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## REVIEW



# The biodiversity of species and their rates of extinction, distribution, and protection

S. L. Pimm<sup>1,†</sup>, C. N. Jenkins<sup>2</sup>, R. Abell<sup>3,†</sup>, T. M. Brooks<sup>4</sup>, J. L. Gittleman<sup>5</sup>, L. N. Joppa<sup>6</sup>, P. H. Raven<sup>7</sup>, C. M. Roberts<sup>8</sup>, J. O. Se...

† See all authors and affiliations

Science 30 May 2014:  
Vol. 344, Issue 6187, 1246752  
DOI: 10.1126/science.1246752

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## RE: Pinocchioland: the role of the Brazilian Amazonian coast in elasmobranch conservation

**Natascha Wosnick**, Research Associate,  
Universidade Federal do Maranhão

Other Contributors:

Ana Rita Onodera Palmeira, Research Associate,  
Universidade Federal do Maranhão

Jorge Luiz Silva Nunes, Professor, Universidade Federal do Maranhão

(29 May 2019)

In a world dictated by fake news, one thing is unarguably true: sharks and batoids are among the most endangered vertebrates worldwide (1). When progress run over conservation, anthropogenic impacts occur in a nightmare-worthy scale and sustainable harvesting seems like distant dream. The Amazonian ecosystems are cradles of life, with high levels of biological diversity and speciation rates (2). However, exploitation in the region have increased at alarming levels and contingency plans are either flawed or non-existent.

In their review, Prim et al. demonstrate the importance of the Amazon coast in terms of richness and endemism, however, the projection considered only freshwater fish (3). The Brazilian Amazon coast is a hotspot for elasmobranch conservation and the status of the Amazonian chondrofauna can be allegorically compared to the story of Pinocchio, the liar doll. In our context, Pinocchios are elasmobranch species that exhibit a prominent snout, and/or a life history affected by overexploitation and possibly irreversible population declines (1).

Further, the Amazonian coast can be compared to the Grand Marionette Theatre, a somber, but still hypnotizing place with a high concentration of endemic/threatened with extinction long-snout species. Besides extinct sawfishes (i.e., *Atlanticopristis* and *Onchopristis*) (4), the region is home for seven extant Pinocchio species (*Fontitrygon colarensis*, *F. geijskesi*, *Isogomphodon oxyrhynchus*, *Pristis pristis*, *P. pectinata*, *Pseudobatos percellens* and *P. lentiginosus*) (5, 6, 7). Still, the occurrence may be underestimated since demersal species, captured only by industrial fleets operating at great depths, may occur in the region.

Their elongated snout, evolutionarily shaped by millions of years to increase sensory capacity, is also their weakness as they get trapped in fishing nets more easily, with high mortality rates even when incidentally caught (8). Point of concern is that, among the species cited, two exhibit extremely

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when incidentally caught (8). Point of concern is that, among the species cited, two exhibit extremely restricted distributions: *F. colarensis* (Vulnerable) and *I. oxyrhynchus* (Critically Endangered) (9, 10). In the past twenty years, alarming population declines have been reported for *I. oxyrhynchus*. However, no conservation measures were adopted, leading the species to a quasi-extinction status (10). Still, although little is known about the biological and ecological aspects of *F. colarensis*, the species is already under threat, with strong fishing pressure that may lead the species to extinction before enough knowledge is generated for the creation of effective management plans.

While Gepetto's Pinocchio achieves his dream of becoming human only after realizing his identity issues, will this Pinocchiofauna achieve the necessary recognition only reaching the brink of extinction? For us, there is only hope that our Pinocchios will eventually find their green fairy and be finally free from the hands of the fire-eater director (aka fishing industry), who does not consider the well-being of his precious puppets but only thinks of his immediate profit. Will our Pinocchios be able to live happily ever after as the troublemaker doll? There is no easy answer but considering the high and still unmonitored commercial harvesting in the region, the future seems obscure and extinction, eminent.

Representative image at: <https://imgur.com/t9nKRxK>

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Competing Interests: None declared.

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Long-snout elasmobranchs (our Pinocchios) overexploited with no management plans in force in an allusion to the puppets trapped in the Grand Marionette Theater (also known as the Brazilian Amazon Coast), a somber but still wonderful place and one of the hotspots for sharks and batoids conservation. [#sharkconservation](#) [#raysneedlovetoo](#) [#endemicspecies](#) [#amazonian\\_sharks](#) [#sharks](#) [#stingray](#) [#flatsharks](#)

