

## SUPPLEMENTARY MATERIAL S2

We quantified the proportion of impervious surface around the stream as a proxy to urbanization around the streams (Hans, McDonnell, 2006; King *et al.*, 2011; Meador, 2020). For this goal we used data on land-use and land-cover categories classified by MapBiomas project (Souza *et al.*, 2020). MapBiomas combines satellite images from Landsat yearly from 1985 to 2019 (Collection 5), classifying different land-use and land-cover categories in Brazil on a pixel basis (30 × 30 m resolution) with a Random-Forest algorithm (Souza *et al.*, 2020). From all the categories available, we used a map with only the urban infrastructure to quantify the extent of urbanization around the streams from Cuiabá in 2017. In this map we had a grid with pixels with urban infrastructures coded with one and zero otherwise. We built a buffer around the coordinates of each stream, then, we summed the number of pixels inside the buffer that had urban infrastructure then divided by buffer area. We calculated the proportion of impervious surface with buffers of different radius (100, 200, 300, 400, 500, 800, 1000, 1500, and 2000 m).

We assessed the influence of using different buffer radius on proportion of impervious surface with a matrix of Pearson correlation ( $r$ ). We considered pairwise proportion of impervious surface with  $r > 0.6$  as high correlated. We also explored visually the overlap among buffer radius in maps and the variability of proportion of impervious surface with boxplots. Finally, we conducted sensitivity analyses changing the proportion of impervious surface estimates in our linear models relating rarefied species richness ( $S_{\text{rarefied}}$ ) and local contribution to beta diversity (LCBD).

We kept our inferences in the proportion of impervious surface with a buffer of 500 m because all buffers were highly correlated ( $r > 0.6$ ; Tab. S2), there were a lower overlap among buffers in this radius than for those buffers with larger sizes (Fig. S3), and this radius presented a less variable proportion of impervious surface compared to buffers with smaller sizes (Fig. S4).

**TABLE S2** | Pearson correlation matrix between proportion of impervious surface estimated with different buffer radius.

Buffer radius (m)	100	200	300	400	500	800	1000	1500
200	0.96							
300	0.90	0.98						
400	0.86	0.94	0.99					
500	0.82	0.91	0.96	0.99				
800	0.75	0.84	0.89	0.94	0.97			
1000	0.72	0.80	0.84	0.89	0.92	0.98		
1500	0.68	0.72	0.75	0.79	0.83	0.91	0.96	
2000	0.66	0.68	0.69	0.74	0.77	0.85	0.90	0.98

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## Neotropical Ichthyology



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