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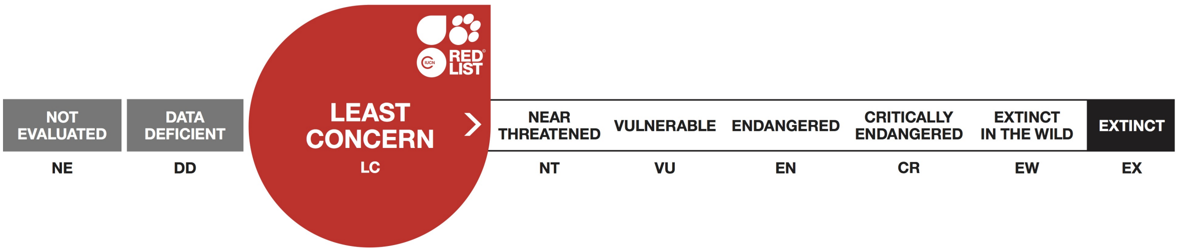
Scope: Global
Language: English

Paleosuchus trigonatus, Smooth-fronted Caiman

Assessment by: Campos, Z., Magnusson, W.E. & Muniz, F.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Reptilia	Crocodylia	Alligatoridae

Taxon Name: *Paleosuchus trigonatus* (Schneider, 1801)

Synonym(s):

- *Crocodilus trigonatus* Schneider, 1801

Common Name(s):

- English: Smooth-fronted Caiman, Schneider's Smooth-fronted Caiman

Assessment Information

Red List Category & Criteria: Least Concern ver 3.1

Year Published: 2019

Date Assessed: March 1, 2018

Justification:

Due to the extremely wide range, multiple country distribution, extensive habitat and very low levels of exploitation and threat, *P. trigonatus* is considered to be Least Concern. A national assessment in Brazil in 2013 concluded the same, noting the estimated area of occupancy (AOO) in Brazil alone at over 3 million km^2.

Previously Published Red List Assessments

1996 – Lower Risk/least concern (LR/lc)
http://dx.doi.org/10.2305/IUCN.UK.1996.RLTS.T46588A11063247.en

Geographic Range

Range Description:

Paleosuchus trigonatus is found in Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname, Venezuela, but does not enter the Brazilian shield region or the Paraguay River drainage. In Brazil, *P. trigonatus* is found principally in the rivers and streams of heavily-forested habitats (Magnusson 1992; Villamarín *et al*. 2017), in igapó forest in the Central Amazon (Mazurek-Souza 2001), and open water or near waterfalls in the large rivers such as the Mamoré, Madeira, Abunã (Vasconcelos and Campos 2007) and Beni Rivers (Z. Campos, unpublished data). Campos *et al*. (2017a) presented new records of occurrence of the species and extended its geographical distribution. These are the first records of the species in the Cerrado biome, although still in the Amazon drainage.

In Venezuela, *P. trigonatus* is principally restricted to oligotrophic forest streams from 100 to 1200 m asl (Godshalk 1982, Gorzula and Paolillo 1986, Gorzula *et al*. 1988, Seijas 2007), and has been reported at elevations up to 1300 m. The habitat in Bolivia is similar to that reported for *P. palpebrosus* (King and

Videz-Roca 1989).

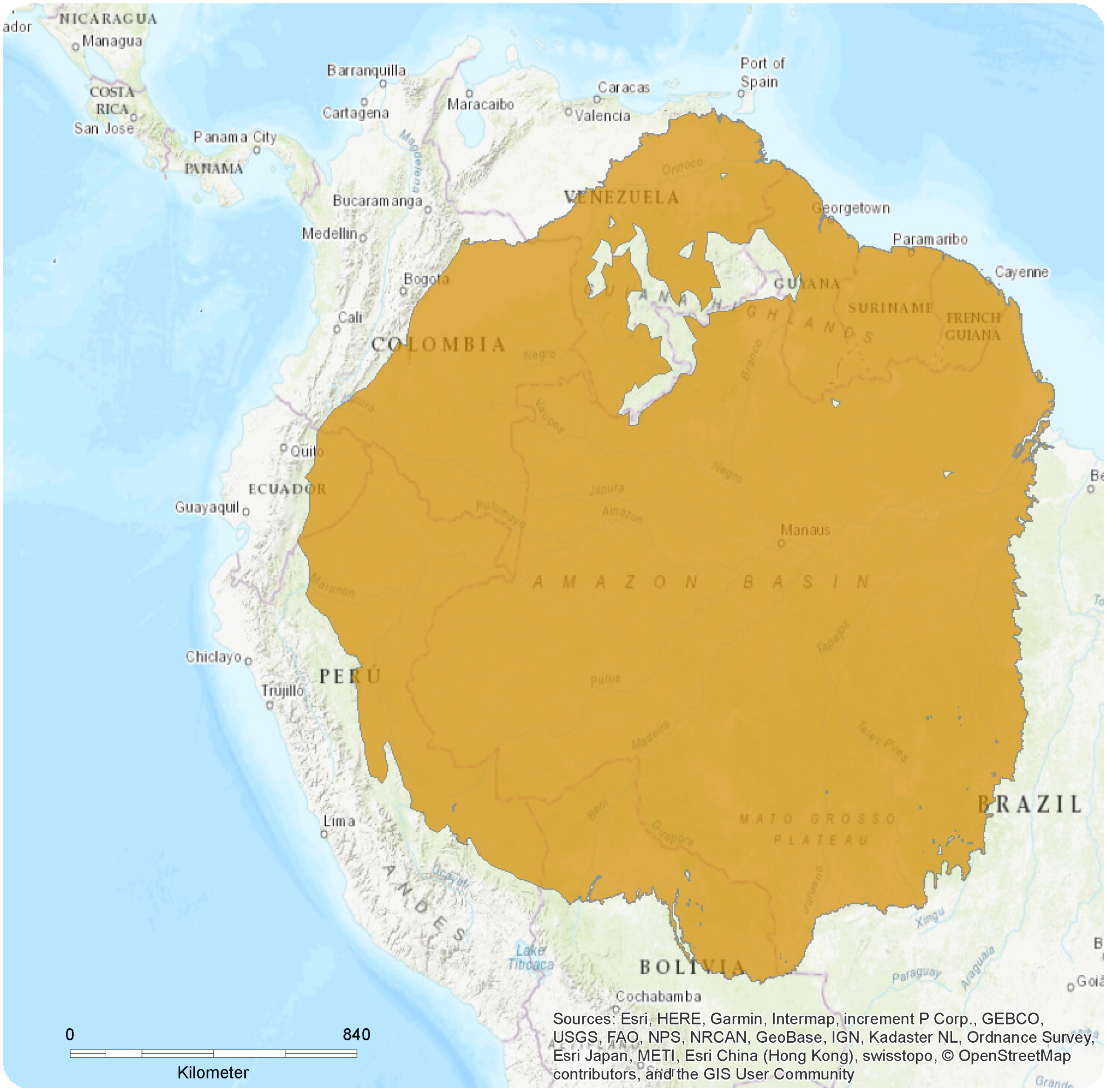
Hrbek *et al*. (2008) investigated the phylogenetic relationships of South American alligatorids and identified signs of strong population genetic structuring in *Paleosuchus spp*. in the upper Madeira River. Microsatellite genetic markers were characterized for the species using the traditional construction of DNA enriched libraries (Vilela 2008). Muniz *et al*. (2017) are developing new microsatellites markers using Next Generation Sequencing and evaluating genetic diversity and genetic structure of *P. trigonatus* from the Madeira and Xingu Rivers. Bittencourt (2016) found strong genetic structure between *P. trigonatus* individuals from two areas using total cytochrome b gene. Future studies will target genetic variability using biparental molecular markers, mating systems and morphometry of individuals in the Mamoré-Madeira-Abunã system and other rivers in the Amazon.

Country Occurrence:

Native: Bolivia, Plurinational States of; Brazil; Colombia; Ecuador; French Guiana; Guyana; Peru; Suriname; Venezuela, Bolivarian Republic of

Distribution Map

Paleosuchus trigonatus

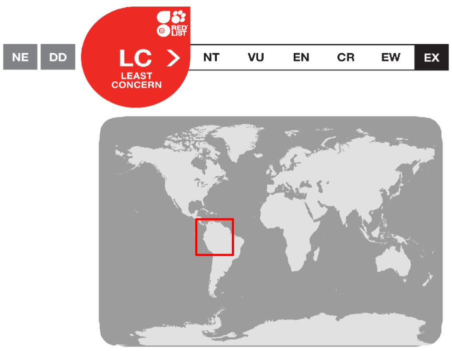


Range

Extant (resident)

Compiled by:

Campos, Z., Magnusson, W.E. & Muniz, F.



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

Population

Most reports of *P. trigonatus* have originated from surveys conducted for other species of crocodilians. Owing to the limited potential for commercial exploitation, *P. trigonatus* has been hunted mostly on a subsistence basis for food and populations appear to remain healthy throughout the species' range.

Current Population Trend: Stable

Habitat and Ecology (see Appendix for additional information)

Magnusson (1989) summarized much of the published information on this species. *Paleosuchus trigonatus* has a maximum length of around 2.3 m (Medem 1952, 1981). It is well adapted to a terrestrial mode of life and to existence in swift-running waters (Medem 1958). Pritchard (1995) reported a specimen emerging from the sea onto a beach in Guyana, although the identification of the specimen may be in question (Ross *et al*. 1995). In Peru, the species was reported in artificial pasture approximately 3 miles southwest of Iberia, Departamento de Madre de Dios (Campbell 1973). Ecological studies on this species by Magnusson (1985) and Magnusson *et al*. (1987) revealed that the diet is comprised to a large extent of terrestrial vertebrates. Juveniles and adults consume vertebrates such as small fish, birds, reptiles and mammals (Magnusson *et al*. 1987). Predation by *P. trigonatus* is reported on *Rhinella marinus* (cane toad) (de Assis and Dos Santos 2007), *Brotheas paraensis* (Morato and Batista 2011), *Caecelia marcusi* (Sampaio *et al*. 2013) and porcupine (*Coendou sp.*; Ortiz *et al*. 2013). Villamarin *et al*. (2017) combined stable isotope and spatial analyses and found evidence of diet differences between the two species of *Paleosuchus* independent of habitat selection. Villamarín *et al*. (2018) used data on diets, growth rates and stable isotopes in *Paleosuchus* species to show that reported ontogenetic changes in trophic position of crocodiles based on δ15N reflect more changes in physiology related to size than changes in diet. Merchant *et al*. (2016) proposed that the enlarged nuchal scutes of *P. trigonatus* could be used to discourage predators.

Estimated minimum ages at reproduction for wild *P. trigonatus* are 11 years for females and 20 years for males (Magnusson and Lima 1991). Egg-laying apparently takes place at the end of the dry season and many mound nests are located adjacent to or on top of termite mounds, thereby maintaining a stable elevated nest temperature (Magnusson *et al*. 1990). The incubation period, in excess of 100 days, appears to be the longest of any crocodilian (Magnusson *et al*. 1985; Yamakoshi *et al*. 1987; Magnusson 1989). Embryonic development was described by Vasquez (1983). Rivas *et al*. (2001) reported a *P. trigonatus* nest with 16 eggs in the Ecuadorian Amazon Basin, in terra firma habitat, and measured 5 hatchlings. In Brazil, female *P. trigonatus* attempted to defend their nests from attacks by armadillos (*Priodontes maximum* and *Dasypus novemcintus*), but were not observed to defend nests against coati *(Nasua nasu*a), tayra (*Eira barbara*) or *Tupimanbis teguixim* (Campos *et al*. 2016). The nests had between 12 and 19 eggs and were attacked by predators after more than 60 days of incubation (Campos *et al*. 2016).

Systems: Terrestrial, Freshwater

Use and Trade

Due to small body size and extensive ventral ossification, the commercial value of the skin of *P. trigonatus* is very low. The management of *P. trigonatus* is based principally on protection of wild populations. Limited harvesting for the pet trade is only allowed in Guyana under a CITES quota (currently 1000 animals per year).

Threats (see Appendix for additional information)

The main threats to the species are habitat loss and loss of connectivity in Amazonian rivers (Campos *et al*. 2013). Road kills occurred in the area near the Madeira River (Campos *et al*. 2012). *Paleosuchus trigonatus* are killed both intentionally and incidentally by human activities at a hydroelectric dam (Campos 2015) and areas in Roraima (Muniz *et al*. 2015). Campos *et al*. (2017b) investigated the effect of dam construction on movement of *P. trigonatus* in the upper Madeira River where home range varied from <1km^2 to 5km^2. Environmental pollution associated with gold mining in Venezuela and Brazil (and increasingly in Bolivia and Peru) appears to be having an increasingly negative impact on riverine ecosystems and is affecting this and other crocodylian species.

Conservation Actions

Conservation of *P. trigonatus* is dependent on maintaining the forest and headwaters of the watersheds within its range. Proposed conservation actions include:

1. Monitoring abundance and evaluation of habitats: Because of its extensive distribution, the overall abundance of *P. trigonatus* appears relatively unaffected by habitat destruction, deforestation and dams as well as the pressure of hunting in the Amazon and Mamoré-Madeira-Abunã River systems. Surveys are required in all range states in order to quantify the status, assess potential local threats and ensure conservation and management programs are evidence based. With this knowledge, appropriate conservation management programs can be developed.
2. Investigations on ecology and population biology: Although more is known about the behaviour and ecology of this species than of *P. palpebrosus*, most of the studies have been concentrated in central Amazonia and many aspects of the species´ life history remain uninvestigated. One important management-related topic is to determine the effect of gold mining, hydroelectric dams, urbanization and illegal hunting on populations of *Paleosuchus*.

Credits

Assessor(s): Campos, Z., Magnusson, W.E. & Muniz, F.

Reviewer(s): Isberg, S. & Webb, G.J.W.

Contributor(s): Balaguera-Reina, S.A.

Facilitators(s) and Compiler(s): Ross, J.P.

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External Resources

For Images and External Links to Additional Information, please see the Red List website.

Appendix

Habitats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Habitat	Season	Suitability	Major Importance?
1. Forest -> 1.6. Forest - Subtropical/Tropical Moist Lowland	Resident	Marginal	-
5. Wetlands (inland) -> 5.1. Wetlands (inland) - Permanent Rivers/Streams/Creeks (includes waterfalls)	Resident	Suitable	Yes

Threats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Threat	Timing	Scope	Severity	Impact Score
1. Residential & commercial development -> 1.2. Commercial & industrial areas	Ongoing	Minority (50%)	Negligible declines	Low impact: 4
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
3. Energy production & mining -> 3.2. Mining & quarrying	Ongoing	Minority (50%)	Negligible declines	Low impact: 4
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
4. Transportation & service corridors -> 4.1. Roads & railroads	Ongoing	Minority (50%)	No decline	Low impact: 4
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.11. Dams (size unknown)	Ongoing	Minority (50%)	Negligible declines	Low impact: 4
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		

Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km^2): 4000000
Continuing decline in area of occupancy (AOO): No
Extreme fluctuations in area of occupancy (AOO): No
Lower elevation limit (m): 0
Upper elevation limit (m): 1300
Population
Extreme fluctuations: No
Population severely fragmented: No

Habitats and Ecology
Generation Length (years): 25

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