We welcome Purple Martins back to our colonies with open arms each spring. We commune with them daily, knowing the ins and outs of their life while here on their breeding grounds. We understand the negative effects that habitat loss and invasive species have had on their populations. We do our best to protect them while they go about the business of producing their next generation. But for most martins, the majority of the year is spent elsewhere. It is hard to believe that these birds that seem so tame, so tolerant of humans, are very much at home in the wilds of the Amazon rainforest. So, when gauging our understanding of the ecology of Purple Martins, there is a huge hole. The PMCA along with colleagues from the University of Manitoba and Disney Animal Kingdom embarked on an expedition (funded by a grant from the Disney Conservation Fund and by generous supporters of the PMCA) in November of 2016 to the heart of the Amazon rainforest. Our mission: to intensify our efforts to understand the entirety of Purple Martin ecology, to identify conservation issues that affect martin survival, to boldly go where no martin researchers have gone before.

The groundwork for this expedition began being laid in 2005??? With cutting edge migration research begun by Bridget Stutchbury of York University, and later expanded by Kevin Fraser of Univer-

PMCA'S 2016 AMAZON EXPEDITION

Joe Siegrist
PMCA

sity of Manitoba and the PMCA as partners along with many other collaborators across North America. The advent of the light level geolocator gave us our first look at so many aspects of martin migration. These little devices strapped to the back of a martin record sunlight intensity minute after minute, day after day. From this simple data, we can determine where the birds are on the globe. The length of day tells us latitude and the relative timing of sunrise and sunset tells us longitude. Through geolocator research, we have learned so much. We have learned when martins migrate, how fast they travel, routes they take, and so much more. The only hindrance is that the location accuracy of these devices is around 200km. Over the years technology marched on and soon GPS technology was miniaturized enough to be used with martins. GPS data loggers have location accuracy of 1 meter. So, instead of drawing a big circle on a map that a martin should be located within, we can determine the exact tree being roosted in by the martin. 2014 was the first year that GPS loggers were deployed in our study. Data was retrieved when the birds returned in 2015 and used to plan our trip.

Bird with GPS credit here.

After months and months of logistics, we had our plan. Several of our tagged martins had spent time near Manaus in the heart of the Amazon rainforest. We hoped to explore those locations to characterize the habitat used by the martins as well as assess any conservation risks to it. We also intended to visit the famous martin roost at the Petrobras oil refinery and determine if it could be a research hub for our planned work in Brazil. Finally, we planned to spend as much time as possible networking with other researchers in Brazil and planning collaborative research. Our fearless explorers would be Dr. Kevin Fraser and graduate student Amanda Shave from the University of Manitoba, Dr. Jason Fischer from Disney Animal Kingdom, and yours truly. Our flight itinerary would take us from our connections in the US, to São Paulo in southern Brazil, then back up to our base of operations: Manaus. We would have only six days in the Amazon to work with, so we would need the tropical weather to cooperate and a little luck on our side.

The Journey South—November 15 and 16

Departure was on November 15th. The first leg of my trip would be a short hop at 5:00 PM from Erie PA to Chicago. As all flights out of Erie seem to be, it was delayed about a half hour. However, there was a three-hour layover to spare in Chicago. So, it was no big deal. It gave me extra time to experience the butterflies of anticipation for this long awaited trip. With fingers crossed we lifted off, the adventure had begun. In no time, I had arrived in Chicago. A quick bite of Chicago deep-dish pizza and I was ready for anything. Kevin and Amanda arrived a short time later on their flight from Winnipeg, Manitoba. We had the same itinerary from Chicago onward. A quick dinner for them, a brief discussion verifying the supplies that we packed, a quick glance at the Brazilian bird guides that we purchased, and we were already boarding to fly overnight to Sao Paulo.

Departure to São Paulo was at 8:50 PM and we would not be arriving until 11:40 AM the next morning. Definitely the longest flight I have ever been on and I can't really sleep on planes…uh oh. I quickly exhausted all of the podcasts I had downloaded, became sick of all of the music I brought, organized and reorganized the files and emails on my computer. With the help of some Benadryl, I was able to mercifully catch a few minutes of sleep. When I awoke, the sun had risen and I caught my first glimpses of southern Brazil. In a few hours or so, the remarkable urban sprawl of Sao Paulo came into view on the horizon. São Paulo is the 11th largest city in the world and that fact showed during our approach to landing.

When arriving in São Paulo, we were faced with a conundrum. We had a 10-hour layover and were toying with the idea of leaving the airport to visit Instituto de Butantan (Butantan Institute). There was initial concern about whether leaving the airport after transferring our bags would cause security complications upon our return. We transferred our bags and headed to the area where we would check in to our next flight, stepping outside to catch our first breath of hot, humid Brazilian air and realized that we were already outside of the secured area. Obviously there would be no issue with returning to the airport later. After some trial and error in figuring out how to use our cell phones in Brazil, Jason got through to our contacts at Butantan. We grabbed a taxi and we were on our way.

A one hour taxi ride awaited us (São Paulo is infamous for its traffic congestion). We brought our backpacks and binoculars to attempt some birding. A half-hour into the ride and I spot our first martin flying over a roadside canal! The body shape and flight characteristics are unquestionably "martin". We all struggle to get a look at the swooping bird as our taxi speeds along. It is dark on the back, but more brown than purple. Those of us on that side of the car conclude that it was a *Brown Chested Martin (Progne tapera).

For the remainder of the ride, we were riding high from spotting our first martin and just being in the midst of this trip that we had talked about for years. We soon arrived at the Butantan Institute and met up with our contacts Erika Hingst-Zaher and Luciano Moreira-Lima. Butantan is a virtual island of protected forest habitat in the midst of São Paulo's sprawl. The institute is considered one of the major scientific centers in the world and is known for its production of antivenoms and vaccines. However, tucked into the woods, there is a small group of conservation biologists working to catalog the diversity of species throughout Brazil. We are particularly interested in working with them to expand our citizen science

*A WHAT martin?

In Brazil, our Purple Martins (Progne subis) mingle with other (Progne) martin species. Most commonly they can be found with Brown-Chested (Progne tapera) and Grey-Breasted (Progne chalybea) martins. (See page 1 for photos.) In all, there are nine different species of martins throughout the Americas. Some of which could pass for our Purple Martins if you saw them in your back yard. Luckily these doppelgangers live elsewhere, such as the Cuban Martin (Progne cryptoleuca), the Galapagos Martin (Progne modesta), and my favorite the Southern Martin (Progne elegans). You could think of the Southern Martin as a backwards version of the Purple Martin. It looks like our bird, but breeds in southern South America (Argentina and Bolivia). It, too, migrates in the winter to the Amazon. However, being from the southern hemisphere, it experiences the opposite seasons as the Purple Martin. So, when our birds are leaving Brazil to breed to the north, the Southern Martins are arriving from the south to avoid the southern winter.

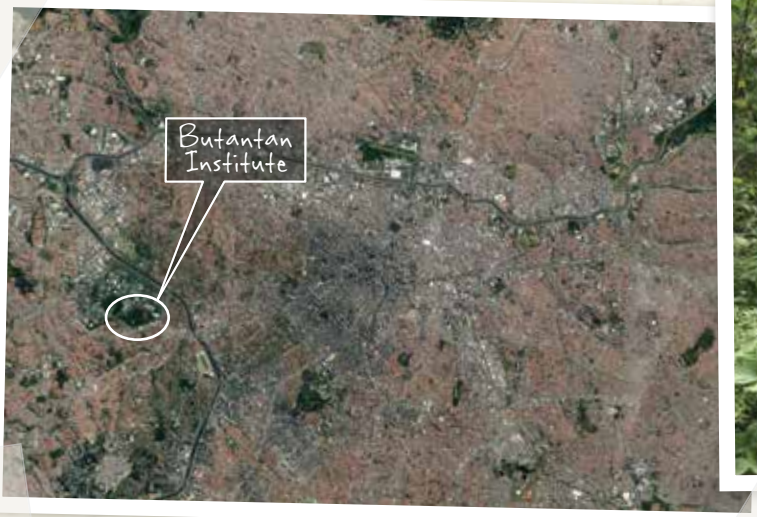
offerings to a Brazilian audience to help locate martin roost locations. This effort is a natural progression of the PMCA's Project MartinRoost in which we locate and monitor premigratory roosts and identify any conservation issues facing them. Erika and Luciano are already involved with a similar effort in Brazil, so a partnership is a natural fit. We have just enough time for a tour of the grounds and then we head back to the airport, only this time it is a two-hour taxi ride in rush hour traffic. We make it back on time and proceed to our next flight, a five-hour flight back north to Manaus. We arrive bleary eyed in the early AM of the 17th and taxi to the hotel. Like zombies, we shuffle up to our rooms, exhausted from a 32-hour travel marathon, and sleep like babies.

Day 1 — November 17

All too soon, the sunlight burns through the curtains. Throwing open the curtains; I first set eyes on the colorful favelas (shantytowns), sporadic high-rises, and lush green wooded areas that pattern Manaus. Manaus, a once affluent city born from the rubber trade, has since transformed to a manufacturing center. It is located in the middle of the Amazon Rainforest where the Rio Solimões and Rio Negro converge to create the Amazon River. It is also home to the Instituto Nacional de Pesquisas da Amazônia or National Institute of Amazonian Research (INPA) which is our destination for the day. We are off to meet with Mario Cohn-Haft, curator of the bird collection and graduate faculty member at INPA. Originally from the US, Mario moved to Brazil at 25 and has been there ever since. Being fluent in Portuguese, he is our anchor and lifeline in Brazil.

With a 20-minute cab ride, we arrive at INPA. We discuss our plans to expand research in Brazil and potential collaborative efforts. Hours go by, looking at the collection of preserved bird specimens, marveling at the biodiversity of the Amazon including a brand new unnamed species of XXXXXX. One drawer holds all of the martin species, including one adult male Purple Martin collected at the Petrobras refinery in town. Petrobras is a martin roost made famous in the BBC series The Life of Birds. Purple Martins were featured in a segment where broadcaster and naturalist

Butantan Institute Grounds



David Attenborough climbed up on the pipes and catwalks of the refinery and martins descended around him at sunset despite the harsh conditions. The segment then transitions to a colony near the PMCA headquarters in Northwest PA, showing their reliance on humans. If you watch closely, you can see some PMCA staff in the background of those shots. For months we had been trying to get permission to access the refinery grounds to do a survey of the roosting birds with the hopes of negotiating terms to use the refinery as a study site. But, our requests had been met with silence. We asked Mario to reach out to his contacts at Petrobras to ask about permission. Shortly after lunch he gets a brief text, "The martins don't come here anymore". We are shocked. We ask Mario what to make of the message. Could they be blowing us off because they don't want the hassle, because they don't want environmental types snooping around? Did they do something to the martins to make them leave? Our trip immediately transforms into a mission to solve a mystery: "What happened at Petrobras and where are the martins now?" If the martins are indeed gone, we are left without a known local roost at which to conduct research. Where are those Manaus martins? Mario has some ideas where martins might be locally. So, we build a plan for the next day. We will hire a boat to head up the Rio Solimões to the location of some known martin sightings and see if anything looks like it may be a martin roost.

at the National Institute of Amazonian Research

Day 2—November 18

The next morning, we head down to the port in the early AM. We have a hastily drawn map on a scrap of paper created by Mario that shows the three locations that we should search. We struggle through our negotiations with the boat captains. It takes everything at our disposal to communicate: phrasebooks, phone translation apps, pointing, wild gesturing, and the local common name for Purple Martins "Andorhina Azul". But, eventually we come to an understanding and embark. We did not catch the name of the captain, but the other captains on the dock think that Jason called him Capybara instead of captain and have a belly laugh about it. We leave port on the shore of the Rio Negro and have to go slightly downstream around the point to head up the Rio Solimões. In doing so, we cross one of the biggest tourist attractions in Manaus, "The Meeting of the Waters". The Rio Negro, a cool black water river, and the Rio Solimões, a warm muddy river, combine to form the Amazon River. But, they don't mix. Instead the two waters run side by side downstream for miles. After pausing for a few minutes in fascination of the natural phenomenon, we get to work on our search.

The Amazon and its tributaries vary greatly in depth between the rainy and dry season (up to 40 ft). Our trip is at the end of the dry season when the waters are at their lowest. With low water, we are surrounded by sheer 40 ft. high mud banks on either side. Even with poor visibility beyond the banks, we quickly spot martins. The "Capybara" stops the motor to listen and look. It sounds like a Purple Martin! But, after a few seconds we realize that it sounds close but is not quite right. It is another Brown-Chested Martin. We see many martins feeding in the air throughout the boat trip, certainly some are Purple Martins, but the only ones that we can get an ID on are Brown-Chested. They are actually fighting along the bank for nesting holes in the mud. Farther up the river, we notice a familiar silhouette circling above some taller trees. It appears to have a blue back and light chest. Excitement builds as we try to get a positive id on our first female or subadult Purple Martin. We are nearly convinced by looking with our scopes that it is a female martin. However, I see her go into a woodpecker hole in a snag. Another similarly colored martin then perches nearby. A Purple Martin would not be exhibiting this breeding behavior since they only breed in North America. We can then safely identify it as a Grey-Breasted Martin. Still farther up the river we spot a group of swallows sitting on a power line at a riverside farm. We beach the boat and scamper up the mud bank to get a better look. We quickly notice the distinctive forked tail of the Barn Swallow. And so it goes, up and down the river… Brown-Chested after Brown-Chested, Barn Swallow after other local swallows…no Purple Martins positively identified. The mystery deepens. Where did the Purple Martins go???

Despite the lack of Purple Martins on the Rio Solimões, we learn a lot about the importance of the water level changes to both the wildlife and the locals. A forty-foot difference in river height changes everything from one season to the next. Important information for our assessment of the river habitat used by our GPS martins. We spot countless bird species that are new to us. We stop at a huge sandbar and explore it. It is nearly impossible to see the other side of and reaches thirty feet above the water.

Interesting picture right here!

Silt is carried away by the muddy Solimões, but the sand remains and deposits huge sandbars scattered around the turns of the river. We even spot a pink Amazon River Dolphin as we go. But, our time runs out on this excursion. We turn around at Iranduba and head back to Manaus wash up.

After cleaning up, it's back to INPA to present our research to faculty and graduate students. We repeat our plans to expand research in Brazil and our desire to build relationships with collaborators. One graduate student that we are introduced to had been hired by Petrobras to research methods to deter martins from roosting at the refinery…the plot thickens. He informs us that his recommendation was to use balloons that simulated predator eyes to scare the martins away, but that it was unsuccessful as far as he was aware. Everyone we speak with seems surprised that the martins would be gone from Petrobras. Tania Sanaiotti, a researcher for INPA had just returned from a trip and came straight to our talk from the airport. During her graduate studies in the late 1980's she had studied the martins of the Petrobras roost. In fact, she is the one who collected that lone Purple Martin in the INPA collection. She had since moved on to become the world's foremost expert on Harpy Eagles. However, she thought she might still have her data in storage. So we make plans to visit her office the next day.

Day 3—November 19

The next morning finds Amanda and Jason both falling ill to Montezuma's Revenge. Perhaps too much river water splashed in their faces during the previous day's boat trip. We have the luxury of time today. We spend the morning hours discussing how to further our research collaborations between the PMCA, University of Manitoba, and Disney. Despite being at less than 100% physically, we come up with exciting plans that will be implemented over the coming years. After lunch we head to Tonia's office to discuss her past research with Purple Martins. She quickly began pulling out records and articles from 30 years prior. She had actually worked with the PMCA on two separate occasions back in the 80s and 90s, initially during the PMCA's first trip to Manaus, and later while banding Purple Martins at Petrobras. We spent time discussing a topic that had come up multiple times during our trip, that martins are seen as a nuisance in some municipalities where their roosts are in cities. If a premigratory roost that lasts just a few weeks here in the states can cause issues, it stands to reason that a roost that lasts several months could be frowned upon. Clearly, we have our work cut out for us in the court of public opinion. Our conversation naturally shifted back to the Petrobras roost and what may have happened to it. Tonia suggested that the location would be visible by boat from the water. And just like that, a plan was hatched for a stakeout. The next night, we would hire a boat and surveil the Petrobras site from the river as night fell. We would then know for sure if we were just being brushed aside or if the roost was truly gone...

Coming up in the Summer issue of the The Purple Martin Update: The Petrobras stakeout and a trip up the Rio Negro to explore the habitat used by our tagged Purple Martins.

Interesting picture right here!

Our research is made possible by supporters like you. Please consider donating to the PMCA to help continue this groundbreaking research and build new exciting projects in the future.