

# More than numbers. The continuous changes on bird diversity: the case of the Yucatan Peninsula Parrots

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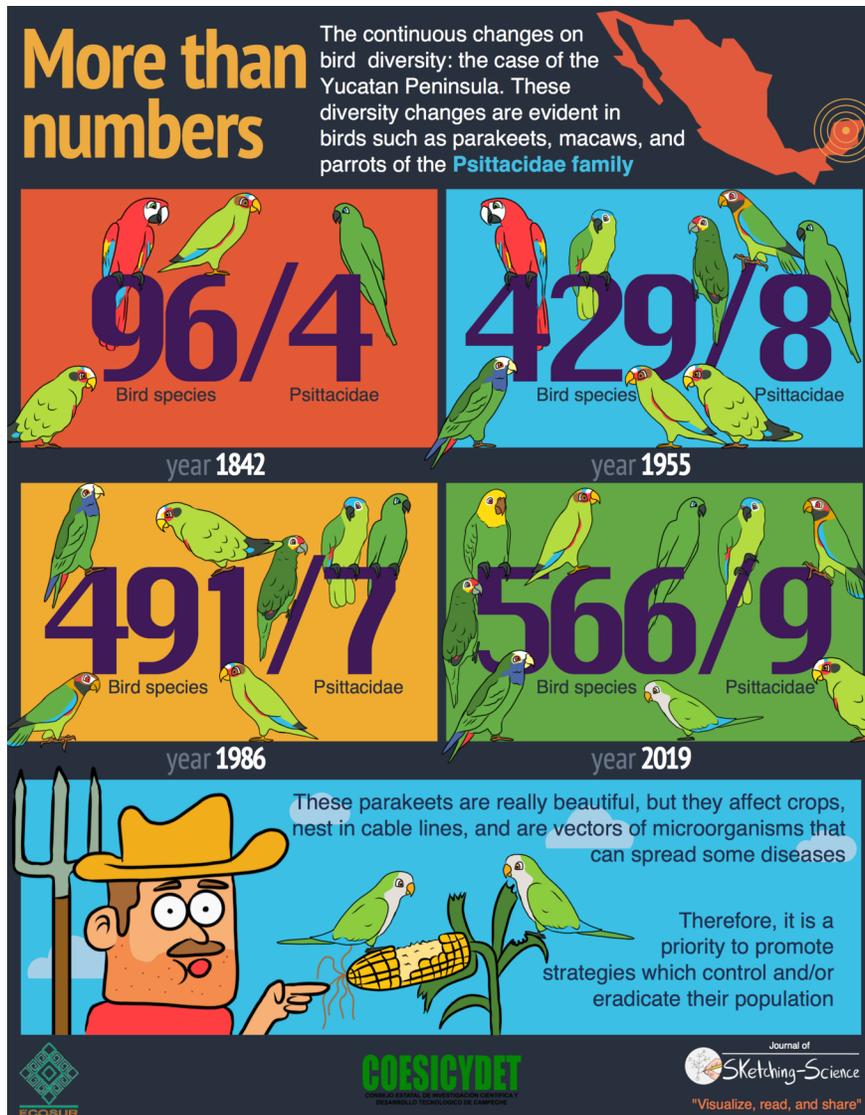
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Preserving biodiversity is difficult for many reasons. Biodiversity is complex and changing, and also includes all hierarchical levels ranging from genes to ecosystems. Furthermore, it is complicated to include all the ecological and evolutionary processes in which biodiversity participates, making it unmanageable to conserve it all. However, we need to know the basic aspects of biodiversity such as: where it is, and what it is doing in those spaces. Simultaneously, the work of conservation biologists is to identify which of the “apocalypse riders”, or man-made factors, are affecting biodiversity at different points in time and space, and suggest actions to counteract or diminish their effects. The riders of the apocalypse are the loss of habitats, fragmentation, illegal hunting/trafficking, pollution, climate change, and dispersion of alien invasive species.

At the beginning of any distributional study, things seem simple, and one begins only by counting species and individuals, or any biodiversity level. However, when we include size scales of time, space, and the factors that determine the distributions of those species, the overview becomes more complex. To illustrate these changes, we considered taking one of the most charismatic groups of birds that inhabit the planet: the “parakeets, macaws & parrots” of the Psittacidae family.

Mexico harbors 22 species of Psittacines whose populations struggle to survive due to pet trafficking, and the destruction/fragmentation of tropical and temperate forests where they live <sup>1 2</sup>. In the Yucatan Peninsula before the 1980s, only eight species had been recorded: Scarlet Macaw (*Ara macao*), Olive-throated Parakeet (*Eupsittula nana*), Brown-hooded Parrot (*Pyrilia haematotis*), White-crowned Parrot (*Pionus senilis*), White-fronted Parrot (*Amazona albifrons*), Yellow-lored Parrot (*A. xantholora*), Red-lored Parrot (*A. autumnalis*), and Mealy Parrot (*A. farinosa*). In 2001, the Red Macaw was considered extinct due to the pet trade <sup>3 4</sup>. However, a few years later during 2002-2003 explorations in the most extreme and wettest region of Campeche, the Yellow-headed Parrot (*A. oratrix*) was added to the species list <sup>5</sup> and during 2014, birdwatchers reported the Monk Parakeet (*Myiopsitta monachus*) in Ciudad del Carmen, Campeche. Thus, two species were added but we lost the largest species.

Does species richness has increased? In reality, the number of species shows that more places and people are interested in recording bird species. Also, there is no significant difference in species richness locally. Instead, its composition differs (*i.e.*, the kind of species and their abundance changes). On the other hand, should we be happy to have new species even if it is exotic? There are habitat generalists such as the White-fronted Parrot, whose populations are exponentially growing in the Yucatan Peninsula. While the Mealy Parrot, whose populations survive in the largest tropical forest fragments, is becoming rarer (Plasencia-Vázquez et



al. 2017)<sup>6</sup>. Therefore, although numbers are significant, it is equally important to know what those numbers represent.

If you have a Monk Parakeet , keep it at home!

## Contributions

- Griselda Escalona Segura wrote and edited the article. She is a researcher at El Colegio de la Frontera Sur in Campeche, Mexico. Her work focus on animal distribution and conservation. <https://www.ecosur.mx/academico/gescalon/>
- Alexis Herminio Plasencia-Vázquez wrote the article. He is a professor and researcher of the Department of Archeology, Ethnohistory and Human Ecology, Center of Historical and Social Studies of the Center of Historical and Social Studies, Autonomous University of Campeche. <http://uacam.academia.edu/AlexisHerminioPlasenciaV%C3%A1zquez>

- Lauren Nelson edited the article. Lauren is a Ph.D. student at Newcastle University (UK), researching computational drug design alongside the Northern Institute for Cancer Research. Lauren also writes a scientific blog, bringing science to the masses. (Twitter ([@ashortscientist](#)); Facebook ([@ashortscientist](#)); Instagram ([@ashortscientist](#)); Blog: [ashortscientist.wordpress.com](#)).
- Ernesto Llamas made the illustrations. He obtained his Ph.D. in Biotechnology from Universitat de Barcelona doing his research at the Centre for Research in Agricultural Genomics. Creator, editor, and illustrator of Sketching Science. (Twitter [@neto\\_flames](#); Instagram [@ellamas](#)).

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