



Habitat loss and the impact on species in the Pacific

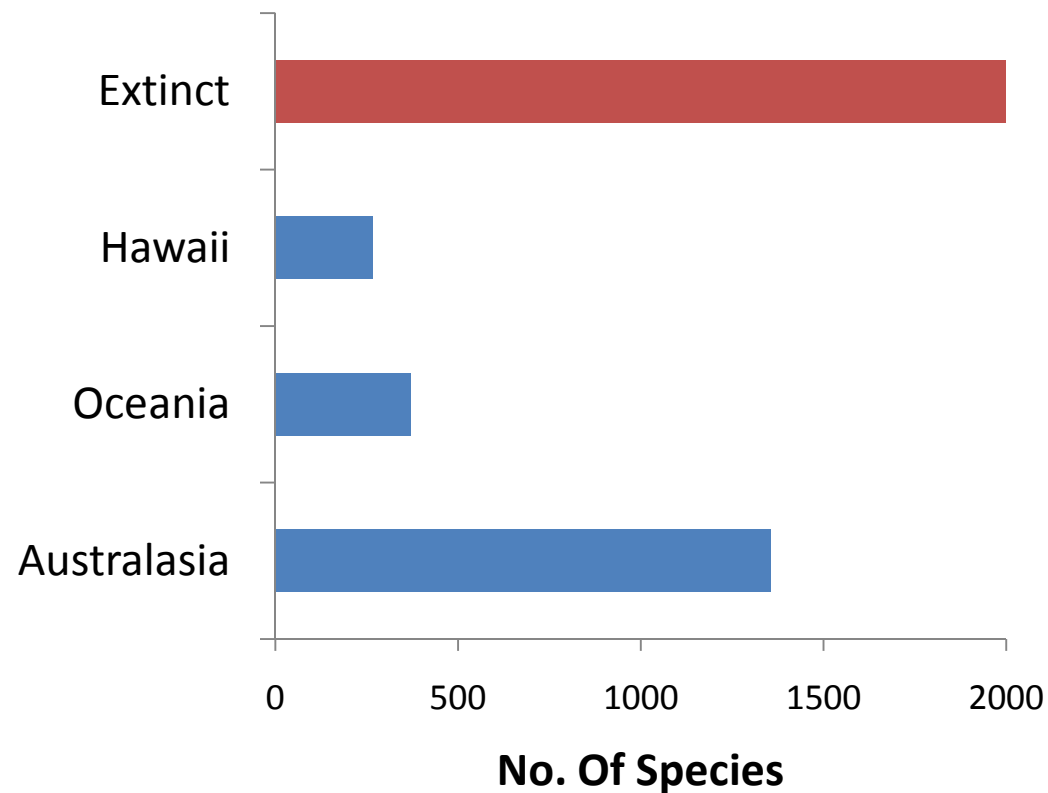
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Subjects covered.

- Background – Extinction rates in the Pacific.
- Factors driving these Extinction Rates
- Habitat loss
- Interactions between factors
- Case Studies

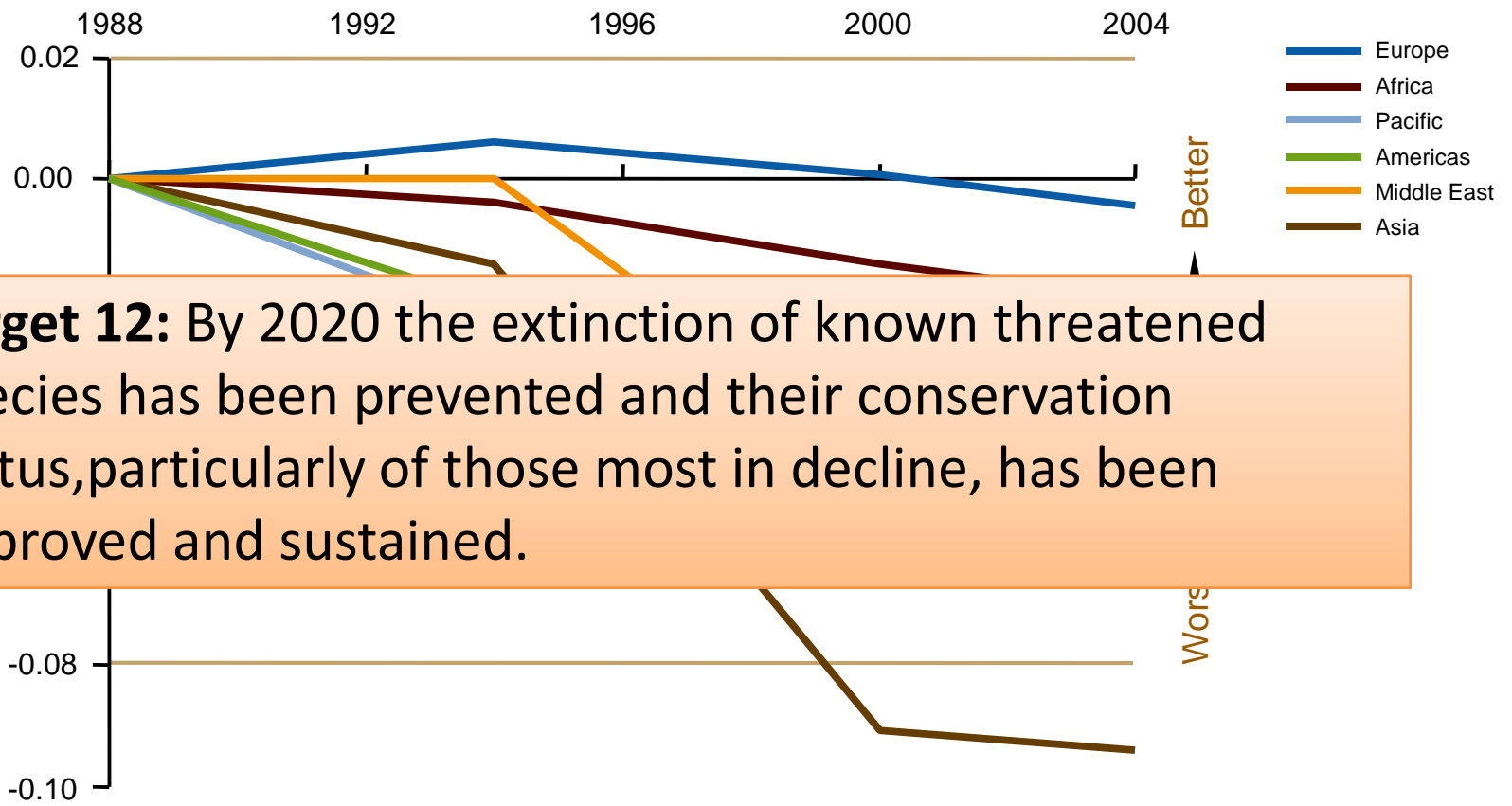
Avian Extinction Rates in the Pacific.

- Study of fossil records at anthropological sites across the Pacific.
- “Extinction of birds in Oceania is one of the best substantiated rapid extinction episodes in the vertebrate fossil record.”



Steadman & Martin 2003. Earth Science Review 61, 133-147

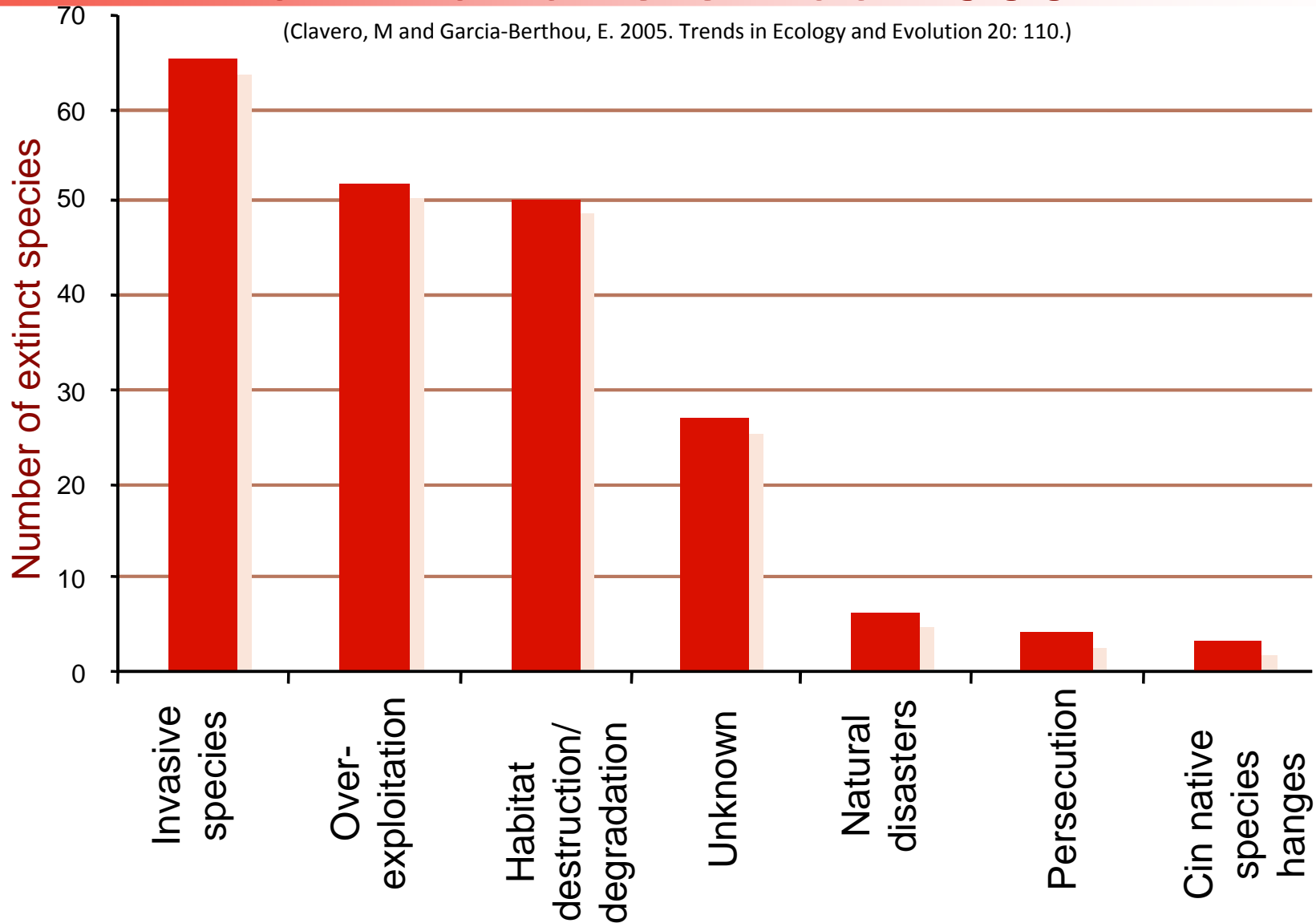
Red List Indices for birds in different regions



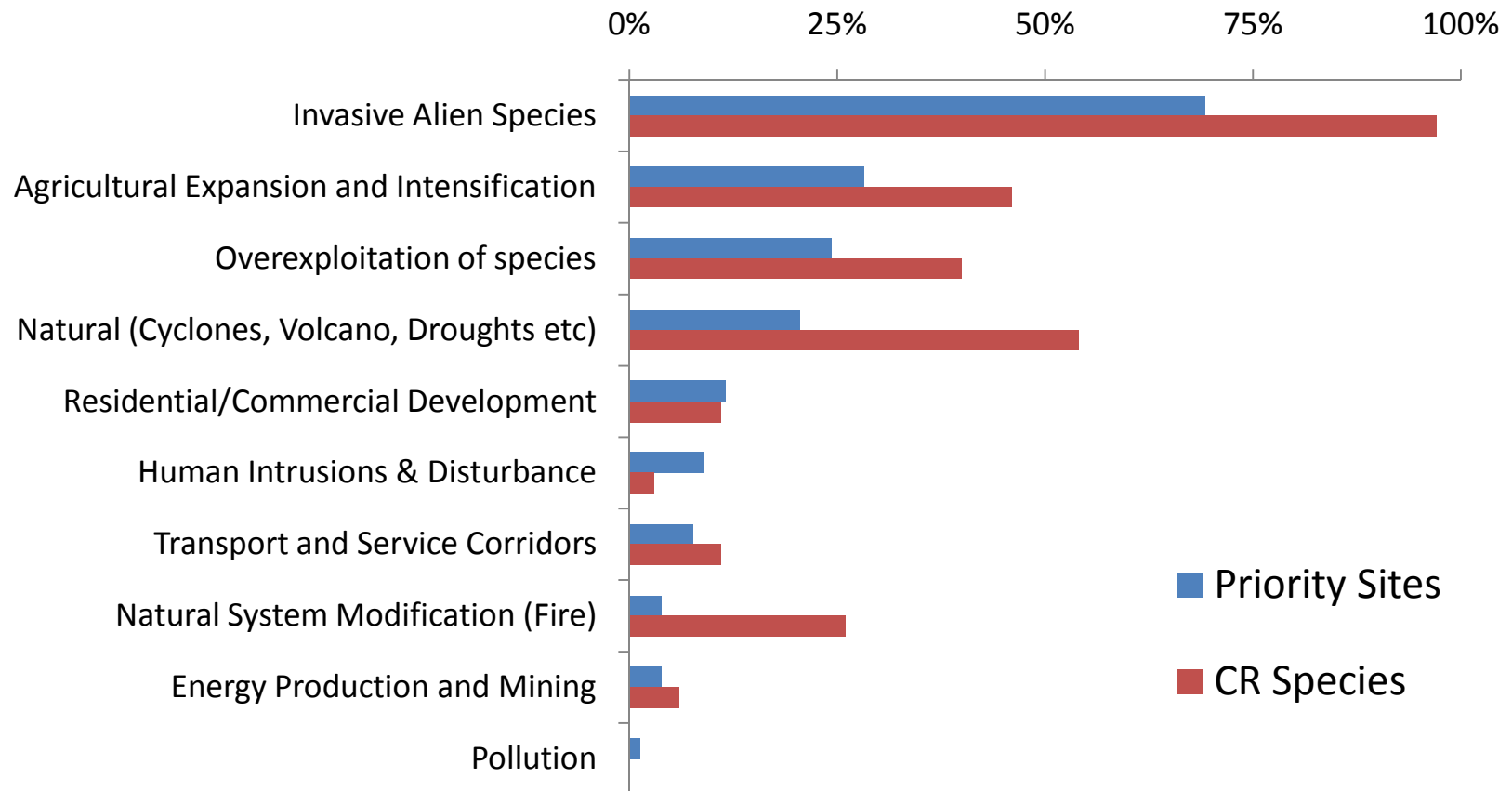
Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

The major threats contributing to bird extinctions since 1500.

(Clavero, M and Garcia-Berthou, E. 2005. Trends in Ecology and Evolution 20: 110.)



Threats to Priority Species and Sites in the Pacific Region.



Habitat Destruction



**Agricultural
clearance**



Logging



**Exotic
plantations**

Agricultural Activities impacting on deforestation in the Pacific

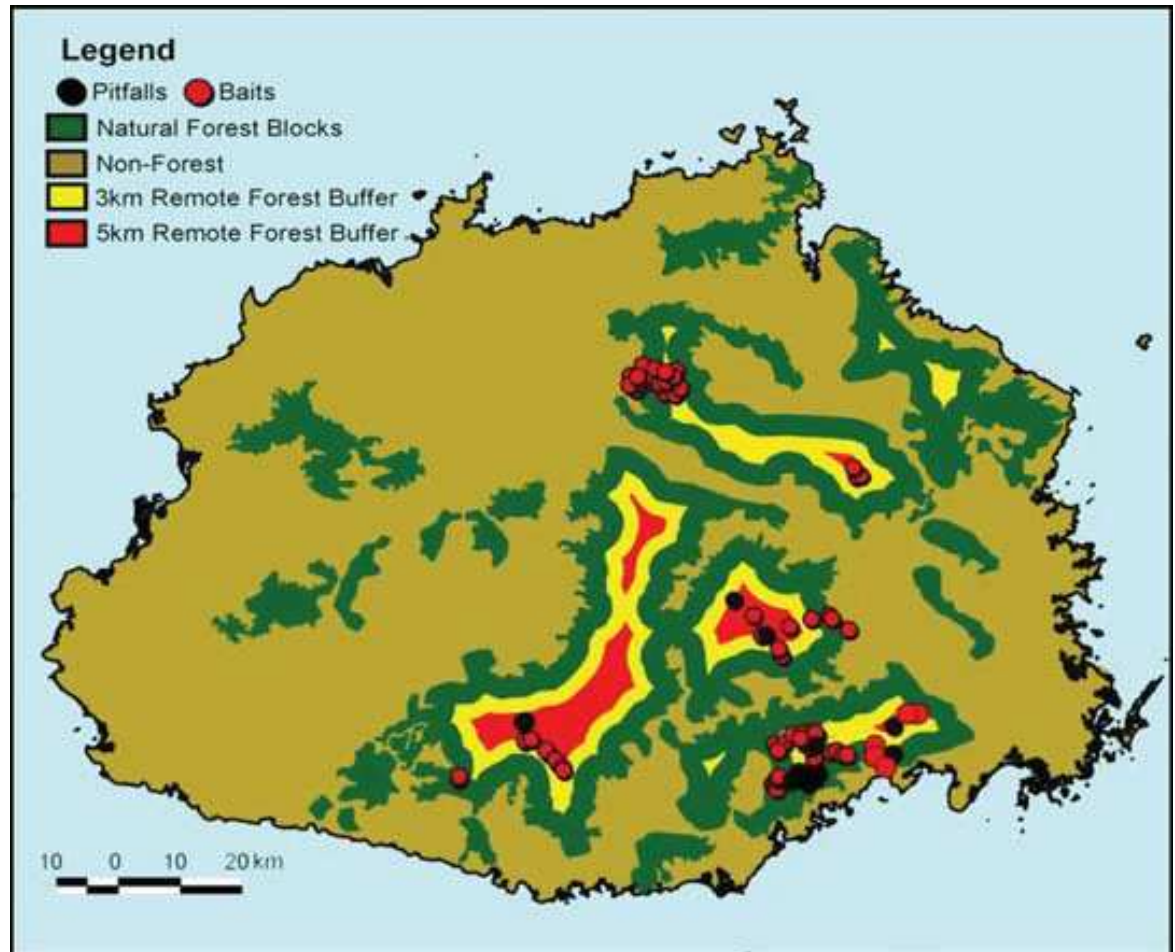
- Most deforestation is related to agricultural activities such as
 1. swidden (slash and burn) agriculture
 2. commercial cash cropping of kava, taro, copra and cocoa.
- Reforestation that has occurred has tended to use exotic species that
 1. lack fruits eaten by native birds and bats,
 2. have limited ecological value,
 3. Can be invasive

Habitat loss in the Pacific.

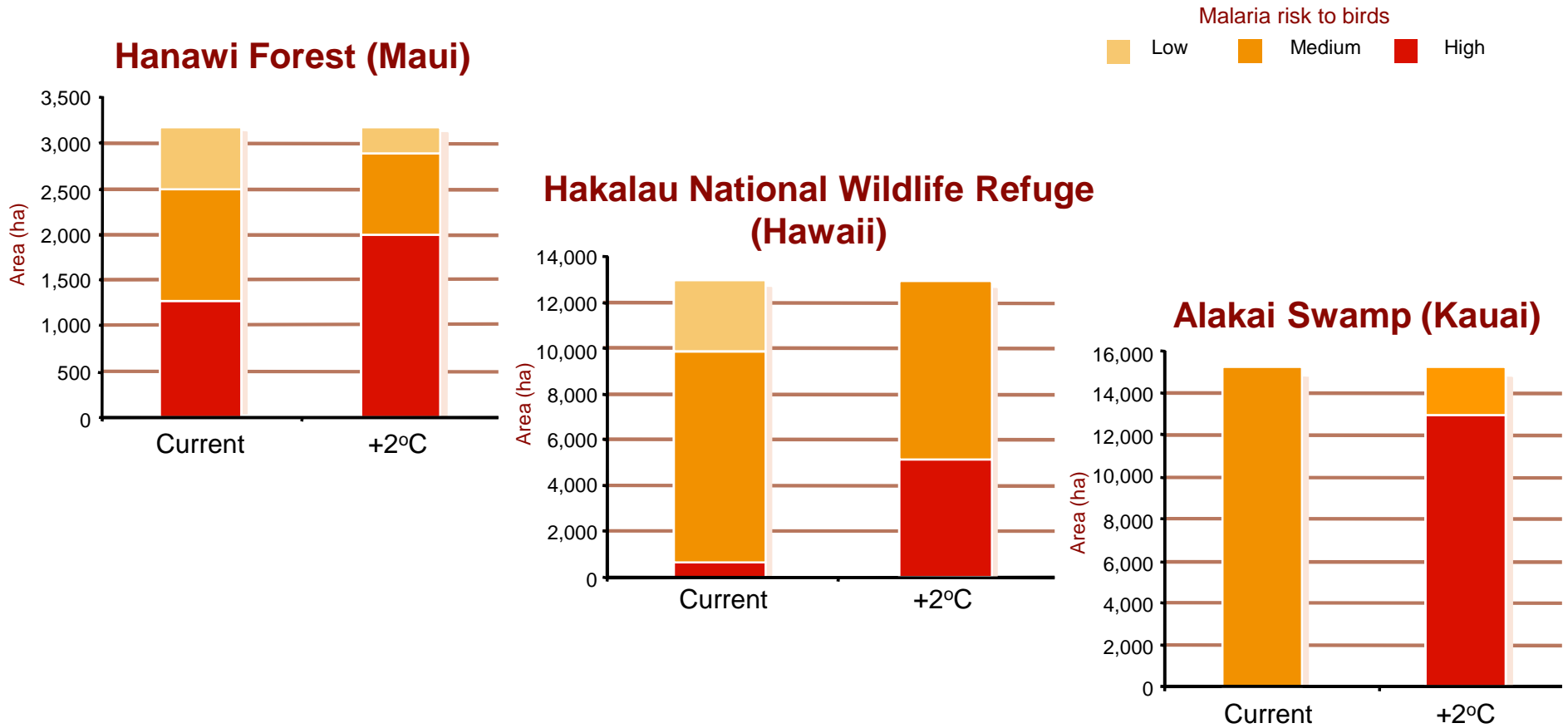
- Within the Polynesia Micronesia Hotspot only 21% of the region's original vegetation, remain in more or less pristine condition (Allison and Eldredge 1999).
- Forest Loss across the Oceania Region (excluding Australia and New Zealand) was most recently recorded as 0.4% per annum, or c1,300km².
- ^{(D}
16 **Target 5:** By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Combined impact of Forest Fragmentation and Alien Invasive species on distribution of 'remote' or 'natural' forest.

- All coloured land represents distribution of Natural Forest Blocks on Viti Levu in Fiji.
- Olson *et al* (2006) laid out bait (roasted coconut) in transects from forest edge into forests to monitor rate of uptake (by rats and mongoose) at different distances from edge.
- They found that bait uptake declined with distance from edge, with none found >5km from the forest edge.
- Clearly forest fragmentation is damaging to forest biodiversity.
- But **in the presence of AIS** it can be much more damaging.
- Forest area on Viti Levu is clearly less fragmented than forests in most other Polynesian/Micronesian countries.



The area of forest with medium and low malaria risks for native bird species in forest reserves on three Hawaiian islands is predicted to decrease substantially following a temperature rise of 2°C



Case Study 1. 'Grow Low' Campaign in Pohnpei.

- Planting of sakau in the highlands of Pohnpei was identified as a problem.
- Over a third of natural vegetation had been removed by the mid 1990s.
- The grow low campaign has encouraged farmers to plant in the lowland areas, and so reduce the pressure on forest in the uplands, the Pohnpei Forest Watershed Reserve.
- Advice together with fertiliser have been provided for farmers to grow Sakau in the lowlands.



Case Study 2. Restoration of Mule in the Marshall Islands

- Micronesian Imperial-pigeon, of the subspecies *ratakensis* dropped to less than 10 individuals by the late 80s.
- Combination of
 - Hunting restrictions
 - Habitat restoration
 - Predation reduction
- Has resulted in a substantial increase with c80 individuals present in 2009.



Case Study 3. Alternative livelihoods and sustainable agriculture in Kadavu.

Community were cutting forest to create more agricultural land as their current sites suffered from erosion.

Identifying improved agricultural practices has reduced pressure on forest AND provided opportunities for more cash crops.

Here pineapples are being grown

using

Vet

nut

Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

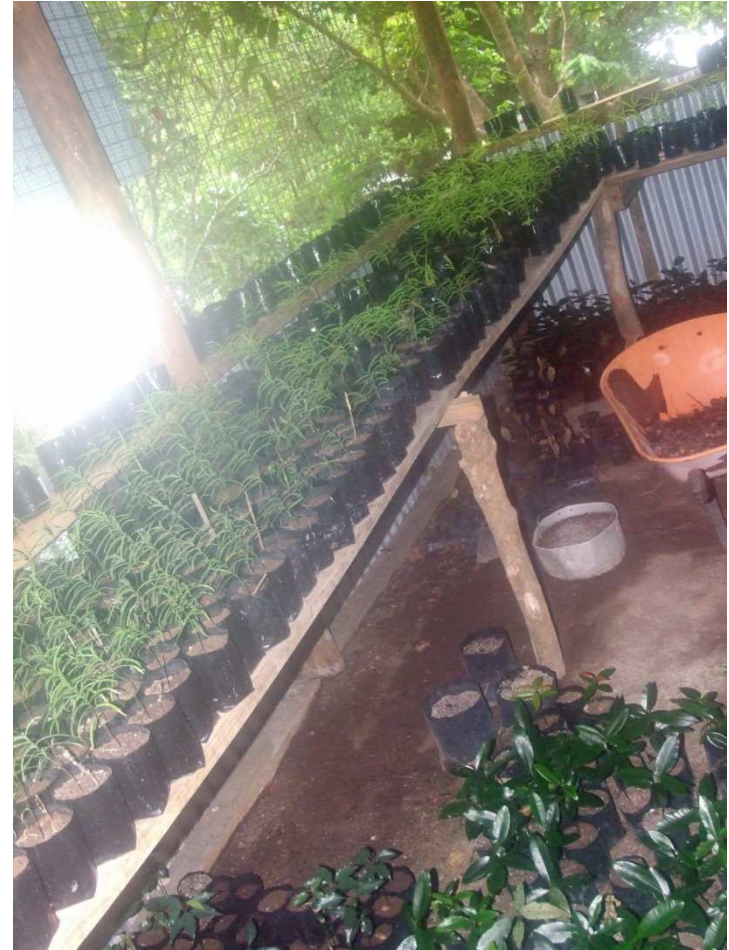


Case Study 3. Alternative livelihoods and sustainable agriculture in Kadavu.

Developed a nursery for germinating tree seedlings.

Profit made from Sandalwood seedlings.

Also growing other native forest trees for reforestation areas to fill gaps in forest cover.



Conclusions

- Bird species in the Pacific Region have been struggling for some considerable time.
- Habitat loss is one of the key drivers of declines in bird conservation status.
- It is difficult to disentangle the impact of Habitat loss from other key drivers.
- Some local level successes have indicated some of the ways that habitat restoration or protection can be attained.

Predicted increase in human pressure in Oceania.

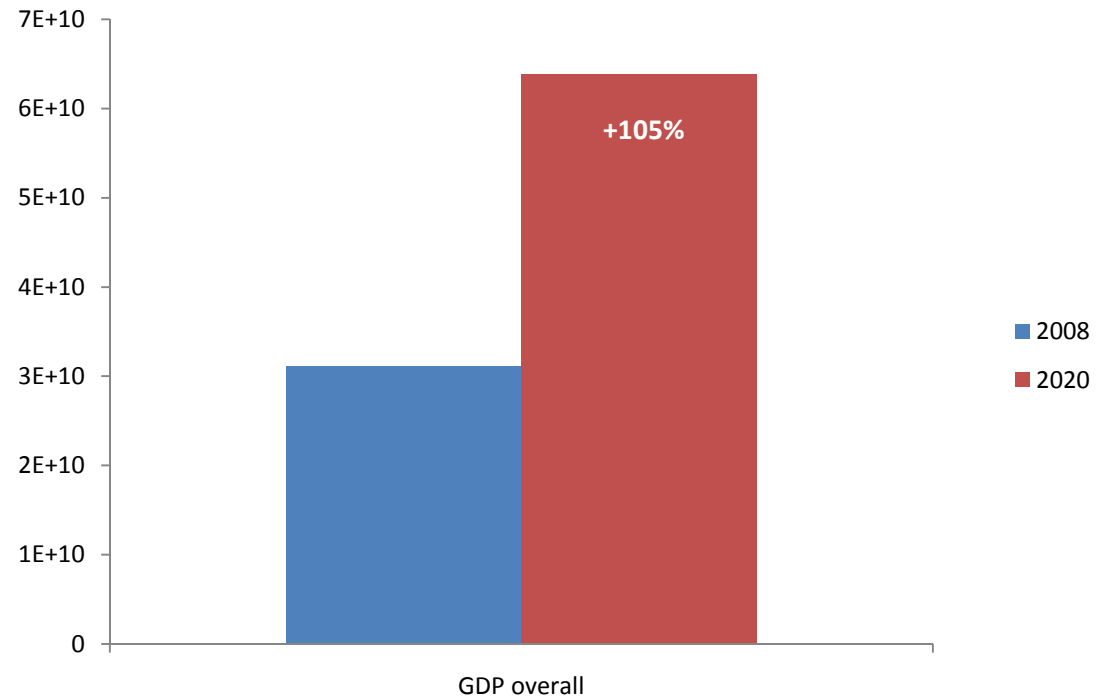
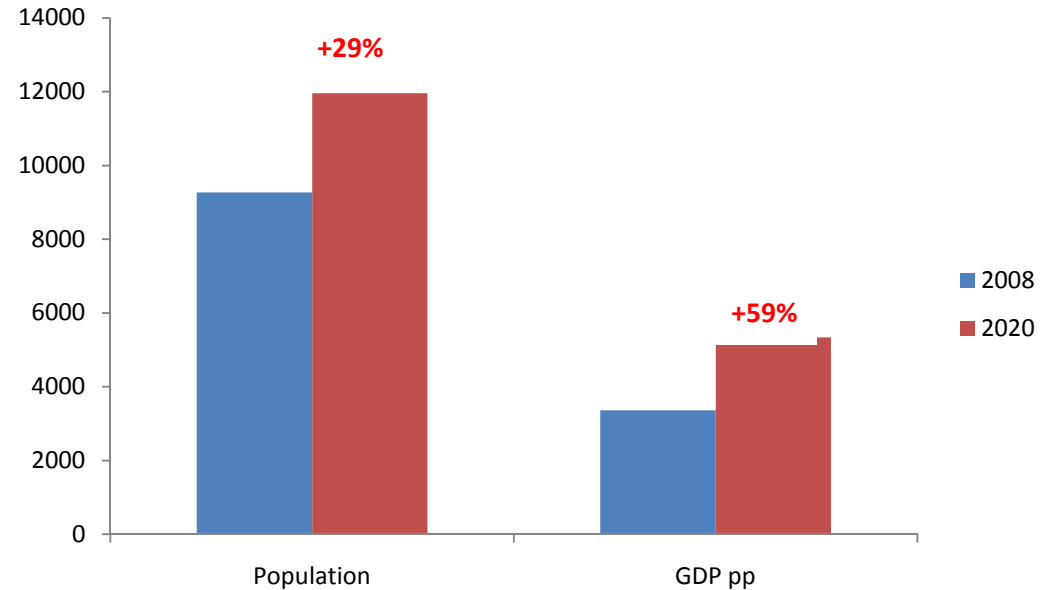
- Population growth rate c2.2% pa
- GDP pp (a measure of the amount of 'stuff' people want) increase c3.9%pa
- GDP Overall is the combination of increased population and increased GDP per population.
- By 2020 there will be TWICE as much PRESSURE on the environment compared with now.

(Baseline year of 2008.

Data for Oceania excluding Australia and New Zealand.

Population data from <http://faostat.fao.org/site/550/default.aspx#ancor>.

GDP data from World Bank (2010) at <http://databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=2>



Background Information

Humans are implicated in the 100 to 10,000 fold increase in the natural or background extinction rates¹.

Two principal causes of extinction

- **Deforestation** – the prime direct, and indirect, cause of extinction globally.²
- **Invasive Species** –over half of all extinctions where causes had been reliably identified were due to IAS³.

Rapid Climate Change – ‘acting in conjunction with other drivers will be the most pressing conservation issue over the next 50-100 years’⁴.

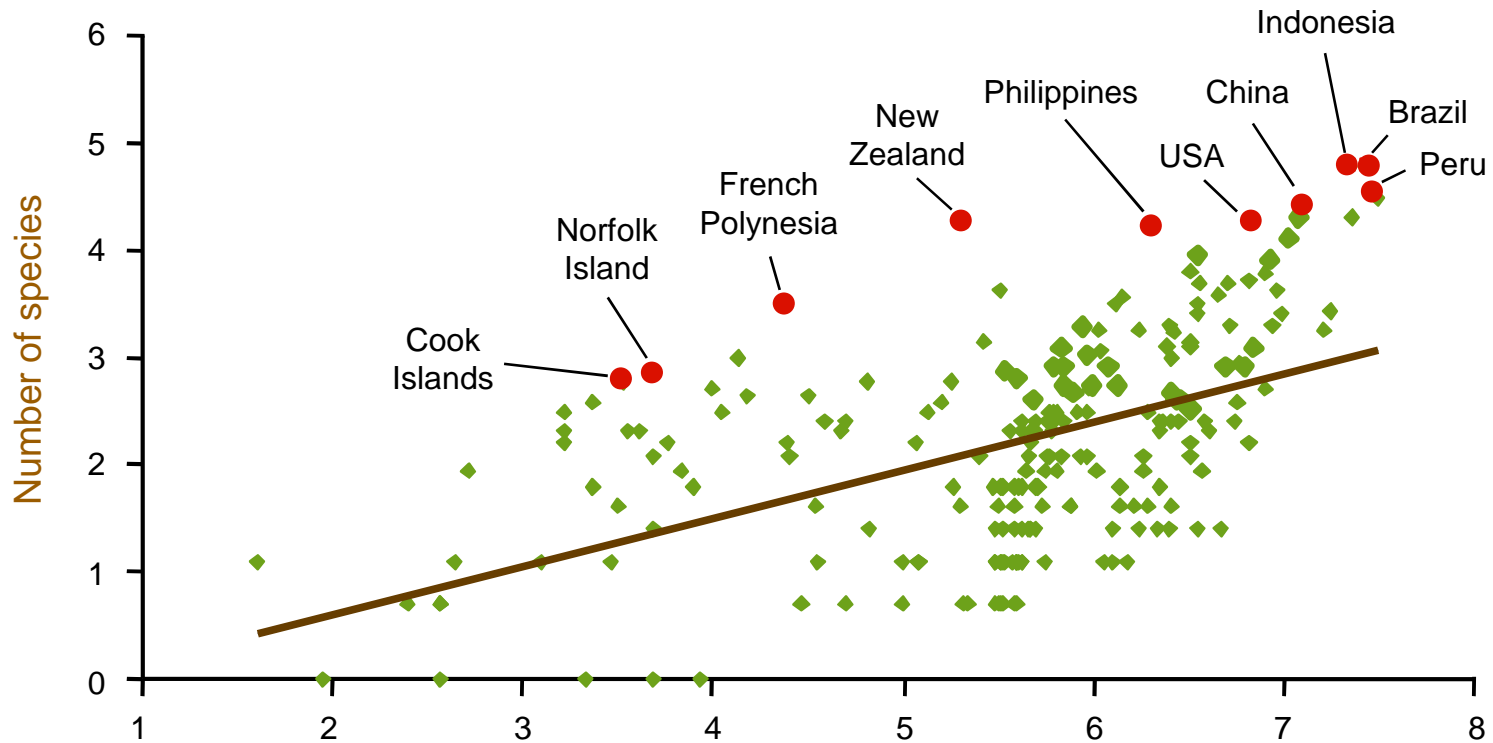
1 Pimm, SL and Raven P. 2000. Nature 403: 843–845.

2 Brook BW, Sodhi NS, and Ng PKN. 2003. Nature 424: 420–423.

3 Clavero, M and Garcia-Berthou, E. 2005. Trends in Ecology and Evolution 20: 110.

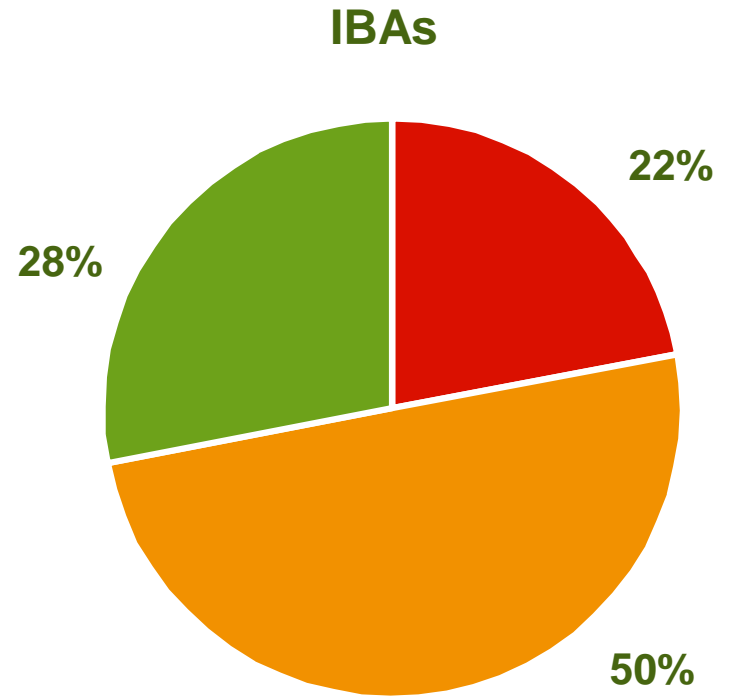
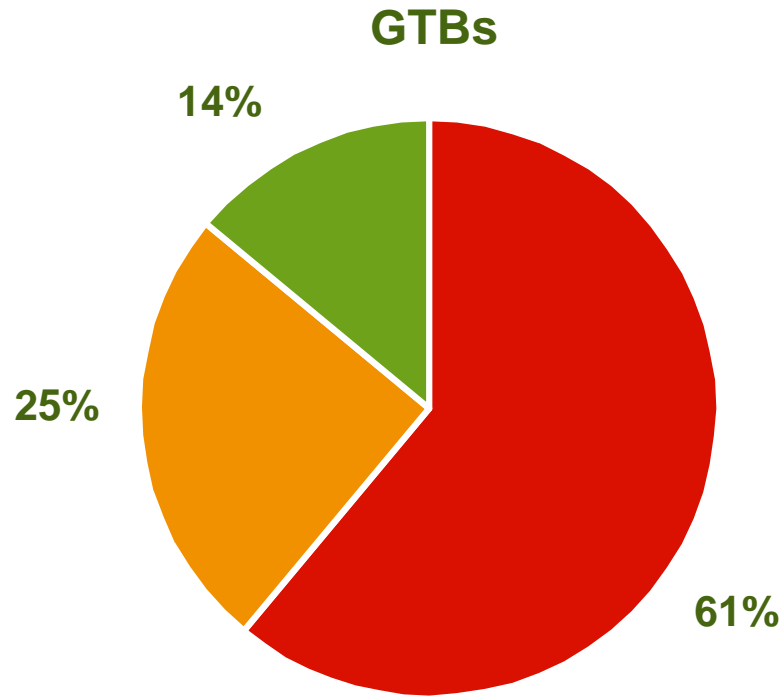
4 Sodhi , NS Brook, BW and Bradshaw CJA. 2009. Species Extinctions. In Biological Conservation. Princeton University Press.

The countries with the most threatened avifaunas



Countries marked in red on a regression of number of GTBs against total number of bird species for each country

How well is the conservation of GTBs and IBAs addressed by 36 NBSAPs?



- Weakly
- Moderately
- Effectively