



ESRM 350

Insularity

Autumn 2016

“Generally, I like all islands. There, it is easier to rule”

- Albert Camus, French-Algerian writer and philosopher

Insularity

- The state of living in geographically isolated environments
 - e.g., on islands, or in isolated fragments (surrounded by extensive matrix)
- Insular species tend to be more susceptible to population declines and extinctions than “mainland” or “continental” species

Insularity and Extinction

Table 2 Extinctions since 1500 according to IUCN and CREO, with per species and per unit area rates.

	Number	%	Per 10 ⁶ km ²	vs. Fossil turnover
Mammals				
Continents	3	0.081%	0.025	0.89–7.4
Islands	58	7.4%	4.43	82–702
Ratio (I/C)		91	176	95
Birds				
Continents	6	0.062%	0.050	0.69–5.9
Islands	122	8.86%	9.38	98–844
Ratio (I/C)		143	187	143

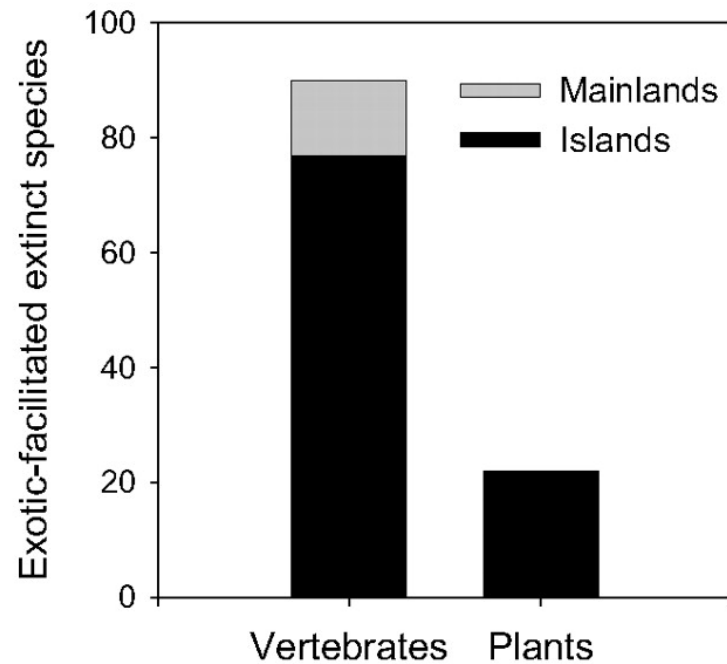
IUCN, International Union for the Conservation of Nature and Natural Resources; CREO, Committee on Recently Extinct Organisms.



Spectacled Cormorant (*Phalacrocorax perspicillatus*)

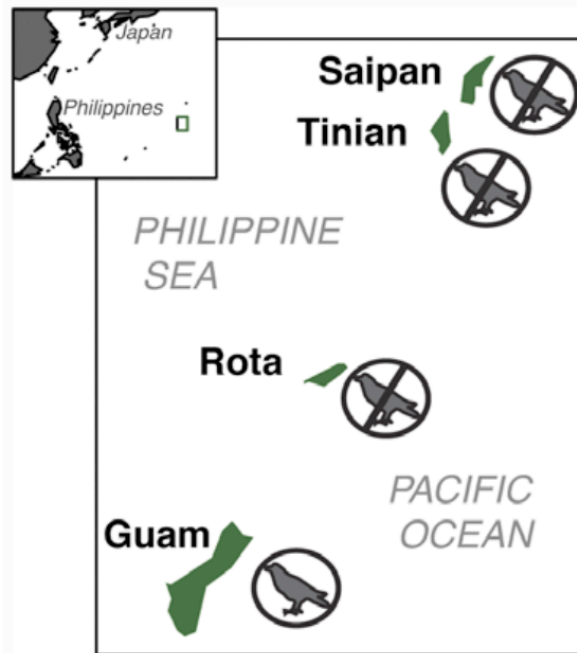
- Once inhabited Bering Island
- Largest species of cormorant (12-14 lbs)
- Described as “clumsy and nearly flightless”
- First identified by Georg Steller (German explorer and zoologist) in 1741
- After discovery, collected for food and feathers
- Reported extinct around 1850

Invasive Effects Larger on Islands



- Most known extinctions caused by invasives have occurred on islands

Invasive Brown Tree Snakes: No More Birds on Guam



brown tree snake (*Boiga irregularis*)



Figure 1. Map of the Mariana Islands. All forest birds are functionally extinct on the island of Guam, whereas relatively healthy bird populations remain on three nearby islands of Saipan, Tinian and Rota.

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Why are Insular Species More Vulnerable?

- **Rescue Effect**

- insular populations are cut off from “rescue” by immigrants, whose arrival can buffer against losses and avert extinction

Immigrants (frequently arrive)



Immigrants (rarely arrive)



Why are Insular Species More Vulnerable?

- **Lack of co-evolution**
 - insular organisms lack adaptations to cope with competitors, predators, parasites, and invasives
 - e.g., insular taxa are often naïve
 - fail to recognize threat posed by exotic predators

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Mala or rufous hare-wallaby
(*Lagochetes hirsutus hirsutus*)

1.3 kg



Feral cats

Hardman and Moro (2006) *Wildlife Research*