



# Project Proposals 2020-2021



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

**Partners:** Fundacion para el EcoDesarrollo y La Conservacion (FUNDAECO), American Bird Conservancy (ABC)

**States that have participated to date:** Missouri, Tennessee, Arkansas, Iowa, Texas

**Overview:** The coastal Caribbean region of Guatemala lies between Belize and Honduras in the province of Izabal (Figure 1). This region includes several unique and isolated massifs rising from sea level up to 1,200 meters, low-land rainforest, large mangrove and natural beach systems, and a Ramsar Wetland. The region is bathed in moisture-laden Caribbean trade winds and supports a unique transitional ecosystem from the shoreline to wet rainforests and pine-oak forests on south-facing rain-shadow slopes. The unique combination of topographical and climatic conditions creates important stop over and wintering habitat for at least 153 species of neotropical migrants. This region is one of ABC's high priority BirdScape called the Conservation Coast.

FUNDAECO, ABC's Guatemalan partner, is ensuring the conservation of these sites by purchasing and managing core habitat in areas identified for national protection by the Guatemalan government, who themselves lack the funds to purchase or manage land. Southern Wings, and matching funds, have made it possible to create an extensive and robust protected area system. With much of the core habitat already protected, the project is focused on protecting forest and restoring degraded lands in the buffer zones of these protected areas.

**Threats:** Cattle ranching, oil palm expansion, illegal logging, and slash-and-burn and industrial agriculture.

**Birds:** Over 140 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. Other Watchlist species that use other FUNDAECO reserves include golden-winged and Canada warbler, and olive-sided flycatchers. 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 winter migration. Other migrants in the region include Swainson's hawk, blue-winged warbler, Tennessee warbler, magnolia warbler, Louisiana waterthrush, Baltimore oriole, and indigo bunting.

**Overall project goal:** The goal is to secure the protection of core migratory bird habitat through protected area creation and management, and implementation of sustainable agroforestry systems with local landowners on over 5,000 acres. Critical to the agroforestry approach of land restoration is providing hands-on training and technical expertise to landowners. ABC and FUNDAECO have started to create a series of "BioCenters," plots of land where we implement agroforestry systems and demonstrate to landowners the methodology of planting native tree species along with black pepper, cacao, and other crops that can be grown in forest cover. BioCenters have the added benefit of earning money by selling the products grown in the demonstration plots. The profits can be invested back into conservation. BioCenters provide complementary conservation value to our land acquisition and protection activities.

**Previous Southern Wings Successes:** Since 2012, Southern Wings has supported the creation and expansion of five protected areas and one BioCenter called Guaytan. In total, these lands account for 11,262 acres of habitat for

migratory birds. FUNDAECO has now established protections for core areas within all priority locations of the Conservation Coast. This includes Sierra Caral, Cerro San Gil, Punta Manabique, Rio Sarstun (Tapon Creek), and Sierra Santa Cruz. The Guaytan BioCenter is the largest BioCenter established by FUNDAECO (there are seven altogether). Within the Guaytan BioCenter, 16.8 ha of black pepper and 31.2 acres of cinnamon have been established in agroforestry plots to restore cattle pasture. In 2019, FUNDAECO began working on another property called Santa Marta and started investments at Las Jaras with matching funds. Here plans and funding is in place to expand pilot agroforestry plots.

**New Activities:** With many protected areas now under control and management by FUNDAECO, it is important that FUNDAECO have the resources and capacity they need to adequately protect them. In 2020, ABC will support FUNDAECO in improving their capacity to patrol and protect the five protected areas mentioned above. This includes training reserve guards. We will use the SMART guard training protocol, developed by Wildlife Conservation Society (WCS), as both ABC and FUNDAECO are familiar with this protocol and know it to be a successful method. FUNDAECO is currently using the SMART protocol in the El Peten region where they collaborate with WCS on a project. Francisco Asturias, FUNDAECO Coordinator for El Peten, will oversee training activities. The goal is hold six trainings for 28 park guards. Each training will be five days long and include practical experience in the field. In addition, seven technical staff will complete three trainings on the management of data generated by the SMART protocol and other aspects of the program. The goal is to improve patrolling and protection of 3354.25 hectares (8285 acres) within the Conservation Coast and improve data collection and management for the reserves.

At least two patrolling missions per Reserve (total of 10 patrol missions) will be conducted. As a result of the trainings, FUNDAECO will update their Patrolling and Surveillance Strategy for the Conservation Coast. Patrolling reserves is key to ensuring migratory bird habitat remains protected. The patrolling will also help with downloading data from the two Motus towers that ABC will be installing in 2020 with support from the Missouri Department of Conservation. The guards patrolling the two sites where the towers will be installed will receive training from ABC on how to download data from the tower systems and transfer it to ABC for upload into the Bird Studies Canada/Motus database.

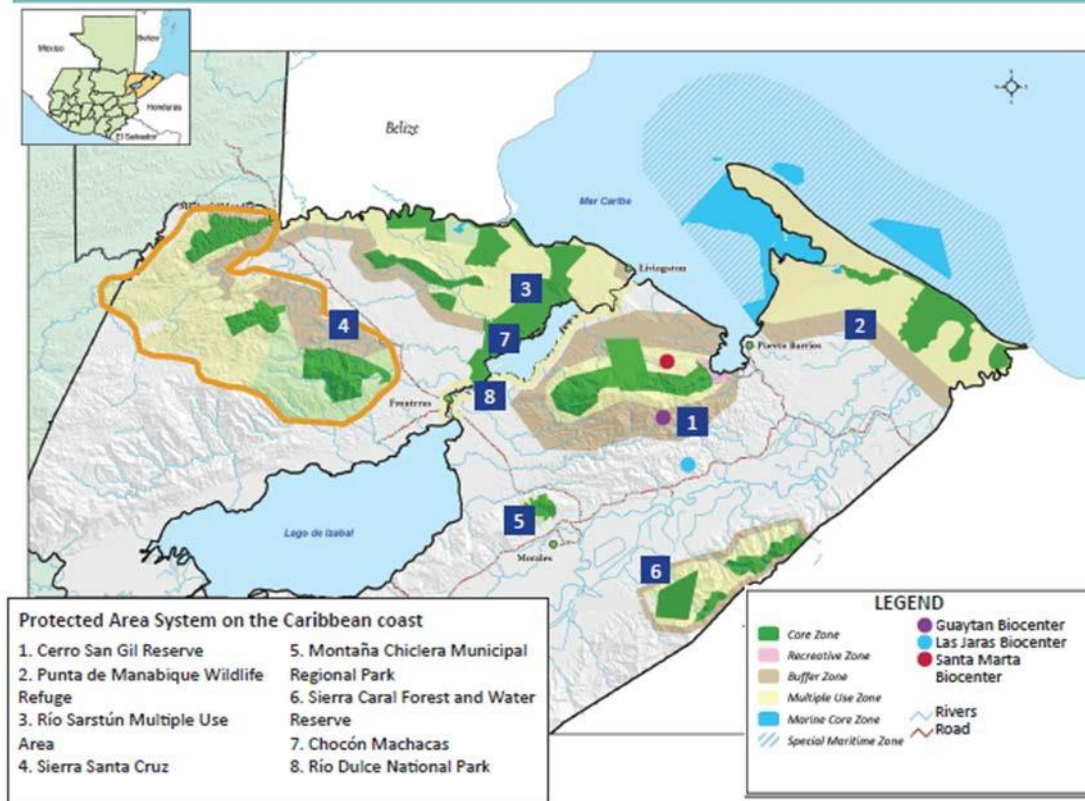
FUNDAECO and ABC will continue our work to advance BioCenters and encourage the use of bird-friendly agroforestry systems throughout the BirdScape. With matching funds, FUNDAECO will be expanding their promotion of tourism opportunities at some of their reserves. The revenue from tourism is a vital source of funds for reserve management and operating support for their organization.

**Budget:** The project needs a total of \$48,103 to implement all project activities but smaller amounts of money can be put towards specific activities.

**Matching funds:** Funds and time invested in agroforestry system implementation, producer outreach and trainings, tourism marketing and management, and staff time and travel.

**Figure 1:** The Conservation Coast Protected Area System, including BioCenter locations. Reserves circled in red will be focus of training and patrol work.

### Conservation Coast - Guatemala





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

**Partners:** Pronatura Noreste (PNE), Universidad Autónoma de Nuevo León (UANL), ABC

**States that have participated to date:** Oklahoma, South Dakota, Nebraska, Iowa, Texas, Kansas

**Overview:** The desert grasslands, located south of the town of Saltillo in northern Mexico, are high elevation (6,000 to 7,000 feet) grasslands and are important to numerous wintering migratory birds as well as threatened resident bird species and a threatened endemic mammal, the Mexican prairie dog. PNE's Chihuahuan Desert Grasslands program goal is to ensure the protection and management of 2,400,000 acres of grassland habitat. ABC is working in partnership with PNE to help them achieve this goal, 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 BirdScape program as the El Tokio BirdScape. Within this GPCA, the goal is to ensure habitat sufficient to support 30% of the global long-billed curlew population, 12% of the mountain plover global population, and to increase the population of the globally endangered Worthen's sparrow by 30 individuals by 2020 (we will have data by the end of the summer that will indicate our progress in achieving this goal).

Within El Tokio, PNE and ABC have supported conservation efforts on more than 150,000 acres of habitat through the creation of private reserves, ejido (community-based) reserves, and conservation agreements that restrict cattle ranching and agriculture practices; and through the installation of erosion control measures and 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, and La Esperanza. PNE and ABC also manage two formal protected areas, Cuatro Gorriones and Loma del Gorrión, which are being managed for the conservation of migratory grassland birds. Additional ejidos in both Nuevo León and San Luis Potosí states are being targeted for future work. These include ejidos San Juan del Prado and Refugio de los Ibarra.

While our work is limited by the staffing capacity of PNE, working with ejidos is a dynamic process and there are opportunities to work with new ejidos, when problems arise with others. As such funding is desired to expand conservation actions to new properties in the region and to conduct habitat improvement activities on properties with whom PNE already has conservation agreements. Specific activities include creation of management plans and grazing recommendations, installation of erosion control systems to help restore grasslands, restoration and creation of water sources, installation of water infrastructure, and installation of fencing for livestock control. In addition to these habitat management activities, PNE and ABC have determined there is a need to identify a larger set of economic opportunities for ejidos and policy solutions to prevent and combat illegal land use and well development.

**Threats:** One of the most significant threats to grassland habitat in El Tokio is overgrazing by cattle and goats. The loss of vegetative cover, in a region with naturally arid soil, has exacerbated drought conditions and is leading to desertification of this ecosystem. Erosion and a proliferation of invasive species are also side effects of overgrazing and contributing to an overall loss of grassland and declines in the populations of migratory birds that depend on this habitat. Another significant threat is the rapid conversion of the land to agriculture across the Chihuahuan Desert Grasslands. In El Tokio, potato production is on the rise and we anticipate will drive

additional loss of grassland. Industrial agriculture of this kind requires intense irrigation and the digging of new wells, which will seriously deplete the underground water supply if it is not managed adequately by the government. Finally, the expansion of the city of Saltillo (population of approximately 700,000) is also beginning to drive land use change away from grassland habitat, threatening grassland bird populations even further.

**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 (LBCU) (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 plovers and Sprague's pipit. Other Species of Conservation Concern include loggerhead shrike, lark bunting, Brewer's and Baird's sparrow 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 endemic to this region.

**Project 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 370,000 acres of grasslands through improved grassland management and erosion control. A key part of achieving this goal is to create a habitat corridor that would connect approximately 15 ejidos and ensure that each has at least some percentage of ejido land dedicated to conservation. We also have the goal of setting legal precedence by harnessing the power of constitution laws of the Mexican government and ensuring the enforcement of existing laws to protect the environment, something that has not been done much in Mexico.

**Previous Southern Wings Successes:** With Southern Wings funding, ABC and PNE have helped restore grasslands on nearly 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. 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. In addition, we have installed erosion control devices, reforested with native junipers, removed invasive species, developing sustainable cattle grazing plans with ejidos, trained local ranchers on best practices, and conducted prescribed burns to help restore habitat.

More recently we have worked with the La Hediondilla, Tanque Nuevo, Matehuapil, San José del Alamito, Puerto México, La Carbonera, and La Esperanza ejidos. ABC has provided match funding for working in other ejidos like La India. PNE works to develop conservation agreements on these properties and implement management activities that help protect and restore portions of these ejidos. A key success at La Hediondilla was the protection of a pond where thousands of LBCU congregate each year. A water management plan which manages the use of water from this pond was implemented, and the pond itself was fenced off for protection. Two livestock management plans were developed for La Carbonera and Puerto México ejidos which will lead to reduce the number of livestock grazing in the ejido and improve the grazing practices. Monitoring has been conducted across multiple ejidos to better understand the distribution of migratory birds and their presence and abundance on different properties. Worthen's sparrows were monitored in 2017. During this monitoring 256 individuals were observed and 33 Worthen's sparrow nests found with 93 egg, of which 17 birds successfully left the nest. Over 55% percent of the nest found, were in La Concha. New monitoring is underway in 2020.

**New Project Activities:** ABC and PNE would like to continue collaborating with ejidos already in the program, as well as expand into additional ejidos, such as Refugio de los Ibarra, and San Juan del Prado, and San Luis Potosi and Zacatecas.

The communities of San José del Alamito and La Esperanza have signed a conservation agreement with PNE and we have begun to create a conservation and livestock management plan to guide sustainable grazing practices. Once these plans are completed, we will provide technical support for their implementation. In the meantime, some immediate actions have been identified that we will work on this coming year, including the removal of invasive species. For the community of La Esperanza there is the potential to convert the agreement into a formal protected area; under the Mexican law it would be considered an “area voluntarily destined for conservation.” This conservation mechanism allows communities to access public funding to implement a conservation plan; the designation can last from 20 to 99 years. To complete the process will require some funding for the application and working with the appropriate government agency.

Now that La Carbonera has a livestock management plans, it is important to review it with the community to make sure they will commit to the grazing plan and work on the infrastructure enhancements (e.g., water and fencing). Additional trips to visit the community will be necessary to guide the installation of new infrastructure.

Excitingly, people from the communities of Refugio de los Ibarra and San Juan del Prado have shown interest in working with us. PNE has conducted preliminary assessments and has identified clear opportunity areas for preventing loss of grassland habitat. Ideally, we can move forward with developing an action plan for these communities and raise funds to start implementing the plans.

While we work to develop new conservation opportunities, it is extremely important that we maintain contact with ejidos that have already signed agreements and have received support. We have identified a need to help CONANP (National Commission of Protected Areas), and the local authorities, manage and enforce the rules of the Llano de Soledad Protected Area, which is made up of multiple ejido reserves with whom PNE has conservation agreements. This year we would like to help PNE raise funds to support a Protected Area Administrator, to ensure regular, onsite supervision of these areas and to deter land speculation and illegal activities.

To avoid excluding some members of ejidos by only focusing on ranching (cattle or goats), PNE and ABC will be working with the Department of Agribusiness of UANL to complete a socioeconomic evaluation to more fully understand the breadth of economic needs and opportunities within the La Carbonera and San José del Alamos ejidos. Resources are required for these workshops and additional sustainable development strategies to be developed.

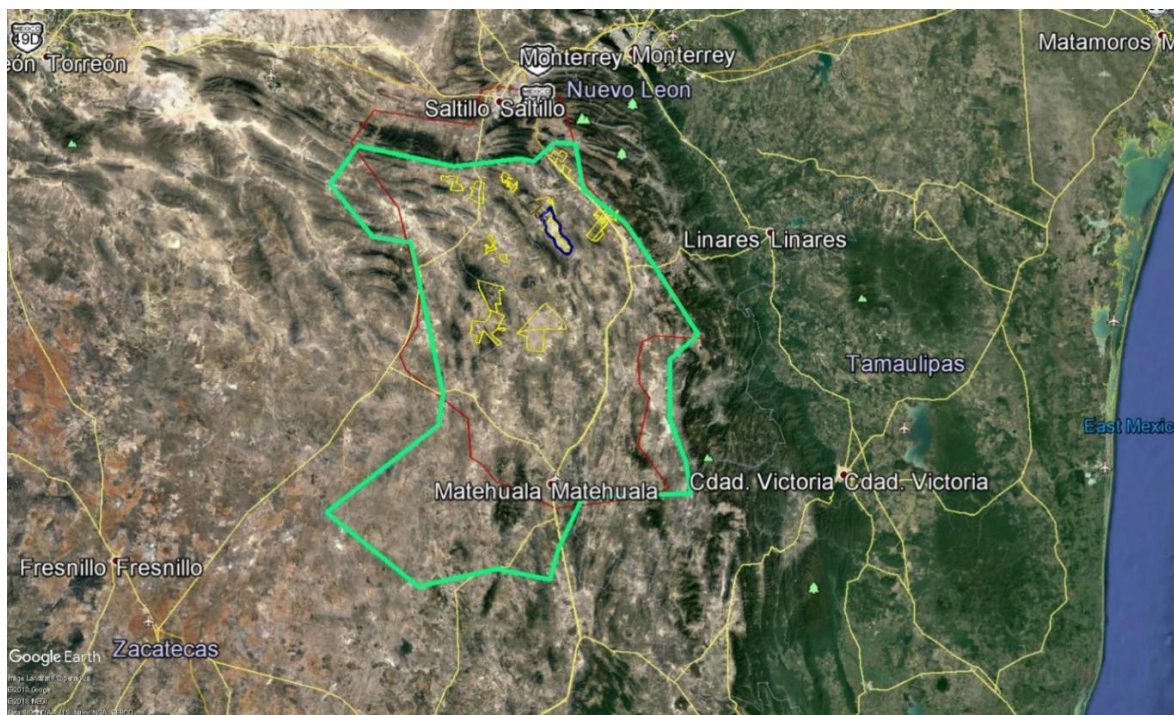
It has become clear that policy solutions are required to prevent land use change. Given some of the recent events—expansion of industrial agriculture in protected areas and illegal digging of wells—we see a need to also take a policy approach, whereby we pursue legal action in the courts to help uphold and enforce state and federal laws. We have already seen the efficacy of such an approach; PNE has had success in limiting the distribution of water rights in Cuatro Ciénegas GPCA until the Mexican National Water Commission (CONAGUA) develops a more effective system for monitoring and managing the aquifers. The main lever of power for PNE in Cuatro Ciénegas was the constitutional right of all Mexicans to have access to clean water. CONAGUA was found to be in violation of that right by granting more permits to drill wells and use waters than the aquifers could sustain. ABC and PNE will use matching funds as to help advance this policy work in El Tokio.

**Budget:** The project needs a total of \$89,050 to implement all project activities but smaller amounts of money can be put towards specific activities.



**Matching Funds:** ABC and PNE have secured funding from NMBCA, the Rio Grande Joint Venture, and CONAFOR. Organizations like the University of Nuevo Leon are providing in-kind investment (e.g., support for monitoring). Ejidos are contributing in-kind match for installation of infrastructure.

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



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

## Partners:



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

**States with strong biological connections:** Seven to 28 species of greatest conservation need 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 70% of their global populations since 1970. The Chihuahuan Desert, more than two-thirds of which lies in Mexico, is a continentally-important wintering area for grassland birds. It supports 90% of migratory species breeding in the western Great Plains, including 27 species recognized as high priorities for conservation, such as Baird's sparrow and chestnut-collared longspur, which winter nowhere else. These birds are sentinels for unsustainable practices that are degrading grasslands and aquifers across the continent, especially in Mexico. Conservation and restoration of winter habitat in northern Mexico is needed to stabilize and recover grassland bird populations and prevent the need for additional listings under the Endangered Species Act. Our collaborative, non-regulatory approach to conserving grassland birds addresses the root cause of habitat loss in northern Mexico – desertification due to unsustainable grazing practices. Using scientific guidance from our peer-reviewed research, we collaborate with landowners to foster planned grazing and grassland restoration to protect and improve habitat for grassland birds while at the same time making each ranch more productive, resilient and resistant to land use change. Less farming conserves aquifers that are being depleted, jeopardizing pastoral economies, rural communities, a shared cultural heritage and way of life spanning generations and nations.

**Birds:** chestnut-collared longspur, vesper sparrow, Brewer's sparrow, savannah sparrow, horned lark, grasshopper sparrow, lark bunting, chipping sparrow, mourning dove, clay-colored sparrow, Baird's sparrow, eastern meadowlark, scaled quail, Cassin's sparrow, Sprague's pipit, loggerhead shrike, Say's phoebe, short-eared owl, northern harrier, Chihuahuan raven, western meadowlark, red-tailed hawk, American kestrel, mountain

bluebird, burrowing owl, long-billed curlew, Aplomado falcon, white-tailed kite, ferruginous hawk, prairie falcon and golden eagle.

**Threats:** Intensive cropland agriculture is rapidly expanding in Janos and the Valles Centrales, threatening to eliminate remaining native valley-bottom grasslands by 2025. Between 2006 and 2011, croplands in Valles Centrales expanded by 34%, destroying 170,000 acres of grasslands and displacing 355,000 grassland birds, including 133,000 wintering chestnut-collared longspurs. Land use change has continued since then, and croplands now occupy more than 63% of former low-slope grasslands in the Valles Centrales. Long-term unsustainable grazing along with increased aridity/drought have reduced rangeland productivity and increased financial strain on ranchers, driving many to sell their land for farming. This phenomenon is also happening across the desert grasslands of northern Mexico.

**Success to Date:** Since 2013, we have enrolled 24 ranches encompassing over 420,000 acres into the SGN and have identified another 105,000 acres we plan to enroll in 2020, along with hundreds of thousands of additional acres of ranchlands with a high value and potential for enrollment. The SGN includes both co-managed ranches, where we develop an integrated wildlife and grazing management plan with each landowner and provide technical and cost-share assistance for implementing the plan, as well as reference ranches that provide models of excellence for range management, and opportunities for outreach, habitat capacity and enhancement, and bird monitoring. We have improved over 100,000 acres of grasslands through these actions, and we are monitoring the response of birds and vegetation annually to assess progress and inform our next steps. This collaborative, win-win and science-based approach has significant proof-of-concept and is ready to be scaled up.

**Goals:**

1. Enroll an additional 100,000 acres in the Chihuahuan Desert into the Sustainable Grazing Network (SGN) in 2020 to reach 500,000 acres.
2. Restore, enhance or improve at least an additional 25,000 acres of desert grasslands in 2020 to reach 125,000 acres.
3. Increase abundance and survival of priority grassland bird species on SGN lands, including Sprague's pipit, Baird's sparrow and chestnut-collared longspur, through habitat restoration.
4. Increase the Aplomado falcon population to at least 12 breeding pairs (11 pairs documented in 2019, up from 5 in 2012) and improve habitat for endangered Pronghorn and other resident grassland species.

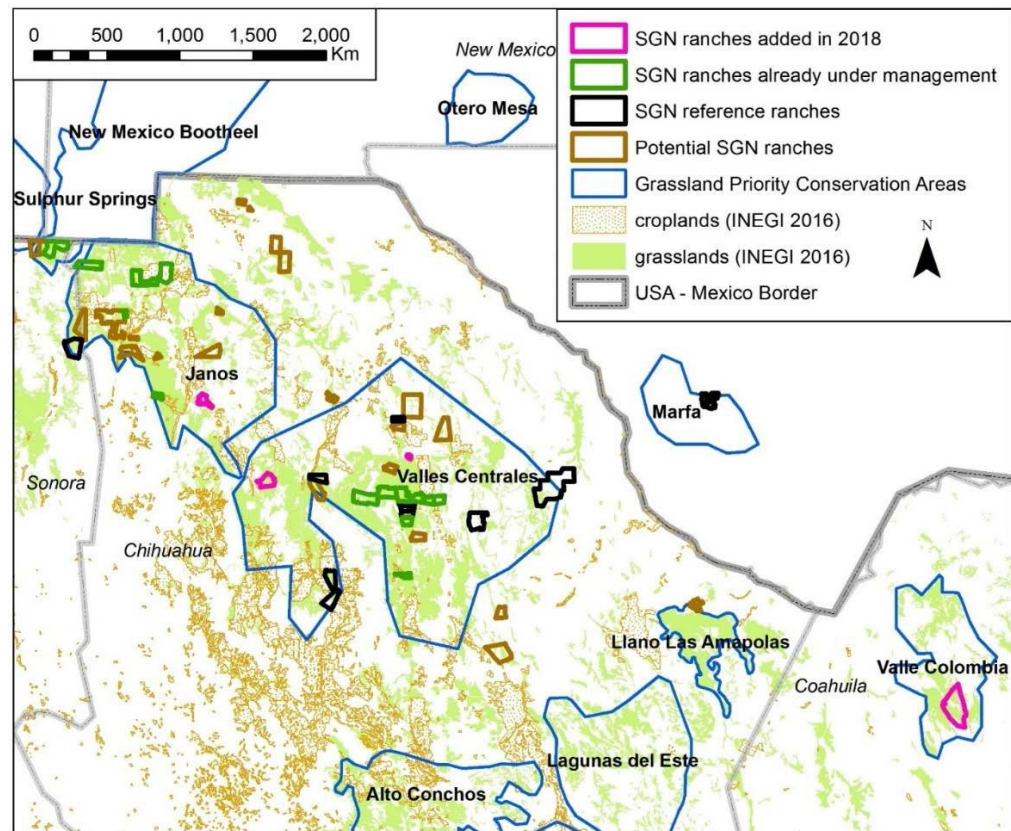
**Current Capacity and Needs:** Keeping ranchers on the land by helping them improve their management, profitability and carrying capacity for birds and other wildlife is the most immediate and cost-effective way to slow and begin to reverse the decline in grassland birds. BCR collaborates closely with IMC-Vida Silvestre, A.C., a Chihuahua-based non-profit with expertise in landowner outreach, grazing management and grassland birds. Thanks to support from our many partners, we currently support four full-time private lands wildlife biologists (PLWBs) at IMC-Vida Silvestre who operate all aspects of the SGN from outreach and landowner relations, to development and implementation of management plans, to bird monitoring and evaluation. Funding is needed to help acquire infrastructure necessary to implement grazing plans and improve grass conditions (i.e., fencing, water lines and storage, etc.), as well as pay for diesel and machinery rental for shrub removal (\$125/acre) and sub-soil aeration (\$130/acre). Funding is also needed to construct water tank escape ladders (2 m tall, \$60/each) and Aplomado Falcon nest platforms (\$250/each), and support PLWB training and landowner outreach events.

**Matching Funds:** This project leverages significant additional investment from Mexican landowners, CONANP, the Carlos Slim Foundation-WWF, Bobolink Foundation, Dixon Water Foundation, Canadian Wildlife Service, Neotropical Migratory Bird Conservation Act, Bureau of Land Management, the U.S. Forest Service International



Program, U.S. states including Montana, Colorado, New Mexico and Arizona, and the City of Fort Collins, Colorado. Every dollar invested leverages at least one additional dollar from other sources.

**Figure 3:** The SGN in 2019



## Protecting stopover and wintering habitat for key priority species of shorebirds and waterbirds in Laguna Madre, Mexico

**Partners:** PNE, CONANP, Rio Grande Joint Venture

**States that have participated to date:** Texas, Pacific Flyway Council

**Overview:** Shorebird and waterbird species are experiencing serious population declines. For some we understand the biggest threats, but for many others we are still identifying important stopover and wintering sites, and developing conservation strategies. For example, the International Reddish Egret Working Group has been active and is currently in the process of updating the rangewide conservation action plan for this species, as well as the development of a conservation business plan for the U.S. The anticipated completion date is April 2020. Also, our partner PNE, along with ABC and the Río Grande Joint Venture led the development of a Reddish Egret Conservation Plan for Mexico that identified five priority regions for that country, including Laguna Madre, in the state of Tamaulipas in northeast Mexico.

Laguna Madre is formed by a barrier island, enclosing a lagoon more than 100 miles long and as wide as 15 miles in some places, although on average it is much narrower. There are many bays, inlets, and sand islands; overall the water is hypersaline, with some bays at times reaching salinity levels that are 150% greater than sea water. Large numbers of shorebirds and ducks winter in the lagoon and on its shores and the barrier island, including hundreds of thousands of redheads—more than two-thirds of the total population. The lagoon and its islands also serve as important breeding, stopover and wintering areas for priority bird species including piping plover, American oystercatcher, red knot, long-billed curlew, reddish egret, snowy and Wilson’s plovers, gull-billed tern, and black skimmer. Conservation action at Laguna Madre has been identified as a priority in the Rio Grande Joint Venture implementation plan, and supports priorities identified in the United States Shorebird Conservation Plan (Brown et al, 2001) and The North American Waterbird Conservation Plan, Version 1 (Kushlan et al, 2002). Our focus in Laguna Madre has been on habitat restoration, biological monitoring, community engagement, and land protection.

**Threats:** The principal threats to shorebirds include shoreline and wetland modification, aquaculture, poor water management policies and enforcement, habitat disturbance from recreation activities and predators, invasive species, development, and climate change. Frequently, sites experience many or all these threats. Drought is a serious issue and is reducing wetland habitat. The loss of mangroves in this ecosystem has led to increased erosion of barrier islands and is decreasing available resting and roosting habitat for migratory water birds. Furthermore, fishers frequent barrier islands and leave dogs there that disturb and prey on birds.

**Birds:** The focal species include: reddish egret, Wilson’s plover, snowy plover, red knot, long-billed curlew, and piping plover. Secondary focal species include: American oystercatcher, sanderling, least tern, black skimmer, western sandpiper, and semipalmated sandpiper, redhead duck.

**Project goals:** Conservation planning with our partners have identified the following objectives for Reddish Egrets in Mexico.

- Improve management and conservation of existing habitats
- Cultivate and empower conservation constituencies



- Engage commercial industries impacting natural resources.
- Strengthen compliance and enforcement of local laws
- Develop and improve environmental, water and wildlife policies
- Improve knowledge of current habitat use and threat status
- Increase partner and stakeholder capacity

Specific conservation objectives in the Laguna Madre de Tamaulipas include:

- Conservation and stabilization of the current populations
- Mapping and better understanding of breeding populations
- Determination of breeding and foraging habitat use
- Better understanding of the hydrological regimes in breeding and foraging areas

**Activities:** In the 240,000-ha Laguna Madre, our conservation priorities include:

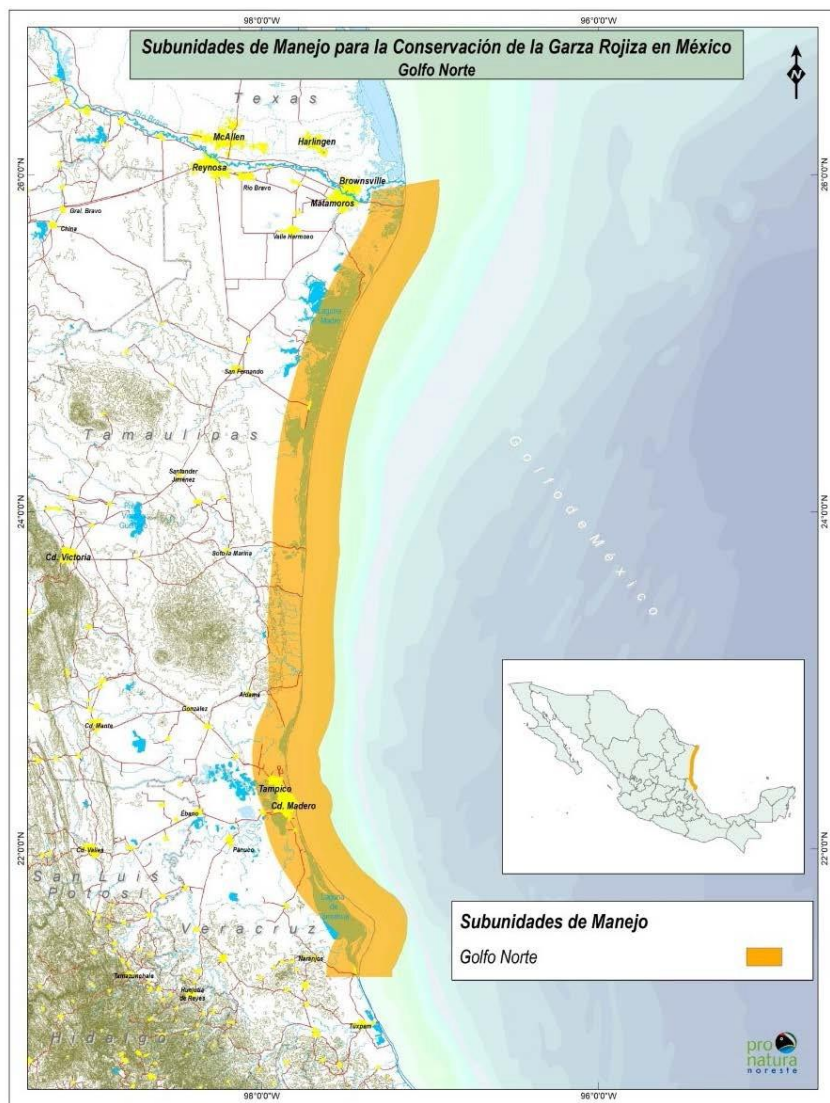
- Mangrove reforestation on key breeding islands
- Coastal dune reforestation on key barrier islands
- Construction and installation of containment barriers
- Breeding season monitoring
- Community outreach and education –fishermen, school children, etc

**Previous Southern Wings Successes:** In 2013 and 2017, Southern Wings invested in the Laguna Madre project, funding mangrove reforestation that resulted in the planting of nearly 21,000 mangrove saplings over 75.6 acres. Previously, with funding from NFWF, ABC and PNE created two new conservation agreements on private lands totaling over 10,000 acres, began a program to control feral animals on islands, improved fencing to reduce cattle and other agricultural animals from entering sensitive areas of Laguna Madre, conducted focal species monitoring, began mangrove restoration, and protected key nesting and wintering sites. In 2018, Southern Wings funding went to advancing the development of range-wide conservation plan for the Reddish Egret and the development of a Mexico specific conservation plan.

**Budget:** The project needs a total of \$40,500 to implement all project activities but smaller amounts of money can be put towards specific activities.

**Matching Funds** – In-kind support from ABC and PNE.

Figure 4: Laguna Madre, Mexico



## Migratory Bird Wintering Grounds Conservation in Nicaragua and Honduras

### **Current, Past and Potential Partners:**

**Nicaragua:** El Jaguar Private Wildlife Refuge, ABC, the Red de las Reservas Silvestres Privadas de Nicaragua (RSP), Indiana University of Pennsylvania (IUP), Audubon North Carolina, North Carolina Museum of Natural Sciences, El Centro de Entendimiento con la Naturaleza (CEN), Cornell Lab of Ornithology, MARENA, URACCAN, SELVA, WCS, Paso Pacifico

**Honduras:** ABC, WCS, La Asociación de Investigación para el Desarrollo Ecológico y Socio Económico (ASIDE), Mesoamerican Development Institute (MDI); U.S. Forest Service; UMASS - Lowell; Universidad Nacional de Agricultura de Honduras (UNA); Instituto Nacional de Conservación y Desarrollo Forestal, Áreas Protegidas y Vida Silvestre (ICF), CATIE, Mi Ambiente

**States that have participated to date:** Missouri, Indiana, Pennsylvania

**Overview:** The cloud forests of the northern Nicaragua highlands are fragmented by agriculture, including sun-coffee production, potatoes, cabbage and other annual crops. These highlands, located in the Departments of Jinotega, Matagalpa and Atlantico Norte, are important wintering grounds for species such as the golden-winged warbler (GWWA) and provide stopover habitat for bay-breasted and Canada warblers, plus many other neotropical migrants. Almost all of the GWWA Focal Areas identified for Nicaragua are in this region. ABC has established two BirdScapes in northern Nicaragua (Bosawas BirdScape and Northern Highlands BirdScape). We work with a broad range of partners to identify conservation opportunities, develop creative solutions, protect existing forest, and improve habitat connectivity through native species reforestation and agroforestry projects.

In Honduras, our work is currently focused on the eastern slope of the Sierra de Agalta National Park and the larger protected areas of the Río Platano and Tawahka Biosphere Reserves and La Muralla National Park. Previously, we worked in the Agalta Valley and the Yoro Biological Corridor, which connects four national protected areas (Pico Pijol, Maria Auxiliadora Central National Park, Montaña de Yoro National Park, and Texiguat National Wildlife Refuge). However, due to capacity and status of partner work in these locations, we are not including activities in these locations in this proposal.

Combined, the Sierra de Agalta National Park, and the Río Platano and Tawahka Biosphere Reserves in Honduras, and the Bosawas Biosphere Reserve in Nicaragua, which includes Saslaya National Park, encompass an area of 19,000 square kilometers and is the largest contiguous parcel of forest in Central America. It is an extremely important area for wintering migratory birds, specifically wood thrush. The eastern slope of Sierra de Agalta National Park is also a GWWA Focal Area. The goal is to decrease deforestation (especially in core zones of these protected areas) by providing technical support to community groups—several of which are indigenous—in order to improve cattle management and production practices for cacao and coffee and decrease pressure of the protected areas.

**Threats:** The most common threat in both countries are land use practices that are not compatible with forest preservation. In Bosawas there is a growing issue of migration to the region from other parts of the country, and even the rest of Central America, leading to encroachment on indigenous lands. There is a lack of understanding regarding land tenure in the region and indigenous communities lack the resources necessary to defend their rights and prevent the incursions. It is leading to conflict as well as deforestation as homesteads and livelihoods are carved out. The migration to Bosawas, and the autonomous region of Nicaragua in general, is spurred by the high price of land elsewhere in the country and the knowledge that law enforcement is limited in this region. Speculators are also taking advantage of the situation, facilitating land grabs that lead to additional forest

destruction and new settlements. Similar displacement is occurring in Honduras; land speculators are taking advantage of the economic crisis and the desire of Honduras to leave their homes to pursue better opportunities elsewhere.

**Birds:** There is considerable overlap in species between our projects in Honduras and Nicaragua. However, we list each country separately.

**In Honduras,** our species of principal interest are wood thrush, GWWA, and golden-cheeked warbler. Other migratory bird species of interest that are found in our focal regions include magnolia Warbler, blue-winged warbler, Kentucky warbler, worm-eating warbler, Louisiana waterthrush, eastern wood-pewee, yellow-throated vireo and white-eyed vireo. The endemic and endangered Honduran emerald is present within a portion of the BirdScapes targeted in this project.

**In Nicaragua,** more than 25 neotropical migrants winter in these BirdScapes. This includes: GWWA, wood thrush, yellow-breasted chat, Wilson's warbler, hooded warbler, MacGillivray's warbler, mourning warbler, Kentucky warbler, Louisiana waterthrush, northern waterthrush, ovenbird, worm-eating warbler, black-and-white warbler, black-throated green warbler, chestnut-sided warbler, cedar waxwing, blue-headed vireo, alder flycatcher, yellow-bellied flycatcher, eastern wood-pewee, yellow-throated vireo, northern parula, ruby-throated hummingbird, and broad-winged hawk. More than 15 other species also use this area as a stop-over on their annual migratory cycle including Canada warbler, bay-breasted warbler, and yellow-billed cuckoo.

**Overall Project goal:** The long-term goal is to slow the rate of deforestation in Honduras and Nicaragua. We aim to do this by working landowners and communities to adopt land use practices that are compatible with forest preservation and helping indigenous communities learn how to conduct safe and effective law enforcement patrols, which is helping them organize and better protect their land.

#### **Southern Wings Successes to Date:**

**In Honduras,** with Southern Wings funding as well as matching funds, over the past two years we have conducted outreach to nine communities around the Sierra de Agalta National Park that has led to seven communities beginning to implement reforestation activities on 32 properties. A total of 89.18 ha of coffee plantations have been improved by the planting of disease-resistant shade varieties of coffee and 1,500 native trees. Additionally, nine communities signed conservation agreements that secured commitments to protect 1,734 ha of land within the buffer zone of Sierra de Agalta.

In the Tawakha and Rio Platano Biosphere Reserves, similar agreements have been signed by 64 landowners who are actively reducing the impact of their cattle ranching through implementation of silvopasture techniques, tree planting, and the creation of feed banks and rotational grazing systems. Rotational grazing helps reduce the amount of land needed for cattle and allows natural regeneration to occur where cows previously fed. We have also identified cacao producers who could be part of conservation activities in the region moving forward.

In 2017, ABC and WCS organized and conducted a special patrolling operation with the Ministry of Environment, the University of the Autonomous Caribbean Region (URACCAN), and several community members in the regions of Saslaya National Park and the Bosawas Biosphere Reserve. These patrols utilize a guard patrol protocol developed by WCS called SMART©. In November of 2018, similar special patrols were conducted in the 2800 km<sup>2</sup> Indigenous Territories of Alto Wangky and Bocay using the SMART protocol. A small number of invaders were apprehended and detained and a much larger number of squatters in indigenous conservation zones were identified. Satisfaction was high among the national police, and the indigenous for these operations.

In previous years of this project in the Agalta Valley, we established a native plant nursery in San Esteban to raise and distribute woody plant seedlings to local ranchers and the El Ciruelo Wildlife Refuge to help restore dry forest. The dry forest proved important to both wood thrush, one of the migrants with the highest abundance in the area, and female GWWAs. A total of 4,900 trees were planted and best management practices were implemented on three ranches across 23 acres. Our partner, ASIDE, remains in contact with the ranchers and continues to help manage El Ciruelo, a municipal reserve.

As part of our work in 2015 and 2016, we developed partnerships with RSP and CEN within the Peñas Blancas Focal Area; both partners that can help implement conservation in multiple GWWA Focal Areas. In 2017, ABC helped expand production of a tree nursery operated by CEN leading to a total of 17,800 trees planted on 19 farms, across a total 54.34 acres in the Peñas Blancas Focal Area.

### **New Activities:**

#### **HONDURAS**

**In the Tawahka and Río Platano Biosphere Reserves**, we want to explore the possibility of creating an agroforestry corridor along the Patuca River. There is an existing market for cacao from this region, and we see the potential to engage growers in more sustainable methods that would ultimately help them increase the quality of their cacao. To advance this idea, we will identify and map cacao farms along the Patuca River and complete an analysis of the existing and potential economic impact of cacao, as well as “map” the existing cacao market chain. We will begin outreach to cacao growers and identify interested parties. We will work with cacao technicians to visit and evaluate as many farms as possible as to determine current condition, production volumes, weaknesses, and opportunities.

**In the Sierra de Agalta National Park (Sierra de Agalta BirdScape)**, there are nine coffee growing communities around the national park with whom we are working to improve or re-establish at least 400 acres of shade coffee production. We have been working to remove old non-productive coffee bushes, replace them with disease-resistant coffee bushes (specifically ones resistant to the “roya” fungus) and plant native trees for shade within the plantations. In return for this support, communities will agree to protect areas of intact forest within Sierra de Agalta National Park and its buffer zone. In addition, due to the extreme lack of resources from the national government, there are few park guards in the region. Community members have a vested interest in ensuring the integrity of the park and its environs, particularly for water security. Over the next year, we will be training community members in the WCS SMART® protocol to help conduct patrols and report infractions. Specifically, we would like to:

- Hire a technical coordinator to oversee communication with coffee producers in the Sierra de Agalta BirdScape
- Maintain a tree nursery and facilitate the planting of 3,000 native hardwood species on coffee properties
- Provide other materials needed for implementing improved production techniques (e.g., fencing) to producers who enter into conservation agreements
- Provide training local coffee cooperatives and producers to work with local Municipalities and the ICF in protected area management using the SMART® protocol; and training them the use of GPS for the purpose of mapping incursions discovered while on patrol.

**In La Muralla National Park**, a GWWA and GCWA Focal Area, ABC has identified multiple needs and opportunities around this important national park co-managed by ABC’s partner, ASIDE. First, the Park’s pine forests have been destroyed by pine beetles and then ravaged by fires. With the loss of trees, access to areas within the Park is not as difficult, making it more susceptible to incursions. Since the Park is currently poorly



protected, we are seeking funds to support park guards and conduct patrol operations. We would also like to start pine reforestation over 400 ha (988 acres).

Second, the “roya” coffee disease has impacted this region significantly and many people are abandoning coffee. Since shade-grown coffee systems can provide high quality habitat for migrants, we want to replicate in Muralla what we are doing in Sierra de Agalta. We would like to hold workshops, identify interested coffee growers, and provide assistance in planting roya-resistant varieties and native trees for reforestation and shade. We would also like to enter into similar Conservation Agreements, with an initial target of protecting 20 ha of forest. Finally, a second access point to the park’s east side is completely vulnerable due to the lack of park guard infrastructure and capacity. Visitation to this part of the park is desired by birds for opportunities to see the rare and vulnerable Ocellated Quail. As such infrastructure on this side of the park would also facilitate opportunities for promoting bird tourism and collecting funds from visitors to maintain protection and tourism facilities.

## **NICARAGUA**

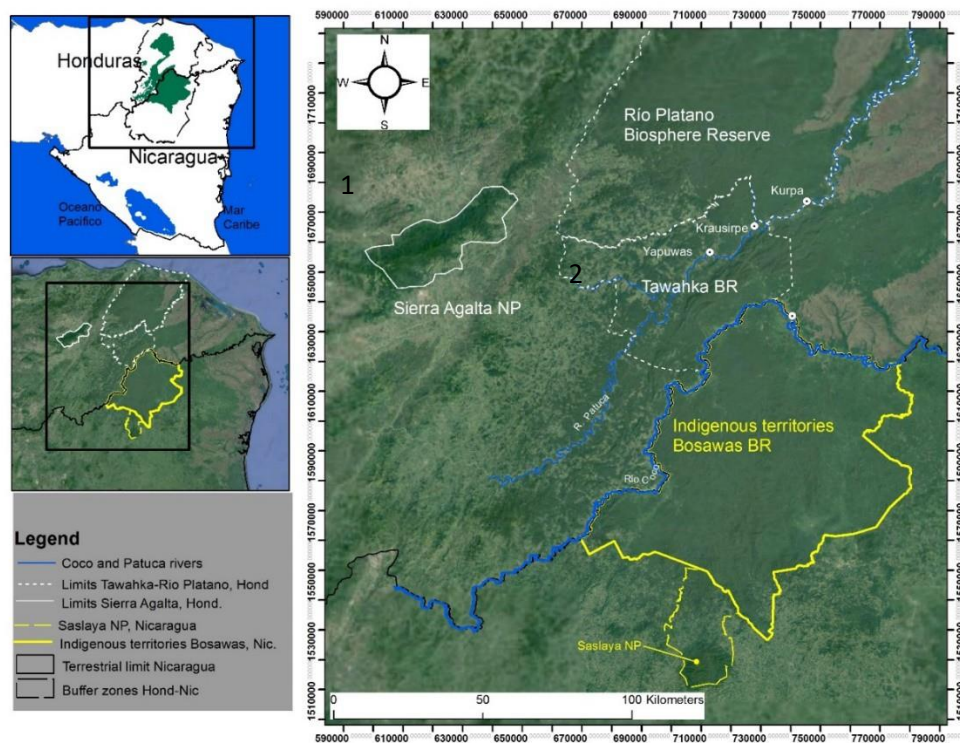
The primary focus in Nicaragua is improving cacao production techniques in the Bosawas Biosphere Reserve and around Saslaya National Park. Socio-economic studies in the region demonstrate a clear preference by landholders for growing cacao over producing cattle. However, many cacao growers are new to the crop and lack experience, resulting in poor plantation management. Our goal is to support these growers; if they can receive training and become solvent cacao producers, this could have significant benefits for migratory birds. To achieve this goal, we have an opportunity to partner with COPESIUNA, one of the largest cacao cooperatives in the region. They are well-organized and primarily export their product to a company called Rittersport in Germany. COPESIUNA has five trained cacao specialists who can provide technical assistance to the cacao growers that are struggling to produce enough high quality product to earn an income. Over the next two years our objectives are to:

- Partner with COPESIUNA and provide support for cacao technicians to work with producers and communities most in need of assistance.
- Host community cacao workshops to promote best practices
- Provide support to producers looking to become certified organic.
- Help increase the supply of cacao plants that are best suited to the climate of this region and that are also disease-resistant.

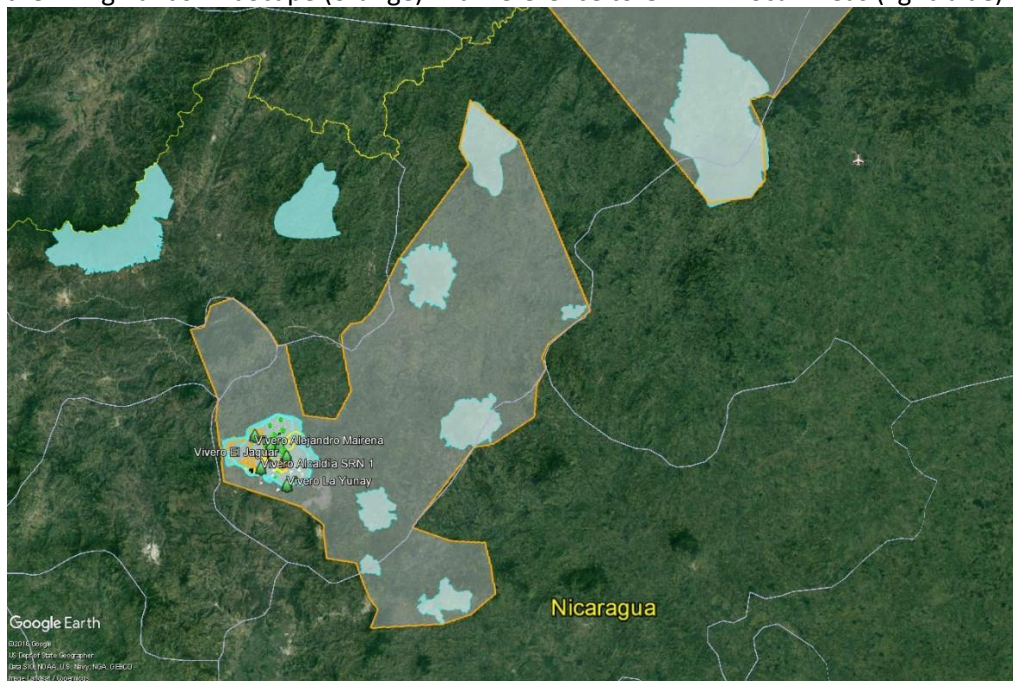
Over the next two years we also plan to develop a conservation strategy for the Northern Highlands BirdScape. Our focus will be on convening partners and participants of past projects to discuss needs and opportunities moving forward. As we have been doing in other coffee- and cacao-growing regions in which we work, we would like to complete a market study for cacao and coffee in the Northern Highlands BirdScape. Information from the study will help inform our conservation strategy, particularly how to make it more financially attractive to farmers to implement sustainability measures. Finally, at El Jaguar, we hope to be able to continue to deploy more nanotags on migratory birds that can be read by Motus tower stations. This will help us learn more about the birds that overwinter at El Jaguar, and where they go to breed and the pathway they take to get there. Every year more Motus towers are added to the system in the Americas, but they are only useful if enough birds have tags.

**Budget:** The project needs a total of \$176,928 to implement all project activities but smaller amounts of money can be put towards specific activities.

**Figure 5: The bi-national region, encompassing several areas in Nicaragua and Honduras.**



**Figure 6: Northern Highlands BirdScape (orange) with reference to GWWA Focal Areas (light blue)**





**Figure 7:** Existing infrastructure for growing trees and plants at La Muralla National Park



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

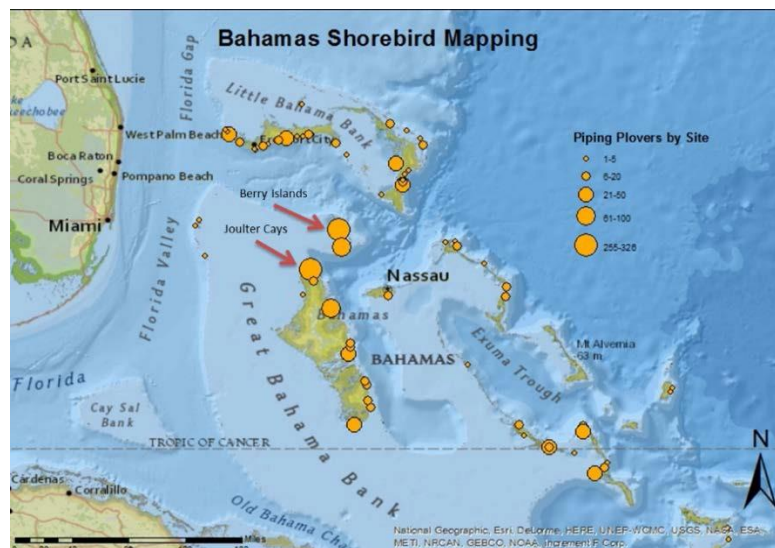
**Partners:** National Audubon Society, Bahamas National Trust (BNT), Virginia Tech, Environment and Climate Change Canada, Foundations, Private Donors

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

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

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

The importance of The Bahamas for wintering piping plovers and other declining shorebirds was first understood in 2006, when Audubon scientists discovered high numbers of the Atlantic breeding population spending the



winter months in remote parts of the archipelago. Now, Audubon, The BNT and other partners are taking ambitious steps to conserve and protect several of the highest priority sites across the Bahamas archipelago that are necessary to ensure the survival of these wintering shorebirds. By protecting these habitats, we are also helping many other vulnerable species, including the red knot (*rufa*) the semipalmated sandpiper, reddish egret—and supporting important commercial and sport fish nurseries, coral reefs, eel grass beds and mangroves necessary for sustainable fisheries and traditional economic opportunities for local communities.

Audubon and BNT are close to achieving our 2020 goal that Bahamian Protected Areas support at least 20% of the Atlantic piping plover population (announcement for new MPAs are expected in 2020). Further, significant capacity has been developed and many of the islands are aware of and take actions to support piping plover conservation. Over the next five years, we will consolidate our efforts and double down on a few critical sites, strengthening community support for conservation.

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

1. Long term protection of Bahamas wintering habitats that support at least 20% of the Atlantic breeding population of piping plover, 32 other important shorebird species and local marine and terrestrial wildlife. By 2025, effective management established at new MPAs that are critical for piping plover survival.
2. Communities actively engaged in conserving important migratory and endemic bird species on all major islands of the Bahamas. By 2025, community conservation and protection efforts solidified at critical sites that are not formally protected.
3. Local conservation capacity is improved when Audubon shares our science, policy and organizational expertise with BNT and other organizations.
4. By 2024, update Key Biodiversity Area (KBA)/ Important Bird & Biodiversity Area (IBA) portfolio for coastal habitats associated with piping plover and shorebird habitat across The Bahamas.

**Activities:** To achieve our goals over the next 12 months to advance our understanding, which will lead to future land protection and on-the-ground community habitat management actions, we will leverage investments to:

- Complete the 2020-21 International Plover Census. (\$5,000) We will engage Bahamian researchers and community scientists, alongside volunteer biologists and community scientists from the U.S. and Canada, to complete the Census to assess wintering population and generate information that can be used to update KBA/IBA designations across The Bahamas.
- At critical sites (> 1% Atlantic piping plover pop.) that are not protected, we will work with local stakeholders to develop community conservation initiatives including nomination of sites as Western Hemisphere Shorebird Reserves, creating signage, community education, community science efforts and building local government support to reduce threats. (\$8,000)
- Work with management agencies to support development of management plans for priority protected areas and continued capacity development.



### From Discovery to Protection

**2006:** Audubon discovers over 400 piping plovers wintering on several islands.

**2010:** 57 plovers are banded on three islands in The Bahamas.

**2011:** 41 banded plovers are found along the Atlantic coast, from North Carolina to Nova Scotia.

**2011:** 1,066 piping plovers are found on 14 Bahamas islands by 31 researchers from 10 organizations

**2012:** Audubon focuses efforts and discovers 708 birds or 20% of the Atlantic piping plovers wintering on just 3 islands Andros, the Joulter Cays and The Barry Islands.

**2013:** Audubon and BNT submit a proposal to the Bahamian government for establishment of a 92,000 acre National Park on the Joulter Cays.

**2015:** The Bahamian Government declared the 92,000 acre Joulter Cays a National Park protecting winter habitat for over 10% of the Atlantic breeding population of piping plover.

**2016:** International Plover Census records 1404 piping plovers in the Bahamas and adds important sites in Turks and Caicos.

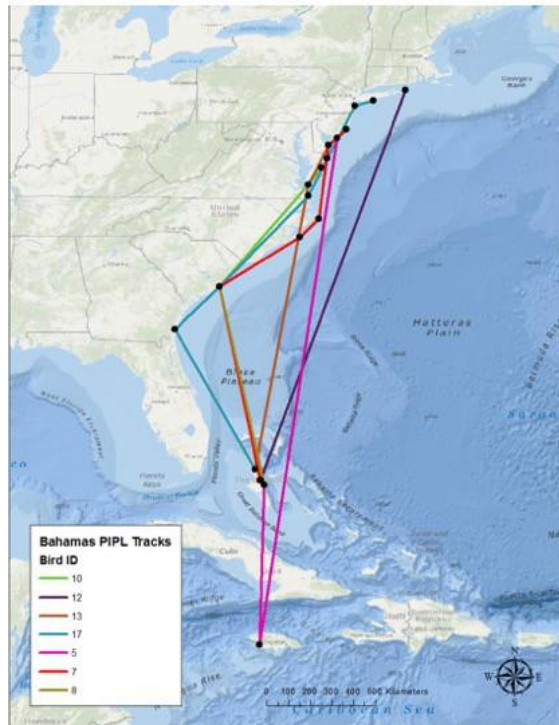
**2017:** First Motus Tracking efforts from the Bahamas maps initial migration pathways.

**2018:** Critical shorebird and seabird sites included in recommendations to Bahamian Government for new protections, including Berry Islands IBA (7% PIPL pop) and Long Island.



**Budget: (Match: Disney Conservation Fund (\$15,000)):** The project needs a total of \$14,950 to implement all project activities but smaller amounts of money can be put towards specific activities.

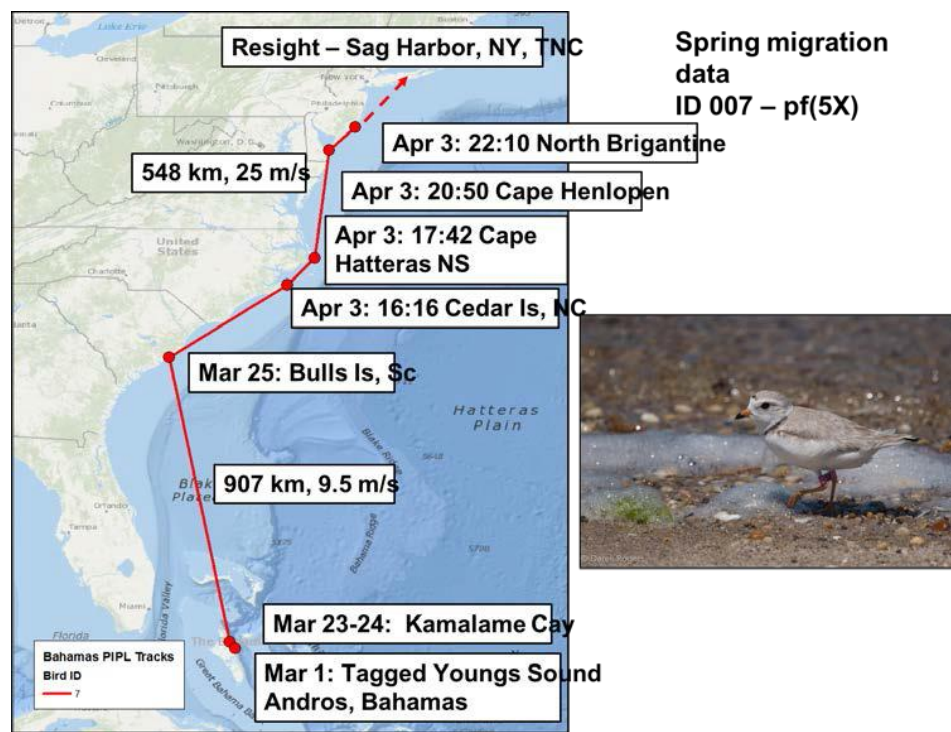
**Figure 8:** Motus Wildlife Tracking of Northern Migration Piping Plovers



**Spring migration data**

- 10 tags deployed in Bahamas
- 7 tags w/spring migration data
- Duration (days):
  - Mean 40 (SD 40; 19-21)
- Distance (km, Euclidean):
  - Mean 1862 (SD 649, 932-3087)

**Figure 9: Spring Migration Data**



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

**Partners:** Organización Vida Silvestre A.C (OVIS), Ejidos (local communities), CONANP, Comisión Nacional Forestal (CONAFOR), Arizona Game and Fish Department (AGFD), Unidad Forestal Galván, Asociación de Silvicultores de Guadalupe y Calvo, San Diego Zoo Global (SDZG), U.S. Fish and Wildlife Service (USFWS, Neotropical Migratory Bird Conservation Act), 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 best management into forest management plans. 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 eminent. 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) (an endemic species) and Neotropical migrant populations dependent on old-growth forests.

This project implements strategies outlined in the Partners in Flight *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:** The birds of the SMO are seriously threatened from the loss and degradation of habitat as a result of poor forest management policies over more than a hundred years, as well as from fire suppression and a higher incidence of catastrophic fires. Large scale timber harvest has been practiced for many decades without considering the need to also manage for biodiversity. These main threats to forests have caused the Imperial Woodpecker to be considered extinct and for two other species endemic to the Sierra Madre to be critically endangered (Sierra Madre sparrow and the TBPA). Forest exploitation has eliminated old-growth forests (it's estimated that less than 1% remains of their original distribution) affecting whole groups of birds that depend on mature forests to provide cavities for nesting and shelter, 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 United States 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.

**Birds:** The rugged Sierra Madre harbors a system of canyons dominated by temperate forests in the higher areas and jungles in the lower areas. As a result, the footprint of the project can be felt over an extensive area of

critical habitat for more than 300 bird species, 45% of which are Neotropical. At least 19 species in the region are considered species of common concern (USFWS 2008) and more than 30 species are listed as high priority by Partners in Flight, 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.

**General Strategies:** The project focuses on conserving habitat and implementing sustainable forest management practices that benefit the SMO. Also, in partnership with AGFD, the project will implement habitat conservation actions and management of breeding populations of TBPA in the protected natural areas of Tutuaca, Papigochi, Campo Verde, Mesa de Guacamayas and Madera (Figure 14). The project will also use new information on TBPA wintering areas (obtained from new satellite tracking of migrating TBPA) to begin conservation planning of wintering habitats.

**Project Goal:** Integrate habitat needs of Neotropical Migratory Birds (NMBs) and the TBPA 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.

**Southern Wings Successes 2019:** In coordination with CONANP, CONAFOR, Forestry Units and Ejidos of the Sierra Tarahumara in 2019, the following achievements were accomplished.

#### **Habitat conservation and implementation of Forest Best Management Practices**

- Promoted the creation of the Advisory Council of the APFF Tutuaca protected area and OVIS is currently the chair. Holds the NGO representation on the Advisory Council of the Janos Biosphere Reserve (which includes Mesa de Guacamayas, the northernmost nesting site of the TBPA).
- Analyzed (for conservation planning) land tenure, land use, vegetation cover and other thematic layers for an area of more than 4 million hectares of the Sierra Tarahumara.
- Reviewed and modified 96 Forest Harvest Plans in the Sierra Tarahumara and segregated 152,000 hectares of forest areas for conservation, through Segregation of Forest Use (Figure 13).
- Established a biological corridor by managing the payment of environmental services for 56 properties totaling of 69,000 ha (Figure 13).
- Promoted the establishment of 6 properties as Voluntary Conservation Areas (Alicitos, Mulato, Rounded, Cathedral and Pinitos) for a total of 12,569 ha (Figure 13).
- Conditioned water sources to ensure water availability for TBPA in Tutuaca and Campo Verde, and documented (via video) the successful use of one of these drinking sites.
- Maintained 20 existing TBPA artificial nests in Tutuaca and Papigochic.
- Manufactured and installed 25 new artificial nests for TBPA in Tutuaca, Papigochic and Mohinora.
- Installed 4 km of barbed wire fence to segregate TBPA nesting and feeding sites in Papigochic and Mohinora, resulting in the protection of 80 hectares of habitat.

#### **Habitat restoration**

- Restored 978 ha through reforestation with a plant density of 968,050 (990 plants per hectare that included pines (*Pinus duranguensis*, *P. strabiforme*) and pinabetses (*Pseudotsuga* sp y *Abies* sp) and with soil conservation works such as stone barriers (84,000 m<sup>3</sup>) and dead plant material (17,500 linear meters), within 14 polygons of 4 properties (El Nopal, San Simón, El Tule and Mohinora). In order to avoid soil loss and capture rainwater to favor reforestation

#### **TBPA population censuses**

- Estimated a total population of 1050 individuals through a simultaneous census conducted across three protected areas (two other areas were not surveyed due to accessibility issues). Additionally, we recorded 158 breeding pairs, of which 90 were confirmed as active pairs at nests.

#### **Monitoring of TBPA breeding populations**

- Monitored 20 nests, documenting annual productivity of 59 eggs, of which 52 hatched and 30 fledged.
- Documented failure of 20 nests, with 15 of these failed nests attributed to predation.
- Deployed 10 satellite transmitters on adults and juveniles which have begun to reveal migration routes (Figure 12) and priority wintering sites (such as Cerro Mohinora).

#### **Identification and evaluation of TBPA nest predation**

- Used 31 video cameras at nest trees to record any predation events. Cameras documented 15 predation events by bob cats, with an estimated mortality of 11 adults and 22 chicks across three breeding areas.
- Implemented mitigation measures to reduce predation events by installing metal barriers at 22 nest trees and 7 adjacent trees.

#### **Training on Forest Best Management Practices**

- Created two field guides, one focused on other wildlife associated with TBPA habitat and the other one on other birds occupying these same old-growth forests (Figure 11).
- Developed a manual (draft) of best forest management practices for the conservation of migratory Neotropical bird populations (Figure 10).
- Implemented two workshops to inform and train 60 decision makers and forest managers in the implementation of best management practices for forest bird conservation.

**Specific Activities planned for 2020:** Organización Vida Silvestre A.C. will implement the following conservation actions;

#### **Monitor populations of Neotropical migratory species and TBPAs.**

- Conduct point counts to monitor migrant and resident species
- Survey TBPA populations and monitor breeding colonies

#### **Implement habitat conservation measures to protect, restore and manage mixed coniferous forests.**

- Develop educational/outreach material to raise awareness among key audiences of the SMO.
- Complete the Manual of Forest Best Management Practices for the Conservation of NMBs.
- Work with foresters and other partners to continue implementing Forest Best Management Practices to obtain more sustainable forests that maintain biodiversity values. The work will focus where it is considered most appropriate, considering the interests of partners and where opportunities for collaboration occur (Figure 14).
- Install 2 km of barbed wire fencing to complete exclusion areas in Cerro Mohinora.

#### **Manage breeding populations of TBPAs**

- Monitor and manage accessible nests to increase reproductive success.
- Continue research to identify potential predators and develop approaches to mitigating threat.
- Continue research at understanding migratory patterns of TBPA populations through use of satellite transmitters. Work will involve deployment of additional transmitters.
- Maintain existing or install new artificial nests at Cerro Mohinora and Mesa de Guacamayas.
- Install depredation barriers on nest trees to reduce mortality of breeding pairs and fledglings.



- Maintain natural water sources by appropriate conditioning of drinking sites.
- Protect food banks (nectar, seeds etc) to enhance foraging habitat.

#### Verification and characterization TBPA wintering areas

- Update breeding habitat map including new migration routes and wintering habitat.
- Integrate new distribution information (obtained from satellite telemetry work) into a conservation plan that encapsulates the network of newly discovered migration/wintering areas and provide this CONANP to inform conservation planning and management.
- Disseminate information on migration and wintering areas to key decision makers and conservationists through workshop(s) and other communication means.

**Budget:** Arizona will provide \$USD 15,000. Partners match funds \$66,000 (San Diego Zoo \$36,000 + OVIS \$30,000).

Objective/activity	AGFD	San Diego Zoo	OVIS	TOTAL
<b>Monitor populations of Neotropical migratory species and TBPAs.</b>				
Conduct point counts to monitor migrant and resident species	\$750		\$1,500	\$2,250
Survey TBPA populations and monitor breeding colonies	\$750		\$3,000	\$3,750
<b>Implement habitat conservation measures to protect, restore and manage mixed coniferous forests.</b>				
Develop educational/outreach material to raise awareness among key audiences of the SMO	\$1,000		\$500	\$1,500
Complete the Manual of Forest Best Management Practices for the Conservation of Neotropical Migratory Birds	\$500		\$500	\$1,000
Work with foresters and other partners to continue implementing Forest Best Management Practices to obtain more sustainable forests that maintain biodiversity values.	\$1,500		\$3,000	\$4,500
<b>Manage breeding populations of TBPAs</b>				
Maintain existing or install new artificial nests (10) at Cerro Mohinora and Mesa de Guacamayas	\$1,500		\$1,500	\$3,000
Install depredation barriers (metal devices) on nest trees to reduce mortality of breeding pairs and fledglings.	\$1,500		\$4,000	\$5,500
Maintain natural water sources by appropriate conditioning of drinking sites			\$1,000	\$1,000
Monitor and manage nests to increase reproductive success.	\$1,500		\$3,000	\$4,500
Continue research (using camera traps) to identify potential predators and develop approaches to mitigating threat	\$2,000		\$3,000	\$5,000
Continue research at understanding migratory patterns of TBPA populations through use of satellite transmitters.	\$3,000		\$4,000	\$7,000
Install satellite radio transmitters (10 units X\$3,000 each = \$30,000, 000 and 10 X\$600 annual signal cost )		\$36,000		\$36,000
<b>Fieldwork to verify and characterize wintering sites.</b>				
Update GIS map of breeding habitat, and newly discovered migration routes and wintering habitat.	\$1,000		\$2,000	\$3,000
Integrate new migration/wintering information into a conservation plan and provide this document to CONANP			\$2,500	\$2,500
Disseminate information on migration and wintering areas to key decision makers			\$500	\$500
<b>Total</b>	<b>\$15,000</b>	<b>\$36,000</b>	<b>\$30,000</b>	<b>\$81,000</b>

**Figure 10:** Best Management Practices manual for conserving SMO habitats to benefit Neotropical migratory species and TBPAs (draft)



**CONANP**  
COMISIÓN NACIONAL  
DE ÁREAS NATURALES  
PROTEGIDAS



## **Mejores Prácticas Forestales Para la Conservación de la Biodiversidad en la Sierra Madre Occidental**



**Figure 11:** Outreach material to raise awareness on the species of the Sierra Madre Occidental.







**Cotorra Argentina**  
*Myiopsitta monachus*

OTPS: **Amenaza I**  
Especie exótica  
**INVASORA**

Mediana  
(29 cm)

a. Frente y pecho gris  
b. Cola larga y puntiaguda  
c. Puntas de alas azules

**Descripción:** Su distribución original es suramericana, se ha establecido debido a liberaciones voluntarias o escapes de las casas. Se considera una amenaza para cultivos y aves nativas ya que pueden ser desplazadas por esta especie.

**Habitat:** Urbano

Los guacamayos, cotorras y loros que habitan al estado de Chihuahua se encuentran en peligro de extinción. Sus poblaciones se ven afectadas negativamente por la destrucción del hábitat, la caza y la extracción de pollos de los nidos para su venta ilegal. Los factores naturales como los incendios también reducen el hábitat de anidación y alimentación de los monjes.

La guía de loros, cotorras y guacamayos de Chihuahua fue desarrollada por investigadores del Instituto, Secretaría, A.G. y la ONG Fundación Vida Silvestre A.C. como un instrumento de consulta. Escrito para la población que convive con estas especies, está dirigido principalmente a niños y jóvenes de primaria y secundaria, así mismo, a todos los personas interesadas en su conservación en la Sierra Madre Occidental.

Todos los ejemplares de animales mexicanos (guacamayos, loros, loros y loros) están protegidos por la ley. No debes capturarlos, venderlos o comprarlos.

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[www.fundacionvidasilvestre.org.mx](http://www.fundacionvidasilvestre.org.mx)

La impresión de este material se realizó con recursos del proyecto PROCEB Encauzado por la CONANP

**Guía de Identificación**

**LOROS, COTORRAS y GUACAMAYAS DE CHIHUAHUA**

Autores: Juan Carlos García Guadalupe, María Elena Sánchez, Susana Patricia Miguel, Pamela Guadalupe, Juan Carlos García

Coautores: María Elena Sánchez, Juan Carlos García

**Guacamayo Verde o Azules**  
*Amazona aestiva*

OTPS: **Amenaza I**  
Especie exótica  
**INVASORA**

Muy grande  
(38-43 cm)

a. Cara roja brillante  
b. Pico oscuro  
c. Alas azules

**Descripción:** Es un ave muy grande, predominantemente verde, posee un pico negro, rostro desnudo, frente roja, las alas y la cola tienen algunas plumas azules en las puntas, también se pueden observar algunas plumas rojas en la cola.

**Habitat:** Selva baja caducifolia, cafetales, rios.

**Amenazas:** Tráfico ilegal, destrucción de hábitat.

**Cotorra Argentina**  
*Myiopsitta monachus*

OTPS: **Amenaza I**  
Especie exótica  
**INVASORA**

Mediana  
(29 cm)

a. Frente y pecho gris  
b. Cola larga y puntiaguda  
c. Puntas de alas azules

**Descripción:** Su distribución original es suramericana, se ha establecido debido a liberaciones voluntarias o escapes de las casas. Se considera una amenaza para cultivos y aves nativas ya que pueden ser desplazadas por esta especie.

**Habitat:** Urbano

**Guía de Identificación**

**LOROS, COTORRAS y GUACAMAYAS DE CHIHUAHUA**

Autores: Juan Carlos García Guadalupe, María Elena Sánchez, Susana Patricia Miguel, Pamela Guadalupe, Juan Carlos García

Coautores: María Elena Sánchez, Juan Carlos García

**Guacamayo Verde o Azules**  
*Amazona aestiva*

OTPS: **Amenaza I**  
Especie exótica  
**INVASORA**

Muy grande  
(38-43 cm)

a. Cara roja brillante  
b. Pico oscuro  
c. Alas azules

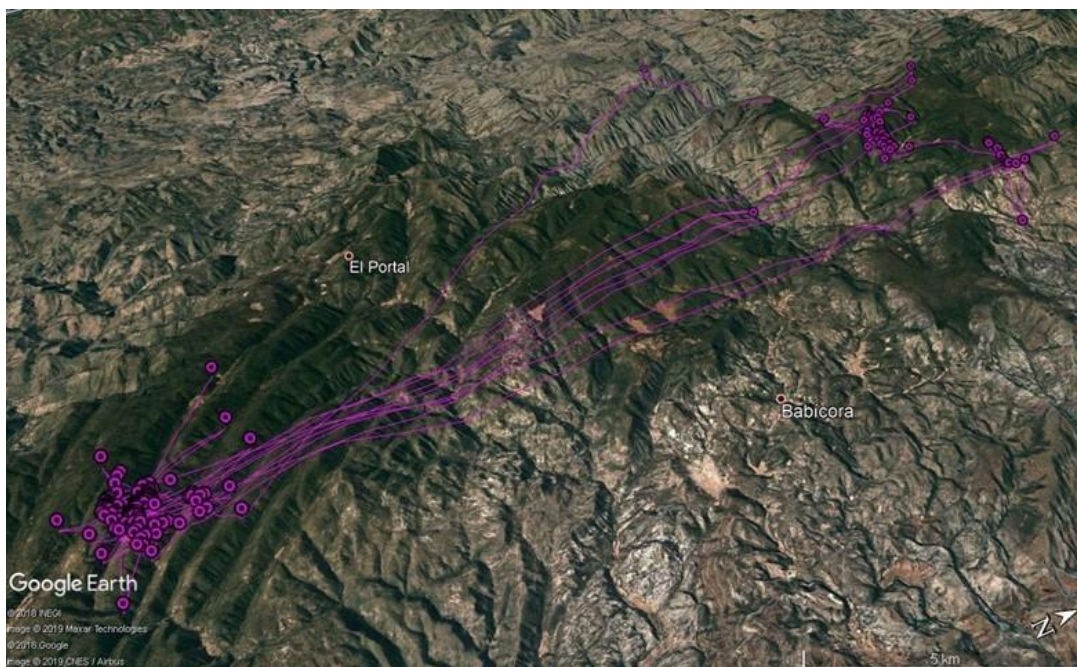
**Descripción:** Es un ave muy grande, predominantemente verde, posee un pico negro, rostro desnudo, frente roja, las alas y la cola tienen algunas plumas azules en las puntas, también se pueden observar algunas plumas rojas en la cola.

**Habitat:** Selva baja caducifolia, cafetales, rios.

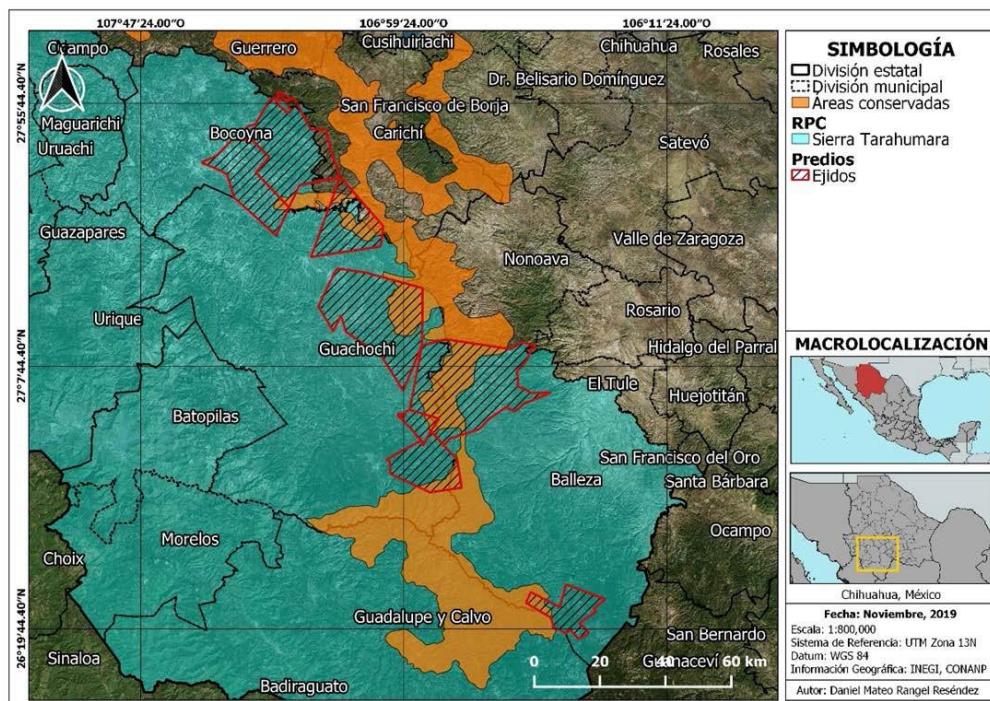
**Amenazas:** Tráfico ilegal, destrucción de hábitat.



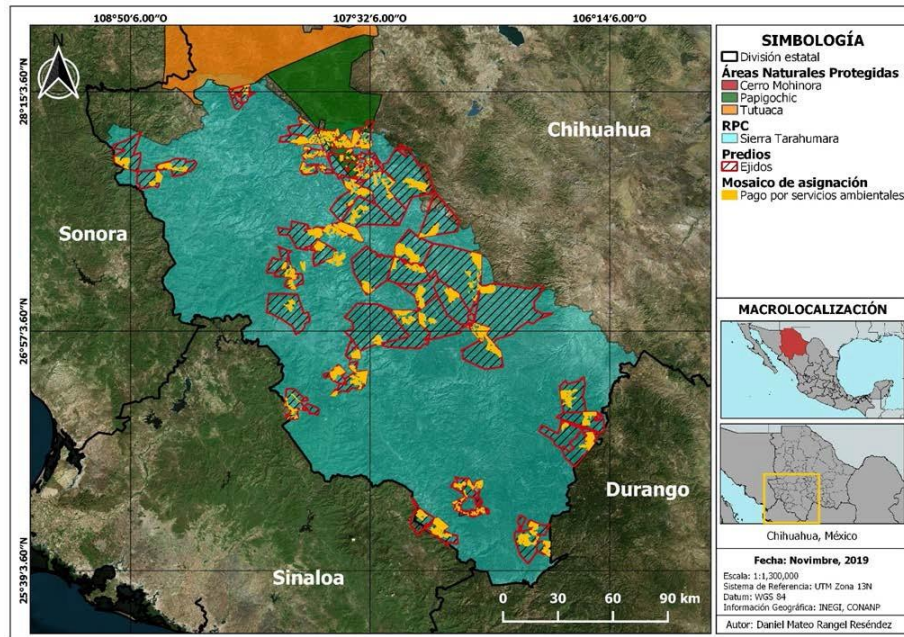
**Figure 12:** Migratory pattern of a juvenile TBPA tracked along the SMO using a satellite transmitter in 2019.



**Figure 13:** Location of project activities: a) Biological Corridor Map composed of 8 protected areas under Forest Segregation schemes (69,491 ha) in the Sierra Tarahumara of the SMO.

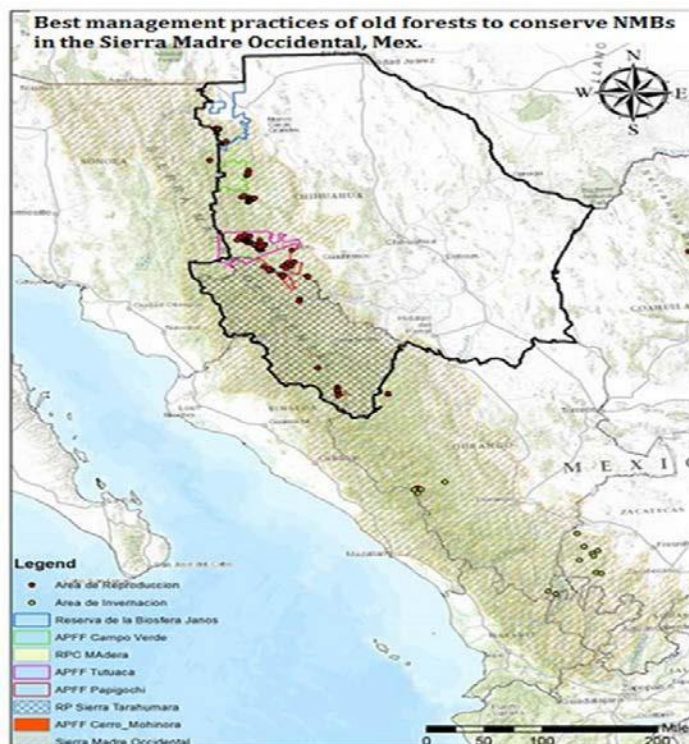


b). Map ejidos (red polygons) and areas segregated for conservation (yellow) where best forest management practices have been implemented, in Sierra Tarahumara, Sierra Madre Occidental.





**Figure 14:** Designated Natural Protected Areas (high elevation mix-conifer forest habitats) in the Mexican state of Chihuahua, within the Sierra Madre Occidental. Breeding localities of TBPA include: (1) Mesa de las Guacamayas at Ejido 5 de Mayo in the Janos Biosphere Reserve (2) At the Ejido El Largo Maderal and Socorro Rivera in RPC Madera, (3) Ejidos Tutuaca and Conoachi in APFF Tutuaca. (4) Ejidos Heredia, Rojo Gómez, El Ranchito and Cerro Rumúrachic in APFF Papigochi and (5) Ejido Las Pomas and Heroínas in APFF Campo Verde. (6) RPC Cerro Mohinora where parrot nests were registered until 2011 (Cruz 1998 and Cruz et al. 2014). Potential locations of TBPAs in the winter range: Durango, Zacatecas, Jalisco and Michoacán (all south of Chihuahua).



## Neotropical Flyway Project: 2020-2021 Season

**Partners:** SELVA: Investigación para la Conservación en el Neotropico, Colombia; Cornell Lab of Ornithology; Environment and Climate Change Canada; Bird Studies Canada; Parques Nacionales Naturales de Colombia; ADOPTA: Panama Rainforest, Panama; Canopy Family, Panama, Costa Rica Bird Observatories; Cerulean Warbler Conservation-CR; Las Brisas Nature Reserve; Reserva El Jaguar, Nicaragua.

**States that have participated to date:** Missouri and Wisconsin

**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. 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, and it is likely that vital stopover regions exist 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, agro-forestry, and development. Although some agro-forestry 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.
- The Caribbean Sea represents a major **ecological barrier** to many species and quality of stopover sites on either side can influence the success of migration.
- 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 five 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 professional biologists and students from six countries in research techniques for studying and monitoring migratory birds.
- The combined results will be used to develop a **conservation business plan** for stopover sites along the western Caribbean flyway.
- **Major discoveries to date:** (1) Sierra Nevada de Santa Marta, N. Colombia critical for Gray-cheeked Thrush and other migrants in spring; (2) N. Colombian dry forests critical for Yellow-billed Cuckoo in spring, and Blackpoll Warblers arriving after trans-oceanic crossing in fall; (3) major fall stopover by Cerulean Warblers in Caribbean foothills of Costa Rica; (4) global populations of most aerial insectivore species funnel through the Darien in spring and fall.

**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 warbler, cerulean, and golden-winged warbler, 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 for specific species connected to representative states. A few western migrants, such as western wood-pewee, olive-sided flycatcher, and yellow-billed cuckoo, which may be of interest to western states.

TABLE 1. Species targeted by the NFP, and their SGCN List status in selected states. These species migrate to South American wintering grounds and use sites within northern Colombia for stopover or as migration corridors. PIF continental status: **XX** = Red Watch List, **XX** = Yellow Watch List, **XX** = Common Bird in Steep Decline (2016 PIF Landbird Plan).

PIF	Species	NY	MO	LA	NC	GA	VA	TN	KY
XX	golden-winged warbler	X			X	X	X	X	X
XX	common nighthawk	X	X		X				
XX	black-billed cuckoo	X	X		X				
XX	olive-sided flycatcher	X						X	
	Tennessee warbler	X							
	bay-breasted warbler	X							
XX	cerulean warbler	X	X		X	X	X	X	X
	dickcissel	X	X	X	X			X	X
	Louisiana waterthrush	X	X	X			X	X	X
XX	Canada warbler	X			X		X		X
	scarlet tanager	X	X				X		
XX	prothonotary warbler	X	X	X			X	X	X
XX	yellow-billed cuckoo		X	X	X		X	X	
XX	chimney swift		X		X		X		
	eastern wood-pewee		X		X		X	X	
	rose-breasted grosbeak		X		X		X		X
	Mississippi kite		X		X			X	X
	eastern kingbird		X		X		X		
	black-and-white warbler		X				X		
	yellow warbler		X				X		
	yellow-throated vireo		X				X	X	
XX	bank swallow		X				X		X
	Acadian flycatcher		X					X	
	blackburnian warbler								X

**Project goal:** The NFP has been designed to tackle enormous gaps in our knowledge of stopover regions in Central America and northern South America. This information will feed into a wealth of conservation plans that currently lack actions addressing the needs of species such as the cerulean and Canada warbler during their lengthy migrations through Neotropical regions. The goal is to prioritize and protect key habitats and sites through a conservation business plan for migration stopover sites in Central America and northern South America. This plan will guide actions aimed at ensuring that not only major stopover regions for currently threatened are safeguarded, but also for the millions of individuals that belong to common yet declining species that are essential to ecosystem functionality across the Americas.

Specific objectives of this project are to:

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; and
5. incorporate migration-stopover needs into full life-cycle bird conservation plans.

**Previous Successes and history:** During the initial phases of NFP in 2016-2018, with funding from Cornell Lab of Ornithology, Environment and Climate Change Canada, and SELVA, more than 10,000 transect surveys were conducted along 450 transects at 32 sites across northern Colombia, Panama, and Costa Rica. The surveys produced over 50,000 records during passive transects and migration counts during fall migration in Colombia,

recording a total of 1.7 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. 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, while also highlighting the importance of pre-montane forests for species like blackburnian warbler, and scarlet tanager.

During Fall 2017 and 2018, we studied the use of coastal dry scrub on the Guajira Peninsula, NE Colombia, by blackpoll warblers arriving after their trans-oceanic crossing from North America. Our results revealed the critical importance of this habitat for blackpolls to recovery muscle mass and body fat and to refuel for the remaining 1,000-km+ journey to wintering grounds in the Amazon Basin. In Fall 2018, surveys identified a previously unknown stopover region for cerulean warblers in the Caribbean foothills of Costa Rica.

We also successfully tested and implemented a new survey protocol for migratory birds, trained 9 Colombian, 6 Panamanian, and 5 Costa Rican biologists; and worked alongside the National Parks authority in three national parks and carried out education activities in local schools. Other outreach activities included 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](#)), at least 10 additional peer-reviewed publications, presentation of results to three Colombian National Parks, the Colombian Ornithology Congress (Nov 2016), American Ornithological Society (April 2018), and International Ornithological Congress (August, 2018).

**Proposed Activities/Actions for 2020-2021:** The broader NFP will focus on understanding migrant strategies and stopover use in six countries over a period of six years: Colombia, Panama, Costa Rica, Nicaragua, Honduras and Belize. In the current proposal, we are seeking funding for planned actions during 2020/2021 that will build on the activities carried out during 2016-2019. These include:

January-December 2020 – Carry out occupancy analyses for fall and spring migration through Panama, Costa Rica and Colombia to identify major stopover regions (ongoing).

March-May 2020 – Carry out occupancy surveys across Nicaragua during spring migration (ongoing).

August-October 2020 – Carry out occupancy surveys across Nicaragua during fall migration (ongoing).

August-October 2020 - Carry out second season of mist-netting and banding of Cerulean Warblers and other migrants at Las Brisas in Costa Rica (identified by occupancy surveys) to determine stopover behavior and use.

October 2020 – Detailed study of blackpoll warbler habitat use and relation to precipitation at critical recovery/stopover sites in NE Colombia, where birds arrive following trans-oceanic flights >2500 km. This dry region of Colombia may be highly susceptible to climate change. It is important to understand how this might impact the declining blackpoll warbler and other species using this region (e.g. yellow-billed cuckoo).

March-May 2021 - Carry out occupancy surveys during spring migration across Honduras, Guatemala, and Belize.

March-May 2021 – Carry out mist-netting and banding at a major site (TBD) in Nicaragua to document stopover behavior and use.

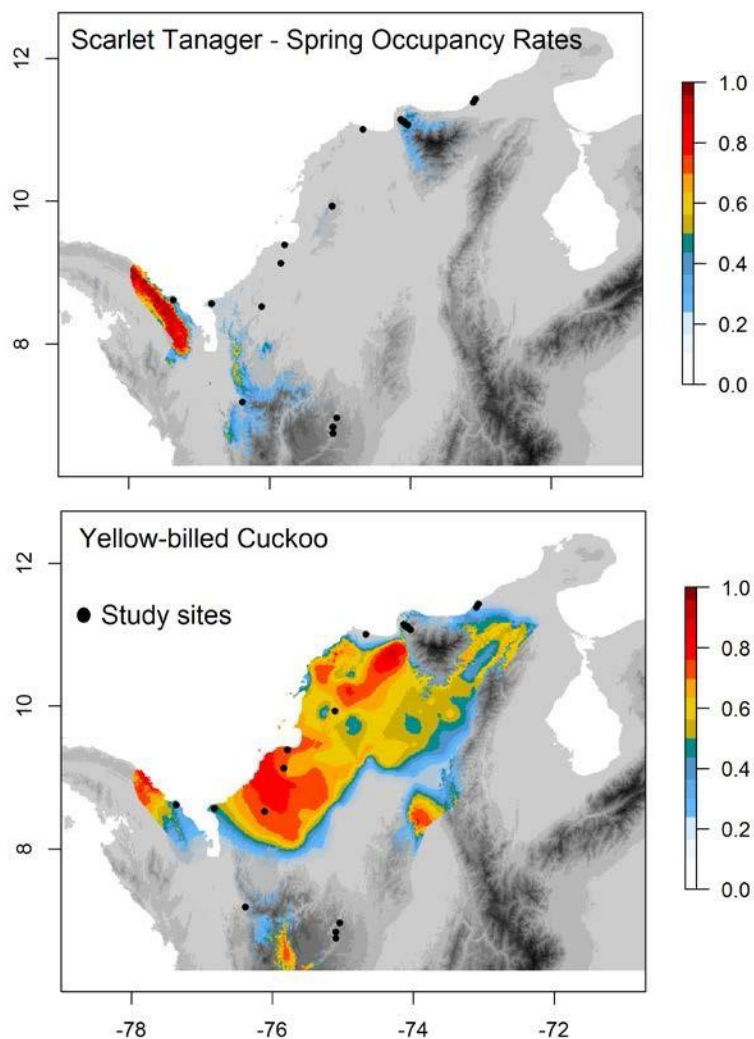


Figure 15: Predicted occupancy rates for Scarlet Tanager and Yellow-billed Cuckoo across northern Colombia reveal spring stopovers in pre-montane forests (SCTA) and in lowland tropical dry forests (YBCU).

#### Budget: (Fall 2019 and Spring 2020)

YEAR	COUNTRY	REGION	ACTIVITY	TOTAL	MATCH
<b>2020</b>					
Spring	Nicaragua	4 regions (country-wide)	Occupancy Surveys	\$25,000	\$25,000
Fall	Nicaragua	4 regions (country-wide)	Occupancy Surveys	\$25,000	\$25,000
	Costa Rica	Las Brisas Reserve	Mist-netting 1 site	\$15,000	
	Colombia	La Guajira	Mist-netting and obs	\$10,000	
	CO, CR, PA	Multiple	Occupancy analyses	\$5,000	\$2,500
<b>2021</b>					
Spring	Honduras	3 regions (country-wide)	Occupancy Surveys	\$15,000	\$10,000
	Belize/Guatemala	2 regions (country-wide)	Occupancy Surveys	\$10,000	
	PA/CR	1 Stopover site (TBD)	Mist-netting 1 site	\$15,000	
			<b>TOTALS</b>	<b>\$120,000</b>	<b>\$122,500</b>



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. **There is an immediate need for funding for Fall 2020 banding stations and Spring migration 2021 occupancy surveys.**

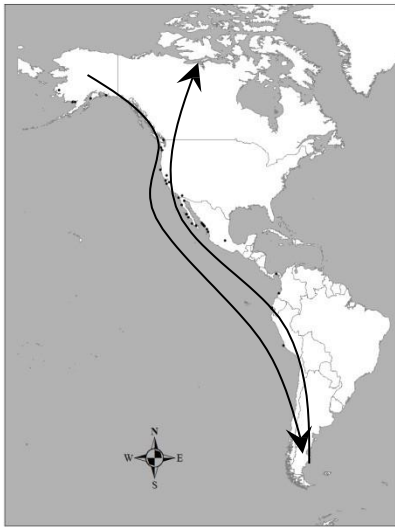
**Matching funds:** a 1 to 1 match is required. Funding has been provided by Cornell Lab of Ornithology -- \$10,000 for 2018, and \$15,000 is promised for 2019. The Canadian Wildlife Service has provided \$33,000 for 2018/2019, Southern Wings (\$18.5K from 2 states), and a private donor (\$10K). Smaller contributions from SELVA, Acadia University, Guelph University and Saskatchewan University total \$10,000. Equipment, namely 20 radiotransmitters, represent a further \$3,500. In 2019/2020 Environment Canada provided \$25,000 towards conservation activities in key stopover regions identified in Colombia.

## The Pacific Flyway Shorebird Survey: Identifying Threats and Conservation Hotspots 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), U.S. Forest Service International Program (USFSIP), Grupo Aves del Noroeste De México (GANO)

**States that have participated to date:** Arizona, California (new for 2019), Pacific Flyway Council (new for 2019). Since 2017 Southern Wings contributions have totaled \$25,000.

**Overview:** Nearctic-neotropical migratory shorebirds (Order: Charadriiformes; Families: Charadriidae, Recurvirostridae, Scolopacidae) are highly mobile animals that traverse thousands of kilometers across the Western Hemisphere bi-annually and are reliant upon a network of coastal and interior wetland ecosystems. The Pacific Coast of the Americas (Figure 16) 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 sites in NW Mexico. The



**Figure 16:** 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 Western Hemisphere Shorebird Reserve Network.

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).

The lack of broad-scale coordinated monitoring for Pacific Flyway shorebirds has limited our ability to effectively manage their populations particularly in light of the predictions of climate change, which will likely alter habitat conditions (e.g. sea-level rise, reduced wetlands due to drought). In 2011, in collaboration with the Copper River International Migratory Bird Initiative and >100 individual and organizational partners throughout the Pacific Flyway, we initiated the Pacific Flyway Shorebird Survey (PFSS) and then the Migratory Shorebird Project (MSP) to fill gaps in Pacific Flyway population status and trends and then to assess hypothesized threats to shorebirds and identify priority conservation locations, respectively. Specifically, the objectives of the PFSS and then the Migratory Shorebird Project 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 14 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 3 for a complete list of species. 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. For example; all 13 sites of importance for wintering pacific brant in northwest Mexico are surveyed each year, and brant as well as other waterfowl are counted as part of the MSP (Table 2).

**Project goal:** 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 17) and compile these survey data in to the PFSS node of the Avian Knowledge Network (AKN). Data collected includes the number of birds (shorebirds, waterbirds and waterfowl), measures of bird disturbance, and assessment of habitat condition. The number of avian predators (raptors) of shorebirds and other waterbirds are also recorded.
2. Expand survey efforts on sandy beaches to improve sampling for snowy plover, red knot, willet, and sanderling, and improve our understanding of human impacts which primarily occur on beaches.
3. Integrate survey data from new and existing sites, along with spatial data on the distribution of shorebird habitat across Mexico, into models to determine drivers of shorebird distribution and abundance, and the prevalence of different threats. Distribution models developed with these data for Pacific Flyway State Wildlife Action Plan focal species will be used to highlight priority areas for non-breeding shorebird conservation.

**Southern Wings Successes in 2019:** Funds have helped to conduct midwinter pacific brant surveys in all major wintering sites in northwest Mexico, nonbreeding shorebird and waterfowl surveys as part of the MSP, breeding shorebird surveys at coastal wetlands and sandy beaches (targeting breeding snowy plover, Wilson's plover and American oystercatchers), identify key wintering sites and develop conservation strategies (as data becomes available and analyzed). Also, these funds have strengthened conservation and management of specific sites, disseminate information to land managers, and conduct education/outreach campaigns to the general public. Achievements of the project to date include:

#### *Nonbreeding Surveys*

- Nonbreeding Shorebirds Monitoring: During January-February of 2019 we completed the annual non-breeding midwinter shorebird surveys at 21 sites across northwest Mexico (Fig. 2). These sites included 243 sampling units that are surveyed by about 50 volunteers in northwest Mexico.
- Pacific Brant Surveys: We provided a technical report on recent brant surveys in Mexico (2017-2019) to The Pacific Flyway Council for their annual meeting on February 15, 2019. *Report available upon request.* Also Collaborated with local hunting organization to monitor wintering pacific brant in Bahia San Quintin and protect their wetland habitat.
- Snowy Plover Nonbreeding Surveys: During January 2019 we coordinated with the snowy plover midwinter window survey along the Pacific coast of United States to conduct Nonbreeding snowy plovers surveys in five sites in northwest Mexico (Estero de Punta Banda, San Quintin, Laguna Atotonilco, Marismas Nacionales and Ceuta).
- Nonbreeding American Oystercatcher Monitoring: During November-December of 2019 we completed winter surveys of roosting aggregations of American Oystercatchers at 15 priority sites across northwest Mexico. We documented more than 50% of the total population roosting during high tides in these sites.

#### *Breeding Surveys*

- Snowy Plover Monitoring: From April through June of 2019 breeding western snowy plovers were monitored in six sites (Estero de Punta Banda and Bahía San Quintin, Baja California; Ensenada de La Paz, Baja California Sur; Laguna Atotonilco, Jalisco; Bahía Ceuta, Sinaloa; and Marismas Nacionales, Nayarit). In collaboration with partners during May-June, 2019 we captured and marked snowy plovers with colored rings and GPS receivers from Ensenada, BC, to Guerrero Negro, BCS.
- Expanding survey efforts on sandy beaches: During May-June 2019 we conducted snowy plover breeding surveys along the coastline between Faro de San José and Santa Rosalillita, BC.
- California Least Tern Monitoring: During June-July we conducted a range-wide survey of the endangered California least tern colonies along the Pacific coast of the Baja California peninsula. Also, from May through June we monitored several colonies of this species located near Ensenada, and San Quintin, Baja California. In June we color banded adults and young of this species in several colonies from Ensenada, BC to La Paz, and Los Cabos, BCS.
- American Oystercatcher Monitoring: During April through June we conducted repeated counts of American oystercatchers breeding pairs in Natural Protected Areas of Northwest Mexico, including Marismas Nacionales, NAY; Bahías Santa María, Ceuta and Navachiste, SIN; El Tóbari, Bahía Kino, and Puerto Peñasco, SON; Laguna Ojo de Liebre, Bahía Magdalena, Bahía de La Paz, Bahía de Loreto, and Isla San Marcos, BCS. As an outcome of this effort, a first publication of the breeding population size and trend of American oystercatchers on small islands of Bahía Santa María-La Reforma, Sinaloa, Mexico, was published at the Journal of Field Ornithology (2019, 90:325-334).

#### *Education/Outreach/Training*

- Outreach Talk: On 12<sup>th</sup> February 2019 we celebrated the World Wetlands Day by giving a talk to college students about the importance of Bahia San Quintin to wintering Pacific Brant.
- Dissemination of data: Along with students and collaborators, six talks were presented at the Western Hemisphere Shorebird Group meeting in Panama in October 2019.



### *Data Entry*

- Database: We entered mid-winter shorebird survey data into the project's online data entry portal hosted by CADC (California Avian Data Center), which is a node of the AKN. Data includes the number of shorebirds, waterbirds and waterfowl, measures of human disturbance and raptors, and assessment of habitat condition.

### *Conservation Planning/Management*

- Application of shorebird data: Mentored students (bachelor and graduate fellows) on data analysis and interpretation for use in conservation and management. Jonathan Vargas, a fellow of the Coastal Solutions Fellows program is focusing his project on reducing human disturbance on the western Snowy Plovers in Baja California. In April, Heredia finished her M.Sc. thesis at CICESE on shorebirds and disturbance by using shorebird data from this project (MSP). Ivonne I. Vega-Ruiz finished her M.Sc. thesis at PCML-UNAM on breeding ecology of American oystercatchers at Melendres and El Rancho, Bahía Santa María. In addition, Estefanía Muñoz finished her Bachelor's thesis at UABCS on the abundance and distribution patterns of three large shorebirds in the Baja California peninsula, also using the data from MSP.
- Protection of Habitat: In order to protect the nests of snowy plovers and California least tern in March 2019 we installed temporary fences on the nesting beaches of the Estero de Punta Banda, Punta Azufre and Punta Mazo Natural Reserve in Bahía San Quintín, northwest Baja California. These fences remained installed until August. See: <https://www.sqnoticias.com/single.php?id=2199>. We also conducted habitat enhancement on a dredge spoil island in Ensenada de La Paz, BCS.
- Collaborating with the local hunting organization in Bahía San Quintín: We supported the local hunting organization of San Quintín "Los Volcanes" in designing and creating a new logo, cards, letterhead, etc. (a package) to improve their marketability and promote their participation in habitat conservation and best management practices.

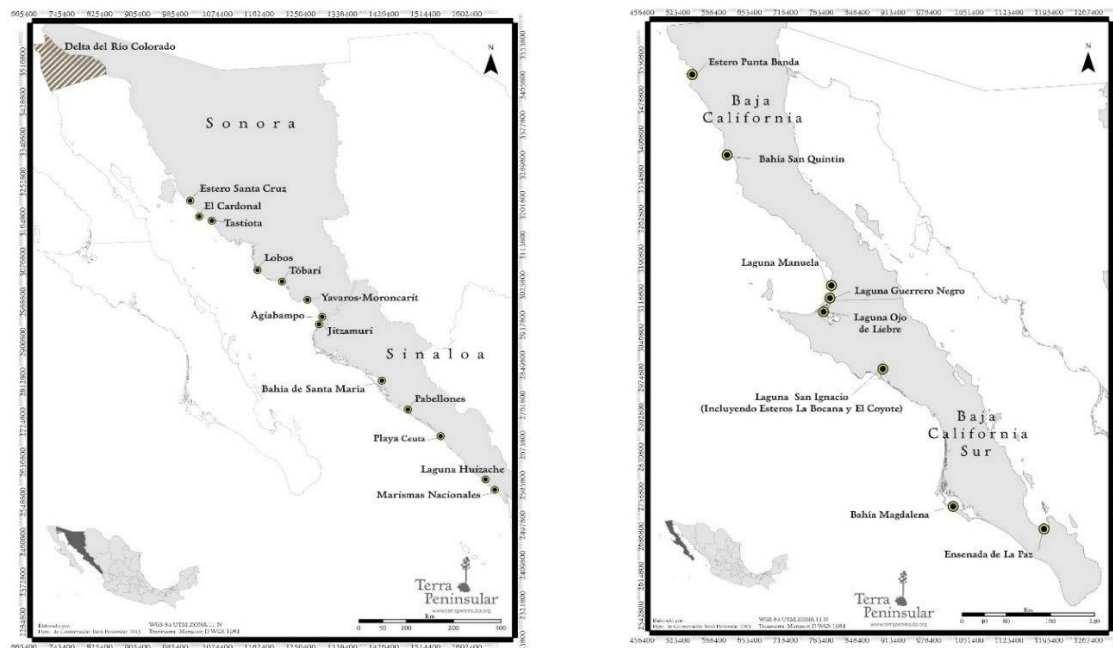
**Specific Activities planned for 2020:** Terra Peninsular and partners will implement the following conservation actions.

- Conduct standardized annual non-breeding bird surveys of 21 wetland sites across NW Mexico (Fig. 2), 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.
- In collaboration with local hunting organizations we will strengthen conservation and management of designated wildlife conservation units (UMAs) in San Quintín, Baja California and El Tóbari, Sonora, including:
  - Monitor wintering population of Pacific Brant and work to maintain/enhance habitat.
  - Assist in the voluntary designation of hunting and non-hunting units within the UMA.
  - Improve capture of harvest information (sex and age) for hunted Pacific Brant.
  - Conduct outreach and a workshop on sustainable and responsible hunting practices.
  - Promote birding and wildlife photography tours.
  - Implement a beach cleanup campaign.
- Initiate a monitoring program of breeding secretive marsh birds in southern Sonora and Baja Californias Sur, specifically focused on the threatened Ridgway's rail, including the two subspecies (Yuma and Belding's rail) using mangrove habitats.
- Conduct monitoring of breeding snowy plover at six sites across NW México (Estero de Punta Banda and Bahía San Quintín, Baja California; Ensenada de La Paz, Baja California Sur; Laguna Atotonilco, Jalisco; Bahía Ceuta, Sinaloa; and Marismas Nacionales, Nayarit). Breeding Least Tern colonies will also be monitored at three of these sites (Ensenada de La Paz, Punta Banda and San Quintín).

- Protect nesting habitat (through perimeter fencing) and implement public outreach/education activities at three sites (Guerrero Negro, Bahía San Quintín and Estero de Punta Banda) to mitigate the effects of human disturbance on breeding snowy plover and least tern.
- Implement or support education/outreach and training activities such as 1) outreach campaign “Share the Beach” focused on nesting Snowy Plover and Least Tern, 2) other activities that disseminate conservation information to land managers, new professionals, and the general public.

**Budget:** Contributions of \$5,000 to \$10,000 each will significantly advance implementation of these shorebird/waterbirds/waterfowl conservation actions. Arizona will provide \$5,000 to support completion of some of the project’s objectives and activities and the Pacific Flyway Council will provide another \$5,000.

<b>Activities</b>	<b>Total Cost</b>	<b>Southern Wings Request</b>	<b>AZ</b>	<b>Need</b>	<b>Pacific Flyway Council</b>	<b>In-kind (CICESE, GANO, Terra Peninsular)</b>	<b>USFSIP</b>
Conduct standardized midwinter waterbird surveys (pacific brant and shorebirds) at 21 wetland sites in NW Mexico	\$27,000	\$4,000	1,000		\$4,000	\$8,000	\$10,000
Conduct monitoring of breeding secretive Marsh Birds (Ridgway’s rail) in mangroves of Sonora and Baja California Sur	\$9,000	\$2,000	\$2,000	\$2,000		\$3,000	
Protect nesting habitat, public outreach and monitoring of breeding snowy plover and least tern at Guerrero Negro, San Quintín and Punta Banda	\$11,500	\$2,000	\$500	\$6,000		\$3,000	
Strengthen conservation and management of key areas	\$22,000	\$2,000	\$1,000		\$1,000	\$8,000	\$10,000
Workshop on sustainable and responsible hunting practices at UMAs of Bala California and Sonora	\$7,500	\$2,000	\$500				\$5,000
<b>Total</b>	<b>\$77,000</b>	<b>\$12,000</b>	<b>\$5,000</b>	<b>\$8,000</b>	<b>\$5,000</b>	<b>\$22,000</b>	<b>\$25,000</b>



**Figure 17:** Location of 21 coastal wetland sites which are part of the PFSS in NW Mexico.

Table 2. Waterfowl abundance and distribution documented in the sampling units of the MSP sites in NW Mexico.

Common Name	Abundance	Percent of sites	Number of sites
northern shoveler	35606	29	7
green-winged teal	28380	38	9
Brant	5378	50	12
Redhead	4932	17	4
ruddy duck	4032	29	7
northern pintail	3457	58	14
American wigeon	2872	25	6
gadwall	2568	13	3
blue-winged teal	889	33	8
lesser scaup	858	33	8
cinnamon teal	689	25	6
surf scoter	557	17	4
black-bellied whistling-duck	259	8	2
red-breasted merganser	193	46	11
bufflehead	116	29	7
mallard	34	4	1
fulvous whistling-duck	10	8	2
greater white-fronted goose	5	4	1
white-winged scoter	3	4	1

**Table 3:** 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	
morthern pintail							X					X
cinnamon teal											X	
greater white-fronted goose	X											
great egret		X										
ruddy turnstone			X									
black turnstone	X		X									
lesser scaup	X											X
brant goose			X								X	
Pacific black brant	X								X			
sanderling	X		X									
red knot			X								X	
western sandpiper	X						X					
semipalmated sandpiper	X											
mountain plover		X	X	X		X		X				X
snowy plover			X					X		X	X	
western snowy plover		X		X			X		X			
killdeer	X											
black tern			X	X	X		X					X
black-bellied whistling duck		X										
fulvous whistling duck			X									
snowy egret		X							X			X
common loon			X		X		X				X	X
gull-billed tern			X									
black oystercatcher	X		X						X			
black-necked stilt									X			
Caspian tern					X	X			X	X		X
loggerhead shrike			X	X			X	X	X		X	
California gull					X							
ring-billed gull					X							
short-billed dowitcher	X											
long-billed dowitcher	X						X					
marbled godwit												
belted kingfisher	X											
surf scoter											X	
wood stork			X									
long-billed curlew				X	X		X	X	X			X
whimbrel	X											
black-crowned night heron												X
American white pelican			X	X	X		X		X	X	X	
brown pelican (California)			X						X		X	
neotropic cormorant								X				



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

## Restoration of Migratory Bird Habitat in Ecuador

**Partners:** Fundación Jocotoco and ABC

**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 Species of Conservation Concern List. Ecuador has the highest deforestation rate in South America over the last 50 years. 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, prompting our partner, Fundación Jocotoco (Jocotoco), to establish bird reserves in these regions and elsewhere throughout the country where habitat protection is needed the most.

In FY 2021, ABC will be focusing our work with Jocotoco in the Ecuadorian Chocó, located in northwest Ecuador, which is one of the last remnants of the Tumbes-Chocó-Magdalena Global Biodiversity Hotspot. The Chocó is characterized by high species endemism and accelerated habitat loss; only 2% of the original forest in the area remains. The Chocó rainforest is important to numerous wintering migratory birds including olive-sided flycatcher, cerulean warbler, Acadian flycatcher, western wood-pewee, and Swainson's thrush. The area is also important for threatened resident bird species such as the great green macaw and the banded-ground cuckoo. In this region, ABC has established the Chocó-Canandé BirdScape, which encompasses the 13,000-acre Canandé Reserve and the Tesoro Escondido Reserve with 4,560 acres, owned and managed by Jocotoco.

The Chocó-Canandé BirdScape includes a matrix of different land uses such as cacao plantations, oil palm plantations, monocultures (e.g., rice, pepper, plantain, cassava, etc.), pastures, abandoned land, and patches of primary forest. Most people in the area arrived nearly 40 years ago, migrating from other provinces. Their agricultural practices and grazing techniques poorly match the local conditions, and their activities are creating access to highly impactful industries such as Palm Oil. Poverty is an enabling condition for environmental degradation in the Esmeraldas province, where the Ecuadorian Chocó is located.

Our goal in this BirdScape is transform existing monocultures, pastures, and abandoned lands into silvipastures and agroforestry systems in eight communities. By introducing trees in pastures, farmers will provide shade and diet supplements to the cattle while protecting the soil from erosion and providing additional habitat and corridors to neotropical migratory birds. By adding trees to their existing monocultures, farmers will generate extra revenues, which have the potential to prevent further deforestation. In addition, by restoring abandoned lands that were previously deforested, the communities will be able to secure a clean source of water year-round. Our goal is to target communities around remaining forests to limit their impact on these important forests that remain.

**Threats:** Forests in Ecuador, especially in the Chocó, are rapidly disappearing due to local timber extraction and agricultural expansion (mostly oil palm). Land use change is an on-going 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 Canada warbler, olive-sided flycatcher, blackburnian warbler, cerulean 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 Jocotoco began working in four communities in the Chocó-Canandé BirdScape. Currently each community is in the process of building a tree nursery to produce 20,000 seedlings to restore 75 acres of abandoned lands and monocultures. Plans are in place to build capacity among the community members to maintain the nursery, produce healthy seedlings, and maintain reforestation plots.

**Project goal:** The goal of this project is to slow the rate of deforestation and work with landowners to improve land use practices and create better habitat connectivity in the buffer zones of existing protected areas in the Chocó-Canandé BirdScape in Ecuador. Specifically, we want to restore 37 acres through agroforestry and 741 acres through assisted reforestation. In FY 2021 our objective is to complete the first four nurseries and start restoring 75 acres of degraded lands. In addition, we will start to identify and engage additional communities.

**Project Activities:**

In the Chocó-Canandé BirdScape, we will:

- identify at least three new areas for reforestation in and around the Canandé and Tesoro Escondido Reserves,
- conduct seven community workshops to strengthen the knowledge gained through the first round of workshops (four communities) and start building capacity in three new communities,
- complete one tree nursery in each of the four communities already participating in this project, with a total production capacity of 20,000 seedlings, and
- plant 20,000 seedlings across at least 75 acres to restore abandoned and degraded lands.

**Budget:** The project needs a total of \$34,800 to implement all project activities but smaller amounts of money can be put towards specific activities.

**Matching Funds:** ABC and Jocotoco have secured funds for work in Canandé from Synchronicity Earth, the Canadian Wildlife Service, and private donors. Fundación Jocotoco and the local farmers will provide in-kind investment into this project including providing the tools, land, expertise, and workforce to plant tree seedlings.

**Figure 18:** Location of Chocó-Canandé BirdScape and project area in NW Ecuador, Esmeraldas Province.





## Improving Migratory Bird Habitat on Coffee Farms in Colombia

**Partners:** Coffee Producer Ecological Foundation (FEC), Vivo Cuenca, SELVA, and ABC

**States that have participated to date:** Missouri and Indiana

**Overview:** The country of Colombia is an integral part of the lifecycle of more than 170 migratory species. ABC has been working in Colombia for more than 15 years to support the creation and management of bird reserve and ecological easements; develop and promote bird tourism opportunities; restore degraded lands; and promote bird-friendly agriculture. ABC has begun to identify BirdScapes in Colombia. BirdScapes are large landscapes targeted for conservation action for migratory birds of conservation concern. One of these BirdScapes, the Central Andes BirdScape, encompasses much of the Caldas and Tolima Departments, one of the highest coffee producing regions in the country.

Through workshops and meetings with stakeholder groups in the Central Andes BirdScape we have decided to prioritize in 2020-2021 work in the Río Chinchiná watershed and the micro-watershed of one of its tributaries, the Río Claro, in the Caldas Department. Here there are multiple agencies and groups already working successfully to restore watersheds, implement best management practices for coffee growing and processing, and conduct outreach to involve the communities in conservation. We aim to build off that success and incorporate migratory bird conservation into the work of these organizations.

We are also working on the eastern side of the Central Andes in the Tolima Department. This region supports a variety of habitats and high bird diversity for a small area; more than 500 bird species have been recorded in just under 1,500 km<sup>2</sup>, including multiple threatened species and migratory species of concern like the golden-winged and cerulean warblers. Native vegetation is being replaced with agriculture and pasture lands. In 2019 we started working with SELVA to develop alliances with stakeholders, conduct outreach activities, and promote best management practices that will restore, connect and improve habitat in the community of Libano.

**Threats:** The Colombian Andes have some of the highest rates of deforestation in Latin America; a significant amount of this loss is due to agriculture. In Colombia, it is estimated that 87% of neotropical migratory birds occur in agroecosystems and more than 70 species have been registered in coffee systems. It is imperative that we target these landscapes in our migratory bird conservation strategy in Colombia.

**Birds:** Seventy-four migrant bird species have been registered in Caldas, including golden-winged, cerulean, Canada, black-and-white, Tennessee, Blackburnian, yellow and blackpoll warblers; 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:** The project goal is to improve habitat quality and connectivity for migratory birds in the coffee-growing area of the Caldas and Tolima departments. One of the ways we will advance this goal is through education and outreach, specifically with farmers, regarding bird-friendly production practices that are better for the long-term health of the local watersheds, plus have the potential for improving the financial sustainability of their business.

**Previous Southern Wings Success:** With Southern Wings funding, ABC worked in the Eastern Andes, specifically the Cerulean Warbler Corridor. Here ABC and ProAves engaged cacao and coffee producers in the buffer zones of two ProAves reserves, Cerulean Warbler and Pauxi Pauxi. Southern Wings funds contributed to the creation

of this habitat corridor through the planting of more than 500,000 saplings on 2,835 acres across 200 private farms. A total of 18 ecological easements were also established by ProAves, as a measure to reduce deforestation. 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, and through the distribution of educational materials.

#### **New Project Activities:**

- **Habitat restoration.** Over the next two years we will work to increase capacity within the Río Claro watershed in the Caldas Department to produce native trees for restoration purposes, with the goal of planting 100,000 native trees. These trees will be planted in key riparian zones (to protect important water sources), for living fences, in shade coffee systems and pasturelands (silvipasture), and in other strategic areas (mini-corridors) to increase forest coverage with native tree species in the watershed.
- **Community education and outreach.** Facilitate 12 workshops to increase awareness of issues surrounding water contamination from pesticides and fertilizers, the impact of forest loss on the health of the watershed and long-term availability of water, the importance of birds in the ecosystem, and sustainable production practices. For the workshops we will be using three booklets (Conserving my Watershed Biodiversity, Producing Sustainable and Quality Coffee, and Conserving my Watershed's Water and Soil) that were developed by the partners through a prior project funded by KfW, the German Development Bank. There is a need to update and reprint these booklets for the workshops.
- **Sustainable Coffee Production.** We will work on 15 farms in the Río Claro watershed to improve the sustainability of coffee processing methods by installing infrastructure such as pulp processing pits, fermentation tanks, and anaerobic water filters
- **Bird Monitoring.** With Selva, we will conduct a migratory bird census in Libano, in the Tolima Department, to gather baseline information on the distribution of golden-winged, cerulean, and Canada warblers, to plan and prioritize conservation activity in this part of the BirdScope. In addition, we will host pre- and post-bird monitoring workshops in Libano to present the project and introduce the importance of the birds and conserving them to the community. These workshops will hopefully allow us to identify farmers interested in participating in habitat restoration and the implementation of best practices on their land.

**Budget:** The project needs a total of \$173,800 to implement all project activities but smaller amounts of money can be put towards specific activities.

**Matching Funds:** ABC has funding support from Canadian Wildlife Service and the Elisha Mitchell Audubon Society for this project. ABC also submitted a proposal to NMBCA in 2019 for this project. In addition, Vivo Cuenca and FEC have available matching funds for related activities in the Río Claro micro-watershed and other areas in the Caldas coffee zone, and SELVA has match for the Tolima area. Local communities provide in-kind match by taking care of nurseries and planting trees.

**Figure 19:** Map shows the Central Andes BirdScope (in red), The Río Claro watershed (white polygon) in the Caldas Department and the Libano area in Tolima (in blue).



## Protection of Migratory Bird Habitat in the Northern Venezuelan Coastal Mountain BirdScape

**Partners:** Provita and ABC

**States that have participated to date:** Tennessee has supported golden-winged warbler searches in the region in FY 2019 and FY 2020.

**Overview:** The focal area of our project is a corridor of privately-owned farms between two national parks in northern Venezuela, Henri Pettier and Macarao National Parks, both of which are recognized as crucial transitory or winter breeding habitat for more than 70 species of migratory birds, including olive-sided flycatcher, cerulean warbler, northern waterthrush, blackpoll, Connecticut warbler, and Tennessee warbler. This region also supports threatened resident bird species such as the red siskin. ABC and Provita created its first BirdScape here, called the Northern Venezuelan Coastal Mountain BirdScape, with the goal of protecting and restoring key stopover and wintering migratory bird habitat.

We are first focusing on the Piedra de Cachimbo and La Florida communities, and have been successful in planting more than 35,000 native trees and coffee bushes (shade grown varieties) to convert nearly 400 acres (160 ha) of sun crop coffee to shade-grown coffee and restore 100 acres (40 ha) of degraded lands. We have a growing contact list of close to 50 farmers who are eager to participate, and funding is needed over the next two years so that we can convert an additional 500 acres of plantations from sun to shade, as well as work to restore tree cover across 150 acres of deforested lands. Funding is also needed to conduct capacity building workshops for community members on the benefits of shade grown coffee and more sustainable methods of production (e.g., use of more organic fertilizer).

**Threats:** Deforestation is very prevalent in northern Venezuela, most commonly to clear land to produce coffee grown in the full sun. In 2006, shade coffee plantations ceased to be economically viable in Venezuela, due to accelerating inflation and a regulated coffee price by the government that did not keep pace. As a result, coffee, as it had been traditionally grown and sold, was no longer a viable source of income for farmers. To compensate, farmers have turned to unregulated sun crops, which can yield a higher volume. Field visits have confirmed that coffee plantations, many over 100 years old, have been cut down to make way for sun coffee. Continued inflation has further escalated pressure on farmers to clear remaining shade coffee plantations, increasing the threat of habitat loss.

At the same time the shade coffee crops are being cutting down, demand has remained strong for this variety of coffee; national roasters are eager to buy any and all shade-grown coffee that is available for export purposes. Coffee that can be classified as a "specialty" product, which includes Organic and Bird-Friendly® (BF) certification, is exempt from price control and can be exported, opening the door for conservation measures as an economic incentive can be created through certification and export of sustainably grown coffee. Interestingly, farmers in the region have already been using organic production techniques, as they lack capital for the chemical inputs required by more intensive farming.

**Recent successes:** For the past two years, with non-Southern Wings funding, ABC and Provita have been implementing a project called "Birds and Coffee," through which we have supported the training of nearly 90 farmers through 14 workshops about the benefits of shade grown coffee, organic farming practices, and the establishment and maintenance of tree and coffee nurseries. ABC and Provita have also helped 38 local coffee farmers get certified as organic, of which 11 are now also certified as Bird-Friendly®. These certifications mean



greater earning potential for these farmers and their families, which is helping lead to the conservation of more than 400 acres of habitat for migratory birds. To support the commercialization of specialty coffee from Venezuela, ABC and Provita conducted a market research study to identify potential buyers of Organic and Bird-Friendly® coffee from our Northern Venezuelan Coastal Mountain BirdScape.

**Birds:** More than 70 migratory bird species have been found in the Venezuelan Northern Coast. Of special interest are the golden-winged warbler, olive-sided flycatcher, and Tennessee warbler. Other migratory bird species found in Piedra de Cachimbo include black-and-white warbler, northern waterthrush, summer tanager, cerulean warbler, blackburnian warbler, American redstart, blackpoll warbler, and broad-winged hawk.

**Project goals:** The long-term goal of this project is to slow the rate of deforestation in northern Venezuela and create a habitat corridor between the Henri Pittier and Macarao National Parks. As part of our long-term objectives, Provita and ABC, and other international NGOs, are considering land acquisition within the BirdScape. Our short-term objectives include:

- convert an additional 500 acres of plantations from sun to shade (in addition to the 400 acres already converted through this project);
- restore tree cover across 150 acres of deforested lands;
- advance creation of a buffer zone between remaining tracts of primary forest and sun-crop agriculture by restoring 40 acres of land;
- integrate farmers from up to five new communities into the project. Provita will help these farmers establish at least one demonstration farm in each new community and provide technical guidance in establishing shade-grown crops in previously deforested lands and improving farming practices. In addition to planting native trees and shade coffee, banana and/or avocado trees could also be planted in order to diversify income for the farmers;
- conduct five workshops for farmers on the topics of migratory bird conservation and the value of birds in the ecosystem, the BirdScape concept, Bird-Friendly farming practices and how to advance toward Bird-Friendly coffee certification, and the mechanics of establishing a tree nursery and restoring degraded lands; and
- explore land acquisition opportunities. Provita has identified two properties for sale: one 271-ha (670 acres) property for \$135,500 and one 2,000-ha (4,942 acres) property for \$1,600,000. To determine the conservation value of these properties for migratory birds and biodiversity in general, ABC and Provita would like to complete a comprehensive biodiversity assessment.

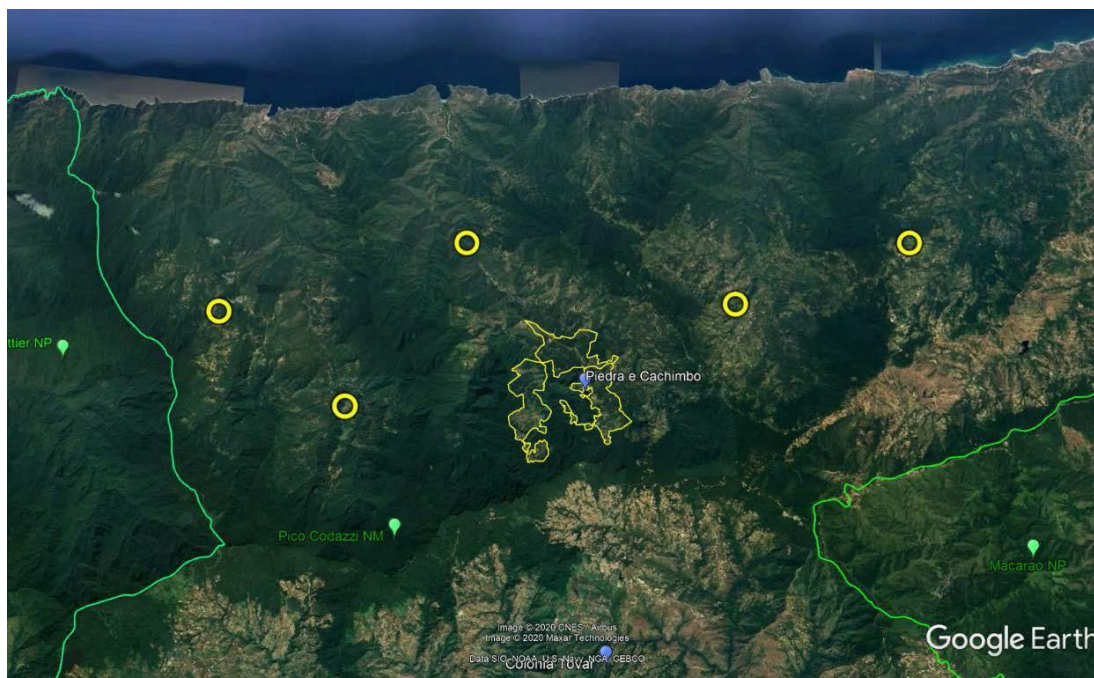
These objectives will be supported by continuous technical advice and field visits from Provita staff. Moreover, we will take advantage of a growing network of participating farmers, already trained in, and implementing, habitat restoration and sustainable agriculture as part of this project. Provita will also continue monitoring migratory birds using protocols established by SELVA, an ABC partner in Colombia. We will continue to monitor for golden-winged and cerulean warblers two species of priority conservation concern.

**Budget:** The project needs a total of \$234,000 to implement all project activities but smaller amounts of money can be put towards specific activities.

**Matching Funds** – ABC and Provita have secured funding from NMBCA, The Smithsonian Institution, IUCN, and the British Embassy in Caracas. Local farmers will provide in-kind investment into this project including providing the land, tools, and workforce to plant tree seedlings.

**Figure 20:** Northern Venezuela Coastal Mountains BirdScape including the location of Piedra de Cachimbo (yellow tack) west of Caracas, Venezuela.





**Figure 21:** Location of potential communities to join the project to create a corridor between two natural protected areas.

# 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 Pacifico, Zoological Foundation of El Salvador (FUNZEL), Fundación Enrique Figuerola Lemus, Ministerio de Medio Ambiente y Recursos Naturales, AGFD

**State(s) Participating:** Arizona

**Overview:** Continued declines in populations of NMBs have demonstrated the need to take a full life-cycle approach to NMB conservation. Actions taken only within the U.S. (including Arizona) may not be adequate for the long-term conservation of migratory birds that spend much of their life south of the U.S. Investing in international conservation work is crucial for addressing the needs of migratory birds throughout their annual cycle. Therefore, 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 use Central America's Pacific coast during stopover migration and overwintering respectively. Most of these areas were once dominated by seasonally dry tropical forests (Figure 22); however, large scale conversion to agriculture and pasture has made this one of the world's most endangered ecosystems, with less than 2% of the original forest intact in Central America. Only 5% of remaining dry forest in Mexico and Central America receive some degree of protection, making this ecoregion a global priority for conservation.



**Figure 22:** Map of El Salvador showing the distribution of dry tropical forests (yellow).

**Threats:** The primary threats to NMBs overwintering in El Salvador are: 1) habitat conversion from forest to intensive agriculture, 2) draining or modification of adjacent wetlands, and 3) direct mortality from unregulated hunting (e.g., sling shots). The first threat is perhaps the largest in the tropical dry forest lowlands of Central America. Although dry tropical forest areas often have a high level of disturbance, they nevertheless provide important habitat to western migratory birds. In Guatemala and El Salvador, the expansion of sugar cane and commercial melon farming has been noteworthy during the last decade.



**Birds:** El Salvador is a country with high avian biodiversity with 585 species, despite its relatively small size. For example in the lowlands portion of the Metapan area (Santa Ana Department) approximately 364 bird species have been recorded, including 60 species that are on either the 2014 State of the Birds Watchlist or on Arizona's SGCN list. Arizona SGCN species using these dry tropical forests include Southwestern willow flycatcher (WIFL), yellow-billed cuckoo, Mississippi kite, common black Hawk, peregrine falcon, Swainson's hawk, brown-crested flycatcher, MacGillivray's warbler, summer tanager, and Bell's vireo, among others (Table 4).

Of particular interest are the southwestern willow flycatcher (*Empidonax traillii extimus*, WIFL) and yellow-billed cuckoo (*Coccyzus americanus*, YBCU), both federally listed species that 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. Within their breeding grounds, loss of suitable nesting habitat was a major threat for these species and there is extensive research and habitat management for these species during the breeding season.

However, the threats in non-breeding areas are much more poorly understood, making full lifecycle conservation planning particularly difficult. WIFL and YBCU use Central America's Pacific coast during stopover migration and overwintering respectively.

In addition to NMBs, there are other priority species such as the endemic White-bellied Chachalaca (*Ortalis leucogastra*) and the endangered yellow-naped amazon (parrot) that use these dry tropical forests. The proposed project activities will compliment Paso Pacifico's Yellow-naped Amazon Conservation Program which operates in the same geography to protect parrot nests and to monitor the population.

**Program Goal and Strategies:** This project seeks to recover and conserve overwintering habitat and bird populations (including several of Arizona's SGCN) in dry tropical forests of El Salvador. To reach this goal, the project will use a four-pronged strategy: 1) identify and evaluate sites for conservation potential, 2) implement appropriate habitat conservation measures (e.g., protection, restoration and/or management), 3) monitoring and research of key SGCN (i.e. YBCU, WIFL), and 4) capacity building amongst local people and governments for improved habitat management and awareness and appreciation for birds and their habitats through education/outreach/training activities.

**Year 1 Focus:** The project aims to protect overwintering birds and their dry tropical forest habitats in the northern region of Metapan, El Salvador (Figure 22). This geography has been selected given the presence of several of Arizona's SGCN. A 2002 analysis indicated that Montecristo National Park, a protected area in the highlands contained 42% of El Salvador's nationally threatened birds. While this national park provides some protection to the highlands, the lowlands in the area are currently unprotected. This project will address threats to overwintering habitat and bird populations by identifying and evaluating sites for conservation potential, implementing appropriate habitat conservation measures at these key sites, reducing threats to bird populations through community awareness, and building local capacity through outreach and training.

**Activities planned for 2020:** Paso Pacifico and local partners (FUNZEL, Enrique Figueroa Foundation, and El Salvador Birding clubs) plan to implement the following activities:

- 1. Conserve dry tropical forest habitats**

- Evaluate conservation potential of land parcels found within IBAs or KBAs and those that may serve as habitat corridors. At present there is one potential area of over 200 acres that provides landscape

connectivity which spans from Lake Guija RAMSAR site and San Diego-La Barra national park, and up to the mountains of Montecristo.

- Map potential land parcels and engage interested landowners to discuss potential acquisition of land for protection (Note: Paso Pacifico has a policy against purchasing land from small land-holders).
- Develop proposals to seek external funding for land purchase with potential funders that might include IUCN-NL, World Land Trust, or Rain Forest Trust. No Arizona funds will be used for land acquisition.
- Delineate key bird habitat patches at three private properties and work with landowners to develop ranch-level management plans that will consider the conservation value and promote the sustainable management of bird habitats.

## 2. Promote bird monitoring as a tool to inform management

- Conduct birding and eBird workshops for ranch caretakers and/or landowners for three private properties.
- Provide training on bird monitoring protocols to Ministry of the Environment rangers and other staff from two protected areas and work with government authorities to incorporate monitoring into regular ranger duties.
- Provide basic binoculars to trained individuals to begin implementing bird monitoring activities.

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

- Build appreciation for birds amongst over 10,000 people in the Metapan area through radio spots related to habitat and bird conservation.
- Coordinate with the national birding club to promote birding trips to area properties, resulting in birders from San Salvador contributing financially to any local birding guides trained through this project.

### Budget 2020:

Objective	Total Cost	PP request to other funders	AZ contribution
Conserve dry tropical forest habitat	\$7,000	\$5,000	\$2,500
Promote bird monitoring as a tool to improve management	\$7,000	\$4,000	\$2,500
Build local awareness and appreciation for birds and their habitat	\$6,000	\$3,000	\$1,500
Total Cost USD	\$20,000	\$12,000	\$6,500

**Table 4:** A select list of bird species recorded in the Metapan region of El Salvador. \*Arizona species to be benefited by implementation of project objectives.

Common Name	Scientific Name	2014 State of the Birds Watchlist	AZ SGCN
black-bellied whistling-duck	<i>Dendrocygna bicolor</i>		1C
band-tailed pigeon	<i>Patagioenas fasciata</i>		1C
common gallinule	<i>Gallinula galeata</i>		1C
snowy egret	<i>Egretta thula</i>		1C
*Mississippi kite	<i>Ictinia mississippiensis</i>	x	1B
*common black hawk	<i>Buteogallus anthracinus</i>	x	1C
harris's hawk	<i>Parabuteo unicinctus</i>	x	1C

Common Name	Scientific Name	2014 State of the Birds Watchlist	AZ SGCN
*Swainson's hawk	<i>Buteo swainsoni</i>	x	1B
ferruginous pygmy-owl	<i>Glaucidium brasilianum</i>		1B
elegant trogon	<i>Trogo elegans</i>	x	1B
acorn woodpecker	<i>Melanerpes formicivorus</i>		1C
*peregrine falcon	<i>Falco peregrinus</i>	x	1A
rose-throated becard	<i>Pachyramphus aglaiae</i>	x	1B
northern beardless-tyrannulet	<i>Camptostoma imberbe</i>	x	1B
dusky-capped flycatcher	<i>Myiarchus tuberculifer</i>		1B
*brown-crested flycatcher	<i>Myiarchus tyrannulus</i>		1C
sulphur-bellied flycatcher	<i>Myiodynastes luteiventris</i>		1B
*olive-sided flycatcher	<i>Contopus cooperi</i>	x	1C
*willow flycatcher	<i>Empidonax traillii</i>	x	1A
savannah sparrow	<i>Passerculus sandwichensis</i>		1B
grasshopper sparrow	<i>Ammodramus savannarum</i>	x	1B
eastern meadowlark	<i>Sturnella magna</i>		1C
*MacGillivray's warbler	<i>Geothlypis tolmiei</i>		1B
*yellow warbler	<i>Setophaga petechia</i>	x	1C
Grace's warbler	<i>Setophaga graciae</i>	x	1C
*summer tanager	<i>Piranga rubra</i>	x	1C
*yellow-billed cuckoo	<i>Coccyzus americanus</i>	x	1A
*Bell's vireo	<i>Vireo bellii</i>	x	1B
masked duck	<i>Nomonyx dominicus</i>	x	
ruddy duck	<i>Oxyura jamaicensis</i>	x	
red-billed pigeon	<i>Patagioenas flavirostris</i>	x	
common ground-dove	<i>Columbina passerina</i>	x	
mangrove cuckoo	<i>Coccyzus minor</i>	x	
black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>	x	
limpkin	<i>Aramus guarauna</i>	x	
short-billed dowitcher	<i>Limnodromus griseus</i>	x	
solitary sandpiper	<i>Tringa solitaria</i>	x	
lesser yellowlegs	<i>Tringa flavipes</i>	x	
black skimmer	<i>Rynchops niger</i>	x	
black-crowned night-heron	<i>Nycticorax nycticorax</i>	x	
roseate spoonbill	<i>Platalea ajaja</i>	x	
white-tailed hawk	<i>Geranoaetus albicaudatus</i>	x	
short-tailed hawk	<i>Buteo brachyurus</i>	x	
yellow-bellied sapsucker	<i>Sphyrapicus varius</i>	x	
northern flicker	<i>Colaptes auratus</i>	x	
*American kestrel	<i>Falco sparverius</i>	x	
scissor-tailed flycatcher	<i>Tyrannus forficatus</i>	x	
veery	<i>Catharus fuscescens</i>	x	
wood thrush	<i>Hylocichla mustelina</i>	x	
orchard oriole	<i>Icterus spurius</i>	x	
altamira oriole	<i>Icterus gularis</i>	x	

Common Name	Scientific Name	2014 State of the Birds Watchlist	AZ SGCN
worm-eating warbler	<i>Helminthos vermivorum</i>	x	
Louisiana waterthrush	<i>Parkesia motacilla</i>	x	
golden-winged warbler	<i>Vermivora chrysoptera</i>	x	
blue-winged warbler	<i>Vermivora cyanoptera</i>	x	
prothonotary warbler	<i>Protonotaria citrea</i>	x	
*common yellowthroat	<i>Geothlypis trichas</i>	x	
black-throated green warbler	<i>Setophaga virens</i>	x	
Canada warbler	<i>Cardellina canadensis</i>	x	
dickcissel	<i>Spiza americana</i>	x	
painted bunting	<i>Passerina ciris</i>	x	