



The genetic consequences of urbanisation: the Eastern Water Dragon (*Intellagama lesueurii*) as a model species

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Introduction to urbanisation

- Worldwide
- Sunshine Coast

Urban non-adapters

- Definition and examples

Urban adapters

- Definition and examples
- Gaps in knowledge

Introduction of study species

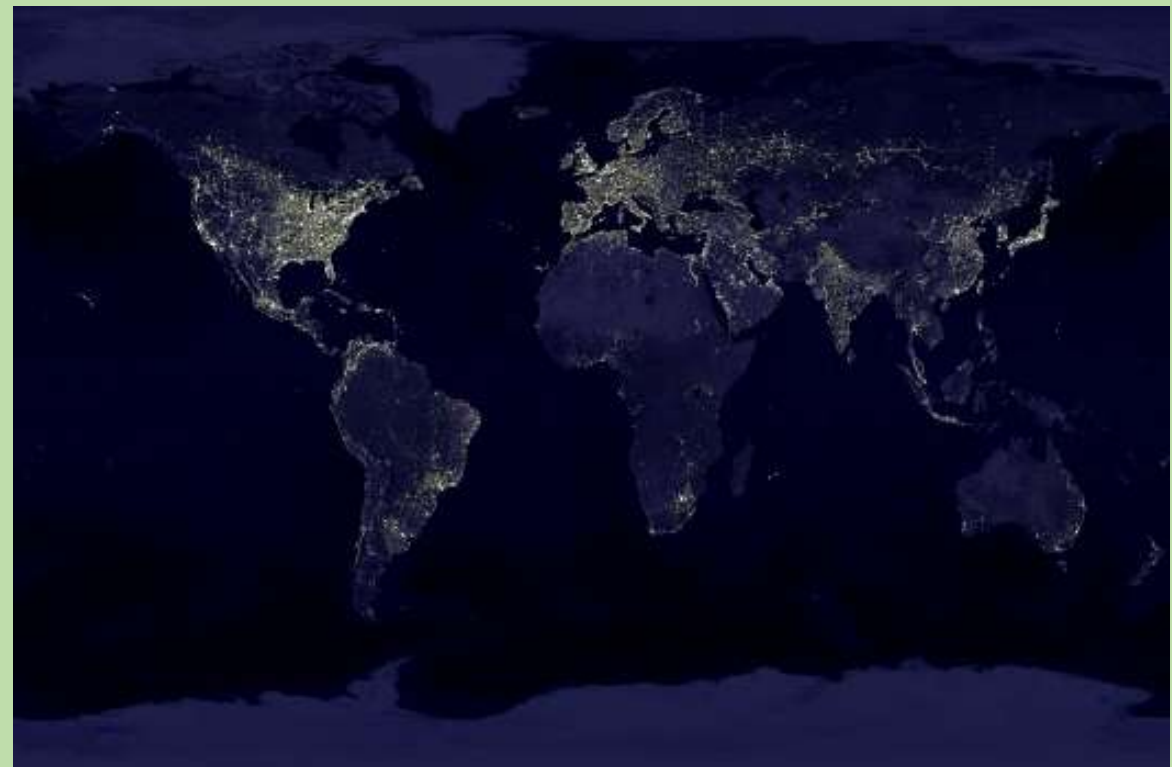
- Eastern water dragon

My PhD focus

- Questions I will address
- Methods

Preliminary data

Significance of research





Introduction to urbanisation

Worldwide

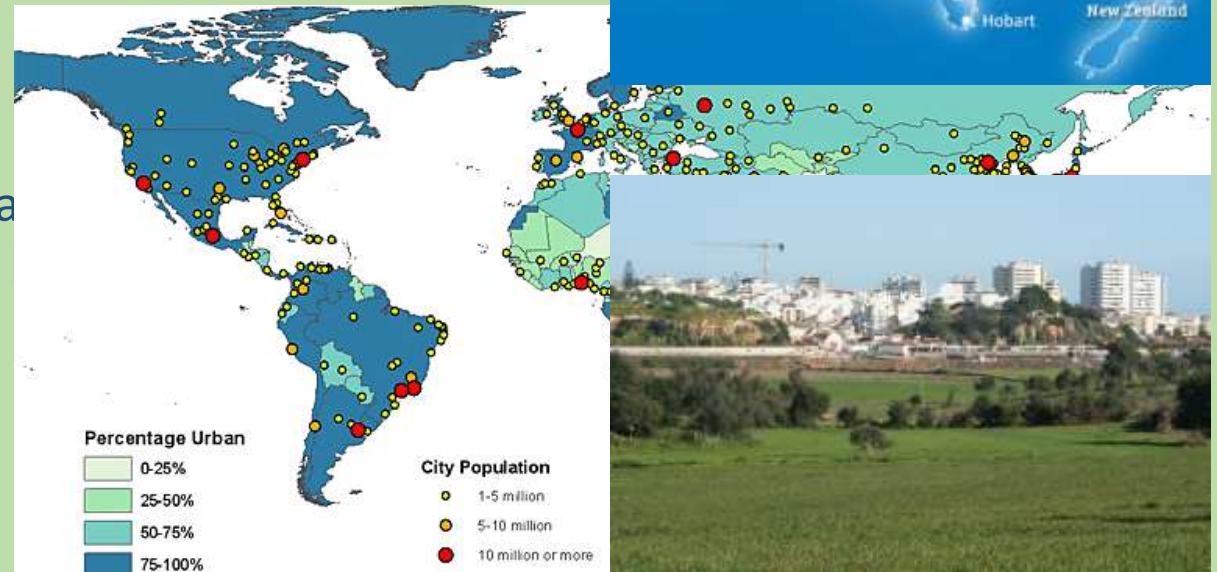
- By 2050 two thirds of world's population will live in urban areas
- In next 20 years 90% Australia's population will live in urban areas
- Creating a homogeneous environment?
- Important threat to biodiversity
- Concern to conservation biology

Sunshine Coast

- 180,000 people to settle within the next 20 years
- Sunshine Coast Regional Council (2013) report

Urbanisation

- Habitat loss
- Habitat fragmentation
- Extinction





Urban non-adapters

Definition

Species that do not thrive within cities as they are unable to adapt to new conditions and environments

Examples

- Red squirrels
- Eastern pygmy possum
- Specialist species





Urban adapters

Definition

Species that proliferate and expand their range within cities. They may be able to adapt their phenotype to local conditions or have pre-existing life history traits that allow them to exploit urban conditions

Examples

- European blackbirds
- Red foxes
- Pigeons
- Eastern water dragons





Introduction of study species

Eastern water dragon

- Protected
- Temperature sex dependent
- Semi aquatic
- Native to Australia
- Listed as abundant

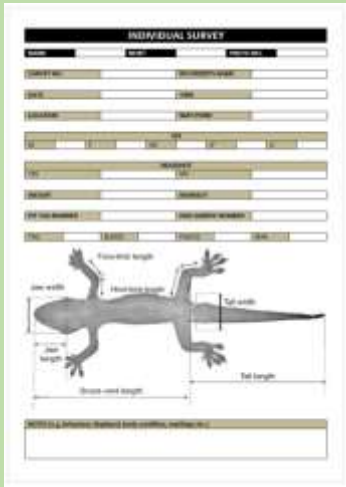


Found in urban and non-urban environments





My PhD



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Methods

- Extensive fieldwork (single species, urban gradient, replicated sampling design)
- Lab work (DNA extraction, MtDNA genotyping, microsatellite sequencing, diet analysis)
- Analysis (Population genetics, F_{st} vs Q_{st} , bioinformatics)



Preliminary Data





Significance of research

- Allow us to determine the evolutionary trajectories of urban adapters
- Start predicting the short and long term effects of urbanisation on a local and global scale
- Start to determine the extent of urban selection on species
- Establish if urbanisation may lead to urban speciation

My research will hopefully allow a new line of evidence for environmental decision makers to develop conservation strategies to maximise the potential for wildlife (large and small) to coexist with humans in an ever increasing urban world

