CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

Nineteenth meeting of the Conference of the Parties
Panama City (Panama), 14 – 25 November 2022

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

Include the species *Chelus fimbriata* and *Chelus orinocensis* in Appendix II, in accordance with Article II, paragraph 2 (a) of the CITES Convention, which states, "*all species which although not necessarily now threatened with extinction may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival*". Moreover, the species meet criteria A and B of Annex 2 a of Resolution Conf. 9.24 (Rev. CoP17), namely: A. It is known, or can be inferred or projected, that the regulation of trade in the species is necessary to avoid it becoming eligible for inclusion in Appendix I in the near future; or B. It is known, or can be inferred or projected, that regulation of trade in the species is required to ensure that the harvest of specimens from the wild is not reducing the wild population to a level at which its survival might be threatened by continued harvesting or other influences. They also meet the precautionary measures outlined in Annex 4 of the Resolution, according to which "*When considering proposals to amend Appendix I or II, the Parties shall, by virtue of the precautionary approach and in case of uncertainty either as regards the status of a species or the impact of trade on the conservation of a species, act in the best interest of the conservation of the species concerned and adopt measures that are proportionate to the anticipated risks to the species"*.

B. Proponent

Brazil, Colombia, Costa Rica, Peru*

C. Supporting statement

1. Taxonomy

1.1 Class: Reptilia

1.2 Order: Testudines

1.3 Family: Chelidae

1.4 Genus, species or subspecies, including author and year:

Genus : *Chelus* (Duremil, 1806)

Species: *Chelus fimbriata* (Schneider, 1783)

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* *The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat (or the United Nations Environment Programme) concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.*

Chelus orinocencis Vargas-Ramírez, Caballero, Morales-Betancourt, Lasso, Amaya, Martínez, Silva-Viana, Vogt, Pires-Farias, Hrbek, Campbell & Fritz, 2020, 2020

1.5 Scientific synonyms:

Chelus fimbriata: *Testudo* terrestris Fermin, 1765 (nomen oblitum, non T.t. Forskål 1775), Testudo fimbriata Schneider, 1783, Testudo torticollis Ferreira 1784 (manuscript, see CERÍACO & BAUER 2017); Testudo fimbria Gmelin, 1789 (nomen subst. pro T. fimbriata Schneider), Testudo matamata Bruguière, 1792; Testudo bi-spinosa Daudin 1802; Testudo rapara Gray, 1831 (nomen nudum), Testudo fimbriata Cuvier, 1831, Chelys matamata Duméril & Bibron, 1835, Testudo raparara Gray, 1844 (nomen nudum), Testudo raxarara Gray, 1855 (nomen nudum), Chelys fimbriata (Günther, 1882; Boulenger, 1889; Chelus fimbriatus — Mertens 1934; Gorzula & Señaris 1999; Rivas et al. 2012 and Ceríaco & Bauer 2017 Chelus fimbriata Iverson, 1992; TTWG 2014 (Uetz 2021).

Chelus orinocencis: None

1.6 Common names:

Chelus fimbriata	English:	Amazon matamata
	French:	
	Spanish:	Matamata amazónica, Matamata del Amazonas
Chelus orinocensis	English:	Orinoco matamata
	French:	
	Spanish:	Matamata del Orinoco, matamata orinocensis

1.7 Code numbers: n/a

2. Overview

In 2011, the Tortoise and Freshwater Turtle Specialist Group assessed the global conservation status of the species *Chelus fimbriata* considering its broad area of distribution in South America and classified the species in the category of Least Concern – LC (Vargas – Ramírez et al. 2020; TFTSG, 2018).

Before *Chelus orinocensis* was described, differences had already been observed between the populations of the Amazon basin and those of the Orinoco River basin in the shape and length of the intergular scute, the colour of the neck, the abdominal surface and the margin of the carapace (Rueda-Almonacid et al. 2007, Pritchard 2008, Wood, 1976).

However, the new description of the species *Chelus orinocensis*, which involved splitting *C. fimbriata* into two species (Vargas-Ramírez et al. 2020), implied that the broad area of distribution that *C. fimbriata* was considered to have was in fact a geographic space that corresponded to two species with a separate distribution occurring in different territories: *C. fimbriata* in the Amazon basin and the drainage region of the Mahury River, and *C. orinocensis* in the Orinoco, Río Negro and Esequibo basins (Figure 1.). This reduction in the area of distribution of both species increases their vulnerability to threats such as habitat loss and overexploitation. (Vargas – Ramírez *et al*. 2020).

Indeed, these taxonomic changes have resulted from the use of molecular techniques. Amaya (2016) proved the significant genetic differences between individuals of matamata turtles from the Orinoco River basin and the Amazon River basin. Yet, it was not until the year 2020 that the existence of two geographically separate species – *Chelus fimbriata* and *Chelus orinocensis* – was concluded based on molecular and morphological analyses (Vargas-Ramírez *et al.* 2020).

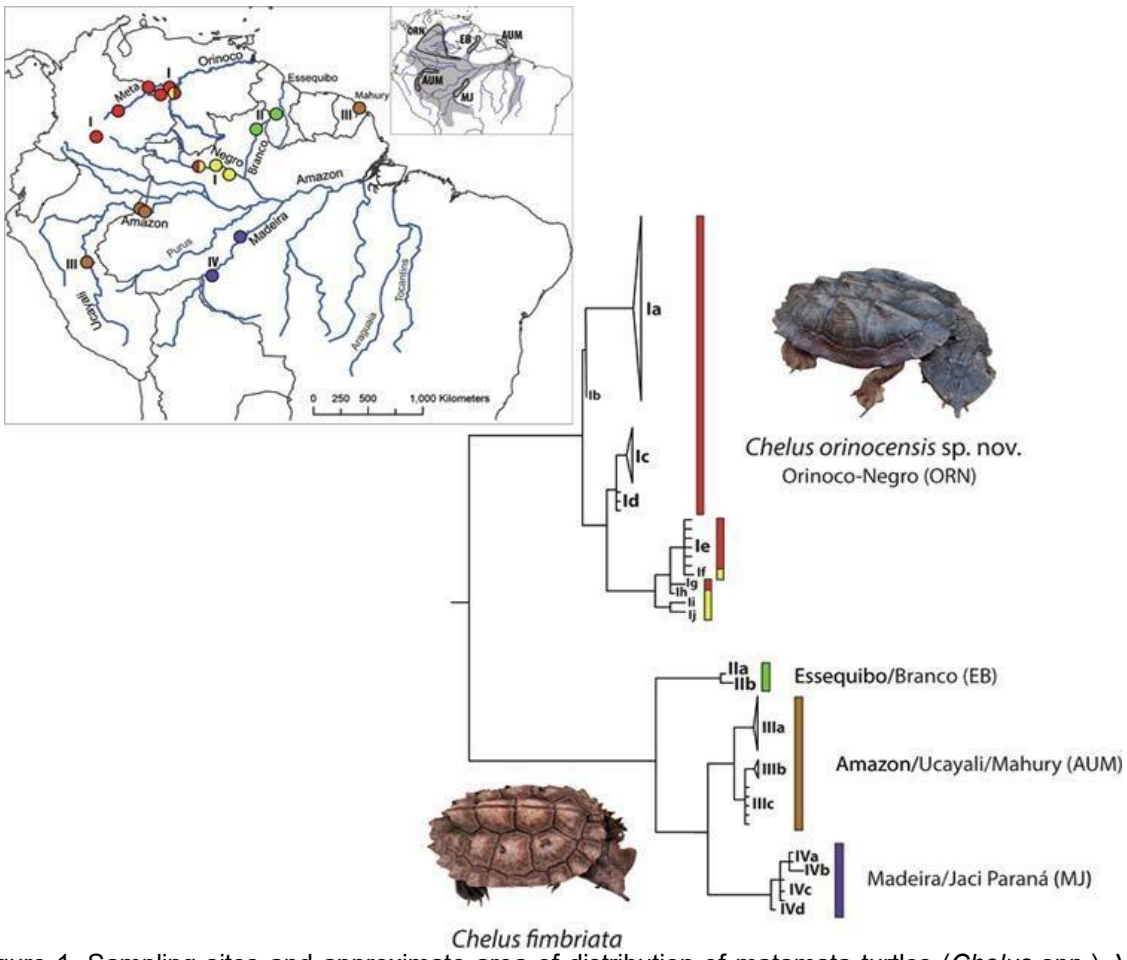

Figure 1. Sampling sites and approximate area of distribution of matamata turtles (*Chelus* spp.), Vargas-Ramírez *et al*. 2020.

These turtles, which are sideneck turtles (Pleurodira), fold their head in a horizontal plane, retracting it into the carapace by bending in an "S" shape their long and strong neck, which has outgrowths of the skin on the sides and the throat (Rueda – Almonacid *et al.* 2007; Pritchard. 2008; Restrepo & Paez. 2012). Additionally, both matamata species have other physical characteristics that clearly distinguish them from other species of turtles. They have an extremely rough, tuberculate carapace and a very flattened and triangular head; they also have a huge mouth, very small eyes and an elongated snout with tubular nostrils at the tip (Pritchard, 2008). These species occur in shallow aquatic habitats with slow-moving or quiet waters. In Colombia, Medem (1971) reported that they are found mainly in still water systems such as lakes with muddy bottoms and fallen leaves and in flooded forests when the water level is high.

There are no quantitative data on the estimated population size of these species. However, in their area of distribution, they are rarely seen and, when found, they are alone (Pritchard, 2008); yet, in some sites of the Venzuelan Llanos region (distribution of *Chelus orinocensis*), they seem to be common in some swamps and oxbow lakes, particularly when water levels are low and several water bodies are isolated from their main courses (Daza 2004).

The aim of this proposal is to include the only two species of the genus *Chelus* – *C. fimbriata* and *C. orinocensis* – in CITES Appendix II.

It should be noted that these species are the subject of a growing international demand and their trade is regulated by the legislation of each country; moreover, illegal trade is poorly documented in the Neotropics (Lasso *et al*, 2018). Nevertheless, there is a significant number of seizures, as shown by those that have taken place in Colombia and Peru. More than 2,000 hatchlings were seized in in one single shipment at El Dorado International Airport in Colombia (antena3 (2021) and, according to the Management Authority of Peru, more than 1,000 individuals (i.e., juveniles and adults) were seized in 40 operations in 17 departments and 468 eggs were seized in one single operation. These data show that these species are taken from the wild for domestic and international cross-border trade, and that illegal trade is a threat to their populations in all their life stages (i.e., eggs, hatchlings, juveniles and adults). In Colombia, according to seizure data from the environmental authority of the Colombian Amazon region, called Corpoamazonia, in the last few years

(2013-2018) there have been movements of significant volumes of *Chelus* specimens that have led to seizures of a large number of hatchlings transported by plane to the city of Leticia, the capital of the department of Amazonas, apparently to smuggle them to Peru, where the export of the species is permitted (Lasso et al. 2018).

Only in Peru, legal exports of *Chelus fimbriata* increased from 749 live individuals in 2010 to 19,715 in 2018, according to export databases of the authorities of the country, and international demand persists (in 2020, the export of over 4,000 hatchlings was recorded).

Shipments of matamata turtles exported from Peru are of wild-collected individuals obtained through ranching and specimens produced by authorized breeding operations. It should be noted that at least three individuals/companies currently administering breeding operations for this species are listed as being under investigation for illegal possession of matamata turtles in the database on seizures kept by the Peruvian National Forestry and Wildlife Service (SERFOR). In addition, one of them has been fined by the Forest Resources and Wildlife Supervisory Agency (OSINFOR) for not providing information to the authority on the management of *Chelus fimbriata* in captivity (OSINFOR 2014).

Young matamata turtles are traded in large volumes in international pet markets and are sought after by aquarium and turtle hobbyists in Europe and the United States. Hence, it is necessary to monitor international trade in these species (Rueda-Almonacid *et al*, 2007; Pritchard, 2008).

These elements show that the regulation of international trade of the species *Chelus fimbriata* and *Chelus orinocensis* is necessary and appropriate to reduce the potential threats resulting from commercial demand for both species. Their inclusion in CITES Appendix II will make it possible to allow exports as long as the conditions for such international trade are met, ensuring that it is not detrimental to the survival of the species. It will also enable the *in situ* and *ex situ* management process to be characterized by the transparency of its records at all stages, applying the control and enforcement mechanisms provided for species protected by the Convention, thus complementing the domestic measures on species trade taken by the countries.

3. Species characteristics

3.1 Distribution

Both species occur in South America:

Chelus fimbriata: It is restricted to the Amazon River basin (Ecuador, Peru, Colombia, Brazil and Bolivia), and the Mahury River basin (Suriname and French Guiana). (Vargas-Ramírez *et al*, 2020).

Chelus orinocensis: It has a smaller area of distribution, which comprises the Orinoco, Río Negro and Esequibo basins, with confirmed records in Brazil, Colombia, Guyana and Venezuela (Bolivarian Republic of). (Vargas-Ramírez *et al*. 2020).

The total distribution of both species amounts to about 6,907.551 km^2. This is one of the turtle genera with the largest distributions in the Amazon basin (Cunha et al. 2021). Additionally, in the reptile collection of the Instituto Sinchi, there are records of *C. orinocensis* that are new for the species in Laguna El Cejal, to the west of the town of Inírida.

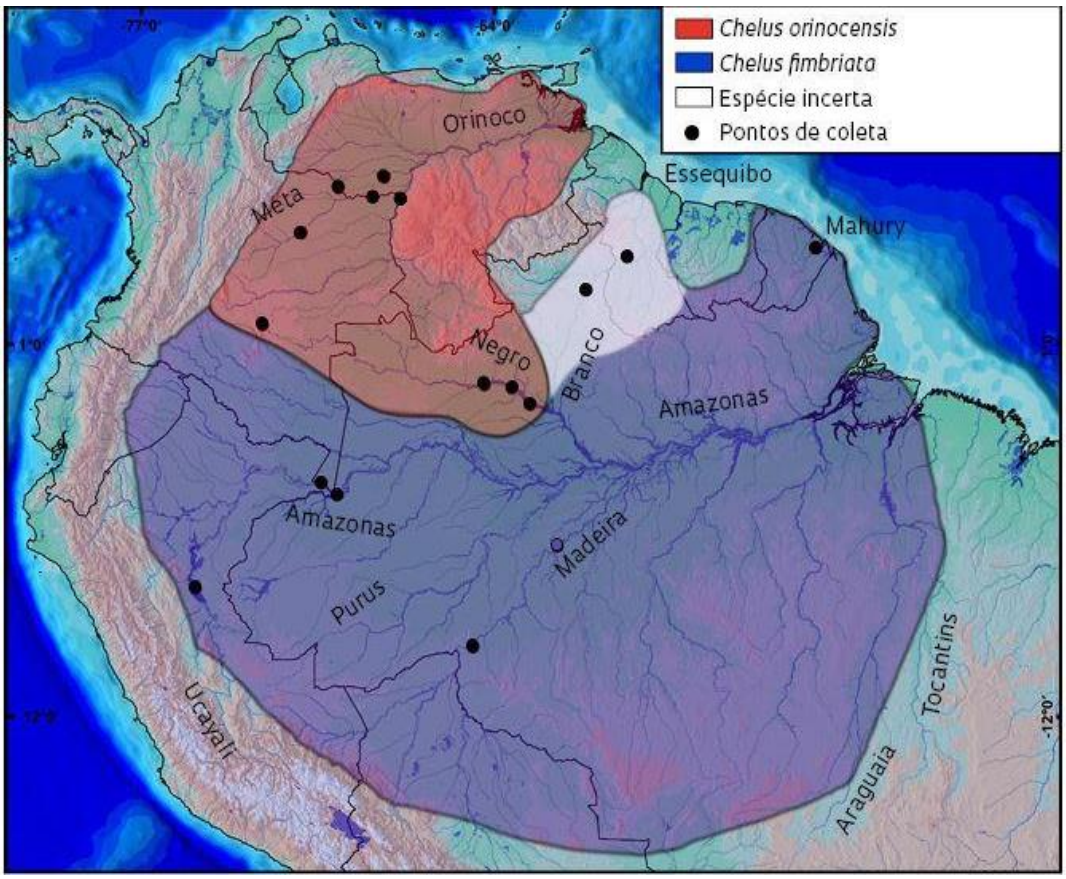

Figure 2. Distribution map of matamata turtles. Source: Fabio Muniz/UFAM, taken from Schmidt S. (2020). *Espécie incerta* = uncertain species; *pontos de coleta* = collection points.

3.2 Habitat

These are benthic aquatic species that live preferably at the bottom of shallow water bodies. They are rarely seen floating or swimming and spend most of the time at the bottom of dark waters with high sediment load (e.g., Amazon wetlands, river meanders and pools, lakes). They emerge to the surface regularly to breathe and their environments are generally surrounded by marginal vegetation with abundant leaf litter. They can penetrate brackish waters and occasionally deep wells (Rueda – Almonacid *et al.,* 2007; Trebbau & Pritchard, 2016). Although they can be found in different types of aquatic environments, they have a preference for quiet and slow-moving water systems with a slow current and can occasionally penetrate brackish and salt waters, as in the case of Trinidad Island. (Trebbau & Pritchard, 2016).

3.3 Biological characteristics

Matamata turtles are extremely specialized carnivores that can detect minimum changes in water currents and thus recognize the movements of their prey with the fringes and flaps on their head (triangular, wide, flattened and with tubercles) and their elongated neck, which are innervated; these characteristics and the developed muscles of the hyoid apparatus are considered an element of adaptation of these species and allow them to eat the prey they have detected by opening their mouth quickly and sucking the prey by contracting the muscles of the hyoid and neck in the environment of nocturnal darkness and turbid waters they inhabit (Espenchade 1990; Rueda – Almonacid 2007; Pritchard 2008; Daza & Correa-Viana 2015, Carvajal-Campos, A. & Rodríguez-Guerra, 2019).

The potential longevity of these species is unknown (Pritchard, 2008). Although information about their reproduction is limited in the wild, there is information about captive specimens in private collections or zoos in different parts of the world (Trebbau & Pritchard, 2016). The species are known to reach sexual maturity at the age of 5 to 7 years. Females build solitary nests in sandy beaches on the banks of the water bodies where they live. They lay 12-28 eggs and the nesting season is synchronized with the end of the rainy season and the beginning of the dry period, that is, the months of October to December, when the level of the water bodies starts to decrease (Rueda – Almonacid, 2007, Daza & Correa – Viana, 2015). This periodicity is identified as a possible strategy to ensure the birth and survival of the

hatchlings before the rainy season, given that the incubation period lasts 200 days (Daza & Correa – Viana, 2015). Sexual dimorphism is not very marked but males look a bit smaller than females, with more concave plastrons, longer tails and more distal cloacas (Pritchard 2008).

The courtship of these species has been described by observing captive specimens: there is recognition and contact between males and females with movements and rubbing of the head and legs of the male against the female and the pair makes synchronized rhythmic movements in the water; during copulation, the male keeps its head above the female (Metrailler 2003; Trebbau & Pritchard, 2016)

3.4 Morphological characteristics

Matamatas are Pleurodira or sideneck turtles, that is, their head and neck fold to one side of the shell in a horizontal plane. These species are large and can reach a size of 30 to 50 cm; their limbs have well-formed digits; the forefoot has five claws and the hind foot has four claws. The pectoral scutes are in contact with the marginal scutes; the plastron has 12-13 scutes; the intergular scute and chin barbels are present. They have a nuchal scute and the head is a very wide and flattened; the snout has the shape of a long tube and the mouth is wide, with a “smiling” appearance; the neck is almost as long as the carapace and its skin has protuberances with an irregular shape and contour on both sides of the throat; their function is tactile and sensitive to the movements of their prey in the water. These turtles can reach a length of 30-50 cm. The carapace has a serrated edge and has prominent pyramid-like projections (Rueda – Almonacid *et al.* 2007; Pritchard 2008, Páez & Restrepo 2012, Zariquiey 2015). The most important characteristics for the identification of the genus *Chelus* are presented below.

Main characteristic	*Chelus fimbriata*	*Chelus orinocensis*
Colour of the dorsal area (neck)	Dark	Pale
Colour of the plastron	Dark-pigmented	Pale yellow
Shape of the carapace	Rectangular	Oval
Colour of the carapace	Pale	Dark

Figure 3. Source: Comparison of the dorsal and ventral appearance of *Chelus orinocensis* (top), subadult female, and *Chelus fimbriata* (bottom), subadult female (Vargas-Ramírez *et al*. 2020)

Although both species can reach the same size, up to 50 cm, they live in different territories and the distinctive physical characteristics of each species are based on the colour of the plastron and the dorsal area and the colour and shape of the carapace.

3.5 Role of the species in its ecosystem

In general, information about the importance of the ecological role of turtles is scarce in the scientific literature and no specific studies have been conducted on matamata turtles, possibly because of their cryptic nature (Lovich, *et al*. 2018). Turtles in general and matamatas in particular, which are predatory carnivorous species and feed on fish and aquatic invertebrates as well as birds and small mammals, play an important role in the redistribution of energy and nutrients between themselves and their prey and also with their natural predators (Rueda – Almonacid et al. 2007; Lovich, *et al*. 2018). Both matamata species and their eggs are eaten by other species and, although there is little information available on predators of matamatas, the giant otter has been identified as such (Pritchard 2008). In addition, *Tupinambis teguixin* is believed to be the main natural predator of matamata eggs in Venezuela (Daza & Correa –Viana 2012). Communities of eminently aquatic turtles such as matamatas, which only leave the water to lay their eggs on the shore, contribute to the redistribution of energy and nutrients between aquatic and terrestrial habitats (Rueda Almonacid *et al*. 2007; Lovich 2018); the dry content of their eggs is purely protein and lipids (Booth 2003).

4. State and trends

4.1 Habitat trends

Until 2020 it was assumed that the genus *Chelus* only included the species *C. fimbriata* as a relict species and that it was broadly distributed in the basins of the Orinoco and the Amazon rivers; however, based on the research by Vargas-Ramírez *et al*. (2020), which concluded on the existence of two separate species – *C. fimbriata* and *C. orinocensis* –, the reduction of the habitat of each species should be considered.

4.2 Population size

Pritchard (2008) reported the absence of qualitative data on the population size of *C. fimbriata*. In Venezuela its populations seem stable (Trebbau & Pritchard 2016). Given that the size of the harvest of matamata turtles is not known, it is not possible either to determine its impact on their population (Vargas *et al*. 2020). However, it is logical to expect that the current division of *C. fimbriata* into two species with a separate geographic distribution may have implications on the population size of both *C. fimbriata* and *C. orinocensis.*

4.3 Population structure

There is no information available on the population structure of the species.

4.4 Population trends

There is no information available on the population trend.

4.5 Geographic trends

On the basis of the large area of distribution of *Chelus fimbriata*, the species was classified in the category of Least Concern in the IUCN Red List (Vargas-Ramírez *et al.*, 2020; TTWG, 2017). Currently, taking into account the phylogeographic differentiation between *C. fimbriata* and *C. orinocensis*, it is critical to recognize the Evolutionary Significant Unit for each species (Vargas-Ramírez *et al.*, 2020), considering the current smaller area of distribution of both taxa and the geographic trend of the species.

5. Threats

Both species of the genus *Chelus* are exposed to threats that could lead to a decline in their population. These threats are basically anthropogenic, that is, human activities that cause the degradation and pollution of the environment, habitat loss and fragmentation and also direct overexploitation by harvesting large numbers of individuals from the wild – mainly hatchlings and juveniles – for international trade during the breeding season (Rueda – Almonacid *et al.* 2007, Morales-Betancourt 2012, Paez *et al*. 2012, Trebbau & Pritchard 2016).

Anthropogenic predation has been recognized as a cause of the reduction of the reproductive success of matamata turtles, even to a larger extent than natural predation and the flooding of the nests, which causes their destruction (Daza & Correa Viana 2015). In that regard, recommendations have been made for monitoring international trade of live individuals and environmental degradation as conservation measures for these species (Pritchard 2008). In Colombia, in the Estrella Fluvial Inírida Ramsar Site, in the department of Guainía, with the financial support of the GEF project “Corazón de la Amazonia” and the technical assistance of the Instituto SINCHI, indigenous communities are monitoring the use and availability of populations of *Chelus orinocensis*, specifically in the Guaviare River and a tributary of the Inírida River. The reason for this monitoring is that the species is traditionally used for food and its meat is sometimes also locally traded; the aim is to use the information obtained to design management measures that can ensure sustainable use.

6. Utilization and trade

6.1 National utilization

Both species of matamata turtles are harvested in large numbers mainly at the stages of hatchlings and juveniles for the pet trade and for selling to commercial aquaria. Although the size of their harvest

and its impact are unknown (Castaño-M. 2002, Pritchard, 2008, Páez *et al*., 2012, Morales – Betancourt *et al*., 2015, Vargas Ramírez, *et al.,* 2020), they are also captured for ornamental purposes (Morales – Betancourt & Lasso, 2015).

In Colombia, matamata turtles are used as food for the subsistence of members of indigenous communities and their eggs are consumed in Casanare (Alfaro *et* al., 2011, Morales – Betancourt & Lasso, 2015).

In Venezuela, the Marikitare indigenous people also consume them (Pritchard & Trebbau, 2016); in the Cojedes and Tinaco rivers there is some consumption of matamatas and their eggs, although 60% of the population reported not considering them as an animal for consumption (Daza, 2004).

In Peru, *Chelus fimbriata* is also used for consumption as food for native communities in Iquitos, but only occasionally (Dixon & Soini, 1977). Although *Chelus fimbriata* used to be one of the main animals sold for food in the markets of the city of Iquitos (Castro et al., 1976), its consumption is currently less frequent but is still present, and the species is mainly sold for its meat (D'Cruze *et al*., 2021). Its use for medicinal purposes has been recorded to treat the symptoms of diarrhoea by drinking the decoction of the carapace in the Tikuna community of Cushillo Cocha, in Mariscal Ramón Castilla. The Tikuna indigenous people are one of the groups with the largest population of the entire Amazon basin (López 2002, Rengifo-Salgado *et al*., 2017).

In Brazil, it has been recorded that the preferred method to capture *Chelus fimbriata* is the use of hooks in the upper course of the Río Negro. The lines used have several hooks and are baited with pieces of decomposing fish or chicken (De La Ossa *et al.,* 2012).

6.2 Legal trade

Both species of matamatas are traded in large numbers in international pet markets and are sought after by aquarium and reptile hobbyists in Europe and the United States (Rueda – Almonacid, 2007, Pritchard, 2008).

In Peru, of the species not classified as threatened and not listed in the CITES Appendices, *Chelus fimbriata* is the main species exported. Exports consist of live young specimens from the department of Loreto. Until 2015, the source was exclusively breeding operations, and exports required a permit issued by the National Forestry and Wildlife Authority, which is in charge of the CITES Management Authority. Yet, since the entry into force of the new Forestry and Wildlife Act (*Ley Forestal y de Fauna Silvestre*) in October 2015, a permit is not necessary for species that are not listed in the CITES Appendices. Since 2016, the harvest of matamata turtles has extended to *in situ* wildlife management areas. Currently, two management sources coexist: *ex situ* management, in four breeding farms (CENCRIREFAS, FAPEX, Fundo Gaviota and Reptilians Turtles & Tropical Fish E.I.R.L), and *in situ* management, in areas of two indigenous communities: Betsaida and Santa María de Fátima II Zona. It is not possible to reliably determine nor differentiate the volume of matamata turtles that originate from *ex situ* and *in situ* management.

The total volume of specimens exported shows an increasing trend, with a mean annual growth of 50% from 2010, rising from less than 1,000 specimens to more than 18,000 specimens in 2018 (Table 1).

Table 1: Exports for commercial purposes of *Chelus fimbriata* from Peru to various destinations, 2010 – 2020

Importer	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**Total**
Belgium	-	-	-	-	-	-	100	-	-	-	-	**100**
Canada	-	3	-	-	-	-	-	-	-	-	-	**3**
Chile	-	30	-	-	100	--	-	-	-	-	-	**130**
China	585	461	1213	2174	1636	1872	5300	4780	15330	2907	3567	**39825**
Germany	-	-	-	-	-	-	-	-	-	156	200	**356**
Italy	-	-	30	-	-	-	-	-	-	-	-	**30**
Japan	97	112	130	201	307	100	120	229	100	120	100	**1616**
Malaysia	-	65	-	-	-	-	50	500	-	-	-	**615**

Mexico	-		120	200	200	-	-	-	100	-	-	**620**
Netherlands	10	-	-	-	-	-	-	-	-	-	-	**10**
Spain	-	168	41	285	843	142	150	1250	-	140	120	**3139**
Taiwan	-	950	300	-	50	-	100	300	150	138	200	**2188**
United Kingdom	-	-	-	-	-	-	-	300	-	20	-	**320**
United States	57	-	-	-	272	400	241	5845	2675	4885	285	**14660**
Total	**749**	**1789**	**1834**	**2860**	**3408**	**2514**	**6061**	**13204**	**18355**	**8366**	**4472**	**63612**

Source: SERFOR Database and Regional Government of Loreto, Peru.

The main destinations of *Chelus fimbriata* exported from Peru are China and the United States, which jointly represent 85% of exports since 2010. It is worth noting that China dominated the market between the years 2012 and 2018, representing over 60% of mean annual exports, and in 2019 the United States imported 58% of the exports of *Chelus fimbriata* from Peru.

In 2017, the CITES Management Authority of The Netherlands halted the export of a shipment of turtles from Peru which included 200 individuals of *Chelus fimbriata* because of animal welfare issues; the containers did not meet IATA standards for the transport of live animals. The animals were returned to Peru.

The CITES Management Authority of Peru is concerned about the growing international trade of the species *Chelus fimbriata*. The decrease in the size of its geographic area of distribution considering the description of the new species *Chelus orinocensis*, which was previously considered to be *Chelus fimbriata,* leads to inferring a decrease of its population size.

6.3 Parts and products in trade

No parts or derivatives of the species are exported.

6.4 Illegal trade

In Peru, *Chelus fimbriata* is the second species of freshwater turtle that is seized most often, behind *Podocnemis unifilis* (Zariquiey *et al.,* 2016). The size of its illegal trade is partially reflected in the seizures made by the authorities. According to the records, in 2001–2020 there were 46 seizures involving a total of 1,000 live individuals in five of the twenty-four departments of the country; 98% of the total number of animals were seized in the department of Loreto.

In Colombia, molecular studies conducted in specimens seized in the city of Leticia show that the species currently identified as *Chelus orinocensis* is being harvested in the Orinoco River basin and probably smuggled to Peru to be traded internationally in the legal market at a later stage (Lasso, *et al*, 2018). Moreover, in the department of Casanare there are records of large seizures of matamata hatchlings traded for commercial purposes (Alfaro *et al.* 2011).

In Colombia, in 2019, the Environmental Police and the Airport Police seized 1,359 individuals in Bogota that were going to be shipped as an order from there to Leticia (Barreto, 2019). The method of concealing live specimens in shipments of ornamental fish is well known. A recent event related to this species took place on 1 May 2021 with the seizure of 1,936 individuals at El Dorado Airport in Bogota which were intended to be trafficked towards the south of the country (SDA, 2021).

Matamata turtles may be subjected to a high harvest pressure because they are very attractive for the pet and collector trade internationally. Consequently, this active and unregulated trade may affect the viability of the species. Although it is possible that the animals seized are harvested from the wild through ranching, there is also a high chance that they are illegally bred in captivity, given the similar morphological conditions and size of most individuals in the same shipments in the latest seizures, which are difficult to obtain with wild-taken specimens.

The recent description of the new species of matamata (*Chelus orinocensis*), distributed in the Orinoco, Rio Negro and Essequibo river basins, which shows clear differences from the species *Chelus fimbriata*, distributed in the Amazon basin and the drainage region of the Mahury River (Vargas-Ramírez et al., 2020), is a challenge for the correct identification of the species during seizures. It

highlights the importance of molecular analysis to determine the place of origin and release seized animals without causing an impact on the wild populations. These events have taken place mainly in the department of Amazonas in Colombia and may be linked to an international network that operates transporting the specimens to Peru, where their trade is legal (Lasso et al., 2018).

The species are not currently listed in any CITES Appendix and are not classified in any global or national categories of threat in their range countries; as a result, it is urgent to take decisions aimed at their protection and regulation, which should be extended to the countries of the Amazon region, where the illegal trade network is believed to operate.

In Colombia, seizures made in the last three years suggest the existence of an exit route for individuals from Bogota to Leticia at the same time of the year (i.e., between March and April) and with a similar way of packaging the individuals, hiding them among fish. This pattern of operations clearly shows the need to include the species in the mechanisms aimed at regulating species trade in each country and internationally to strengthen the monitoring of the market, which has been identified as being in continuous rise.

6.5 Actual or potential trade impacts

The high levels of international trade in themselves might not be causing a reduction in the population size. However, it is necessary to consider that this is a case in which two geographically separate species are now documented in an area that used to be considered to include only *Chelus fimbriata*. Thus, the geographic area of distribution has decreased and consequently also the population size. This, added to other threats such as the initiatives to build waterways in the Orinoco and Amazon rivers, which could affect the flooding pulses of the rivers, could decrease the availability of nesting beaches (Alfaro *et al*., 2011), with potential detrimental effects for the survival of matamata species.

The inclusion of the species *Chelus fimbriata* and *Chelus orinocensis* in Appendix II implies the implementation of management, monitoring and control measures aimed at ensuring that trade does not pose a threat to these species.

7. Legal instruments

7.1 National

In Colombia, Venezuela and Brazil, the export of matamatas is prohibited (Pritchard, 2008).

In Peru, trade of *Chelus fimbriata* is permitted and is legal in the framework of the Forestry and Wildlife Act (*Ley Forestal y de Fauna*, Ley N° 29763) and the Regulation on Wildlife Management (*Reglamento para la Gestión de Fauna Silvestre*), adopted by Supreme Decree No. 019-2015-MINAGRI (01.12.2015), which lays down the conditions for wildlife trade, banning captive breeding of threatened species, and authorizes the management of species such as *Chelus fimbriata* in breeding operations and also their management in wild areas. Given that it is not listed in CITES, it is exempted from the requirement of applying for a permit for its commercial export and of reporting on record keeping and operational procedures (e.g., parental stock in breeding farms, harvest rate, food, health care).

7.2 International

No international legal instruments have been identified for these species and their trade is not regulated at international level.

8. Species management

8.1 Management measures

In Peru, anybody wishing to trade in *Chelus fimbriata* must present to the Regional Forestry and Wildlife Authority a declaration equivalent to a management plan explaining the actions that have been planned to produce offspring for commercial purposes. Management can be done *in situ* in wild management areas or *ex situ* in breeding operations. There are no national management plans for the species nor quotas set for it.

8.2 Population monitoring

There is no information on any monitoring programs on the status of the wild populations or assessments of the viability of their harvest from the wild in their range countries.

8.3 Management measures

8.3.1 International

There are no measures in force to control the cross-border movement of the species between countries. In Peru, an export permit issued by the Ministry of Agriculture was required until 2015. Yet, this measure was repealed with the entry into force of the Forestry and Wildlife Act No. 29763 and its Regulation (01.10.2015).

8.3.2 Domestic

In Peru, trade of *Chelus fimbriata* is subject to compliance with administrative requirements to obtain the approval of its management, whether in the wild or in captivity.

In Colombia, illegal trade is regulated under the control of “illegal harvest of renewable natural resources”, regulated by the Penal Code (Act 599 of 2000, Article 328).

There is no information about all the range countries.

8.4 Captive breeding and artificial propagation

Peru: There are two authorized *in situ* management areas and four authorized breeding operations, which are the source of the production of *Chelus fimbriata* for commercial exports. Data on the size of the parental stock are not currently available. The production exported amounted to 75,740 live individuals in 2010–2020. Of this amount, 83% was exported in the last five years (2016–2020).

Colombia: There are no authorizations for captive breeding or ranching for commercial purposes.

It should be noted that, outside their range countries, there are numerous matamata turtles in captivity. In 1982, several hundreds of juveniles were exported illegally from Guyana to the United States, where they were seized and deposited at Los Angeles Zoo or redistributed to other collections (Pritchard, 2008).

8.5 Habitat conservation

In the countries where the species are distributed, there are several protected areas where they have been recorded:

Ecuador:
Chelus fimbriata
- Reserva de Producción de Fauna Cuyabeno,
- Parque Nacional Yasuní and Estación de Biodiversidad Tiputini (Carvajal & Rodriguez, 2019).

Peru:
Chelus fimbriata
- Parque Nacional del Manu (Catenazzi *et al*. 2003),
- Parque Nacional Alto Purús (Rodríguez 2003),
- Parque Nacional Yaguas (SERNANP 2016).
- Parque Nacional Gueppi-Sekine (SERNANP 2018),
- Reserva Nacional Pacaya Samiria (Soini, 1996), and
- Reserva Nacional Allpahuayo Mishana, (Overjluis, 2003).

Venezuela:
Chelus orinocensis
- Parque Nacional Delta del Orinoco (Trebbau & Pritchard, 2016).
- Parque Nacional Santos Luzardo (Trebbau & Pritchard, 2016), and
- Parque Nacional Aguaro – Guariquito (Trebbau & Pritchard, 2016).

8.6 Safeguards

None.

9. Information on similar species

There are no similar species.

10. Consultations

N/A

11. Additional remarks

None.

12. References

Amaya-Calderon, L.A., 2016. Estructura poblacional y diversidad genética de la tortuga matamata, *Chelus fimbriatus* (Schneider, 1783), en las cuencas del Amazonas y el Orinoco: trayectorias evolutivas independientes? MSc Thesis. Universidad de los Andes, Bogotá.

Alfaro, JP., Acosta-Galvis, A. R., & Vejarano, M.(2011). Reptiles de Casanare. Pp. 153-156 In*:* Usma, J.S.& F. Trujillo (Eds.). 2011. Biodiversidad del Casanare: Ecosistemas Estratégicos del Departamento. Gobernacion de Casanare - WWF Colombia. Bogotá D.C.286p.

antena3 (2021). Rescatan a miles de tortugas dentro de bolsas en el Aeropuerto Internacional de Colombia. Retrieved 28 May 2021, from https://www.antena3.com/noticias/mundo/rescatan-a-miles-de-tortugas-en-colombia_202003095e660af524692800019fe5fa.html

Booth, David. (2003). Composition and energy density of eggs from two species of freshwater turtle with twofold ranges in egg size. Comparative biochemistry and physiology. Part A, Molecular & integrative physiology. 134. 129-37. 10.1016/S1095-6433(02)00216-7.

Castano-Mora, O.V. 2002. Libro rojo de reptiles de Colombia. Libros rojos de especies amenazadas de Colombia. Instituto de Ciencias Naturales–Universidad Nacional de Colombia, Ministerio del Medio Ambiente, Conservacion Internacional–Colombia. Bogota, Colombia. 160 p.

Carvajal-Campos, A. & Rodríguez-Guerra, A. 2019. *Chelus fimbriatus* In: Torres-Carvajal, O., Pazmiño-Otamendi, G. & Salazar-Valenzuela, D. 2019. Reptiles del Ecuador. Version 2019.0. Museo de Zoología, Pontificia Universidad Católica del Ecuador. https://bioweb.bio/faunaweb/reptiliaweb/FichaEspecie/Chelus%20fimbriatus, retrieved 11 March 2021.

Castro, N., Revilla, J., & Neville, M. 1976. Carne de Monte como una Fuente de Proteínas en Iquitos, con Referencia Especial a Monos. Revista Forestal del Perú 6: 19-23.

Catenazzi, A ., Lehr, E . & von May, R . (2013). The amphibians and reptiles of Manu National Park and its buffer zone, Amazon basin and eastern slopes of the Andes, Peru. *Biota Neotropica*, *13*(4), 269-283. https://dx.doi.org/10.1590/S1676-06032013000400024

Cunha, F., Camila, A. G., Fagundes, K., Brito, E. S., Vogt, R. C., Maffei, F., Pezzuti, J., Félix-Silva, D., Rojas-Runjaic, F. J. M., Lasso, C. A., Morales-Betancourt, M. A., Tadeu De Carvalho, V., Valsecchi Do, J. (2021). Distribution of *Chelus fimbriata* and *Chelus orinocensis* (Testudines: Chelidae). Chelonian Conservation and Biology 20, (1): 109-115. https://dx.doi.org/10.2744/CCB-1398.1

Daza, M. X., 2004. Ecología y manejo de la matamata (*Chelus fimbriatus*) en el estado Cojedes, Venezuela. Trabajo para optar el título de magister scientiarum en manejo de fauna silvestre. UNELLEZ. Guanare. 76 pp+anexos In: Trebbau, P. & Pritchard P.C.H. 2016. Venezuela y sus Tortugas. Oscar Todtmann editores. 2016. Caracas 184 pp.

Daza, X. & Correa – Viana, M., 2015. Ecología reproductiva de la matamata (*Chelus fimbriatus*) en el estado Cojedes, Venezuela. *Mem. Fund. La Salle Cien*. *Nat.,* 72(177–178): 75–90.

D'Cruze N., Rodriguez Galarza F., Broche O., El Bizri H., Megson S., Elwin A., Carniel Machado F., Norrey J, Coulthard E. & Megson D. 2021. Characterizing trade at the largest wildlife market of Amazonian Peru, Global Ecology and Conservation, Volume 28, e01631.

De la Ossa, J., Cárdenas-Arévalo & Páez V., 2012. Métodos de campos para estudios demográficos. Capítulo 13. Pp. 103-113. *In:* Páez, V. P., M. A. Morales- Betancourt, C. A. Lasso, O. V. Castaño-Mora y B. C. Bock (Editores). 2012. V. Biología y conservación de las tortugas continentales de Colombia. Serie Editorial Recursos Hidrobiológicos y Pesqueros Continentales de Colombia. Instituto de Investigación de Recursos Biológicos Alexander von Humboldt (IAvH). Bogotá, D. C.

Dixon J.R. y Soini P. 1977. The reptiles of the upper Amazon basin, Iquitos region. Peru. II Crocodilians, turtles and snakes. Contr. Biol. Geo. Milwaukee Publ. Mus., 12:1-91 in Trebbau, P. & Pritchard P.C.H. 2016. Venezuela y sus Tortugas. Oscar Todtmann editores. 2016. Caracas 184 pp.

Espenshade W. H. 1990. Matamata, Chelus fimbriatus Retrieved 28 May 2021, from https://tortoise.org/archives/matamata.html

Lasso, C. A., Trujillo, F., Morales-Betancourt, M. A., Amaya, L., Caballero, S. & Castañeda, B. (2018). Conservación y tráfico de la tortuga matamata, Chelus fimbriata (Schneider, 1783) en Colombia: Un ejemplo del trabajo conjunto entre el Sistema Nacional Ambiental, ONG y academia. *Biota Colombiana*, 19(1), 147-159. DOI: 10.21068/c2018.v19n01a10

López Garcés, C. 2002. Los ticuna frente a los procesos de nacionalización en la frontera entre Brasil, Colombia y Perú. *Revista Colombiana de Antropología,* 38, 77-104. Retrieved 5 June 2020 http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0486-65252002000100004&lng=en&tlng=es.

Rengifo-Salgado, E., Rios-Torres, S., Fachín, L., & Vargas-Arana, G. 2017. Saberes ancestrales sobre el uso de flora y fauna en la comunidad indígena Tikuna de Cushillo Cocha, zona fronteriza Perú-Colombia-Brasil. *Revista Peruana de Biología*, 24(1), 67-78. https://dx.doi.org/10.15381/rpb.v24i1.13108

Lovich, J., Ennen, J., Agha, M., Gibbons, J.W. 2018. Where Have All the Turtles Gone, and Why Does It Matter?, *BioScience*, Volume 68, Issue 10, October 2018, Pages 771–781, https://doi.org/10.1093/biosci/biy095

Metrailler, S. 2003. Note sur l'élevage et la reproduction de la matamata, *Chelus fimbriata* (Schneider, 1783) Manouria 20:35-39 en Trebbau, P. & Pritchard P.C.H. 2016. Venezuela y sus Tortugas. Oscar Todtmann editores. 2016. Caracas 184 pp.

Medem, F, 1971. AFOSR Grant. 68 1418. Final Technical Report: Ecological and Disease Transmission Potential in the Colombian Amazon Basin. 138 pp.

Morales-Betancourt, M. A., C. A. Lasso, V. P. Páez & B. C. Bock. 2015. Libro rojo de reptiles de Colombia (2015). Instituto de Investigación de Recursos Biológicos Alexander von Humboldt (IAvH), Universidad de Antioquia. Bogotá, D. C., Colombia. 258 pp.

OSINFOR. 2014. Resolución Directoral N° 274-2014-OSINFOR-DSPAFFS (20.03.2014)

Oversluijs – Vasquez, M., 2004. Animales de caza en la zona reservada Allpahuayo – Mishana. *Folia Amazónica.* 14. 1. ISSN 1081 – 5674

Páez, V. P., M. A. Morales-Betancourt, C. A. Lasso, O. V. Castaño-Mora & B. C. Bock (Editores). 2012. V. Biología y conservación de las tortugas continentales de Colombia. Serie Editorial Recursos Hidrobiológicos y Pesqueros Continentales de Colombia. Instituto de Investigación de Recursos Biológicos Alexander von Humboldt (IAvH). Bogotá, D. C., Colombia, 528 pp

Pritchard, P. C. H. 2008. *Chelus fimbriata* (Schneider 1783) - matamata turtle. *In:* Rhodin, A. G. J., Pritchard, P. C. H., van Dijk, P. P., Saumure, R. A., Buhlmann, K. A., Iverson, J. B. & Mittermeier, R. A. (Eds.). Conservation biology of freshwater turtles and tortoises: A compilation project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group. Chelonian Research Monographs (5):020.1-020.10.

Restrepo, A & Paez, V. P. 2012. Familias y especies de tortugas dulceacuícolas y terrestres de Colombia. Capítulo 18. Pp. 241- 242. *In:* Páez, V. P., M. A. Morales-Betancourt, C. A. Lasso, O. V. Castaño-Mora y B. C. Bock (Editores). 2012. V. Biología y conservación de las tortugas continentales de Colombia. Serie Editorial Recursos Hidrobiológicos y Pesqueros Continentales de Colombia. Instituto de Investigación de Recursos Biológicos Alexander von Humboldt (IAvH). Bogotá, D. C.,Colombia.

Rodríguez, L.O. 2003. Anfibios y reptiles de la región del Alto Purús. In Alto Purús: Biodiversidad, Conservación y Manejo (R.L. Pitman, N. Pitman & P. Álvarez, eds). Gráfica S.A. Lima-Perú, Center for Tropical Conservation Duke University, p.89-96.

Rueda-Almonacid, J.V., J. L. Carr, R. A. Mittermeier, J. V. Rodríguez-Mahecha, R. B. Mast; R. C. Vogt, A. G. J. Rhodin, J. de la Ossa-Velásquez, J. N. Rueda & C. G. Mittermeier. 2007. Las tortugas y los cocodrilianos de los países andinos del trópico. Serie de guías tropicales de campo Nº 6. Conservación Internacional. Editorial Panamericana, Formas e Impresos. Bogotá, Colombia. 538 pp.

SERNANP, 2016. *Expediente técnico del Parque Nacional Yaguas.* Perú. Servicio Nacional de Áreas Naturales Protegidas. https://www.sernanp.gob.pe/documents/10181/360818/2.+Expediente_T%C3%A9cnico_Preliminar_PN_Yaguas.pdf/9b1a2ecc-82f6-4b7f-8f90-ff8af735ccd2

SERNANP, 2018. *Diagnóstico del Parque Nacional Güeppí – Sekime 2014 – 2019*. Perú. Servicio Nacional de Áreas Naturales Protegidas.

Schmidt S, 2020. A divisão dos matamatás. Descrição de uma nova espécie de quelônio, antes vista como única, poderia ajudar no combate ao tráfico desses animais amazónicos. https://revistapesquisa.fapesp.br/a-divisao-dos-matamatas/. 28-5-2021.

Trebbau, P. & Pritchard P.C.H. 2016. Venezuela y sus Tortugas. Oscar Todtmann editores. 2016. Caracas 184 pp.

TTWG, 2017. Turtles of the World: Annotated Checklist and Atlas of Taxonomy, Synonymy, Distribution, and Conservation Status, 8th Ed. Chelonian Research Foundation and Turtle Conservancy, Lunenburg, MA. https://doi.org/10.3854/crm. 7.checklist.atlas.v8.2017.

Uetz, P. (editor), The Reptile Database, http://www.reptile-database.org, accessed May 23, 2006.

Vargas-Ramírez, M. *et al.* Genomic analyses reveal two species of the matamata (Testudines: Chelidae: Chelus spp.) and clarify their phylogeography. *Molecular Phylogenetics and Evolution*. v. 148, 106823. jul. 2020.

Wood, R.C. 1976. Two new species of *Chelus* (Testudines: Pleurodira) from the late Tertiary

of northern South America. *Breviora.* 435:1–26.

Zariquiey, C., Y. Murillo, N. Cavero, G. Chávez. 2016. Guía de Reconocimiento. Herramienta para el control del tráfico ilegal de tortugas terrestres y de agua dulce del Perú. WCS, Lima