

South America

Neotropical Otter

Lontra longicaudis



A species closely related to the North American river otter, the Neotropical otter is widely distributed across Latin America. Often found in areas inhabited by the Giant otter, the two species appear to coexist.

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Red List Status

The Neotropical otter is classified as Near Threatened in the IUCN Red List. It is projected to undergo a decline of 25% in the next 27 years, or three generations (Pacifiçi *et al.* 2013). CITES: Appendix I.

Distribution

The Neotropical otter is widely distributed throughout north, south and central South America and Mexico (Sánchez and Gallo-Reynoso 2007, Rheingantz and Trinca 2015). The species is present in almost the entire South American continent except for Chile. Across the known distribution, the Neotropical otter has high genetic diversity based on geographic factors (Trinca *et al.* 2012, Hernandez-Romero *et al.* 2018). Three subspecies are proposed by their present disjunct distribution: *L. longicaudis annectens*, restricted to Central America and northwestern South America; *L. l. enudris*, distributed across the Amazonian region, from eastern Venezuela, Colombia, Guianas, Suriname, Ecuador and Peru to northwestern Bolivia and northern Brazil; and *L. l. longicaudis*, present in the rest of the range in South America (Larivière 1999, Trinca *et al.* 2012, Hernandez-Romero *et al.* 2018).

Habitat and Ecology

The 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 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, from sea level up to 4000

m (Larivière 1999, 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 human activities (Rheingantz *et al.* 2016).

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). In spite of 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, González *et al.* 2004, Rheingantz *et al.* 2017a) but also 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

The Neotropical otter

The Neotropical otter has been a well-known species since pre-Hispanic times. Indigenous histories report a harmonious relationship between these otters and humans.

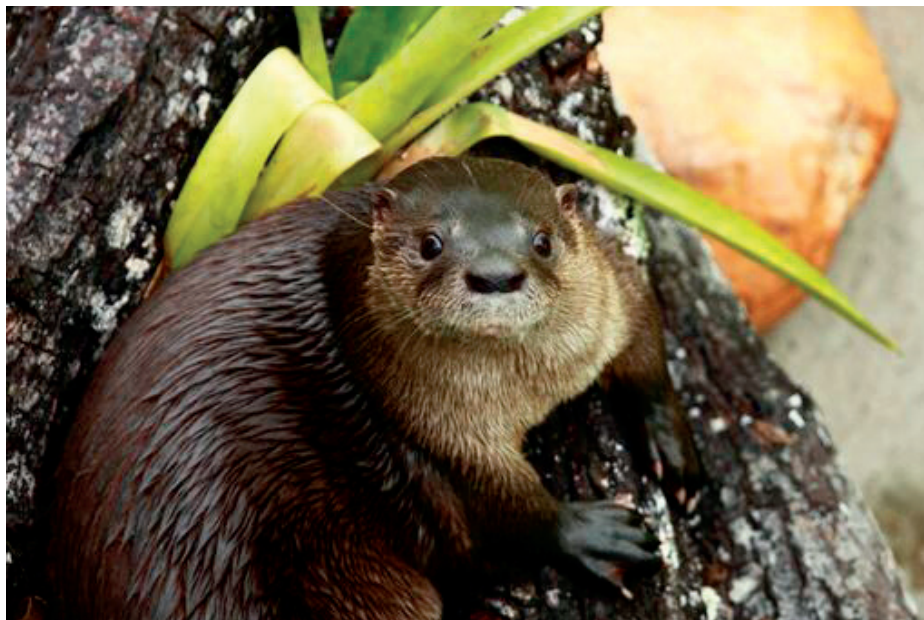
The VIII Aztec emperor 'Ahuitzotl' was named after the Neotropical otter in Nahuatl language.

Later on, otters were described to missionaries as a well-known species and the subject of several legends.

Nowadays there are many place names referring to otters in Spanish -- nutria, perro de agua, lobo de rio, lobito de rio, in Portuguese -- lontra, lontrinha, cachorro de agua -- in French -- loutre à longue queue, loutre d'Amérique du Sud -- and in indigenous languages (Gallo-Reynoso 2013).

Otters were kept as pets by indigenous people throughout their distribution range, and even today otters are sometimes kept as pets by fishermen and indigenous people.

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.





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 changed the IUCN Red List status from Data Deficient to Near Threatened (Rheingantz and Trinca 2015).

Threats

The modification and fragmentation of natural habitats by human activities represents the main threat to the species by creating isolated populations of otters. The species may occur in areas with some human activities and habitat degradation, but human density is negatively correlated to otter presence (Rheingantz *et al.* 2014, Rheingantz and Trinca 2015). 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, Antunes *et al.* 2016). Even this estimate is probably low, since official export numbers may be less than 50% of the actual trade (Donadio 1978). Despite this heavy demand for fur, biological and ecological characteristics

make Neotropical otters more resilient to exploitation than giant otters. Oral history and data from historical documents indicate that Neotropical otter populations have persisted at low densities in local and regional scales (Pimenta *et al.* 2018).

Neotropical otters are still illegally hunted and killed in conflicts with fishermen and fish hatcheries due to perceived 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 the Neotropical otter is small (Barbieri *et al.* 2012, Castro *et al.* 2014, Fonseca and Marmontel 2011). Indeed, fishermen from northeastern Mexico showed a positive attitude toward conservation actions for the otter (Mayagoitia-González *et al.* 2013). Otters also become entangled in fishing nets, as reported in southern Brazil (Quintela *et al.* 2011).

Exposure to and 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), and in otter scat in southeastern Brazil (Josef *et al.* 2008). Studies show that the Neotropical otter may be exposed to 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).

Roadkills of Neotropical otters have also been documented in the Guianas (Duplaix 2004), in southern and southeastern Brazil (Quintela *et al.* 2011), and in Costa Rica and Mexico (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 only slowly.

The effect of cattle ranching in the riparian habitat of some rivers in Mexico has devastated the biodiversity of some rivers, causing significant river bank erosion and turning the river ecosystem into an oxygen poor environment, thus reduced fish abundance. There is also a concern that zoonotic diseases may be transmitted by cattle to wildlife (J.P. Gallo-Reynoso pers. comm.).

The long-term impacts of dam construction on the species are poorly understood. Dams have the potential to 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). Despite this, the species has been recorded in hydroelectric reservoirs years after damming (Cabral *et al.* 2008, Róseo 2010).



Neotropical otters are held in a number of zoos in Latin America but are currently absent from zoos in the Northern Hemisphere.



The protozoans *Giardia spp.* and *Cryptosporidium spp.* were recently first reported for *L. longicaudis* from northern and northeastern Brazil. 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. The intensity and effect of the impact of diseases on local otter populations need to be further investigated.

Keeping Neotropical otter cubs as pets has been reported in México (Gallo-Reynoso 1989), in the Brazilian Amazon (Marmontel *et al.* 2011, Silva pers. comm.) in Venezuela (Gonzalez and Utrera 2004), and in north of Costa Rica (Santiago-Plata pers. comm.). In some locations, medicinal use of otters has been documented. In the Brazilian Amazon for example, an infusion of Neotropical otter skins has been said to cure shortness of breath and asthma (Fonseca and Marmontel 2011). In Costa Rica, among indigenous Bribri in the Talamanca Mountains range, when a family wants one of their children in the future to be a good fisherman, they bring an Awá (Shaman) to pass a piece of otter skin over the back of the pregnant mother (Borge and Castillo 1997).

The intensity and effect of these threats on otters is poorly understood, but there is a perception that populations are declining

across the species' range (Rheingantz and Trinca 2015). With expanding human activities in Latin America, Neotropical otter populations may further decline in the future. The threat is more acute in some regions, such as in Northeastern Brazil, where the otter populations are concentrated in lowland rivers which are prime locations for agriculture, ranching and other human activities (Rosas-Ribeiro 2017).

Threat Mitigation Measures

Policies need to be adopted to mitigate the impact of human modification and fragmentation of riverine and coastal habitats such as dams, gold mining, agriculture, deforestation and overfishing, as well as regulate the release of domestic and toxic waste in riverine systems near critical populations of otters.

Throughout their range, Neotropical otters are present in many protected areas, the centerpiece for the conservation of the species. Standardized monitoring programs should be implemented in protected areas and data collected from all range countries should be combined to compare regional status.

National otter conservation plans should be developed for range countries that do not yet have them and implemented in countries that do have them. National conservation plans can identify regional threats and design specific conservation actions at a country and regional level.



The enforcement of laws protecting otters is usually weak, even though the species is listed on Appendix I of CITES and declared illegal to kill in several countries. National legal protections must be more strongly enforced.

Surveys should be conducted in areas with little information in Suriname, Guyana, Paraguay and most countries of Central America. We recommend long-term research on human impacts on otters both inside and outside protected areas throughout the species range. The geographic distribution of the species needs to be better understood, especially in border areas of its distribution, such as Mexico, Argentina, and northeastern Brazil. This will advance an understanding of which climatic and ecological factors influence limitations on the species range as well as the role of corridors and geographical barriers.

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 fishermen of otters in coastal and riverine habitats. Such programs already exist in Mexico, Colombia, French Guiana and Brazil, and need to be expanded elsewhere in the species range. Training local people to work in the field and community involvement generates empathy for the animal.

Strategies should be developed to prevent otter predation on fish farms and damage to fishnets. We recommend the adoption of electric fences in fish farms as used in Europe for Eurasian otters. A baseline evaluation of the economic impact of otters in fisheries and fish farms is needed. At indigenous and community levels, community agreements for

responsible fishing need to be designed and implemented.

We recommend that environmental impact studies be required for all dam projects and legal instruments developed that ensure compensatory measures for negative impacts on otters. Monitoring the impact of dams on Neotropical otters before and after dam construction is needed to assess changes in population dynamics and genetic structure. We recommend the establishment of long-term Neotropical otter conservation programs in coastal areas of the Atlantic forest, Mexico, the Cerrado, Central America, Argentina, and the Amazon Basin.

Captive Populations

Neotropical otters are held in a number of zoos in Latin America but are currently absent from zoos elsewhere. In Mexico: Zoológico de Guadalajara, Acuario de Veracruz, Zoológico de la Ciudad de México, Acuario Michin-Jalisco, ZOOMAT-Chiapas, Zoológico de San Juan de Aragón. In Colombia: Parco Zoológico de Cali. In Brazil: Aquário de São Paulo, Fundação RioZoo – Zoológico do Rio de Janeiro, Museu Emilio Goeldi. In Ecuador: Zoológico Parque Histórico, Zoológico Yanacocha.

Site-specific Conservation Locations

The vast Amazon Basin represents the best opportunity for the conservation of the Neotropical otter. The dozen or so conservation mosaics made up of neighboring national, state and municipal protected areas, together with overlapping indigenous territories, are crucial as strongholds for the conservation of Amazonian wildlife, including the Neotropical otter.

Other priority areas for Neotropical otter protection are the headwaters of major rivers across its wide distribution range. Neotropical otter habitat is important in the headwater rivers of the highlands of Brazil, Mexico and Andes, where studies of fish farms can enable an assessment of otter interaction with these facilities. We recommend the protection of perennial tributaries of the Paraná and Amazon Rivers.

Protected Areas with suitable habitat, both those with and without otter populations, should be managed for otter, particularly in Northeastern Brazil, the Cerrado, Brazilian Amazon, Central America, and Mexico. The Gulf of México Basin includes many large rivers used for navigation and oil-related industries and heavily used for fishing. In the Pacific Basin, including the Gulf of California Basin, two or three rivers are used for port activities and transport of mineral, agricultural and industrial goods. These lower basins can dry out seasonally, trapping water in the upper basin tributaries, which then provide crucial habitat for otters.

In Mexico, the upper parts of the basins of the two oceanic slopes are areas with high anthropogenic pressure and high degree of disturbance and are important areas to otter conservation. There are several dams and lagoons in the interior of the country, where there is still adequate habitat for otters and are important to be conserved. There are few rivers on the Yucatán Peninsula, but marshes, wells and lagoons provide good otter habitat and deserve protection (Ortega-Padilla *et al.* In press).

Estuarine and coastal habitats and islands of southern, southeastern and northeastern Brazil and in Central America and Mexico are key marine habitats for Neotropical otters, both inside and outside protected areas.

In northeastern Brazil, otter populations are concentrated in coastal river basins partially or completely covered by Atlantic Forest. The northeastern Atlantic Forest is the least conserved portion of this biome, with high human populations, putting otters at risk. Here, the São Francisco River is the largest perennial river crossing the Caatinga biome and has been suggested as an important potential dispersal route connecting coastal river basins with those located north of the Caatinga (Rosas-Ribeiro, 2017).

In coastal areas and islands of the south, southeast and northeast of Brazil, Central America and Mexico, otters need conservation attention.

The Choco region, on western slopes of Colombia, Venezuela and Ecuador, presents an important opportunity to develop regional conservation actions in an ecosystem that is highly altered by human activities.

In Peru, Manu National Park is a case of special concern. Otter presence has been confirmed there in two southern Peruvian rivers, but lack clear species identification. If the species is the Neotropical otter, it would be an expansion of known distribution range of the species to the west and would deserve attention. Surveys to confirm distribution range

are needed in Mexico, Northeastern Brazil, Paraguay and Argentina, and in the highlands of Brazil, Mexico, central region of Venezuela and the Andes of Peru and Ecuador.

Success Stories

The large conservation landscapes of the Amazon Basin provide hope for the conservation of the immense biodiversity of the region. The Basin, with its many large and small rivers, represents a collective opportunity for national, state and municipal protected areas, together with large indigenous territories, to protect the Neotropical otter. Almost 50% of the Amazon Basin is already designated either as protected area or indigenous territory. These conservation mosaics are especially important for wide-ranging and naturally scarce species such as the Neotropical otter. Conservation efforts should continue to concentrate on securing and supporting these conservation strongholds.

In Southern Brazil, two long-term projects have focused not only in otter research, but also in riverine and coastal community involvement: Projeto *Lontra* and Instituto de Pesquisas Cananéia. These two programs have identified human-otter conflicts, otter bycatch, and use of otters as pets in their region. Through educational programs in elementary and high schools, the programs teach students about the

entire ecosystem, wildlife, environmental impacts, and ways to mitigate those impacts. They work together with wildlife managers, local leaders and public authorities to sensitize the riverine and coastal communities in environmental conservation.

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 elsewhere in the species range.



Neotropical Otter *Lontra longicaudis* Projects and Funding Opportunities

Region	Actions	Costs
All countries	Conduct national surveys to confirm the distribution range of the species every 5 years to evaluate possible range contraction or expansions	\$ 60,000/year per survey
All countries	Create a long-term program to evaluate the impacts of otters in fish farms and fisheries; stable isotopes and feeding ecology research to evaluate actual otter-human conflict	10 years Field trips and analyses \$10,000/year per area
All countries	Clarify phylogeography – gather 20 samples of each genetic group to confirm subspecies status	\$5 years Full-time position \$ 20,000/year salary Analyses and support \$ 100,000
All countries	Train Protected Areas rangers to conduct surveys for otter presence/absence	10 years One full-time position of a teacher/researcher to train rangers \$ 20,000/year per area
Central America	Create full-time researcher position to gather information and conduct surveys in areas lacking information	5 years \$ 12,000 annual salary Field work/year; \$ 20,000
Brazil, Colombia, Argentina and Mexico	Develop long-term population ecology research (genetics, radiotelemetry) at least in one area of each proposed subspecies	10 years \$ 50,000/year per area
Brazil, Colombia, Mexico	Create educational programs with riverine communities that coexist with otters, to portray the otter as wetland ambassador	\$ 30,000/year for 3 years Four projects in 4 countries
Highlands of Peruvian Andes and Mexico)	Conduct surveys to document presence of Neotropical otters in mountainous areas	\$ 500,000 \$ 50,000/year for 10 years

Neotropical Otter *Lontra longicaudis* Projects and Funding Opportunities

Region	Actions	Costs
Brazil	Implement before and after monitoring of otter population in areas of dam projects	\$ 30,000/year per study area
Brazilian Amazon	Investigate human-otter conflicts; feeding ecology and prey community	3 years At least 6 areas \$ 5,000 /year per area \$15,000 total per area
NE Brazil	Conduct surveys to document presence and absence of otters south of São Francisco River; population genetics surveys throughout Northeastern region and along São Francisco River Basin to investigate the limits of the subspecies <i>L. l. enudris</i> and <i>L. l. longicaudis</i> ; human-otter conflict research	One full time research position, two assistants, ten campaigns \$30,000/year for 5 years \$ 30,000 for genetic analyses
Otters in coastal areas and islands of Brazil	Conduct population monitoring; environmental education; studies on feeding ecology and habitat use	Six areas – 5 years \$ 10,000/year per area \$50,000 per area
Urban environments – Rio de Janeiro, Panambi and Florianópolis, Brazil	Conduct population monitoring	4 years \$ 20,000/year per area
Southern Brazil	Conduct population genetics survey and human-otter conflicts research	4 years \$ 20,000/year per area
Paraguay	Create full-time research position to study ecology of <i>Lontra longicaudis</i> and <i>Pteronura brasiliensis</i> ; surveys in areas with no information	4 years \$ 20,000 per area per year
Argentina	Create baseline for long-term monitoring program by rangers in Protected Parks	5 years One full time and two PhD positions One survey in each Protected Area/year \$ 40,000/year