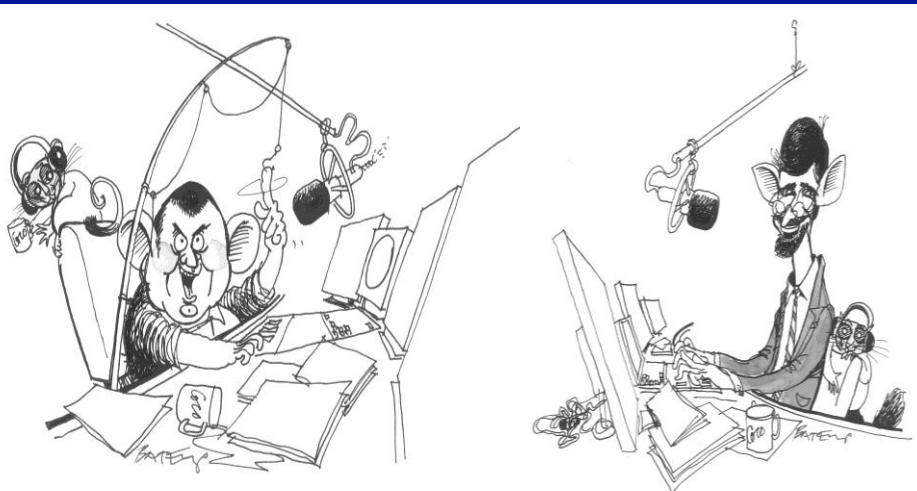


# Citizen Science: Connecting people with Nature through spider research.



Barbara Hardy  
Institute

Philip Roetman & Chris Daniels



# URBAN ECOLOGY



Urban ecology is a mixture of introduced and native species, and the entirely new relationships that can and do develop between species in the urban environment



**The Adelaide region supports significant percentages of the State's**

terrestrial plants (30%, ~ 1130 species)  
birds (58%, ~ 290 species) terrestrial  
mammals (32%, 40 species) reptiles (20%,  
56 species) frogs (22%, 7 species)  
freshwater fishes (20%, 11 species)

in an area that is only 0.15% of the total  
land area of the state.



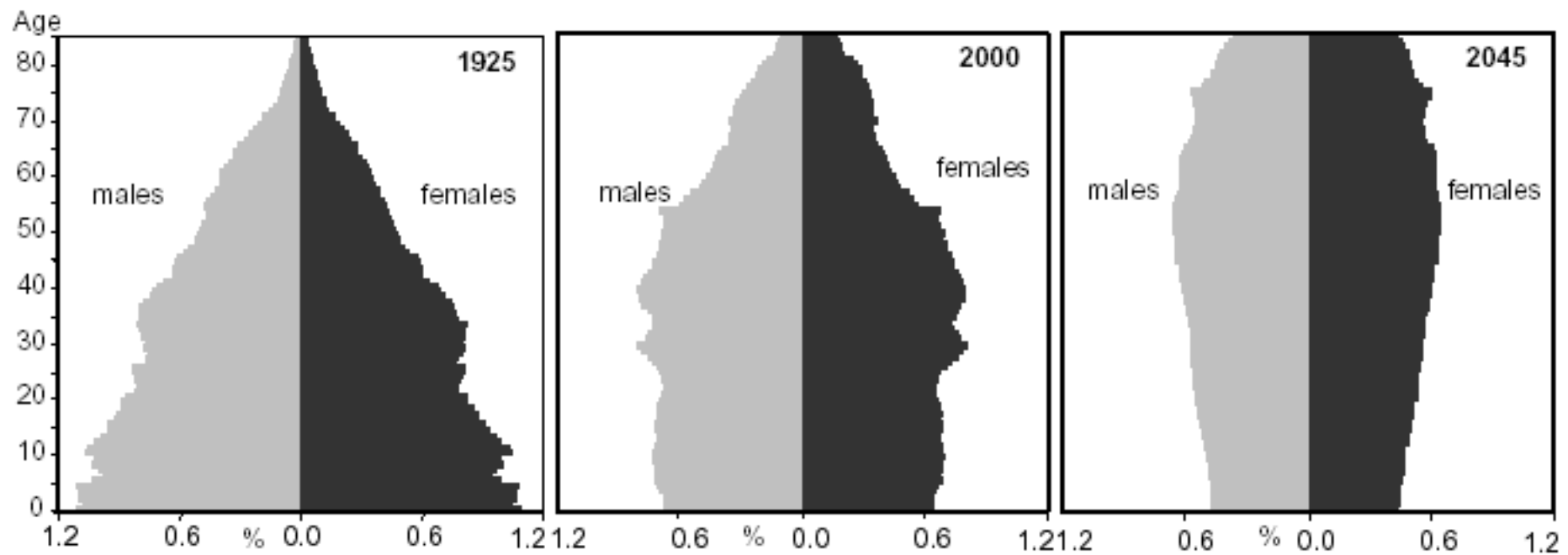
# Wildlife Creates a Sense of Place



# From pyramid to coffin

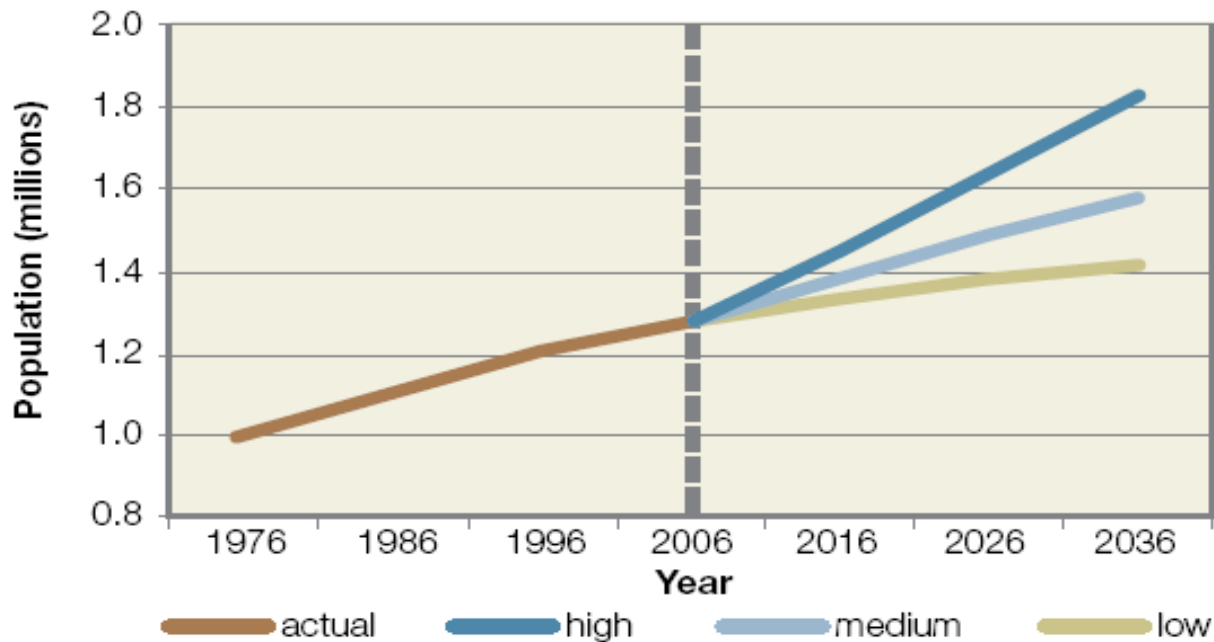
Changing age structure of the Australian population 1925-2045

Graeme Hugo



# Adelaide's growing population increasing by migration

Figure 3 – Actual and Projected Population, Greater Adelaide  
1976-2036



Source: ABS Cat. 3204.4, November 1987, Cat.3218.0, July 1997, Census of Housing and Population 1976-2006, ABS online data from the 1996, 2001 and 2006 censuses and population projections and estimates produced by Planning SA.



# ENVIRONMENTAL CONFLICT: Native Animals Are Bad!

**THIS IS AUSTRALIA**

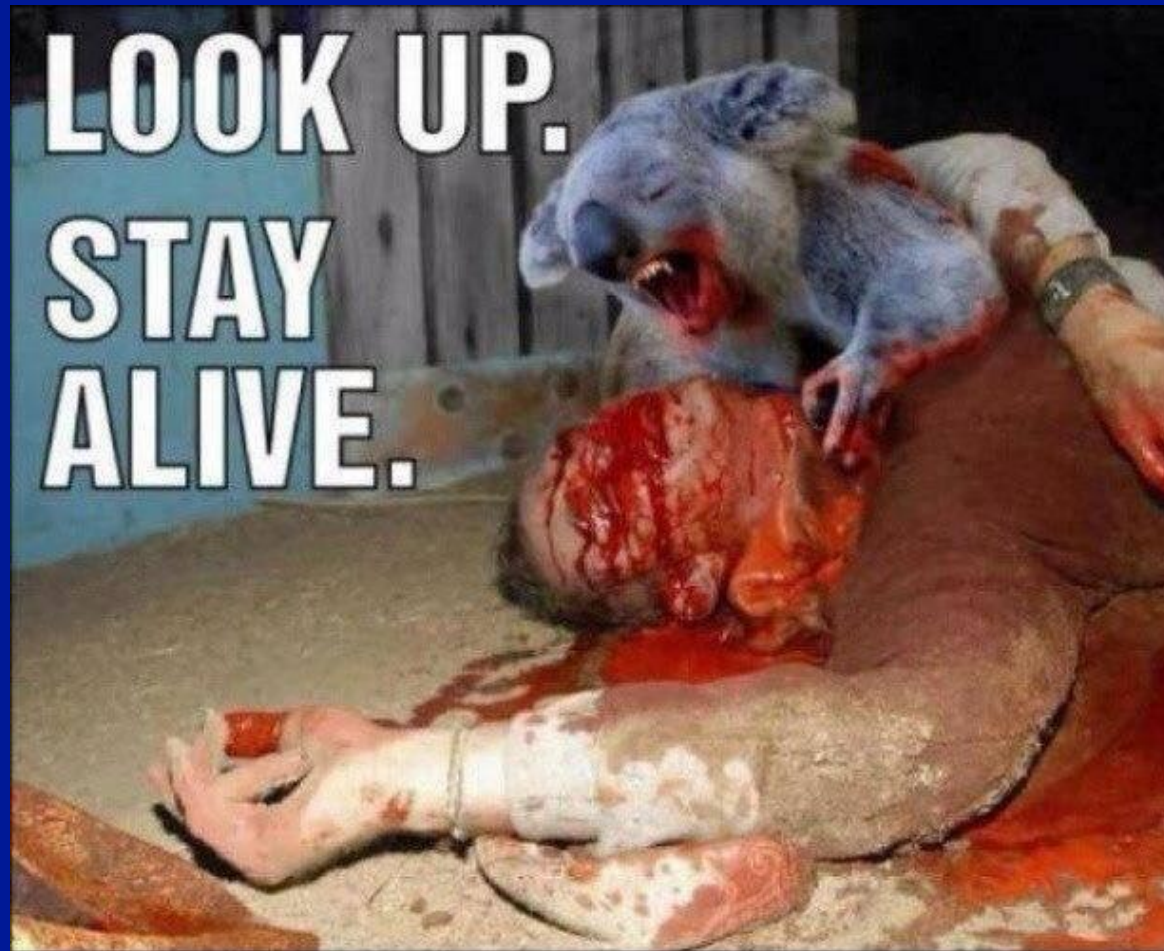
**THERE ARE 1275 ANIMALS THAT COULD  
KILL YOU IN THIS PICTURE**



# ENVIRONMENTAL CONFLICT: Native Animals Are Bad!



# ENVIRONMENTAL CONFLICT: Native Animals Are Bad!



Dropbears are a very real danger to all Australians. Almost one in ten Australians has been attacked by a Dropbear, and the rate is even higher for foreign visitors. Don't become another statistic. Always beware low branches and doorframes. *Look up. Stay alive.*



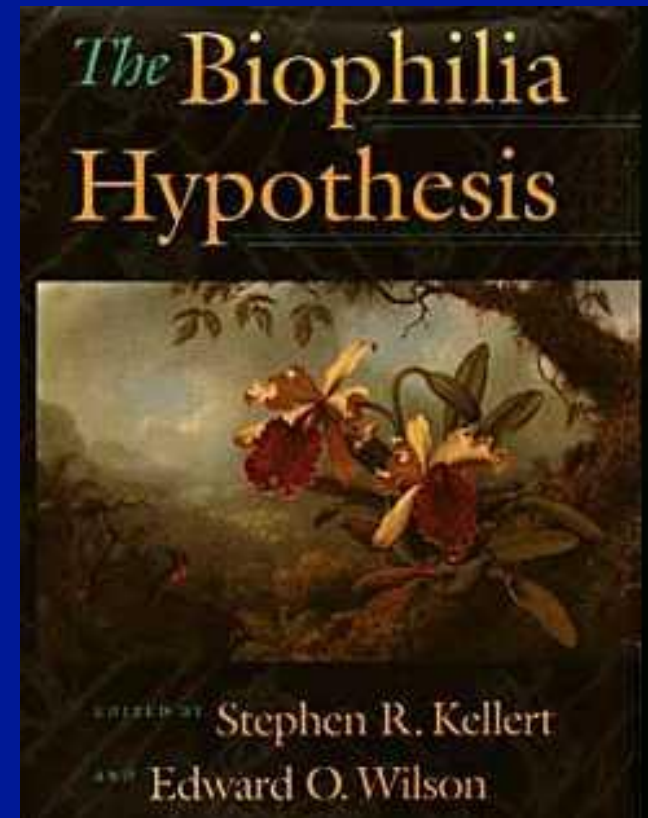
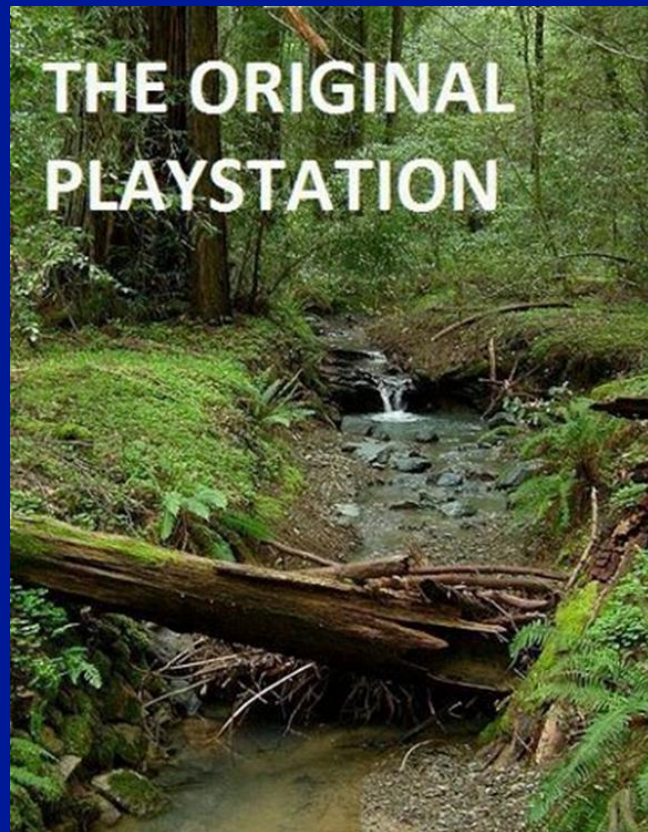
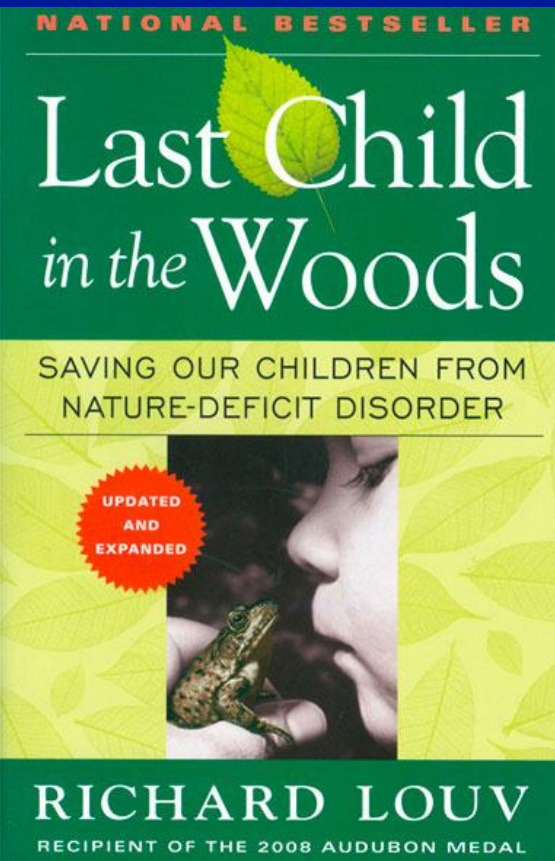
**Apparent Environmental Threats, Urban Infill,  
Small Block Urban Sprawl and Changing Recreational Practice  
eliminates Urban Biodiversity, decreases water recycling and increases  
energy demand**

**“people do not want backyards”**





# Nature Deficit Disorder and Biophilia





# The Backyard as a Habitat:

Can it reconnect people with the natural environment **And** Answer important biological questions in urban ecology?





# The Scientific Approach to Problem Solving

- Experimental manipulation (eg developing vaccines)
- Collect data (monitoring) to allow future predictions (eg meteorological data for climate change)
- “I am sick of all this research – Just give me the answers!” (NSW Minister for Health 1999)
- The Post – Truth Era

# What is Citizen Science?

- Professional researchers engage the public to collect or analyse data within a cooperative framework of research and education

(Cooper *et al.* 2007; Phillips 2007)

- Rapidly developing methodology

(Bonney 2007; Lepczyk *et al.* 2009; Stodden 2010)

- Great potential – new questions, new participants

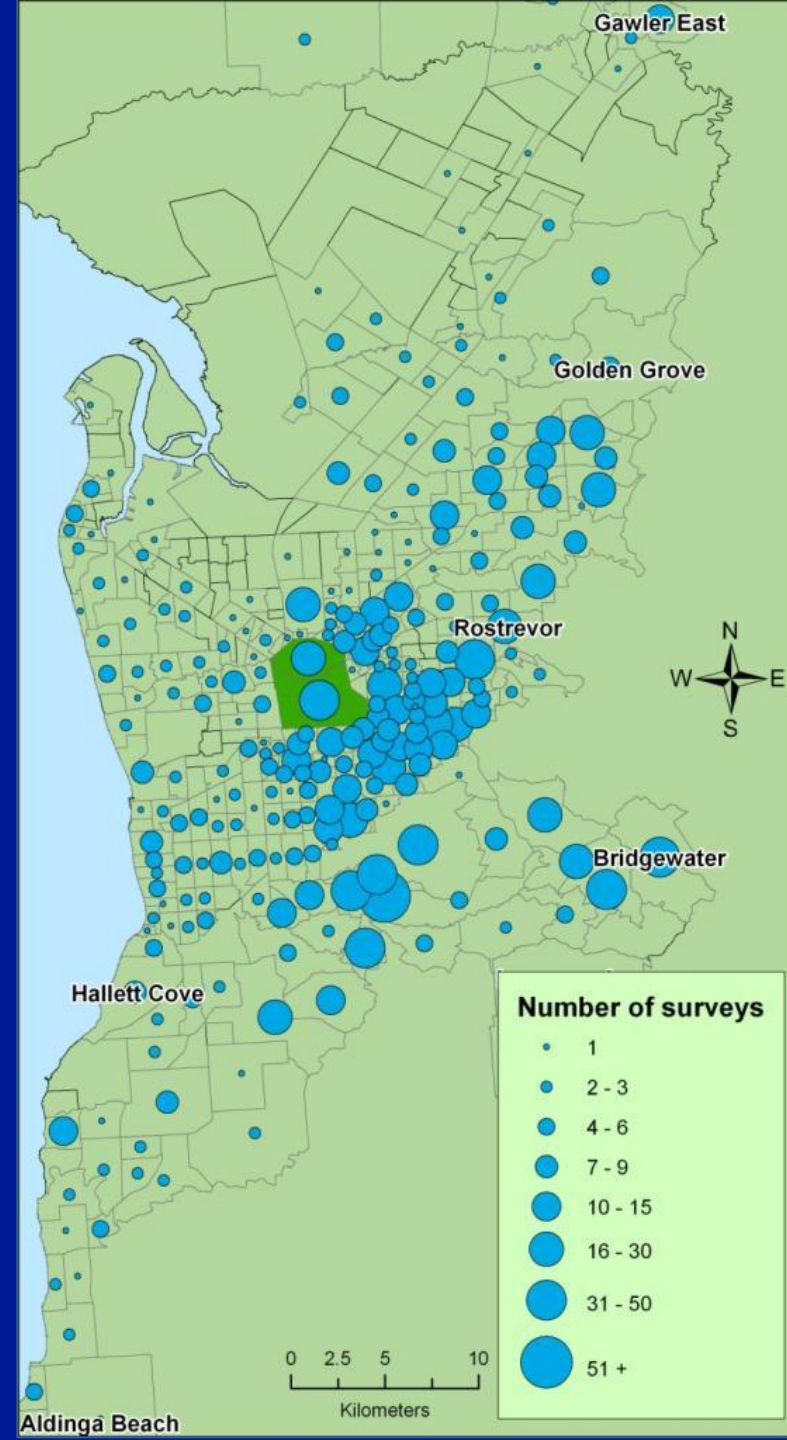
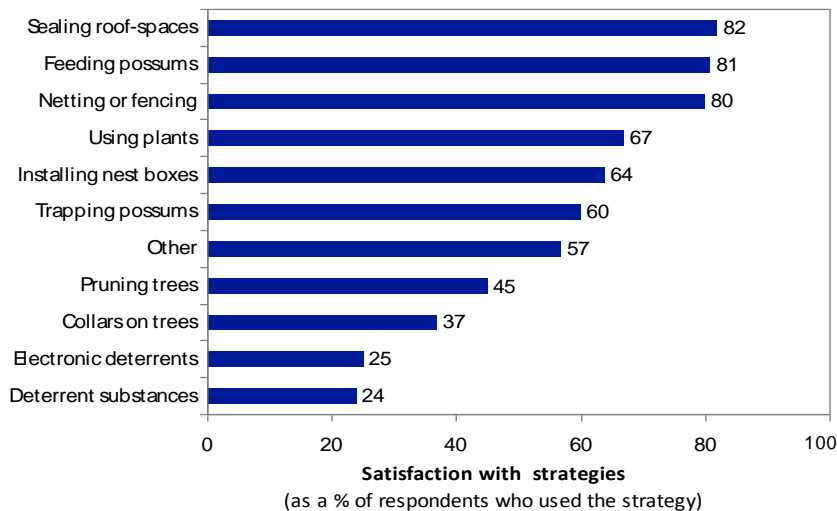
(Bonney *et al.* 2009)



# Collecting data

- Large-scale
- Long-term
- Inaccessible locations
- Types of data

**Satisfaction with possum management strategies reported by respondents (n = 1953)**





# Examples of Citizen Science



- Wells Cook

Bird migration data; 1880s – 1950s (Droege 2007)

- Christmas Bird Count

27 observers in 1900 to 57,000+ (LeBaron 2007)

- eBird

Cornell Lab of Ornithology (Bonney *et al.* 2009)

- Project BudBurst

4,861 observations in first year (<http://www.budburst.ucar.edu/>)

- Waterwatch

15,000 individuals monitor 5000 sites (Thomson 2007)

- GLOBE at night

Participants in 86 countries ([Gurton 2007](#); <http://www.globeatnight.org/>)

# The **value** of the data

## Birds in Forested Landscapes project

Lab of Ornithology, Cornell University

Papers on: bird species distributions (tanagers), habitat fragmentation and Metapopulation Theory

- Hames, Rosenberg, Lowe, & Dhondt, 2001
- Rosenberg, Lowe, & Dhondt, 1999

## Protea Atlas Project

National Botanical Institute, South Africa

Papers on: plant species distributions (proteas), biogeography, conservation planning and species diversity modeling

- Gelfand, *et al.*, 2005
- Grantham, Wilson, Moilanen, Rebelo, & Possingham, 2009
- Latimer, Silander Jr, Rebelo, & Midgley, 2009
- Latimer, Wu, Gelfand, & Silander Jr, 2006
- Manne, *et al.*, 2007

# The **validity** of the data

- Participant training
  - Training courses
  - Online information
- Validation of data
  - Plant samples  
(Bonney *et al.* 2009)
  - Water samples  
(Engel & Voshell 2002)
  - Comet sightings  
(Gurton 2007)




<b>Brushtail Possum</b>  <b>General description</b> <ul style="list-style-type: none"><li>• Up to the size of a large cat</li><li>• Light grey fur</li><li>• Thick, black tail</li><li>• Large, pointed ears</li><li>• Excellent climbers</li></ul> <b>SELECT</b>	<b>Ringtail Possum</b>  <b>General description</b> <ul style="list-style-type: none"><li>• Up to the size of a cat</li><li>• Grey-brown fur, red flanks</li><li>• White tipped tail</li><li>• Rounded ears</li><li>• Excellent climbers</li></ul> <b>SELECT</b>	<b>Pygmy Possum</b>  <b>General description</b> <ul style="list-style-type: none"><li>• Around mouse-sized</li><li>• Fawn to reddish-brown fur</li><li>• Tail mostly naked</li><li>• Large ears</li><li>• Excellent climbers</li></ul> <b>SELECT</b>
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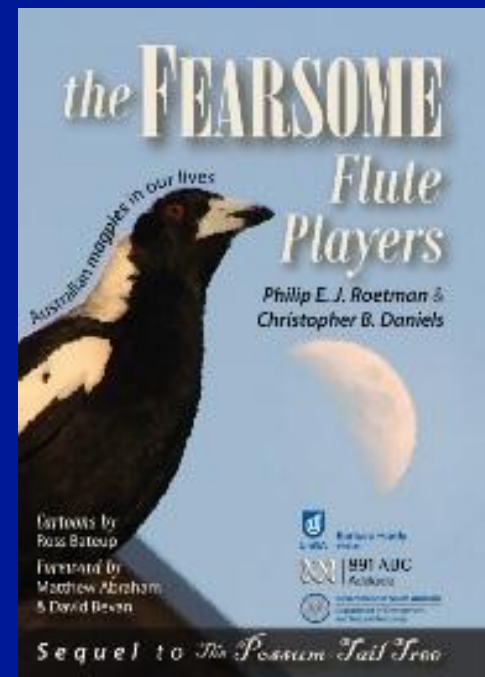
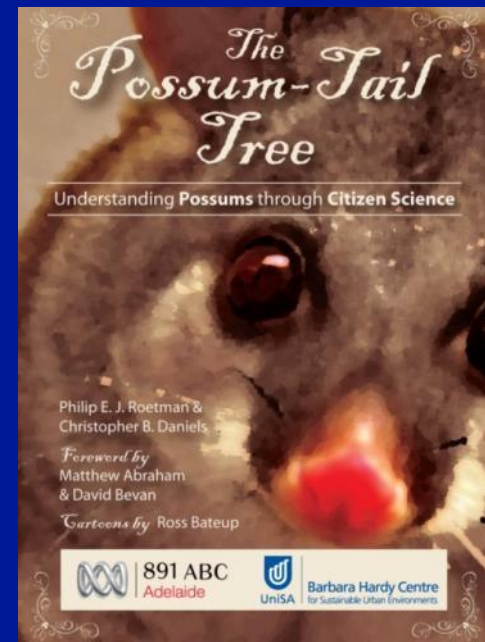
Photo courtesy of Angela Pestell



# Engaging the community

- **The Education process**
- So people *can* do the surveys
- So people *do* do the surveys
- Feedback builds trust
- Community understanding
- Change **attitudes** and **behaviour**
- **Voice of the community**

*“...in an ambiguous situation, other people can induce conformity by providing us with information suggestive of what people generally do...” (Aronson 2008)*



# What drives **behaviour**?

1. People are complex:
  - Genetic variation
  - Experiential variation
2. Behaviour is influenced by:
  - **Attitudinal factors**
  - Contextual factors
  - Personal capabilities
  - Habit and routine

(Stern 2007)





# What are attitudes?

*“Attitudes are **evaluations** of people, objects, or ideas” (Aronsen et al.2007)*

good / bad

pleasant / unpleasant

positive / negative

Attitudes come from from 3 sources:

**1: Beliefs**

**2: Feelings**

**3: Actions**

# Development of attitudes

- Knowledge and experience
- Mostly childhood experience  
(Chawla & Cushing 2007)
- Fit within experience





# Choosing a **focus** animal?

- Not Declining numbers
- Urban strategies
  - (Blair 2001)
    - Avoiders?
    - Adapters?
    - Exploiters?
- Positives and negatives
- Environmental attitudes
- Suitable for Citizen Science? Charismatic?



# A series of **Operations**



**2007**

Distributions & interactions with bluetongue lizards



**2008**

Management of possums & environmental attitudes



**2009**

Magpies observations & place attachment to gardens



**2010**

Distributions & attitudes towards spiders



**Government of South Australia**

Department of Environment  
and Natural Resources




**891 ABC**  
Adelaide

South Australian Museum





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### Operation Spider

#### Operation Spider: Find out more about our creepy crawly friends

With thousands of species of spiders found throughout South Australia, from the deserts in the north, to the coastline and urban areas in the south, they are a part of our daily lives, but we know very little about the important role that they play in our ecology. With Operation Spider, we hope to debunk rumours and learn more about our creepy little eight legged friends.

- [Operation Spider teacher resources](#)
- [Operation Spider survey](#)
- [Operation Spider facebook page](#)

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- ABC South East SA
- ABC Riverland
- ABC Eyre Peninsula
- ABC North and West SA
- ABC Broken Hill

http://www.abc.net.au/tv/

Internet

100%

start

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Search Desktop

3:13 PM

# PROVIDING RESOURCES FOR COMMUNITY —AND SOMETHING TO DO!!


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**The Barbara Hardy Centre for Sustainable Urban Environments**

The Barbara Hardy Centre is focussed on the sustainability of cities, the conservation of biodiversity and the maintenance of the natural processes that sustain life. Our work is underpinned by community participation and education. [Find out more...download our Centre brochure.](#)

**Latest News:**


Book, DVDs and CDs at special prices...

Water book wins 3 awards...


**Our Mission Statement:**

*The Barbara Hardy Centre will develop sustainable solutions to complex issues of natural and built environments, and promote their application in urban communities, through multidisciplinary and collaborative approaches.*


**Quick Links:**




Book receives 3 awards:  
Adelaide: Water of a City...



See a YouTube video about the book  
Adelaide: Water of a City



Operation Spider on YouTube...  
Operation Spider webpage...


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**Operation Spider**

Operation Spider is a Citizen Science research project we're running in conjunction with radio station 891 ABC Adelaide, the SA Museum and the Department for the Environment and Natural Resources.


**How to be involved**

There are a number of ways to get involved with Operation Spider...

- 1. Community survey and questionnaire**  
You may hear about Operation Spider on ABC Local Radio in South Australia. From September 1st until October 22nd we're running a state-wide survey in which all South Australians can participate and send in data about spiders via an online questionnaire. You can send in information about the spiders you see and your attitudes towards spiders. The survey, and more information about the project, are available at: <http://www.abc.net.au/adelaide/operation/>
- 2. School projects**  
As part of the Operation Spider program, we have put together a broad range of educational materials for primary and middle school classes. We have developed an Interactive Teaching Sequence and support materials to make it easy and interesting for classes to be involved. Click here to find out more about the School Projects...
- 3. Poetry competition**  
We're running a poetry competition in conjunction with the Operation Spider survey.  
There are 5 age-group categories to enter (early years, primary, middle, secondary and 18+) for sixth-lined poems about spiders. There are prizes from us and 891 ABC Adelaide...over



**Operation Spider**



See Operation Spider on YouTube...

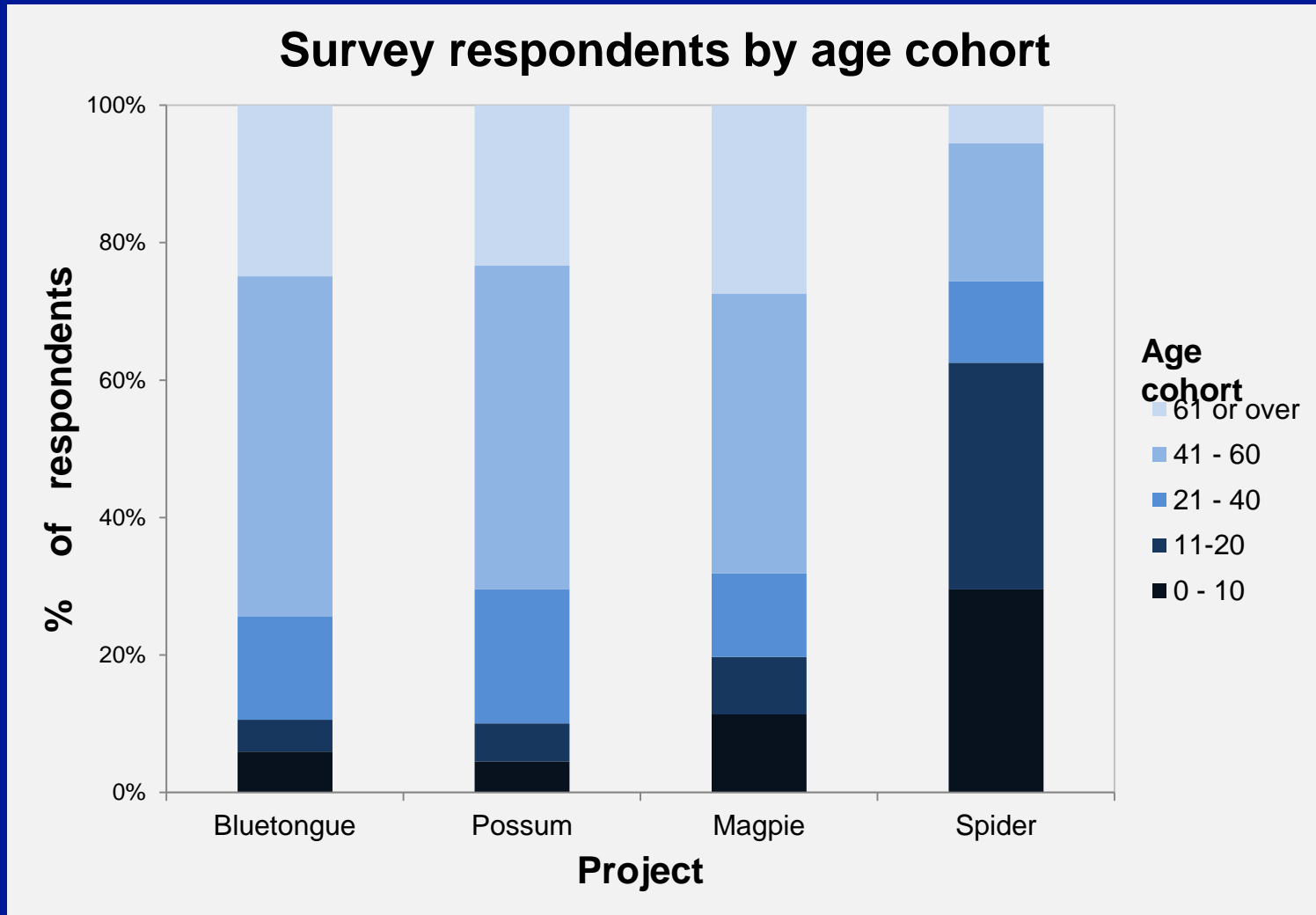
**School Projects find out more...**

Click here to find out more about School Projects

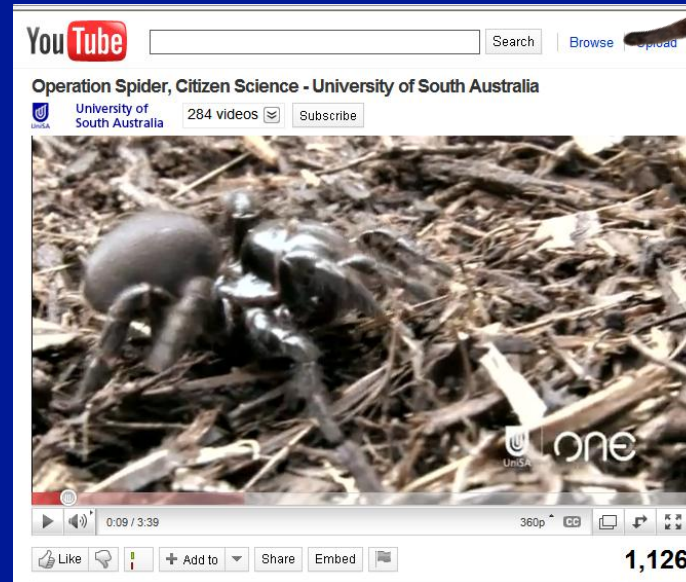
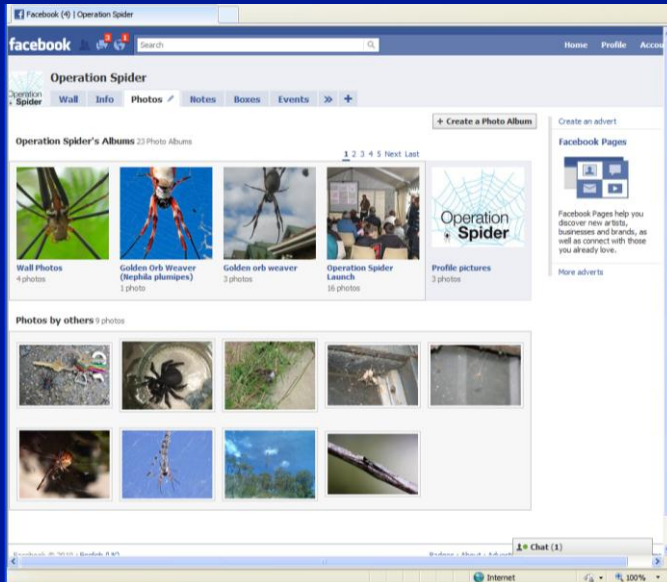




# Age of participants

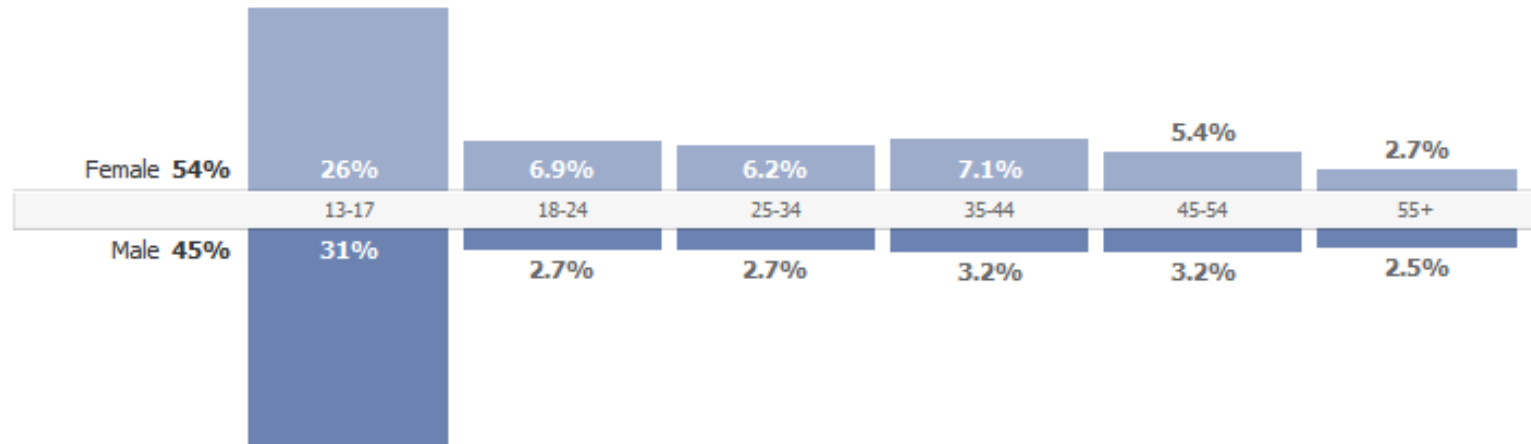


# Attracting generation Z



## Demographics

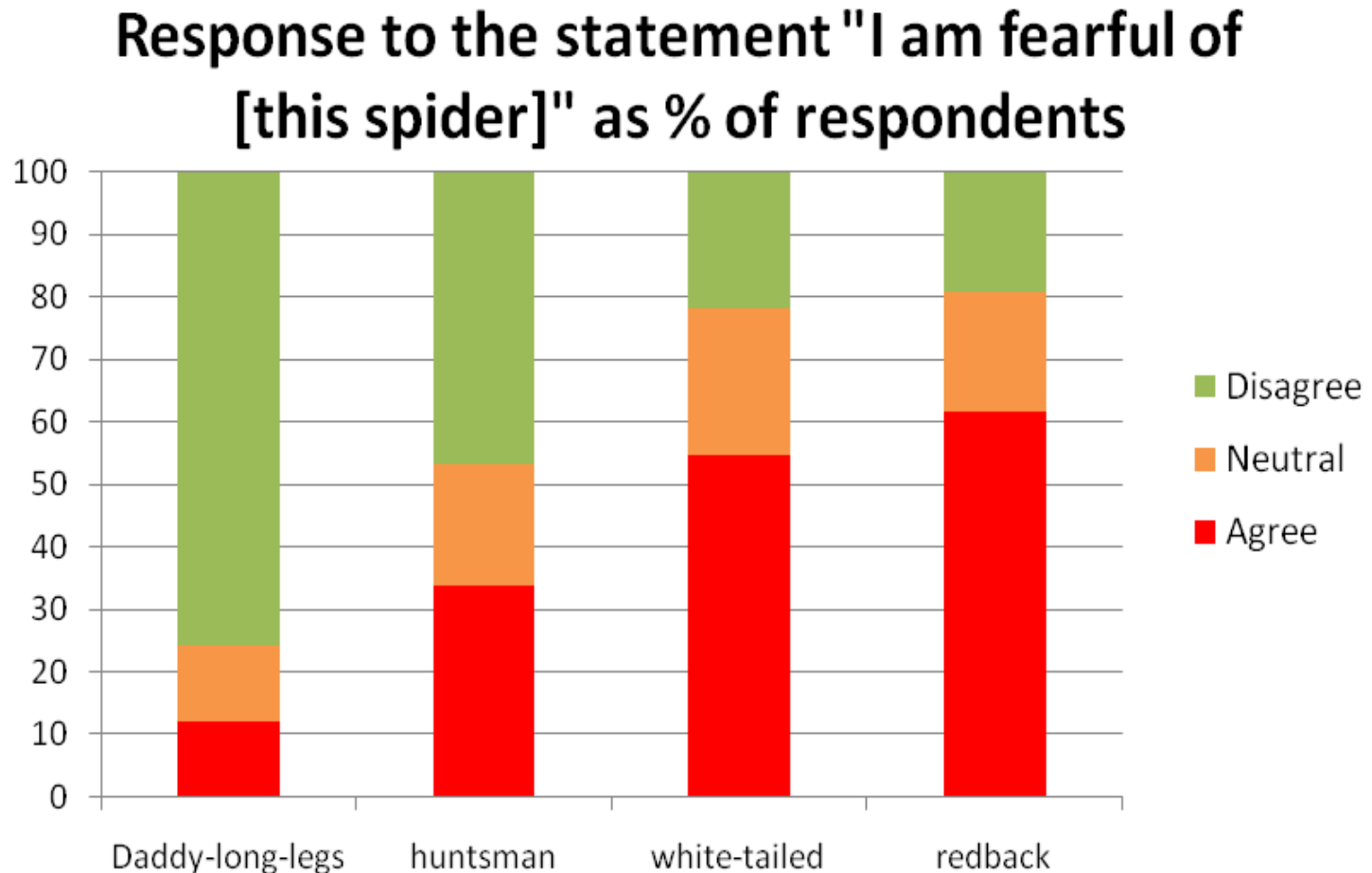
### Gender and age





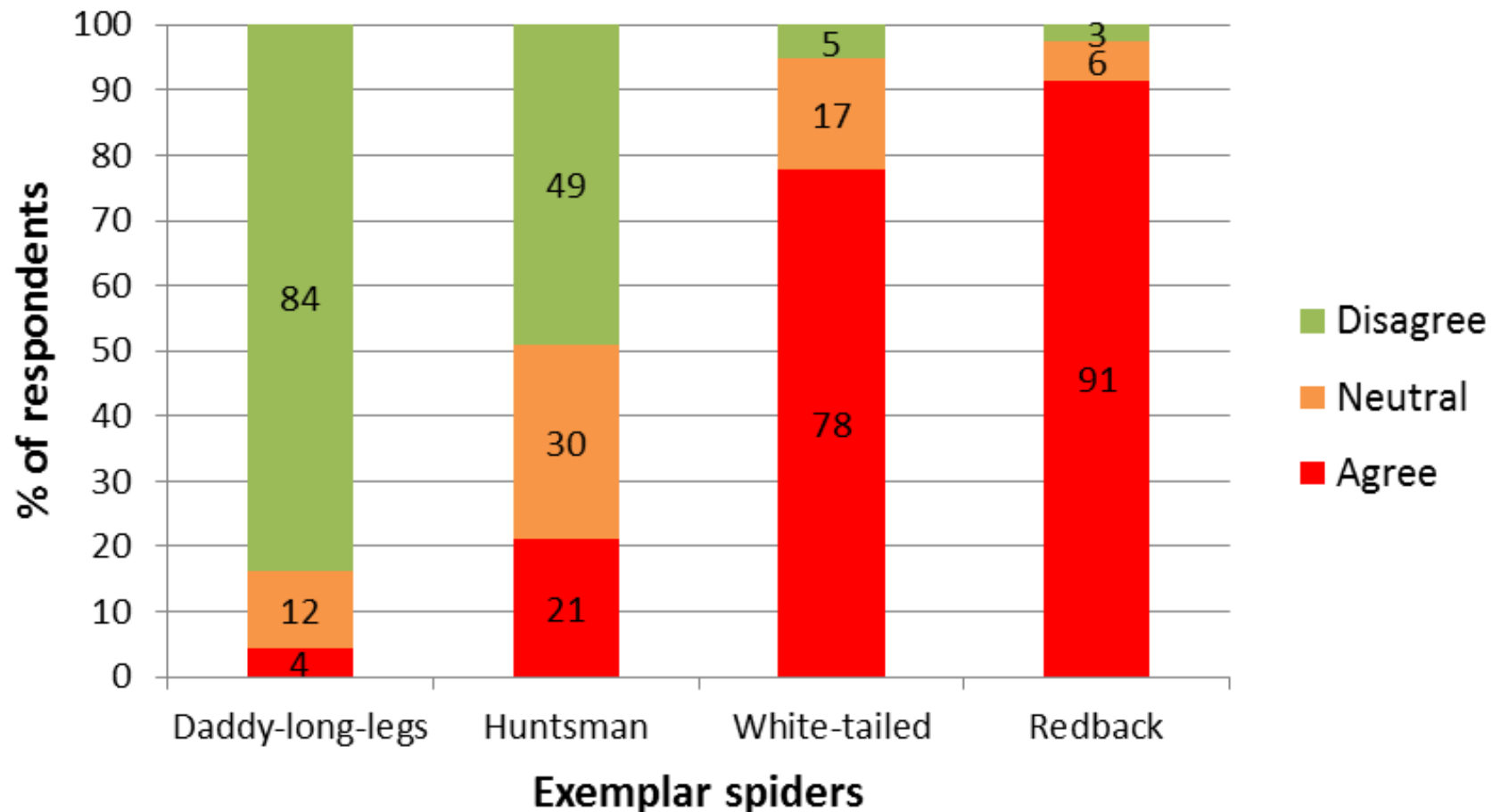
# Spiders ain't spiders: 1

## Unequal fear



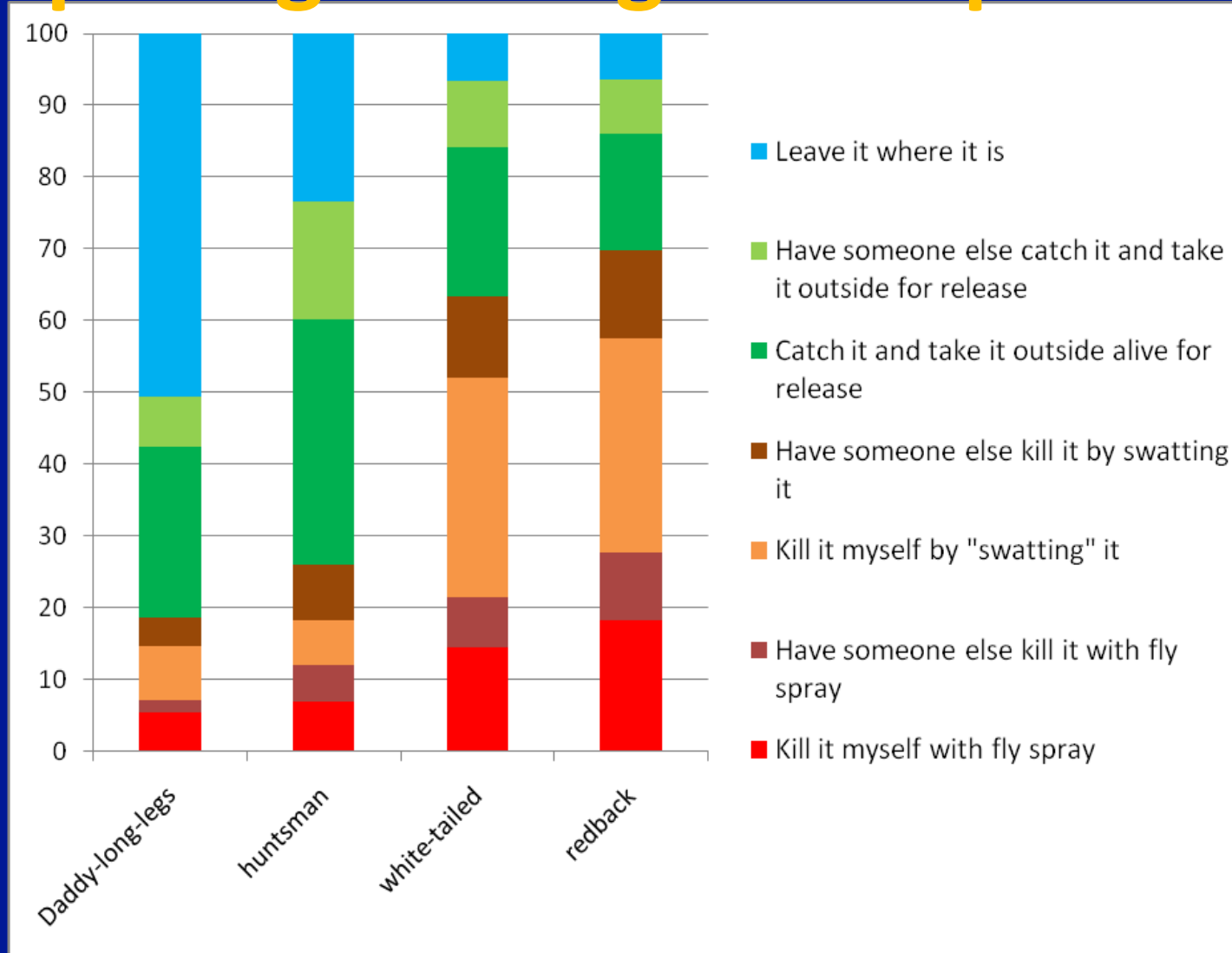
# Spiders ain't spiders: 2

Responses to statements about the perceived danger spider taxa



# Spiders ain't spiders: 3

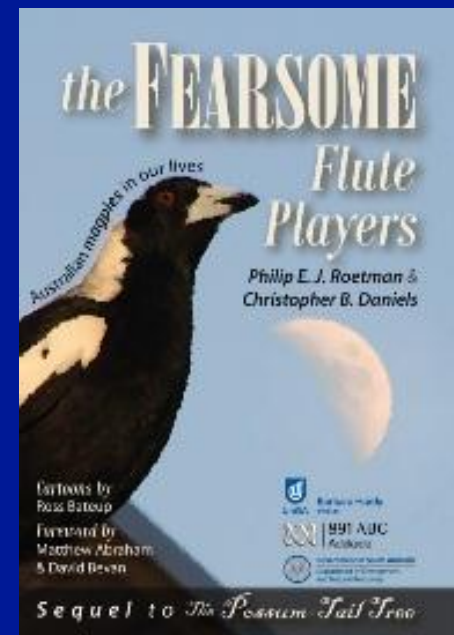
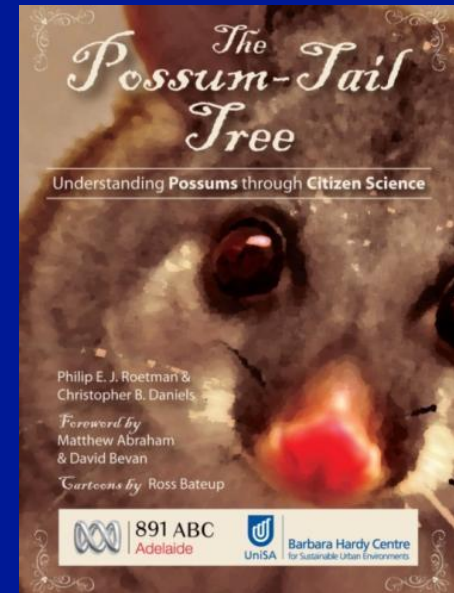
## Disposing of dangerous spiders





# The power of Citizen Science

- **How** to engage people
  - Media
  - Education
  - Social media
  - Ask the right questions
  - Bilateral exchange
- **Why** engage people
  - Information about wildlife and people
  - Engaging and educating people who already interact with wildlife
  - Understanding the silent majority who like wildlife
  - Increasing awareness for those not engaged



# In conclusion...

- Citizen Science enables:
  - Data collection
  - Education
  - Engagement
- Increasing Knowledge and Experience
  - Data collection
  - Education program
  - Bilateral exchange of information
- Great potential to engage new participants
  - Subject of project
  - How it is promoted
  - Who it is promoted to

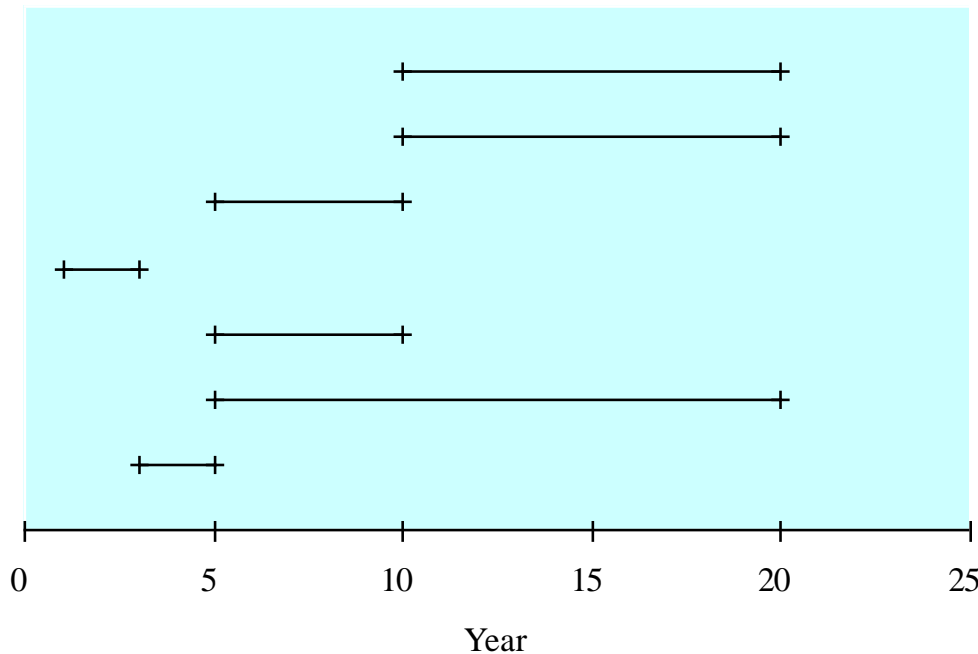






# Sustainability Planning – Temporal Scale

Temporal scale of planning



Urban landuse planning

Urban infrastructure development

Industrial development strategy

Purchase of utility goods

Transportation planning

Solid waste management

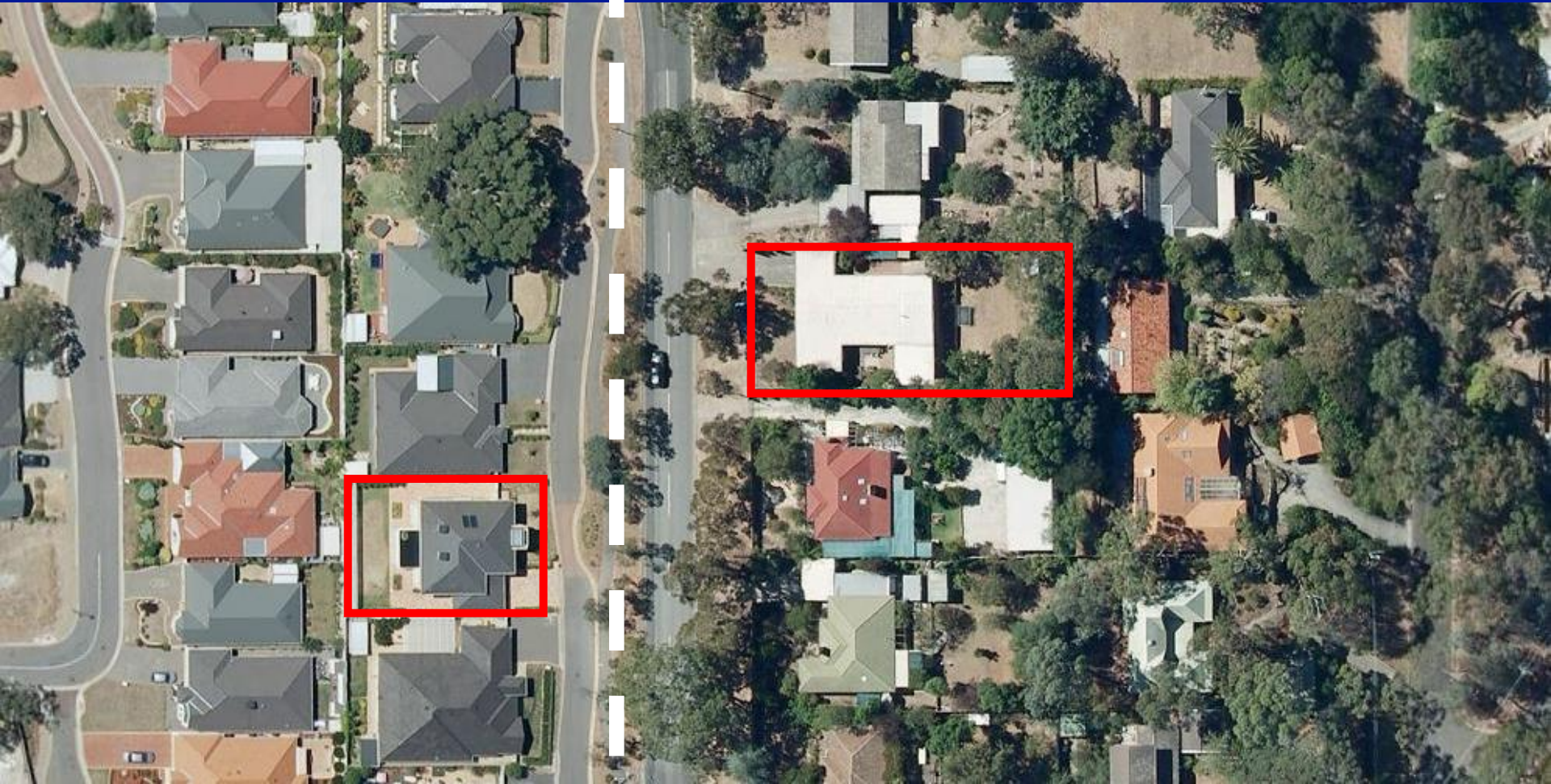
Public service pricing

**Temporal scale of a council's decision making.**

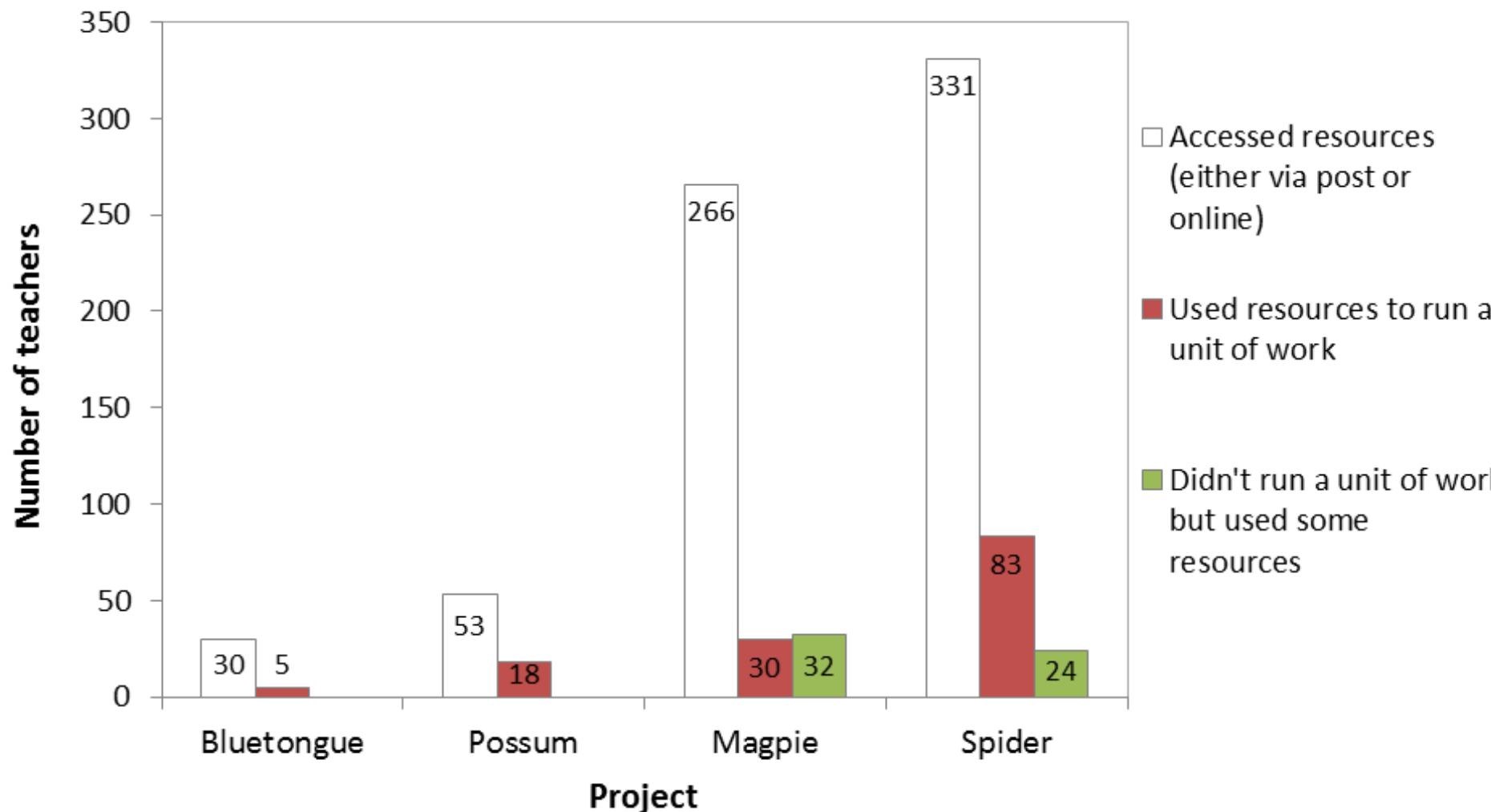
**Temporal scale of planning (Dr X Bai, CSIRO Sustainable Ecosystems)**

**The new**

**and the old**

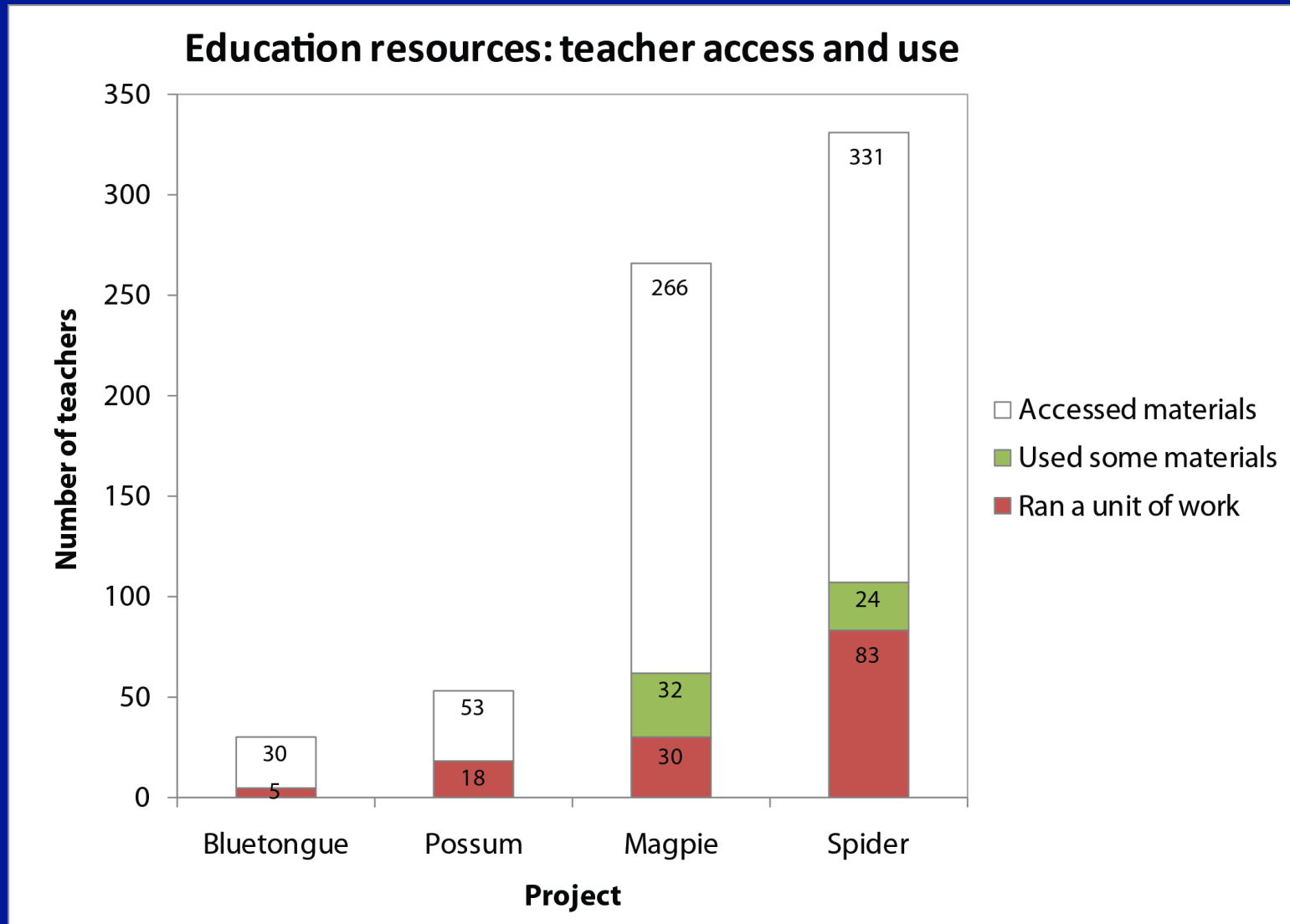


# Access and use of project materials by teachers (data from during and prior to each project).





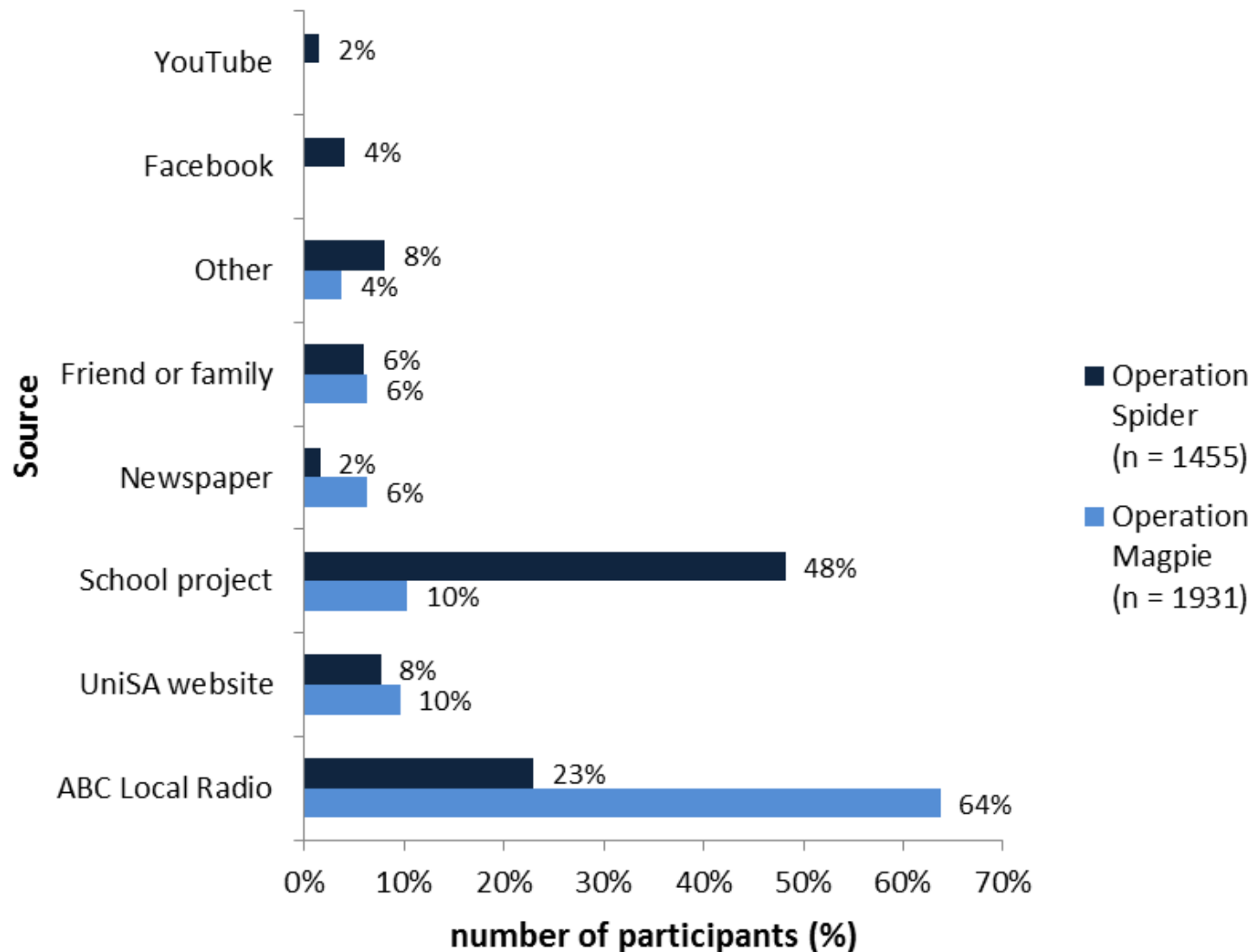
# Growth of the education program



# Age and gender of Operation Spider respondents

Age cohort	Total (also given as a percentage of respondents who submitted their age cohort)	Males including only respondents who submitted both age and gender	Females including only respondents who submitted both age and gender
0 - 10	295 (24.6%)	148	147
11 - 20	415 (34.6%)	210	187
21 - 30	65 (5.4%)	25	37
31 - 40	92 (7.7%)	28	61
41 - 50	110 (9.2%)	36	66
51 - 60	150 (12.5%)	42	95
61 - 70	58 (4.8%)	17	39
71 - 80	10 (0.8%)	8	2
81+	3 (0.3%)	3	0
TOTALS	1198	517	634

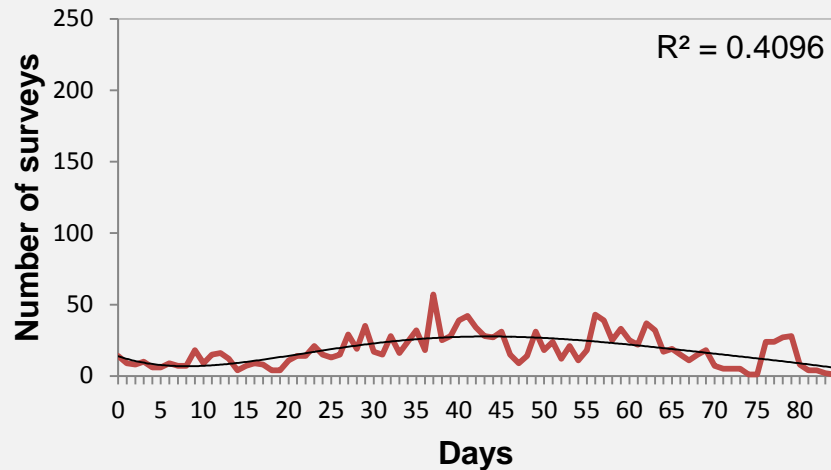
# How participants 'found out' about the projects they participated in (data for Operations Magpie and Spider only: multiple responses were allowed).



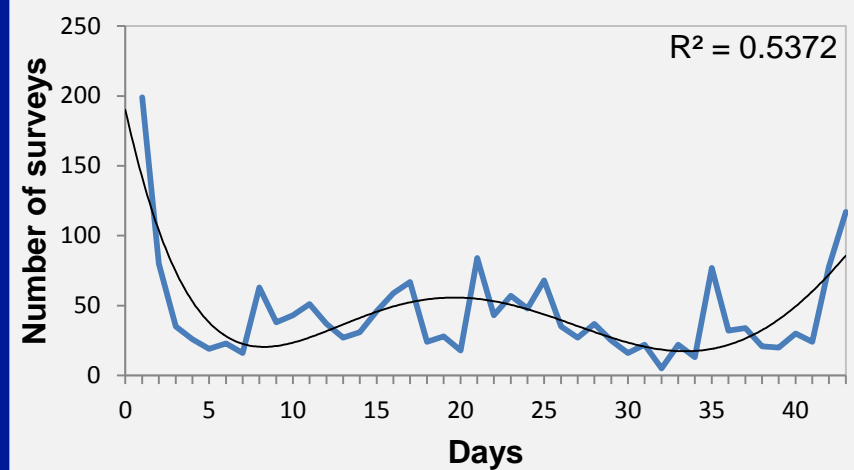


# Survey returns

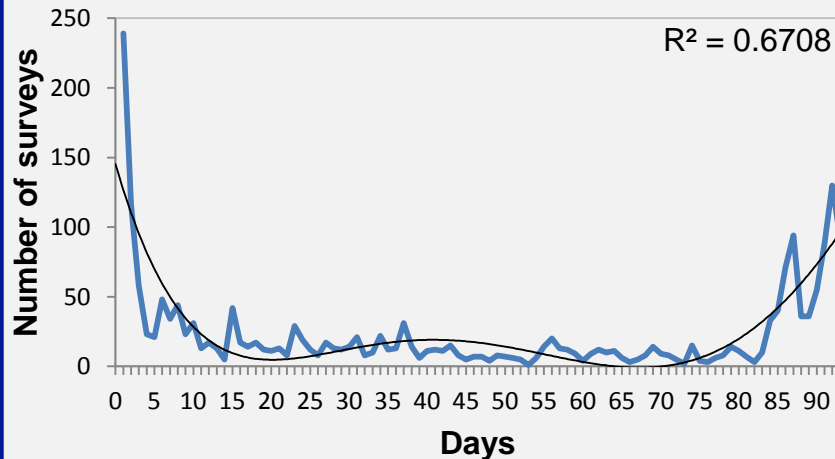
**Operation Bluetongue (n=1,500)**



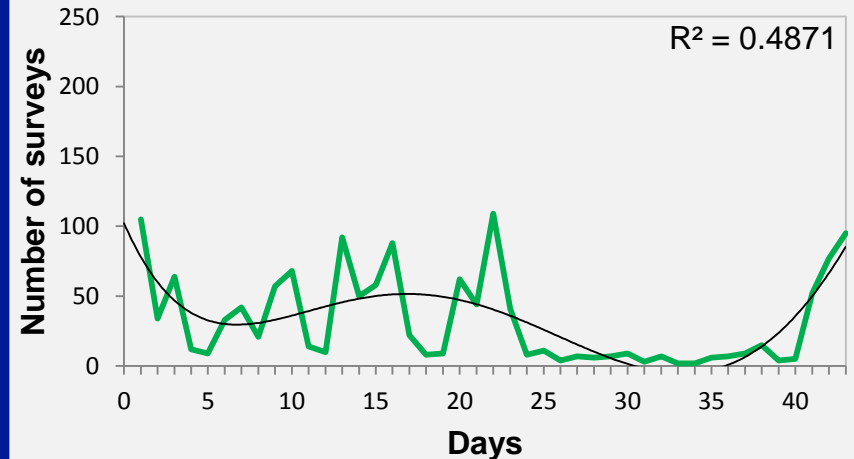
**Operation Magpie (n=1,865)**



**Operation Possum (n=2,123)**



**Operation Spider (n=1,388)**



# Philip Roetman



**And More than 50 Collaborators**