whimbrel	*				*
Numenius americanus	Long-billed Curlew			*		*
Tringa solitaria cinnomomea	Solitary Sandpiper	*				*
Calidris alpina pacifica	Dunlin	*				
Calidris alba	Sanderling	*				
Tringa incana	Wandering Tattler	*				*
Calidris mauri	Western Sandpiper	*				
Limnodromus griseus	Short-billed Dowitcher	*				*
Phalaropus fulicarius	Red Phalarope	*				
Himantopus mexicanus	Black-necked Stilt			*		

Scientific Name	Common Name	State Wildlife Action Plans				NAWCA Priority Bird Species
Bartramia longicauda	Upland Sandpiper		*			
Anarhynchus nivosus	Western Snowy Plover		*			*
Waterbirds						
Pelecanus erythrorhynchos	American White Pelican		*	*		*
Pelecanus occidentalis	Brown Pelican		*	*		*
Haematopus bachmani	Black Oystercatcher	*		*		
Pluvialis squatarola	Black-bellied Plover	*				
Charadrius vociferus	Killdeer	*				
Gavia stellata	Red-throated Loon	*				
Gavia immer	Common Loon		*			
Egretta thula	Snowy Egret			*		*
Leucophaeus pipixcan	Franklin's Gull			*		*
Rissa tridactyla	Black-legged Kittiwake	*				
Larus glaucescens	Glaucous-winged Gull	*				
Sterocarius pomarinus	Pomarine Jaeger	*				
Hydroprogne caspia	Caspian Tern			*		
Phoebastria albatrus	Short-tailed Albatross		*		*	
Sternula antillarum browni	California Least Tern				*	
Brachyramphus marmoratus	Marbled Murrelet	*	*		*	
Synthliboramphus hypoleucus	Guadalupe Murrelet				*	
Synthliboramphus scrippsi	Scripps's Murrelet				*	
Aechmophorus clarkii	Clark's Grebe		*			*
Aechmophorus occidentalis	Western Grebe		*			*
Landbirds						
Cypseloides niger	Black Swift			*		*
Asio flammeus flammeus	Short-eared Owl	*				*
Laterallus jamaicensis coturniculus	California Black Rail				*	*
Coccyzus americanus occidentalis	Western Yellow-Billed Cuckoo		*		*	*
Vireo bellii pusillus	Least Bell's Vireo				*	*
Spizella passerina	Chipping Sparrow			*		
Lanius ludovicianus	Loggerhead Shrike		*	*		
Contopus cooperi	Olive-sided Flycatcher			*		
Buteo swainsoni	Swainson's Hawk			*	*	
Buteo regalis	Ferruginous Hawk		*			
Otus flammeolus	Flammulated Owl		*			
Empidonax traillii	Willow Flycatcher			*	*	
Haliaeetus leucocephalus	Bald Eagle	*	*		*	
Falco peregrinus	Peregrine Falcon	*	*			
Falco sparverius	American Kestrel	*				
Contopus cooperi	Olive-sided Flycatcher	*				
Empidonax difficilis	Pacific-slope Flycatcher	*				
Contopus sordidulus	Western Wood-Pewee	*				
Spizella passerina	Chipping Sparrow	*				

Scientific Name	Common Name	State Wildlife Action Plans				NAWCA Priority Bird Species
Melospiza melodia	Song Sparrow	*				
Melospiza lincolnii	Lincoln's Sparrow	*				
Passerculus sandwichensis	Savannah Sparrow	*				
Rallus obsoletus levipes	Light-footed Ridgway's Rail				*	
Rallus obsoletus obsoletus	California Ridgway's Rail				*	
Rallus obsoletus yumanensis	Yuma Ridgway's Rail				*	
Colaptes chrysoides	Gilded Flicker				*	
Melanerpes uropygialis	Gila Woodpecker				*	
Vireo bellii arizonae	Arizona Bell's Vireo				*	
Riparia riparia	Bank Swallow				*	
Polioptila californica californica	Coastal California Gnatcatcher				*	
Passerculus sandwichensis beldingi	Belding's savannah sparrow				*	
Progne subis	Purple Martin		*			

Expanding the Motus Network in Northern Central America to Advance Conservation of Migratory and Resident Avian Species

Partners: Paso Pacifico, Mujeres y Naturaleza, Pronatura Sur, Chicatana (Tlaxiaco Bird Observatory), Tracy Aviary.

Participating States: Arizona, Utah

Overview: The Motus Wildlife Tracking System (Motus) is an international collaborative research network that allows researchers and managers to collect critical movement data on birds, enhancing our understanding of their migratory patterns, timing, survival, connectivity, stopover areas, and breeding and wintering locations. Even now, these are poorly known for many conservation target species. In recent years, the Motus network has expanded significantly, especially in the north, contributing to conservation by providing crucial ecological information for migratory species. Despite being at the heart of annual migrations, Central America, particularly in Guatemala, Honduras, El Salvador, and Southwestern Mexico remain underrepresented, with significant gaps in the monitoring network (Figure 17).

Our project focuses on two sub-regions: northern Central America, including El Salvador, Guatemala, and Honduras, and southern Mexico, including Oaxaca and the Isthmus of Tehuantepec. It addresses important knowledge gaps for migratory and resident birds that rely on the freshwater wetland, dry tropical forest, and pine-oak forest habitats found along the Pacific slope of northern Central America, and southwestern Mexico – a critical geography for Pacific Flyway birds. The limited number of Motus stations highlights the urgency of expanding and maintaining the Motus network in this geography, a region that has an important role as a stopover and wintering area for migratory birds (Figure 18). The work will be accomplished by growing and strengthening the existing regional Motus network by installing new stations, reinvigorating inactive stations, deploying tags as part of research studies, and supporting technical training. We next highlight the project's relevance to Bird Conservation Regions (BCRs) in the Pacific Flyway.

Figure 17. General geography of Southern Mexico and northern Central America showing active (green and yellow) and inactive (blue and pink) Motus stations as of August 2025, highlighting the limited coverage and the potential for network expansion in the region (Motus.org, 2025).

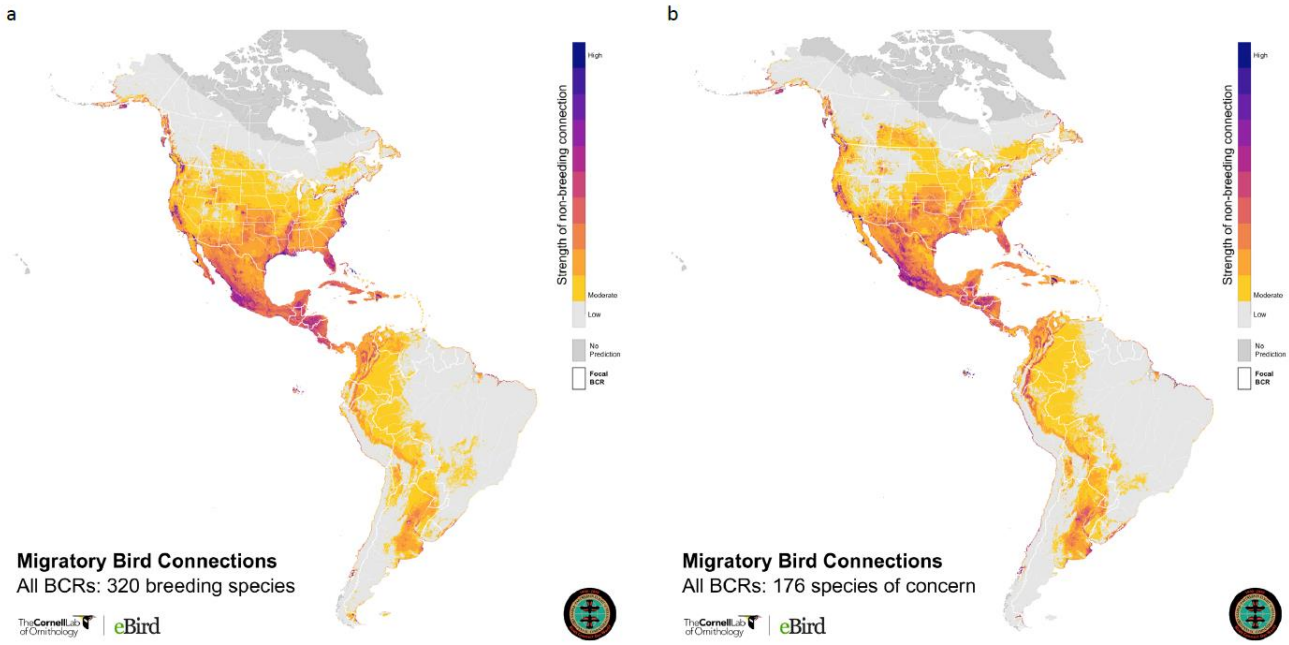
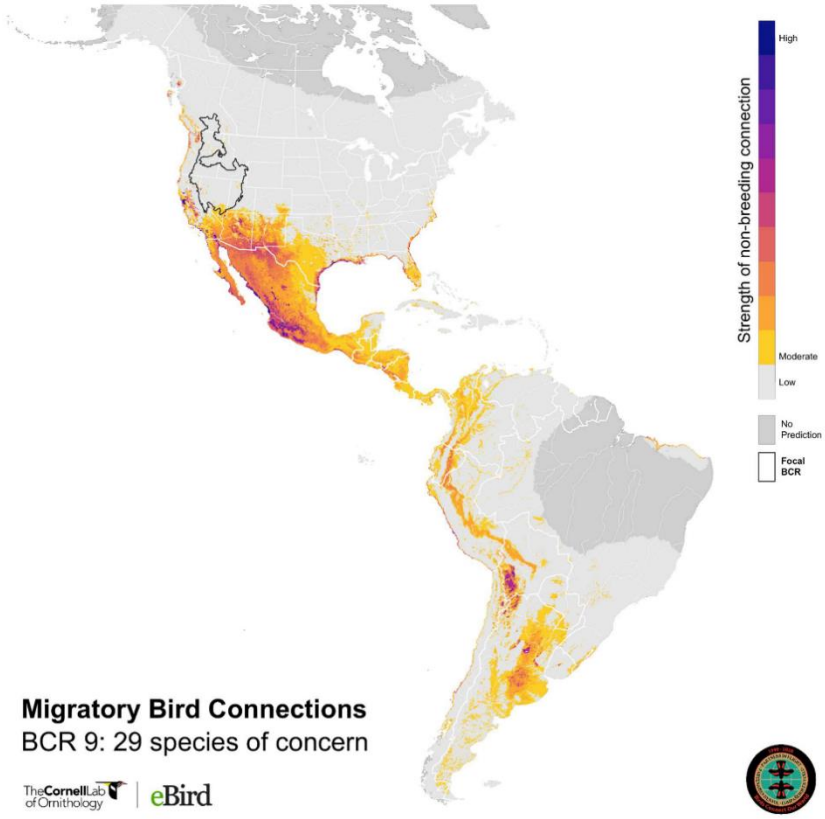


Figure 18. Migratory bird connections maps illustrate where connections are strongest (dark purple) between a) all migratory breeding species and b) species of conservation concern and their non-breeding grounds. Of course, nearly all birds that winter in South America also pass through Central America in both spring and fall.

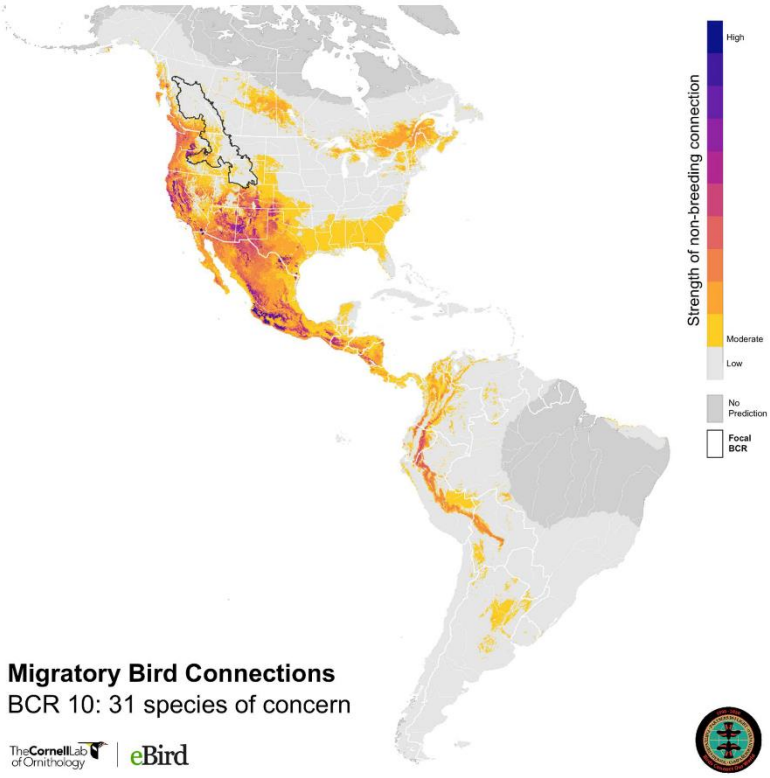
Great Basin (BCR 9): The project area is an important wintering and stopover area for 29 species of concern that breed in the Great Basin, showing the need for conservation efforts in these regions (Figure 19).

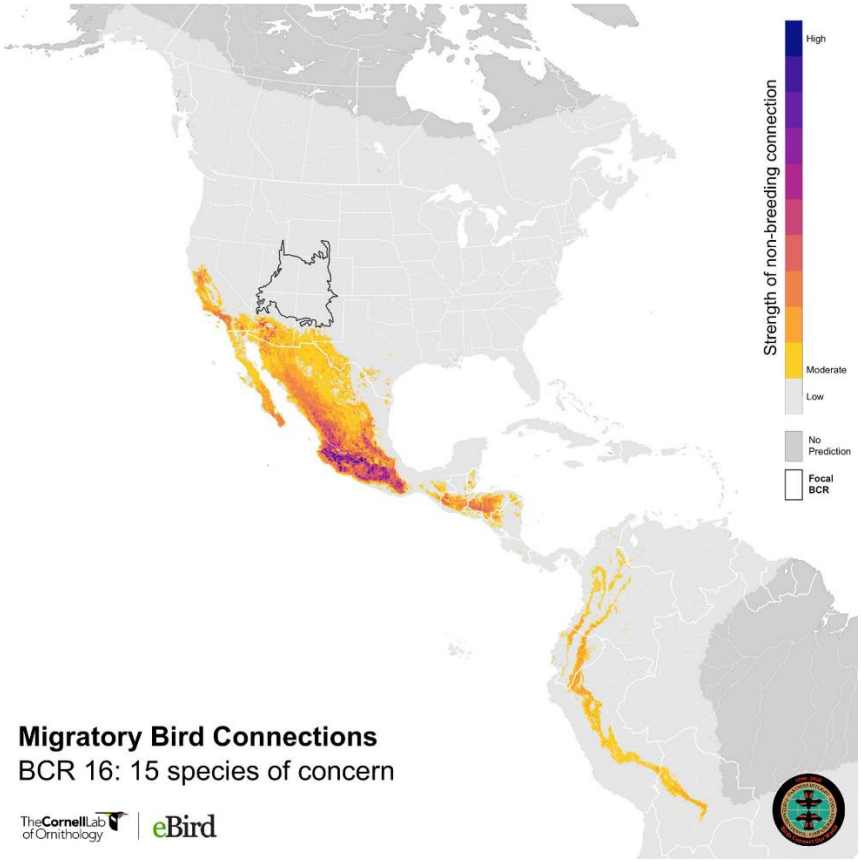
Figure 19. Partners in Flight Migratory Bird Connections map showing the importance of Central America/Southwestern Mexico as a wintering region for these species that breed across BCR 9.



Northern Rockies (BCR 10): Figure 20 highlights the importance of the project area as stopover or overwintering sites for 31 species of concern migrating from the Northern Rockies.

Figure 20. This detailed map focuses on BCR 10 (Northern Rockies), emphasizing its significance for migratory species and identifying priority areas for the installation of Motus stations in Northern Central America/southwestern Mexico.





Southern Rockies/Colorado Plateau (BCR 16): Figure 21 emphasizes the connections between 15 species of concern from BCR 16 that migrate through or winter in the project geography.

Figure 21: This map delineates BCR 16 (Southern Rockies/Colorado Plateau), highlighting the importance of Central America/Southwestern Mexico for migratory bird conservation and showcasing the strategic locations for future Motus station deployment in the Region.

The eBird models that generated these maps clearly show the highly concentrated importance of Northern Central America and Southwestern Mexico to the breeding grounds of the Pacific Flyway. Using these connectivity maps, the project will prioritize key areas for station placement and enhance the tracking and conservation of SGCN and other priority species.

Expanding the Motus network in the region is key to understanding the full annual cycle of migratory SGCN and other migratory and resident species. By utilizing this technology and collaborating with partners, we can begin to fill in knowledge gaps about birds and other wildlife and enable conservation efforts that benefit species, their habitats, and people.

Goals:

1. Co-establish and collaborate in a Motus Working Group within this geography to facilitate communication and build local capacity,
2. Identify and support the identification of suitable sites for Motus stations,
3. Install new stations and assist with trouble-shooting existing stations,
4. Develop and implement research studies that harness the power of the Motus network through strategic deployment of tags on conservation target species, and
5. Strengthen Motus local capacity through supporting virtual and in-person training workshops and facilitating experience exchanges.

We next detail the opportunities in the three project sub-regions: northern Central America, including El Salvador, Guatemala, and Honduras, and two areas in southern Mexico, the Isthmus of Tehuantepec and western Oaxaca

Northern Central America (El Salvador, Guatemala, Honduras): Most of this geography was once seasonally dry tropical forests; large scale agricultural conversion has made the dry tropical forest one of the world's most endangered ecosystems (<2% remains intact). Only 5% of the remaining dry forest in Central America receive some degree of protection. These conversions have a disproportionate impact given their centrality to migrating species and the sheer per hectare density of over-wintering North American birds. Currently, no Motus stations are operational in El Salvador. In Honduras, there is one station at Bella Vista (inactive), and there are five stations in Guatemala, only two of which are active. Taken together, these few installations underscore not just the need for more stations, but the significant gap in the local capacity needed to maintain stations in the region (Figure 17).

Birds: Most migratory species from the Pacific Flyway use western Central America during migration and overwintering periods. Migratory species of conservation concern found here include U.S. federally endangered species like the Southwestern Willow Flycatcher and the Yellow-billed Cuckoo; Partners in Flight species of conservation concern such as Black Swift and Olive-sided Flycatcher. Numerous migratory waterbirds such as American White Pelican and White-faced Ibis also winter or pass through the region. Resident species are also of conservation interest - these include priority species such as the Azure-rumped Tanager found in the Pacific slope foothills of Guatemala and Chiapas, game birds such as the Great Curassow, Highland Guan, and the Ocellated Quail, as well as forest birds such as the Pale-billed Woodpecker and the Emerald Toucanet. Basic life history is poorly known for many of these, and an expanded Motus network will help us all.

Threats: Large areas of seasonally dry tropical forest continue to be cleared for livestock and agriculture, often using fire as a tool for land management. These repeated burns degrade forest structure and limit regeneration, making the ecosystem increasingly vulnerable. In some areas, deforestation is accelerated by infrastructure expansion and development, which spread across the remaining forest patches. These pressures have fragmented the landscape and reduced the availability of habitats for migratory birds.

Project Activities: Our local project partner, Paso Pacifico, will:

- facilitate a Motus Working Group within this geography,
- conduct field visits to assess suitability of sites for hosting Motus stations,
- coordinate the maintenance of existing stations in Honduras and/or Guatemala,
- obtain parts and supplies for two Motus stations, and
- deploy two new stations across the region.

Southern Mexico - Isthmus of Tehuantepec: At ~200 km wide, the Isthmus of Tehuantepec is the narrowest part of Mexico between the Pacific Ocean and the Gulf of Mexico and represents an ideal location for a Motus 'fence'. In this very narrow region, there is a vast diversity of ecosystems, such as: coastal lagoons, pine-oak forests, dry forest, cloud forest and rainforests that are potentially used by more than 220 species. The tidal flats of the Lagunas del Istmo de Tehuántepec in Oaxaca/Chiapas is a huge and remote tidal flat complex which is rarely surveyed for birds. (Newstead et al. 2024). Currently there are only two Motus Stations on the Isthmus of Tehuantepec and the potential for recording marked birds in the region is very high as millions of migrating birds pass through this area each spring and fall (Figure 22).

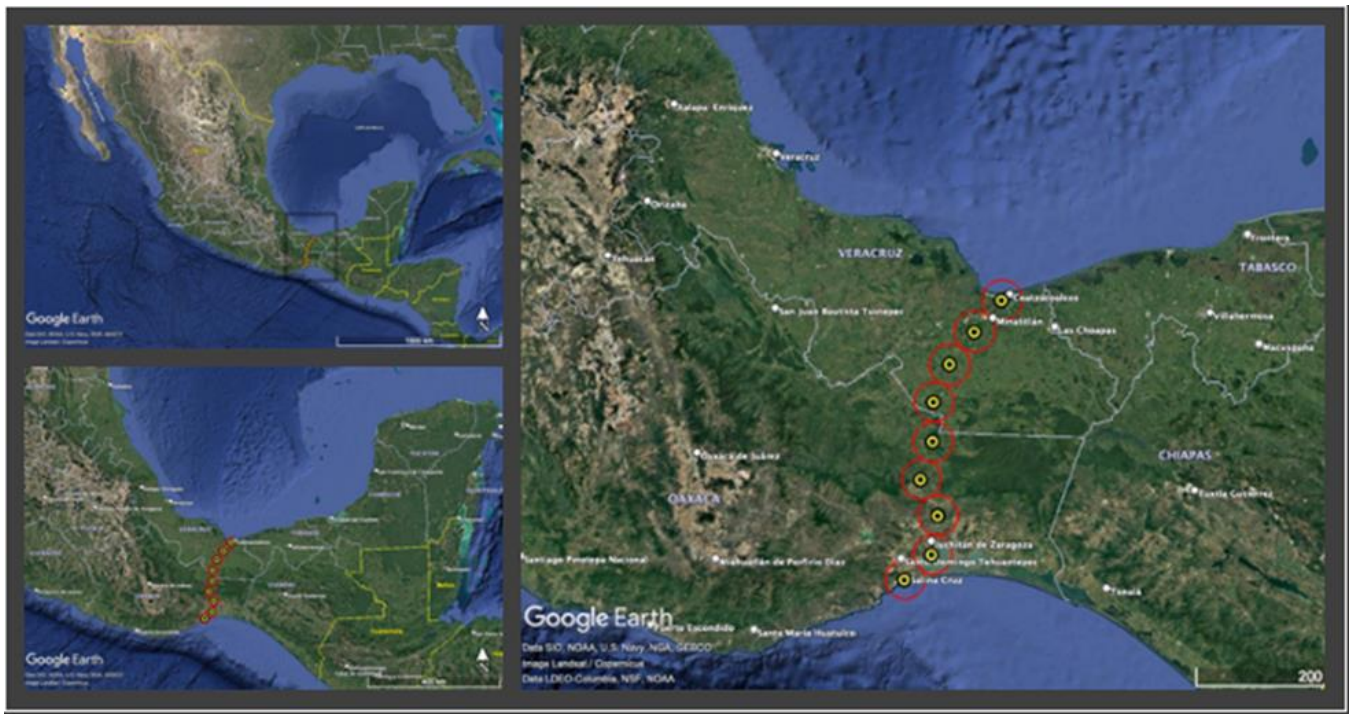


Figure 22. Conceptual proposal for the 'fence' of Motus stations across the Isthmus of Isthmus of Tehuantepec in Southern Mexico.

Birds: The Important Bird Area (IBA) Istmo de Tehuantepec - Mar Muerto is in this region. Within this IBA is the Selva de Los Chimalapas, which according to Townsend Peterson and his collaborators, is the area of the country with the greatest diversity of birds in Mexico, having collected and recorded 458 bird species in their studies from 1990-2000 (Peterson, et al., 2003). The Isthmus of Tehuantepec is not only an area of importance for resident and endemic birds, but also one of the migratory corridors of greatest global importance for many species of landbirds (Lamb, et al., 2017). Species from the eastern, central and northwestern part of the continent, as well as migratory species from the southern cone of the continent, use this area as feeding and sheltering sites during migration, as well as wintering sites (BirdLife International, 2025). Entire populations of neotropical migratory birds cross the Isthmus of Tehuantepec, such as: Swainson's Hawk, Hudsonian Godwit, Upland Sandpiper, Franklin's Gull, Canada and Golden-cheeked Warbler, among others.

Threats: Coastal development, industrial/intensive agriculture, overexploitation or destruction of wetlands and freshwater watersheds.

Project Activities: Our local project partner Pronatura Sur seeks to continue to build a Motus fence in the Isthmus of Tehuantepec that will collect data on different groups of neotropical migratory birds tagged in different regions of the northern hemisphere and will help to understand migratory connectivity patterns.

- Install Motus stations and provide maintenance.
- Develop/support opportunities for capacity building (installations and tagging).
- Deploy Motus tags, analyze data.

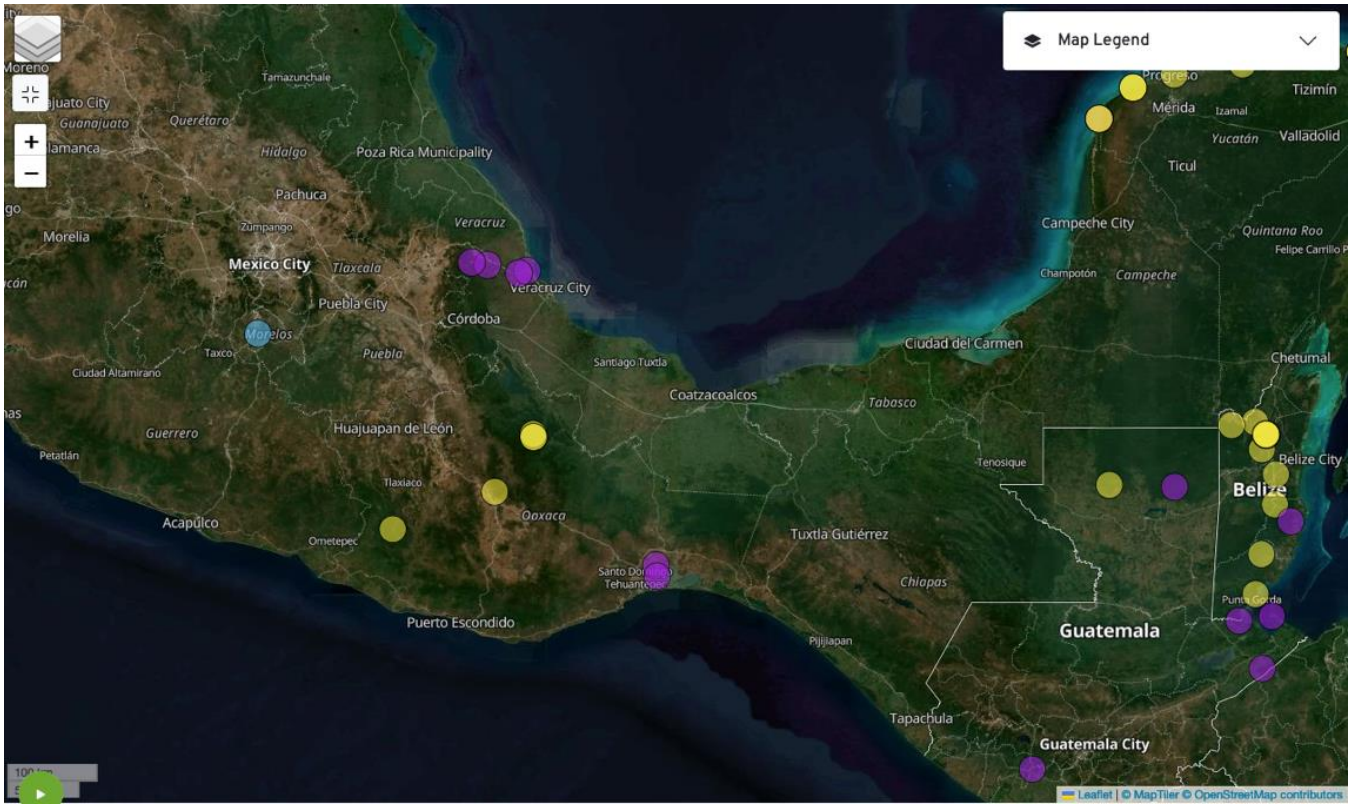


Figure 23: Map of existing Motus stations in Oaxaca and the Isthmus of Tehuantepec in southern Mexico (Motus.org, 2025).

Southern Mexico - Western Oaxaca: Oaxaca is also an area of high biological diversity and migratory flow. Despite its obvious importance to many Pacific Flyway states, the number of Motus stations in this region remains limited. The goal here is to grow the Motus network and to generate data on the local and regional movements of migratory birds in the Mixteca region, a critical but largely undocumented area, even regarding basic species presence.

In 2023, the local NGO Chicatana, through its Tlaxiaco Bird Observatory, established a foothold for the Motus network in western Oaxaca. Work began in the community of Atoyaquillo. At this site, we have focused our efforts on studying the winter survival and habitat use of the Yellow-breasted Chat, a migratory species of international conservation concern. Currently, one Motus station is operational at this location, actively detecting tagged birds and contributing valuable data in this region and at the continental level.

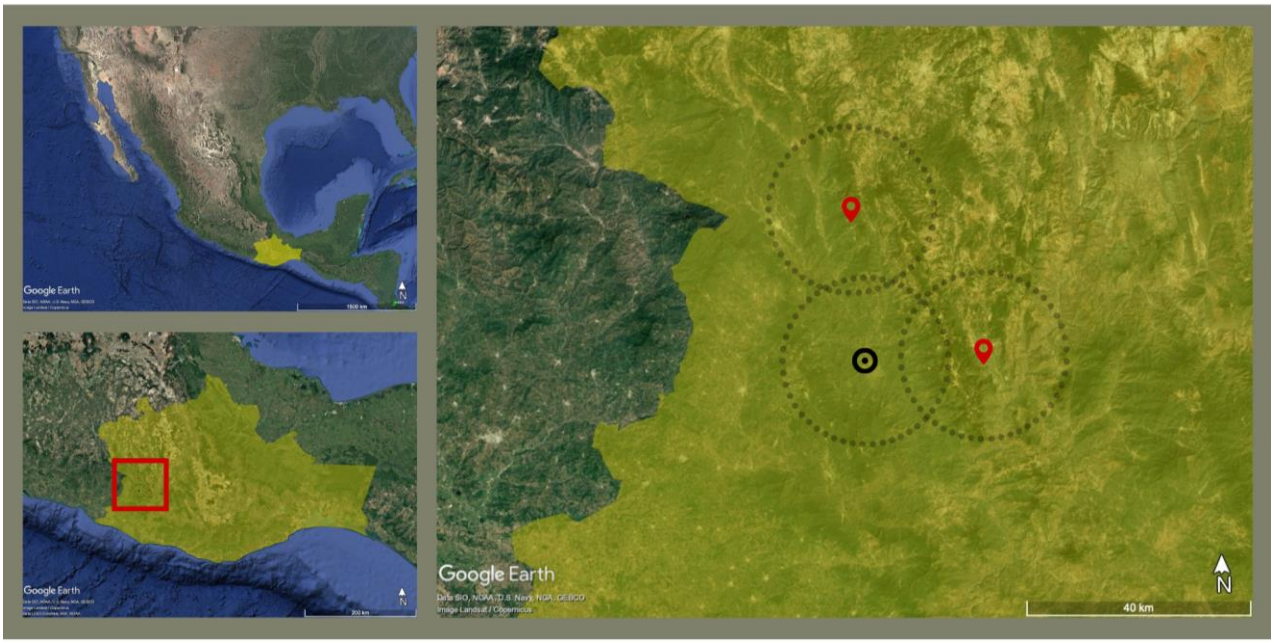


Figure 24: Location of the state of Oaxaca and the station in Atoyaquillo (black), along with proposed locations for new stations (red).

Birds: Willow Flycatcher, Flammulated Owl, Yellow-breasted Chat, Loggerhead Shrike, Common Nighthawk, Bell's Vireo, Scott's Oriole, Rufous Hummingbird, Common Yellowthroat, Summer Tanager, Swainson's Thrush, Vermilion Flycatcher, Western Screech Owl, and Black-throated Gray Warbler, Grace's Warbler, Virginia's Warbler, and Yellow Warbler. Endemic species that would potentially benefit from this project include, Balsas Screech Owl, White-throated Jay, Collared Towhee, Long-tailed Wood-Partridge, Gray-crowned Woodpecker, Hooded Yellowthroat, Red-headed Tanager, and Red Warbler.

Threats: Climate change, tree clearing for cattle ranching, flooding, hunting of birds of prey, capture of psittacines for illegal trade, unregulated extraction of materials for construction, and logging of timber-yielding trees.

Project activities: Our local project partner, Chicatana, will focus on creating a network of stations in the western region of Oaxaca. Currently two new stations are funded, maintenance of the one operational station is covered, and around 50 tags have been deployed on migratory birds. More tagging is planned.

- Training of local technicians for the operation and installation of Motus stations.
- Installation of two Motus stations.
- Tagging of priority migratory species with Motus tags.
- Environmental education workshops for children and teenagers focused on bird migration and the connectivity between breeding and wintering grounds.

Success to Date: N/A, New project

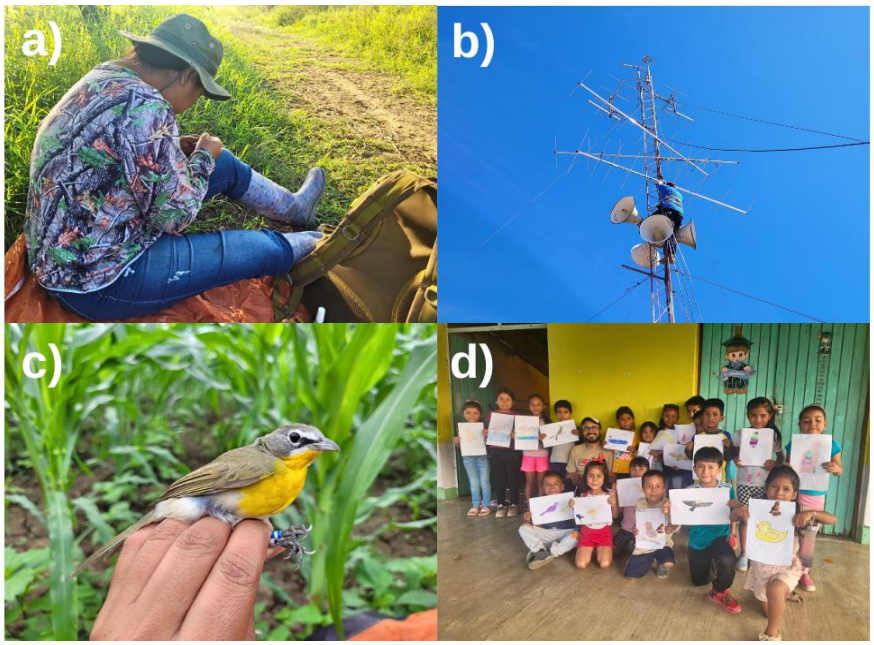


Figure 25: Previous work in Atoyaquillo: a) training of local technicians; b) installation of a Motus station; c) tagging Yellow-breasted Chats; d) environmental education workshops focused on bird migration.

Budget: Funds provided will expand and enhance activities already being implemented with support from partners, including Arizona, Utah and the Tracy Aviary.
W. Oaxaca - $20,350; Isthmus of Tehuantepec - $15,400; N. Central America - $15,400