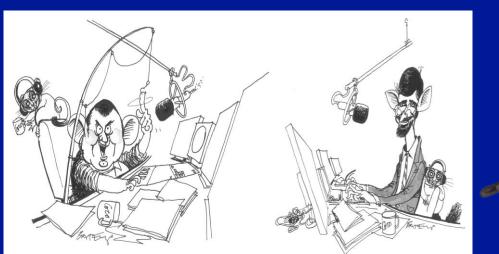
Citizen Science: Connecting people with Nature through spider research.



Philip Roetman & Chris Daniels



URBAN ECOLOGY

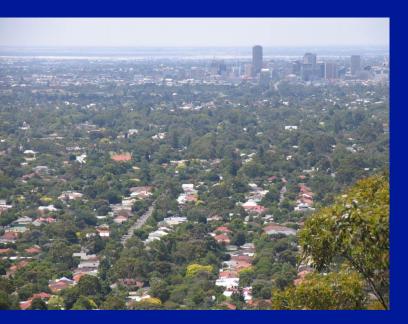


Urban ecology is a mixture of introduced and native species, and the entirely new relationships that can and do develop between species in the urban environment

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)

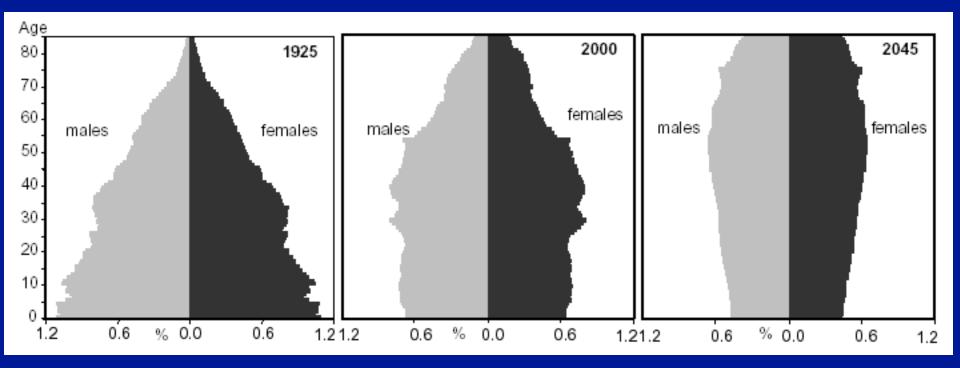
in an area that is only 0.15% of the total land area of the state.



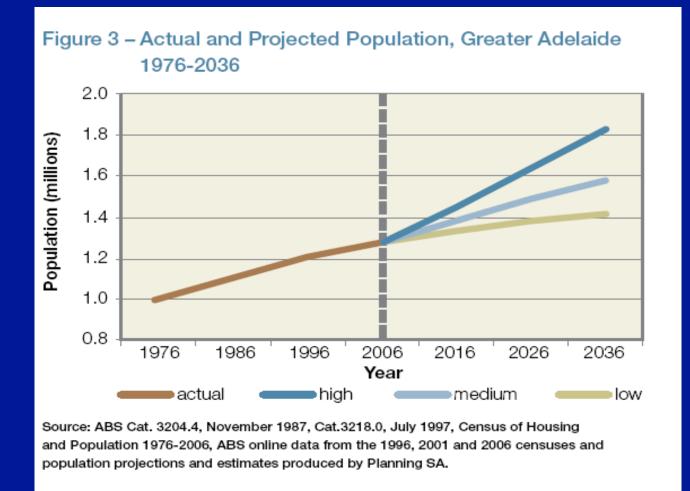
Wildlife Creates a Sense of Place



From pyramid to coffin Changing age structure of the Australian population 1925-2045 Graeme Hugo



Adelaide's growing population increasing by migration



Source: Government of South Australia (2008) Better Planning, Better Future: Directions for Creating a New Plan for Metropolitan Adelaide

ENVIRONMENTAL CONFLICT: Native Animals Are Bad!



WeKnowMemes

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"

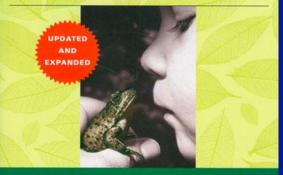


Nature Deficit Disorder and Biophilia

NATIONAL BESTSELLER

Last Child in the Woods

SAVING OUR CHILDREN FROM NATURE-DEFICIT DISORDER



RICHARD LOUV

THE ORIGINAL PLAYSTATION

The Biophilia Hypothesis

Edward O. Wilson

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

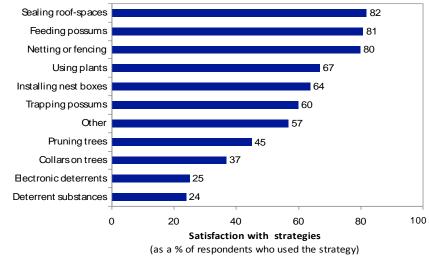
What is Citizen Science?

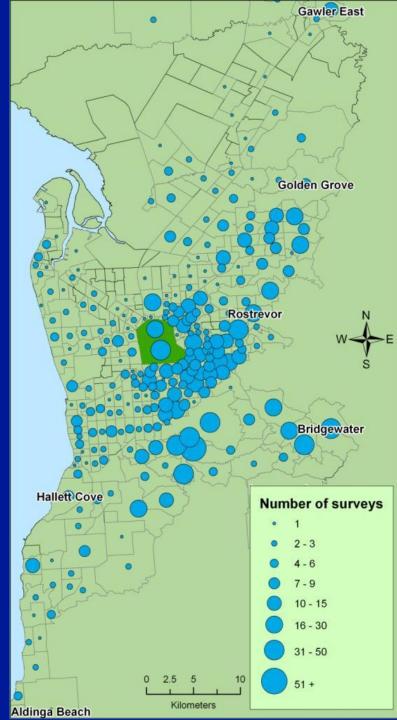
- Professional researchers engage the public to collect or analyse data within a cooperative framework of research and education (Cooper et al. 2007; Phillips 2007)
- Rapidly developing methodology (Bonney 2007; Lepczyk et al. 2009; Stodden 2010)
- Great potential new questions, new participants (Bonney et al. 2009)

Collecting data

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







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

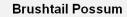
Lab of Ornithology, Cornell University Papers on: bird species distributions (tanagers), habitat fragmentation and Metapopulation Theory •Hames, Rosenberg, Lowe, & Dhondt, 2001 •Rosenberg, Lowe, & Dhondt, 1999

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)





General description •Up to the size of a large cat •Light grey fur •Thick, black tail •Large, pointed ears •Excellent climbers SELECT

Ringtail Possum



General description •Up to the size of a cat •Grey-brown fur, red flanks •White tipped tail •Rounded ears •Excellent climbers SELECT

Pygmy Possum



General description •Around mouse-sized •Fawn to reddish-brown fur •Tail mostly naked •Large ears •Excellent climbers SELECT



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)



Christopher B. Daniels

Manthew Abraha

Sequel to The Possium Jail Tree

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



peration

ssum

2009

2010

Magpies observations & place attachment to gardens

Operation • Spider Distributions & attitudes towards spiders

South Australian Museum



Government of South Australia

Department of Environment and Natural Resources





PARTNERING WITH TRADITIONAL MEDIA





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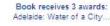
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4

PROVIDING RESOURCES FOR COMMUNITY -AND SOMETHING TO DO!!

DMsIon of information Technology, Engineering and the Environment C J Division of information Technology, Engineering and the Environment Barbara Hardy Centre for Sustainable Urban Environments Barbara Hardy Centre for Sustainable Urban Environments UniSA UniSA 🔐 UniSA home search UnISA website Staff Email myUniSA 1 Library Search G UniSA home Directory Staff Email search UnISA website Search myUniSA Library About UniSA Study at UniSA Research Community About Uni SA Study at UniSA Research Community Home Home Operation Spider Our patron Our patron Operation Spider is a Citizen Science research Our people Our people project we're running in conjunction with radio Events Events station 891 ABC Adelaide, the SA Museum and the Research Department for the Environment and Natural Operation Spider Research Resources. Citizen Science Citizen Science study Operation Spider How to be involved Operation Magple Photography There are a number of ways to get involved with Operation Possum Books and DVDs The Barbara Hardy Centre for Sustainable Urban Environments Operation Spider... Operation Elizatoporue Teacher resources The Barbara Hardy Centre is focussed on the sustainability of cities, the conservation of Bring us your Bugs 1. Community survey and questionnaire Fact-sheets biodiversity and the maintenance of the natural processes that sustain life. Our work is underpinned You may hear about Operation Spider on ABC study Video by community participation and education. Find out more ... download our Centre brochure. Local Radio in South Australia, From September Photography 1st until October 22nd we're running a state-wide Links at Uni\$4 Books and DVDs survey in which all South Australians can Latest News: Our Mission Statement: Contact us Teacher resources participate and send in data about spiders via an The Barbara Hardy Centre will develop sustainable solutions to online questionnaire. You can send in information Book, DVDs and CDs at Fact-sheets complex issues of natural and built environments, and promote their about the spiders you see and your attitudes special prices... Video application in urban communities, through multidisciplinary and towards spiders. The survey, and more Links at UniSA Water book collaborative approaches. information about the project, are available at: See Operation Spider on YouTube. Contact us http://www.abc.net.au/adelaide/operation/ wins 3 awards. School Projects 2. School projects As part of the Operation Spider program, we have Quick Links: find out more 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





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

Operation Spider on YouTube. Operation Spider webpage.

3. Poetry competition

more about the School Projects ...

We're running a poetry competition in conjunction with the Operation Spider survey.

for classes to be involved. Click here to find out

There are 5 age-group categories to enter (early years, primary, middle, secondary and 18+) for eight-lined noems shout enders. There are great prizes from us and 891 ABC Adelaids - over





School Projects

RESOURCES FOR THE STUDY –LINKED TO FACEBOOK AND TRADITIONAL MEDIA FOR Q AND A

Operation • Spider Fact Sheet	Spider Fact Sheet 2	Coefficient Fact Sheet 3
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Click here to download	Click here to download	Click here to download
factsheet 1:	factsheet 2:	factsheet 3:
Introduction to invertebrates	The variety of invertebrates	What are spiders?
Operation • Spider Fact Sheet	Spider Fact Sheet 5	Spider Fact Sheet
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factsheet 4:	factsheet 5:	factsheet 8:

People and spiders

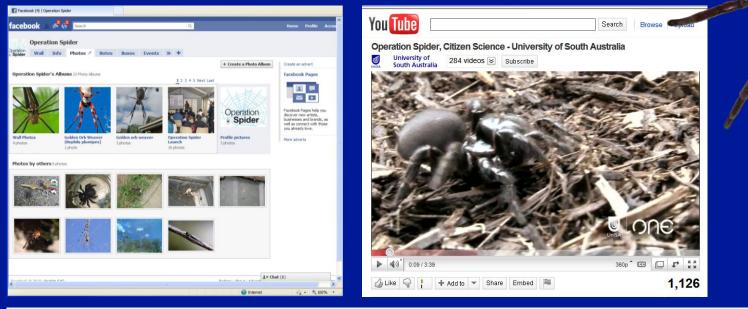
Spider webs

Some local spiders

Age of participants

Survey respondents by age cohort 100% 80% of respondents Age 60% cohort 61 or over 41 - 60 21 - 40 40% 11-20 ■ 0 - 10 % 20% 0% Bluetongue Possum Magpie Spider Project

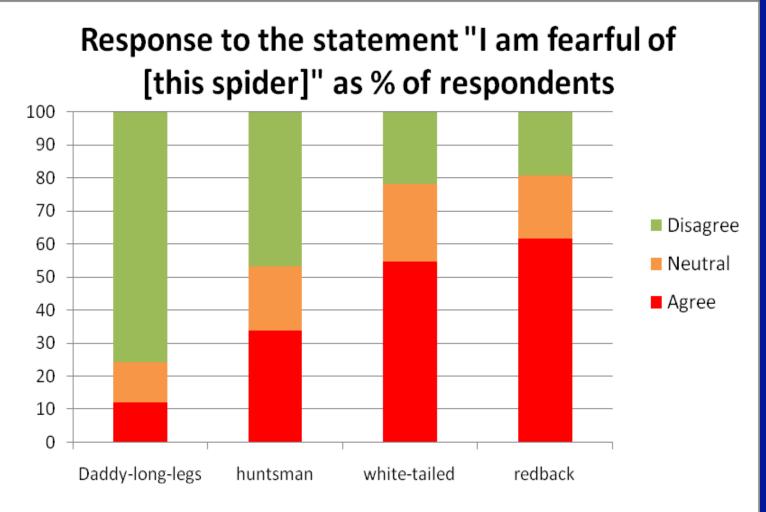
Attracting generation Z



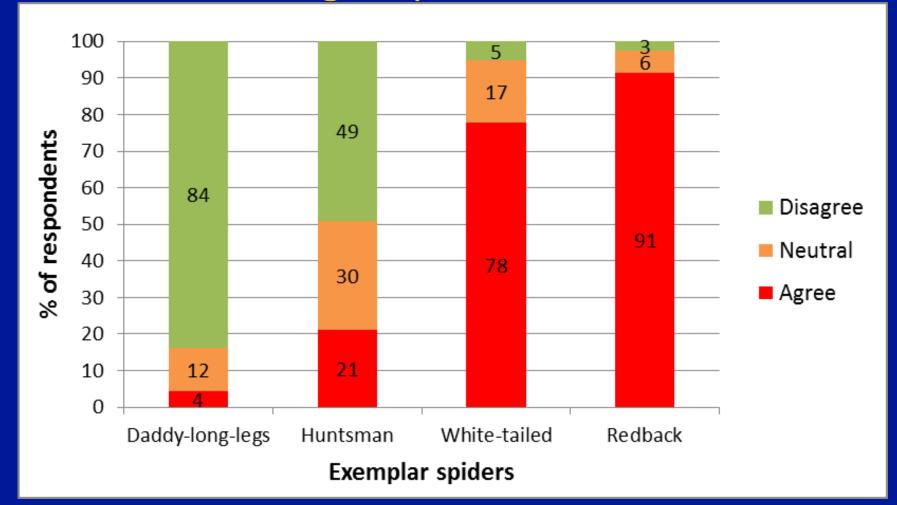
Demographics



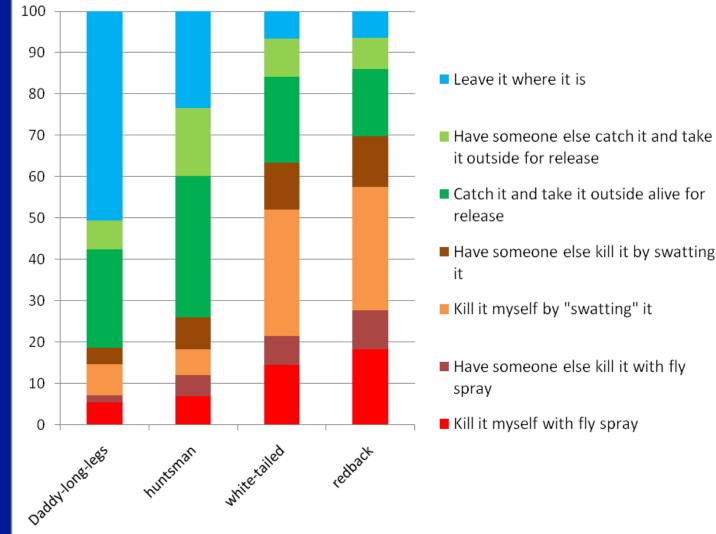
Spiders ain't spiders: 1 Unequal fear



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...

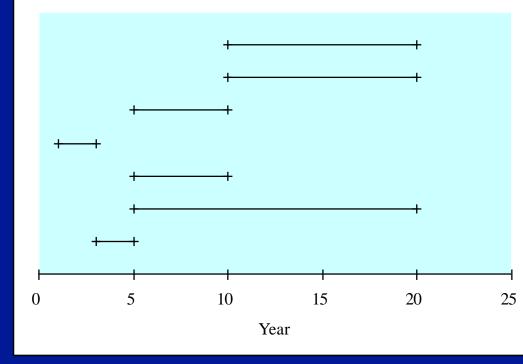
- Citizen Science enables:
 - Data collection
 - Education
 - Engagement



- 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

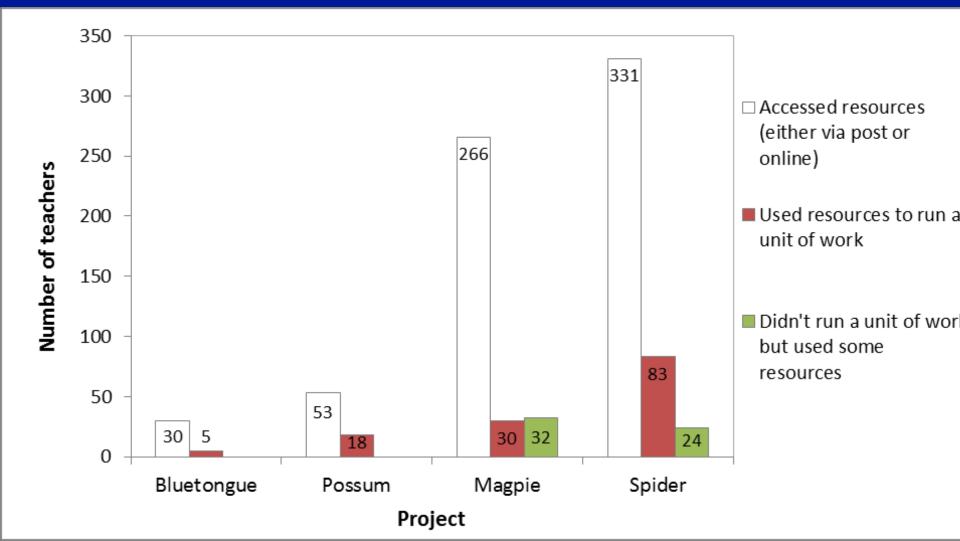
Temporal scale of a council's decision making. Temporal scale of planning (Dr X Bai, CSIRO Sustainable Ecosystems) 3: Housing: The Loss of the Backyard

The new

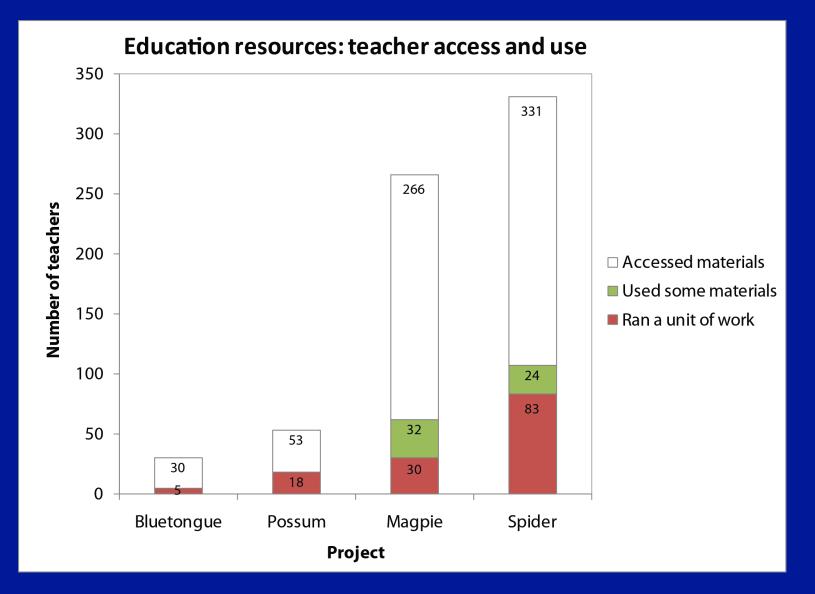
and the old



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



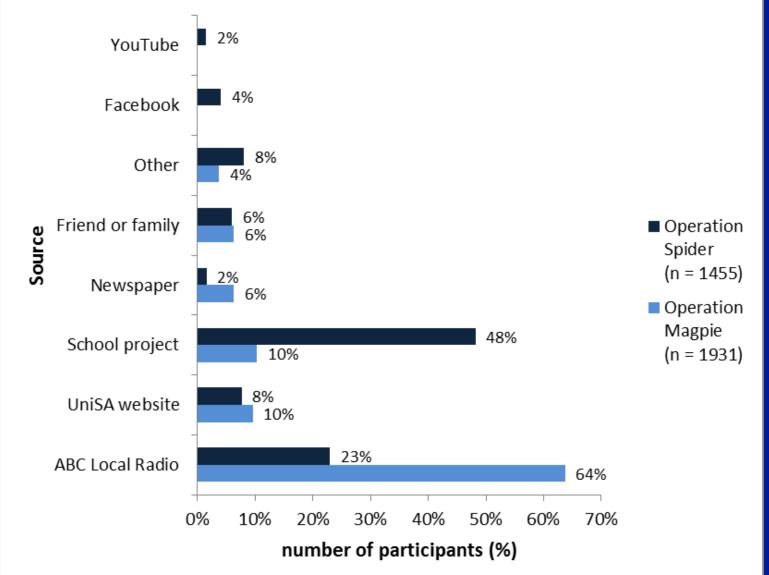
Growth of the education program



Age and gender of Operation Spider respondents

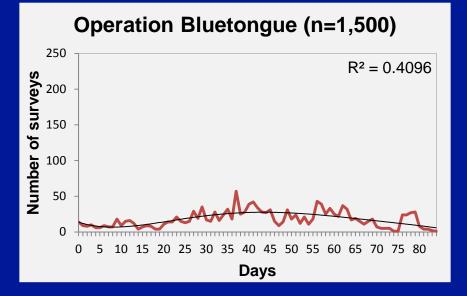
	Total (also given	Males	Females
	as a percentage of	including only	including only
	respondents who	respondents who	respondents who
Age	submitted their	submitted both	submitted both
cohort	age cohort)	age and gender	age and gender
0 - 10	295 (24.6%)	148	147
11 - 20	415 (34.6%)	210	187
21 - 30	65 (5.4%)	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	63/

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

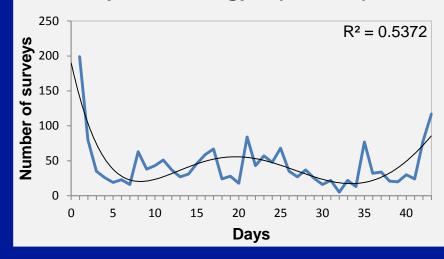


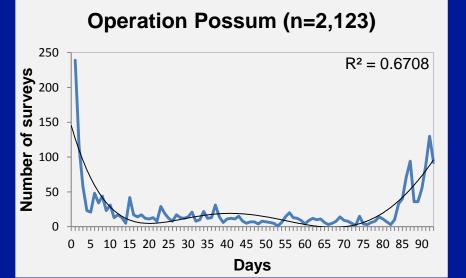
Survey returns

250

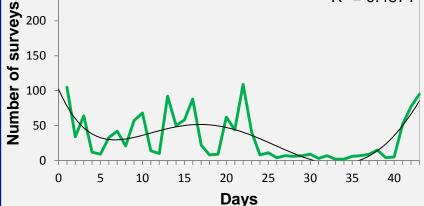


Operation Magpie (n=1,865)









Philip Roetman



And More than 50 Collaborators