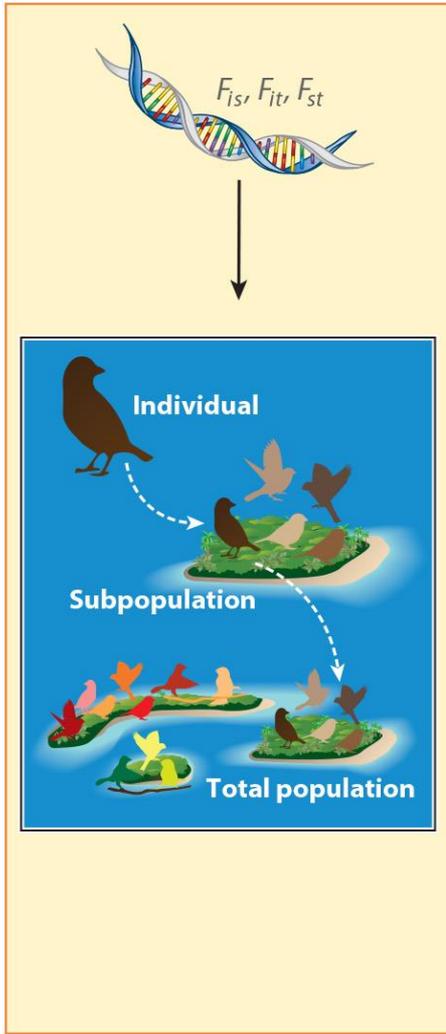


Protecting Islands from Invasion and Disease: Biosecurity and Strategic Environmental Assessment

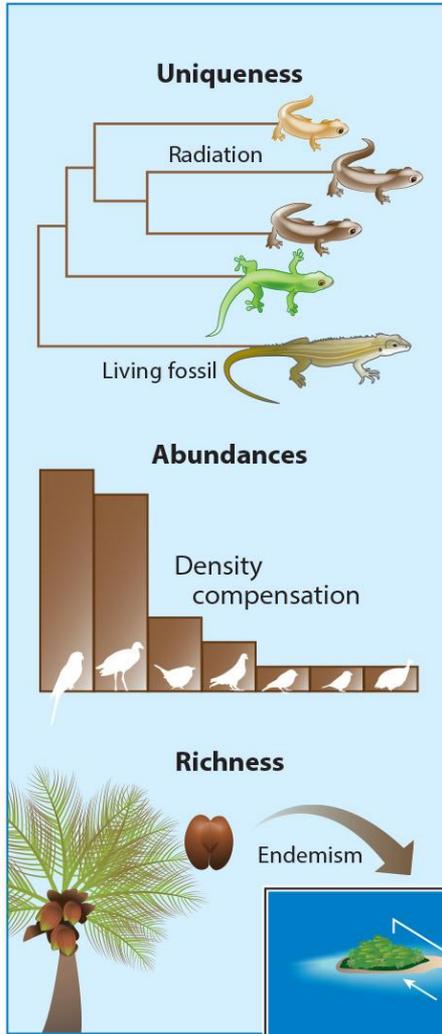
Dr James Russell, University of Auckland

BIODIVERSITY

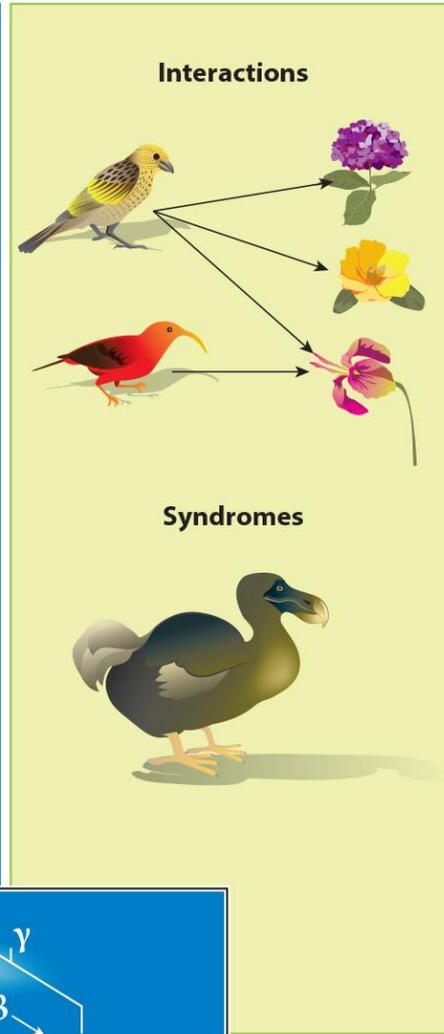
GENETIC



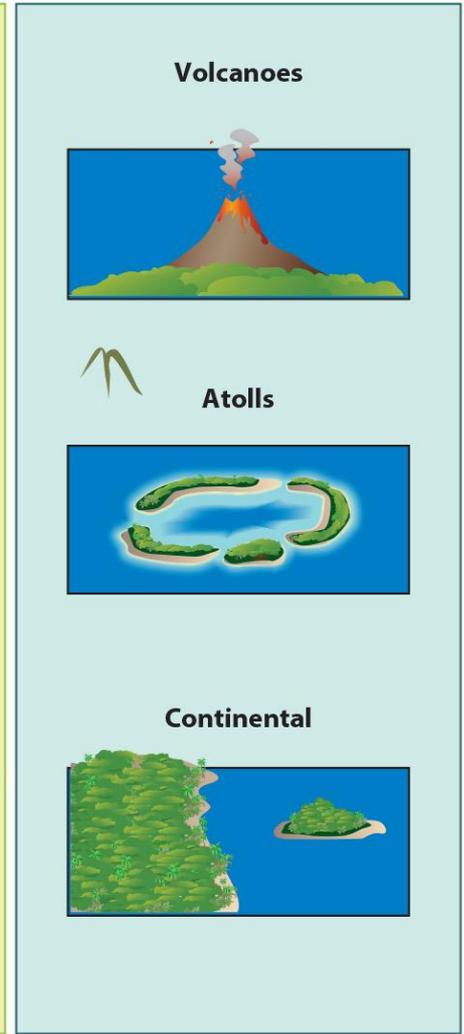
SPECIES



FUNCTIONAL



HABITAT



Russell & Kueffer (2019)

Island biodiversity in the Anthropocene. *Annual Review of Environment and Resources*, 44, 31-60.

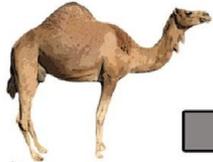
PROBABLE ORIGIN



COVID-19 ([20] = 2019-present)
Likely bats or pangolins
as intermediary hosts



Ebola ([19] = 2014-2016)
Likely bats as a reservoir



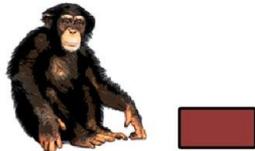
MERS ([18] = 2012-present)
Camels as intermediary hosts



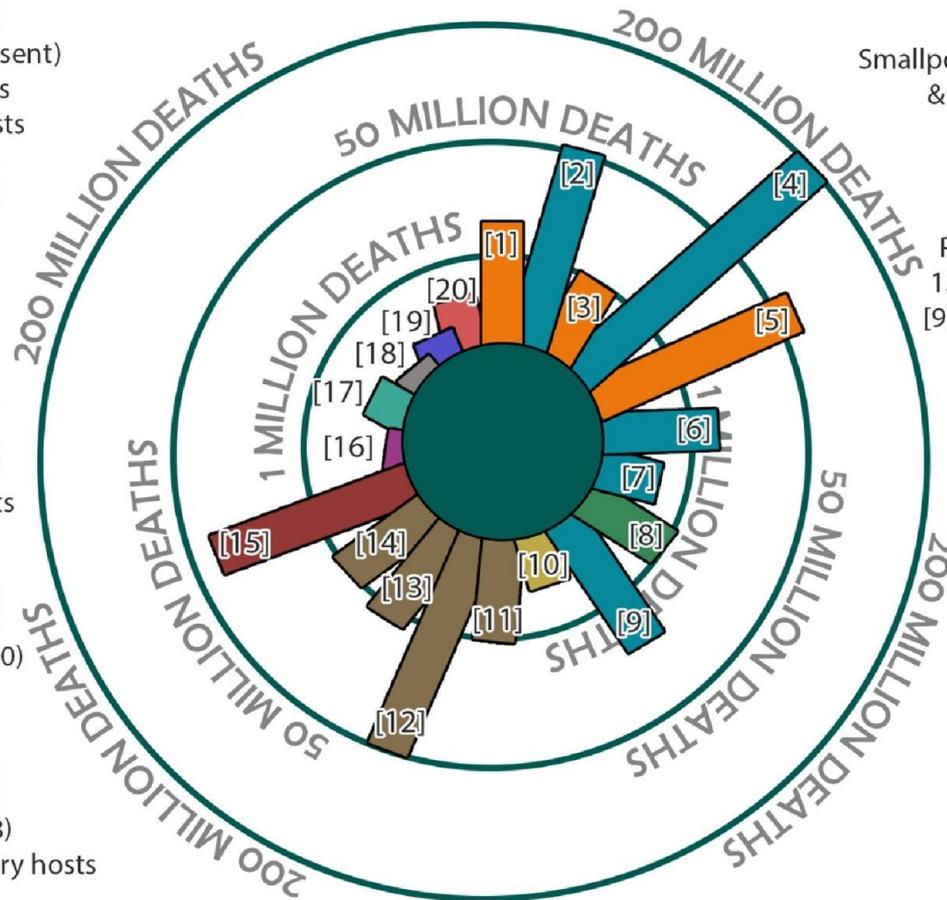
Novel H1N1 ([17] = 2009-2010)
Pigs



SARS ([16] = 2002-2003)
Likely civet cats as intermediary hosts



HIV ([15] = 1981-present)
Chimpanzee



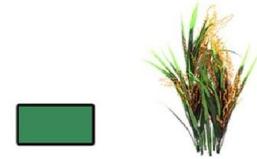
PROBABLE ORIGIN



Smallpox ([1] = 165-180, [3] = 735-737 & [5] = 1520) Likely rodents



Plague ([2] = 541-542, [4] = 1346-1353, [6] = 1600, [7] = 1709-1713 & [9] = 1855-1960) Rats and their fleas



Cholera ([8] = 1817-1923)
Likely contaminated rice



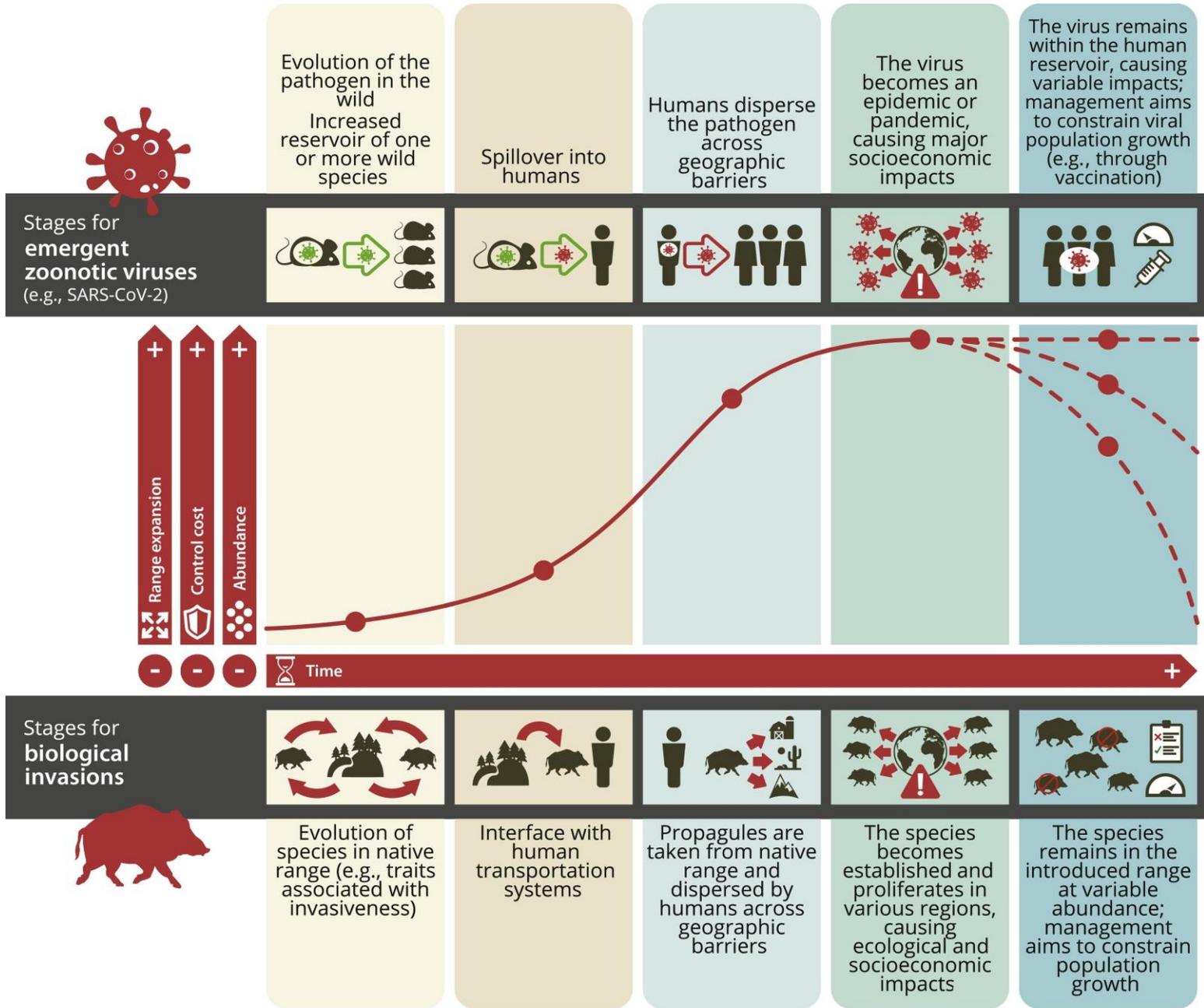
Yellow Fever ([10] = late 1800s)
Mosquito



Influenza - H1N1, H2N2, H3N2 & H3N8
([11] = 1889-1890, [12] = 1918-1919, [13] = 1957-1958 & [14] = 1968-1970)
Comprising avian/human genes

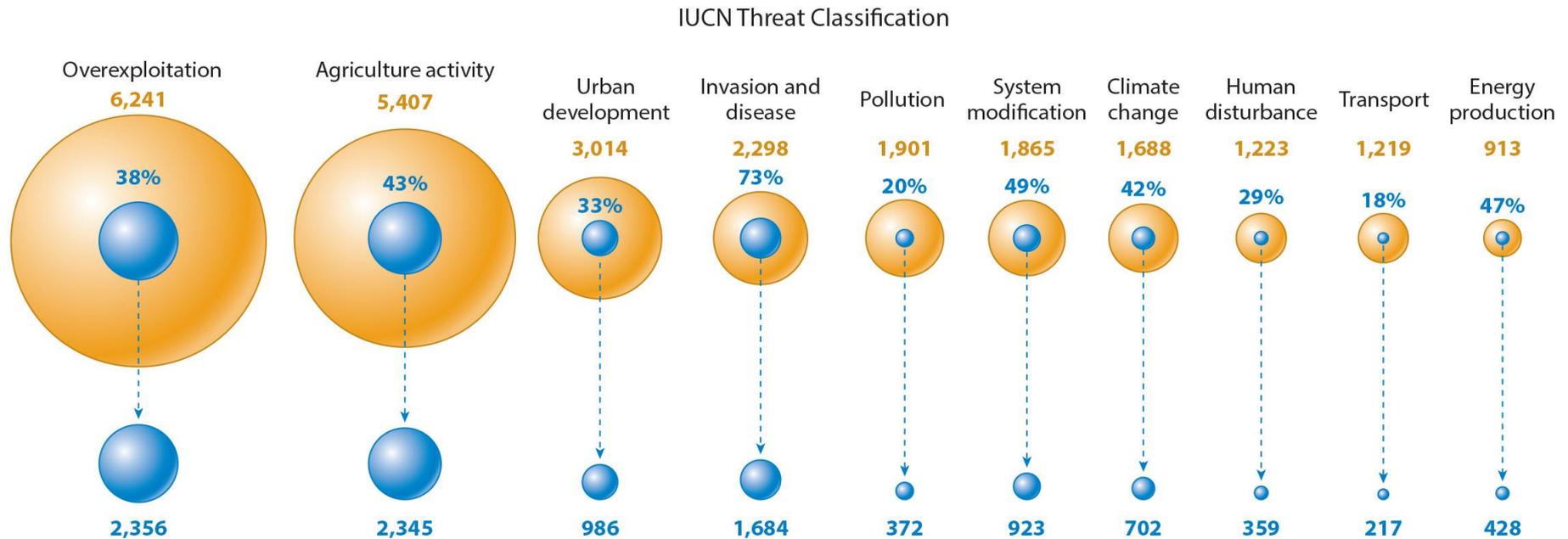
Trends in Ecology & Evolution

Montgomery & Macdonald
(in press) COVID-19, health,
conservation, and shared
wellbeing: details matter.
Trends in Ecology & Evolution.



Nuñez et al. (in press) Invasion science and the global spread of SARS-CoV-2. *Trends in Ecology & Evolution*.

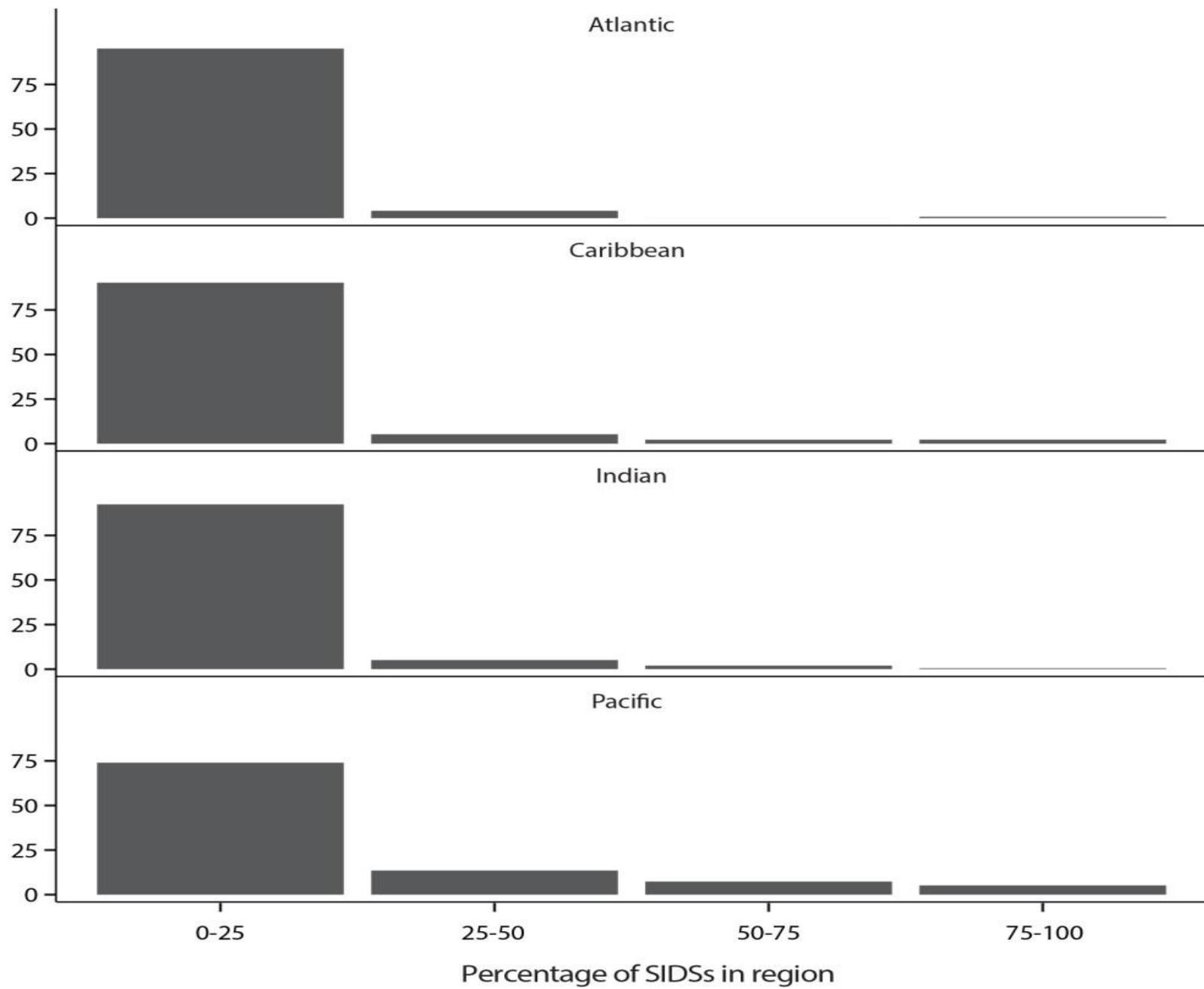
Threats to IUCN Red listed species



- Just under half of IUCN Red Listed threatened species are found wholly on islands
- Invasion and disease is the only threat *more likely* to be impacting a species on an island

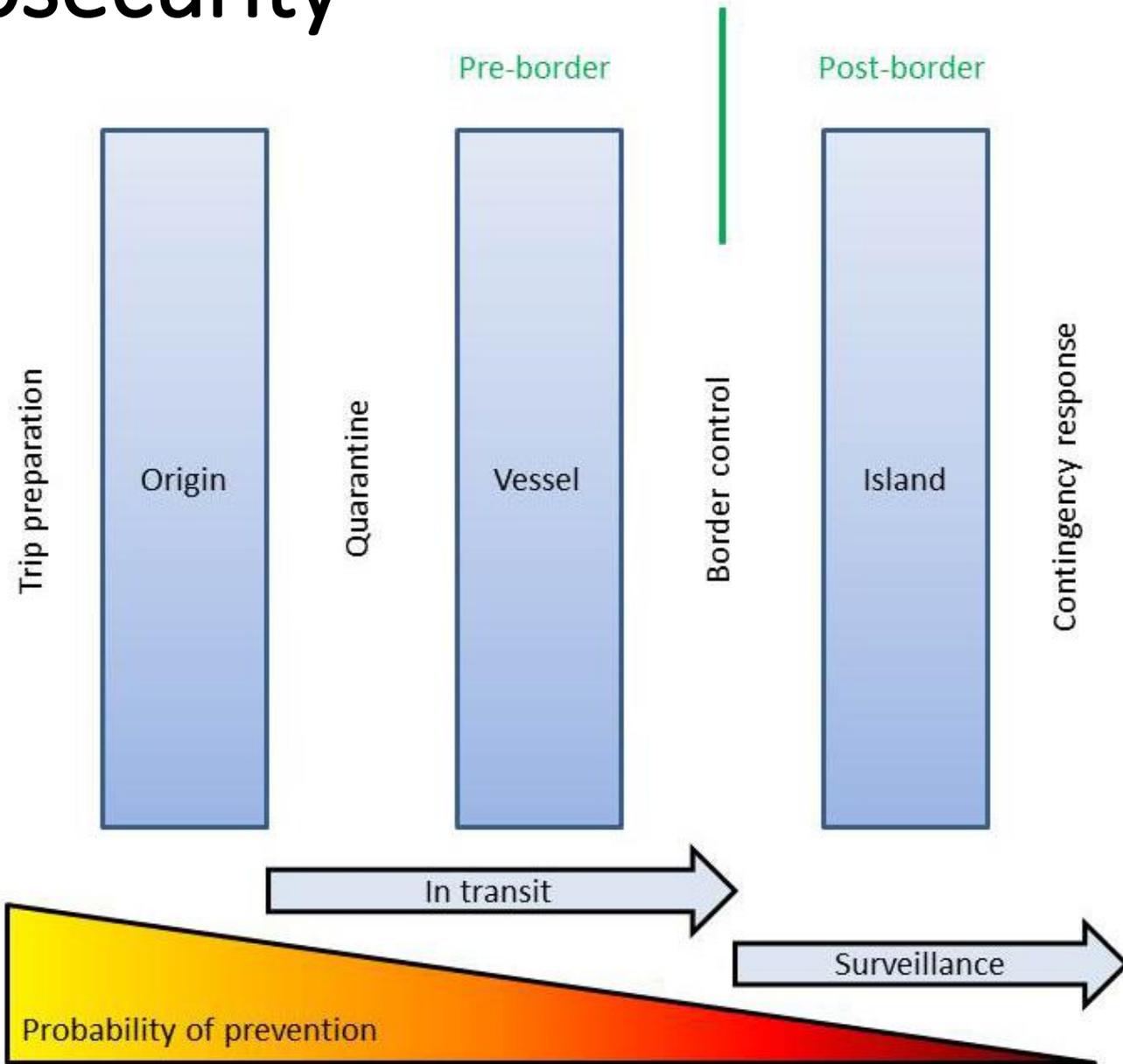
Russell & Kueffer (2019) Island biodiversity in the Anthropocene.
Annual Review of Environment and Resources, 44, 31-60.

Percentage of IASs in region



Russell et al. (2017) Invasive alien species on islands: impacts, distribution, interactions and management. *Environmental Conservation*, 44 (4), 359-370.

Biosecurity



Russell et al. (2017) Invasive alien species on islands: impacts, distribution, interactions and management. *Environmental Conservation*, 44 (4), 359-370.

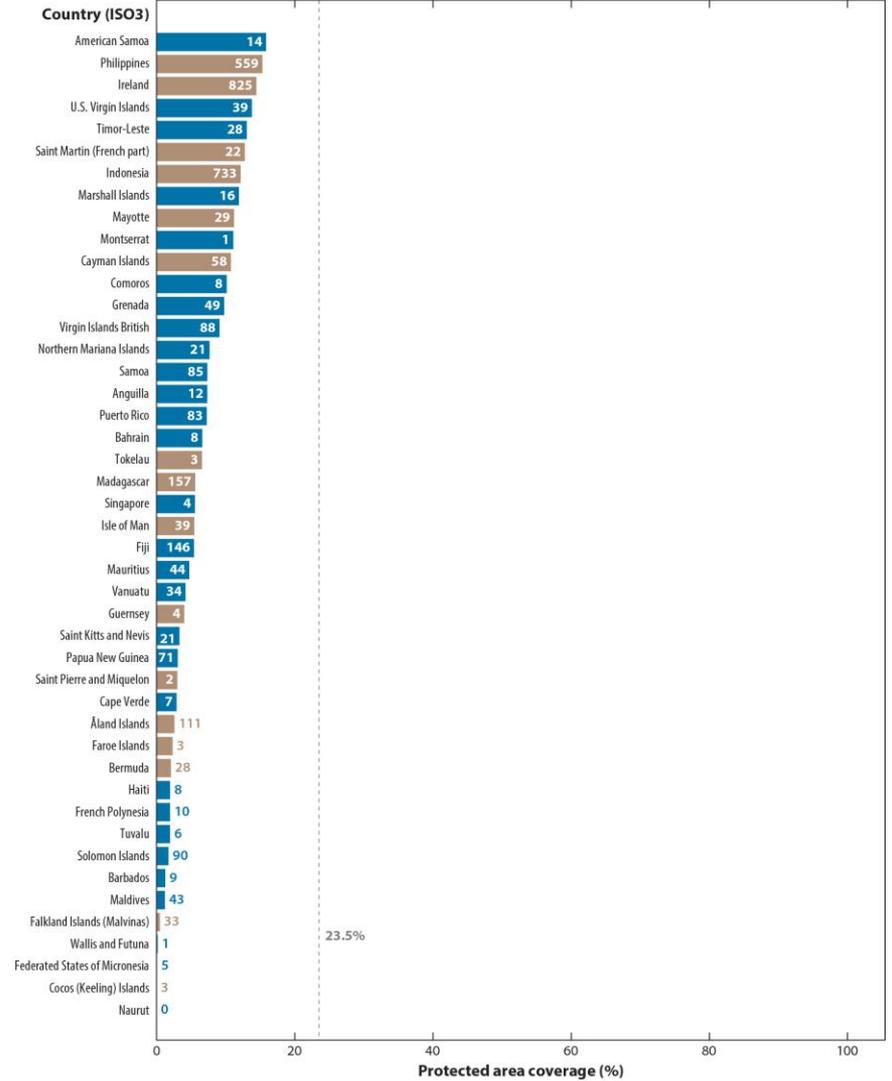
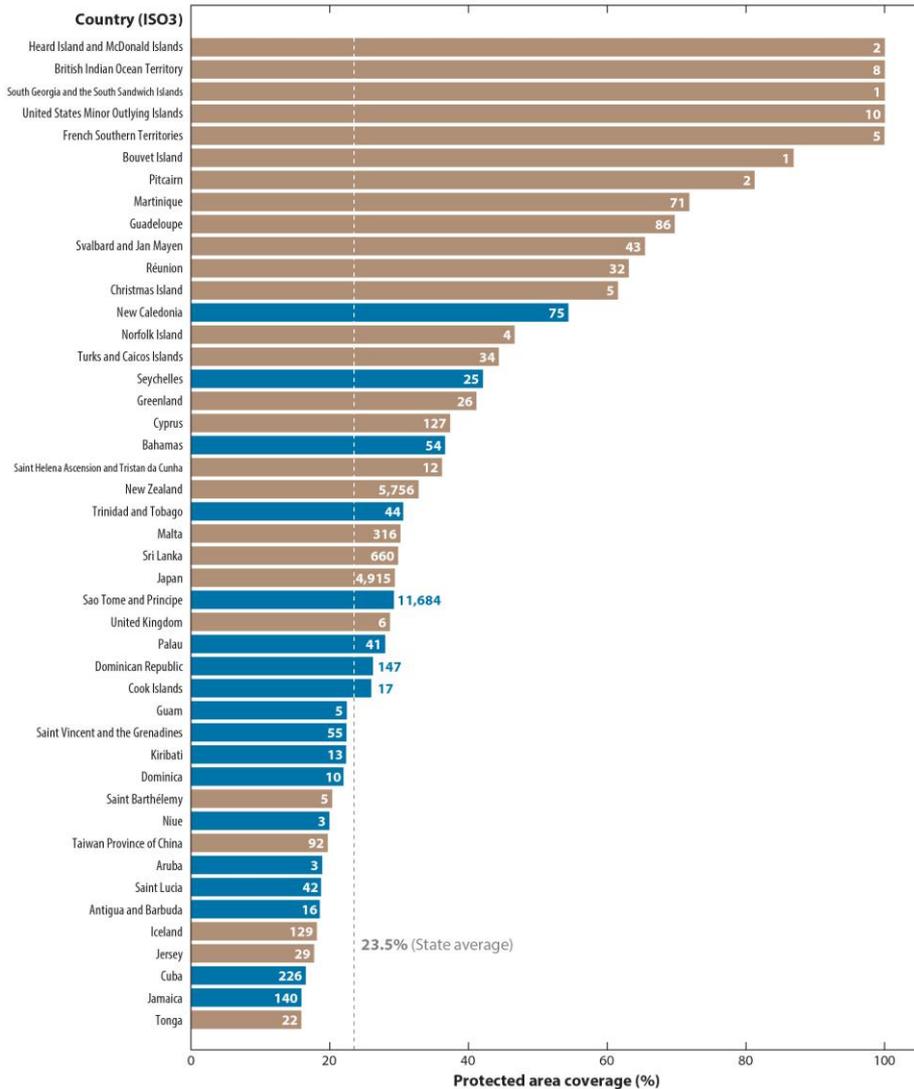
Strategic Environmental Assessment

- SEA is the analytical and participatory approaches that aim to integrate environmental considerations into policies, plans and programmes and evaluate the inter linkages with economic and social considerations
- An over-arching framework of a collection of tools rather than a single, fixed and prescriptive approach (just like eradications operations)
- Invasive species eradication is not just a technical problem

SEA Toolbox

- Community and stakeholder engagement techniques
- Social profiles/baselines and social impact assessment (SIA)
- Health impact assessments
- Cost benefit analysis
- Ecological baselines and impact assessments (EIA)
- Technical feasibility studies
- Livelihoods analysis
- Social marketing/environmental education
- Environmental and social monitoring
- Institutional analysis and change management (includes ongoing biosecurity planning)

Protected Areas on Islands

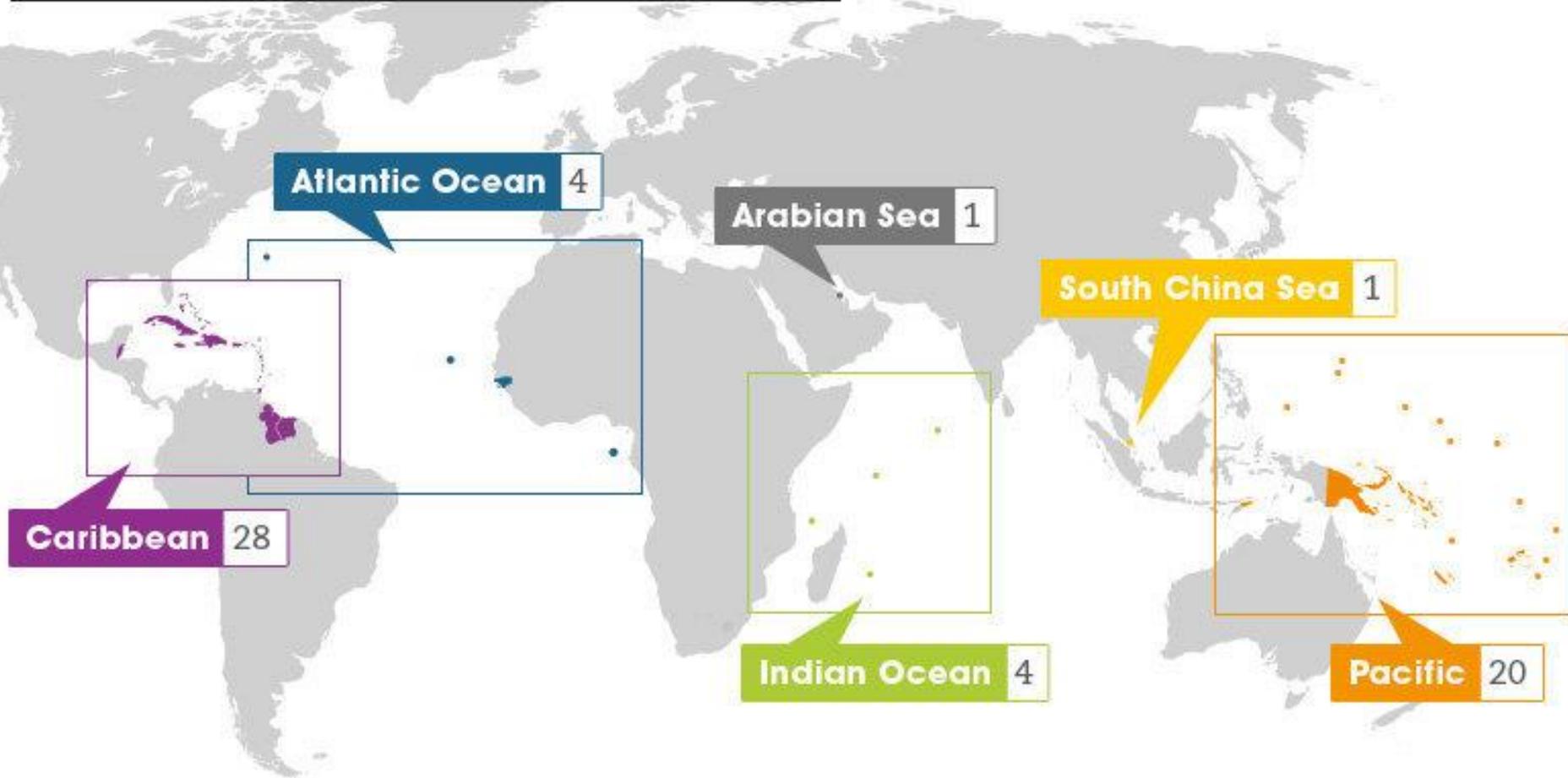


Russell & Kueffer (2019) Island biodiversity in the Anthropocene.
Annual Review of Environment and Resources, 44, 31-60.

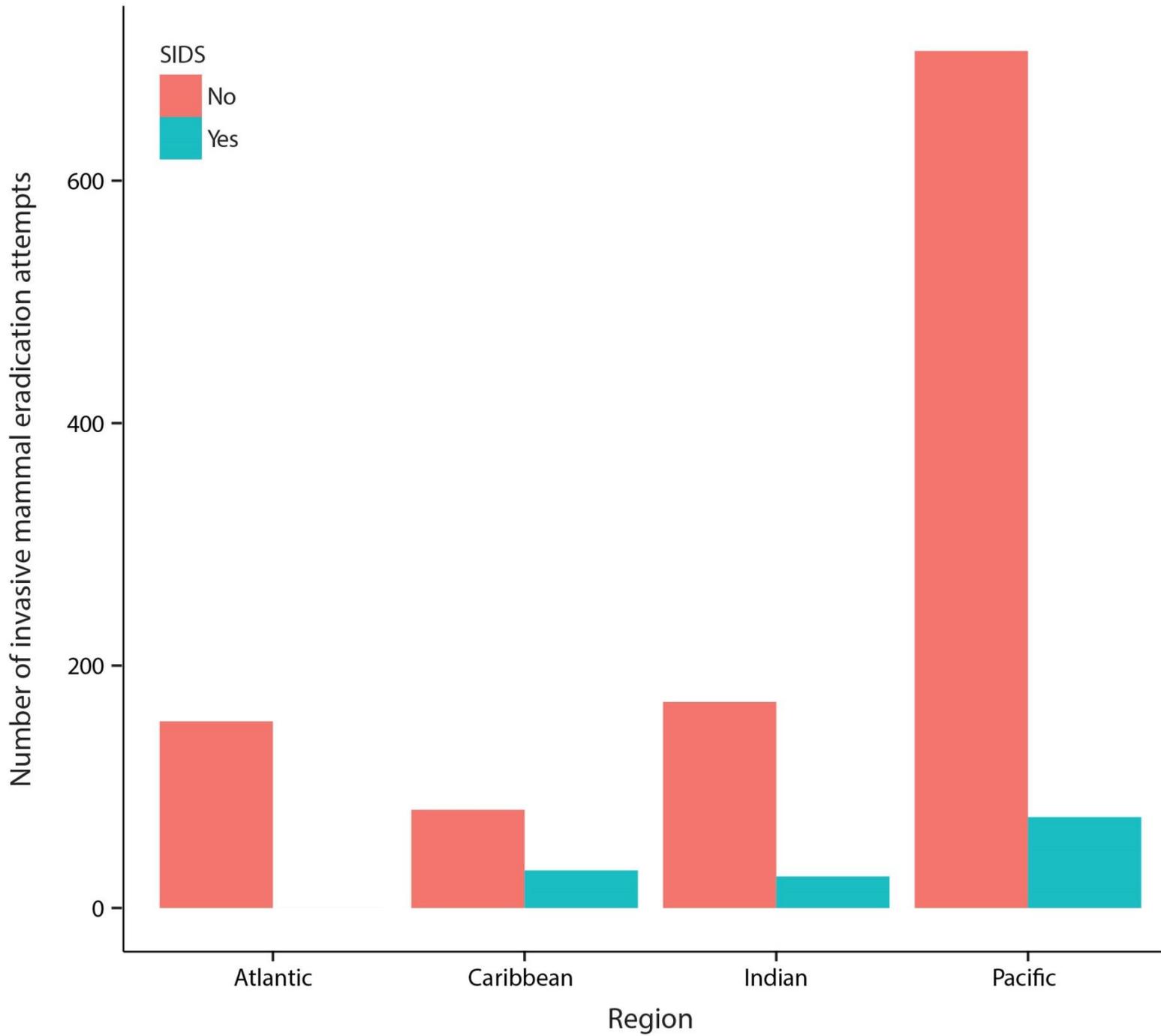
Mammal Eradications on SIDS

Small Island Developing States

58 SIDS in total



Russell et al. (2017) Invasive alien species on islands: impacts, distribution, interactions and management. *Environmental Conservation*, 44 (4), 359-370.



Russell et al. (2017) Invasive alien species on islands: impacts, distribution, interactions and management. *Environmental Conservation*, 44 (4), 359-370.

The future of island biodiversity will depend on envisioning new human-nature relationships on islands that build on the biocultural knowledge of indigenous and local people, are in line with local and global pathways of long-term sustainability, and integrate island biodiversity into culture practices ranging from stewardship (protection and restoration of qualities of prehuman biodiversity) to biodiversity-friendly land-use practice and the regeneration of the cultural and ecological potentials of island life

Russell & Kueffer (2019)

Island biodiversity in the Anthropocene. *Annual Review of Environment and Resources*, 44, 31-60.