

Tracking Inter-tropical Migratory Movements of Waterbirds Breeding In the Peruvian Amazon

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In South America, seasonal flooding of the Amazon influences many breeding birds to undertake annual migrations. Yet, the destinations and routes are relatively unknown for many intra-tropical migrants, especially waterbirds. Bird migration studies in South America have generally concentrated on north-temperate forest species



Photo by Kate Goodenough

Black Skimmer pair with chick roosting along a riverine sandbar in Manu National Park, Peru in August 2014.

with much of the research focusing on short-range seasonal movements of birds at specific locations primarily because the environment of the Amazon Basin limits the ability of researchers to document long-range movements for many species.

Migratory connectivity is a key focus in migration research because it is becoming more and more evident that cross-seasonal effects are important drivers of population demographics. What occurs during the non-breeding season can have profound influences upon successive breeding seasons; without understanding these potential cross-seasonal effects linking these stages of the lifecycle, this gap in our knowledge limits our ability to understand how migrant species may respond to changes locally and across the landscape. Our research aims to gather critical knowledge of the connectedness of the Amazon system at the continent-wide scale from the perspective of migratory waterbirds. Two of our goals for this tracking project are to develop linkages between breeding and non-breeding locations for targeted waterbird species and to explore how waterbirds respond locally to patterns of riverine flooding within the Amazon Basin, inter- and intra-annually.

Skimmers are piscivorous waterbirds from the Americas, India, and Africa, which are recognized for their specialized bill and flight mechanics that allow them to skim across the water and catch fish within the top six inches of the water's surface. Tropical skimmers are predominantly riverine species which breed on sandbars during low-water periods; after breeding, they leave interior regions and form large non-breeding aggregations along both the Pacific and Atlantic coasts of South America.

There are two subspecies which are morphologically distinct with *Rynchops niger cinerescens* distributed along northern and western South America and *Rynchops niger intercedens* from eastern Brazil to northeastern Argentina. Few sightings of *R. n. cinerescens* (our Peruvian skimmers) have occurred along the Atlantic Coast so there has been some suggestion that Manu skimmers may be crossing to the Pacific Coast during the non-breeding season. This habitat switch would mean that at some point skimmers need to cross the Andes Mountain range which is thought to be a geographical barrier for many species. From our main fieldsite at the Cocha Cashu Biological Station (EBCC) in Manu National Park, the Pacific Coast is a mere 500 km distance (plus an Andean crossing) to travel, whereas a move to north of the Equator would require a minimum of 1300 km travel, and travel to the Atlantic at least 2900 km.

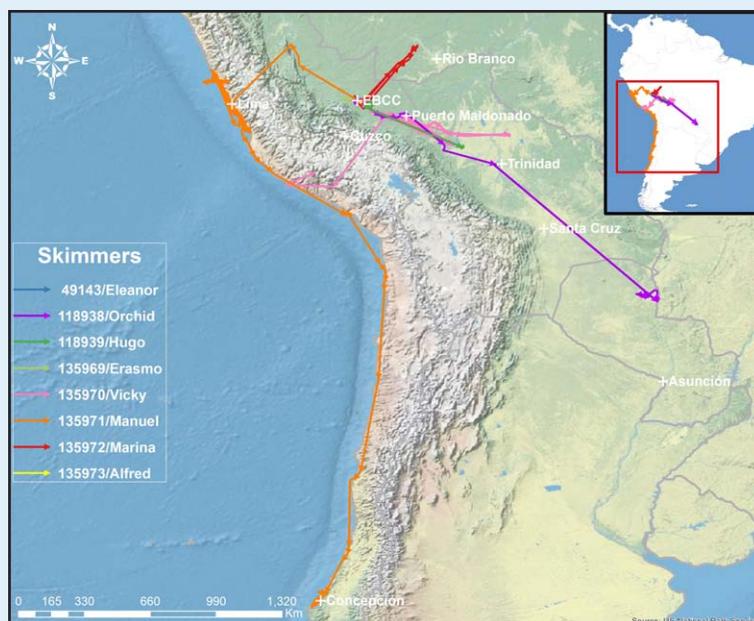


Photo by Bruno Enriquez Struck

A Black Skimmer uses its specialized bill to catch fish.

Summer 2014 was our first field season, and, thanks to the Christiane Howey grant provided by Microwave Telemetry to Katharine Goodenough (in addition to transmitters purchased privately), we were able to deploy seven 5g solar PITs on Black Skimmers. Much to our delight, we documented not only an Andean route to the Pacific Coast but also a potential differential migration strategy with some skimmers going west to the Pacific Coast and others heading east to the Atlantic Coast.

Two skimmers provided confirmation of a trans-Andes migration route, crossing the Andes to the Pacific Coast of Peru, while one individual took a southeastern route towards the Atlantic Coast. The two trans-Andes migrants used quite different routes to the Pacific Coast. Manuel moved northwest from the Manu River into the Ucayali drainage before crossing the Andes to Isla San Lorenzo (see map). Vicky crossed the



Manuel's [orange] and Vicky's [pink] routes over the Andean Mountain range of Peru and Orchid's route [purple] southwest into Paraguay. Note Manuel's track south along the Pacific Coast to southern Chile.

Andes arriving 3.8° south of where Manuel arrived. No intermediate points within the Andes were obtained from Manuel, but his start and end locations suggest he could have used passes near Ticlio (4818 m) or Abra de la Viuda (4817 m) in a narrow section of the Andes. From Vicky, we

received three Andean locations that indicated she crossed over one of the widest sections and higher elevations of the Peruvian Altiplano (5800 m) (see map). Orchid travelled over 1800 km from the Manu River to the Paraguay River in eastern Paraguay before transmission halted (see map). If Orchid continued her travels, she could have reached the Atlantic Coast near Mar Chiquita, Argentina, which is a site of significant non-breeding concentrations of *R. n. intercedens*.

Another unexpected feature of the Manu skimmer migration was also uncovered by this study that illustrates how little we know about migratory connectivity of bird populations within South America. Manuel (after transiting the Andes) began a southern movement from Lima to Concepcion, Chile. The long southerly migration demonstrated by Manuel is close to the maximum

latitudinal shift known for any Neotropical austral migrant. Future tracking studies are planned to continue to document these fascinating continental-scale movements.