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Identifying spatial conservation priorities for the giant otter (*Pteronura brasiliensis*)

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Abstract

The giant otter (*Pteronura brasiliensis*) is a charismatic, South American, social carnivore, and the largest otter species in the world. Historically, giant otters were almost extirpated due to the wildlife skin trade and are currently considered as Endangered. Using the Range Wide Priority Setting methodology, we (a group of 33 giant otter experts) updated the species' historical range (9,021,590 km^2), modelled an adjusted and more conservative aquatic historical range of 2,813,539 km^2, systematized 5,593 giant otter distribution points across the range, and identified geographic areas for which there was expert knowledge (63%), including areas where giant otters no longer occur (19%), and geographic areas where giant otter presence is uncertain due to a lack of expert knowledge (37%). To prioritize conservation actions into the future and identify existing giant otter population strongholds, we used expert knowledge to identify 22 of the most important areas for the conservation of the species (*i.e.*, Giant Otter Priority Conservation Units [GOPCUs]) that cover 29% of the historical range, and range in size from 1,367 km^2 to 829,152 km^2. In general, GOPCUs were relatively large and approximately 35% of the total GOPCU area is already designated as protected areas. Using the Range Wide Priority Setting results, we make a series of recommendations towards the long-term conservation of this iconic aquatic species.

Keywords:
expert knowledge, historical distribution, Priority Conservation Units, Range Wide Priority Setting

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Introduction

The giant otter (*Pteronura brasiliensis*) is an endemic and emblematic species of the tropical river ecosystems of lowland South America, to the east of the Andes from northern Venezuela to northern Argentina (Groenendijk et al., 2023). As a large, social, and vocal carnivore, concentrated along waterways, the giant otter is particularly vulnerable to hunting, and illegal hunting for the commercialization of its fur between the 1930s and 1970s extirpated the giant otter from large portions of its distribution (Groenendijk et al., 2023). Previous estimates suggest that the giant otter occurs today in only 60% of its historical range (Colodetti, 2014).

The giant otter is considered extinct in the wild in Argentina and Uruguay, although some recent reports of solitary animals may be new arrivals in Argentina (Leuchtenberger et al., 2023). The species is considered Endangered in all other countries in its historical range, except in Ecuador and Paraguay, where it is considered Critically Endangered (Leuchtenberger, 2025). Overall, the giant otter is considered as Endangered on the IUCN Red List (Groenendijk et al., 2023) and is also listed on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

The main threats to the giant otter today include habitat loss and degradation, conflicts with fisherpeople, gold mining, hydroelectric projects, deforestation for pasture and soybean cultivation, climate change and catastrophes including extreme droughts and fires, and exposition to zoonotic pathogens (Garrett et al., 2021; Marengo et al., 2021; Michalski & Norris, 2021; Groenendijk et al., 2023; Colman et al., 2024; Leuchtenberger, unpubl. data).

Nevertheless, giant otters play a crucial role in maintaining the balance of aquatic ecosystems and are also considered a sentinel of environmental health (Duplaix, 2003). Assessing the conservation status of populations across their range and protecting source populations are essential steps to ensure the conservation of the giant otter. However, there are many knowledge gaps about the species distribution and population estimates are especially limited. Although some national conservation plans exist, for example in Brazil (https://www.gov.br/icmbio/pt-br/assuntos/biodiversidade/pan/pan-ariranha) and Colombia (Trujillo et al., 2008, 2016), integrated and effective strategies are urgently needed to ensure the long-term conservation of the giant otter.

The main objective of this work was to identify priority conservation areas for the giant otter throughout its distribution and to inform future multi-national conservation decision-making by systematizing existing distributional knowledge. The expert-

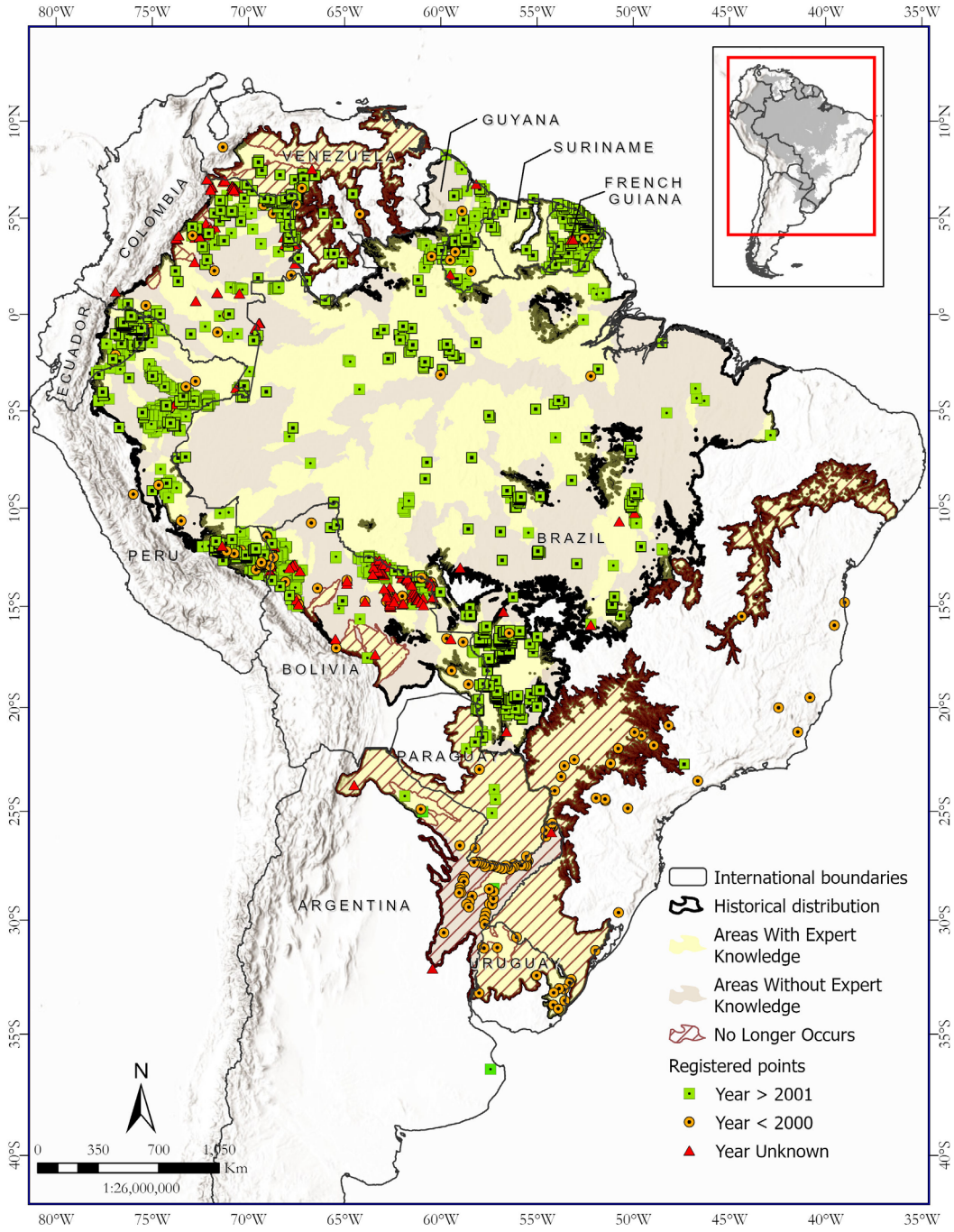

Figure 1. Revised giant otter (*Pteronura brasiliensis*) historical range highlighting areas with and without expert knowledge, areas where they no longer occur, and confirmed localities obtained from experts during the Range Wide Priority Setting (RWPS) exercise. Adapted from Wallace et al. (2025).

driven Range-Wide Priority Setting exercise (RWPS) was developed to systematize scarce and dispersed data regarding the overall distribution of globally threatened wildlife species, and to inform management decisions regarding their conservation (Sanderson et al., 2002; Thorbjarnarson et al., 2006; Taber et al., 2009; Wallace et al., 2014, 2022).

The result of the RWPS was the published report *Assessing an Aquatic Icon: A Range Wide Conservation Priority Setting Exercise for the Giant Otter* (Pteronura brasiliensis) (Wallace et al., 2025). This publication summarizes that report.

Material and Methods

In 2018, a partnership of the Frankfurt Zoological Society, the Wildlife Conservation Society, and the Manu National Park and National Protected Area Service of Peru, launched a Range Wide Priority Setting Exercise (Sanderson et al., 2002) for the giant otter with 33 experts working with the species in different parts of its distribution.

Before an in-person late May 2018 workshop in Puerto Maldonado, Peru, we systematized information about giant otter distribution from two sources. Firstly, we gathered giant otter distribution points through a literature review. Secondly, we solicited unpublished information from giant otter experts across their historical range using a specific spreadsheet on observed giant otter, including direct observations, dens, spraints, and feeding sites (see Supplemental Materials for details). For the latter, we used models previously designed for jaguars (*Panthera onca*; Sanderson et al., 2002), white-lipped peccaries (*Tayassu pecari*; Taber et al., 2009), lowland tapirs (*Tapirus terrestris*; Taber et al., 2009), Andean bears (*Tremarctos ornatus*; Wallace et al., 2014), and Andean condors (*Vultur gryphus*; Wallace et al., 2020, 2022). We eliminated duplicate distribution points arising from multiple sources by comparing the location, date, and observer information for each distribution point. All current giant otter distribution areas were also assumed to be included in the historical distribution. All unique distribution points were used in the mapping analyses described below.

Figure 2. Adjusted giant otter (*Pteronura brasiliensis*) aquatic historical range. Adapted from Wallace et al. (2025).

Before the workshop, giant otter experts were asked to draw polygons representing their giant otter knowledge (Sanderson et al., 2002) including: (1) Area of Knowledge (areas where experts are knowledgeable enough to express opinion about the presence or absence of giant otters); (2) Proposed Actual Distribution (areas where experts believe the giant otter has occurred in the last 20 years); and (3) Giant Otter Priority Conservation Units (GOPCUs; areas perceived by experts to be important strongholds for the long-term conservation of giant otter populations within the expert's area of knowledge). An additional tool used by experts were country maps in GoogleEarth™ format with which to draw polygons and/or place distribution points. We processed and combined all information into one Geographic Information System (GIS) using the ArcGIS platform (Version 10.3) and incorporated data on human settlements; international, state, and provincial boundaries; and main and secondary roads (DIVA-GIS; https://www.diva-gis.org/Data), as well as satellite images to facilitate recognition of physical characteristics such as rivers and lakes.

The Puerto Maldonado workshop participants worked in six geographical groups: (1) Guyana; (2) Colombia and Ecuador; (3) Peru; (4) Bolivia; (5) Brazil; and (6) Argentina. Using printed map material and digital versions on portable computers, the working groups sequentially reviewed and refined the giant otter RWPS exercise, including: (i) historic distribution polygon; (ii) current distribution polygon; (iii) places (polygons) where collectively the experts had knowledge of the giant otter; (iv) places (polygons) where collectively the experts lacked knowledge of the giant otter; (v) most important threats to the giant otter in each geographic region; and (vi) proposed Giant Otter Priority Conservation Units (GOPCUs).

Changes were clearly marked on the printed satellite image maps, which included populations, roads, and rivers to further help interpretation, as well as in digital kmz format (Google Earth™, 2018). Each map prepared for the geographic working groups included the following cartographic information: background satellite image (World Physical Map, ESRI, 2020), digital elevation model (World Wildlife Fund, 2006), rivers (Venticinque et al., 2016), basins (Basin Level 5 or BL5) (Lehner & Grill, 2013; Venticinque et al., 2016), political-administrative boundaries (RAISG, 2021), protected areas (RAISG, 2021), giant otter distribution points (from pre-workshop data systematization), and workshop polygons on Historical Distribution, Known Giant Otter Absence, Known Giant Otter Presence, Unknown Presence or Absence, and proposed Giant Otter Priority Conservation Units (based on the combination of information from multiple experts received before the workshop). Upon conclusion, the geographic working groups reported back to each other, which was particularly important from the perspective of several transboundary areas.

Table 1. Giant otter historical range area and distribution points by country (Wallace et al., 2025).

Country	Historical giant otter range size (km²)	Percent of historical range (%)	Number of distribution points in RWPS	Distribution point density per 1,000 km²	Adjusted giant otter aquatic distribution (km²)
Argentina	297,245	3.29	69	0.232	77,279
Bolivia	562,630	6.24	898	1.596	161,003
Brazil	5,580,734	61.86	1,003	0.180	1,695,852
Colombia	690,116	7.65	476	0.690	268,947
Ecuador	70,467	0.78	262	3.718	31,454
French Guiana	94,579	1.05	766	8.099	30,396
Guyana	232,985	2.58	318	1.365	67,139
Paraguay	229,704	2.54	27	0.118	56,501
Peru	565,509	6.27	1,714	3.031	226,275
Suriname	144,684	1.61	13	0.090	37,983
Uruguay	100,846	1.12	14	0.139	27,156
Venezuela	452,089	5.01	33	0.073	133,552
Total	**9,021,590**	**100%**	**5,593**	**0.620**	**2,813,539**

After the workshop, the maps were digitized using the ArcGIS (ESRI, 2018) software and modified according to the corrections and proposals from the giant otter workshop participants. Experts from countries across the range who were not present at the workshop (French Guiana, Paraguay, Suriname, Uruguay, Venezuela) were consulted virtually using the same methodology. We also consulted iNaturalist (https://www.inaturalist.org) and the Global Biodiversity Information Facility (https://www.gbif.org), and included additional distributional records for the giant otter, being careful to eliminate any duplicate records already captured through the pre-workshop literature review and expert consultation.

The post-workshop methodology also added a watershed criterion, and so each expert-drawn polygon was adjusted to the overlapping BL5 basin (Venticinque et al., 2016). The resulting maps show basin limits rather than the original polygons. Since giant otters are an aquatic species, the expert group agreed to produce a map highlighting the species' connection to rivers, lakes, oxbow lakes, and lagoons within their distribution, by creating a 1-km buffer along either side of rivers classified from Strahler Order 2 (Strahler, 1957) and higher. Strahler's method classifies the hydrographic network by assigning a numerical order to each segment of a river or stream according to the contribution of its tributaries, where first order streams have no tributaries, and the order is increased when two streams of the same order converge. During the workshop, the giant otter experts also defined the 500 m a.s.l. altitudinal contour as the maximum upper range for giant otter distribution. A Digital Elevation Model (DEM) was used to delimit this maximum altitude and to eliminate the portions of river basins above this value.

We then sent modified maps to the participating giant otter experts for review and final edits. We divided the GOPCUs into three population size classes: (1) relatively small GOPCUs thought to be home to < 50 animals, (2) medium-sized GOPCUs thought to harbor between 50 and 250 animals, and (3) relatively large GOPCUs thought to contain > 250 individuals.

Finally, we calculated the percentage of each GOPCU protected by three jurisdictional categories of protected areas: (1) National Protected Areas, (2) State or Regional Scale Protected Areas, and (3) Municipal or Private Protected Areas, by overlapping the GOPCUs with the protected areas using the Clip and Intersect tools in ArcGIS (ESRI, 2018).

Results

Historical Range of the Giant Otter

The expert-driven revision of the giant otter historical range resulted in a classic distribution polygon of 9,021,590 km² (Fig. 1). The aquatic version of this distribution polygon diminished to 2,813,539 km², or 31.2% of the traditional historical distribution polygon (Table 1). However, this reduced area only captured 59.2% of the systematized distribution points, due in large part because the analytical basin level (BL5) does not capture smaller rivers and streams and more isolated oxbow lakes where otters occur, and also due to the precision of specific localities from general databases for threatened species, for example, this was a particular problem with data from the Global Biodiversity Information Facility with just 34.5% of points from this source falling within the adjusted aquatic distribution polygon. The portion of the historical distribution range in each country ranged significantly, from 0.78% in Ecuador to 61.86% in Brazil, with more than 5% in Bolivia, Colombia, Peru, and Venezuela, collectively covering 24.9% of the historical distribution. Argentina, Ecuador, French Guiana, Guyana, Paraguay, Suriname, and Uruguay each had less than 5% of the historical distribution of the giant otter (Table 1).

Giant Otter Distribution Points

We obtained a total of 5,593 points for the overall database of giant otter distribution. The number of systematized distribution points for each country ranges from 13 in Suriname to 1,714 in Peru (Table 1).

Table 2. Giant otter expert knowledge across the revised historical range (Wallace et al., 2025).

Polygon	Total area (km²)	% Historical range
Area with expert knowledge where giant otters still occur	3,971,998	44
Area with expert knowledge where giant otters no longer exist	1,693,007	18.8
Area without expert knowledge	3,356,595	37.2
Total Revised Historical Giant Otter Range	**9,021,590**	**100.0**

To further demonstrate differences in the level of knowledge about the distribution of giant otters between countries, we calculated a standardized distribution point density, expressed as the number of distribution points per 1,000 km² (Table 1). There was a relatively low distribution point density (< 1/1,000 km²) in Brazil, Colombia, Paraguay, Suriname, Uruguay, and Venezuela, and higher distribution point densities (> 1/1,000 km²) in Guyana, Bolivia, and especially Peru, Ecuador, and French Guiana (> 3/1,000 km²).

Giant Otter Extirpated Areas

The areas where giant otters were considered to no longer occur amounted to 18.77% of their historical range, concentrated in Argentina, Paraguay, Uruguay, small areas in central Bolivia, and extreme southeastern and eastern Brazil, in the southeast of the historical distribution. In the northern historical range, giant otters have been extirpated from parts of Venezuela and some watersheds in Colombia.

Areas Identified With and Without Giant Otter Expert Knowledge

Giant otter experts expressed knowledge about 62.8% of the giant otter revised historical range including areas where they are now considered absent (Table 2). Experts considered 37.2% of the historical range as areas without knowledge on the presence of giant otters (Table 2).

Giant Otter Priority Conservation Units (GOPCUs)

Giant otter experts proposed 36 GOPCUs at the workshop, representing 28.79% of the historical range. Almost half of the total GOPCU area is in Brazil (45.13%), significantly less than would be expected based on Brazil's portion of the historical range (61.86%), a relationship repeated for Argentina, Paraguay, Uruguay, and Venezuela; whereas Bolivia, Colombia, Ecuador, French Guiana, Guyana, Peru, and Suriname prioritized larger areas as GOPCUs than might be expected based on their percentage of the historical range.

Subsequently, participants in neighboring countries worked to combine some of the proposed GOPCUs. Three combinations involved two countries, four involved three countries, and one was a combination of GOPCUs from five countries. This process reduced the number from a total of 36 to 22 GOPCUs (Table 3, Fig. 3). The 22 GOPCU polygons overlapped with 88.6% of the available distribution points for the giant otter.

The GOPCUs range from nine smaller areas of < 25,000 km² in Argentina, Brazil, Colombia, and Uruguay, to four intermediate sized areas (> 25,000 and < 100,000 km²) dotted across the range, to nine larger areas of > 100,000 km², the majority of which are transboundary areas within the Amazon Basin (Table 3). Table 3 details the major BL3 (basin level 3) river basins (Venticinque et al., 2016) covered by each GOPCU. Overall, 35.3% of the GOPCU area lies within formal protected areas, ranging from 0.01% to 99.77% across the 22 GOPCUs (Table 3). At least 22% of eight out of nine of the largest and most important Type I GOPCUs (> 250 reproducing adults) are under formal protection, although six out of eight of the Type II GOPCUs (> 50 reproducing adults) have < 10% under protection. The five Type III population recovery GOPCUs (< 50 reproducing adults) were far more variable in levels of protection (Table 3).

Discussion

Giant Otter Historical Range

The expert-derived giant otter historical range increased the previously estimated historical range (Colodetti, 2014; Groenendijk et al., 2023) from 6,657,101 km² (Groenendijk et al., 2023) to 9,021,590 km². While this range is smaller compared to other large charismatic wildlife species in Latin America, such as the jaguar (19 million km², Sanderson et al., 2002), the white-lipped peccary (14,220,461 km², Taber et al., 2009), and the lowland tapir (13,129,874 km², Taber et al. 2009), it is substantially larger than that for the Andean bear (607,257 km² in Bolivia and Peru which represents 70% of the overall range, Wallace et al., 2014), or the Andean condor (3,230,061 km², Wallace et al., 2020, 2022).

Nevertheless, for an aquatic species, the overall historical distribution polygon overestimates the reality of the species distribution. The estimated aquatic historical distribution of 2,811,512 km² represents only 31.2% of the larger overall historical distribution polygon, and further highlights the restricted and linear distribution of the species. Both historical range estimates are important perspectives for setting conservation targets in the future, as well as for measuring decline to date.

Giant Otter Distribution Points

The systematized giant otter distribution database amounting to 5,593 distribution points is a solid start, but at the same time underlines the need for further efforts to gather historical records in Suriname and Venezuela, and especially in Brazil, given the enormous size of the distribution area. Fig. 1 underlines the patchy distribution for the giant otter across its historical range, further highlighting the factors which justify its Endangered IUCN status (Groenendijk et al., 2023).

Expert Knowledge Coverage within the Giant Otter Historical Range

According to participating experts, giant otters are known to be present in 44% and absent in 18.8% of the revised historical range, amounting to a total knowledge coverage of 62.8% of the historical range. Nevertheless, areas without expert knowledge about giant otters totaled 37.21% of the historical range, with significant gaps noted in Argentina, Bolivia, Brazil, Colombia, and Peru.

An expert knowledge coverage of 62.8% is considerably lower than that of most other iconic lowland species for which Range-Wide Priority Setting exercises exist in the region. The original

Table 3. Giant Otter Priority Conservation Units (GOPCUs) (Wallace et al., 2025).

GOPCU	Countries	Name	Area (km²)	Aquatic Area (km²)	GOPCU	Total % Protected
GOPCU - 1	Venezuela	Apure	42,503.50	11,747.46	II	3.95
GOPCU - 2	Colombia	Arauca	72,497.45	25,446.30	II	1.93
GOPCU - 3	Colombia	Meta River	64,330.86	24,720.65	II	9.91
GOPCU - 4	Colombia	Estrella Fluvial Inírida	21,414.04	8,291.84	II	5.42
GOPCU - 5	Colombia - Brazil - Guyana - Suriname - French Guiana	Guianan Shield	829,151.73	248,191.08	I	44.52
GOPCU - 6	Colombia - Brazil	Chiribiquete, Japurá, Putumayo	163,114.27	63,870.58	I	41.48
GOPCU - 7	Colombia - Ecuador - Peru	Putumayo, Napo, Pastaza	147,913.66	63,526.58	I	25.37
GOPCU - 8	Peru - Brazil - Colombia	Amazon, Içá - Putumayo, Ucayali, Marañon	216,966.78	86,013.51	I	12.84
GOPCU - 9	Brazil	Juruá	6,724.71	2,353.22	II	91.98
GOPCU - 10	Brazil	Purus	5,472.13	1,965.67	II	83.68
GOPCU - 11	Peru - Brazil - Bolivia	Madidi-Manu	178,552.26	60,970.39	I	57.7
GOPCU - 12	Bolivia - Brazil	Madeira	153,412.18	54,535.73	I	51.96
GOPCU - 13	Bolivia - Brazil	Guaporé-Iténez	141,299.05	36,268.85	I	55.54
GOPCU - 14	Brazil	Tapajós	54,188.60	17,918.64	II	8.41
GOPCU - 15	Brazil	Cerrado	191,315.31	53,433.95	I	29.83
GOPCU - 16	Brazil	Gurupi	10,472.06	2,001.97	II	5.91
GOPCU - 17	Bolivia - Brazil - Paraguay	Pantanal	235,176.41	58,478.82	I	22.34
GOPCU - 18	Argentina	Bermejo	22,423.22	6,036.47	III	9.09
GOPCU - 19	Argentina	Santa Lucía	12,804.66	3,417.69	III	92.42
GOPCU - 20	Argentina	Paraná	1,367.11	548.84	III	99.77
GOPCU - 21	Uruguay	Cuareím-Arandi	15,564.67	4,425.44	III	0.01
GOPCU - 22	Uruguay	Tacuarí-Laguna Merín	10,240.51	2,887.23	III	13.26
Total			**2,596,905.18**	**837,050.90**		**35.28**

jaguar RWPS detailed expert knowledge areas covering 83% of the historical range (Sanderson et al., 2002), which increased in 2006 to 96% (Marieb, 2007). Expert knowledge covered 99.1% and 99.6% of the historical range for the less cryptic, white-lipped peccary and lowland tapir, respectively (Taber et al., 2009). However, expert knowledge coverage was just 57.7% for Andean bears in Bolivia and Peru (Wallace et al., 2014), and 65.8% for the Andean condor across its continental range (Wallace et al., 2020, 2022), both of which have exceptionally linear distributions, largely confined to the eastern slopes of the Andes mountain range from Venezuela to Bolivia in the case of the Andean bear, stretching further south to Argentina and Chile for the Andean condor. However, as an aquatic species, the giant otter is also particularly vulnerable to water-related threats such as pollution because watercourses can run for up to thousands of kilometers, and therefore threats need to be considered at the scale of the entire watershed beyond the limits of giant otter distribution.

As a large, social, and vocal carnivore that inhabits waterways and leaves easily detectable signs such as dens, spraints, footprints, and feeding sites, the giant otter is not a cryptic species. Thus, conducting rapid surveys along the major waterways and oxbow lakes in the areas identified by giant otter experts as areas without expert knowledge is an urgent requirement and would greatly improve our current understanding of the distribution and population status of the species.

Giant Otter Actual Range

Giant otters are considered as absent from 19% of their historical distribution. Jaguars are extirpated in 39% of their historical range (Marieb, 2007), and white-lipped peccaries and lowland tapirs in 20% and 14% of their historical ranges, respectively (Taber et al., 2009). Andean condors are missing from 7% of their range (Wallace et al., 2020, 2022), and in Bolivia and Peru, Andean bears are absent from 3% of their range (Wallace et al., 2014).

Nevertheless, there is another 38% of the giant otter historical distribution for which experts did not have information and/or published information was not available. Given that giant otters are relatively conspicuous, and that their pelts were also of highest value during the skin trade period, the extirpated area for the giant otter may be considerably larger. This observation underlines the need for conservation planning and actions, including further targeted fieldwork for giant otters.

Giant Otter Priority Conservation Units (GOPCUs)

Giant otter experts identified 22 Giant Otter Priority Conservation Units from northern Argentina to Venezuela, collectively representing the highest probability for the long-term conservation of the species across the actual range. The GOPCUs cover 28.8% of the historical range of the species but encouragingly included 88.6% of all distributional records suggesting that these polygons encompass most of the known remaining populations of the species. The GOPCUs ranged from relatively small areas of just 1,367 km² in Cuareím-Arandi in Uruguay to huge areas of up to 829,152 km² in the Guiana Shield of Brazil, Colombia, French Guiana, Guyana, and Suriname. Giant otter home ranges tend to be larger in the wet season than the dry season, with giant otter groups ranging over approximately 20 km² in the wet season, however these home ranges are often linear along 12 – 32 km of waterways (Auccacusi et al., 2025), and even in relative strongholds social groups are also patchily distributed. This makes estimating populations in large polygons extremely challenging and as such our estimates of potential populations in each GOPCU are based on expert opinion. GOPCUs are relatively small in the southern portion of the range (Argentina, Paraguay, and Uruguay), reflecting the extremely threatened status in those countries, as well as in most of the eastern portion of the range in Brazil. These populations are mostly considered as possible recovery populations, as they are smaller polygons and with small remnant populations and/or ongoing efforts towards species recovery (Wallace et al., 2025).

Most of the medium- and large-sized GOPCUs are in the Amazon and Orinoco basins, and the Pantanal basin. These GOPCUs protect significant populations and will require landscape-scale conservation interventions, particularly on watershed management. This situation underlines the need for integrated conservation approaches that embrace the importance of working beyond protected area limits and with a wide range of local actors.

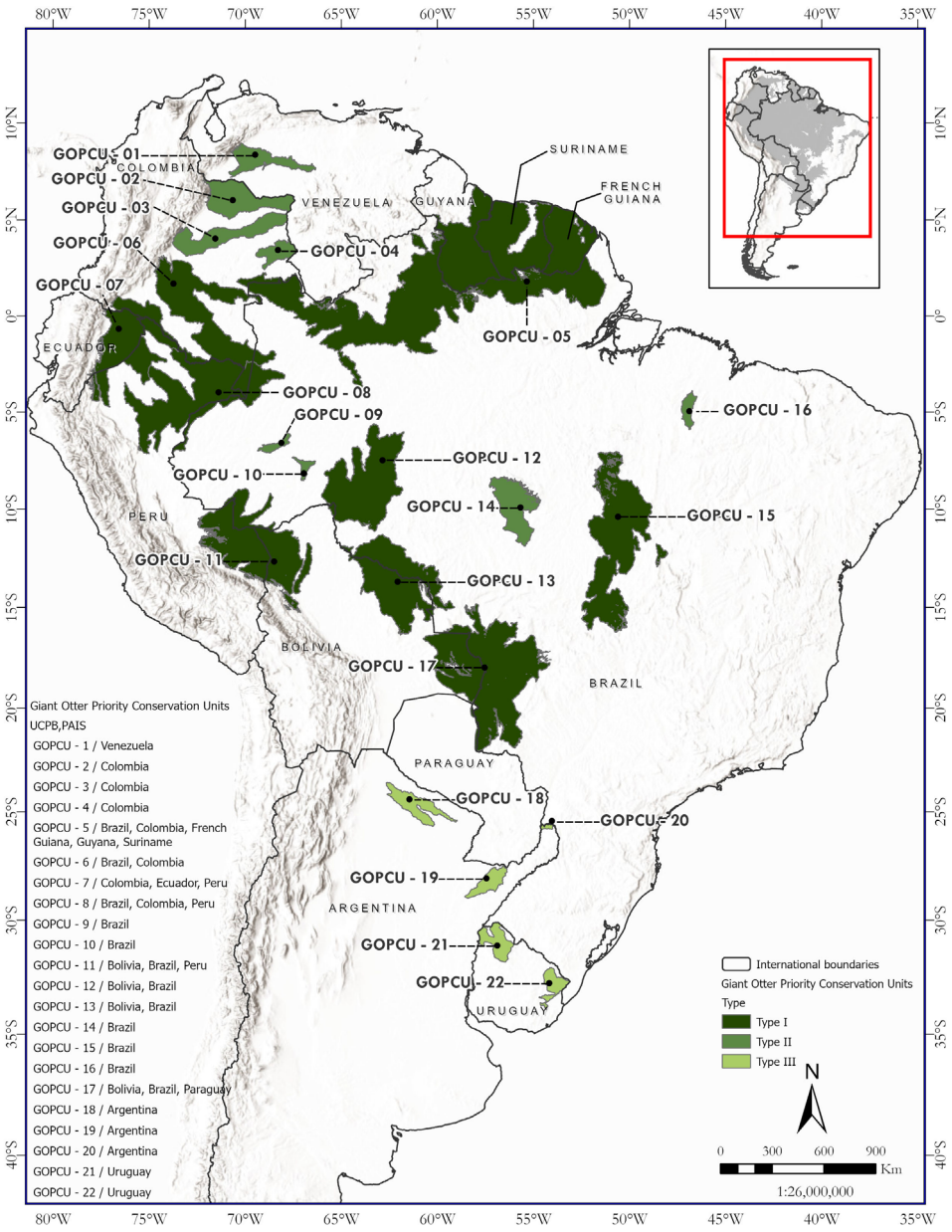

Figure 3. Giant Otter Priority Conservation Units (GOPCUs) across the range in South America. Adapted from Wallace et al. (2025).

Overall, 35.3% of GOPCUs are under formal protection, although protected percentages vary between 0% to over 99% across GOPCUs. The average for Type III GOPCUs is 42.9%, which drops to 26.4% for Type II GOPCUs, but encouragingly is higher in Type I GOPCUs (31.3%) with populations > 250 individuals (Table 3).

Whether populations of this size are truly sustainable in the long-term is the subject of some debate in the minimum viable population literature (Reed et al., 2003; Traill et al., 2007), and the most recent estimates suggest at least 1,000 individuals for slow reproducing species (Pérez-Pereira et al., 2022). Most of the individual populations of giant otters in the GOPCUs do not meet this criterion, and as an aquatic species connectivity between populations can be compromised, which further emphasizes the need for dedicated population monitoring programs in the GOPCUs.

The Range Wide Priority Setting Exercise detailed a) the historical distribution of the giant otter, b) the current distribution of the giant otter, c) a systematized database of giant otter distribution records, d) identified places where no information is available, and e) a suite of Giant Otter Priority Conservation Areas. Overall, the 22 identified GOPCUs provide a representative coverage of the historical distribution of the giant otter, although the extreme eastern historical distribution is missing, as is a large part of the central Brazilian Amazon (Fig. 3).

Next Steps and Recommendations

Finally, based on the discussions at the workshop in Puerto Maldonado, Peru, and the results of this Range Wide Priority Setting Exercise for the giant otter, we propose the following priority next steps and recommendations: 1) Compile a list of priority sites in the GOPCUs for developing population estimates that will provide reliable data across the range with which to better inform future conservation decision-making processes, 2) Organize international meetings in the future to discuss, analyze, improve, and evaluate priority interventions for the conservation of giant otters, 3) Develop specific and comprehensive analyses and conservation plans with integrated and diverse conservation actions for the identified GOPCUs, 4) Evaluate the presence of giant otters in areas with poor data or without knowledge, within existing GOPCUs, 5) Formalize a digital information exchange mechanism and library for giant otter experts and conservation practitioners, 6) Encourage greater international collaboration and interaction, as most of the expert-identified GOPCUs span more than one country, 7) Work with governments to address key threats to giant otter populations, especially gold mining and associated mercury poisoning and riverine habitat destruction, livestock production, deforestation, forest fires, conflicts between fishers and giant otters, depletion of prey through overfishing, and hydroelectric dams and other major infrastructures, 8) Promote and increase environmental education and outreach related to the conservation of the giant otter as a symbol of the aquatic ecosystems of tropical South America, 9) Develop landscape-scale and watershed-relevant comprehensive conservation actions to ensure the future of the existing most important giant otter populations in the GOPCUs and promote further population recovery in good quality habitat, 10) Continue to inform key decision makers about the plight of the giant otter and the importance of species-specific conservation actions, and 11) Respectfully engage with local communities and Indigenous Peoples to recognize, showcase, promote, and learn about their crucial role in conserving wildlife, biodiversity, water, nature, and the environment.

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