

## Can Pumas protect water sources?

Using habitat selection of an umbrella species to design reserves  
in Southeast Brazil

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Umbrella species are often used to help design reserves for the sake of other species. However, can umbrella species be used to help protect ecosystem services, such as water springs, directly? To measure that, we collected movement data of 13 pumas (*Puma concolor*) every hour from 2016 to 2020, using GPS collars. We then estimated habitat quality for pumas across the Brazilian state of São Paulo, a region

with a heterogeneous mosaic of forests, cattle pastures, and large-scale agriculture. From the habitat quality estimates, we designed an optimal system of reserves for the puma and compared it with an existing system for the protection of riparian forests. Our results show there is extensive agreement between the two goals: a system of ideal reserves for pumas is only 14.7% better at protecting this animal than a system focused in riparian forests of same size. Equally surprising is where this 14.7% difference comes from: the ideal system does not include more forests, the natural habitat pumas are commonly associated in the region. Instead, it includes more sugarcane plantations. While the reason for puma's association with sugarcane is still unknown, these results challenge the notion that better reserves are collections of pristine environments. At the same time, they also show a positive outlook to reserve design. Even diverse conservation goals, such as water supply and carnivore conservation, can be aligned.