

Invasive rats in the tropics

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Desk review of rats on tropical islands

- History of rat introductions
- Rat ecology on tropical islands
- Rat impacts on biodiversity
- Predicted and actual effects of removing rats on biodiversity
- Techniques used to eradicate rats
- Lessons learnt from rat eradications on tropical islands

History of rat introductions in the tropical Atlantic

- Black rats (*R.rattus*) introduced into the Caribbean from Columbus onwards
- To St Helena 'after 1420' and known on Ascension by 1701
- Brown rats (*R.norvegicus*) arrived in the 18th Century



Rat ecology on tropical islands

- Good colonisers - very adaptable
- Able to exploit wide range of habitats and food sources
- A few studies of rat ecology, looking at home range size, foraging behaviour etc.



Rat impacts on biodiversity

- Impacts recorded for a wide range of taxa
- Birds - mainly seabirds
- Reptiles - snakes, lizards & turtles
- Plants & invertebrates



Eradication techniques

- Most projects rely on ground-based poisoning
- Aerial poison drops account for largest area (worldwide)
- Supplementary methods include live and snap trapping



Predicted and actual effects of removing rats on biodiversity

- Predicted: particular benefits for key species and more general benefits for other, usually poorly defined, taxa.
- Actual: poorly recorded, and available only for few key species (mainly vertebrates)

Actual effects of rat eradication

- **Antiguan racer snake** - population increased from 51 to 114 snakes within 18 months (Great Bird Island, Antigua)
- **Seabirds** - % breeding success of three species increased from 0-5% to 38-90% within 2 years (Hardy Island, Martinique)
- **Golden bandicoot** - abundance (live trap success rate) increased from 6.8% to 35% within 8 years (Middle Isl., Australia)

Lessons learnt from other rat eradications in the tropics

- Look at reasons behind failures and successes
- Important to publish failures as well as success stories
- Reasons for failure include:
 - reinvasion (not acting to prevent new arrivals and/ or not detecting them in time)
 - failure to detect survivors
 - legal problems stopping bait use

Main findings

- Ensure resources available for maximum possible duration of project
- Follow up and monitoring are at least as important as actual eradication
- Rat eradication recommended as 'routine' for islands up to 100ha (Howald *et al.*, in press)
- Social acceptance and funding, not island size, are probably now the limiting factors for rat eradications

Relevance to the UKOTs?

- Learn as much as possible from projects elsewhere
- Regional strategies save reinventing wheel & can provide economies of scale
- Two obvious regions - Caribbean and S. Atlantic
- Caribbean UKOTs can benefit from links with other countries in region - sovereign islands and other OTs