

Pteronura brasiliensis

NOT EVALUATED NE	DATA DEFICIENT DD	LEAST CONCERN LC	NEAR THREATENED NT	VULNERABLE VU	<ENDANGERED> EN
CRITICALLY ENDANGERED CR	EXTINCT IN THE WILD EW	EXTINCT EX			

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Taxonomy [\[top\]](#)

Kingdom	Phylum	Class	Order	Family
ANIMALIA	CHORDATA	MAMMALIA	CARNIVORA	MUSTELIDAE

Scientific Name: *Pteronura brasiliensis*

Species Authority: (Gmelin, 1788)

Common Name(s):

English—Giant Otter, Giant Brazilian Otter

Spanish—Lobo del Río, Arirai, Lobito de Cola Ancha, Lobo de Río, Lobo de Río Grande, Lobo Gargantilla, Perro de Agua

French—Loutre géante du Brésil

Synonym(s): *Mustela brasilinensis* Gmelin, 1788
Pteronura sambachii Gray, 1837

Two subspecies have been described (Duplaix 1980): (1) *P. b. brasiliensis* (Gmelin, 1788) from Suriname, the Guianas, southern Venezuela, southern Colombia, eastern Ecuador, eastern Peru, Bolivia, Paraguay, and Brazil; (2) *P. b. paranensis* (Rengger, 1830) from the Paraguay and Parana rivers in Brazil, northern Argentina and Uruguay.

Taxonomic Notes:

However, this subspecific division was rejected by Carter and Rosas (1997) and described as being of “doubtful value” by Duplaix (1980). Wozencraft (2005) treated subspecies *paranensis* as a synonym of a different subspecies *P. b. paraguensis* (Schinz, 1821). Subsequent mitochondrial DNA and microsatellite analysis supports subdivision of the species into four evolutionary distinct units (ESUs). These comprise: (1) the Rio Madre de Dios with the Rio Madeira (2); the Pantanal (3) the Amazon with the Orinoco and Guianas drainages (4) The Itenez/Guapore basin (Garcia *et al.* 2007; Pickles *et al.* 2011, 2012).

Assessment Information [\[top\]](#)**Red List**

Category & Criteria: Endangered A3ce [ver 3.1](#)

Year Published:

2015

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Justification:

The status of Giant Otter is regularly monitored by its range countries. Of the 12 national assessments on the distribution and conservation status of the Giant Otter that were prepared, in two countries the species has been categorized in national Red Lists as Critically Endangered (Paraguay and Ecuador), in four countries as Endangered (Peru, Colombia, Venezuela, Bolivia), and as Vulnerable in Brazil; it is considered Extinct in Uruguay, and probably Extinct in Argentina. In the Guianas, the Giant Otter is also protected by law though this is rarely enforced. There was a strong consensus among workers on Giant Otter that it should be considered as Endangered on a continental level. The total global Giant Otter population size is low but, more critically, individual subpopulations are fragmented and most are small. Because of its conspicuous behaviour and social nature, this species is easy to extirpate and is therefore extremely vulnerable. It remains highly susceptible to hunting (though currently hunting of Giant Otters is not a common practice). The killing of individuals and entire groups continues in some areas where fishermen are active, including in protected areas. Moreover, the Giant Otter is intrinsically vulnerable to extinction: combined with low habitat resilience and the fact that only a quarter to a third of the total population reproduces, the species also shows late maturity, late breeding age, suspected low transient survival, and low cub survival - all are traits which limit Giant Otter recovery and re-colonization. Although widely distributed on a continental scale, overall they may occupy less than 5%, often less than 1% of a given watershed. This means that changes in this specific habitat, or impacts there-in, will have severe effects even if only a fraction of the overall area is affected. Rivers are roads into the forest, this is where people settle, where gold mining takes place, where there is competition for fish or overfishing, where “green” energy can be harvested, where climate change will have strong impacts, where contamination can be spread rapidly, and so on. This vital link to rivers and wetlands renders the Giant Otter much more susceptible than most other comparable large predators of the Amazon, such as the Jaguar.

In South America, only 13 years from now (about half the time-span considered for this assessment) there will be an increase of 44 million people, much more than the total population of Peru. Brazil has seen the highest deforestation rate in the world. There are estimates that the Amazon rainforest will be reduced by 40% in 2030. If just one or two of the Giant Otter’s strongholds is affected, this may be

enough to lead to heavy declines in overall population numbers. Further, once remote watersheds are now accessible so that Giant Otters can no longer retreat to ‘safe zones’.

Many emerging and/or growing threats pose serious problems for Giant Otters including contamination, overfishing and conflict with fishermen, and infrastructure such as roads and hydroelectric dams. With their preference for lowland wetlands, rivers, and lakes, their prime habitat overlaps completely with the demands of humans (gold mining, fishing, deforestation, mega infrastructure and energy developments, settlement, transport, tourism, etc.). The effects of climate change are already being felt, with Brazil recently suffering severe droughts. Large-scale deforestation in the Amazon could reduce basin-wide rainfall by 12% during the wet season and by 21% in the dry season by 2050 (Spracklen *et al.* 2012) with unknown impacts on (semi) aquatic species.

In summary, three Giant Otter generation lengths approximately represent a 25 year period. Accelerating habitat destruction and degradation throughout the Giant Otter's range represents the greatest threat to the species, and is estimated to potentially lead to a future reduction in population size of 50% or more over the next 25 years, through a decline in area of occupancy, extent of occurrence, and quality of habitat (subcriterion c), with pollutants (especially mercury and fossil fuels), pathogens (domestic animal diseases), and competitors (fishermen) (subcriterion e) potentially playing important roles. The species is confirmed to be Endangered.

History:

- 2008 – Endangered
- 2004 – Endangered
- 2000 – Endangered
- 1996 – Vulnerable

Geographic Range [\[top\]](#)

Range Description: *Pteronura brasiliensis* is endemic to South America and is distributed east of the Andes in the Orinoco, Amazonas, and Parana basins, and the hydrographic networks of the Guianas. The northern limit of its distribution range occurs in northern Venezuela, and the southern limit in Misiones, Argentina. The Giant Otter's range has become discontinuous and fragmented due to local extinctions; the Uruguayan and Argentine populations are extinct or nearly so (Gil pers. comm., Buschiazzi pers. comm.), and the species is reduced to a single, small subpopulation in Paraguay, occupying less than 2% of its former distributional range. It is also extinct to the east of the Tocantins and Parana basins in Brazil and only relict subpopulations persist in the upper Parana River above Itaipu lake. Important subpopulations are still found in parts of the Amazon, in the Pantanal region, and, possibly, in the Guianas.

Native:

Countries: Bolivia, Plurinational States of; Brazil; Colombia; Ecuador; French Guiana; Guyana; Paraguay; Peru; Suriname; Venezuela, Bolivarian Republic of

Range Map: [Click here to open the map viewer and explore range.](#)

Population [\[top\]](#)

There is no current total population estimate and current population trends are unknown: however, there is evidence that populations may be recovering in northern Peru (Recharte and Bodmer 2009, Deza pers. comm. 2012), the northeastern Ecuadorian Amazon (Utreras pers. comm. 2012) and the Pantanal (Ribas *et al.* 2012) though in other regions, such as in the Department of Madre de Dios in southeastern Peru (R. Williams pers. comm. 2012) and in western Colombia (J.C. Botello pers. comm. 2012) populations are on the decline due to habitat loss and degradation, and other human activities. Most populations remain isolated from each other.

Population: Population estimates based on surveys exist for only a few areas: Brazilian Pantanal: 2,000-5,000 individuals (Tomas pers. comm. 2012); Madre de Dios, southeastern Peru: 180-400 individuals (R. Williams pers. comm. 2012); Cantao State Park, Brazil: 31 individuals (Campello pers. comm. 2012); Amana, Brazil: 75 individuals (M. Marmontel pers. comm. 2012); Balbina Lake, Brazil: at least 130 animals (F. Rosas pers. comm. 2012); Araguaia, above Bananal Island: 54 individuals (Cabral *et al.* 2011); Yasuni National Park, Ecuador: 32 animals (Utreras and Araya 2002); Rewa Head, Guyana: minimum of 35 individuals (Pickles *et al.* 2011).

Country population estimates have been made for Bolivia: in the northwest (Madre de Dios-Beni sub-basin), 60 individuals in 185 805 km² of this basin; in the Pantanal (Paraguay river sub-basin), 50 individuals in 118,031 km²; and in the northeast (Itenez sub-basin), 600 individuals in 186,460 km², totaling an estimated 700 individuals (Zambrana pers. comm. 2012); Ecuador: less than 250 (Utreras and Tirira 2011); French Guiana: at least 200 (Benoit de Thoisy pers. comm. 2012); and Paraguay: 24-32 (Cartes and R. Pickles pers. comm. 2011).

Population Trend:  Decreasing

Habitat and Ecology [\[top\]](#)

The Giant Otter is known to inhabit large, slow-moving rivers, streams, lakes and swamps (Duplaix 1980, Carter and Rosas 1997). In a long-term study in Peru, Giant Otters were found in most of the river systems in the southeastern part of the country with the exception of those located close to the Andes where the flow gradient is steeper (Schenck 1999). Studies in Suriname have shown a preference for black water creeks and rivers with sandy or rocky bottoms (Duplaix 1980). Large rivers of lowland areas with gentle flow and oxbow lakes with high fish densities represent the environment most favoured by this species (Schenck 1999), and areas with gently-sloped riverbanks and dense, overhanging vegetation are preferred habitat features (Duplaix 1980). On occasion, Giant Otters are seen in agricultural canals, reservoirs of dams and drainage channels along roads (Ribas *et al.* 2012). Giant Otters tend to concentrate in their preferred habitats and maintain territories that can be very small and stable year-round in lakes (105 ha for a group of 5-14 otters; Groenendijk and Hajek 2006), or may show considerable variation and be larger in river systems. Habitat requirements include: undisturbed, high banks for denning, sites for latrines, and abundant prey populations.

Habitat and Ecology: A typical Giant Otter subpopulation consists of family groups of 2-15 with well established territories, plus sexually mature transients. Family groups are composed of a dominant breeding pair, non-breeding subadults and offspring. Sometimes non-related subadults may be accepted by a group (Ribas 2011, Duplaix 2004) As a rule, each group produces a litter once a year, although two litters have been occasionally recorded. Gestation is around 64-77 days and litters range from 1-6 young (averaging 2) though it is rare to see litters greater than four in the wild (Duplaix 1980, Staib 2005, Groenendijk and Hajek 2006). Reproductive success is related to group size and habitat quality with smaller groups having lower success (Schenck 1999, Groenendijk and Hajek 2006).

The Giant Otter diet consists almost exclusively of fish, up to four kilograms per day, although caiman and turtles may also occasionally be consumed (Staib 2005, Ribas *et al.* 2012, Groenendijk and Hajek 2006). The feeding ecology of *P. brasiliensis* has been shown to be highly dependent upon the seasonal migrations of fish populations (Duplaix 1980).

Giant Otters attain sexual maturity at roughly 2.5 years of age (Sykes-Gatz 2005, Oliveria *et al.* 2011), but first breeding occurs on average two years later (Groenendijk *et al.* unpublished). This, in tandem with high cub mortality (Groenendijk *et al.* unpublished), suspected high transient mortality, and difficulty to establish new groups (Schenck *et al.* 2003), means that population recovery and colonization of new areas can be slow.

Systems: Terrestrial; Freshwater

Use and Trade [\[top\]](#)

Use and Trade:

Hunting for the pelt trade was the single, greatest threat to the giant otter in the past and the species came close to extinction in the early 1970s in Ecuador, Colombia, Venezuela, Bolivia, and Brazil (Duplaix 1980). The inclusion of the Giant Otter on Appendix I of CITES in 1973, and the coming into force of international trade restrictions on Giant Otter skins in 1975 finally ended the economic benefits of Giant Otter hunting (Recharte and Bodmer 2009) and commercial hunting ceased shortly after. There is no current trade, although there have been reports of skins being displayed in homes as decoration (M. Marmontel and Lima pers. comms. 2012).

Threats [\[top\]](#)

While in the past, hunting for pelts greatly impacted the Giant Otter population, currently the species is threatened by multiple anthropogenic influences arising from increased human settlement and activity throughout the species range. These result in modification and destruction of riparian habitat, overfishing, contamination of aquatic ecosystems (especially due to gold mining, fossil fuel exploration, and the use of pesticides and fertilizers for monocultures), domestic animal diseases, and mismanaged tourism (Duplaix 1980, Groenendijk 1998, Schenck 1999, Utreras 2001, Utreras and Tirira 2011).

Gold mining, artisanal as well as industrial, is a significant threat to the species, particularly in the Guiana Shield region (Suriname, Guyana, French Guiana, Venezuela and northern Brazil) and in southeastern Peru. Its main impacts are habitat destruction, sedimentation of rivers, and pollution (Mongabay.com). Gold miners cut swathes into the floodplain forest and blast river banks with pressure hoses, using mercury to amalgamate gold particles. Gold prices are at a record high - now approaching US\$1,800/oz. - and mercury is cheap. Peruvian mercury imports have risen 42% (2006-2009) to 130 t/yr, almost all of which is used directly in artisanal gold mining. Forest conversion to mining increased six-fold from 2003-2006 (292 ha/yr) to 2006-2009 (1,915 ha/yr) (Swenson *et al.* 2011).

Areas impacted by gold-mining have been shown to still have depleted fish populations and to not have been re-colonized by otters over a decade after mining stopped. In areas of gold mining, fish are contaminated with mercury. Gutleb *et al.* (1997) found that mercury concentrations in the majority of fish in the area of Manu National Park were higher than what is considered tolerable in the Eurasian Otter. However, the expected high concentrations of methylmercury in Giant Otter tissues have not been corroborated due to the difficulty of finding dead Giant Otters. Migration of contaminated fish and long-range atmospheric transport of mercury probably increase the miner's area of influence.

One of the major future threats are the many planned hydroelectric dams within the region; these will change habitats and alter hydrological regimes of rivers downstream with resulting impacts on fish populations and habitat. There are plans for 151 new dams greater

than two MW over the next 20 years (the time-span considered for this assessment is 24 years), more than a 300% increase. These dams would include five of the six major Andean tributaries of the Amazon. Ecological impact analysis classified 47% of the potential new dams as high impact and just 19% as low impact. Sixty per cent of the dams would cause the first major break in connectivity between protected Andean headwaters and the lowland Amazon. More than 80% would drive deforestation due to new roads, transmission lines, or inundation (Finer and Jenkins 2012). Giant Otters are able to live in some artificial lakes such as the shallow Balbina Lake (Rosas *et al.* 2007 but the population level impact of these projects is unknown. Other major infrastructure projects include the Inter-oceanic highway in southeastern Peru, and the Initiative for the Integration of the Regional Infrastructure of South America (IIRSA) (V. Utreras pers. comm. 2012).

Major Threat(s): Molecular research suggests that the Giant Otter populations of the Madre de Dios drainage have a distinct evolutionary history and consequently represents an evolutionary unit, an important segment of the species' total genetic diversity (Pickles *et al.* 2011). The current and projected high level of threat facing this population together with its intrinsic importance in safeguarding the evolutionary potential of the species make it of high conservation concern. Giant Otters are vulnerable to disturbance from poorly managed tourism, including sport fishing. With increasing tourism in South America it has proved important to control tourism on lakes and rivers both in and outside protected areas (Schenck and Staib 2000, Groenendijk and Hajek 2006). Monitoring of Giant Otter and tourist groups before and after implementation of management zoning has shown that Giant Otter reproductive success and sighting success by tourists on unmanaged lakes is considerably lower than on managed lakes (Groenendijk and Hajek 2006).

Giant Otter cubs held in captivity have died of canine parvovirus and all mustelids are susceptible to canine distemper, so domestic animal diseases could pose a serious threat to wild giant otter populations. Infection could also occur in remote areas since transient otters and people hunting with dogs travel large distances with potential for contact and infection of immunologically naive populations (Schenck *et al.* 1997).

Human/Giant Otter conflict is emerging as an increasingly important problem. Otters may be killed for fun or out of fear, or, more often, because they are seen as competitors for fish by loggers, miners, and fishermen who often blame them for depleting fish resources used for local consumption and in commercial and sport fishing (Gómez and Jorgensen 1999, Recharte *et al.* 2008, Rosas-Ribeiro *et al.* 2011, Utreras and Tirira 2011). Additionally, Giant Otters are sometimes blamed for damage to fishing nets and traps (Rosas-Ribeiro *et al.* 2011). Fish-farming is rapidly increasing within the species' range and may prove to be a source of conflict and habitat degradation in the future. Giant Otters occasionally become trapped in fishing nets and drown. Cubs are sometimes captured illegally to keep as pets.

Giant Otters are highly susceptible to persecution: they are large, easily visible, very social, and vocal. They are diurnal and occupy open habitats and stable territories. Their sign – latrines and dens - is easily recognizable and often visible, making it possible to identify areas of recent activity by a group (Groenendijk *et al.* 2005). Individuals and groups often react to people by approaching to investigate. Moreover, only the dominant pair produces young, and usually only once a year. During the years of the pelt trade, these life history attributes of the species combined to make it extremely vulnerable, and today may cause it to be an easy target for fishermen as was documented recently on two different rivers in southeastern Peru (R. Williams pers. comm. 2012), and in the Sustainable Development Reserve Uacari, in Brazil (Rosas-Ribeiro *et al.* 2011) where 21 Giant Otters were killed over an undefined period between 2006 and 2006 (M. Marmontel and Lima pers. comms.). In 2011-2012, the Kanamari indigenous people promoted a massive Giant Otter killing in their territory (Território Indígena Kanamari, adjacent to the SDR Uacari), based on their

perception that the species is overfishing the river turtle population. The community leader bought 300 cartridges and distributed these amongst other hunters; 64 Giant Otters were shot (Endo pers. comm. 2012). Such incidents of targeted killing can contribute significantly to the extinction of small subpopulations in a watershed.

It seems likely that mining activities and the widespread conversion of forest into agricultural and pasture lands will continue unabated in the near future as part of the economic development of the Amazonian countries. Brazil, which represents roughly three quarters of the Giant Otter's current distribution range, merits greater consideration. As stated earlier, Giant Otter populations of the Pantanal appear to be recovering, with signs of reaching carrying capacity in some areas (Ribas *et al.* 2012). Populations are stable and possibly recovering in some parts of the Amazon (Rosas *et al.* 2008). However, the human population is increasing and expanding simultaneously and the Amazon region registered the highest population growth of the whole country in the last census (IBGE 2010). As a consequence, we can expect colonization of new regions, intensive exploitation of natural resources, destruction of forests, reduction of water quality, and overfishing. Furthermore, the proposed mega-projects included in the Growth Acceleration Plan (PAC) as well as the recently approved federal law, represent a significant threat to Amazonian diversity.

Conservation Actions [\[top\]](#)

The Giant Otter is listed on Appendix I of the Convention on International Trade in Endangered Species (CITES) and as Endangered under the United States Endangered Species Act. The development of a 10-year Action Plan for the species is currently underway, with the first phase, a range-wide assessment of the Giant Otter's distribution and conservation status, nearing completion (J. Groenendijk pers. comm. 2012). Recommended conservation actions are to:

Conservation Actions:

- Create new protected areas in Giant Otter habitat and better manage existing ones;
- Promote the creation of corridors between protected areas with Giant Otter subpopulations to reduce population fragmentation;
- Promote the conservation of riparian habitats and their inclusion within protected areas; promote the Giant Otter as an ambassador of aquatic habitats in local education curricula and amongst local land-owners and stakeholders;
- Continue assessment of predator-prey relationships and trophic cascades;
- Research and seek to resolve or reduce conflicts with subsistence, commercial and sport fishermen and fish-farms;
- Evaluate the impact of mercury used in gold mining on the health and survival of Giant Otter populations in or near gold mining areas;
- Evaluate the impact of hydroelectric dams on populations;
- Train ecotourism otter guides and enforce regulations to minimize impacts; and
- Develop a systematic method for projecting population change over the next twenty years.

Bibliography [\[top\]](#)

Cabral, M.M.M., Zuanon, J.A.S., de Mattos, G.E. and Rosas, F.C.W. 2010. Feeding habits of giant otters *Pteronura brasiliensis* (Carnivora: Mustelidae) in the Balbina hydroelectric reservoir, Central Brazilian Amazon. *Zoologia* 27(1): 47-53.

Carter, S.K. and Rosas, F.C.W. 1997. Biology and conservation of the giant otter *Pteronura*

brasiliensis. *Mammal Review* 27: 1-26.

Chehebar, C. 1991. News from Argentina. *IUCN Otter Specialist Group Bulletin* 6: 17-18.

Duplaix, N. 1980. Observations of the ecology and behaviour of the giant river otter *Pteronura brasiliensis* in Suriname. *Revue d'Ecologie (La Terre et La Vie)* 34: 495-620.

Finer, M. and Jenkins, C.N. 2012. Proliferation of hydroelectric dams in the Andean Amazon and implications for Andes-Amazon connectivity. *PLoS ONE* 7(4): e35126.
doi:10.1371/journal.pone.0035126.

Garcia, D.M., Marmontel, M., Rosas, F.W. and Santos, F.R. 2007. Conservation genetics of the giant otter (*Pteronura brasiliensis* (Zimmerman, 1780)) (Carnivora, Mustelidae). *Brazilian Journal of Biology* 67(4): 819-827.

Gómez, J. R. and Jorgenson, J. P. 1999. An Overview of the Giant Otter-Fisherman Problem in the Orinoco Basin of Colombia. *IUCN Otter Specialist Group Bulletin* 16(2): 90-96.

Groenendijk, J. 1998. A Review of the Distribution and Conservation Status of the Giant Otter (*Pteronura brasiliensis*), with Special Emphasis on the Guayana Shield Region. Commissioned by the International Fund for Animal Welfare, produced by the Netherlands Committee for IUCN.

Groenendijk, J. and Hajek, F. 2006. *Giants of the Madre de Dios*. Ayuda para Vida Silvestre Amenazada, Sociedad Zoológica de Francfort, Peru.

Groenendijk, J., Hajek, F., Duplaix, N., Reuther, C., Van Damme, P., Schenck, C., Staib, E., Wallace, R., Waldemarin, H., Notin, R., Marmontel, M., Rosas, F., de Mattos, G.E., Evangelista, E., Utreras, V., Lasso, G., Jacques, H., Matos, K., Roopsind, I., Botello, J.C. 2005. *Surveying and Monitoring Distribution and Population Trends of the Giant Otter (Pteronura brasiliensis) - Guidelines for a Standardisation of Survey Methods as Recommended by the Giant Otter Section of the IUCN/SSC Otter Specialist Group*. Habitat 16.

Gutleb, A., Schenck, C. and Staib, E. 1997. Giant Otter (*Pteronura brasiliensis*) at Risk? Total Mercury and Methylmercury Levels in Fish and Otter Scats, Peru. *Ambio* 26(8): 511-514.

IUCN. 2015. The IUCN Red List of Threatened Species. Version 2015.2. Available at: www.iucnredlist.org. (Accessed: 23 June 2015).

Kruuk, H. 2006. *Otters: ecology, behaviour and conservation*. Oxford University Press, Oxford.

Oliveira, G.C., Barcellos, J.F.M., Lazzarini, S.M. and Rosas, F.C.W. 2011. Gross anatomy and histology of giant otter (*Pteronura brasiliensis*) and neotropical otter (*Lontra longicaudis*) testes. *Animal Biology* 61: 175-183.

Pacifici, M., Santini, L., Di Marco, M., Baisero, D., Francucci, L., Grottolo Marasini, G., Visconti, P. and Rondinini, C. 2013. Generation length for mammals. *Nature Conservation* 5: 87-94.

Pickles, R.S.A., Groombridge, J.J., Zambrana Rojas, V.D., Van Damme, P., Gottelli, D., Ariani, C.V. and Jordan, W.C. 2012. Genetic diversity and population structure in the endangered giant otter. *Conservation Genetics* 13: 235-245.

Pickles, R.S.A., Groombridge, J.J., Zambrana Rojas, V.D., van Damme, P., Gottelli, D., Kundu, S., Bodmer, R., Ariani, C.V., Iyengar, A and Jordan, W.C. 2011. Phylogeography and identification of evolutionary significant units in the giant otter. *Molecular Phylogenetics and Evolution* 61: 616-627.

Pickles, R.S.A., McCann, N.P. and Holland, A.P. 2011. Mammalian and avian diversity of the Rewa

Head, Rupununi, Southern Guyana. *Biota Neotropica* 11(3): 237-251.

Recharte, M. and Bodmer, R. 2009. Recovery of the endangered giant otter *Pteronura brasiliensis* on the Yavari-Mirín and Yavari Rivers: a success story for CITES. *Oryx* 44: 83-88.

Recharte, M., Bowler, M. and Bodmer, R. 2008. Potential conflict between fishermen and giant otter (*Pteronura brasiliensis*) populations by fishermen in response to declining stocks of arowana fish (*Osteoglossum bicirrhosum*) in northeastern Peru. *IUCN Otter Specialist Group Bulletin* 25: 89-93.

Ribas, C. 2012. Grau de parentesco e relações sociais em ariranhas (*Pteronura brasiliensis*). PhD Thesis. Instituto Nacional de Pesquisas da Amazônia (INPA). Manaus, Brasil.

Ribas, C., Damasceno, G., Magnusson, W., Leuchtenberger, C. and Mourão, G. 2012. Giant otters feeding on caiman: evidence for an expanded trophic niche of recovering populations. *Studies on Neotropical Fauna and Environment* 47(1): 19-23.

Rosas, F.C.W., de Mattos, G.E. and Cabral, M.M.M. 2007. The use of hydroelectric lakes by giant otters (*Pteronura brasiliensis*): The case of Balbina dam in Central Amazonia, Brazil. *Oryx* 41(4): 520-524.

Rosas, F.C.W., Waldemarin, H. and de Mattos, G.E. 2008. Ariranha, *Pteronura brasiliensis* (Zimmermann, 1780). In: A.B.M. Machado, G.M. Drummond and A.P. Paglia (eds), *Livro Vermelho da Fauna Brasileira Ameaçada de Extinção*, pp. 800-801. Fundação Biodiversitas, Belo Horizonte, Minas Gerais, Brasil.

Rosas-Ribeiro, P.F., Rosas, F.C.W., and Zuanon, J. 2011. Conflict between fishermen and giant otters (*Pteronura brasiliensis*) in western Brazilian Amazon. *Biotropica* 44(3): 437-444.

Schenck, C. 1999. Lobo de Río (*Pteronura brasiliensis*) – Presencia, uso del hábitat y protección en el Perú. PhD dissertation. GTZ / INRENA. Lima, Peru; 176 pp

Schenck, C. and Staib, E. 2000. Giant otter tourism in Peru: boon or bust for conservation? . In: M. Shackley (ed.), *Flagship Species; case studies in wildlife tourism management*, pp. 200. Ecotourism Society, Vermont.

Schenck, C., Groenendijk, J., Hajek, F., Staib, E. and Frank, K. 2003. Giant Otters in the Peruvian Rainforest: Linking Protected Area Conditions to Species Needs. In: J.A. Bissonette and I. Storch, (eds), *Landscape Ecology and Resource Management – Linking Theory with Practice*, pp. 341-357. Island Press, Covelo, London.

Schenck, C., Staib, E. and Storch I. 1997. Domestic animal disease risks for Peruvian Giant Otters (*Pteronura brasiliensis*). *IUCN Veterinary Specialist Group Newsletter* 14: 7-8.

Spracklen, D.V., Arnold, S.R. and Taylor, C.M. 2012. Observations of increased tropical rainfall precede by air passage over forests. *Nature* 489: 282-285.

Staib, E. 2005. *Eco-Etología del Lobo de Río (Pteronura brasiliensis) en el Sureste del Perú*. Ayuda para Vida Silvestre Amenazada - Sociedad Zoológica de Francfort Perú.

Swenson, J.J, Carter, C.E, Dome, J.-C. and Delgado, C.I. 2011. Gold Mining in the Peruvian Amazon: Global Prices, Deforestation, and Mercury Imports. *PLoS ONE* 6(4): e18875.

Sykes-Gatz, S. 2005. *International Giant Otter Studbook Husbandry and Management Information and Guidelines. Husbandry and Management of the Giant Otter (Pteronura brasiliensis)*. 2nd Edition, Dortmund. 276pp.

Utreras, V. and Araya, I. 2002. Distribution and conservation status of the Neotropical Otter (*Lutra longicaudis*) and Giant Otter (*Pteronura brasiliensis*) in Ecuador. Proceedings VIIth International Otter Colloquium, Trebon. *IUCN Otter Specialist Group Bulletin* 19A: 365-369.

Utreras, V. and Tirira, D.G. 2011. Nutria gigante (*Pteronura brasiliensis*). In: D. Tirira (ed.), *Libro Rojo de los Mamíferos del Ecuador*, pp. 96-97. Fundación Mamíferos y Conservación / Pontificia Universidad Católica del Ecuador / Ministerio del Ambiente del Ecuador, Quito.

Utreras, V., Suarez, E.R., Zapata-Rios, G, Lasso, G. and Pinos, L. 2005. Dry and rainy season estimations of giant otter, *Pteronura brasiliensis*, home range in the Yasuni National Park, Ecuador. *Latin American Journal of Aquatic Mammals* 4(2): 191-194.

Wozencraft, W.C. 2005. Order Carnivora. In: D.E. Wilson and D.M. Reeder (eds), *Mammal Species of the World: A Taxonomic and Geographic Reference. Third Edition*, pp. 532-628. Smithsonian Institution Press, Washington, DC, USA.

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