



## First giant otter distribution survey in the southeast of Roraima, Brazil, with notes on the OSG Guidelines for a Standardization of Survey Methods

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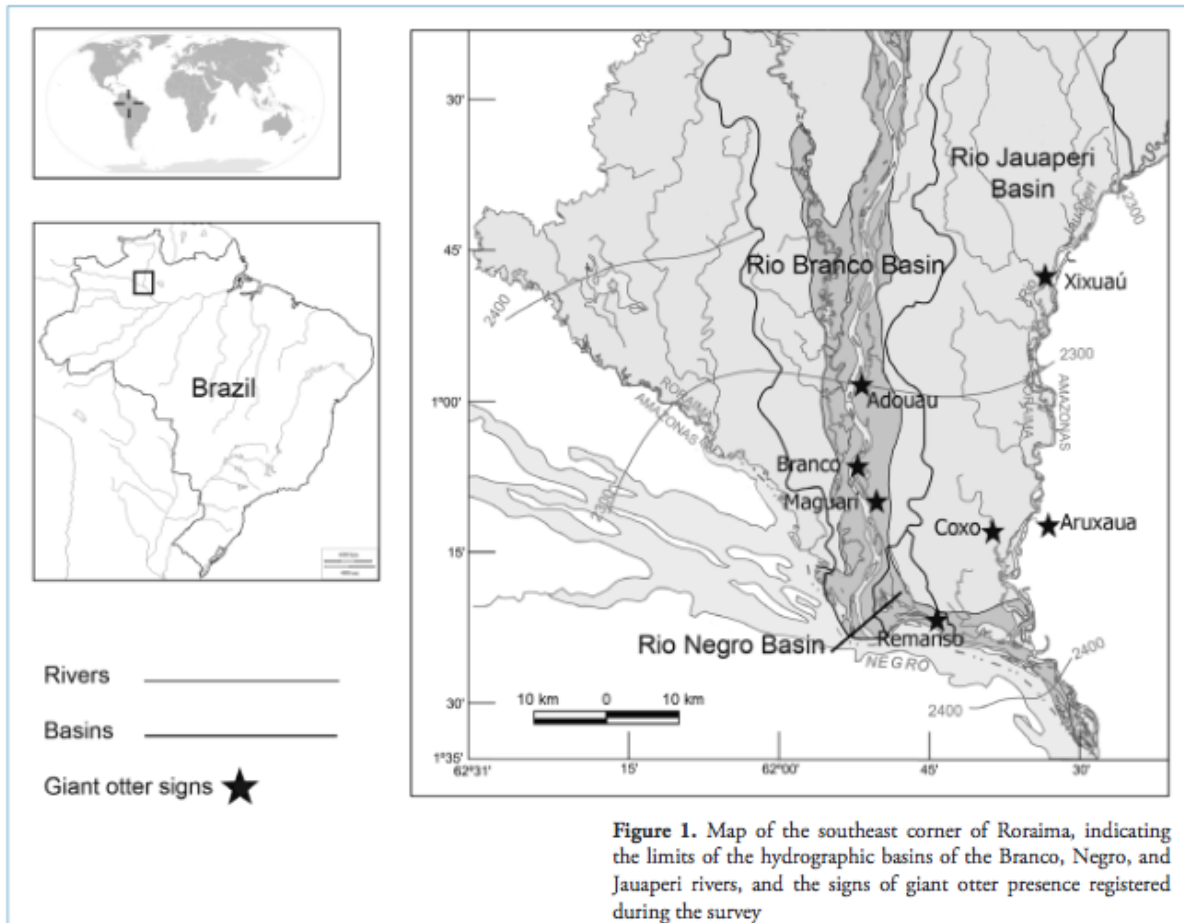
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Despite covering more than three quarters of the range of the giant otter [*Pteronura brasiliensis* (Zimmermann 1780)], Brazil still possesses very limited information on the distribution of the species. For this reason, according to the Otter Specialist Group (OSG)'s Range-Wide Distribution Survey Strategy, investigations should concentrate on large transects over the Brazilian Amazon basin and in existing work areas (Groenendijk *et al.*, 2005). In this note we present the results of the first giant otter distribution survey in the southeast corner of the Brazilian state of Roraima (01°04'S, 61°36'W), an area that has remained hitherto virtually unexplored. Located at the border with the state of Amazonas, it includes the Xixuaú Creek, which was the site of a number of studies on the ecology and biology of the species (Rosas *et al.*, 1999; Evangelista, 2004; Evangelista and Rosas, 2011a, b; Tosi and Evangelista, 2011). The territory is covered with dense ombrophilus forest, crossed by black-water and white-water rivers. It is home to less than a thousand traditional inhabitants, who mainly live off fishing, hunting, small-scale agriculture and extraction of non-timber forest products. The yearly rainfall is about 2000mm; the low-water season lasts from October to March, the water level rising up to 10m during the flooded season. Situated in the Negro River basin, the region comprises the lower section of the Jauaperi River, the lower section of the Branco River and a short stretch of the Negro River itself (Figure 1). The Jauaperi River is a black-water tributary of the Negro River and marks the border between the states of Amazonas and Roraima. Like most of the rivers of the region it is covered with large expanses of tall *igapó*, a term applied to forests seasonally flooded by black-water and nutrient-poor rivers (Prance, 1979). The

Branco River is the most important tributary of the Negro River and is considered a main biogeographical barrier for wildlife (Naka *et al.*, 2006). The banks of the lower Branco River are covered by *várzea*, typical forest seasonally flooded by white-water rivers, which are rich in suspended sediments and have a muddy appearance (Prance, 1979). Geochemical analyses indicate that the Branco River is chemically and sedimentologically intermediate between black-water and white-water rivers, representing an exception among the homogeneous black-water group of rivers that forms the Negro River basin (Küchler *et al.*, 2000; Albert and Reis, 2011).

Our distribution survey followed the guidelines for a standardisation of survey methods as recommended by the IUCN/SSC OSG (Groenendijk *et al.*, 2005). In order to increase the probability of detection of giant otter presence, the survey was conducted at the end of the dry season (February-March), when water level is low and the species is restricted to permanent watercourses. Referring to the UTM grid, the survey was planned to cover two squares of 100x100km and three quadrants of 50x50km. In order to provide a more detailed level of information, it also encompassed six sub-quadrants of 25x25km. For the selection of the site to be surveyed in each sub-quadrant we made use of the local knowledge; when it occurred in the proximity of a community, we visited and informed the community leaders about the intent of the survey, requesting permission to visit the area. Navigation on the main rivers was done using a local boat whereas we paddled canoes to explore giant otters' feeding creeks and side channels, consistently maintaining a traveling speed below 10km/hour. At the selected site we



**Figure 1.** Map of the southeast corner of Roraima, indicating the limits of the hydrographic basins of the Branco, Negro, and Jauaperi rivers, and the signs of giant otter presence registered during the survey

actively searched for direct and indirect signs of giant otters, applying the stop-at-first-sign method, that is, halting the survey at the first sign that unquestionably indicated the presence of the species. The location of any clear indicator of giant otter presence was recorded with a GPS (UTM, WGS 84). The expedition focused on three different river basins. In the Jauaperi River basin we navigated and explored the lower part of the river, from the village of Xixuaú to its mouth; on the left margin of the river we surveyed the Aruxaia Creek, and on the right margin the Coxo Stream, after visiting its community. In the Negro River basin we navigated the Parana da Floresta side channel, visited the village of Remanso, and surveyed its watercourse. In the Branco River basin we explored the left margin of the river, from its mouth to north of the Adouau Island; we stopped at the village of Cota and surveyed the Maguari Stream and the Adouau side channel. In total, two black-water rivers (Jauaperi, Negro), one white-water river (Branco), one white-water side channel and five black-water streams were navigated during two weeks,

( $n = 3$ ) and 50% being indirect signs such as campsites, dens or tracks ( $n = 3$ ). The maximum stop-at-first-sign distance registered was 5km. The presence of three cubs, about five months old, was recorded once (Xixuaú). While traveling towards the selected sites one otter group was recorded on the Branco River (Table 1; Figure 1) but no indirect signs of presence were observed.

In order to increase the effectiveness and improve the organization of future surveys, Groenendijk *et al.* (2005) recommend conducting field-testing of the survey methodology standards and guidelines. We tested some features of the Standard Field Survey Techniques for the Giant Otter (SFST-GO), which proved to be accurate and effective. Using the *Keys to identify and age campsites and dens*, a non-expert surveyor, who received basic training before participating in the survey, was able to recognize and age all the giant otter signs encountered, with the exception of scratch walls that were not recognized as a clear sign of presence of the species. The Standard Distribution Survey

totaling a travel distance of 380km. The survey revealed the presence of giant otters in all the basins investigated. All the sub-quadrants were identified as positive (Table 1; Figure 1), 50% of the recorded signs being sightings of individuals

Method for Giant Otter (SDSM-GO) seems appropriate to the conditions in which we have applied it. It proved to be time- and cost-effective, allowing the investigation of a large area (two squares of 100x100km) in a relatively short time