

Explaining the Amazon Tipping Point - and why we should care

Leonardo de Sousa Miranda

Senior Research Associate

Lancaster Environment Centre

Explaining the Amazon Tipping Point - and why we should care

Agenda

- What is biodiversity and what are its contributions to people?
- Land use, climate change, biodiversity loss and tipping points
- What is science doing?
- What were Bruno Pereira and Dom Philips trying to do? (...and did)
- What can we do?

What is biodiversity?

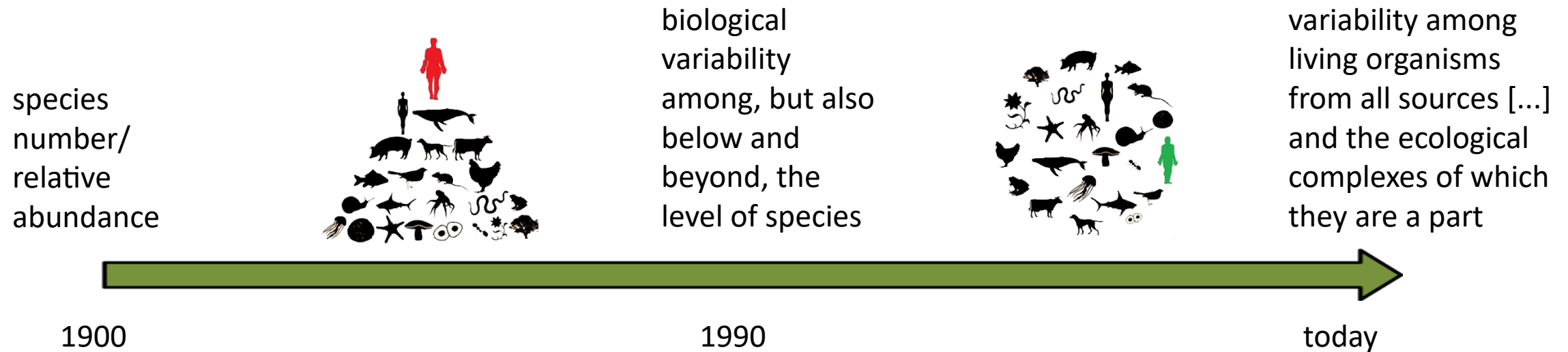


What is biodiversity?

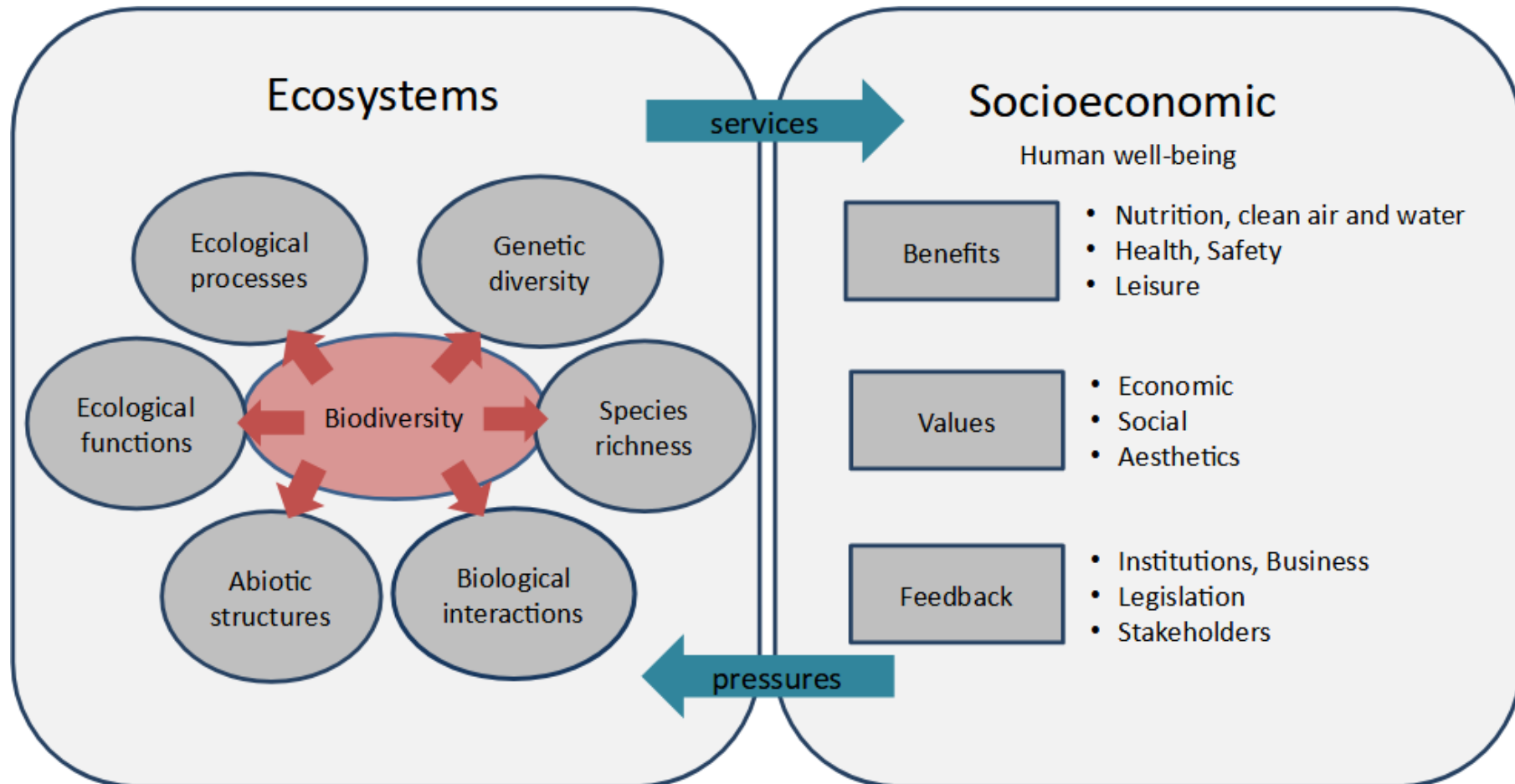


What is biodiversity?

The Meaning of Biodiversity Has Changed Over Time



What is biodiversity?



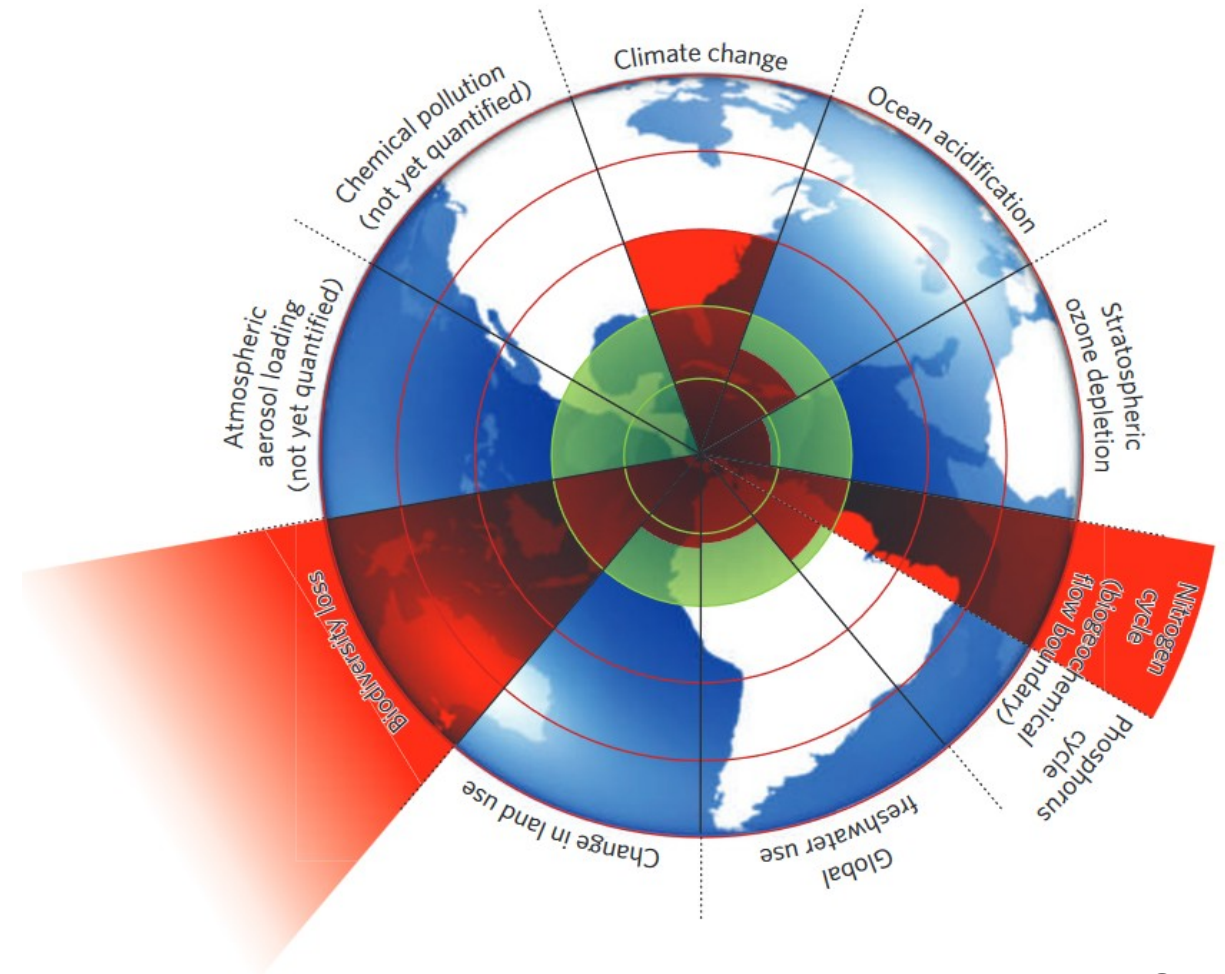
What is the limit?



What is the limit?

Beyond the boundary

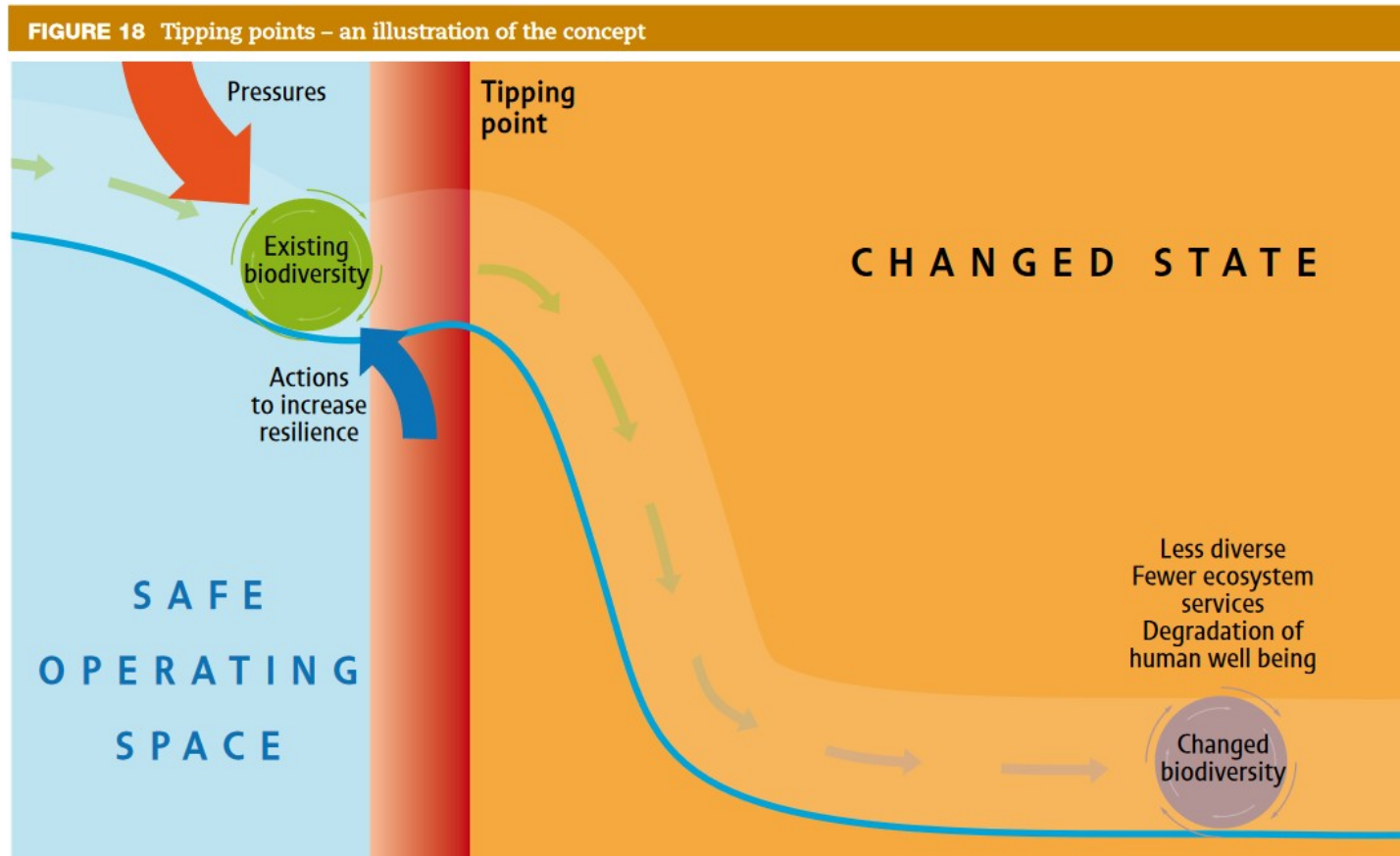
- The inner green shading represents the proposed safe operating
- The red wedges represent an estimate of the current position for each variable



What is the limit?

PLANETARY BOUNDARIES				
Earth-system process	Parameters	Proposed boundary	Current status	Pre-industrial value
Climate change	(i) Atmospheric carbon dioxide concentration (parts per million by volume)	350	387 415	280
	(ii) Change in radiative forcing (watts per metre squared)	1	1.5	0
Rate of biodiversity loss	Extinction rate (number of species per million species per year)	10	>100	0.1-1

What is the limit?

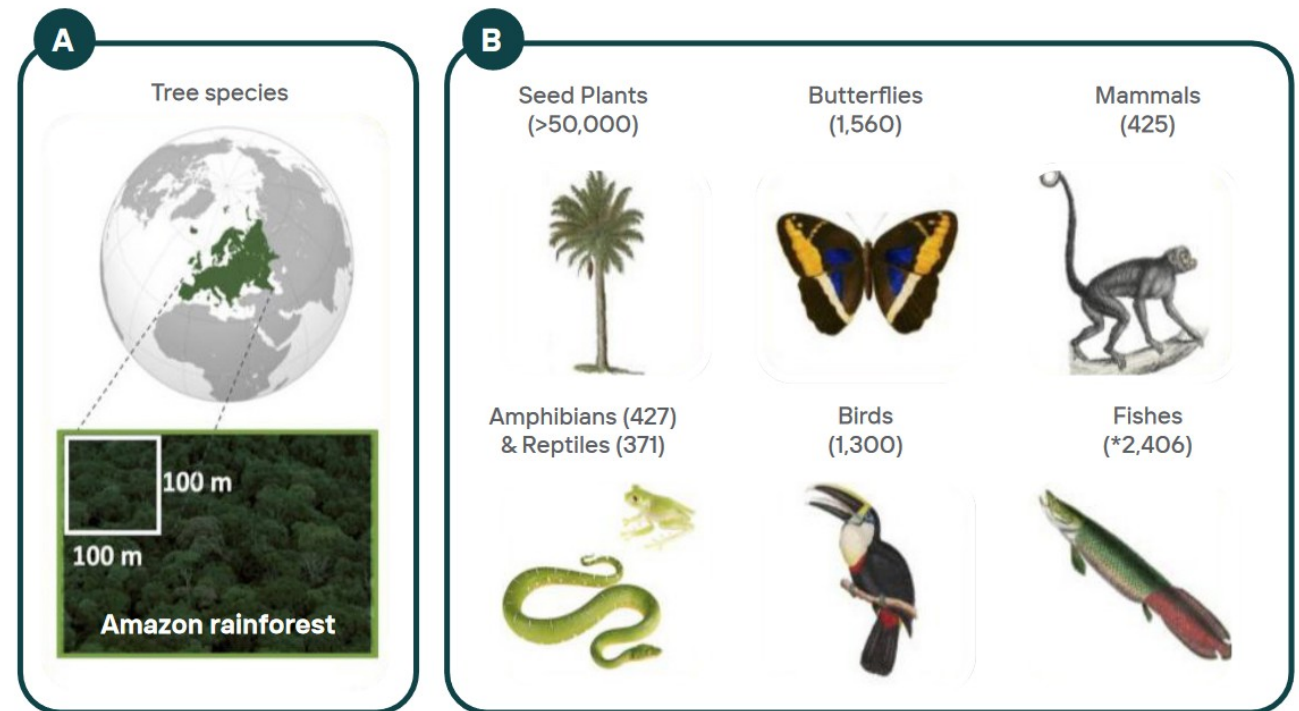


What about the Amazon?



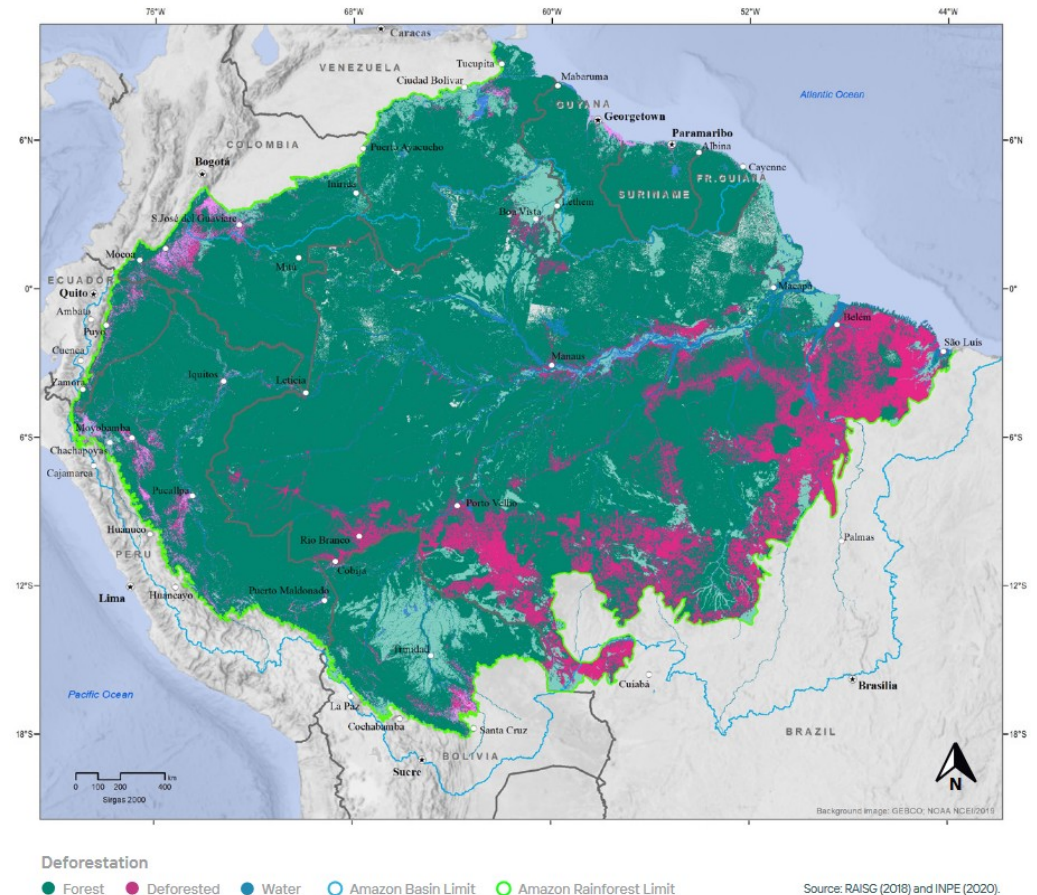
What about the Amazon?

- 150-200 billion tons of **carbon** stored
- An important source of **water and moisture** for ecosystems beyond the basin itself
- Scientists have not been able to estimate **the number of species** in the Amazon



What about the Amazon?

- **18% have been converted to other land uses**
- **17% have been degraded**
- **Unsustainable extraction** model has accelerated deforestation, environmental degradation, and biodiversity loss



What about the Amazon? -- Science

PLOS ONE

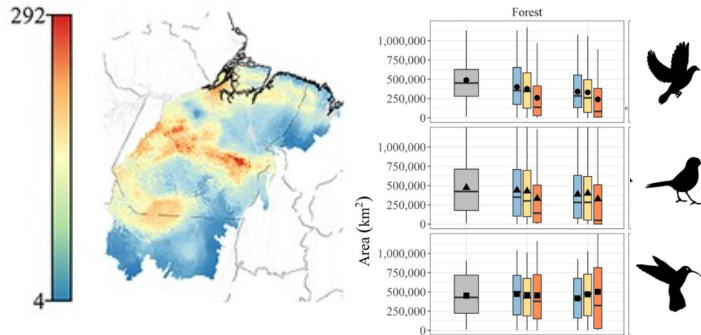
RESEARCH ARTICLE

Climate change impact on ecosystem functions provided by birds in southeastern Amazonia

Leonardo S. Miranda^{1*}, Vera L. Imperatriz-Fonseca¹, Tereza C. Giannini^{1,2}

¹ Instituto Tecnológico Vale, Belém, Pará, Brazil, ² Universidade Federal do Pará, Belém, Pará, Brazil

* leonardo.miranda@pq.itv.org



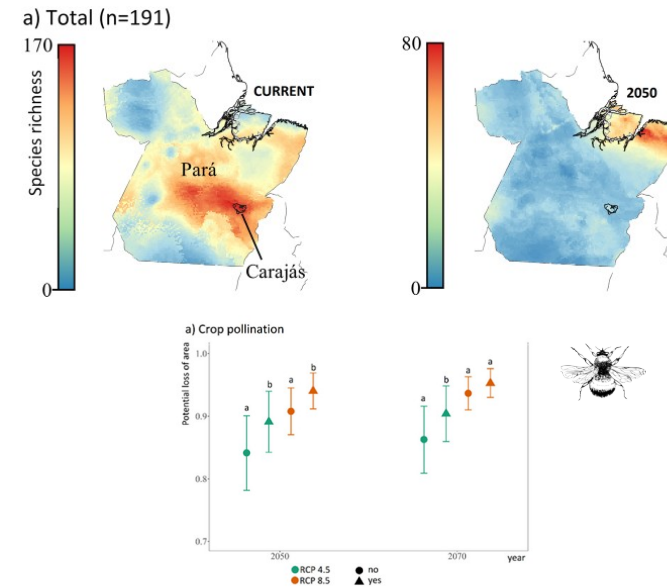
Regional Environmental Change (2020) 20: 9
<https://doi.org/10.1007/s10113-020-01611-y>

ORIGINAL ARTICLE



Climate change in the Eastern Amazon: crop-pollinator and occurrence-restricted bees are potentially more affected

Tereza Cristina Giannini^{1,2}, Wilian França Costa^{1,3,4}, Rafael Cabral Borges^{1,2}, Leonardo Miranda¹, Claudia Priscila Wanzeler da Costa¹, Antonio Mauro Saraiva³, Vera Lucia Imperatriz Fonseca¹



Biological Conservation 257 (2021) 109148



Contents lists available at ScienceDirect

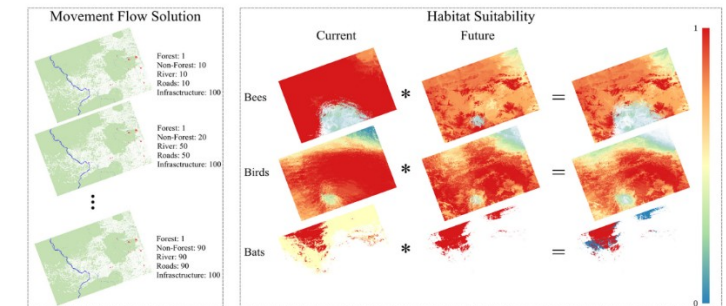
Biological Conservation

journal homepage: www.elsevier.com/locate/biocon



Combining connectivity and species distribution modeling to define conservation and restoration priorities for multiple species: A case study in the eastern Amazon

Leonardo de Sousa Miranda^{a,b,*}, Marcelo Awade^a, Rodolfo Jaffé^a, Wilian França Costa^a, Leonardo Carreira Trevelin^a, Rafael Cabral Borges^{a,c}, Rafael Melo de Brito^a, Leandro Reverberi Tambosi^a, Tereza Cristina Giannini^{a,c}

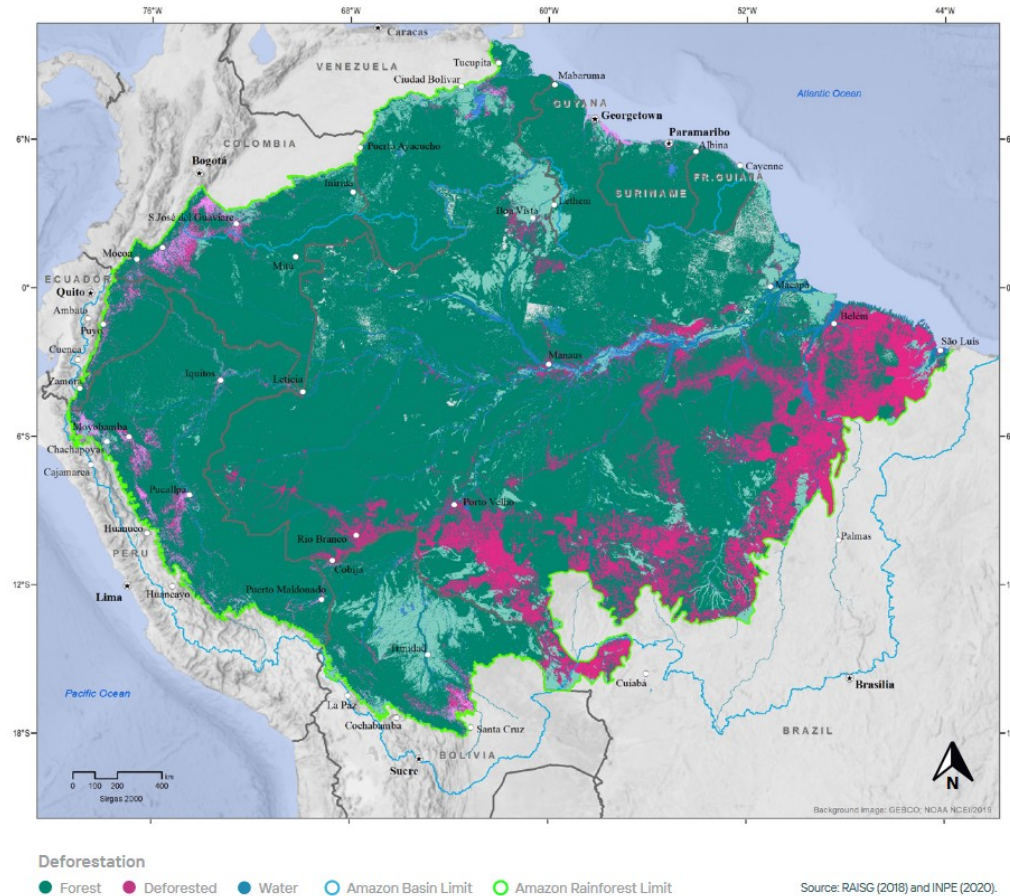


What about the Amazon? -- Science

Achieve zero deforestation by 2030

Avoiding forest degradation

Sustainable restoration of degraded farmland



Restoring forests in protected areas

Restoring forests in undesignated lands

Restoring forests that have been cleared above the legal allowance on private lands

Restoring forest cover beyond legal compliance

What about the Amazon? -- Activism

- BP trained members of indigenous and traditional communities in territory **surveillance** and reporting hunting, logging, fishing, mining and drug trafficking
- DP brought **environmental and Amazon issues to the pages of newspapers** such as The Guardian, and was collecting material and doing interviews for a book on problems and solutions for the Amazon (How to save the Amazon).



Photos: xxx [upper left]
xxx [upper right]
Joao Laet/AFP/Getty Images [bottom left]
xxx [bottom right]

What about the Amazon? -- People



Photo: Antonio Augusto/Ascom/TSE

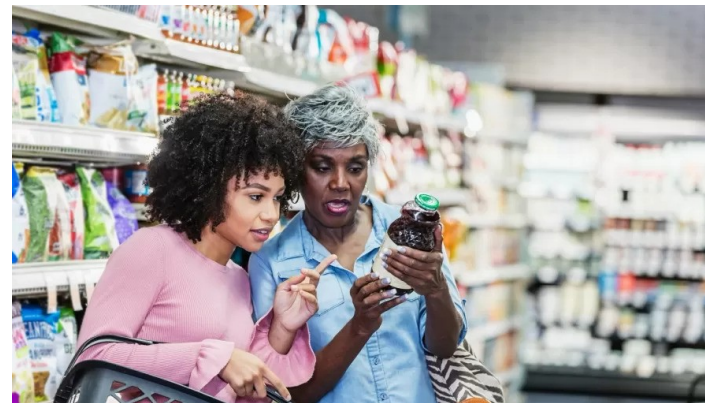


Photo: iStock



Photo: Markus Spiske/Unsplash [upper left]
Tania Malréchauffé/Unsplash [bottom left]
Mika Baumeister/Unsplash [right]

Thank you for attending,
any questions?