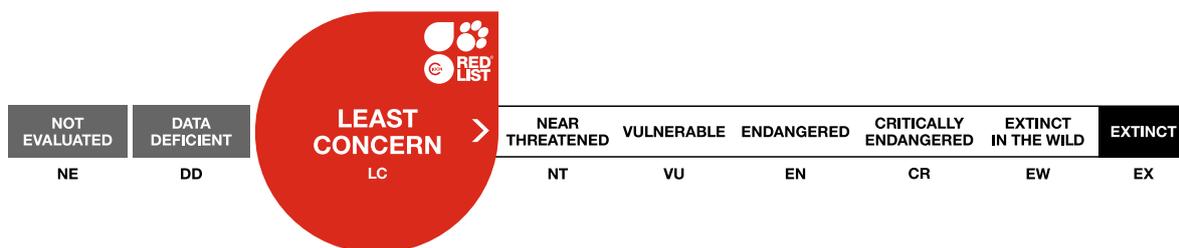


## *Caiman yacare*, Yacaré

Assessment by: Campos, Z., Llobet, A., Magnusson, W.E. & Piña, C.



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## Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Reptilia	Crocodylia	Alligatoridae

**Scientific Name:** *Caiman yacare* (Daudin, 1802)

**Synonym(s):**

- *Crocodylus yacare* Daudin, 1802

**Common Name(s):**

- English: Yacaré

**Taxonomic Notes:**

The species is closely related to, and approximately 6 mya, and derived from *Caiman crocodilus*, the Common or Spectacled Caiman (Godshalk 2006). The two species are sympatric in the Madeira River from its confluence with the Amazon, south to approximately the Bolivian border. Studies of morphology (Brazaitis *et al.* 1998, Busack and Pandya 2001) and genetics (Hrbek *et al.* 2008) suggest a cline of introgression between the two species along this transect although each species retain distinctive and non-overlapping genetic features at the limits of their distributions. Biogeographic investigation suggests that the species arose in its southern range as a vicariance event related to movement of the Brazilian shield and has subsequently re-invaded the Amazon system via the Madeira and its tributaries (Godshalk 2008 a,b). *Caiman crocodilus* and *C. yacare* have been considered as the same or as subspecies. However, careful review of large samples, in regard to both morphology and genetics, indicates that *C. yacare* is a Significant Evolutionary Unit with distinct species level distinction (Vasconcelos and Campos 2007, Hrbek *et al.* 2008).

## Assessment Information

**Red List Category & Criteria:** Least Concern [ver 3.1](#)

**Year Published:** 2020

**Date Assessed:** November 30, 2019

**Justification:**

*Caiman yacare* is an abundant, widely distributed species with extensive habitat and currently effective management programs in all range states. Although locally depleted in some areas, it is widespread and numerous, and does not meet any of the thresholds for the IUCN Red List Criteria.

**Previously Published Red List Assessments**

1996 – Lower Risk/least concern (LR/LC)

<https://dx.doi.org/10.2305/IUCN.UK.1996.RLTS.T46586A11062609.en>

1982 – Indeterminate (I)

## Geographic Range

**Range Description:**

*Caiman yacare* is a medium size crocodylian found across a wide range in South America, occurring in fresh water rivers and wetlands in Brazil, Bolivia, Paraguay and Argentina. The species is restricted to the river drainages/basins of the Madeira River, and its tributaries (Amazon system) and Parana-Paraguay river system South to Corrientes province in northern Argentina, including the Pantanal, a very extensive (195,000 km<sup>2</sup>) wetland of the Parana Basin in Brazil and Paraguay.

*Caiman yacare* and *C. crocodilus* occur sympatrically in the Madeira river from its confluence with the Amazon, south to approximately the Bolivian border. Morphological (Brazaitis *et al.* 1998, Busack and Pandya 2001) and genetic (Hrbek *et al.* 2008) studies suggest a cline of introgression between the two species along this transect although they each retain distinctive and non-overlapping genetic features at the limits of their distributions.

The species occurs both in permanent water bodies (rivers, lagoons, lakes etc.) and in temporary or widely fluctuating wetlands that are a feature of this region such as ox-bows, seasonal ponds and inundated savannahs. They occur in most water bodies throughout their range and move seasonally to residual wetlands as others dry up, achieving very high densities in these seasonal concentrations and dispersing again as water levels rise.

Its extent of occurrence (EOO) and area of occupancy (AOO) both greatly exceed the thresholds for Red List criterion B. The estimated AOO for just the range in Brazil and excluding the area of possible introgression with *C. crocodilus* along the Madeira river exceeds 300,000 km<sup>2</sup> (Farias *et al.* 2013). No estimate of EOO for the whole range has been attempted but in Brazil, the Pantanal alone constitutes 195,000 km<sup>2</sup> and a GIS study in Bolivia indicates a probable occupied area of 96,000 km<sup>2</sup> (Rodrigues Cordero *et al.* 2019).

**Country Occurrence:**

**Native, Extant (resident):** Argentina; Bolivia, Plurinational States of; Brazil; Paraguay

# Distribution Map



## Legend

EXTANT (RESIDENT)

## Compiled by:

Magnusson, W.E., Campos, Z., Pina, C. & Llobet, A. 2020



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



## Population

An estimate of the global mature population of *Caiman yacare* is not available. However, numerous surveys at the national and regional levels indicate that *C. yacare* remains abundant throughout its range with the possible exception of small areas of local decline or extirpation near human population centres. Survey results are complicated by the seasonal concentration of caimans in remaining wetlands as large areas of their habitat dry up, creating unusually high densities and estimates of hundreds or even 1,000s of caiman per km. However, even when excluding these, raw encounter rates of 2–46 individuals (all non-hatchling sizes) per km are reported (King and Videz 1989, King *et al.* 1994, Ergueta and Pacheco 1990, Pacheco 1993, Godshalk and King 2002, Waller 2003). In Argentina, surveys in 2007–2008 revealed very high encounter rates in Corrientes (25 non-hatchling individuals/km) and Formosa (69 individuals/km) provinces (Piña *et al.* pers comm. 2018). Bueno *et al.* (submitted 2018) report high *C. yacare* densities (18–966 individuals/km) in Paraguay during a dry season survey in 2017 where caiman were primarily occupying small artificial water bodies. While these represent unusual aggregations, they do demonstrate the large numbers of individuals present.

Extrapolating these survey data to the extensive linear wetland distances of the range, the total number of individuals is thought to exceed several millions. In the Pantanal, densities of 100 individuals per km<sup>2</sup> throughout that extensive (195,000 km<sup>2</sup>) area indicate millions of individuals there alone. Survey results also record observed size of individuals sighted and give typical estimates of between 25 and 45% of individuals at or above minimum size of reproduction. The mature adult population is very confidently considered to far exceed thresholds for the IUCN Red List Criteria.

**Current Population Trend:** Stable

## Habitat and Ecology (see Appendix for additional information)

Most ecological studies have been carried out in the Pantanal region of southern Brazil (Crawshaw and Schaller 1980; Schaller and Crawshaw 1982; Cintra 1986, 1988; Campos 1993, 2003; Catto and Amato 1994; Campos and Magnusson 1995; Campos *et al.* 1995, 2003, 2005, 2006a, 2006b; Santos *et al.* 1996; Pinheiro *et al.* 1997; Rebelo *et al.* 1997). More recent studies in Bolivia included assessing the distribution and population status of the species, monitoring harvests, and gathering additional data to improve the national program of management (Pacheco 1993, Godshalk 1994, Rebolledo-Garin and Tapia-Arauz 1994, Llobet 1996, Llobet and Goitia 1997, Llobet and Aparicio 1999, Rios 2003, Cisneros 2005, Llobet and CIPTA 2006, Peters 2006). In Brazil, aerial surveys of caimans and nests have been carried out in the Pantanal since 1991 (Mourão *et al.* 1994, 2000; Coutinho and Campos 1996). Nesting habitats were also monitored during incubation and hatching periods (Borges and Filho 1993, Campos and Magnusson 1995), and the effect of water level on nest production and hatchling survivorship (Coutinho and Campos 1996, Coutinho *et al.* 2001, Campos *et al.* 2015).

Yacare Caiman are mound nesters, with egg-laying usually peaking in the middle of the wet season, from December to February. Clutch size typically consists of 22–35 eggs, with a maximum of 45 eggs. Clutch size is related to habitat type (Campos 1993, Zambrana *et al.* 2008). The natural tendency of females to guard their nests is apparently influenced by human hunting pressure (Crawshaw 1987), which results in decreased nest attendance and a lower hatching success. Terrestrial movement in groups was described for caimans in the Pantanal, in response to disturbance (Campos *et al.* 2003). This behaviour may make caimans vulnerable if intensive hunting were it to resume (Campos 2003).

**Systems:** Terrestrial, Freshwater (=Inland waters)

## **Use and Trade (see Appendix for additional information)**

*Caiman yacare* have been subject to extensive exploitation for both international trade and local subsistence (meat, eggs) throughout their range for most of the last century. *Caiman yacare* skins are considered of low, non-classic quality in the fashion market due to extensive osteoderms in most of the scales (King and Brazaitis 1971). The skin used in trade is restricted to a strip of skin on each side (flank) of the animal and parts of the tail and to animals of smaller size. The skins are used primarily for smaller fashion articles such as watch straps, wallets, key fobs, shoe insets and gussets and similar small and low value items. Some skins are also used in the 'hornback' mode to make products featuring the larger bony scales of the back.

The apparently large volume of skins entering trade both legally and illegally in the 1960s and 1970s (approximately one million+ annually) led conservation observers to fear that the species might be in decline. For this reason the species was listed on the US Endangered Species Act and imports into the USA were restricted in 1963. However, the very wide range, immense numbers and rapid reproductive capacity was apparently able to sustain even unregulated trade and no credible reports of actual decline are available. With the adoption of CITES regulations in the mid 1970s, *C. yacare* was placed on Appendix I and all range states adopted protective legislation and began to regulate exploitation and trade, and successfully applied to place the species on Appendix II allowing regulated trade. In the USA, the species was listed as Threatened in 2000 with a special rule allowing regulated trade (US Federal Register 65 (87):25867-25881).

Most of what is written about the conservation of the common caiman applies equally well to *C. yacare*. Basic survey information is available for this species in all countries where it occurs. This information has resulted principally from programs using the species since late 1990s (Bolivia), or new programs whose goal is to utilize the species in near future (Argentina and Brazil). Some basic information for these programs resulted from a series of CITES-sponsored surveys in southern Brazil, Bolivia, and Paraguay, as well as surveys sponsored by local governments, scientific institutions and NGOs working within these countries.

Commercially-oriented management programs are in place in all the four range states for *C. yacare*.

Paraguay suspended its national program in 2003 but reinstated it in 2014 exporting 22,000 stockpiled wild skins in 2013 and between 1,000–2,000 wild skins in recent years (Caldwell 2018). Cropping is permitted in Bolivia, where hides are currently exported under a CITES quota of 50,000 skins. The conservation and use program for *C. yacare* in Bolivia began in 1997 with few evaluations of its population and a small experimental harvest. During the following years, between 30,000 (1999) and 59,000 (2003) individuals were harvested annually through a management model based on eco-regional population sizes. From 2004, a large group of institutions and specialists participated in the re-design of the program to adapt it to the national reality, and strengthen the regulatory and administrative framework by means of a monitoring plan. In addition, standardized sampling protocols were designed; monitoring of harvests commenced, and a new classification of water bodies was made. Additionally, a new basis of technical data (counts, harvests, habitats) and administrative data (users, farms, quotas history, contraventions) was developed, and geographically assessed together through a GIS. This

database is continuously updated with new information. Parallel to this activity, management plans were suggested for development in Indigenous Lands (TCOs = Spanish acronym) and Protected Areas to increase local community participation in Yacare Caiman use, and activities directed to strengthen local communal structures. Currently, there are two management plans in operation and another 12 are under evaluation, with the intention of covering some 8,503,400 ha of the Yacare Caiman distribution in Bolivia (Llobet *et al.* 2004, Llobet and Bello 2008). Between 1999 and 2007, more than 298,000 individuals were harvested. The initial national export quota (1999) was established at 36,500 individuals, but it fluctuated from 45,000 to 50,000 animals per year between 2001 and 2007 (Llobet and Bello 2008).

In Brazil, hunting of wild animals is not permitted. However, ranching and farming are allowed (Coutinho *et al.* 1998), and new legislation for the management of the Pantanal caiman - including a head-starting program - is under evaluation by the Federal and State Governments. The aim is to implement an adult caiman harvesting quota in the Brazilian Pantanal. This program is based principally on proposals by Coutinho (2000).

In Argentina, there are four ranching programs for *C. yacare* (Larriera *et al.* 2008); two in Formosa Province, one in Corrientes Province, and one (inactive) in Chaco Province. Together, they produce around 15,000 skins per year. Recently, a harvesting program was approved by the Federal and State Governments, to collect wild adult caimans from Bañado la Estrella, Formosa, northern Argentina.

CITES trade reports indicate an average of 95,000 skins /year traded globally in the period 2011–2015 with about 90% exported from Bolivia (Caldwell 2018). Discrepancies between national production estimates and CITES reported trade may be the result of (legal) movement of skins between producer countries and lag times between skin production and export. Overall, all range states now have effective control of exploitation and export and are producing legal skins. While low levels of subsistence use, primarily for food, are widespread these appear to be well within sustainable levels. At the same time infrastructure, technical capacity and research results to manage this resource effectively have been developed and economic incentives for conservation of wetlands and caiman by local communities (Bolivia), landowners (Argentina) and commercial interests (Brazil) have been developed.

### **Threats (see Appendix for additional information)**

During the early 1990s, populations of *Caiman yacare* were considered to be somewhat depleted in all four range states, principally due to widespread illegal hunting during the 1970s and 1980s. Illegal hunting is no longer a problem although continued small scale local exploitation for meat still occurs. Habitat destruction, construction of hydroelectric dams, and siltation of rivers continue to affect caiman populations, particularly in Brazil. However, the very large area of distribution and currently small proportion of habitat affected minimizes these impacts. Due to its small size at maturity, ability to adapt to a wide variety of habitat types, and learned wariness, *C. yacare* is particularly resilient to hunting pressure. Studies in Brazil suggest that illegal hunting did not seriously impact populations (Mourão *et al.* 1996). Surveys in Paraguay (Scott *et al.* 1990, King *et al.* 1994) and Argentina (Siroski 2004, Piña *et al.* 2009) indicate that extensive populations remain or have recovered from previous exploitation, since the closure of uncontrolled hunting and implementation of export controls.

### **Conservation Actions (see Appendix for additional information)**

Current management programs in all range states, effective international trade controls and the wide

distribution and resiliency of this species are currently effective in maintaining populations wherever habits remains. Conservation actions proposed in the CSG action plan 2012 include:

**High priority:** 1. Strengthen the monitoring of wild populations and harvesting in Bolivia: the development of a series of management plans has already produced more reliable data on the species. However, it is important to ensure a comprehensive monitoring program to follow the implementation of these management plans, and to make corrections through an adaptive management approach. 2. Reassessment and implementation of a management program in Paraguay: following the self-imposed moratorium on caiman exports in 2003 and reopening in 2013, a reassessment of the Paraguay National Program and the design of a reliable monitoring program for harvesting wild *C. yacare* are considered important to ensure sustainable use into the future. Even though Paraguayan *C. yacare* populations do not depend on a management program for their conservation, a weak management program could affect those populations and other programs for the species in the region. 3. Study of Caiman systematics: the aim is to clarify the complex taxonomic situation of *C. yacare*, develop a map with boundaries for the various caiman populations and to characterize their phylogeography. For enforcement purposes, it would be useful to be able to distinguish the taxon via observable meristic characteristics that can be seen in commercial skins, even if this results in two taxa co-existing in the same population in some areas. Studies of morphological and genetic variation in Brazil and others countries should clarify the issues in the near future.

**Moderate priority:**

4. Control of illegal trade: national management programs need to improve law enforcement and enhance the controls in border areas to avoid illegal trade between countries. 5. Quantification of *C. yacare* distribution on the border between Peru and Bolivia: the border between Peru and Bolivia appears to be the limit of *C. yacare* distribution from the south and for *C. crocodilus* from the north. No studies have been carried out to assess the northwestern distribution limits for *C. yacare*, or the existence of a sympatric area for both species in this region between Peru and Bolivia. 6. Long-term ecological studies in the Pantanal, Brazil: like the llanos of Venezuela and Colombia, the Pantanal is a large seasonally inundated savanna that offers excellent research opportunities for the study of caiman population dynamics. Monitoring programs of the populations via aerial survey and radio-telemetry have been made in the Pantanal region, and habitat destruction, such as deforestation, siltation, hydroelectric dam, agriculture, and mining have been evaluated in the medium-term. These studies should continue and be implemented in the other range states (Bolivia, Paraguay and Argentina). Effects of global climate change on the biology of the caimans in the Pantanal should also be evaluated because the large caiman population in the area is a function of the quality of the wetlands habitat so changes to the flooding regime could affect the distribution and abundance of the species. 7. Implementation of ranching programs in Bolivia, Paraguay and Brazil: Brazil has undertaken a very rapid development of captive breeding (farming) of caiman similar to that in Colombia. A number of facilities are registered with the Government and CITES as captive breeding facilities and are producing skins for export. However, ranching offers greater positive impact than farming for effective conservation of both species and habitats. Thus, it is recommended that a ranching model be implemented, initially on an experimental basis. This information would serve to formulate the basis of non-detriment findings, set harvest limits and assess the feasibility of ranching programs on a national scale.

## Credits

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**Authority/Authorities:** IUCN SSC Crocodile Specialist Group (crocodiles, alligators and caimans)

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## External Resources

For [Supplementary Material](#), and 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?
5. Wetlands (inland) -> 5.1. Wetlands (inland) - Permanent Rivers/Streams/Creeks (includes waterfalls)	Resident	Suitable	Yes
5. Wetlands (inland) -> 5.2. Wetlands (inland) - Seasonal/Intermittent/Irregular Rivers/Streams/Creeks	Resident	Suitable	Yes
5. Wetlands (inland) -> 5.4. Wetlands (inland) - Bogs, Marshes, Swamps, Fens, Peatlands	Resident	Suitable	Yes
5. Wetlands (inland) -> 5.5. Wetlands (inland) - Permanent Freshwater Lakes (over 8ha)	Resident	Suitable	Yes
5. Wetlands (inland) -> 5.6. Wetlands (inland) - Seasonal/Intermittent Freshwater Lakes (over 8ha)	Breeding season	Suitable	Yes
5. Wetlands (inland) -> 5.7. Wetlands (inland) - Permanent Freshwater Marshes/Pools (under 8ha)	Resident	Suitable	No
5. Wetlands (inland) -> 5.8. Wetlands (inland) - Seasonal/Intermittent Freshwater Marshes/Pools (under 8ha)	Resident	Suitable	No

## Threats

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

Threat	Timing	Scope	Severity	Impact Score
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.1. Intentional use: (subsistence/small scale) [harvest]	Ongoing	Minority (50%)	Negligible declines	Low impact: 4
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.10. Large dams	Ongoing	Minority (50%)	Negligible declines	Low impact: 4
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		

## Conservation Actions in Place

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

Conservation Action in Place
In-place research and monitoring
Action Recovery Plan: No
Systematic monitoring scheme: Yes

<b>Conservation Action in Place</b>
In-place land/water protection
Conservation sites identified: Yes, over part of range
Occurs in at least one protected area: Yes
In-place species management
Harvest management plan: Yes

## Conservation Actions Needed

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

<b>Conservation Action Needed</b>
3. Species management -> 3.1. Species management -> 3.1.1. Harvest management
3. Species management -> 3.1. Species management -> 3.1.2. Trade management
5. Law & policy -> 5.4. Compliance and enforcement -> 5.4.2. National level
6. Livelihood, economic & other incentives -> 6.3. Market forces

## Research Needed

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

<b>Research Needed</b>
1. Research -> 1.1. Taxonomy
3. Monitoring -> 3.1. Population trends

## Additional Data Fields

<b>Distribution</b>
Estimated area of occupancy (AOO) (km <sup>2</sup> ): 591000
Continuing decline in area of occupancy (AOO): No
Extreme fluctuations in area of occupancy (AOO): No
Estimated extent of occurrence (EOO) (km <sup>2</sup> ): 1750000
Continuing decline in extent of occurrence (EOO): No
Extreme fluctuations in extent of occurrence (EOO): Yes
Number of Locations: 2
Continuing decline in number of locations: No
Extreme fluctuations in the number of locations: No

<b>Distribution</b>
Lower elevation limit (m): 0
Upper elevation limit (m): 400
<b>Population</b>
Number of mature individuals: 2,000,000-5,000,000
Continuing decline of mature individuals: No
Extreme fluctuations: No
Population severely fragmented: No
<b>Habitats and Ecology</b>
Continuing decline in area, extent and/or quality of habitat: Yes
Generation Length (years): 15
Movement patterns: Not a Migrant
Congregatory: Congregatory (and dispersive)

## The IUCN Red List Partnership



The IUCN Red List of Threatened Species™ is produced and managed by the [IUCN Global Species Programme](#), the [IUCN Species Survival Commission \(SSC\)](#) and [The IUCN Red List Partnership](#).

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