# *Lontra longicaudis* - (Olfers, 1818)

ANIMALIA - CHORDATA - MAMMALIA - CARNIVORA - MUSTELIDAE - *Lontra* - *longicaudis*

**Common Names:** Neotropical Otter (English), Gato de Agua (Spanish; Castilian), La Plata Otter (English), Lobito de Río (Spanish; Castilian), Lobito del Plata (Spanish; Castilian), Long-tailed Otter (English), Loutre d'Amérique Du Sud (French), Loutre à longue queue (French), Neotropical River Otter (English), Nutria De Agua (Spanish; Castilian), Perro De Agua (Spanish; Castilian), South American River Otter (English), Taira (Spanish; Castilian)

**Synonyms:** *Lutra longicaudis* ssp. *longicaudis* Olfers, 1818

**Taxonomic Notes:**

The taxonomy of the genus has been debated, but recent work supports the use of the name *Lontra* rather than *Lutra* for New World river otters (van Zyll de Jong 1982, Larivière and Walton 1998, Wozencraft 1993, Koepfli and Wayne 1998). Three proposed subspecies are suggested by their present disjunct distribution: *L. longicaudis annectens*, restricted to México, Central America and north-western South America; *L. l. enudris,* distributed across the Amazon region, from eastern Venezuela, Colombia, Ecuador and Peru to north-western Bolivia and northern Brazil; and *L. l. longicaudis,* southern part of its distribution in South America (Larivière 1999, Trinca *et al.* 2012, Hernández-Romero *et al.* 2018).

| Red List Status |
| --- |
| NT, A3c (IUCN version 3.1) |

## Red List Assessment

## Assessment Information

**Date of Assessment:** 24/01/2020

**Reviewed:** 10/03/2020

**Assessor(s):** Rheingantz, M.L., Rosas-Ribeiro, P.F.; Gallo-Reynoso, J.P.; Fonseca da Silva, V.C.; Wallace, R., Utreras, V. Hernández-Romero, P.C.

**Reviewer(s):** Hussain, S.A., Duplaix, N., Duckworth, W.

**Contributor(s):** Livia Rodrigues, Maria Camila Latorre-Cardenas, Victor Manuel Santiago-Plata

**Facilitators/Compilers:** NA

## Assessment Rationale

The recent increase in available information on the Neotropical Otter reveals that the species is widespread throughout the Neotropics and some adjacent areas. The species occurs in all regions with water bodies with availability of food resources, such as rivers, streams, lagoons, ponds and in coastal areas close to fresh water, with an altitudinal range between 0 to more than 4000 m a.s.l. The species is negatively affected by human presence and environmental quality. There are local conflicts due to retaliation by fishermen and fish farmers. The species is also affected by mining activities, pollution, cattle ranching, urban expansion, and the hydroelectric network, which have been increasing throughout the species' range since the last 27 years and can lead to local extinctions. While critical data on aspects of its biology, demography and behavior are still lacking for many areas, the effects of a large variety of anthropogenic threats such as pollution, gold and copper mining and habitat loss have not been rigorously assessed and are increasing across Central and South America. Although some populations can occur in disturbed environments, there is little information about the long-term viability and sustenance of such populations. Physiological

stress has been reported in individuals inhabiting areas with high human activity and density, factors that have been negatively correlated with the species presence. As a semi-aquatic species, the Neotropical Otter is associated with well-drained plains and coastal habitats which overlap with the growing human population and its increasing resource demands. This raises negative environmental impacts and potential human-otter conflicts. Despite being widely distributed in Latin America this does not imply that the species is free of population reductions and local extinction risks. In several countries (Mexico, Venezuela, Colombia, Belize, Ecuador), it has been identified as threatened in national and regional Red Lists, indicating its declining trend. Even in Brazil, where Neotropical Otter was recently assessed and nationally classified as LC, the species is identified as threatened in some states and regions, such as the Atlantic Forest biome and has a national decreasing population trend.
The paucity of robust biological and demographical data on this species across its large and diverse range hampers consideration of appropriate Red List category, and this assessment warrants review as knowledge grows of the species tolerance to various factors.
Considering the ongoing threats to the species, it is suspected that in the next 27 years or 3 generations (based on Pacifici et al. 2013) there will be a reduction of ≥ 20% in the global population size of *Lontra longicaudis*, due to habitat loss and degradation. The species is therefore categorized as Near Threatened under the criteria A3c.

## Reasons for Change

**Reason(s) for Change in Red List Category from the Previous Assessment:** The species remains in the same conservation status.

# Distribution

## Geographic Range

The Neotropical Otter presents the broadest distribution among New World otters (Foster-Turley *et al.* 1990, Rheingantz *et al.* 2018), even though there are several areas where its presence is still uncertain. It occurs from north-western Mexico to Uruguay and across the northern part of Argentina to the Buenos Aires province. The species is widely distributed in southern Mexico, extending its range to the state of Morelos where its range is bifurcated until it reaches southern Tamaulipas on the side of the Gulf of Mexico, and to northern parts of Sonora and Chihuahua states, down to the South Pacific in Chiapas (Gallo-Reynoso 1997, Sánchez and Gallo-Reynoso 2007).
In central America, *Lontra longicaudis* is known to occur from the Pacific to the Caribbean regions of Costa Rica (Wainwright 2007), Guatemala (Quintana-Morales 2013) and Belize (Meerman and Clabaugh 2012), occurring in almost all countries. However, very little information is available from this portion of the species' range. In Ecuador, the Neotropical river otter presents a wide range, occupying various habitats from the coastal lowlands to the Amazonia (Utreras *et al.* 2011, Utreras *et al.* 2013). There are extreme records of presence at 3,885 m a.s.l. (Castro and Zapata Ríos 2001). Recently, Neotropical Otter was recorded in new localities, such as areas surrounding the Ecuadorian and Colombian Andes (Rodríguez-Mahecha *et al.* 2006). In Bolivia the species is found across the Bolivian lowlands below 2,000 m a.s.l. (except the Chaco dry forests). There are occasional records at higher

elevations on the humid eastern slopes of the Andes, reaching up to 3,200 m a.s.l. (Tarifa *et al.* 2010, Wallace *et al.* 2013).
In Brazil, *Lontra longicaudis* occurs in almost the entire territory, being absent only from a portion of the arid northeastern Brazil where river basins are fully located within Caatinga biome. Despite being absent from this more arid zone, the presence of the species was recently recorded in Caatinga, in intermittent stretches of river basins situated between the Caatinga and Atlantic Forest biomes, proving that the species can occur in semiarid conditions (Rosas-Ribeiro *et al.* 2017). The presence of *Lontra longicaudis* was also recently recorded in the coastal zone of the Atlantic Forest of northeastern Brazil (Astúa *et al.* 2010, Dantas and Donato 2011, Mendonça and Mendonça 2012, Souto 2012, Rosas-Ribeiro 2017), as well as in the eastern part of Amazonia, in Maranhão state (Mesquita and Meneses 2015). Although Neotropical Otters are predicted to occur in all those areas, there are gaps in the data for the Brazilian Amazon, Pantanal and Paraguay.

## Area of Occupancy (AOO)

**Estimated area of occupancy (AOO) - in km2:** NA
**Continuing decline in area of occupancy (AOO):** Decreasing
**Extreme fluctuations in area of occupancy (AOO):** NA

## Extent of Occurrence (EOO)

**Estimated extent of occurrence (EOO) - in km2:** NA
**Continuing decline in extent of occurrence (EOO):** NA
**Extreme fluctuations in extent of occurrence (EOO):** NA

## Locations Information

**Number of Locations:** > 1,000
**Continuing decline in number of locations:** Not assessed
**Extreme fluctuations in the number of locations:** No

## Very restricted AOO or number of locations (triggers VU D2)

**Very restricted in area of occupancy (AOO) and/or # of locations:** No

## Elevation / Depth / Depth Zones

**Elevation Lower Limit (in metres above sea level):** 0
**Elevation Upper Limit (in metres above sea level):** 4000
**Depth Lower Limit (in metres below sea level):** 14
**Depth Upper Limit (in metres below sea level):** 0
**Depth Zone:** Shallow photic zone (0-15 m)

## Map Status

| Map Status | How the map was created, including data sources/ methods used: | Please state reason for map not available: | Data Sensitive? | Justification | Geographic range this applies to: | Date restriction imposed: |
|---|---|---|---|---|---|---|
| Done | - | - | - | - | - | - |

## Biogeographic Realms

**Biogeographic Realm:** Neotropical and Nearctic

# Occurrence

## Countries of Occurrence

| Country | Presence | Origin | Formerly Bred | Seasonality |
|---|---|---|---|---|
| Argentina | Extant | Native | - | - |
| Belize | Extant | Native | - | - |
| Bolivia, Plurinational State of | Extant | Native | - | - |
| Brazil | Extant | Native | - | - |
| Colombia | Extant | Native | - | - |
| Costa Rica | Extant | Native | - | - |
| Ecuador | Extant | Native | - | - |
| El Salvador | Extant | Native | - | - |
| French Guiana | Extant | Native | - | - |
| Guatemala | Extant | Native | - | - |
| Guyana | Extant | Native | - | - |
| Honduras | Extant | Native | - | - |
| Mexico | Extant | Native | - | - |
| Nicaragua | Extant | Native | - | - |
| Panama | Extant | Native | - | - |
| Paraguay | Extant | Native | - | - |
| Peru | Extant | Native | - | - |
| Suriname | Extant | Native | - | - |
| Uruguay | Extant | Native | - | - |
| Venezuela, Bolivarian Republic of | Extant | Native | - | - |

## Population

Estimates of Neotropical Otter's population size and density have been obtained using different approaches at various times in different study areas. Most estimates are derived from visual censuses performed at distinct localities within the species' distribution and are highly variable when compared to each other. For example, a density estimate of 0.21 otters

per linear km of river (km) was reported for southern Mexico (Orozco-Meyer 1998), whereas in Argentina it was reported to be 0.06-0.47 individuals/km (Gil-Carbó 2003). In Mexico and Guatemala, additional density estimates (0.34-4.4 otters/km) were obtained through calculating the number of faeces/km or the defecation rate (Gallo 1996, Nicolás *et al.*2012, Duque-Dávila *et al.* 2013, Quintana-Morales 2013). In Brazil, Quadros (2012) estimated the population size in a dam lake system based on the number of active dens, as previously proposed for *Lutra lutra* (Kruuk *et al.* 1989).

The use of such methods for population estimation was a widespread theme of discussion during the 1980s and 1990s. Several authors argued that these indirect approaches are not a reliable tool for calculating density and population size, as there is little or no direct correlation between otter abundance and the number of faeces or latrines, or between the number of females and the number of dens (Mason and Macdonald 1987, Kruuk *et al.* 1989, Gallant 2007). Numbers of dens and faeces may vary enormously due to the climate, environmental conditions and features of the waterbody and its margins (Kruuk and Conroy 1987, Mason and Macdonald 1987). It is important to highlight that reports of density and population sizes in Neotropical Otter are informative for local management purposes, and that density represents the only comparable datum.

Population size was recently estimated through non-invasive molecular approaches. Latorre-Cardenas *et al.* (under review) reported a density of 0.88 to 1.66 individuals per km in three river basins located in Mexico. Despite seeming that population sizes are good, the effective population size ($N_e$) per basin was considerably lower than those suggested that a population should have in order to maintain the genetic variation in the short-term. Ortega *et al.* (2012) reported a population size of 154 individuals in a watershed of Mexico. In a similar approach, by using faecal DNA analyses, Trinca *et al.* (2013) estimated linear density and population size of an otter population from an Atlantic Forest area in southern Brazil. They reported one otter per linear km and estimated a population size of 31 individuals during two years of sampling. Additionally, it was possible to estimate relatedness between individuals in the population, and to recover the population pedigree, as well as to gain insights into spatial organization patterns. According to their results, male otters tend to disperse larger distances than females, and relatedness among otters in the same watercourse seems to be higher that among otters from distinct streams, especially in cases of mother-daughter dyads, corroborating the hypothesis of female philopatry.

Population relative abundance was determined in a stream of northwestern México using camera traps, resulting in a 2.2 otters/km in a portion of 5 km of lineal survey of a river, with as many as 11 different otters using different latrines in the surveyed area (Gallo-Reynoso *et al.* submitted), The use of this methodology reveals population structure in the area (i.e. number of adult males, adult females, females with cubs, and juveniles).

## Population Information

**Current Population Trend:** Decreasing
**Number of mature individuals (=population size):** NA
**Extreme fluctuations? (in # of mature individuals):** NA

| Severely fragmented? | Justification |
|---|---|
| No | - |

**Continuing decline in mature individuals?** Decreasing
**Continuing decline % in mature individuals within 1 generation or 3 years, whichever is longer (up to max. of 100 years in the future):** NA

**Continuing decline % in mature individuals within 2 generations or 5 years, whichever is longer (up to max. of 100 years in the future):** NA
**Continuing decline % in mature individuals within 3 generations or 10 years, whichever is longer (up to max. of 100 years in the future):** NA
**Extreme fluctuations in the number of subpopulations:** NA
**Continuing decline in number of subpopulations:** NA
**All individuals in one subpopulation:** No
**Number of mature individuals in largest subpopulation:** NA
**Number of Subpopulations:** three

## Population Reduction - Past

**Percent Change in past:** NA
**Past Population Reduction Basis:** NA
**Causes of past reduction reversible?** No.
**Causes of past reduction understood?** Yes.
**Causes of past reduction ceased?** No.

## Population Reduction - Future

| Percent Change in future | Reduction or Increase | Qualifier | Justification |
|---|---|---|---|
| 20% | Reduction | Suspected | - |

| Basis? |
|---|
| c) a decline in area of occupancy, extent of occurrence and/or quality of habitat |

## Population Reduction - Ongoing

**Both: Percent Change over any 10 year or 3 generation period, whichever is longer, and must include both past and future, future can't go beyond 100 years:** NA
**Both Population Reduction Basis:** NA
**Causes of both (past and future) reduction reversible?** No.
**Causes of both (past and future) reduction understood?** No.
**Causes of both (past and future) reduction ceased?** No.

## Quantitative Analysis

**Probability of extinction in the wild within 3 generations or 10 years, whichever is longer, maximum 100 years:** NA
**Probability of extinction in the wild within 5 generations or 20 years, whichever is longer, maximum 100 years:** NA
**Probability of extinction in the wild within 100 years:** NA

# Habitats and Ecology

Neotropical Otter is found in aquatic environments such as rivers, streams, lakes, lagoons, estuaries, mangroves, marshes and coastal shorelines (Rheingantz and Trinca 2015, Rheingantz *et al.* 2017a). This adaptable otter occurs in a wide variety of habitats from rocky shorelines to deciduous and evergreen forests, warm and cold climate rainforests, and coastal savanna swamps, rivers and mountain lakes from sea level up to 4000 m (Larivière 1999, Castro and Zapata Ríos, 2001, Rheingantz *et al.* 2014). It has been reported using coastal habitats and islands in Brazil (Carvalho-Júnior *et al.* 2006), as well as intermittent rivers in seasonally dry tropical forests of the Brazilian northeast region (Rosas-Ribeiro *et al.* 2017).

The otter has a long, dark brown, heavily built body with fully webbed feet. The species is flexible in its activity behavior, being more diurnal in the Pantanal and more nocturnal in the Atlantic Forest, perhaps due to more intense human activity in the latter (Rheingantz *et al.* 2016) and mainly nocturnal in Mexico, avoiding being exposed to higher air and water

temperature. This also might explain their preference for shadowed areas in their river habitat where lower water and air temperatures are found (Gallo-Reynoso *et al.* 2019).
The Neotropical Otter is considered a solitary species, although pairs are observed during reproductive periods, and small groups of females and their cubs also occur (Rodrigues *et al.* 2013). Despite its high dependence on water, the species spends a considerable amount of time on land, especially in activities such as scent marking, reproduction and parental care (Rodrigues *et al.* 2013). Breeding occurs mostly during the dry or low water season but may occur throughout the year in some places (Parera 1996). Litter size varies from one to five cubs (Larivière 1999), with two or three on average (Parera 1996).
Otters are opportunistic predators that mainly prey on fish and crustaceans (Gallo-Reynoso 1997, Pardini 1998, Utreras *et al.* 2002, Rheingantz *et al.* 2017b), but also opportunistically consume amphibians, mammals, birds, and other prey (Rheingantz *et al.* 2017b). As an otter with a wide distribution range, *L. longicaudis* has a varied diet (Rheingantz *et al.* 2017b).
Detailed data on population size and densities for the species are scarce and limited to small areas but suggest that Neotropical Otter populations are decreasing (Trujillo and Arcila 2006, Rheingantz and Trinca 2015). Recently, efforts by researchers have generated a more complete database on the species status at the continental level that allowed the IUCN Red List status up listing from Data Deficient to Near Threatened (Rheingantz and Trinca 2015).

## IUCN Habitats Classification Scheme

| Habitat | Season | Suitability | Major Importance? |
|---|---|---|---|
| 5.1. Wetlands (inland) -> Wetlands (inland) - Permanent Rivers/ Streams/Creeks (includes waterfalls) | Resident | Suitable | Yes |
| 5.2. Wetlands (inland) -> Wetlands (inland) - Seasonal/ Intermittent/Irregular Rivers/Streams/Creeks | Resident | Marginal | - |
| 5.3. Wetlands (inland) -> Wetlands (inland) - Shrub Dominated Wetlands | Resident | Suitable | Yes |
| 5.5. Wetlands (inland) -> Wetlands (inland) - Permanent Freshwater Lakes (over 8ha) | Resident | Suitable | Yes |
| 5.6. Wetlands (inland) -> Wetlands (inland) - Seasonal/Intermittent Freshwater Lakes (over 8ha) | - | Marginal | - |
| 5.7. Wetlands (inland) -> Wetlands (inland) - Permanent Freshwater Marshes/Pools (under 8ha) | Resident | Suitable | Yes |
| 5.8. Wetlands (inland) -> Wetlands (inland) - Seasonal/Intermittent Freshwater Marshes/Pools (under 8ha) | Resident | Marginal | - |
| 5.12. Wetlands (inland) -> Wetlands (inland) - Geothermal Wetlands | - | Unknown | - |
| 5.13. Wetlands (inland) -> Wetlands (inland) - Permanent Inland Deltas | - | Unknown | - |
| 5.14. Wetlands (inland) -> Wetlands (inland) - Permanent Saline, Brackish or Alkaline Lakes | Resident | Marginal | - |
| 5.15. Wetlands (inland) -> Wetlands (inland) - Seasonal/ Intermittent Saline, Brackish or Alkaline Lakes and Flats | - | Unknown | - |
| 5.16. Wetlands (inland) -> Wetlands (inland) - Permanent Saline, Brackish or Alkaline Marshes/Pools | Resident | Marginal | - |
| 5.17. Wetlands (inland) -> Wetlands (inland) - Seasonal/Intermittent Saline, Brackish or Alkaline Marshes/Pools | - | Unknown | - |

| | | | |
|---|---|---|---|
| 9.10. Marine Neritic -> Marine Neritic - Estuaries | Resident | Suitable | Yes |
| 12.5. Marine Intertidal -> Marine Intertidal - Salt Marshes (Emergent Grasses) | Resident | Suitable | Yes |
| 13.2. Marine Coastal/Supratidal -> Marine Coastal/supratidal - Coastal Caves/Karst | - | Unknown | - |
| 13.4. Marine Coastal/Supratidal -> Marine Coastal/Supratidal - Coastal Brackish/Saline Lagoons/Marine Lakes | Resident | Suitable | No |
| 13.5. Marine Coastal/Supratidal -> Marine Coastal/Supratidal - Coastal Freshwater Lakes | Resident | Suitable | Yes |
| 15.1. Artificial/Aquatic & Marine -> Artificial/Aquatic - Water Storage Areas (over 8ha) | Resident | Suitable | Yes |
| 15.2. Artificial/Aquatic & Marine -> Artificial/Aquatic - Ponds (below 8ha) | Resident | Suitable | Yes |
| 15.3. Artificial/Aquatic & Marine -> Artificial/Aquatic - Aquaculture Ponds | Passage | Suitable | Yes |
| 15.4. Artificial/Aquatic & Marine -> Artificial/Aquatic - Salt Exploitation Sites | - | Unknown | - |
| 15.5. Artificial/Aquatic & Marine -> Artificial/Aquatic - Excavations (open) | - | Unknown | - |
| 15.6. Artificial/Aquatic & Marine -> Artificial/Aquatic - Wastewater Treatment Areas | - | Unknown | - |
| 15.7. Artificial/Aquatic & Marine -> Artificial/Aquatic - Irrigated Land (includes irrigation channels) | - | Unknown | No |
| 15.8. Artificial/Aquatic & Marine -> Artificial/Aquatic - Seasonally Flooded Agricultural Land | - | Unknown | - |
| 15.9. Artificial/Aquatic & Marine -> Artificial/Aquatic - Canals and Drainage Channels, Ditches | Resident | Suitable | Yes |

## Continuing Decline in Habitat

**Continuing decline in area, extent and/or quality of habitat?** Yes, continuing decline in quality of habitat.

## Life History

| Generation Length | Justification | Data Quality |
|---|---|---|
| 9.43 | Based on Pacifici et al 2013 | good |

## Movement Patterns

**Movement Patterns:** Not a Migrant
**Congregatory:** NA

## Systems

**System:** Terrestrial, Freshwater (=Inland waters), Marine (=intertidal)

# Use and Trade

## General Use and Trade Information

**Species not utilized:** False
**No use/trade information for this species:** False

*Lontra longicaudis* was severely hunted until the 1970s for the international fur market. It is estimated that, from the port of Iquitos, Peru, alone, 148,930 Neotropical Otter pelts were exported between 1946 and 1973 (Brack Egg 1978). Another report pointed out that 23,760 skins of this species were exported from Leticia port on the Amazon, Bogota and Barranquilla in Colombia before 1973 (Donadio 1978). Between 1975 and 1985, 877 Neotropical Otter skins were exported from Argentina, 308 from Mexico, 639 from Honduras, 724 from Panama, 2,814 from Peru, and an astonishing number of 67,830 skins were exported from Paraguay (Broad 1987). In central-western Brazilian Amazon it is estimated that 362,335 Neotropical Otters were hunted for their pelts between 1904 and 1969 (Antunes *et al.* 2016). These are probably underestimates, since official export numbers may be less than 50% of the actual trade (Donadio 1978). Despite absence of official numbers, many Neotropical Otter skins were traded from the Ecuadorian Amazonia together with giant otter skins, jaguars, ocelots and black caimans' skins (Utreras and Jorgenson 2003). It is unclear whether or not this heavy demand for fur in the recent past led to local population extinctions (Brack Egg 1978, Donadio 1978, Lariviere 1999). Oral history and data from historical documents indicate that Neotropical Otter populations have persisted at low densities at local and regional scales (Pimenta *et al.* 2018).
After the Washington Convention in 1973, the Neotropical Otter was included on Appendix I of the endangered species list of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Legal hunting of this species has therefore been restricted since 1975. Cubs may be taken as pets locally but appear not to enter the commercial trade (Duplaix 2002).

| Subsistence: | Rational e: | Local Commercial: | Further detail including information on economic value if available: |
|---|---|---|---|
| Yes | - | - | - |

**National Commercial Value:** No
**International Commercial Value:** No

| End Use | Subsistence | National | International | Other (please specify) |
|---|---|---|---|---|
| 10. Wearing apparel, accessories | true | - | - | - |

**Is there harvest from captive/cultivated sources of this species?** No
**Trend in level of total offtake from wild sources:** Increasing
**Trend in level of total offtake from domesticated sources:** Not domesticated
**Harvest Trend Comments:** NA

## Non- Consumptive Use

**Non-consumptive use of the species?** Yes.
**Explanation of non-consumptive use:** Tourism. The species may serve as a flagship species of wetland ecosystems, and also as a research subject to fill the gap in knowledge of its ecology, behaviour, and threats.

## Threats

The modification and fragmentation of natural habitats by human activities represents the main threat to the species, leading to population isolation and reduction. The species may occur in areas with some degree of human activity and habitat degradation (Rheingantz *et al.* 2014, Rheingantz and Trinca 2015, Rheingantz *et al.* 2017a), but its presence has been negatively correlated with human population density (Gomez *et al.* 2014; Rheingantz *et al.* 2014). There are stable populations in more pristine areas throughout the species' range,

but populations are decreasing in more heavily human-modified areas (Rheingantz and Trinca 2015).
The species was severely hunted until the 1970s for the international fur market, with hundreds of thousands of pelts exported from South American ports between 1945 and 1975 (Brack Egg 1978, Donadio 1978, Larivière 1999, Utreras and Jorgenson 2003). Despite the ban on the international pelt trade, Neotropical Otters are still hunted illegally and killed in conflicts with fishermen and fish farmers due to supposed fish depredation (Chehébar 1990, Barbieri *et al.* 2012). Although fishermen often have a negative perception of the otter, many of them report that actual damage from Neotropical Otter is small (Fonseca and Marmontel 2011, Barbieri *et al.* 2012, Castro *et al.* 2014, Hernández-Romero *et al.* 2018). Indeed, fishermen from northeastern Mexico showed a positive attitude toward the development of conservation actions for the otter (Mayagoitia-González *et al.* 2013). Otters can also entangled in fishing nets, as reported in southern Brazil (Quintela *et al.* 2011).
Bioaccumulation of toxins is known to harm the species (Josef *et al.* 2008, Ramos-Rosas *et al.* 2013). Mercury has been observed in fur and tissues samples of the species from the Pantanal (Fonseca *et al.* 2004), as well as high levels in otter spraints from southeastern Brazil (Josef *et al.* 2008). Studies show that Neotropical Otter may have high levels of other heavy metals such as lead and cadmium even in protected areas of Mexico (Ramos-Rosas *et al.* 2013), and other Persistent Organic Pollutants (Latorre-Cárdenas 2013). Industrial waste spills increase heavy metal levels in watercourses and have been associated with otter mortality in Mexico (Gallo-Reynoso 1997). In Ecuador, recent oil spills, increasing mining activities, intense use of agrochemicals and incorrect treatment of residual waters from the cities continue increasing the pollution of many hydrological systems where otters are present. Among other threats, we also find destructive fishing practices including the use of dynamite, electrocution and chemicals.
Roadkills of Neotropical Otters have been documented in the Guianas (Duplaix 2004), in southern and southeastern Brazil (Quintela *et al.* 2011), in Costa Rica and Mexico (V.M. Santiago-Plata pers. comm.).
Episodes of intense rainfall are becoming more frequent and when combined with deforestation along riverbanks, can cause landslides and flooding. According to Navarro and Quadros (2017) this can force otters to abandon an area, to which they return slowly.
Severe and long drought periods cause additional ecological stress to Neotropical Otters, which can be worrying if compounded with other normally tolerated environmental impacts, as pollution, cattle ranching and deforestation. This may have been the cause of the recent absence of Neotropical Otters in some river basins of Piauí state (Northeastern Brazil), where otters have not been seen in the last 50 years (Rosas-Ribeiro *et al.* 2017).
The effect of cattle ranching in the riparian habitat of some rivers in Mexico, as well in other countries, has devastated the biodiversity, causing significant riverbank erosion and turning the river ecosystem into an anoxic environment with reduced fish availability. There is also a concern that zoonotic diseases may be transmitted by cattle (J.P. Gallo-Reynoso pers. comm.).
The long-term impacts of dam construction on the species are poorly understood. Dams degrade the environment by changing flowing to standing water and by decreasing functional connectivity for both individuals and populations. Dams also change the local prey community, affecting otter diet in unknown ways (Quadros 2012).

The protozoans *Giardia* spp. and *Cryptosporidium* spp. were recently first reported for *L. longicaudis* from northern and northeastern Brazil (Borges *et al.* 2017a, b). Although clinical significance of these results is still unclear, they raise concerns about transmission to other aquatic mammals and even humans, since oocysts and cysts may remain infectious for long periods (LeChevallier *et al.* 1991). Mortality of otters due to diseases such as canine distemper (Hernández-Romero pers. obs.) is also a threat. Canine parvovirus infection was documented in an adult otter in southern Brazil, that died after treatment (Echenique *et al.* 2018). This problem is rapidly expanding to rural areas, where interactions with feral dogs and cats are more frequent. The intensity and impacts of diseases on local otter populations need to be further investigated.

The use of Neotropical Otter cubs as pets has been reported in several states of México (Gallo-Reynoso 1989), in the Brazilian Amazon (Marmontel *et al.* 2011, Fonseca da Silva pers. comm.), and in northern Costa Rica (Santiago-Plata pers. comm.), Colombia (Restrepo *et al.* 2018) and the Coast and Amazon region of Ecuador (Utreras *et al.* 2013). In some locations, medicinal use of otters has been documented, for example, in the Brazilian Amazon an infusion of Neotropical Otter skins is said to cure shortness of breath and asthma (Fonseca and Marmontel 2011).

The intensity and effect of these threats on otter populations is poorly known, but there is a perception that populations are declining across the range (Rheingantz and Trinca 2015). Considering the expansion of human activities in Latin America, this otter may be subjected to further population decline in the future. This is more acute in some regions, such as in northeastern Brazil, where otter populations are concentrated in well-drained lowland rivers, which are also prime locations for agriculture, ranching and other human activities (Rosas-Ribeiro 2017).

## Threats Classification Scheme

**No past, ongoing, or future threats exist to this species.** False
**The threats to this species are unknown.** False

| Threat | Timing | Timing score | Scope | Severity | Impact Score | Impact category |
|---|---|---|---|---|---|---|
| 1.1. Residential & commercial development -> Housing & urban areas | Ongoing | 3 | 3 | 3 | 9 | High |
| Stresses: | 1. Ecosystem stresses-> 1.1. Ecosystem conversion<br>1. Ecosystem stresses-> 1.2. Ecosystem degradation<br>1. Ecosystem stresses-> 1.3. Indirect ecosystem effects | | | | | |
| 1.1. Residential & commercial development -> Commercial and Industrial areas | Ongoing | 3 | 3 | 3 | 9 | High |
| Stresses: | 1. Ecosystem stresses-> 1.1. Ecosystem conversion<br>1. Ecosystem stresses-> 1.2. Ecosystem degradation<br>1. Ecosystem stresses-> 1.3. Indirect ecosystem effects | | | | | |
| 2.1.3. Agriculture & aquaculture -> Annual & perennial non-timber crops -> Agro-industry farming | Ongoing | 3 | 2 | 2 | 7 | Medium |
| Stresses: | 1. Ecosystem stresses-> 1.1. Ecosystem conversion<br>1. Ecosystem stresses-> 1.2. Ecosystem degradation<br>1. Ecosystem stresses-> 1.3. Indirect ecosystem effects | | | | | |
| 2.2.2. Agriculture & aquaculture -> Wood & pulp plantations -> Agro-industry plantations | Ongoing | 3 | 2 | 2 | 7 | Medium |

| | | | | | | |
|---|---|---|---|---|---|---|
| Stresses: | 1. Ecosystem stresses-> 1.1. Ecosystem conversion<br>1. Ecosystem stresses-> 1.2. Ecosystem degradation<br>1. Ecosystem stresses-> 1.3. Indirect ecosystem effects | | | | | |
| 2.3.3. Agriculture & aquaculture -> Livestock farming & ranching -> Agro-industry grazing, ranching or farming | Ongoing | 3 | 1 | 2 | 6 | Medium |
| Stresses: | 1. Ecosystem stresses-> 1.1. Ecosystem conversion<br>1. Ecosystem stresses-> 1.2. Ecosystem degradation<br>1. Ecosystem stresses-> 1.3. Indirect ecosystem effects | | | | | |
| 3.2. Energy production & mining -> Mining & quarrying | Ongoing | 3 | 2 | 2 | 7 | Medium |
| Stresses: | 1. Ecosystem stresses-> 1.1. Ecosystem conversion<br>1. Ecosystem stresses-> 1.2. Ecosystem degradation<br>1. Ecosystem stresses-> 1.3. Indirect ecosystem effects | | | | | |
| 5.1.1. Biological resource use -> Hunting & trapping terrestrial animals -> Intentional use (species is the target) | Ongoing | 3 | 1 | 2 | 6 | Medium |
| Stresses: | 1. Ecosystem stresses-> 1.2. Ecosystem degradation<br>2. Species stresses -> 2.1. Species mortality | | | | | |
| 5.1.3. Biological resource use -> Hunting & trapping terrestrial animals -> Persecution/control | Ongoing | 3 | 1 | 2 | 6 | Medium |
| Stresses: | 1. Ecosystem stresses-> 1.2. Ecosystem degradation<br>2. Species stresses -> 2.1. Species mortality<br>2. Species stresses -> 2.3. Indirect species effects -> 2.3.2. Competition | | | | | |
| 5.4.4. Biological resource use -> Fishing & harvesting aquatic resources -> Unintentional effects: (large scale) [harvest] | Ongoing | 3 | 2 | 2 | 7 | Medium |
| Stresses: | 1. Ecosystem stresses-> 1.2. Ecosystem degradation<br>2. Species stresses -> 2.1. Species mortality<br>2. Species stresses -> 2.3. Indirect species effects -> 2.3.2. Competition | | | | | |
| 7.2.11. Natural system modifications -> Dams & water management/use -> Dams (size unknown) | Ongoing | 3 | 3 | 2 | 8 | High |
| Stresses: | 1. Ecosystem stresses-> 1.1. Ecosystem conversion<br>1. Ecosystem stresses-> 1.2. Ecosystem degradation<br>1. Ecosystem stresses-> 1.3. Indirect ecosystem effects | | | | | |
| 8.2. Invasive and other problematic species, genes & diseases -> Problematic native species/diseases | Ongoing | 3 | 1 | 1 | 5 | Low |
| Stresses: | 2. Species stresses -> 2.1. Species mortality<br>2. Species stresses -> 2.3. Indirect species effects -> 2.3.2. Competition | | | | | |
| 9.1.1. Pollution -> Domestic & urban waste water -> Sewage | Ongoing | 3 | 2 | 3 | 8 | High |
| Stresses: | 1. Ecosystem stresses-> 1.2. Ecosystem degradation | | | | | |
| 9.1.3. Pollution -> Domestic & urban waste water -> Type Unknown/Unrecorded | Ongoing | 3 | 2 | 2 | 7 | Medium |
| Stresses: | 1. Ecosystem stresses-> 1.2. Ecosystem degradation | | | | | |
| 9.2.3. Pollution -> Industrial & military effluents -> Type Unknown/Unrecorded | Ongoing | 3 | 1 | 1 | 5 | Low |
| Stresses: | 1. Ecosystem stresses-> 1.2. Ecosystem degradation | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 9.3.2. Pollution -> Agricultural & forestry effluents -> Soil erosion, sedimentation | Ongoing | 3 | 2 | 2 | 7 | Low |
| Stresses: | 1. Ecosystem stresses-> 1.2. Ecosystem degradation | | | | | |

## Conservation

*Lontra longicaudis* is legally protected in Argentina, Bolivia, Brazil, Colombia, Costa Rica, Guatemala, Ecuador, El Salvador, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, French Guiana, Trinidad, Tobago, Uruguay, and Venezuela. It is classified as Vulnerable (VU) in the Brazilian Atlantic Forest biome (Rodrigues *et al.* 2013) and on the Minas Gerais state Red List (Anonymous 2010a), as well as in Ecuador (Utreras *et al.* 2013) and Colombia (Rodríguez-Mahecha *et al.* 2006). It is considered Near Threatened (NT) in Bolivia (Zambrana *et al.* 2009), São Paulo (Bressan *et al.* 2009) and Paraná (Anonymous 2010b) states in Brazil, and Susceptible in Uruguay (González and Martinez-Lanfranco 2010). The species is Endangered (EN) in Argentina (Ojeda *et al.* 2012), Mexico (Sánchez and Gallo-Reynoso 2007), and in Central American countries such as El Salvador (Anonymous 2009a), Guatemala (Anonymous 2009b) and Nicaragua (Rivera and Manzanarez 2013). In Honduras, Neotropical Otter is listed as a Species of Special Concern (Cerrato *et al.* 2002) and it is protected under Act No. 4 of 1981 in Belize (Anonymous 2000). It is considered Critically Endangered in Trinidad and Tobago (Anonymous 2013) and it is protected and regulated by the Law of Conservation of Wildlife No. 7317 in Costa Rica (Anonymous 2005).
The Global Otter Conservation Strategy for the species (Rheingantz *et al.* 2018) recommends priority actions that include:
1. Mitigation of impacts of human activities such as dams, cooper and gold mining, agriculture, cattle ranching along rivers, deforestation and overfishing, as well as regulating the release of domestic and toxic waste in riverine systems near critical populations of otters.
2. Implementing monitoring programs with standardized methods in protected areas and combining data from all range countries to compare regional status.
3. Developing of National otter conservation plans for those range countries that do not yet have them, and implementation of such plans in range countries that already have them. National conservation plans determine regional threats and design specific conservation actions at a country and regional level.
4. Enforcement of existing legal protection, the expansion of protected areas that consider otters requirements, and the adoption of policies that mitigate the impact of humans on riverine and coastal habitats.
5. Surveys in areas with little information, such in Suriname, Guyana, Paraguay and most countries of Central America. We recommend long-term research inside and outside protected areas throughout the species range, to understand how human activities affect Neotropical Otter. Knowledge on the geographic distribution of the species needs to be improved, especially in the border areas of its distribution such as Mexico, Argentina and northeastern Brazil. This will advance an understanding of which climatic and ecological factors influence the limitations on the species range as well as the role of corridors and geographical barriers.
6. Public awareness of the ecological role of otters in aquatic systems and the impact of otters on fisheries need attention, particularly in areas of conflict. Effective education programs help change the negative perception of otters by fishermen in coastal and riverine

habitats. Such programs already exist in Mexico, Colombia, French Guiana and Brazil, and need to be expanded throughout the species range. Training local people to work in the field and community involvement generates empathy for Neotropical Otter.
7. Development of strategies to prevent otter predation on fish farms and damage to fishnets. We recommend the adoption of fences in fish farms as used in Europe for *Lutra lutra*. A baseline evaluation of the economic impact of otters in fisheries and fish farms is also needed, and, at indigenous and community levels, the design and implementation of community agreements for responsible fishing.
8. Requirement of environmental impact studies for all hydroelectric projects and legal instruments to ensure compensatory measures for negative impacts on otters. Monitoring the impact of dams on Neotropical Otters before and after dam implementation is needed to assess changes in population dynamics and genetic structure.
9. Establishment of long-term Neotropical Otter conservation programs in Atlantic Forest coastal areas, Mexico, Brazilian Cerrado, Central America, Argentina and Amazon Basin.

## Conservation Actions In- Place

**Action Recovery Plan:** NA
**Systematic monitoring scheme:** NA
**Conservation sites identified:** NA

| Occur in at least one PA | Note |
|---|---|
| Yes | - |

**Percentage of population protected by PAs (0-100):** NA
**Area based regional management plan:** NA
**Invasive species control or prevention:** NA
**Harvest management plan:** NA
**Successfully reintroduced or introduced benignly:** NA
**Subject to ex-situ conservation:** NA
**Subject to recent education and awareness programmes:** NA

| Included in international legislation | Note |
|---|---|
| Yes | CITES Appendix I |

| Subject to any international management/trade controls | Note |
|---|---|
| Yes | CITES Appendix I |

## Important Conservation Actions Needed

| Conservation Actions | Note |
|---|---|
| 2.3. Land/water management -> Habitat & natural process restoration | - |
| 4.1. Education & awareness -> Formal education | - |
| 4.2. Education & awareness -> Training, monitoring capacitation | - |
| 4.3. Education & awareness -> Awareness & communications | - |
| 5.1.3. Law & policy -> Legislation -> Sub-national level | - |
| 5.4.2. Law & policy -> Compliance and enforcement -> National level | - |

| | |
|---|---|
| 5.4.3. Law & policy -> Compliance and enforcement -> Sub-national level | - |
| 6.1. Livelihood, economic & other incentives -> Linked enterprises & livelihood alternatives | - |

## Research Needed

| Research | Note |
|---|---|
| 1.1. Research -> Taxonomy | - |
| 1.2. Research -> Population structure, size, distribution & trends | - |
| 1.3. Research -> Life history & ecology | - |
| 1.5. Research -> Threats | - |
| 1.6. Research -> Actions | - |
| 2.1. Conservation Planning -> Species Action/Recovery Plan | - |
| 3.1. Monitoring -> Population trends | - |

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