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Baird's Tapir Ecology and Conservation in Mexico Revisited

Eduardo J. Naranjo[1]

Abstract

Baird's tapir (*Tapirus bairdii*) is endangered throughout its distribution range mainly due to habitat loss and overhunting. An increasing number of studies have been done on the distribution, abundance, and other ecological aspects of this mammal in Mexico and Central America within the past decade. These studies have shed new light on the ecology and behavior of Baird's tapirs in the wild and, more importantly, some of them suggest that tapir populations face a variety of circumstances ranging from local recovery within the largest protected areas through increasing isolation in unprotected forest fragments across southeastern Mexico. This work presents a perspective on the results from those studies and their implications for tapir conservation in the country.

Keywords

Tapirus bairdii, conservation, ecology, Mexico

An overview of the ecology and conservation of the endangered Baird's tapir (*Tapirus bairdii*, also known as *Tapirella bairdii*) in Mexico was published a decade ago in *Tropical Conservation Science* (Naranjo, 2009). A substantial amount of research on this topic has been done and many papers have been published since then. The information gathered during the past decade has improved our knowledge on the distribution, abundance, and conservation status of tapir populations in Mexico. This work presents a perspective on the results from those studies and their implications for tapir conservation in the country.

Verified current distribution areas include the Calakmul, Balamkú, Balam-kin, Laguna de Términos, and Los Petenes Reserves in the state of Campeche; the Reserves Lacantún, Montes Azules, El Ocote, El Triunfo, La Sepultura, and some ejidos in the Sierra Madre and the Lacandon Forest in Chiapas; the Chimalapas region, the Río Verde, Sierra Mixe, and Sierra Norte in Oaxaca; Sian Ka'an Reserve and the largest ejidos of central and southern Quintana Roo state; and the upper Uxpanapa river basin in Veracruz (Botello, Sánchez-Hernández, Hernández, Reyes-Chávez, & Sánchez-Cordero, 2014; Cruz et al., 2009; Lavariega, Briones-Salas, & Rodríguez, 2013; Naranjo, Amador-Alcalá, Falconi-Briones, & Reyna, 2015). Potential additional distribution areas to be verified are Pantanos de Centla Biosphere Reserve, the eastern Guatemalan border of Tabasco, and the southern corner of the Yucatan state. Because of their extensive forest cover and good habitat quality, the critical areas for Baird's tapir conservation in Mexico are the Calakmul-Sian Ka'an corridor, the protected areas within the Lacandon Forest and their surroundings, and the Los Chimalapas region (Cruz et al., 2009; Naranjo et al., 2015).

Recent unexpected records of the presence of tapir in community territories such as several ejidos in the Marques de Comillas Municipality in the Lacandon Forest (Muench & Martínez-Ramos, 2016; Naranjo et al., 2015), the upper Uxpanapa river basin (Naranjo et al., 2015), Los Petenes area (Campeche; Naranjo et al., 2015), the Isthmus of Tehuantepec, and the

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Sierra Mixe of Oaxaca (Botello et al., 2017; Peña Azcona, Gómez Ugalde, & Briones-Salas, 2015), constitute encouraging evidence that this mammal is being benefited from forest conservation by residents. Indeed, the author of this article and colleagues have detected a comeback of tapirs in communities of the Lacandon Forest where residents had not seen this species for about 15 years (Naranjo et al., 2015). This comeback is probably associated with an increasing awareness of residents about the endangered status of tapirs and community actions to protect the species and its habitat through controlling poaching and deforestation within their lands. These actions are crucial to favor tapir conservation and habitat connectivity outside government protected areas, improving population survival and dispersal.

Surveys based on transect samplings and camera-trapping have allowed assessing tapir presence, abundance, and density in selected sites across the states of Campeche, Chiapas, Oaxaca, and Quintana Roo. Relative abundances were estimated at 0.03–0.45 tapirs per 100 kilometers traveled (Carbajal-Borges, Godínez-Gómez, & Mendoza, 2014; Naranjo et al., 2015). Besides, between 3.8 and 37.6 tapir photographs were taken per 1,000 camera-days (Botello et al., 2017; Carbajal-Borges et al., 2014; Lira-Torres, Briones-Salas, & Sánchez-Rojas, 2014; Naranjo et al., 2015; Pérez-Cortéz, Enríquez, Sima-Panti, Reyna, & Naranjo, 2012). Based on tapir sightings and track counts, the highest tapir abundances were recorded at La Frailescana (Chiapas), the upper Uxpanapa river basin (Veracruz), and Los Chimalapas (Oaxaca) (Lira-Torres et al., 2014; Naranjo et al., 2015). The highest abundances based on camera-trapping were obtained at Calakmul (around waterholes; Carrillo, Reyna, & Schmook, 2015; Pérez-Cortéz et al., 2012), Uxpanapa, the Lacandon Forest, and the Balam-kin reserve in Campeche (Naranjo et al., 2015).

Baird's tapir density assessments remain scarce after a decade, when Naranjo (2009) reported numbers between 0.05 and 0.24 tapirs/km^2 estimated in several localities of the Lacandon Forest and the Sierra Madre of Chiapas. New studies based on camera-trapping in northern Oaxaca (Botello et al., 2017) and El Triunfo Biosphere Reserve (Carbajal-Borges et al., 2014) updated densities at 0.03 to 0.32 tapirs/km^2. Using the criteria proposed by Naranjo (2009) to calculate tapir population size in Mexico, the recent findings of tapir populations in the Sierra Mixe and Los Petenes would not significantly add to the previously estimated numbers (around 2,600 individuals) for the country. As pointed out earlier, the low densities observed suggest that just a few large interconnected reserves might contain viable tapir populations in Mexico (>1,000 individuals sensu Traill, Bradshaw, & Brook, 2007).

Baird's tapir home range remains poorly known in Mexico, where only two surveys following one individual each have been done so far. An adult female was radio-tracked for two months in the Montes Azules rainforest giving an estimate of 0.67 km^2 (Naranjo & Bodmer, 2002) while a subadult male followed for 4 years traveled over 10 km and used an average home range of 23.9 km^2 in the subdeciduous tropical forest of Calakmul (Reyna, Sanvicente, Pérez-Flores, Carrillo, & Calme, 2016). More radio-telemetry studies are clearly needed to have better estimates and understanding of tapir movements and use of space throughout its distribution range in Mexico.

Recent research has confirmed the preference of tapirs for habitat types with available fresh water bodies, high tree and shrub diversity providing quality food, low hunting pressure, and limited human presence (Carrillo et al., 2015; Lira-Torres et al., 2014; Mendoza & Carbajal-Borges, 2011; Naranjo et al., 2015; Pérez-Cortéz et al., 2012). These optimal conditions are found primarily within large protected areas (e.g., Calakmul, El Triunfo, Montes Azules, and Sian Ka'an). However, relatively well-preserved forest patches remain scattered across neighboring community territories (e.g., Chimalapas and central Quintana Roo; Lira-Torres et al., 2014; Perez-Cortez & Matus, 2010). As more residents of those communities share some of the ecological and economic benefits provided by forests and wildlife, better chances will be to protect tapirs and their habitat.

The main threats for tapir conservation across its distribution range in Mexico are persistent deforestation, forest fragmentation, poaching, forest fires, droughts, floods, and road collisions (Cruz et al., 2009; Mendoza & Carbajal-Borges, 2011; Naranjo et al., 2015). Although deforestation rates have declined during the last two decades in Mexico (Keenan et al., 2015), poaching and road collisions seem to have increased. Tapirs killed after collisions with vehicles have become more common at least on the roads crossing through the Calakmul and Los Petenes regions in recent years (Contreras-Moreno, Hidalgo-Mihart, Pérez-Solano, & Vásquez-Maldonado, 2013; Naranjo et al., 2015). If tapir populations keep healthy and stable over time, more roadkills would be expected as traffic becomes heavier on the roads running through and around protected areas and other habitat fragments. Likewise, in some communities around the Calakmul and Montes Azules Biosphere Reserves, farmers have detected a more frequent crop damage (particularly corn and beans plots) apparently caused by tapirs (Serrano-MacGregor, 2017). Consequently, these mammals are being shot down without notice to local or federal authorities. Sustainable hunting remains a very unlikely goal regarding tapir populations considering their extremely low reproductive rate (Bodmer, Eisenberg, &

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Redford, 1997). Therefore, tapir hunting restrictions should be enforced both in protected areas and community lands to favor population recovery particularly in isolated habitat patches where the extinction likelihood is higher. A good example of this is the initiative recently taken by 14 communities in La Frailescana Reserve in the Sierra Madre of Chiapas, whose authorities signed an agreement to completely ban tapir poaching within their territories (De la Torre, Rivero, Camacho, & Álvarez-Márquez, 2018).

The presence of tapir is affected by habitat fragmentation (Carrillo et al., 2015; Naranjo & Bodmer, 2007). Consequently, effective habitat protection is one of the essential actions to improve tapir survival (Mendoza & Carbajal-Borges, 2011). The conformation and management of a considerable number of federal and state protected areas during the last 25 years in southeastern Mexico is positive in that sense. Nonetheless, poor law enforcement to avoid destructive practices such as poaching, uncontrolled logging, and overgrazing within protected areas remains an unsolved problem (Naranjo et al., 2009).

Population isolation continues to be a major concern for Baird's tapir populations in Mexico and Central America (De la Torre et al., 2018; García et al., 2016; Mendoza et al., 2013). Improving connectivity among forest fragments sheltering tapirs may be feasible by establishing more community reserves and supporting land use practices such as agroforestry systems, organic crops, and sustainable livestock production where farming has already been established (Naranjo et al., 2015; Soto-Pinto, Castillo-Santiago, & Jiménez-Ferrer, 2012). A thorough review and improvement in current public policies for promoting economic growth and sustainability in rural areas of southeastern Mexico should be started as soon as possible, as many of those instruments are actually conflicting or hindering tapir and other wildlife conservation (Santos-Fita, 2013). These and other actions for tapir conservation have been included in a new version of the federal government's Tapir Conservation Action Program (PACE for its Spanish initials). This document is under review by the Mexican chapter of the IUCN Tapir Specialist Group and will be published soon. An outstanding opportunity to design and apply more realistic, efficient, and inclusive conservation strategies in Mexico will be available within the next few months, when recently elected federal and state authorities will start their administrations. The effects of those new conservation strategies will be seen in the years to come.

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