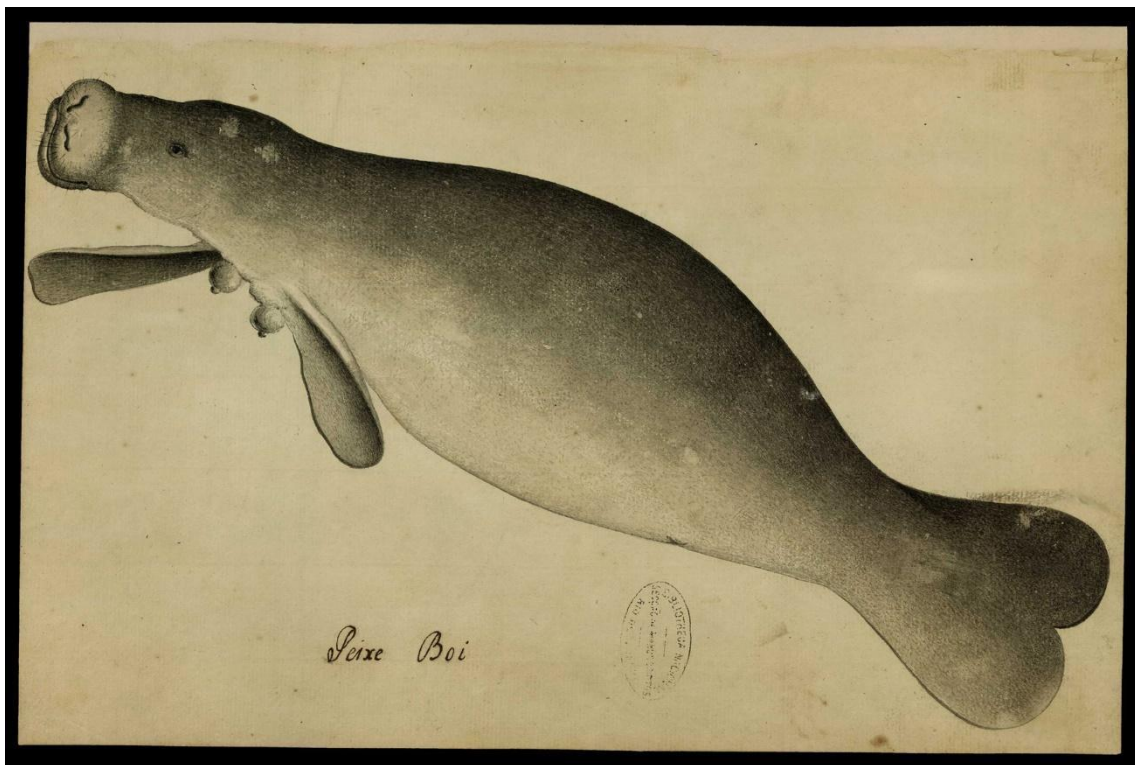




# **Extraction Amazonian Manatees (*Trichechus inunguis*), 1533-1898**

Supporting Documentation

Nina Vieira, Cristina Brito & John Nicholls



***Manatee, in Portuguese Peixe-Boi. Viagem Filosofica of Alexandre Rodrigues Ferreira to Brazil. National Library of Brazil (21A,1,004 nº011–Manuscritos).***

# Summary

<b>Dataset Title:</b>	Extraction Amazonian Manatees ( <i>Trichechus inunguis</i> ), 1533-1898	
<b>Case Study:</b>	Extraction Amazonian Manatees ( <i>Trichechus inunguis</i> ), 1533-1898	
<b>Marine Region:</b>	Amazon River ( <a href="http://marineregions.org/mrgid/18027">http://marineregions.org/mrgid/18027</a> ); Amazonas Estuary & Coastal Drainages ( <a href="https://marineregions.org/gazetteer.php?p=details&amp;id=63656">https://marineregions.org/gazetteer.php?p=details&amp;id=63656</a> )	
<b>Subject:</b>	Amazonian manatee extractions 1533-1898	
<b>Author(s):</b>	Nina Vieira and Cristina Brito	John Nicholls
	4-Oceans Project	4-Oceans Project
	CHAM-Centre for the Humanities	Trinity Centre for Environmental Humanities
	NOVA University of Lisbon	Trinity College Dublin
	Portugal	Ireland
<b>Data Provider(s):</b>	Cristina Brito and Nina Vieira	
	4-Oceans Project	
	CHAM-Centre for the Humanities	
	NOVA University of Lisbon	
	Portugal	
<b>Extent:</b>	151 records	
<b>Keywords:</b>	Marine mammals, marine environmental history, early modern, Atlantic	

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## Overview

This document provides the supporting documentation for the manuscript **Historical population trends of Manatees (*Trichechus inunguis*) in the Amazon basin as determined by systematic cross analysis of documentary sources (16<sup>th</sup>-19<sup>th</sup> centuries)** authored by Cristina Brito, Catarina Garcia, John Nicholls, Jaime Silva and Nina Vieira.

## Methods, Sources and Chronology

Manatees – both the West Indian (*Trichechus manatus*) and the Amazonian (*T. inunguis*) species – are depicted in written and visual Iberian sources since the 16<sup>th</sup> century. The description, appropriation, use and consumption of marine and aquatic mammals were at the core of the European dominion strategies of the Americas (Vieira et al., 2020; Brito, 2023). In the paper **Historical population trends of Manatees (*Trichechus inunguis*) in the Amazon basin as determined by systematic cross analysis of documentary sources (16<sup>th</sup>-19<sup>th</sup> centuries) (Brito et al., 2023)** the goal is to estimate the number and quantity of animals captured or extracted from their original, natural ecosystem, and to provide historical and cultural contextualisations of the exploitation.

Raw data was obtained from three established studies (Antunes et al., 2016; Hulsman, 2009; Domning, 1982), and from sixteen historical sources, ranging from the 16<sup>th</sup> to 19<sup>th</sup> centuries. The latter included correspondence, descriptions of the natural environment, and economic and scientific reports, namely, José de Anchieta (1900 [1560]), Willem Alberts (1607 in Hulsman, 2009), Moreno (1812 [1614]), António Vieira (1658), Nicholas de Combe (1670-1671 in Hulsman, 2009), Alexandre Rodrigues Ferreira (1786), Herculano Ferreira Pena (1854), Angelo Thomas do Amaral (1858), Francisco José Furtado (1858), Manoel Clementino da Cunha (1861; 1862), Adolfo de Barros Cavalcanti de Albuquerque Lacerda (1864), Domingos Monteiro Peixoto (1873), Aristides Justo Marignier (1874), and José Lustosa da Cunha Paranaguá (1883; 1884). Several further documents from the digital library 'Projeto RESGATE' (<https://resgate.bn.br/>) were also analysed and included, namely from the collections 'Rio Negro', 'Pará' and 'Geral Brasil'.

These studies and sources refer primarily to Brazil, with a clear focus on extractions across the Amazon River from the hinterland to the shore and, for almost the totality of cases, we are confident information refers to the Amazonian manatee. The exact number of animals hunted and sold is not present in the sources. Data varies in terms of its levels of description and of units used to quantify amounts and products. Meat (dry, salted or fresh) is given in 'arrobas' or in metric kilograms; fat and butter (the so-called 'mixira') were packaged in barrels, jars and cans (all equivalent in terms of their volume). Occasionally, hides were also accounted for, given they

were a product to be exported, but they are not included for the purpose of this study. In various instances, data is available to provide information on the geographic location of captures.

To convert the given amounts of products of manatees into numbers of hunted manatees, we followed the methodology used by Domning (1982) and cross-checked it with other studies (e.g. Whitehead, 1978) and the available historical sources, particularly Ferreira (1786).

## Conversion factors

One ‘arroba’ (a Portuguese old measure of weight) of meat is equivalent to 15 Kg; based on the above-mentioned references, one jar (‘pote’) corresponds to c. 20-30 Kg, and we apply an average value of 25 Kg; one can (‘lata’) corresponds to 22 Kg. We use a conversion rate of 76 Kg:176 Kg of transformed product corresponding to one hunted manatee. Ferreira (1786) states that for the years 1785-1786 a total of 1500 manatees were hunted and provides the number and measure of products obtained from them. Domning (1982) states minimum and maximum values for the mass (in Kg) per animal, which we also use to provide an interval of confidence (or error). Based on these conversion rates, we obtained minimum and maximum values for extracted manatees for the region and for the period in question. We obtained a total of 52 annual entries for the period between 1533 and 1898. By using a traffic light code system for the level of certainty of obtained data (see Traffic Light Codes section), we excluded all ‘red’ entries that corresponded to non-reliable or non-verifiable estimated quantitative information.

**Table 1: Conversion Factors**

Given value	Converted value	Notes
1 arroba	15 Kg	Arroba could be of dry, fresh or salted meat.
1 libra	0.454 Kg	
1 pote	25 Kg	According to Domning (1982), one pote is between 20 and 30 Kg. The average is taken. Pote can include butter or mixira or lard.
1 lata	22 Kg	A mean value for one lata according to Veríssimo in 1895; Domning (1982) provides the mean as between 18 and 25 Kg; Lata is the equivalent to the pote in its content.
1 manatee	76-176 Kg	Domning (1982) provides a minimum and maximum Kg weight per manatee.
1 leather	20.34 Kg	Antunes et al. (2016) provides this estimate in supplementary material.

# Data Fields

The Metadata system underpinning the database is based on Darwin Core Biodiversity Information Standards (<https://dwc.tdwg.org/>) which provides static formulations of all data fields as outlined in the Data Fields section of this document.

Further fields that develop the insight and awareness of the dataset are provided to expand the data and assist in informing the “Historical population trends of Manatees” (Brito et al., 2023) paper. These fields are recorded alongside the DarwinCore fields in the table below.

Field headers are described and typical examples are shown in brackets after each description.

Field Name	Field Name
OccurrenceID	DwC: Unique record identifier (CHAM-4Oceans-ManBriVieNic-1)
basisOfRecord	DwC: Basis of data observation or reference (HumanObservation)
institutionCode	DwC: Abbreviation of institution conducting research - Centre for the Humanities, NOVA University (CHAM)
collectionCode	DwC: Name of project or research team (4Oceans)
catalogNumber	DwC: Unique identifier of the dataset (ManBriVieNic)
occurrenceStatus	DwC: Status of the observed animal when recorded (present)
datasetName	DwC: Identifying name of the dataset (Extraction Amazonian Manatee 1533-1898)
modified	DwC: Date the data was last modified (20230701)
recordedBy	DwC: Name of researcher who collected the data (Nina Vieira)
eventDate	DwC: Date of the recorded capture, landing or processing of the animal (1533)
locality	DwC: Regional (country) name of the location of the event (Brazil)
location	DwC: Specific location of the event

	(Espírito Santo)
locationAccordingTo	DwC: Name of provider of coordinate values - found in the Marine Regions Gazetteer (MRGID)
decimalLatitude	DwC: coordinate value (-17.753470)
decimalLongitude	DwC: coordinate value (-39.185438)
scientificName	DwC: Scientific name of the species encountered (Trichechus manatus)
vernacularName	DwC: English common name for the species encountered (West Indian Manatee)
scientificNameID	DwC: Marine species ID provided by WoRMS (urn:lsid:marinespecies.org:taxname:159509)
organismQuantity	DwC: Given value of quantity of organisms (2)
organismQuantityType	DwC: Unit of given organismQuantity (individuals)
conversionFactor	Value of the given organismQuantityType in Kg (100 kg)
kgObtained	Calculated value of converted mass in kg derived from organismQuantity (100)
minConversionFactor	Minimum value in kg of a manatee (76)
maxConversionFactor	Maximum value in kg of a manatee (176)
minNumberOfManatees	Minimum number of manatees calculated or given (2)
maxNumberOfManatees	Maximum number of manatees calculated or given (2)
aveNumberOfManatees	Average number of manatees calculated (2)
individualCount	DwC: Number of individual animals recorded (2)

biomassInKG	DwC: Calculated biomass of animals in kg (100)
source	DwC: Primary source of values supplied (Anchieta 1900 (1560))
reference	DwC: References, further sources or links to data sources (Brito, B. G. de (1736). Historia Tragico Maritima... Volume II. Lisboa Occidental: Na Officina da Congregaçã do Oratorio)
dataGeneralizations	DwC: Any further information that informs the dataset and data (The author refers to these encompassing a total of 1500 manatees captured), plus the complete reference of the source or study

## Traffic light codes

Traffic light codes	Description
Green	Good quality or real data extracted directly from reliable sources
Orange	Some level of uncertainty (specified in the dataGeneralizations) or various elements calculated rather than reported from sources
Red	One of the following: poor quality, high degree of uncertainty, estimate based only on calculation

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