

CONTRIBUTIONS

Distribution and conservation status of the Baird's tapir in Panama

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The Baird's tapir *Tapirus bairdii*, listed as endangered on the IUCN red list (IUCN, 2013), ranges from South Eastern Mexico to the Gulf of Guayaquil in Ecuador (Reid, 2009). Within this area, the Isthmus of Panama is a key area because it connects populations of Central America and South America with each other (Webb, 2003). Tapirs may persist in some forested areas of Panama, but their presence has not been verified in most of the potential distribution areas. No studies of wild Baird's tapir have been undertaken in Panama outside of Barro Colorado Island, where the species was studied more than 30 years ago (Terwilliger, 1978). Basic information on tapirs' occurrence and distribution is necessary to evaluate the suitability of protected areas for the conservation of viable tapir populations in Panama (Moreno, 2006; Ahumada *et al.* 2011).

Here, we assess the current distribution and conservation status of Baird's tapir in Panama. We compiled occurrence data from 30 sites scattered across the forested areas of Panama, covering nine distinct regions (Table 1). The data combined camera trapping data, field surveys of tracks, dung and direct observation, and interviews with guides and local people. Previous studies have shown that robust tapir data can be obtained from non-tapir specific camera-trap surveys (Noss *et al.* 2003; Rayan *et al.* 2012).

Tapirs were confirmed at just 14 of the 30 sites, and in six of the nine areas (Table 1, Fig. 1). The results reveal gaps in the distribution range of Baird's tapirs in Panama (Fig. 1). Tapirs occur mainly on the Atlantic side of Panama in relatively undisturbed forests. Populations appear healthy in the remote intact forests of Donoso, and in the forest block East of the Panama

Canal, i.e. Darién and the comarcas de Guna Yala, Wargandi, Mandungandi and Embera-Wounan. These areas have low human population densities and are mainly inhabited and managed by indigenous people – the Gunas, Emberas and Wounaan – who maintain forested areas, practice subsistence hunting and only occasionally kill tapirs (Ventocilla *et al.* 1995; MICI, 2013). With the exception of Donoso, all the above mentioned forests are connected to each other forming a large continuous area where animals can move freely without major anthropomorphic barriers such as highways or cities.

Our assessment suggests that there are three parts of Panama where tapir numbers are critically low. The first is Central Panama that has been intensively monitored for decades due to the presence of the Panama Canal. In this area signs of tapir are rare or nonexistent. The Panama Canal area is the bottleneck of the Mesoamerican Biological Corridor and may present a barrier for the movements of species, due to increasing human population, habitat fragmentation, forest disturbance and high level of poaching (Wright *et al.* 2000). Although tapir is not a preferred game species in Panama, they are often killed opportunistically, because of the large quantity of meat it provides.

An intensive camera trapping survey (120 km²) took place as part of the Tropical Ecology Assessment and Monitoring program (TEAM; Ahumada *et al.* 2011) in the 3-year period from 2010-2012 in Soberania National Park (SNP), a potentially suitable area for tapirs with 225 km² of mature secondary forest. Yet not a single tapir photo was taken (Meyer *et al.* 2013). Nevertheless, we did see tracks in 2011 and 2013 on

Table 1: Sites in Panama with information on tapir presence, with the survey method. For each site, we italicized the method that did not result in any tapir sign.

Province	Site	Method			Tapir occurrence	Source
Chiriquí	¹ Volcán Barú	CT	T	PC	X	ANAM-ANCON, 2004a; J. Willis, pers. com.
	² La Amistad NP			PC	X	ANAM-ANCON, 2004a
	³ Fortuna		T	PC	X	A. Guevara and N. Fossatti, pers. com.
Bocas del Toro	⁴ Palo Seco		T	PC	O	ANAM-ANCON, 2004b
	⁵ San San - Pond Sac		T	PC	O	ANAM-ANCON, 2004b; O. Lopez and A. Santos, pers. com.
Veraguas	⁶ Santa Fé	CT			O	Donoso, 2010
	⁷ Cerro Hoya	CT	T	PC	X	Fort and Nielsen, 2012; ANAM, pers. com.
Herrera	⁸ Montuoso		T	PC	X	Mendez and Santamaria, 2004. M. Arosemena, pers. com.
Coclé	⁹ Donoso	CT	T	PC	O	MWH, 2013, pers. obs.
	¹⁰ El Copé		T	PC	X	L. Martinez and J-P Rios, pers. com.
Colon	¹¹ San Lorenzo NP	CT			X	Meyer <i>et al.</i> , 2013
	¹² BCI	CT	T		O	Terwilliger, 1978; Meyer <i>et al.</i> , 2013; pers. obs. (RM)
	¹³ BCNM Peninsulas	CT	T	PC	X	Wright <i>et al.</i> , 2000; Meyer <i>et al.</i> , 2013; H. Esser unpub. data.; S. Valdes, pers. com.
	¹⁴ Soberania NP	CT	T		O	Meyer <i>et al.</i> , 2013; A. Santos, pers. com.
	¹⁵ Agua Salud	CT			X	Meyer <i>et al.</i> , 2013
	¹⁶ Sierra llorona	CT	T	PC	X	Meyer <i>et al.</i> , 2013
	¹⁷ Santo Domingo	CT		PC	X	Meyer <i>et al.</i> , 2013
	¹⁸ Chagres NP	CT	T	PC	O	Moreno and Bustamante, 2007; I. Lopez, unpub. data.
	¹⁹ Portobelo NP	CT	T	PC	O	Moreno and Bustamante, 2007; H. Rissanen, pers. com.
Panama	²⁰ Cocobolo NR	CT		PC	O	E. Espino, pers. com.; H. Esser, unpub. data.
	²¹ Camino de cruces	CT	T		X	H. Esser, unpub. data; RM
	²² Howard		T	PC	X	ANCON, 2005
Guna Yala	²³ Nusagandi	CT	T	PC	O	Brown and Moreno, 2013
	²⁴ Wargandi			PC	O	MICI, 2013; J. Moreno, pers. com.
	²⁵ Madugandi		T	PC	O	MICI, 2013; J. Moreno, pers. com.
Darién	²⁶ Cerro Chucanti			PC	O	G. Berguido, pers. com.
	²⁷ Cemaco		T	PC	O	Medina, 2013
	²⁸ Serrania de Bagre		T	PC	O	ANAM-ANCON, 2006
	²⁹ Paya		T		O	E. Campos, pers. com.
	³⁰ Cana	CT	T	PC	O	Moreno, 2006

¹CT = camera trapping, T = tracks, dung and direct observation, PC = interviews and personal communication

²X = no tapir sign encountered, O = tapir sign encountered

the west side of Pipeline road, indicating that very few individuals persist in the area. The TEAM survey was also conducted in Barro Colorado Natural Monument (BCNM) located in the middle of the Gatun Lake and consists of Barro Colorado Island (BCI) surrounded by five peninsulas. Tapirs were only detected on BCI, but neither game wardens nor local communities have ever observed signs of tapirs outside of BCI or reported any kills. However, the small population of tapirs on BCI (8-10 individuals, J. Giacalone-Willis, pers. com.), may consist of individual migrants, or transitory individuals through BCI providing renewal of the gene pool. We also found tapir tracks on Isla Maiz, a small island between BCI and the mainland supporting this hypothesis. This suggests that there are migrating

tapirs in the mainland around BCI too.

The route tapirs use to cross the canal and migrate through forests east and west of the Canal remains unknown. Several corridors have been proposed including the Filo de Santa Rita Corridor that connects Chagres NP to SNP (USAID, 2009). However, the corridor consists of small patches of forests in a matrix of cattle pastures, with a high human density and with two major roads that make this area difficult and dangerous for the tapirs to cross.

The second region of critical concern involves tapir populations of the Serrania de Maje and the Atlantic coast. These populations are isolated by the Pan-American Highway that runs across the country in East-West direction.

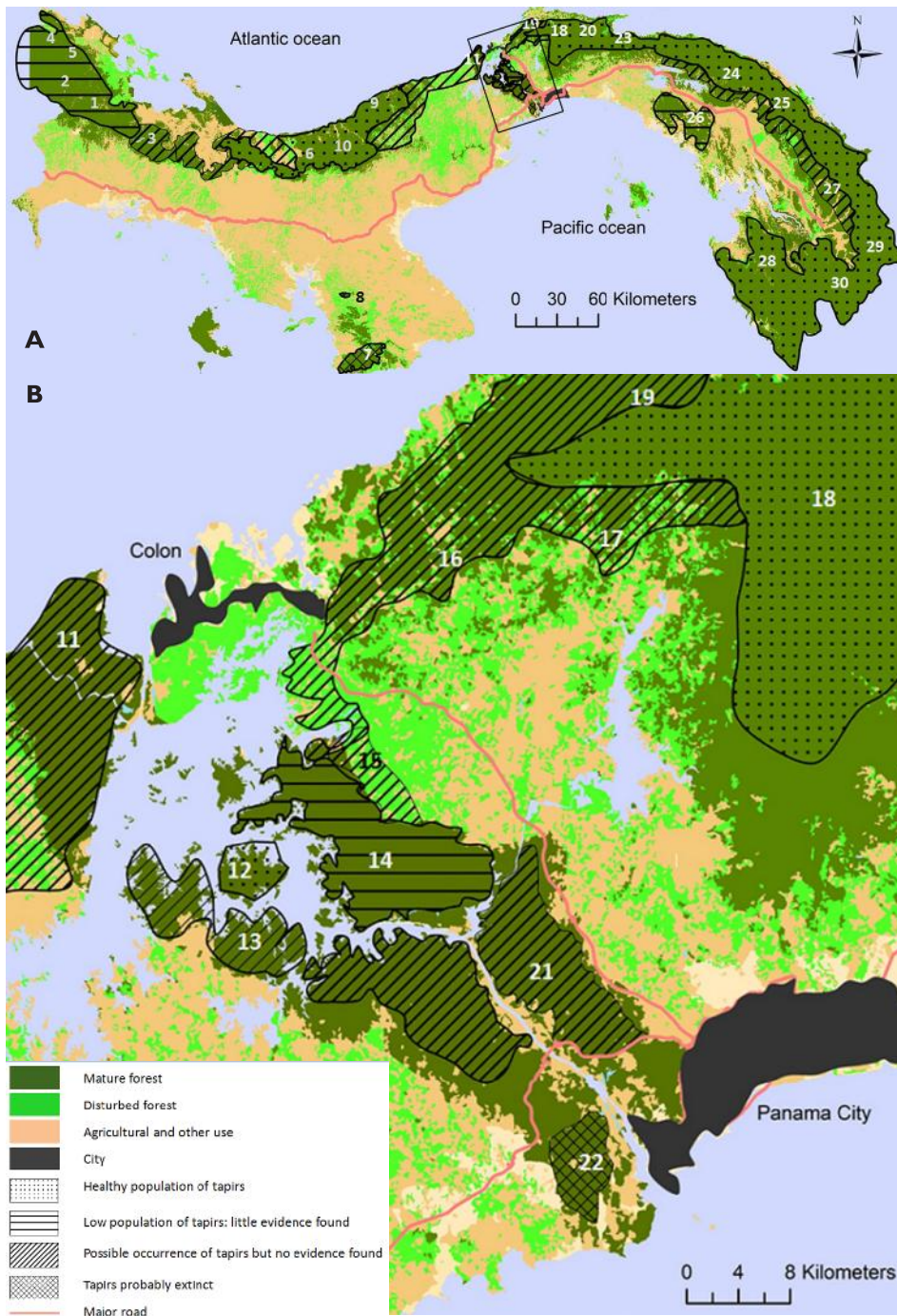


Figure 1: Distribution map of *Tapirus bairdii* in Panama (A) and an inset of Central Panama (B). The numbers correspond with the sites listed in table I.

The third area where poaching, deforestation and resulting habitat fragmentation make it difficult for tapirs to persist (Brooks *et al.* 1997), is in the Comarca de Ngöbe-Bugle between the forests of Santa Fé - El Copé - Donoso and La Amistad International Park (PILA).

Few tapir data are available for the forested area of Chiriquí in Western Panama. Tracks of tapirs have been found in some places and photos taken in the highlands of Costa Rica (Gonzalez-Maya *et al.* 2009)

that are part of the cross boundary continuous forests between Costa Rica and Panama. Poaching levels remain high in some parts of Chiriquí and Western Panama which contributes to the extinction process (Smith, 2008; J. Giacalone-Willis, pers. com.).

The lack of evidence of tapir in the two last remaining forests of the Peninsula de Azuero over the past decades leads us to believe that tapirs are extinct in those areas.

The information compiled in this assessment is an important addition to the existing knowledge about tapirs in Panama. A key point is the importance of restoring the connectivity between forest fragments in Panama thereby allowing for gene flow between tapir populations (Norton & Ashley, 2004). This is especially true for the region in Central Panama, a key area for the species, and where a small population size may reduce the genetic viability of this population. Special attention should also be paid to conserve the corridor between the Comarca de Ngöbe-Bugle to avoid the same problem as in Central Panama. To improve conservation intervention more research is needed regarding tapir population density and habitat requirements in Panama.

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