CONTRIBUTIONS

A New Record of Baird's Tapir *Tapirus bairdii* in Nicaragua and Potential Implications

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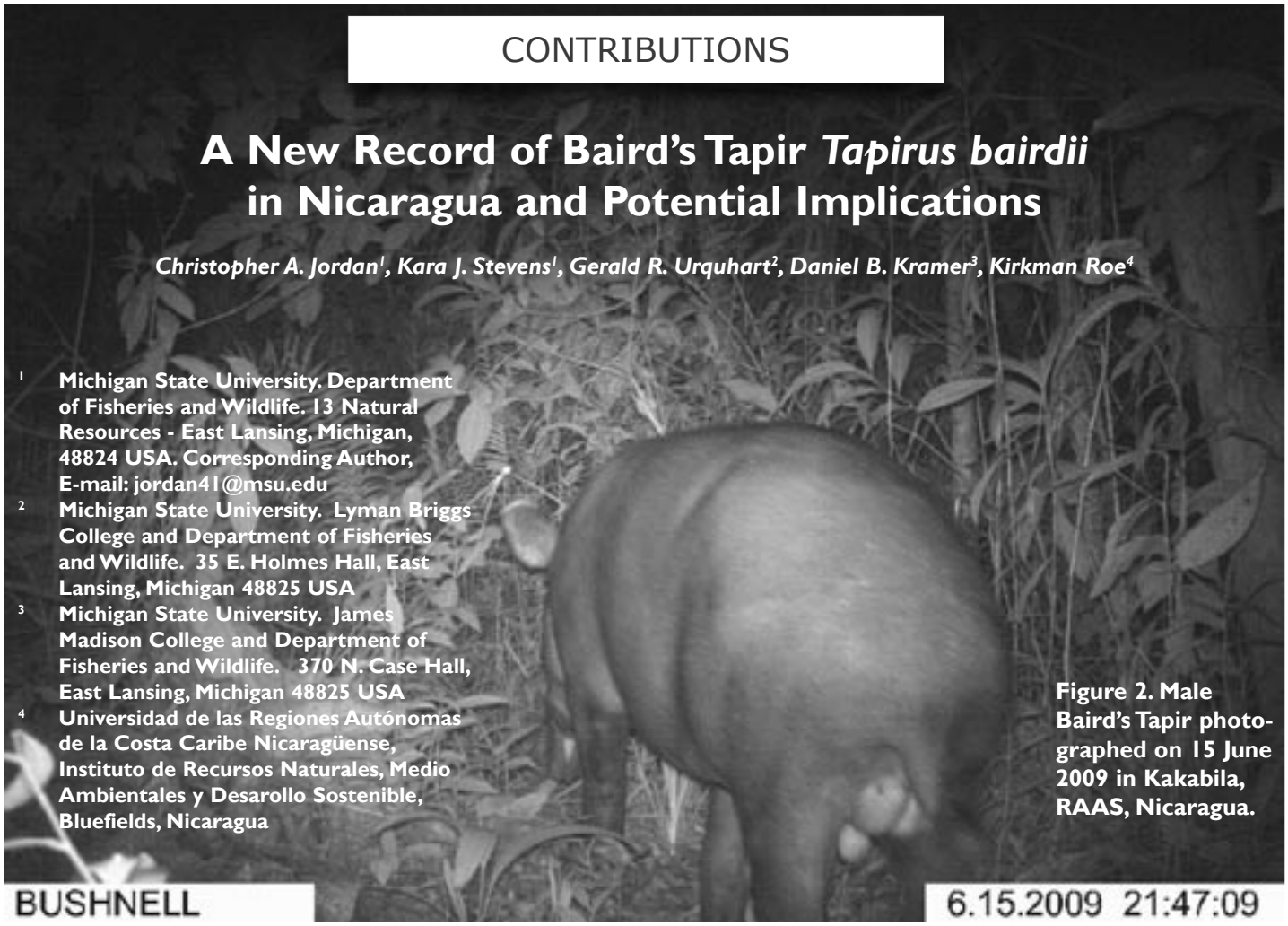

Figure 2. Male Baird's Tapir photographed on 15 June 2009 in Kakabila, RAAS, Nicaragua.

Abstract

The Baird's tapir *Tapirus bairdii*, acknowledged as the largest terrestrial mammal in Central and South America, is also one of the region's *rarer* mammals. The species is listed as endangered on the International Union for Conservation of Nature (IUCN) Red List, is an Appendix 1 Species on the Convention on the International Trade of Endangered Species (CITES), and less than 5,500 are estimated to be left in the wild. Further, it is expected that local overhunting and habitat fragmentation will cause continued declines in remaining populations of the Baird's tapir. Although Baird's tapirs were believed absent or extirpated from the Caribbean coastal forests of Nicaragua, we obtained evidence from camera traps and tracks along with local accounts that demonstrate its occurrence at multiple locations in the region. More rigorous tapir surveys will help elucidate if the tapir population of the Southern Atlantic Autonomous Region (RAAS) of Nicaragua is viable or is merely comprised of dispersing juveniles and not sustainable. Such data will have significant conservation implications for an area undergoing rapid land-use and land-cover changes due to expanding agriculture and increasing investments in infrastructure.

Keywords: Bairds tapir, camera trapping, local ecological knowledge, Miskito Coast, tracking,

Introduction

As the largest member of the megafauna of Neotropical rainforests, the Baird's tapir has become a flagship species for Latin American conservation. Organizations such as the Tapir Specialist Group and independent researchers have undertaken considerable effort to improve the general understanding of the Baird's tapir, but research in much of its range,

including Nicaragua and Honduras, remains limited (Fragoso, 1991; P. Medici pers. comm., M. Garcia pers. comm.). The IUCN Red List classifies it as endangered and estimates that less than 5,500 individuals remain in the wild (IUCN, 2009), and it has been in CITES Appendix 1 since 1975 (CITES, 2009). Furthermore, numerous sources cite the continued decline of the population due to increased habitat fragmentation and localized overhunting (IUCN, 2009; Tobler, 2002).

The geographic range of Baird's tapir extends from Oaxaca province in Mexico, throughout much of Central America, and into parts of the Andes in Colombia (IUCN, 2009) (Figure 1). However, the local distribution is less well known, particularly in those countries where research has been limited (M. Garcia, pers. Comm.; Medici et al. 2006). With reduced populations due to habitat loss, hunting, and other factors, it is increasingly important to understand where extant populations occur. Among the significant gaps in the known range of Baird's tapirs is the Caribbean Coast of Nicaragua, a key region in the Mesoamerican Biological Corridor, with vast areas of lowland rainforest and swamps.

Here, we present evidence of Baird's tapirs on the Caribbean coast of Nicaragua, where they were believed either extirpated or never present (IUCN, 2009). In Nicaragua, the Baird's tapir was previously only confirmed from the northern Atlantic coast near Honduras, the southern Atlantic coast bordering Costa Rica, the northwestern portion of the country, and the Matagalpa region (Brooks et al., 1997). From May to August 2009, we obtained camera trap, track, and anecdotal information from the communities of Kakabila, Wirin Key and Monkey Point, areas where tapirs were previously considered either extirpated or historically absent (Figure 1).

Study Area

Located in the fabled "Mosquito Coast" region of Nicaragua, the Southern Atlantic Autonomous Region (RAAS) is characterized by large expanses of lowland rainforests, swamps and mangroves. The climate in the RAAS is characterized by a marked wet season from May to December during which 2,000 to 4,000 mm of rain falls and large expanses of the terrestrial ecosystems are flooded (Christie et al., 2000). Mean annual temperature ranges from 25.6°C to 27.7°C (Christie et al., 2000). The coastal region of the RAAS under consideration is very ecologically diverse due to its widely varying soil composition, topography, and elevation The advance of agriculture and logging is threatening the ecosystems of the region, and continued hunting places pressure on wildlife populations.

Our research focused on four coastal communities where intact nearby forest is reported to harbor a high

Table 1. Pertinent data on the five study communities mentioned and the tapir data obtained in each.

Location	Area	Habitat	Nearby Community, Population and Distance	Local Tapir Reports	Camera Trap Effort 2009	Tapir Evidence
Kahka Creek	Rio Wawashang Nature Reserve	Lowland Rainforest	Pueblo Nuevo, pop. 4 km	Uncertain as to presence	182	None
Kakabila	Communally Managed Indigenous Lands	Lowland Rainforest, Swamp, Mangrove	Kakabila, pop. 300, 3 km	Considered present but rare	85	2009 Photograph from Camera Trap
Monkey Point	Cerro Silva Nature Reserve	Lowland Rainforest, Swamp, Mangrove	Monkey Point, pop. 120, 4 km	Considered present but rare	142	2009 Track Observations
Wirin Key	Cerro Silva Nature Reserve	Mangrove, Swamp, Lowland Rainforest	Wirin Key, pop. 30, 3 km	Considered present but rare	190	None
Caño Negro	Cerro Silva Nature Reserve	Swamp, Lowland Rainforest	La Union, pop. 40, 1 km	Previously considered present	none	1994 and 1996 Track Observations

diversity of terrestrial mammals (Table 1). Each of these locations faces myriad threats to protecting local ecosystems and ways of life and is the focus of a larger research project on combined social, economic and ecological changes on the coast.

Wirin Key and Monkey Point are coastal communities located in the over 266,000 ha Cerro Silva Reserve (Figure 1). Kahka Creek is located in the 231,500 ha Rio Wawashang Nature Reserve, near the agricultural community of Pueblo Nuevo. Kakabila is not in governmentally protected area but the land and nearby forests have been communally managed by the Miskito people for centuries (Jamieson, 1995).

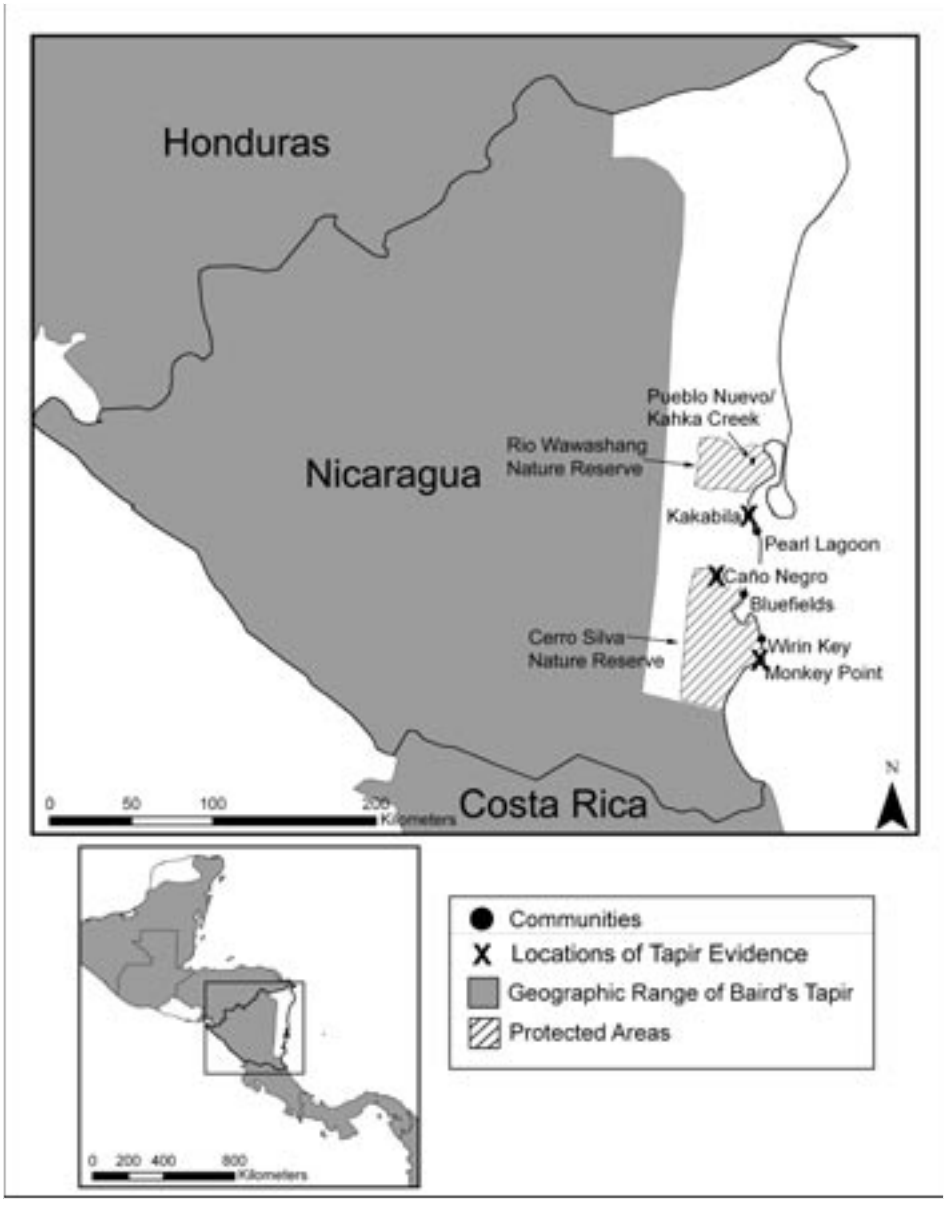

Figure 1. The locations of our study communities relative to the geographic range of the Baird's tapir according to the IUCN SSC Tapir Specialist Group (2009).

Methodology

We deployed 15 Bushnell Trophy Cams in relatively intact forest habitats surrounding four coastal communities to document the local, terrestrial biodiversity (Table 1). We placed cameras in May and June 2009, with the input and guidance of local ecological experts, in locations that we perceived would both take high quality photos and capture the highest species diversity. We retrieved data from the cameras in August 2009. Due to equipment failures with the cameras, we obtained a scattered sampling of mammals from each of these locations.

We also identified and recorded data on tracks and sign observed in time spent going to and from camera locations. Tracks were identified with the assistance of local knowledge and field guides. During previous research by one of the investigators in the coastal swamps of Nicaragua (Urquhart, 1997), track data were irregularly recorded, but some observations from that are also reported here.

Results

During the study period, we obtained data for 599 trap nights from the different locations (Table 1). The cameras that functioned properly recorded a high diversity of species of both the mammalian fauna and avifauna, including white-lipped peccary *Tayassu pecari* (multiple photos), puma *Felis concolor* (two photos), and jaguar *Panthera onca* (one photo).

One individual, male tapir was photographed in forests 3 km from the town of Kakabila on 15 June 2009 at 21:47 at the following coordinates: N 12°23.916, W 083°45.066 (Figure 2). In this forested area, three cameras functioned for a total of 85 total trap nights between 1 June and 17 August 2009, with some cameras failing after only a few days. The other two cameras did not record any photos of tapirs, but did record collared peccary

Tayassu tajacu (multiple photos), northern tamandua *Tamandua mexicana* (one photo), white-tailed deer *Odocoileus virginianus* (multiple photos), and other smaller mammals.

A tapir track was observed near Monkey Point on 11 June 2009 in close proximity to a selected camera trap location (N 11° 37.656' W 83° 41.435') in seasonal swamp forest less than 4km from the village. Two local guides acknowledged the presence of tapir in the area, though they reported observing tracks and direct sightings only very rarely. The cameras deployed at Monkey Point did not photograph tapirs in 142 trap nights, but because we experienced a high rate of equipment failure we are unable to be confident in this estimate of camera effort or the completeness of our mammalian survey. At Wirin Key (190 trap nights) and Kahka Creek (182 trap nights), we did not record any tapir photographs or observe any tracks, but experienced similar equipment failures at these locations as well.

We also accumulated anecdotal evidence of wildlife species through conversations with our local guides, who were very forthcoming with information about the local fauna. In Kakabila, for instance, as we were in the process of placing the camera that took the photo in Figure 2, our local Miskito guide correctly predicted that the location would lead to a tapir photograph. In Wirin Key, while no photos were taken, our guides explicitly informed us post-camera placement that our chosen locations were not far enough into the swamp to photograph a tapir. While this anecdotal evidence of tapir presence is not rigorous by any means, local peoples across the region, including our guide in Kakabila, have been shown to be keenly aware of tapir movement within and around their communities (Estrada, 2004; Flesher and Ley, 1996). This may be a function of the morphology of tapir feet, which is unique amongst the region's mammals and leaves readily identifiable tracks (Emmons, 1997).

Historically, tapir tracks were also observed on two occasions in large palm swamps near Caño Negro, about 15 km from the town of Bluefields in 1994 and 1996 (Urquhart, unpublished data). These are reported here as further evidence of tapir presence on the Caribbean coast.

Discussion and Conclusion

Our camera trap photos from Kakabila constitute a definite record for the Baird tapir in Nicaragua in an area where the species was not expected to occur. Track observations from Monkey Point (2009) and Caño Negro (1994, 1996) provide support for the presence of a population of Baird's tapirs on the Caribbean coast of Nicaragua. It is unlikely that a single individual is responsible for both the Kakabila photographs and the Monkey Point tracks, given the 85km distance and several geographical barriers (rivers, swamps, agriculture) between the two communities.

Despite these positive data, unsustainable harvest rates and expanding agriculture, similarly occurring in other regions of Latin America (See: Koster, 2006; Naranjo, 2009), constitute serious threats to tapirs in the RAAS and may eliminate or have already eliminated what was once a viable population. It is possible that the photographed specimen is an individual dispersing male or the remnant of a previously viable population.

Nonetheless more research is necessary to understand the actual abundance of Baird's tapirs in the region because many of the habitat elements of the RAAS match those found in other regions with tapir populations. One of the two habitat types used most frequently in Fragoso's (1991) study area had been selectively logged 16 years prior to his research. In Nicaragua, current conditions are likely similar to this preferred habitat type as Hurricane Joan created an abundance of early successional vegetation 21 years ago that has since grown into secondary forest with a mix of tree cover and understory browse. Fragoso (1991) also found that tapirs utilize floodplains at a higher rate than expected. The seasonally flooded forests and the abundance of *Raphia taedigera* palm swamps on the Caribbean coast (Urquhart, 1997) likely provide similar cover. Local guides also said that *Raphia* palm fruits are regularly consumed by tapirs. Flesher and Ley (1996), despite using an admittedly small data set from Honduras, applied a frontier model from the econometrics literature to infer that human settlements only exclude tapirs within a buffer zone of a mere 290 m. On top of this, the species does not appear to require an enormous home range; estimates include 94.9-125.0 ha (Foerster and Vaughan, 2002), 0.22-0.8 km^2 (Noss et al., 2003), and 500 ha (IUCN, 2009). Despite the recent increases in development, human settlements along in the RAAS are still at relatively low densities. Therefore, if the 290 m buffer rule and these estimates of tapir home ranges are veritable, the size and spatial distribution of the remaining tracts of suitable tapir habitat in this region of the RAAS are potentially large enough and the human populations sparse enough to support a population. If this is this case, our low number of tapir photos may simply be an artifact of camera placement and equipment failure.

Further research would improve the understanding of the species' local range in Nicaragua and could constitute a strong argument for more proactive conservation along the coast. Two of the large protected areas of the RAAS, the Cerro Silva and Rio Wawashan Nature Reserves, form an important link between two tapir strongholds that are key components of the

Mesoamerican Biological Corridor (MBC): the Corazon del Corredor Biologico Mesoamericano that sits on the Nicaragua-Honduras border to the north and the Corredor Biologico El Castillo-San Juan-La Selva that straddles the Costa Rica-Nicaragua border to the south. The documentation of a viable population spanning this entire range would provide support for local and regional conservation initiatives, strengthen the argument for establishing a contiguous MBC, and have important genetic implications for the survival of the endangered Baird's tapir.

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