

## Other Islands of importance



Orange-tail skink

Photo: Nicole Lohmann

## The need for conservation

- It was recognised that:
  - Their future survival was at great risk
  - To safeguard against extinction, the reptiles should be re-established back to other islands

## The need for conservation


- What does conservation mean?
  - Taxonomy, health and disease, and past and present distribution
  - Habitat restoration, ecological processes and island biodiversity
  - Eradication of mammalian predators and herbivores

**TRANSLOCATION**




## Translocation

- The movement of a species from one location with free release in another – 3 types:
  - Introduction: species release outside its natural range
  - Re-introduction: species release within its past former range
  - Re-stocking: species release within an existing population



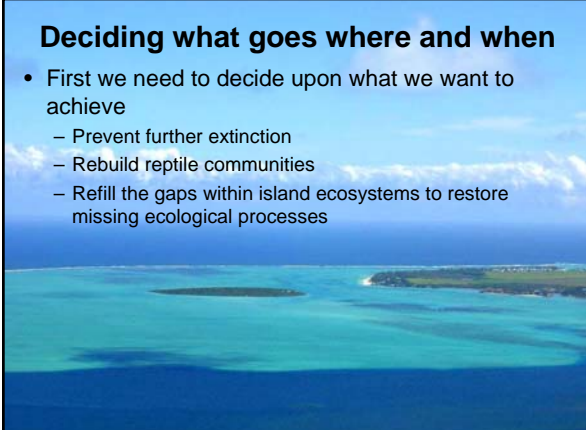
## Translocation

- Re-introduction and re-stocking are common and powerful conservation tools
- However, where do we start?
  - How do we decide what goes where and when?



## Deciding what goes where and when

- First we need to decide upon what we want to achieve
  - Prevent further extinction
  - Rebuild reptile communities
  - Refill the gaps within island ecosystems to restore missing ecological processes





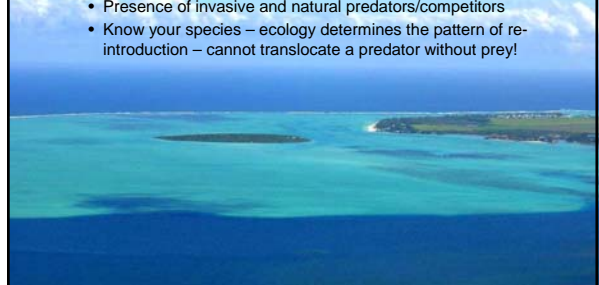
### Deciding what goes where and when

- We need to know:
  - What was present prior to disturbance
  - What caused the original loss of the species



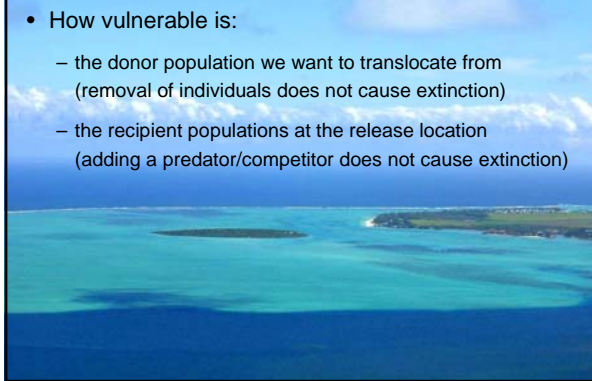
### Deciding what goes where and when

- We need to know:
  - What is currently present/missing from an island that could prevent re-establishment
    - Presence of invasive and natural predators/competitors
    - Know your species – ecology determines the pattern of re-introduction – cannot translocate a predator without prey!



### Deciding what goes where and when

- How vulnerable is:
  - the donor population we want to translocate from (removal of individuals does not cause extinction)
  - the recipient populations at the release location (adding a predator/competitor does not cause extinction)



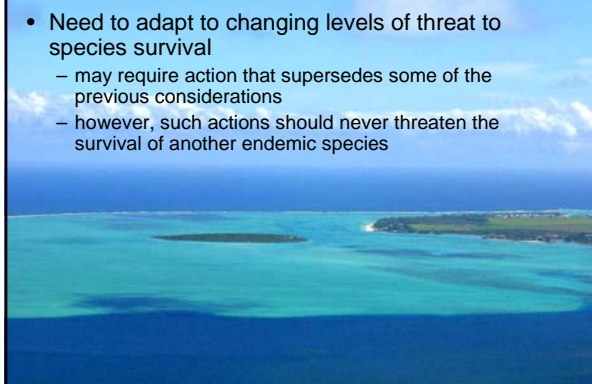
### Deciding what goes where and when

- How secure are the release sites in terms of:
  - The status of the location (nature reserve or golf course)
  - Proposed plans for development (tourism – plantation – recreation)



### Deciding what goes where and when

- Need to adapt to changing levels of threat to species survival
  - may require action that supersedes some of the previous considerations
  - however, such actions should never threaten the survival of another endemic species



### Re-building Mauritian reptile communities

- In 2006, we initiated the first lizard translocations
- To date we have translocated five species to four islands



### Planned translocations

- Translocate Telfair's skinks (*Leiolopisma telfairii*) from Round Island to Ile aux Aigrettes and Gunners Quoin

### Planned translocations

- Translocate the southeastern variant of Bojer's skink (*Gongylomorphus bojerii* sp.) from Ilot Vacoas to Ile aux Fouquets

- January 07 conducted the first annual translocation of 20 skinks from the 3-400 skink population
- January 08 conducted the second translocation of 20 skinks – Re-Stocking

Ilot Chat

### Unplanned translocations

- Orange-tail skink, *Gongylomorphus fontenayi* sp.
  - Only known from Flat Island (1995), very few seen
  - Rats, cats and mice eradicated in 1998
  - By 2003 the population estimated at least 800
  - Current population at least 10,000

- No immediate plans to work on the species

### Unplanned translocations

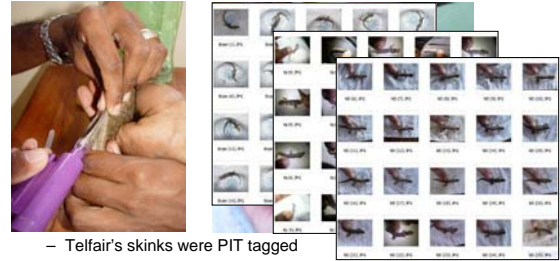
- Orange-tail skink, *Gongylomorphus fontenayi* sp.
  - 2007 rats were eradicated from the island – closed nature
  - Many are concerned to enhance tourism
  - Similar island developments = musk shrew and wolf snake = extinction of *Gongylomorphus*
  - We needed to take action, whilst healthy population







**MONITORING REPTILE POPULATIONS**



- Telfair's skinks were PIT tagged
- Species too small for tagging given photographic IDs
- Pattern of scarring, missing toes/claws, tail breaks recorded

**Individual identity**

- Determine health and disease status of the reptiles over time and between islands
- Distribution
  - Survival, recruitment and population size (recapture rates)

Telfair's skinks on Gunnery Quoin

- Habitat utilization and niche shifts

**Monitoring populations**

- Create a PIT tag to monitor the island vertebrates and invertebrates over time
- Monitor over time for population and relocation
  - Pitfall trapping



**Restoring reptile populations**


- The impacts of translocation will be potentially positive to island ecosystems and successful
- Outlets
  - Reduced Agamid population rates to 10% of pre-skink rates

Quoin

**Not all has gone quite to plan**

- Ultimately we want rebuild island ecosystems to support endangered apex predators
- Rebuild the ecosystem step-by-step
- Each translocation put in place to support the next

- Since we translocated night geckos in 2006:
- Invasive species remain a huge issue for island biodiversity
  - Introductions to Pitcairn
    - Agamid lizard
    - Musk Shrew
    - Wolf snake



- Estimated 155 geckos on the island prior to the rat
- Caught and removed the first three before major impact
- The night gecko populations would have established
- Did not get the rat in time - night geckos lost

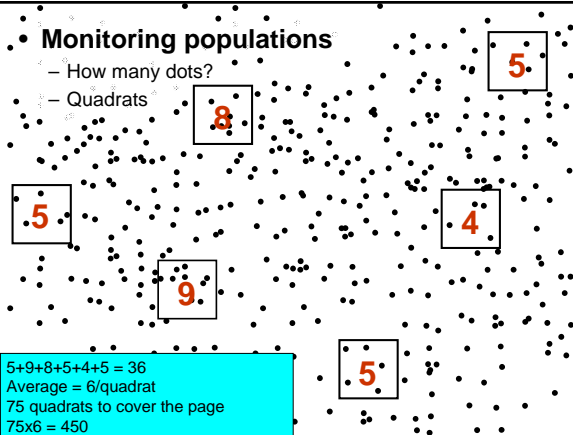
- High level of monitoring on islands

– But detecting some species is not always straight forward – particularly estimating populations

– How do we know what is there?

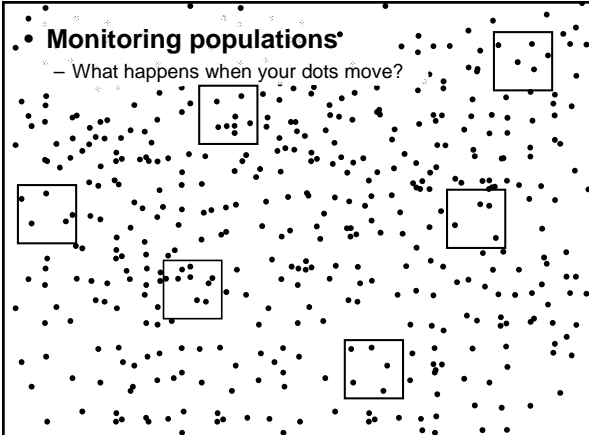


- Monitoring populations
- How many dots?
- Quadrats

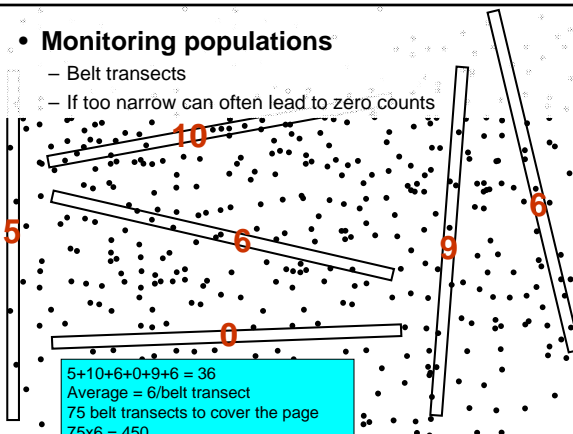


5+9+8+5+4+5 = 36  
Average = 6/quadrat  
75 quadrats to cover the page  
75x6 = 450

- Monitoring populations
- What happens when your dots move?

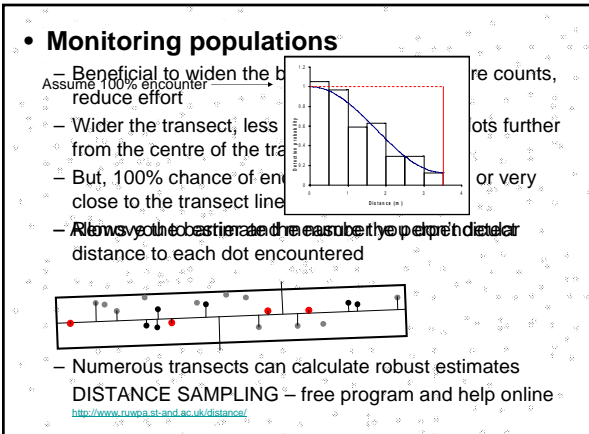


- Monitoring populations
- Belt transects
- If too narrow can often lead to zero counts



5+10+6+0+9+6 = 36  
Average = 6/belt transect  
75 belt transects to cover the page  
75x6 = 450

- Monitoring populations
- Beneficial to widen the belt
- Assume 100% encounter
- reduce effort
- Wider the transect, less from the centre of the transect
- But, 100% chance of encounter close to the transect line
- Allows you to estimate the average perpendicular distance to each dot encountered



re counts, dots further or very

– Numerous transects can calculate robust estimates

DISTANCE SAMPLING – free program and help online  
<http://www.ruwpa.stand.ac.uk/distance/>



• **Monitoring populations**

- Distance Sampling works very well
- Assuming that you can detect species along the transect line
- This is not always the case



• **Monitoring populations**



• **Monitoring populations**

- Went back to using quadrat method
- Enclosed to prevent emigration or immigration



- The only sure way of detecting the undetectable
- Obtain absolute densities

• **Monitoring populations**

- Quadrats frequently used to measure diversity within and between habitats
- Often drives decisions on habitat conservation
- Healthy ecosystems considered to have high species diversity
- But need to consider the status of the species contributing to that diversity
- Shannon Index of species diversity - a measure of evenness



- Fieldwork
- Two habitats
- A diverse world:

- 1) Cocoa Krispies
- 2) Frosted/Corn flakes
- 3) Corn Pops
- 4) Honey Smacks
- 5) Green Loops
- 6) Blue Loops
- 7) Yellow Loops
- 8) Purple Loops
- 9) Orange Loops
- 10) Red Loops
- 11) Blue M&Ms



- What is the population/density of cereal in each habitat?
- Is one habitat better for cereal diversity than another?

