

Endemic and endangered bird species in the Brazilian Atlantic forest: conservation actions directed to local impacts and effects of climate changes



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Acknowledgments

- CEPF, Petrobrás, FAPERJ, CCB (CI)
- IBAMA, CEMAVE, INEA
- Proprietários que permitiram a realização de inventários em suas terras
- Conservação Internacional, Fundação Biodiversitas, SOS Mata Atlântica
- Luiz Paulo de Souza Pinto e Ivana Lamas (Aliança pela Mata Atlântica)
- CNPq, Prociência – UERJ e PósDoc - PDJ
- SERLA, FEEMA, IBGE
- Prefeituras Municipais
- Pesquisadores – Consulta Ampla e Workshop
- Idea Wild
- Movimento Ambiental Pingo D'água
- Lab. Ecologia de Aves, UERJ

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BRAZIL – 1,825 bird spp.

ATLANTIC FOREST

- ca. 1,000 spp., representing about 10% of the World s birds, of which more than 200 endemic
- high no. threatened birds (~100, ~80% total endangered in Brazil), placing this biome among the most worrisome of the biodiversity hotspots
- worst situation in NE – Alagoas and Pernambuco: forest fragmented and replaced by sugar cane, occurrence of one of the last rarest birds Alagoas Foliage-gleaner, *Phylidor novaesi* (CR- Estação Ecológica do Murici e Serra do Urubu)
- high no. threatened spp. in SE - Rio de Janeiro (82)* one sp. endemic of restinga and state: Restinga Antwren, *Formicivora littoralis* (CR – Saquarema to Búzios)



Two bird studies

- First – Focused on the 216 endemic and/or threatened of a total 740 birds that occur in Rio de Janeiro state
- Second - Focused on predicting the possible impacts of climate change to 129 birds that are endemic to the Atlantic forest as a whole.

Rio de Janeiro State

Estratégias e ações
para a conservação
da biodiversidade no
Estado do Rio de Janeiro



Organizadores:

Helena G. Bergallo – UERJ/Biomás

Elaine Cristina C. Fidalgo - Embrapa Solos

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Marco Antônio Santos - Fundação CIDE

Thomaz Corrêa C. Costa – Embrapa Milho Sorgo

Antônio Carlos R. Cozzolino - Fundação CIDE

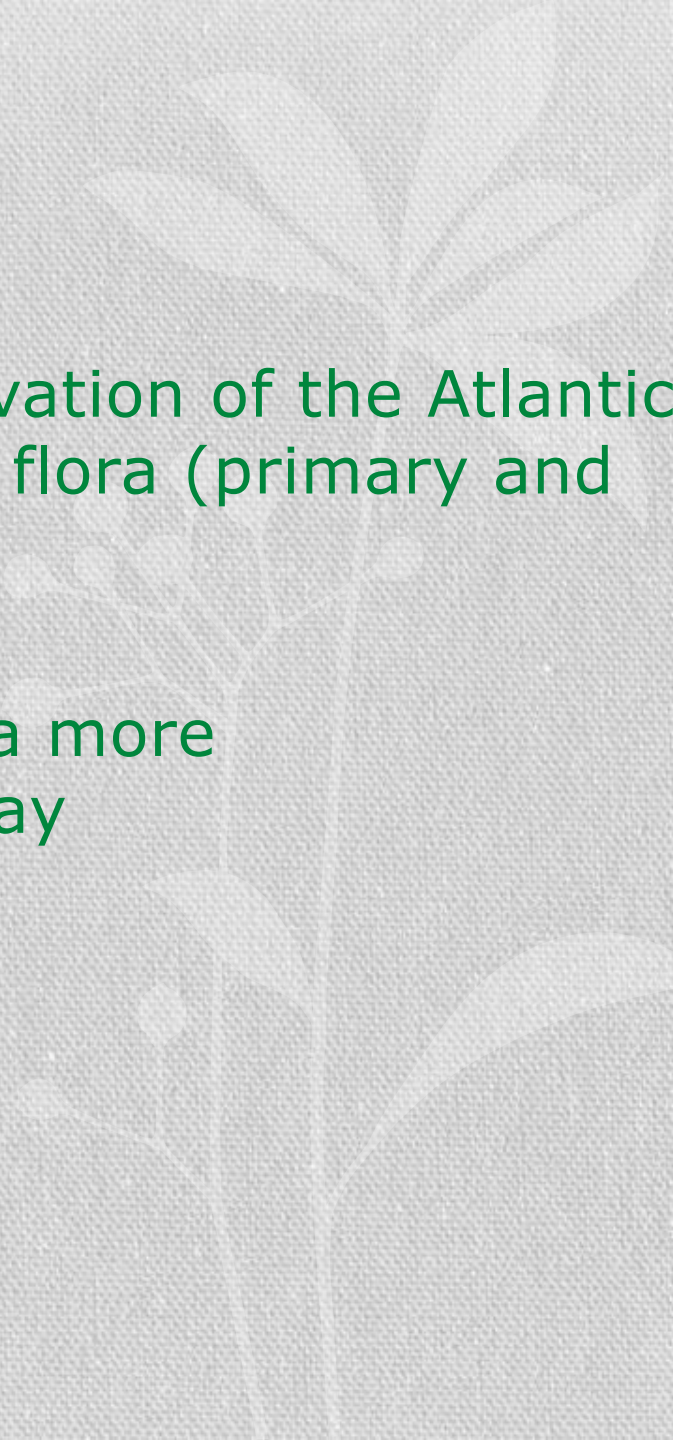
OBJETIVOS:

Conservar a biodiversidade da fauna e da flora da Mata Atlântica,

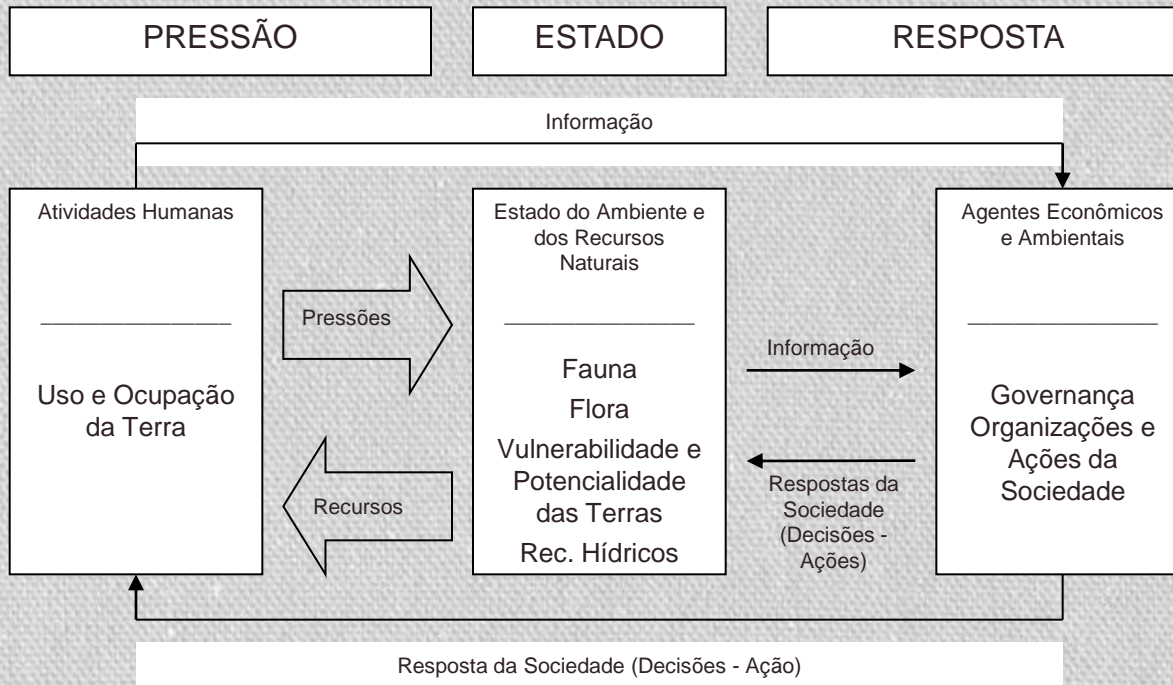
Subsidiar ações para a criação de conectividade entre remanescentes e a recomposição de áreas de floresta,

Subsidiar com dados o estabelecimento de novas UCs e a implementação efetivas daquelas já existentes,

Subsidiar as diretrizes para um apropriado uso do solo

- 
- Strategies developed to conservation of the Atlantic forest were based in fauna and flora (primary and secondary data – Data Base)
 - Analysis of current scenario in a more comprehensive and systemic way (biotic+phistic+socio-economic)

Estratégia de análise



Estado
Resposta
Pressão
↓
situação atual dos
fragmentos florestais
em resposta às
pressões principais
antropicas a que
estão sujeitos os
remanescentes
fragmentos

Modelo Pressão-Estado-Resposta.

Fonte: Adaptado de OECD (1994), p. 11.

Impacts for birds in terms of biodiversity conservation

- Habitat destruction and poaching
- Lack of knowledge (lack of sampling)
- Gaps: semideciduous forests
- Exotic and invasive spp. – they can ↓ pop. of native spp., particularly endemics and endangered with restricted distribution
- Climate changes



Foto: Thiago da Silva Laurindo

Impacts for Birds in terms of biodiversity conservation

- Extraction (“extrativismo”) - spp. of comercial demand
ex. palm tree - ↓ populations of large frugivores,
particularly cracids. Black-fronted Piping-guan, *Pipile jacutinga* – Ex. reintroduction in REGUA (Christine Bernardo)
- Slumming (“Favelização”) – it can lead to the extraction, capture for trade and illegal poaching. Futhermore, it is a remarkable factor of destruction and degradation of habitat

Processos ecológicos e a conservação das aves

- Migration - important in lowland and montane areas (Alves, 2007*): hummingbirds, flycatchers and emberezids; include movements by frugivorous, short and apparently arising from availability of fruits. Obs. w/ Black-fronted Piping-guan *Pipile jacutinga*, (En, PEx in RJ state – palm tree frutification: fruits ripen earlier in lowland altitudes (Sick, 1997)
- Importance for effective strategies for spp., and endemic and endangered as they may depend on resources found throughout the year, in areas with different altitudes.

* Alves 2007. [Revista Brasileira de Ornitologia](#) 15: 243-250.

Actions for birds conservation

- Expand knowledge in areas with gaps in information (interior – Semideciduous forest [Floresta Estacional Semidecidual])
- Research on distribution, taxonomy and ecology of species, particularly endemic of Rio de Janeiro state
- Inventories and research efforts directed – priority for spp. with almost no knowledge (ex. Kinglet *Calyptura Calyptura cristata*)
- Much of the endemic and endangered spp. in RJ state is not sufficiently or effectively protected in Ucs with comprehensive protection (“Ucs de proteção integral - PI”)

Actions for birds conservation

Lowland forests (“Matas de Baixada”) – the creation of UC of comprehensive protection or encouraging the creation of private reserves (RPPNs) for spp. protection

Forests of fog (“Florestas de Neblina”) – transformation of the APA da Serra da Caledônia in UC PI, to preserve spp. restricted to this environment; in this case easily accesible by humans

ex. Grey-winged Cotinga, *Tijuca condita**



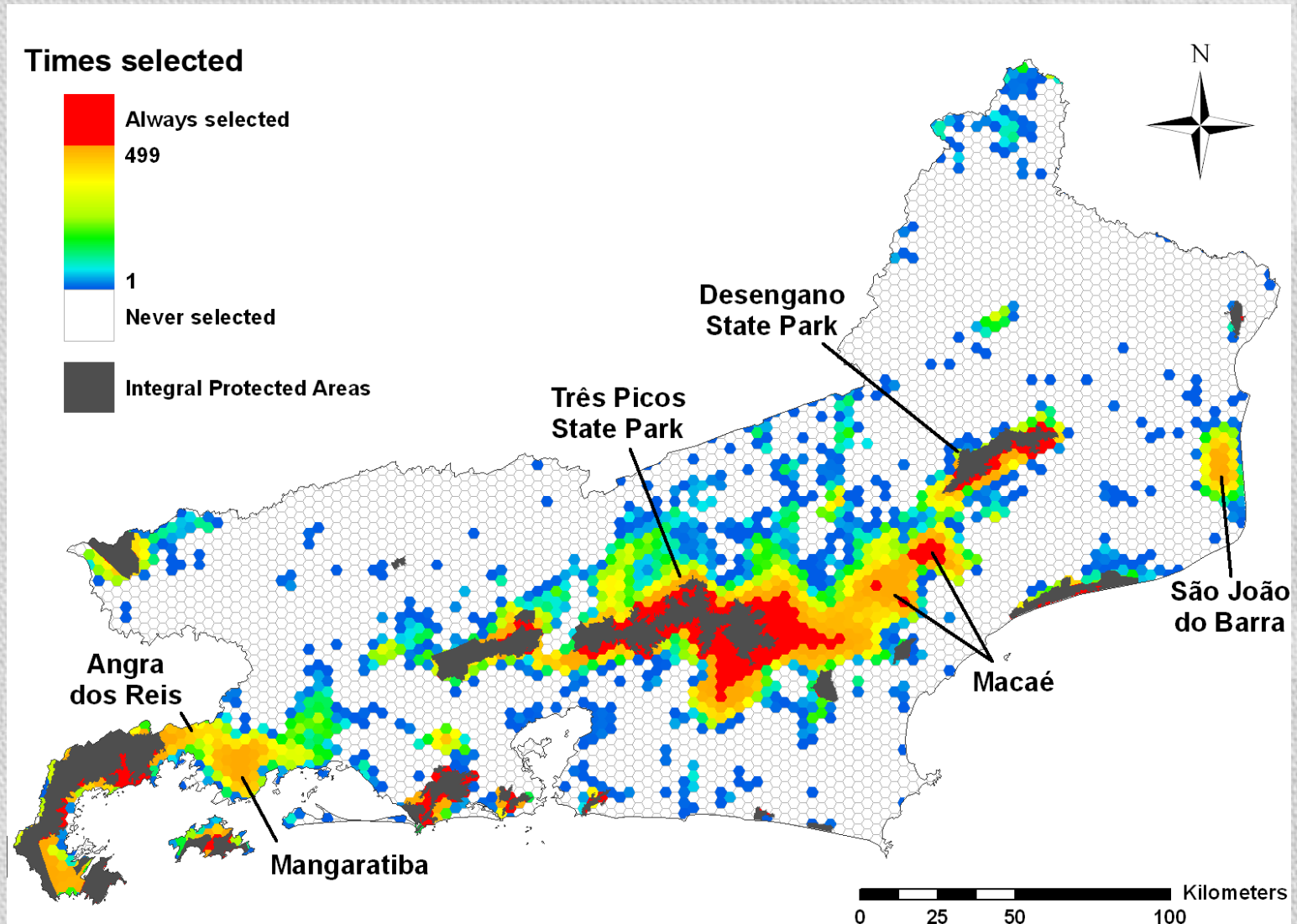
Michael de L. Brooke

Alves et al. 2009. Mapping and exploring the distribution of the Vulnerable grey-winged cotinga *Tijuca condita*. [Fauna & Flora International](#), *Oryx*, 42(4), 562–566

Actions for birds conservation

- Expand areas already established as protected areas
- Expand the area of Parque Estadual dos Três Picos (PETP), to include the Santo Aleixo (Magé), is critical to protecting The Rio de Janeiro Antwren, *Myrmotherula fluminensis*
- Expand the possibilities of connections between fragments
- Around REBIO União – construction of corridors will allow connectivity between this UC and APA de Macaé de Cima, APA da Bacia do Rio São João/Golden Lion Tamarin and PETP
- Dissemination of research: academia, civil society and responsible decision making. Environmental education activities.

APs

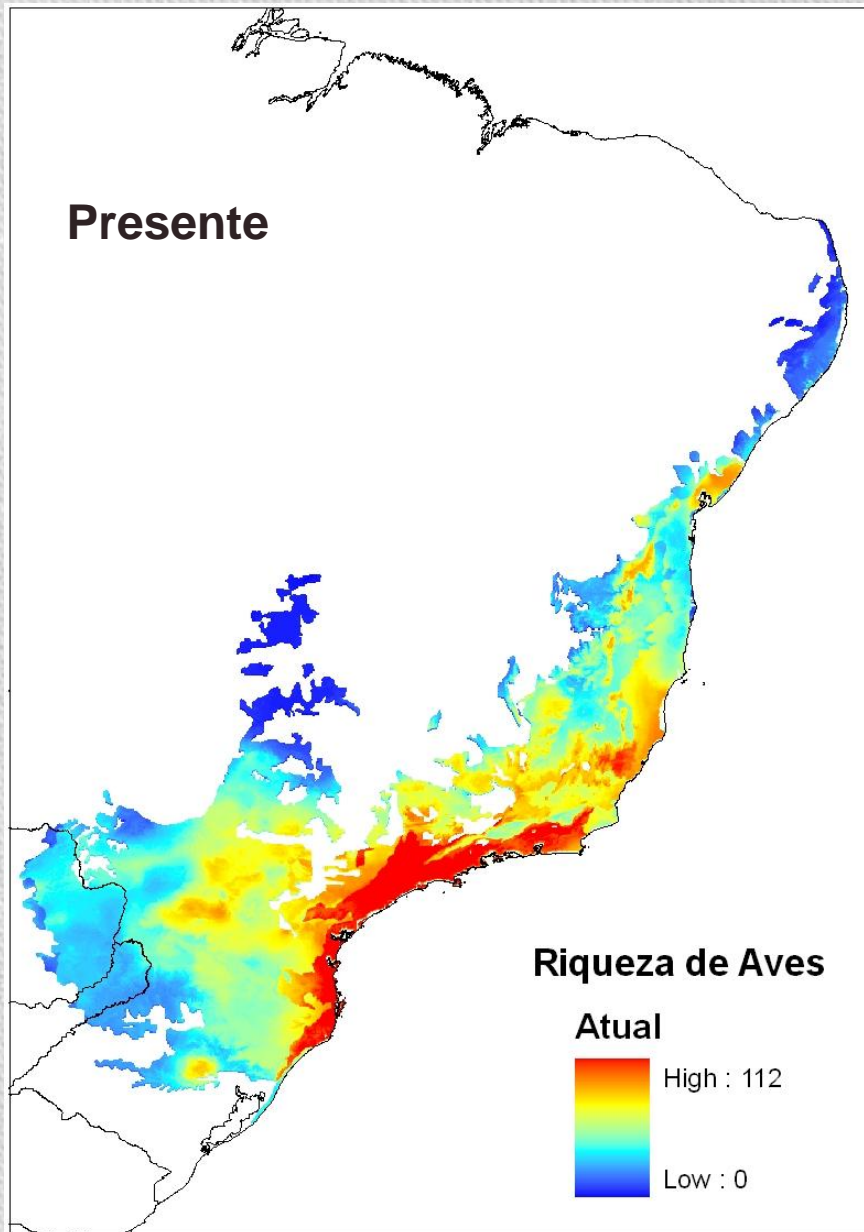


Jenkins, CJ, MAS Alves, SL Pimm. 2010. Avian conservation priorities in a top-ranked biodiversity hotspot. **Biological Conservation** 143: 992-998.

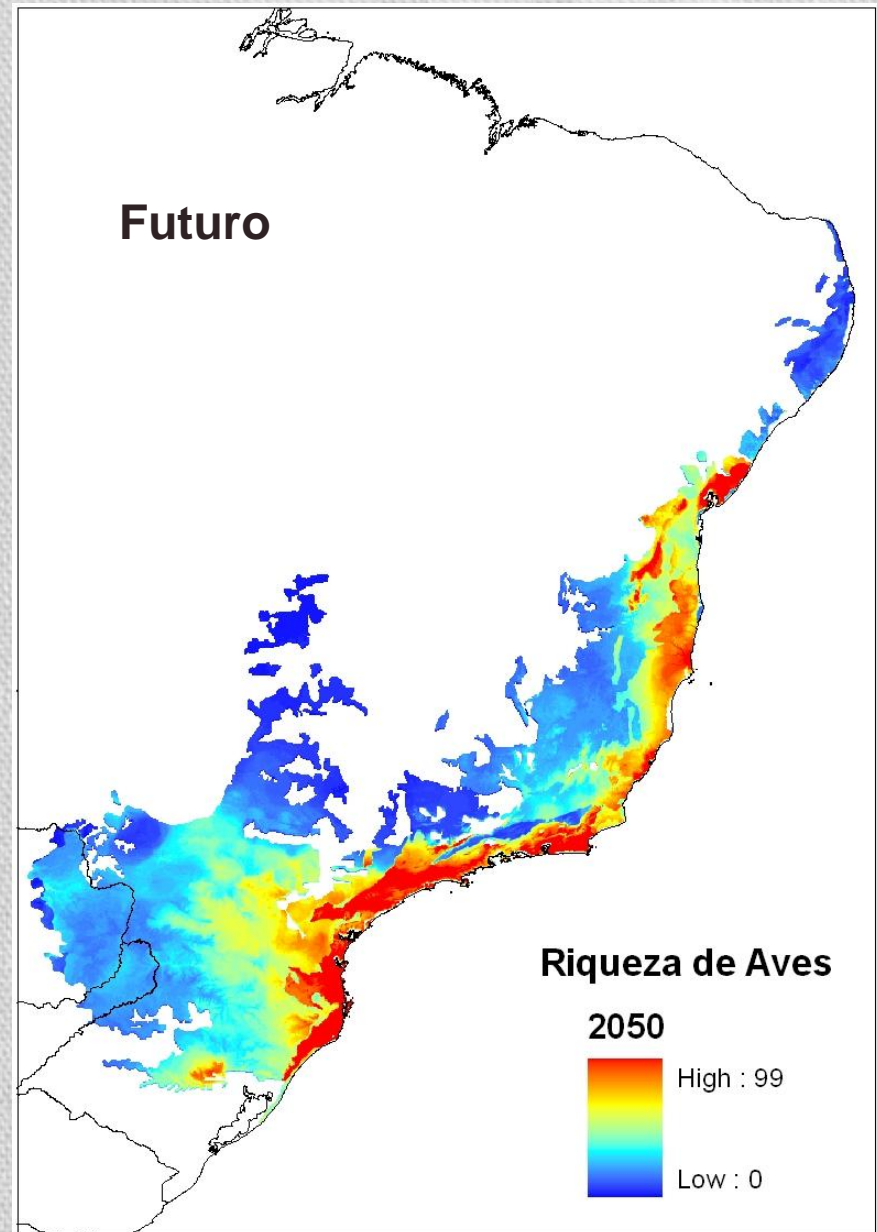
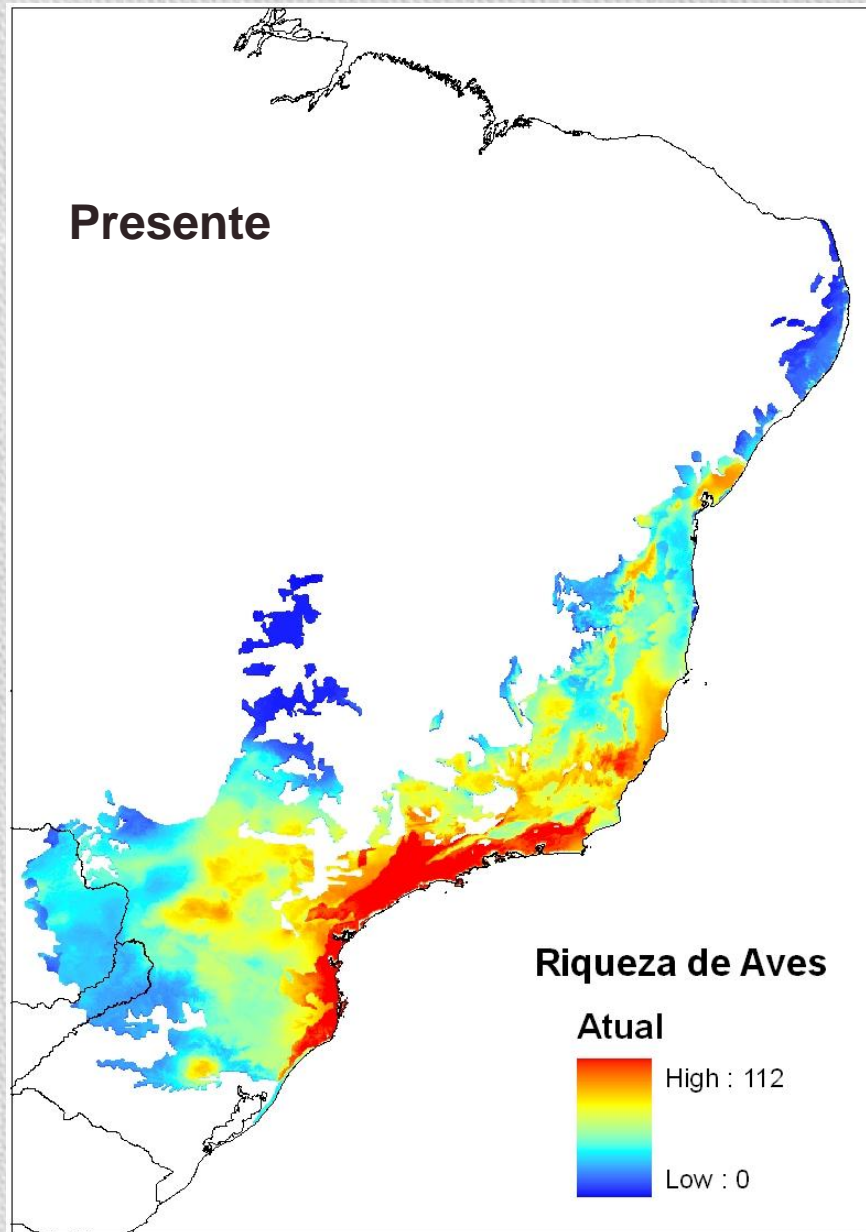
Distribution modelling in a climate change scenario

- Atlantic Forest
- 129 endemic birds
- 6 climatic variables, ecoregions, altitude
- Present vs. Future (2050)
 - A2a emission scenario
 - HadCM3
- MaxEnt distribution modelling

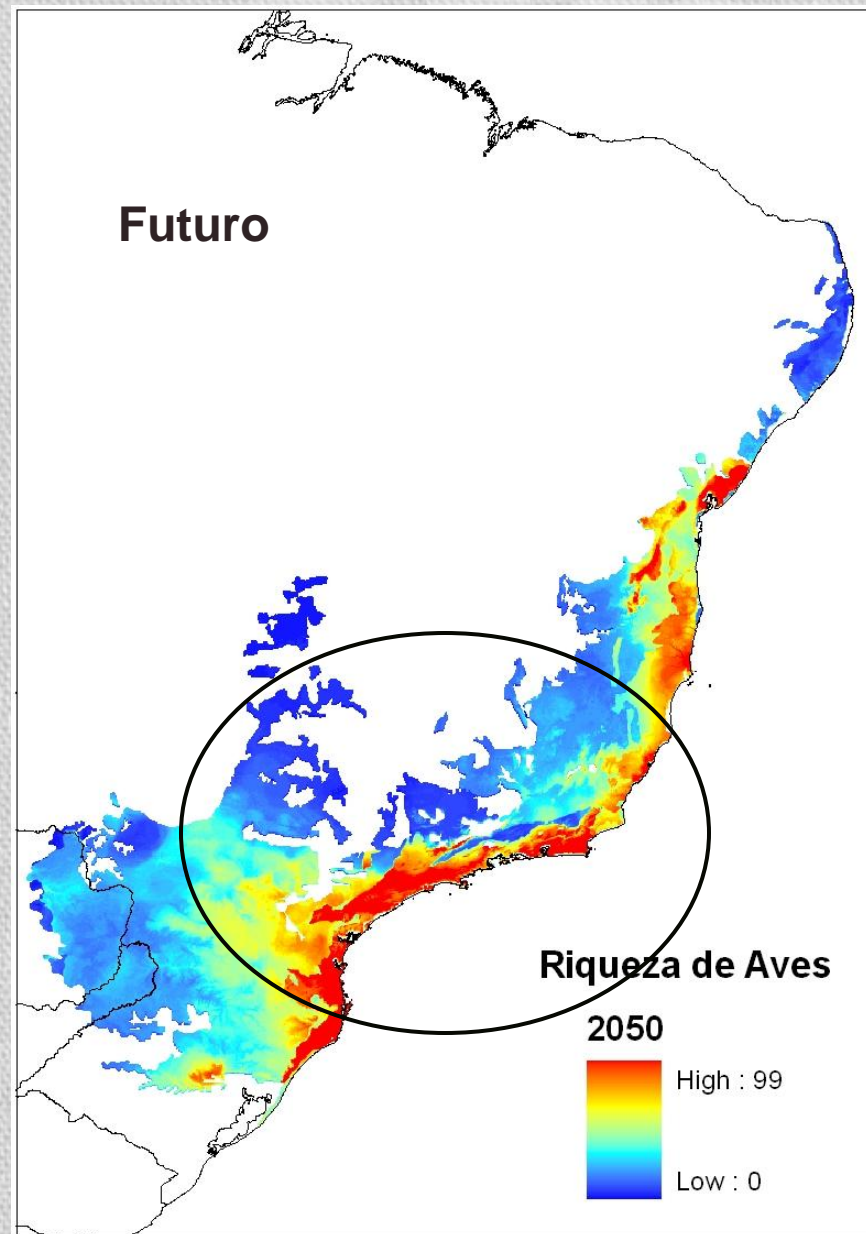
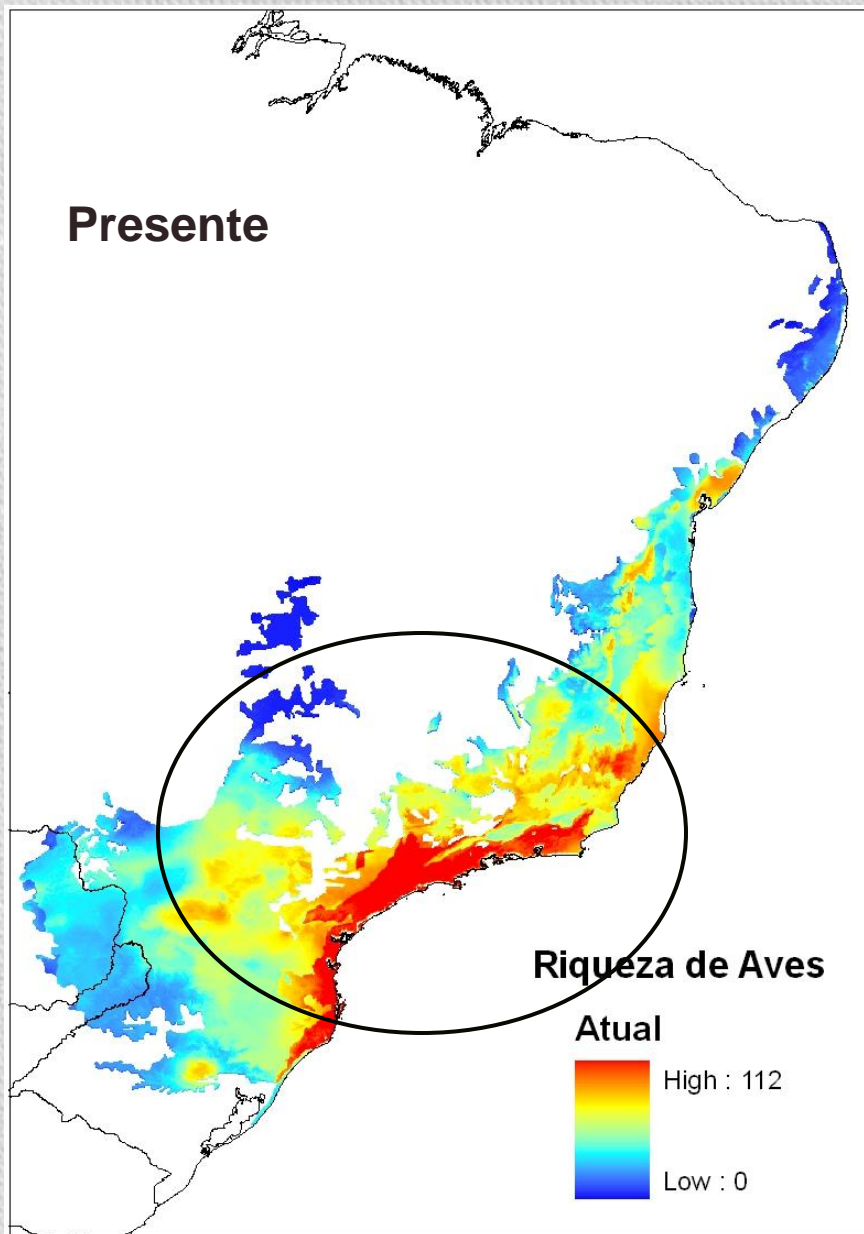
Richness of Atlantic Forest endemics



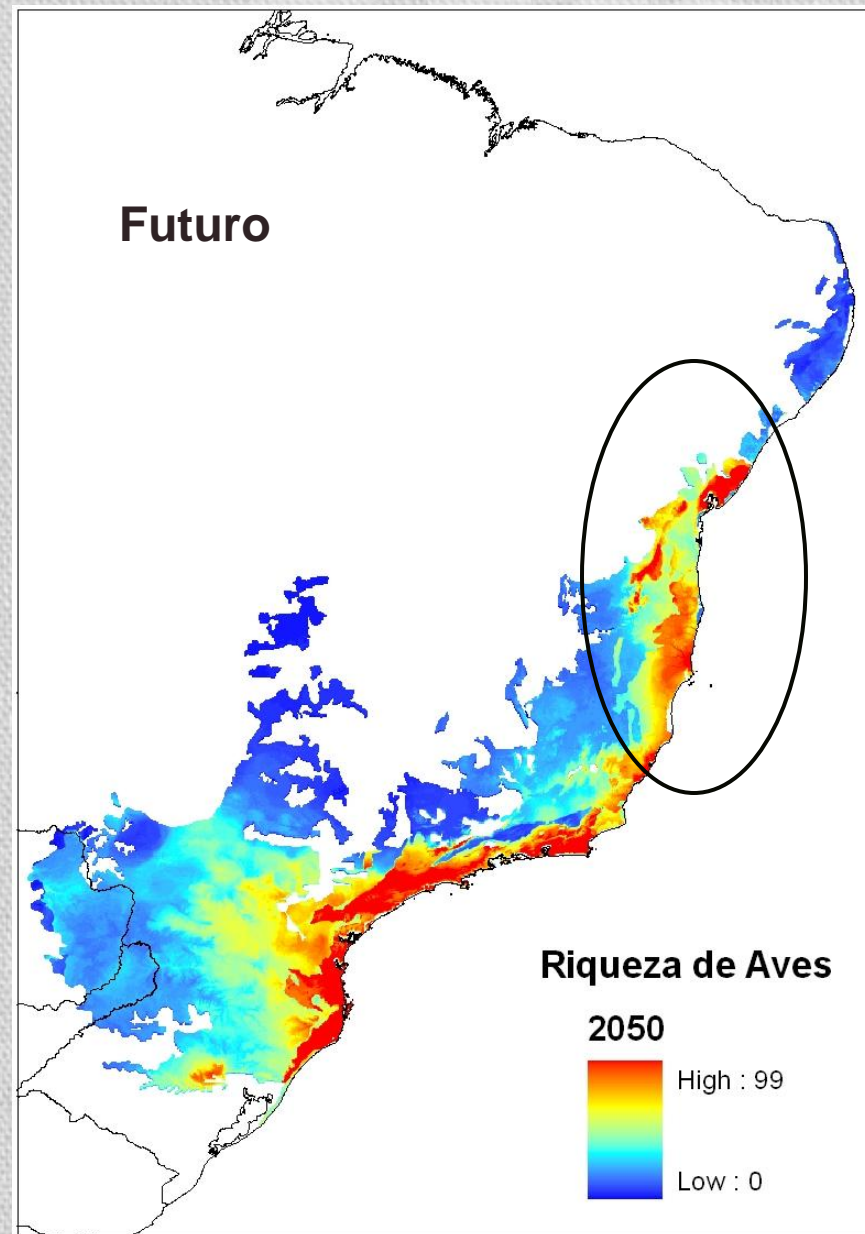
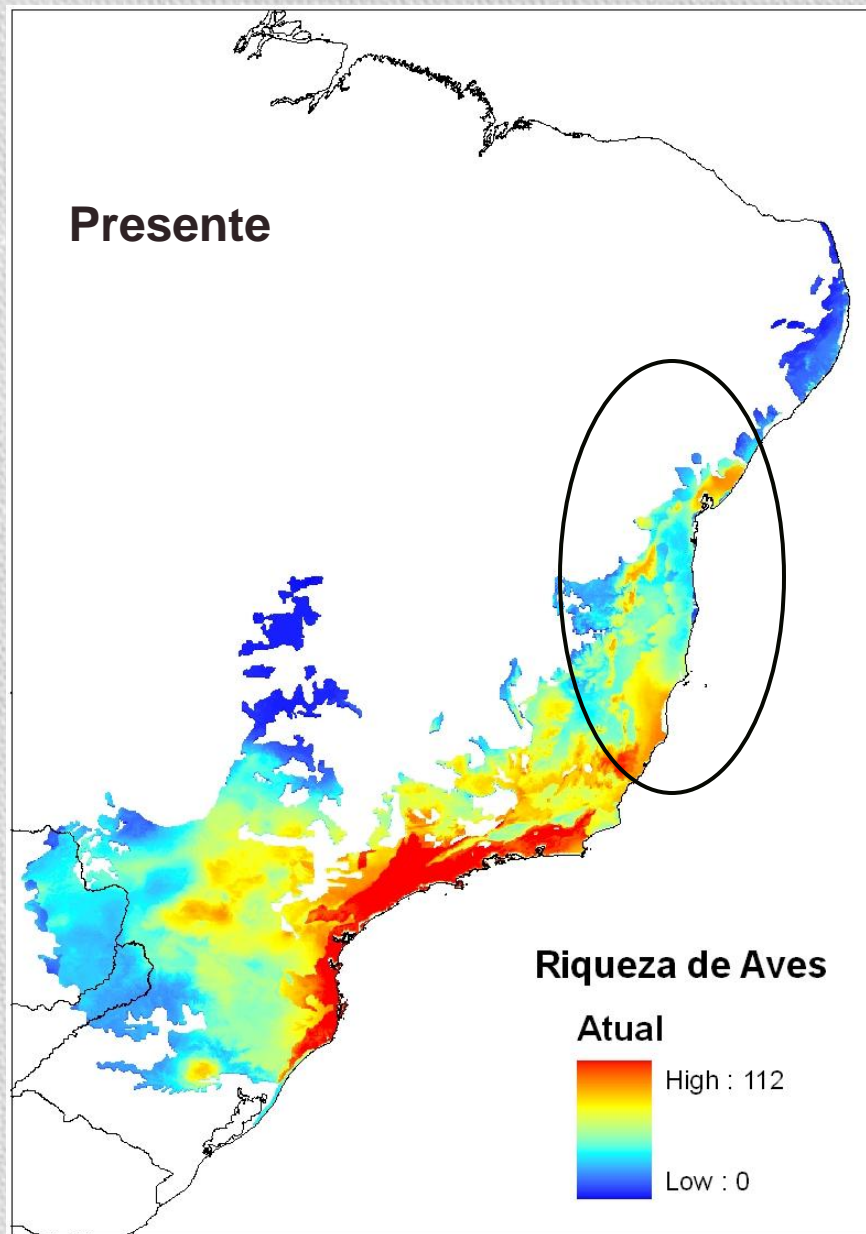
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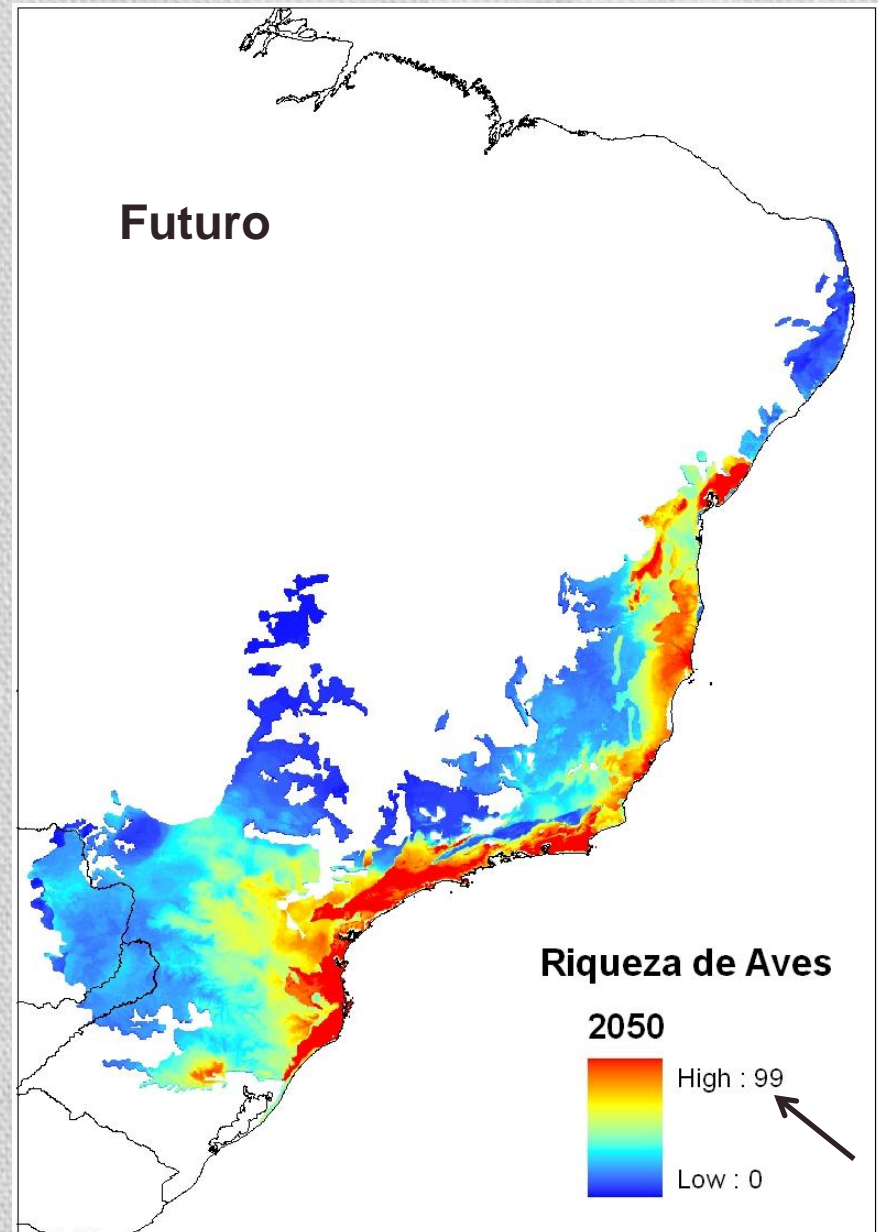
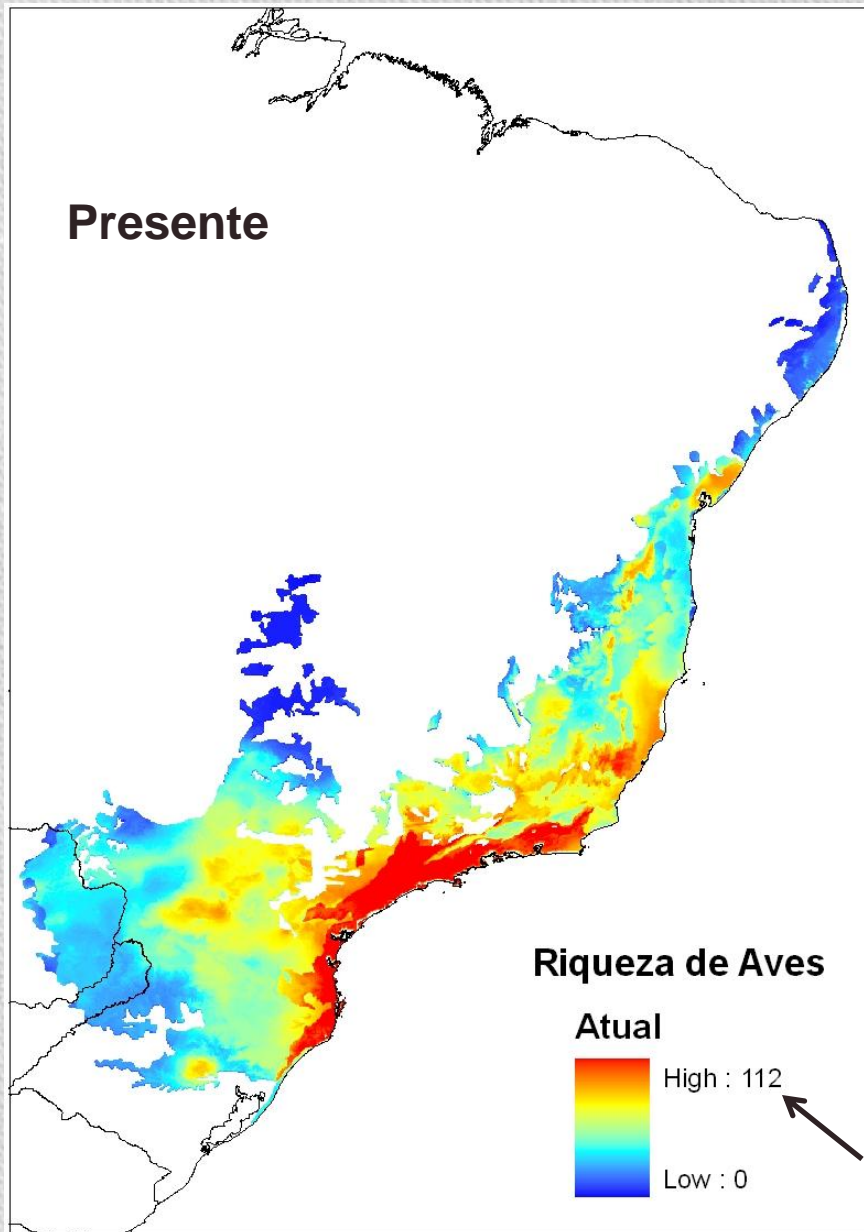
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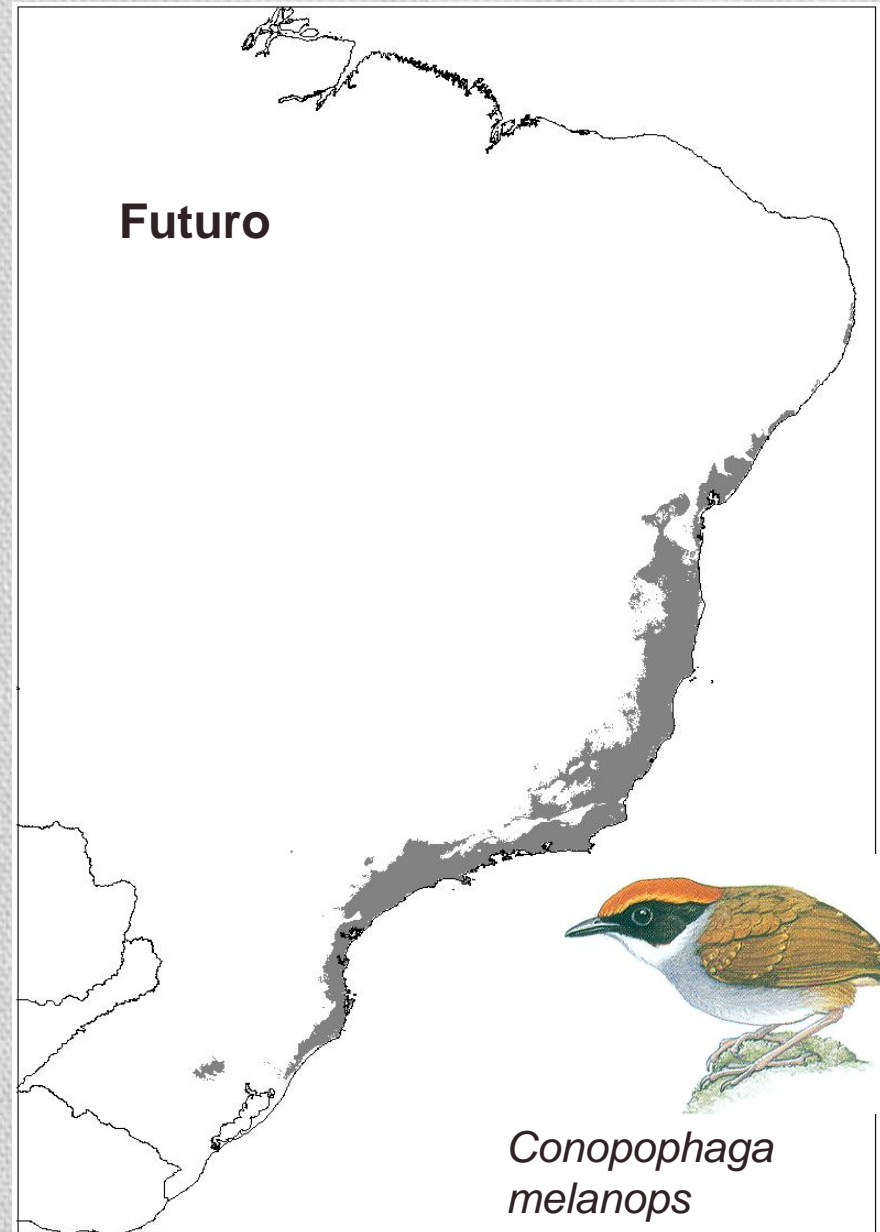
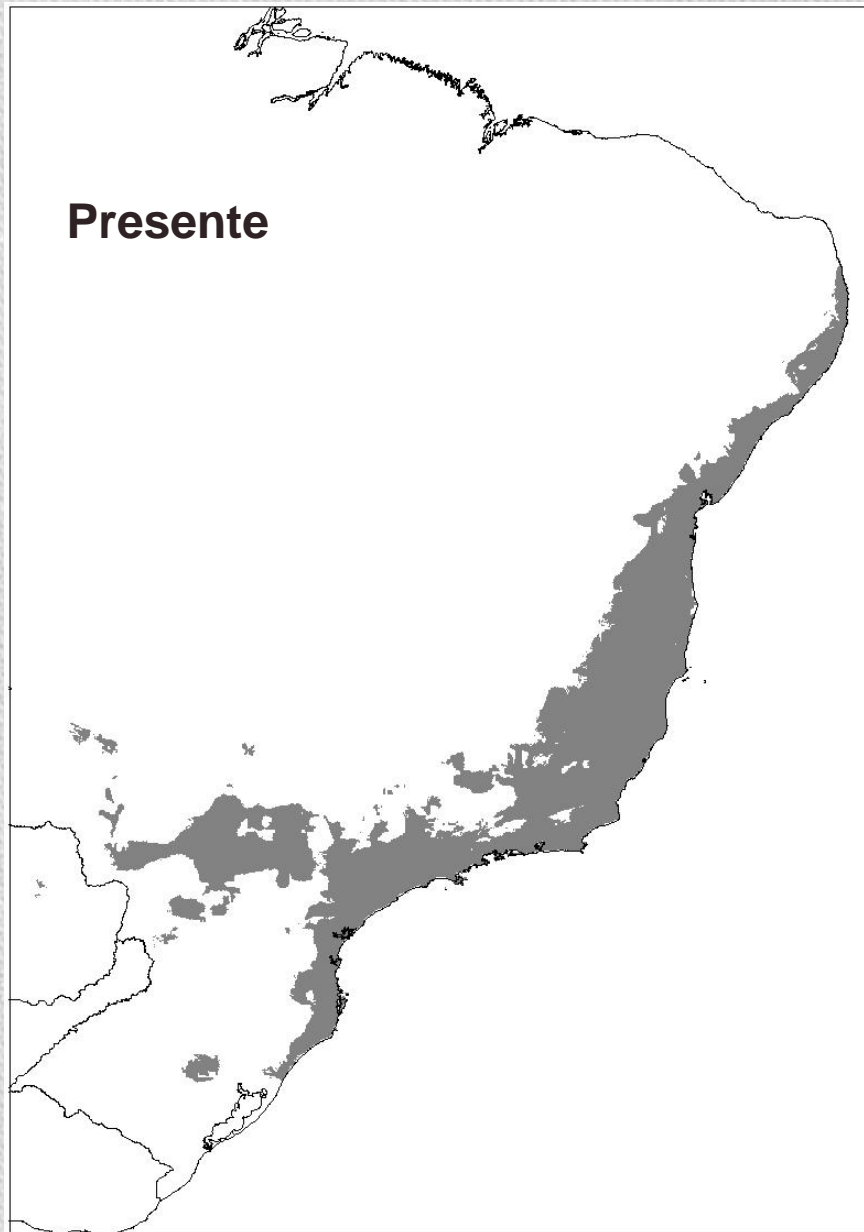
Patterns found

1. Contraction of species rich areas in the southeast
2. Expansion of species rich areas in the northeast
3. Reduction of the maximum richness per unit area

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Species that have a generalized distribution contraction

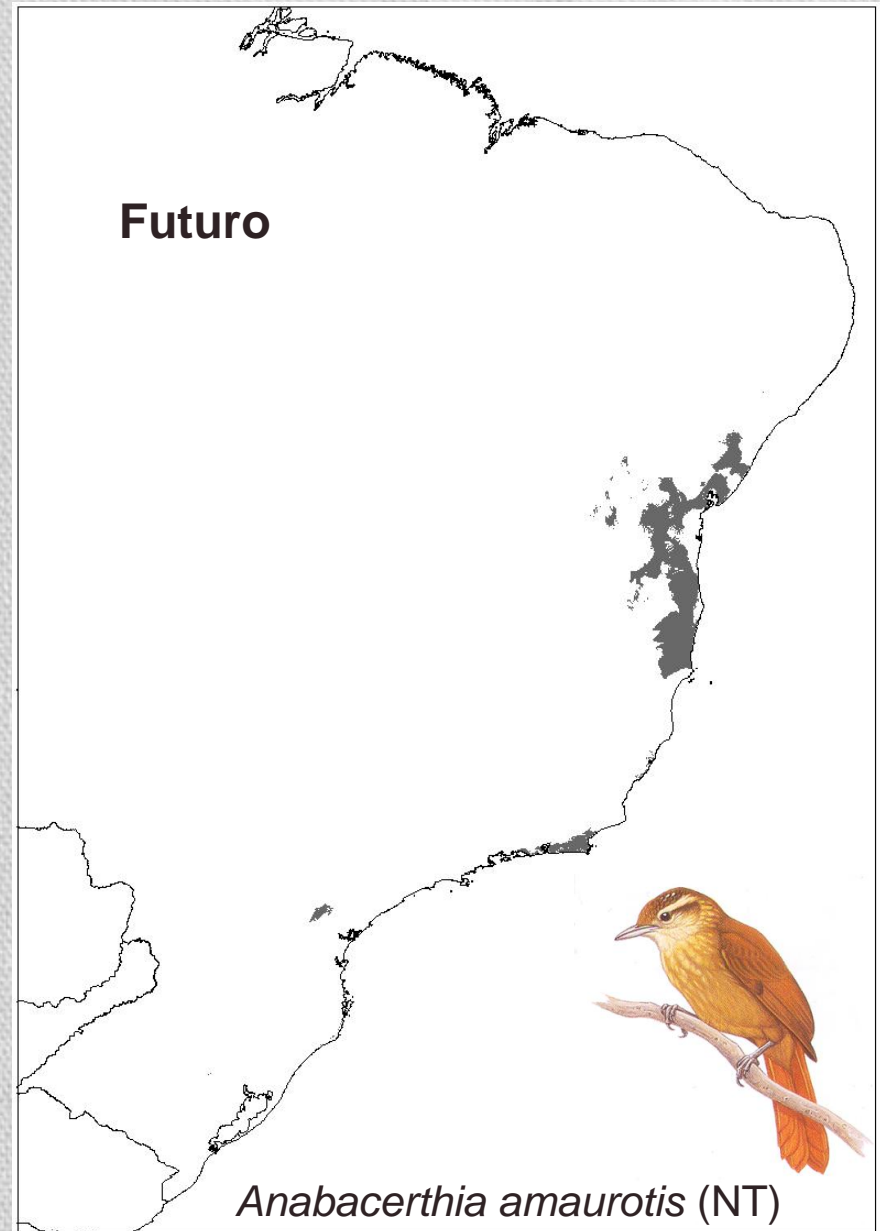
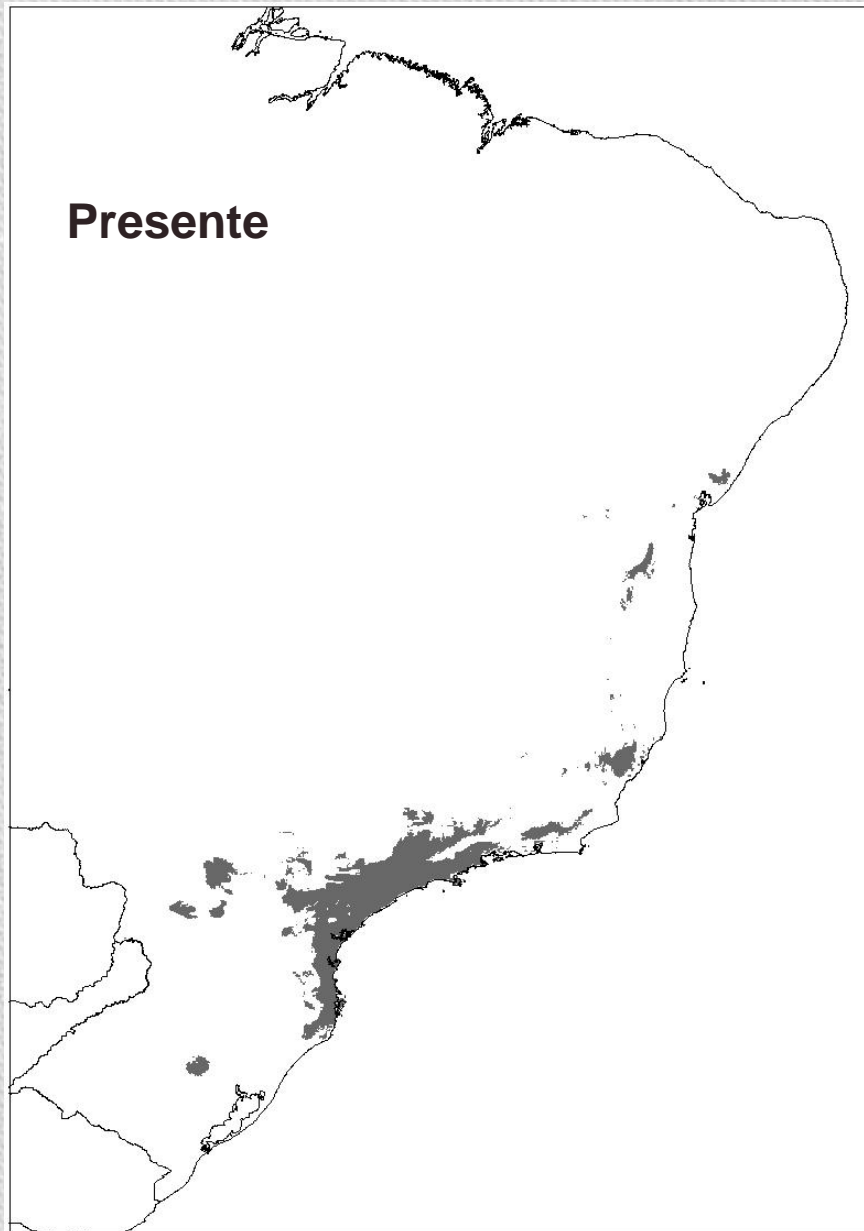


*Conopophaga
melanops*

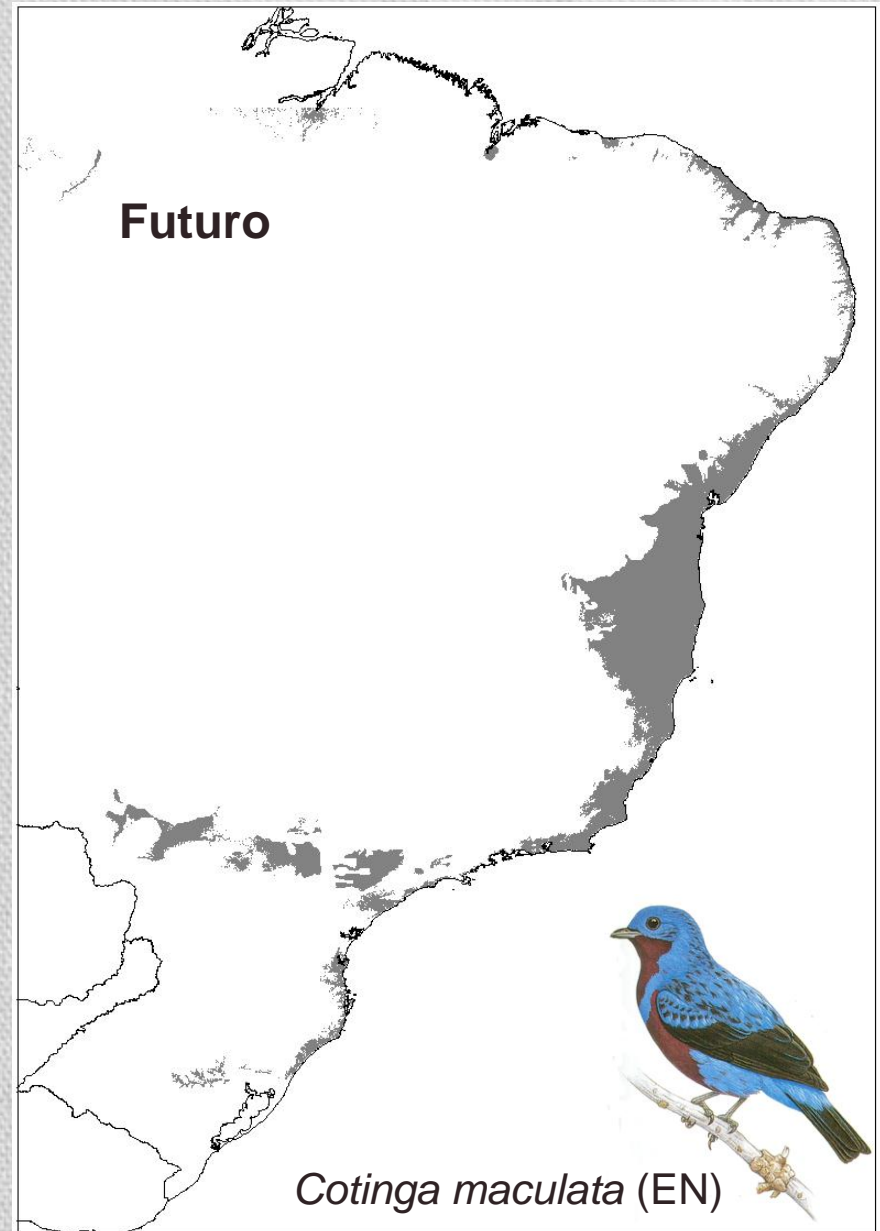
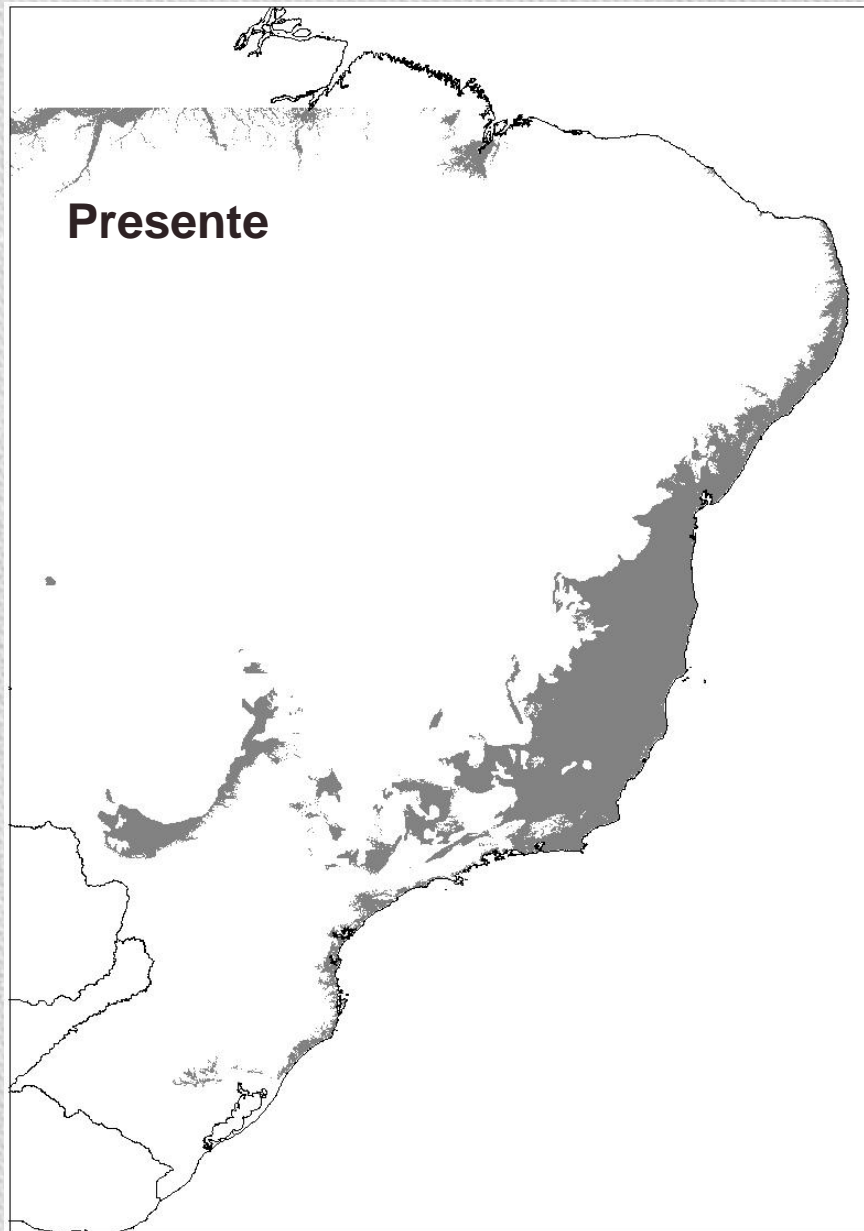
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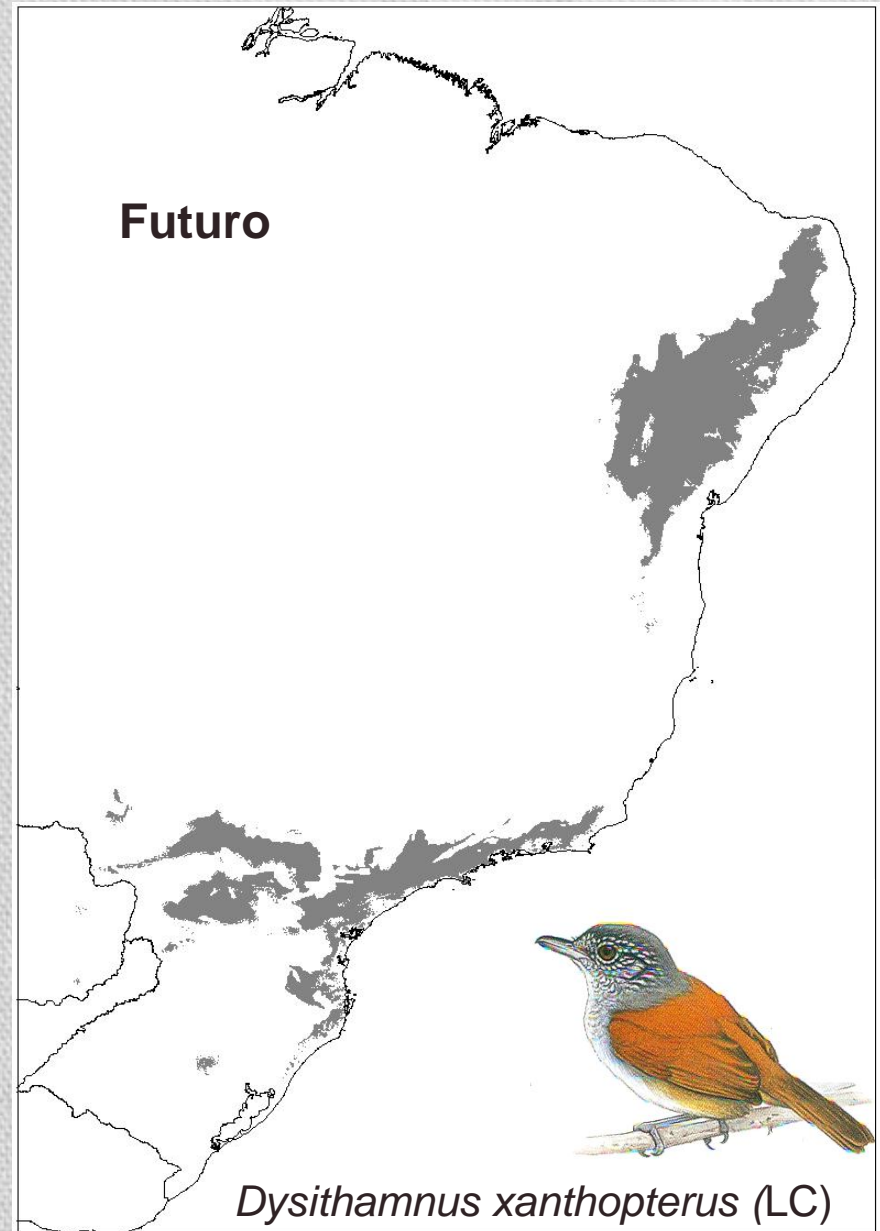
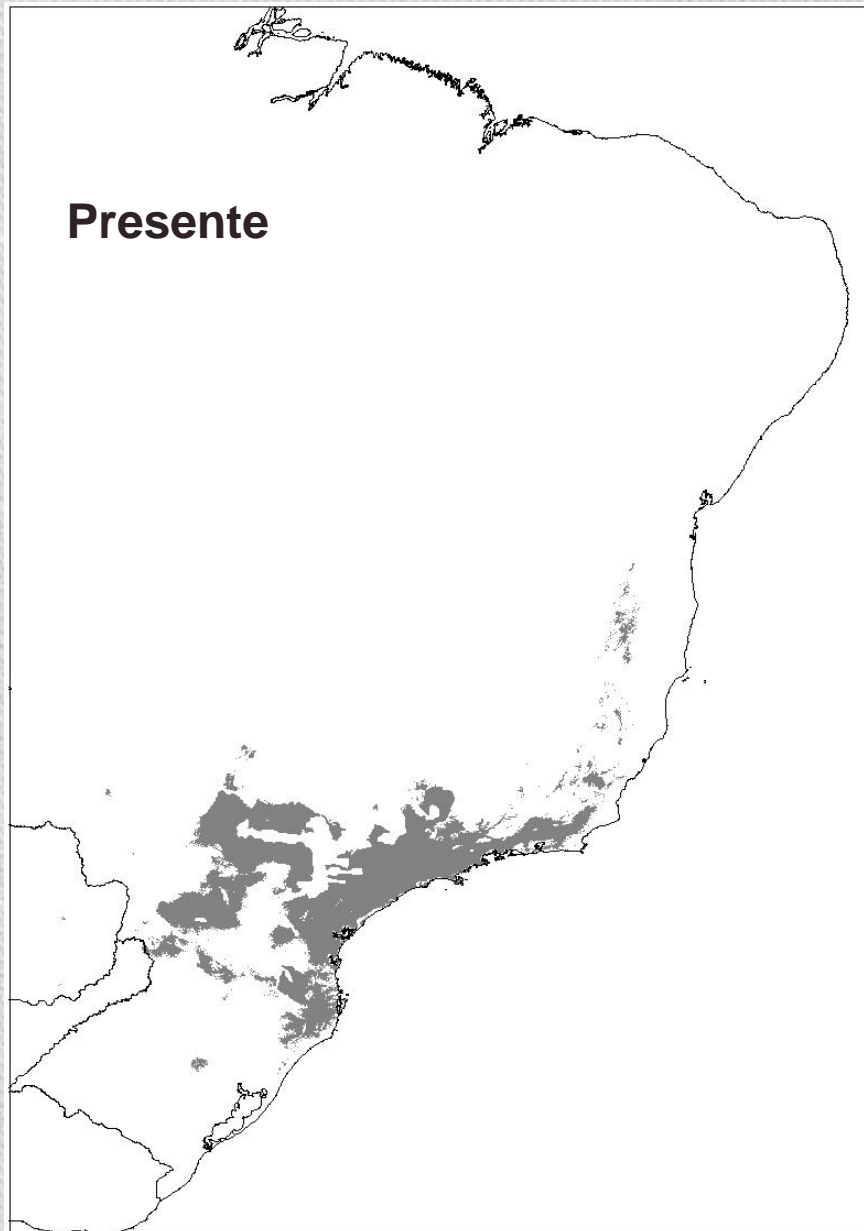
Species contract in the SE and expands in the NE



Species contract in the SE and remains in the NE



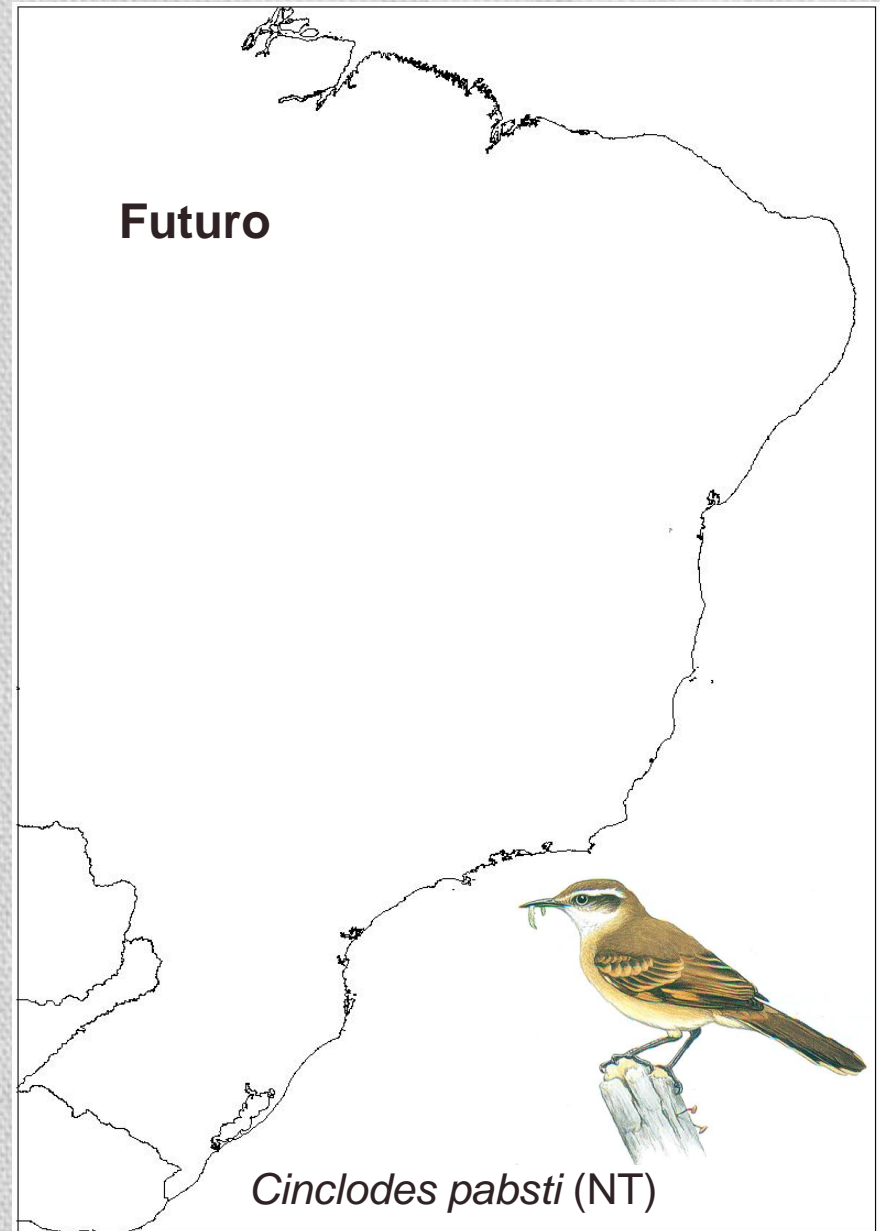
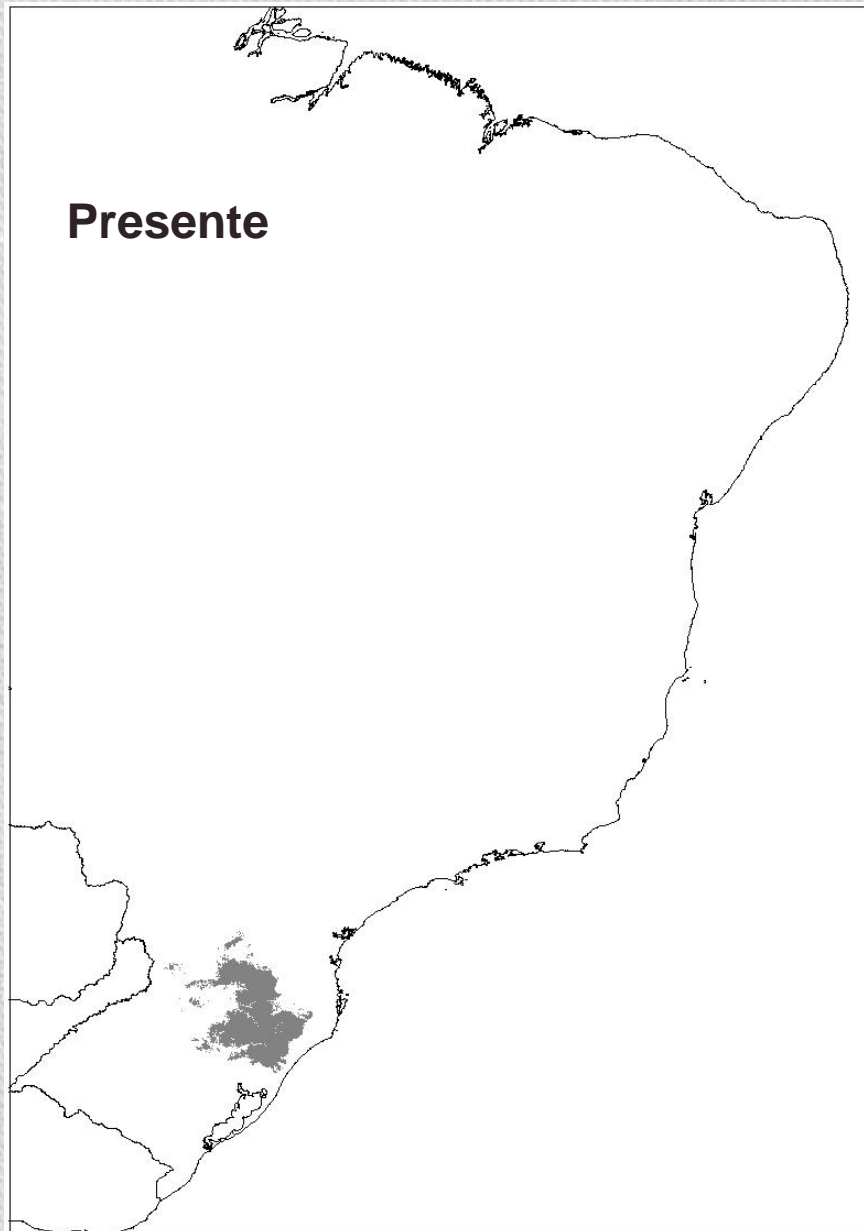
Species remains in SE and expands in the NE



Patterns found

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Species extinction (or almost)



Patterns found

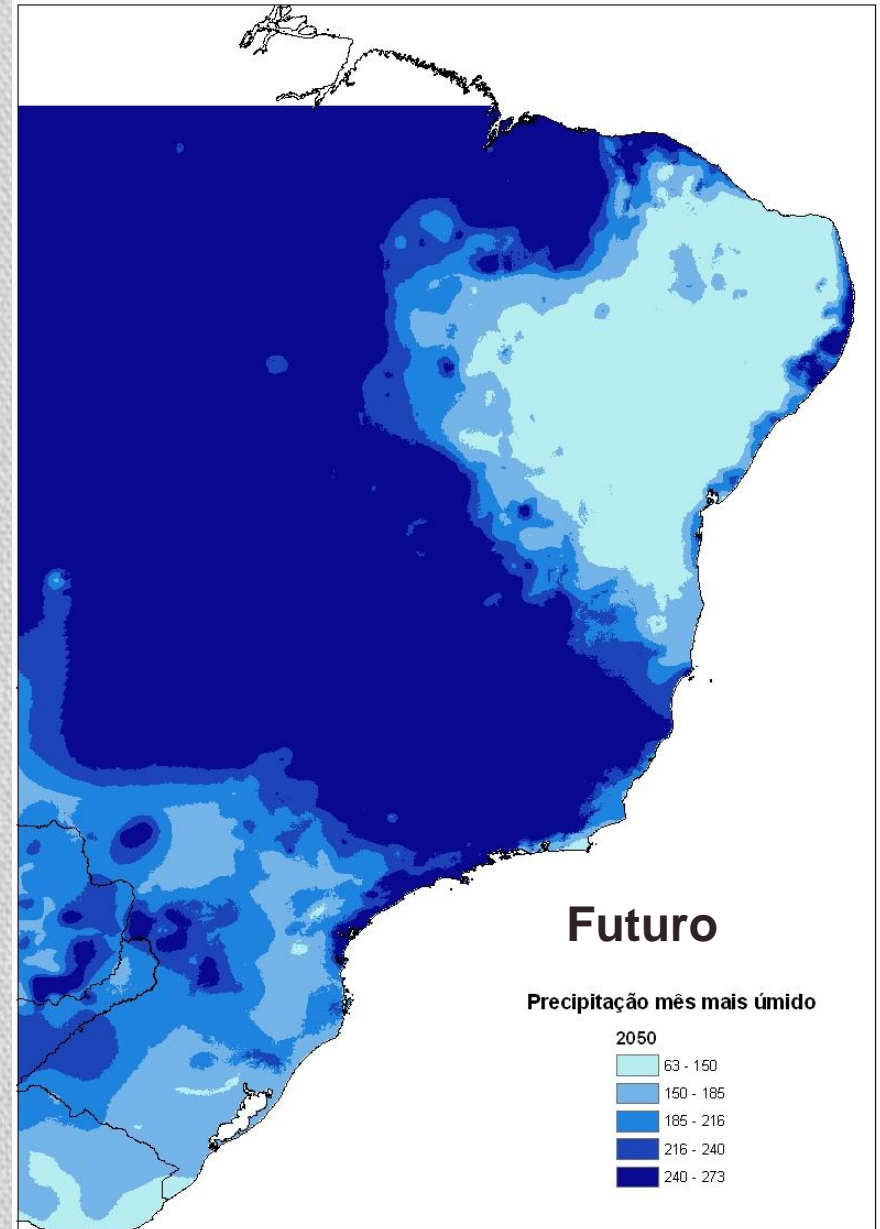
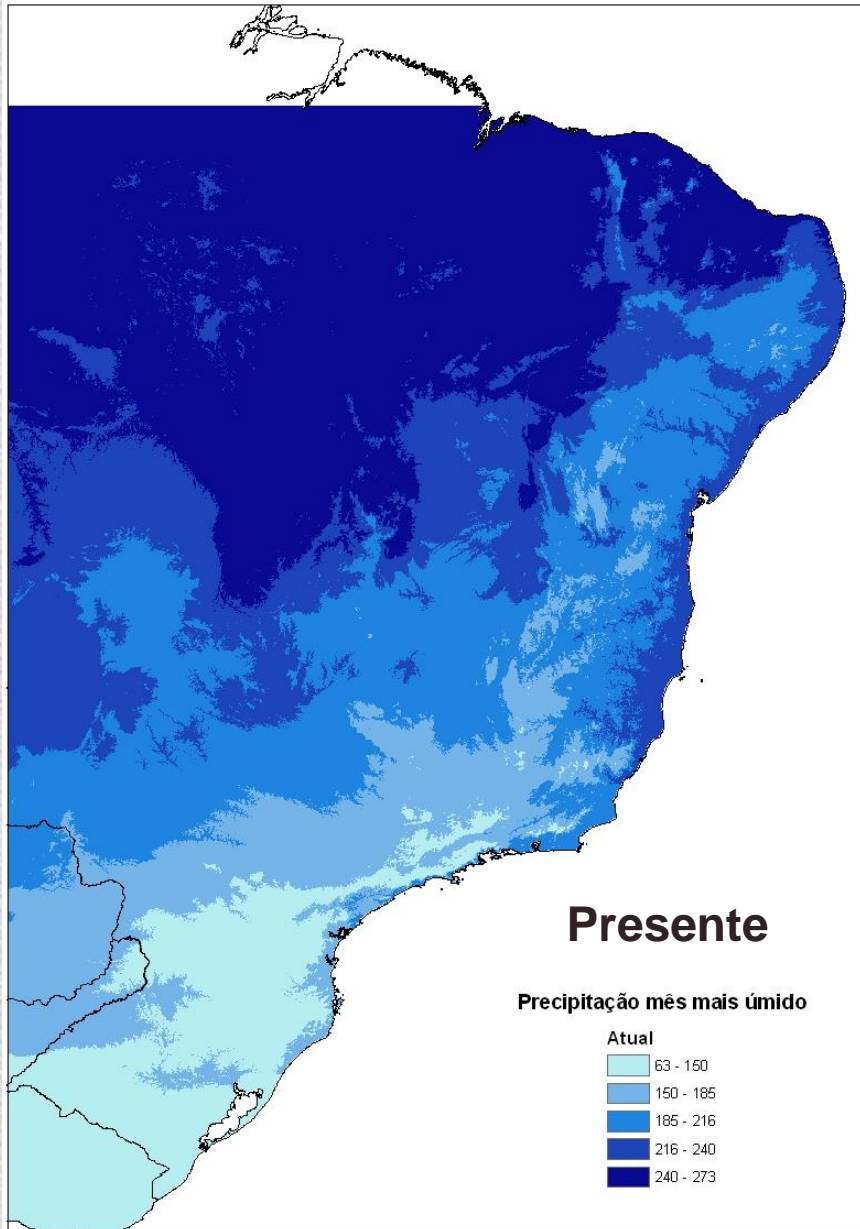
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Patterns found

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4. What's influencing the redistribution in this climate change scenario?

Variable	Average contribution to distribution models
Ecoregions	53 %
Altitude	21 %
Precipitation on the wettest month	12 %
Temperature sazonality	7 %
Precipitation on the driest month	4 %
Maximum temperature in the hottest month	2 %
Precipitaion sazonality	1 %
Minimum temperature in the coldest month	0 %

Precipitation in the wettest month



Preliminary results

- Of 129 species analysed:
 - 84% contracts
 - 15% expands
 - 1% no change

- Average contraction:
 - 250.000 km² (21.000)
 - 60 % (3)



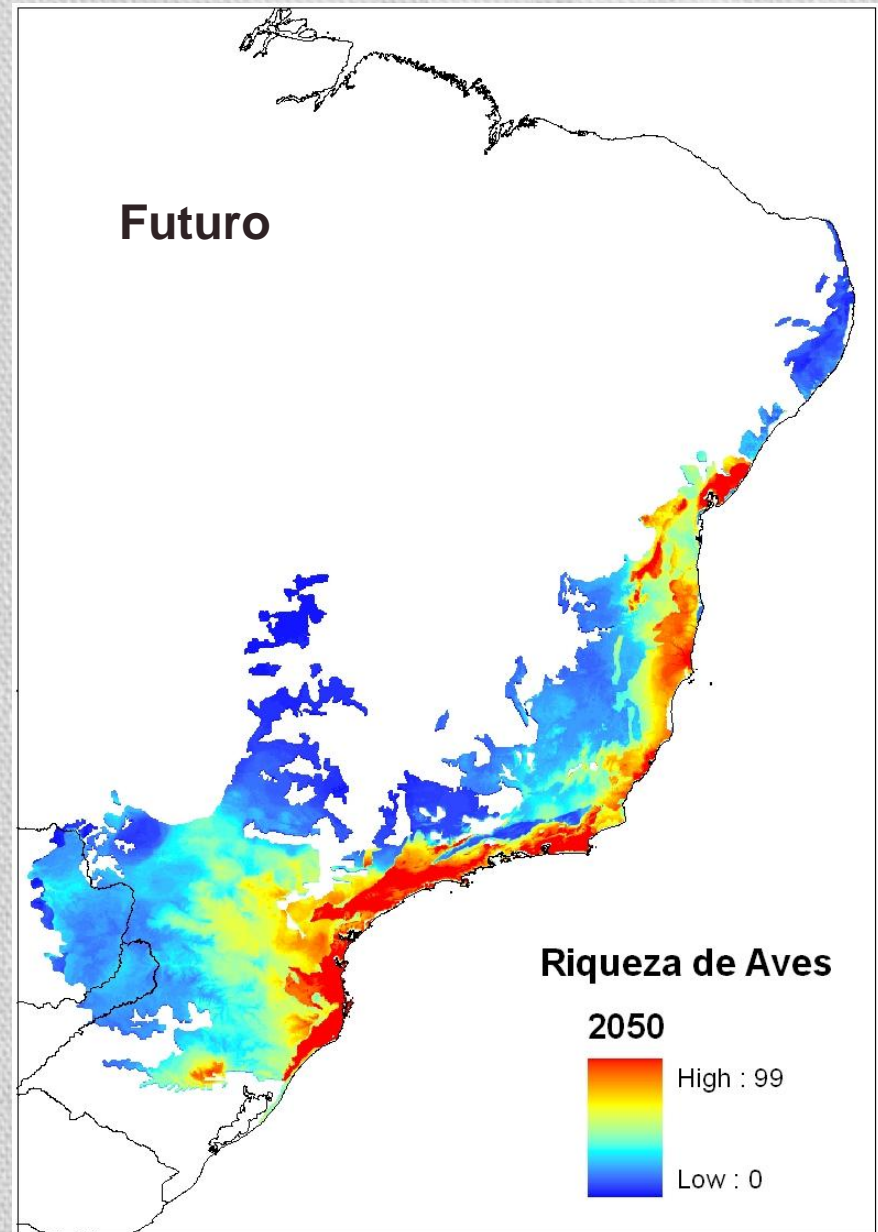
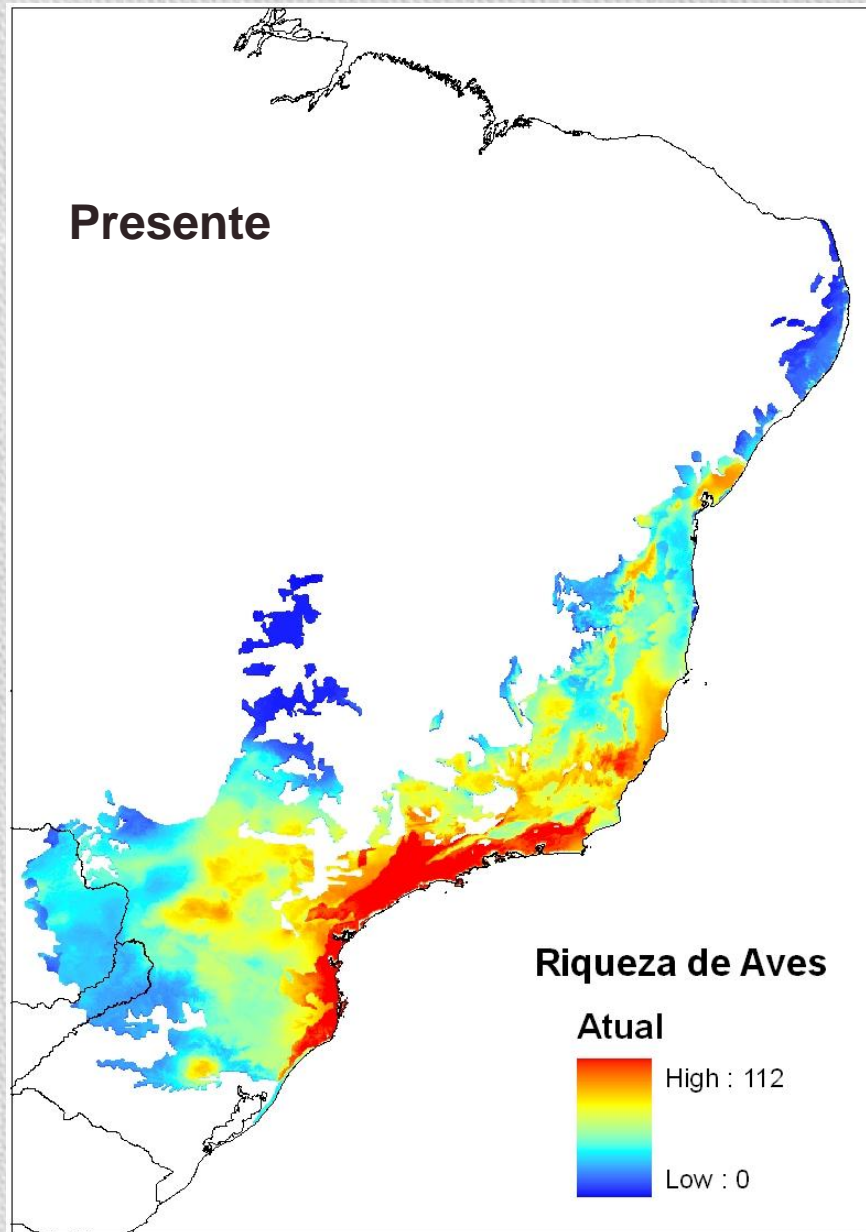
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5. **What about Atlantic Forest deforestation?**

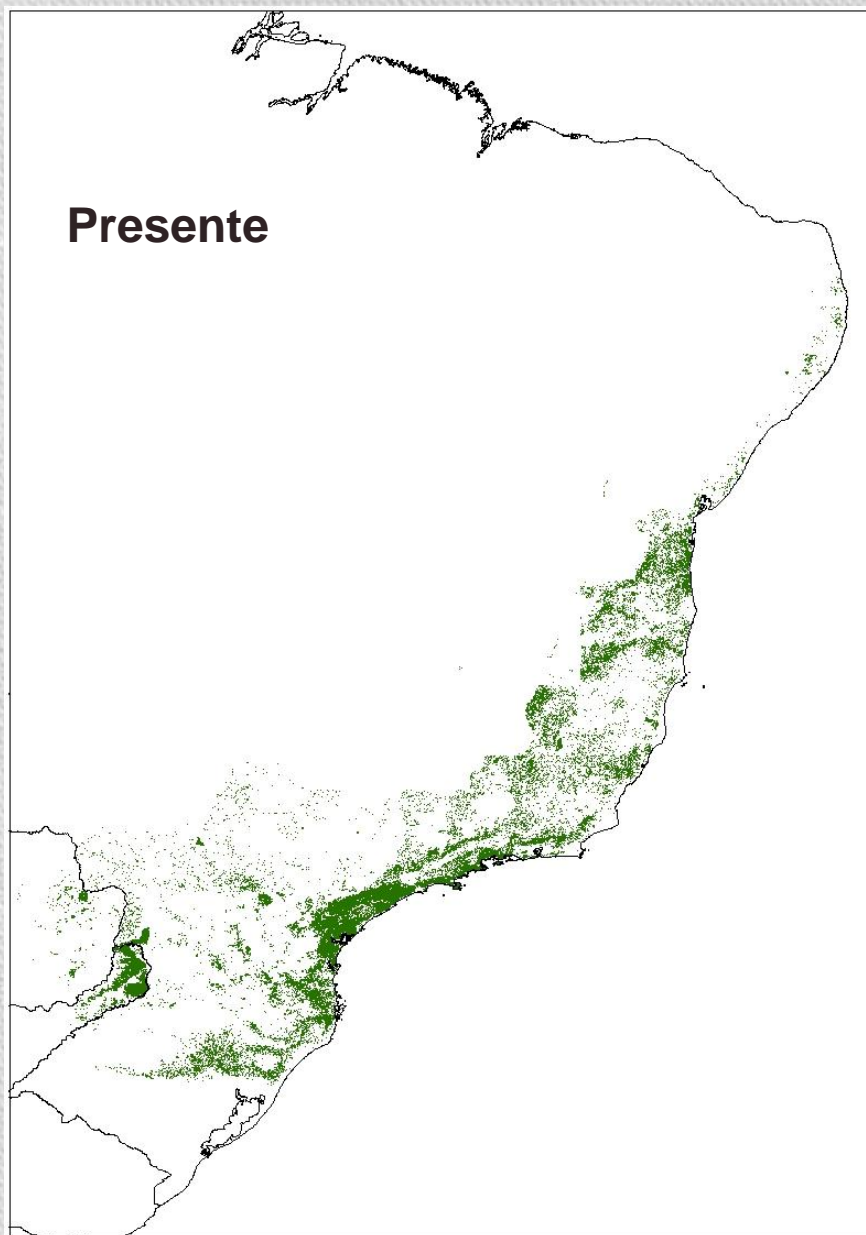
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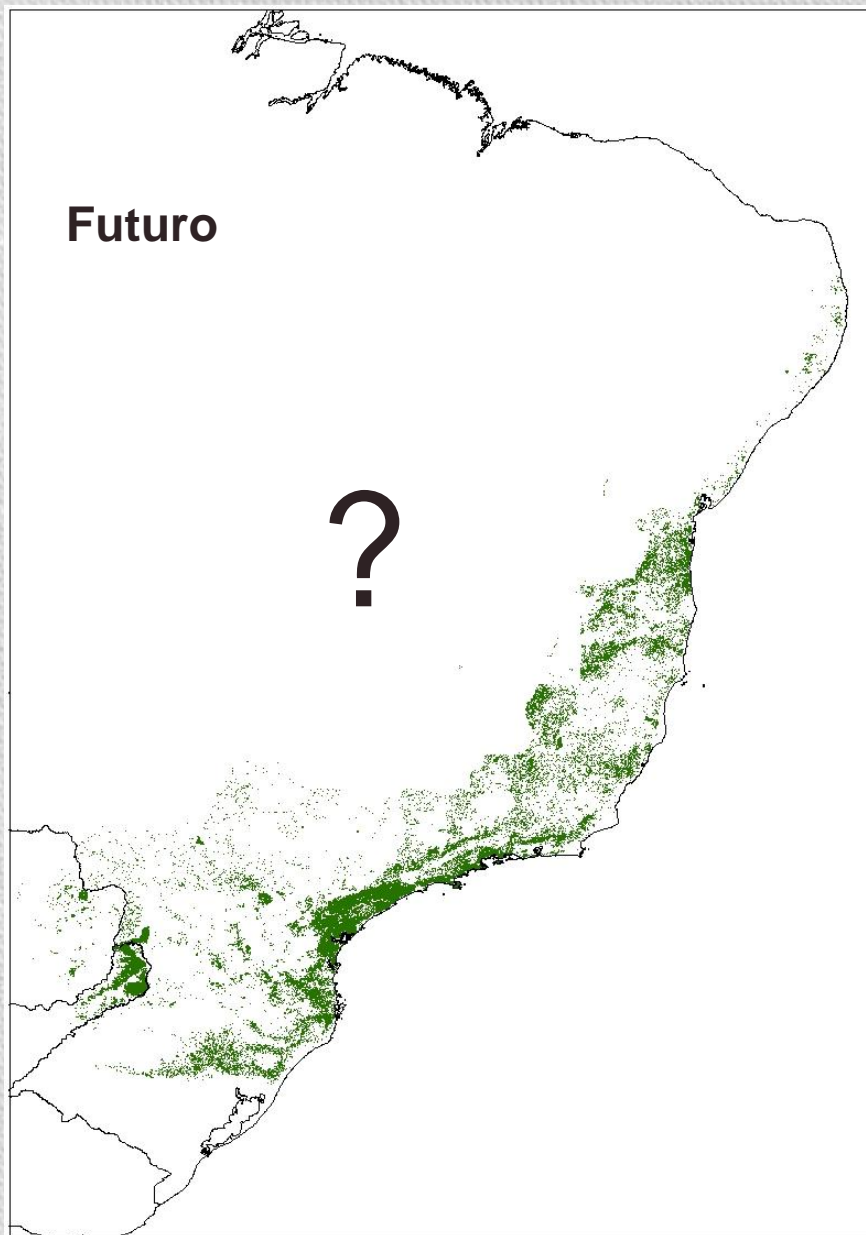
Original forest cover



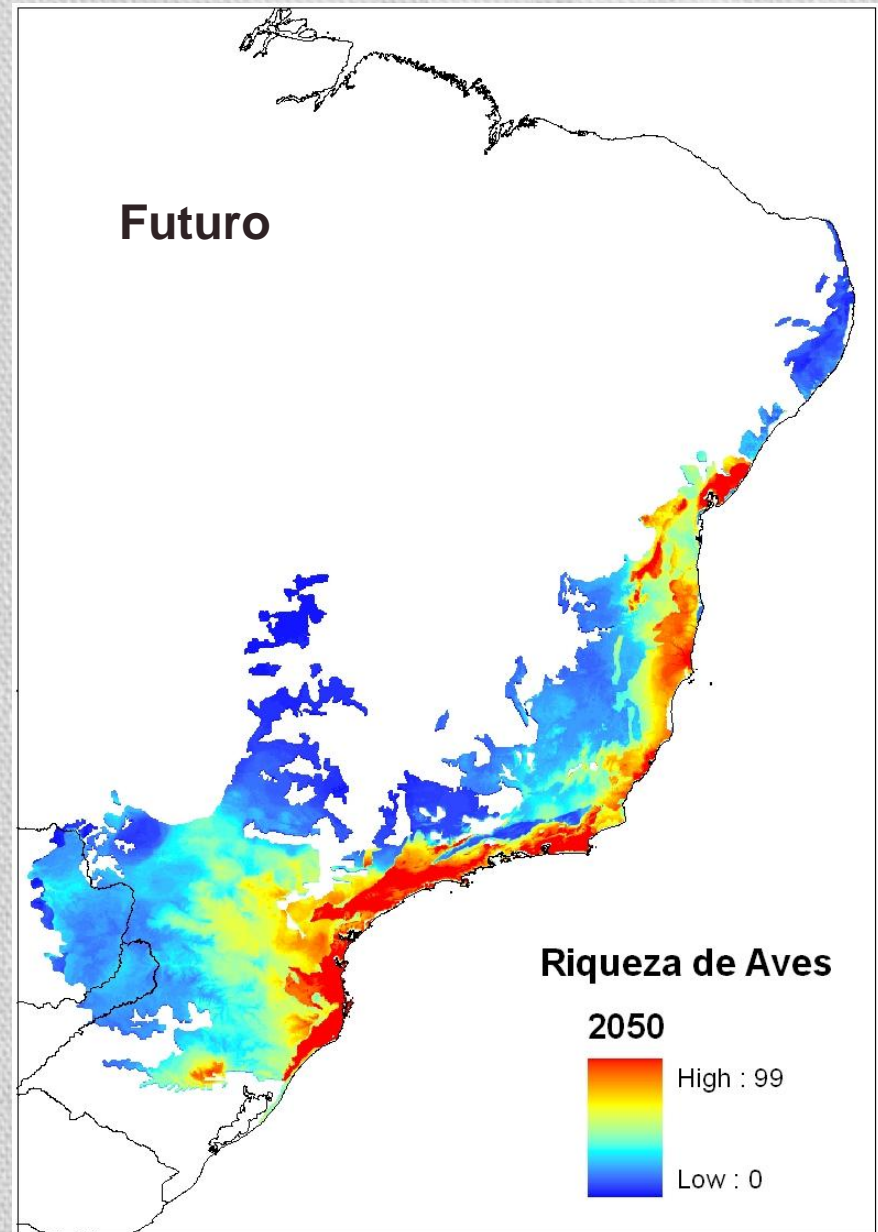
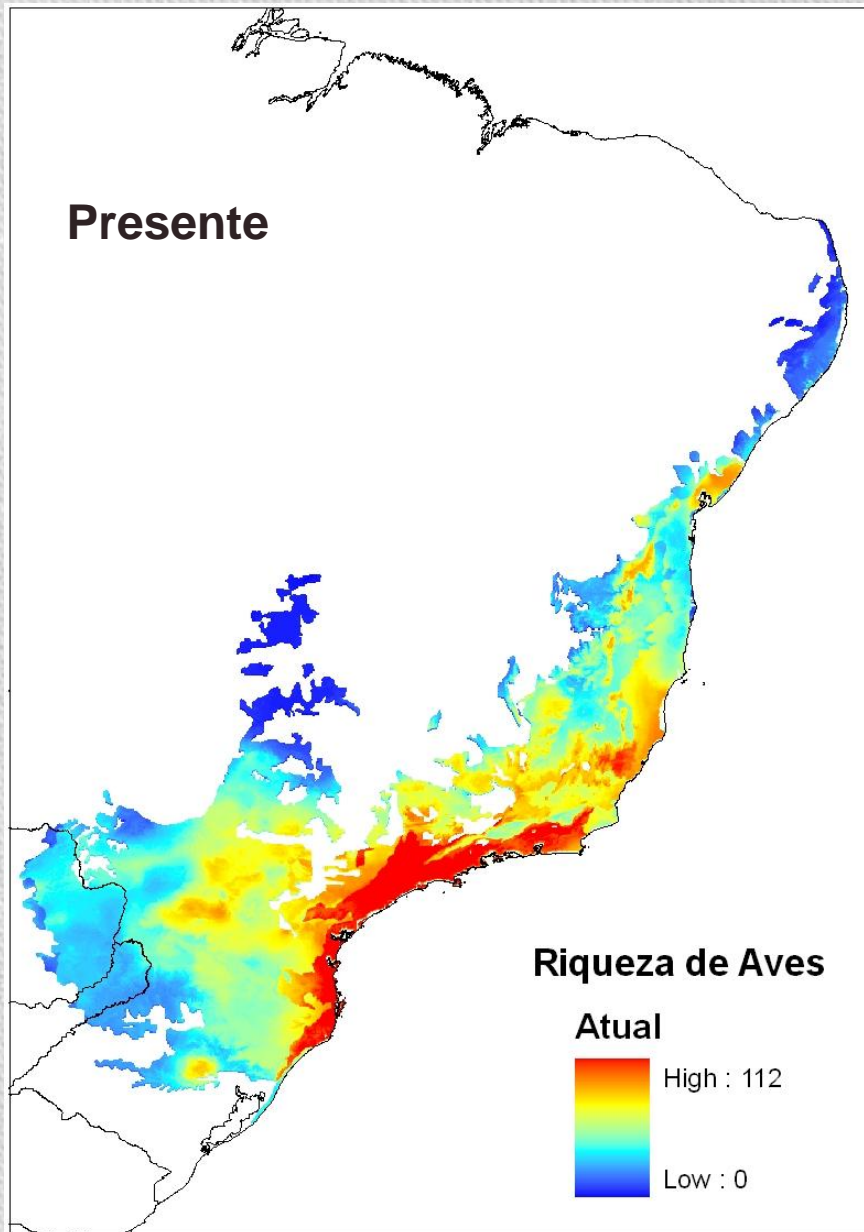
Current forest cover



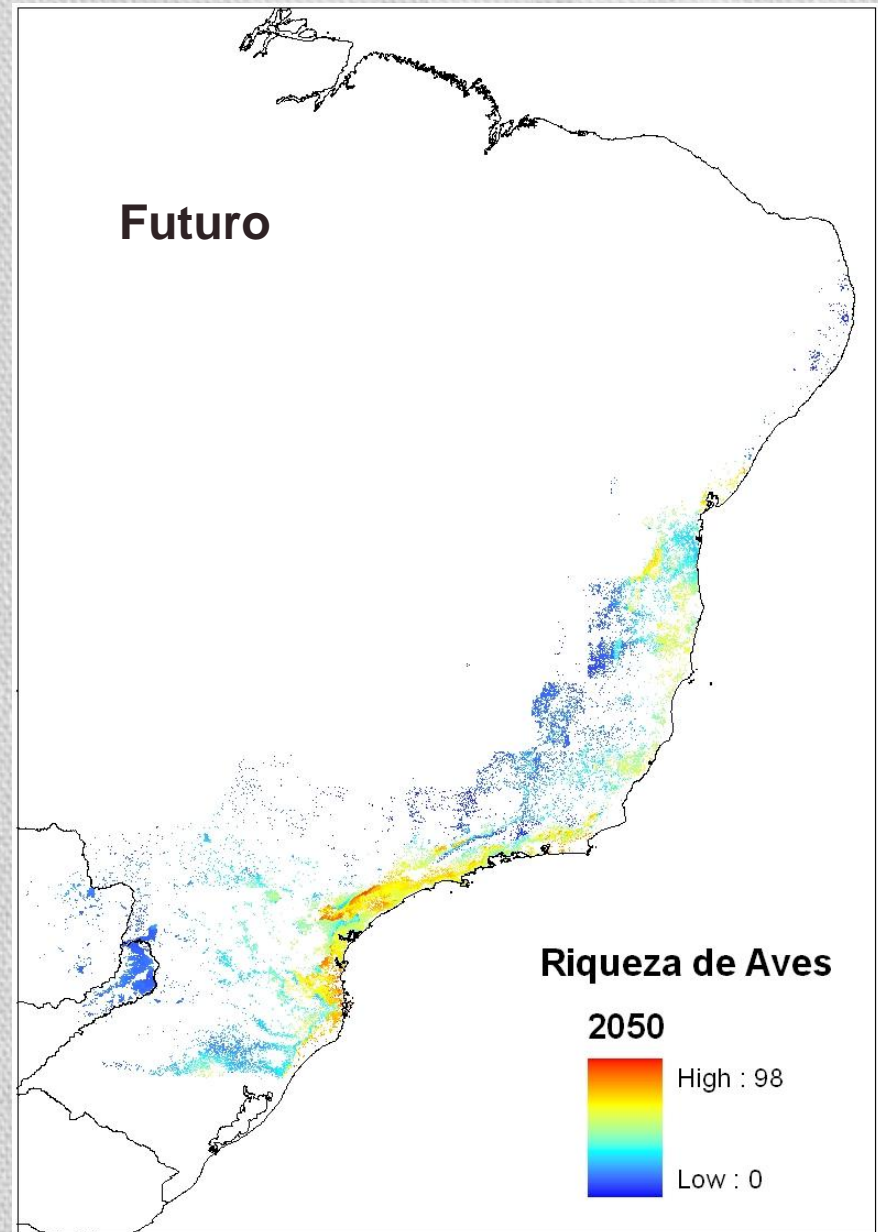
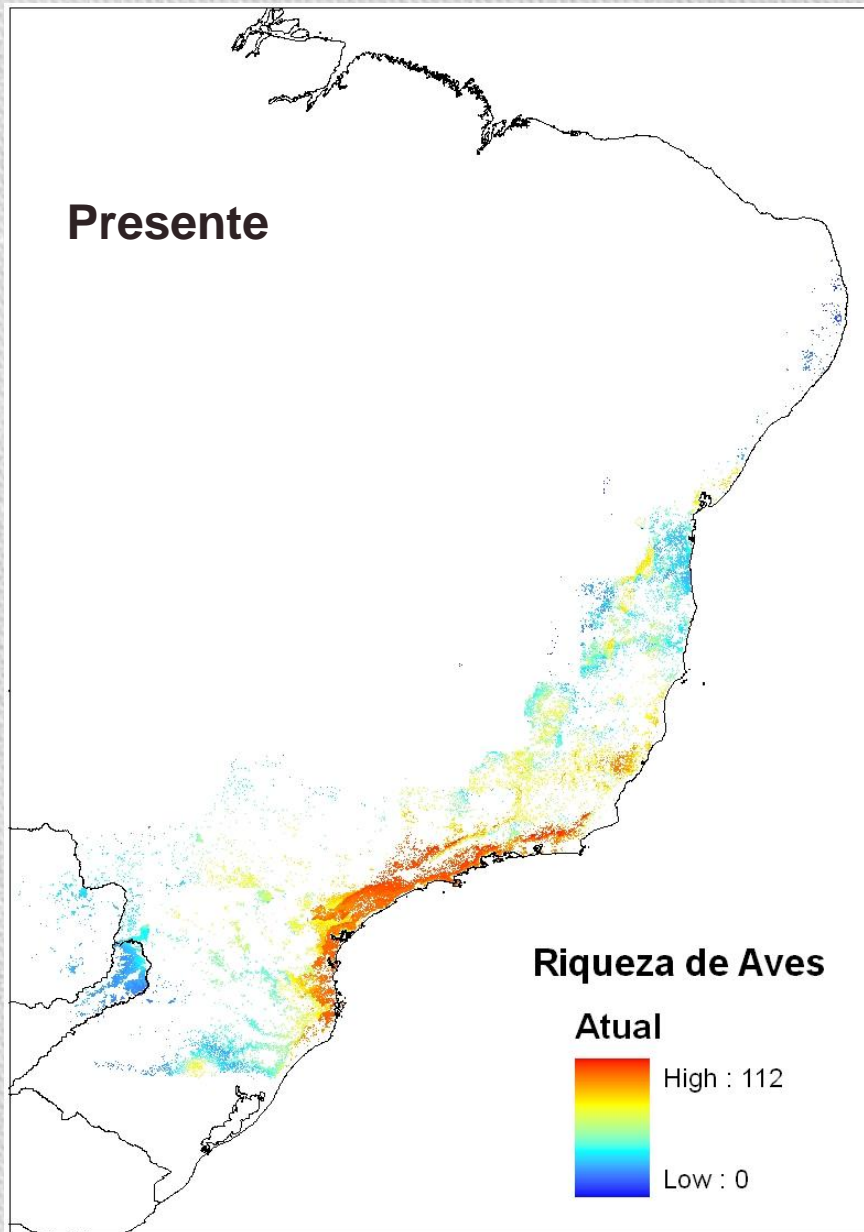
Future forest cover



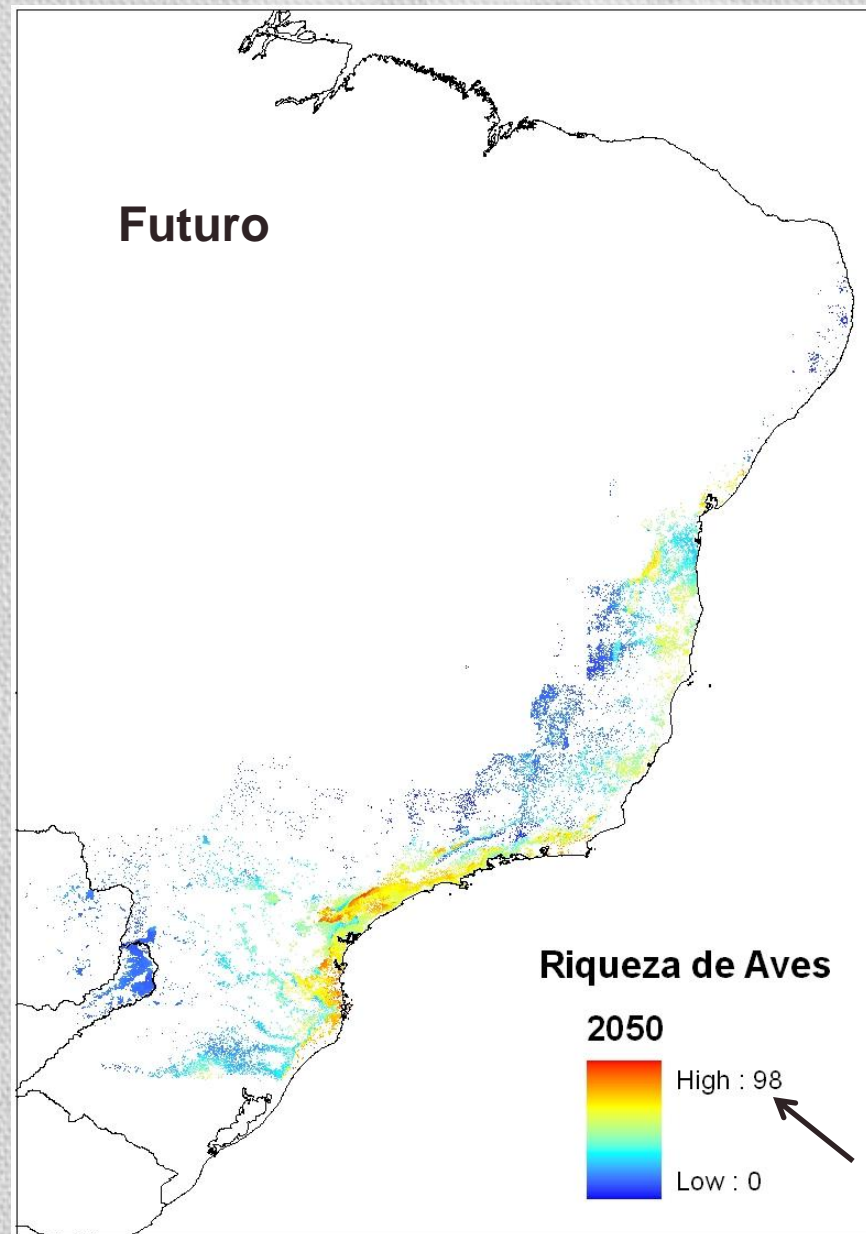
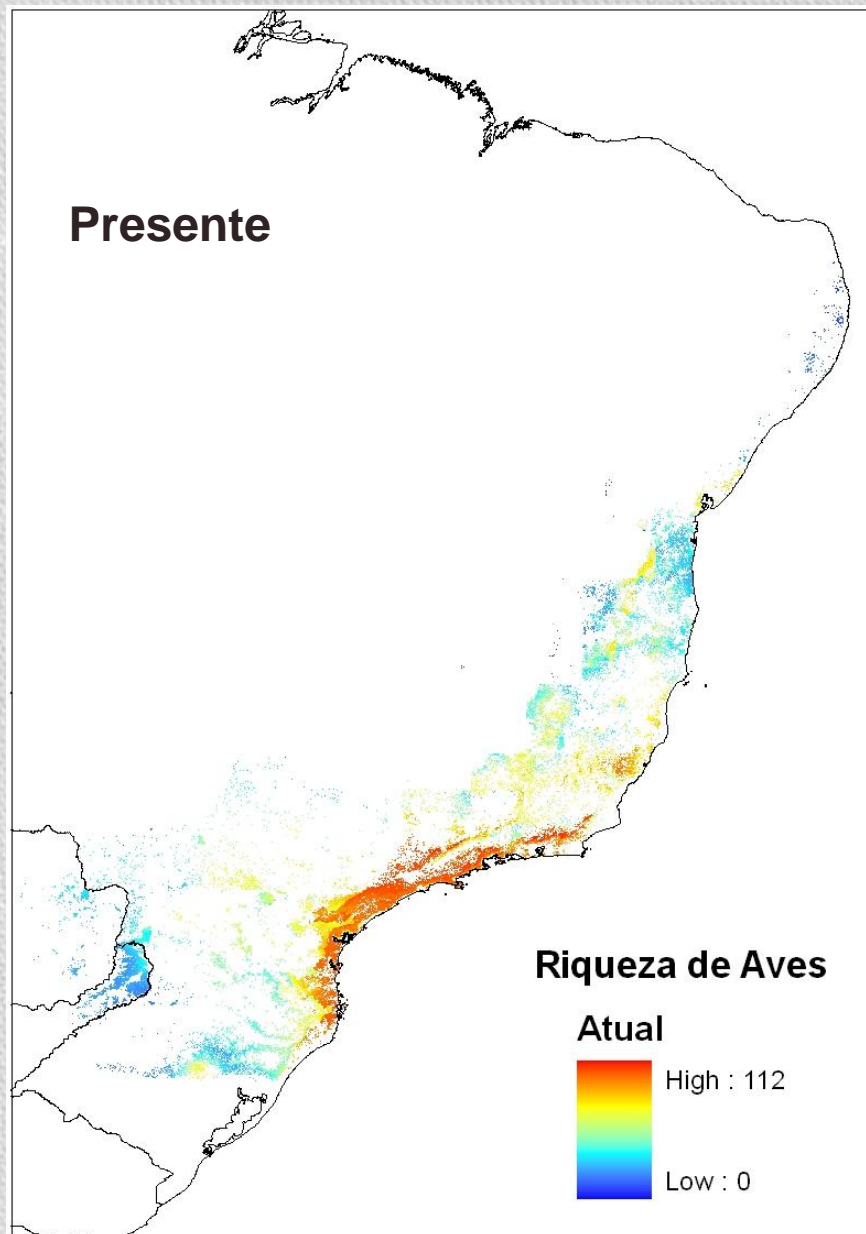
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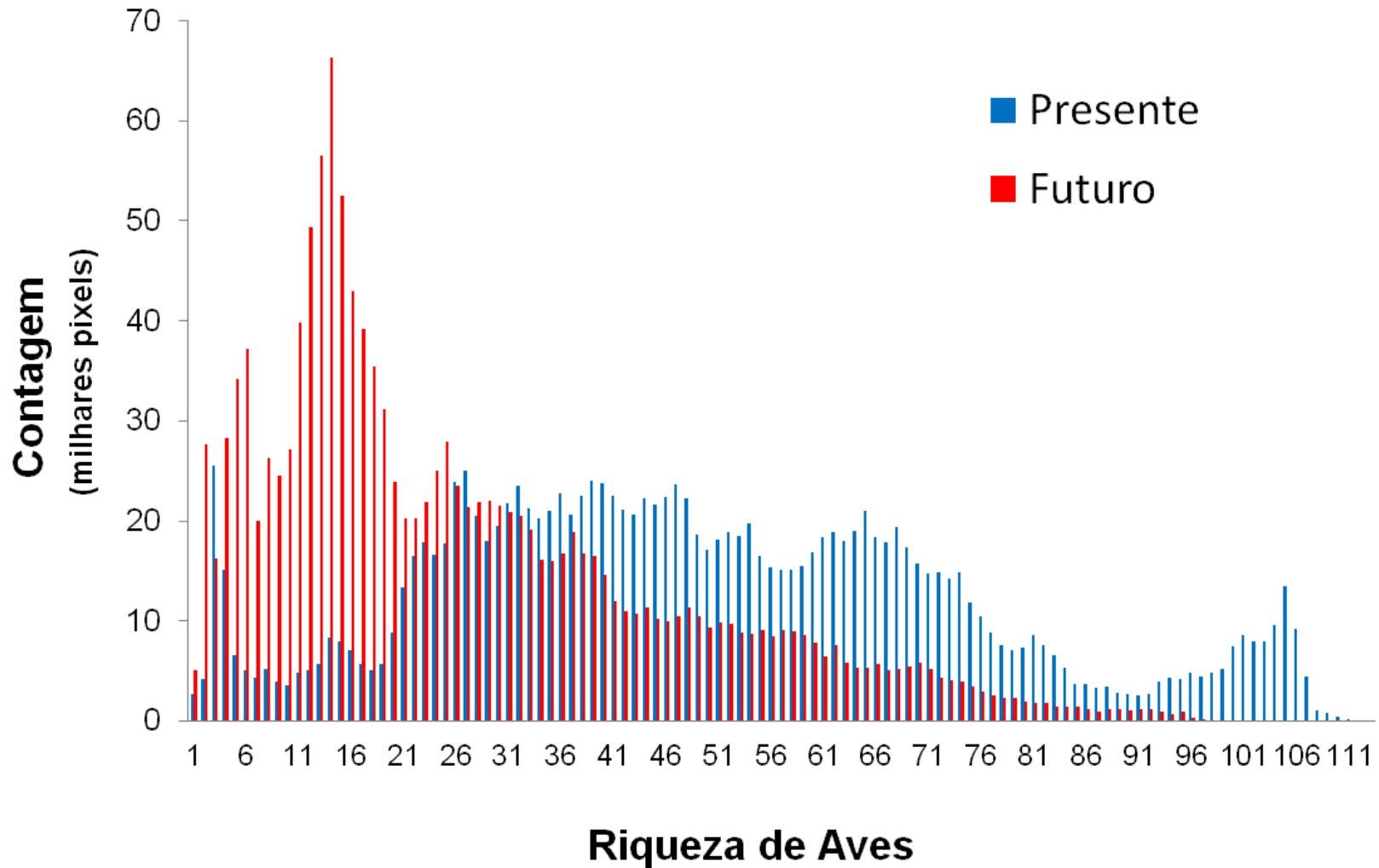


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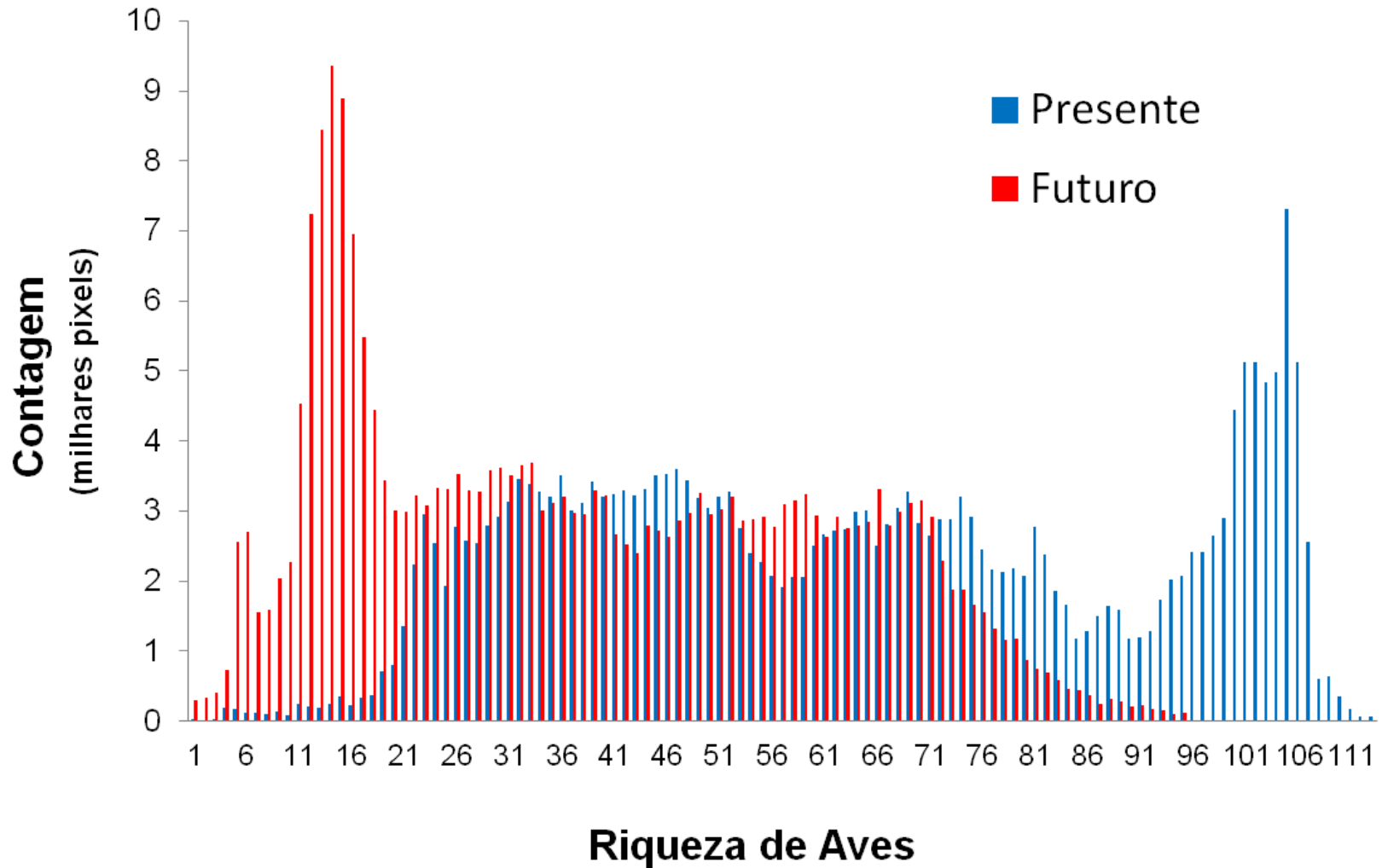
Richness of Atlantic Forest endemics

Bioma Mata Atlântica



Richness of Atlantic Forest endemics

Remanescentes de Mata Atlântica



Conclusions

- State of the art in Rio de Janeiro bird fauna
 - Knowledge gaps
 - Few regions with high conservation value
 - Enhancement in the directing of effective actions in conservation
- Redistribution of birds under climate change
 - Important distribution contraction of endemic birds
 - NE displacement of climatically favorable areas for many species
 - “Nefarious synergy” between climate change and deforestation



Thanks!

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