Measuring success in the Swan Region: Creating a culture of adaptive management

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DEPARTMENT OF
Conservation
AND LAND MANAGEMENT

Are we having an impact?

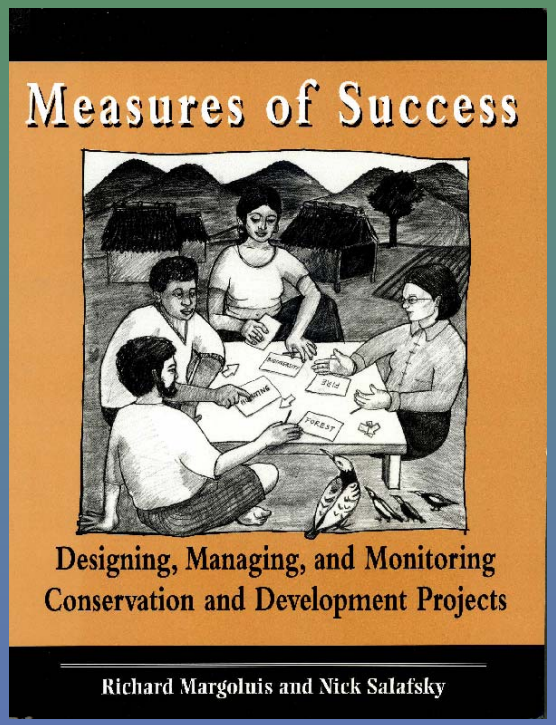
Are we learning and improving our management?

"The effectiveness of DEC's planning, management and regulatory frameworks is dependent on science-based knowledge that informs these processes".
- DEC Science Policy (April 2008)

Science policy:
- *Science is relevant to departmental objectives*
- *Quality is high (good science, testable questions)*
- *Good communication of results*
- *Data are accessible for future application*
- *Personal responsibility for projects is promoted (via links to EPDP)*
- *A legacy remains to promote the retention of corporate knowledge.*

Are we having an impact?

Are we learning and improving our management?



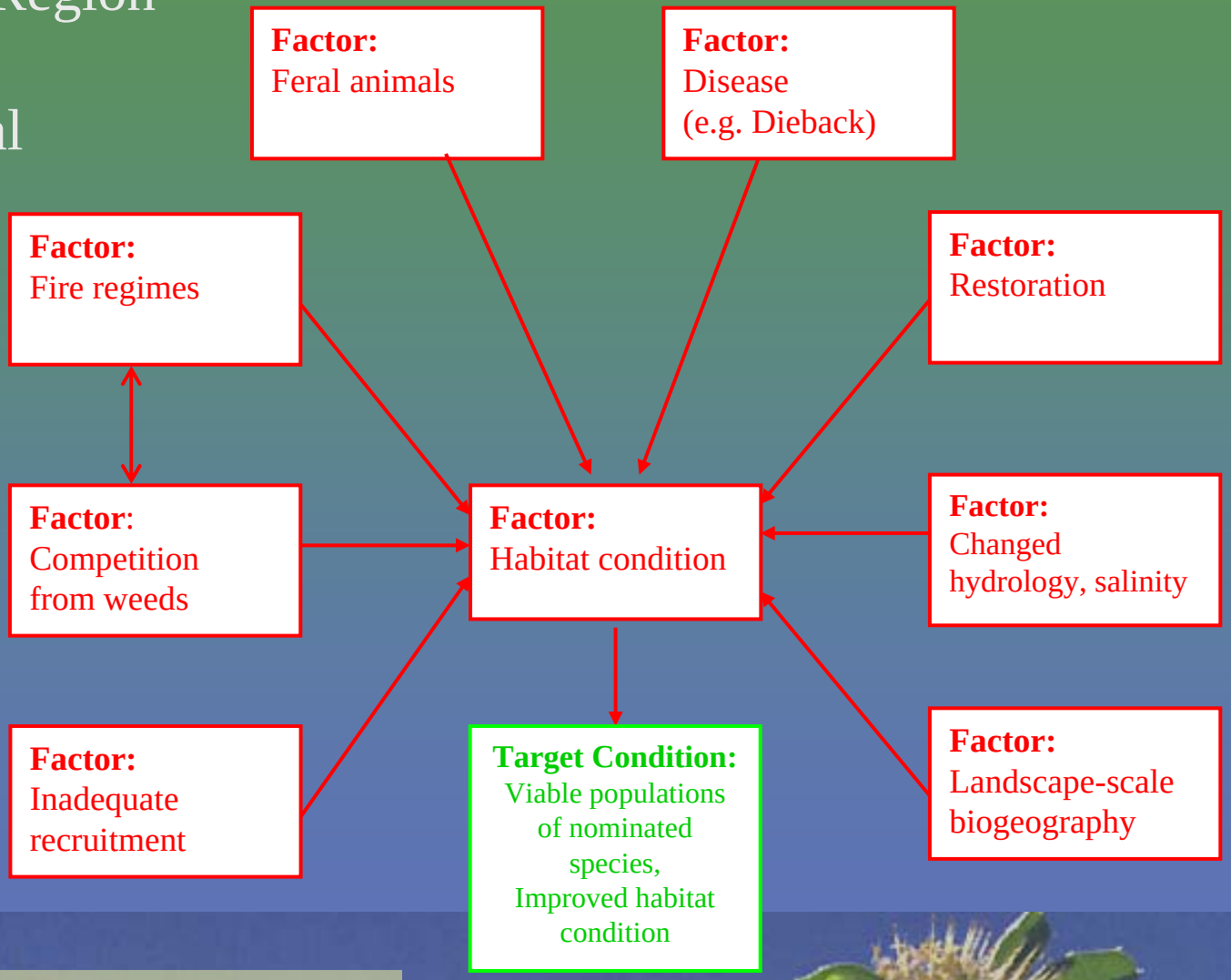
"Adaptive management is a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs".
- *British Columbia Ministry of Forests (2004)*

Margolius, R., Salafsky, N. (1998).
Island Press, Washington, DC, USA.

http://fosonline.org/resources/publications/AdapManHTML/Adman_1.html

There are 70 on-ground, adaptive management projects in the Swan Region

Conceptual Model:



The adaptive management process was formalized using the following tool:

A new project is in Cycle 1

Stage 1: The question is defined

- clear program logic and conceptual model
- scoping document and peer review
- stakeholder engagement

Stage 2: Know how to address the question and success criteria

- methods and experimental design clear
- know what to measure and when to stop
- sites chosen

Stage 3: Monitoring and evaluation are underway

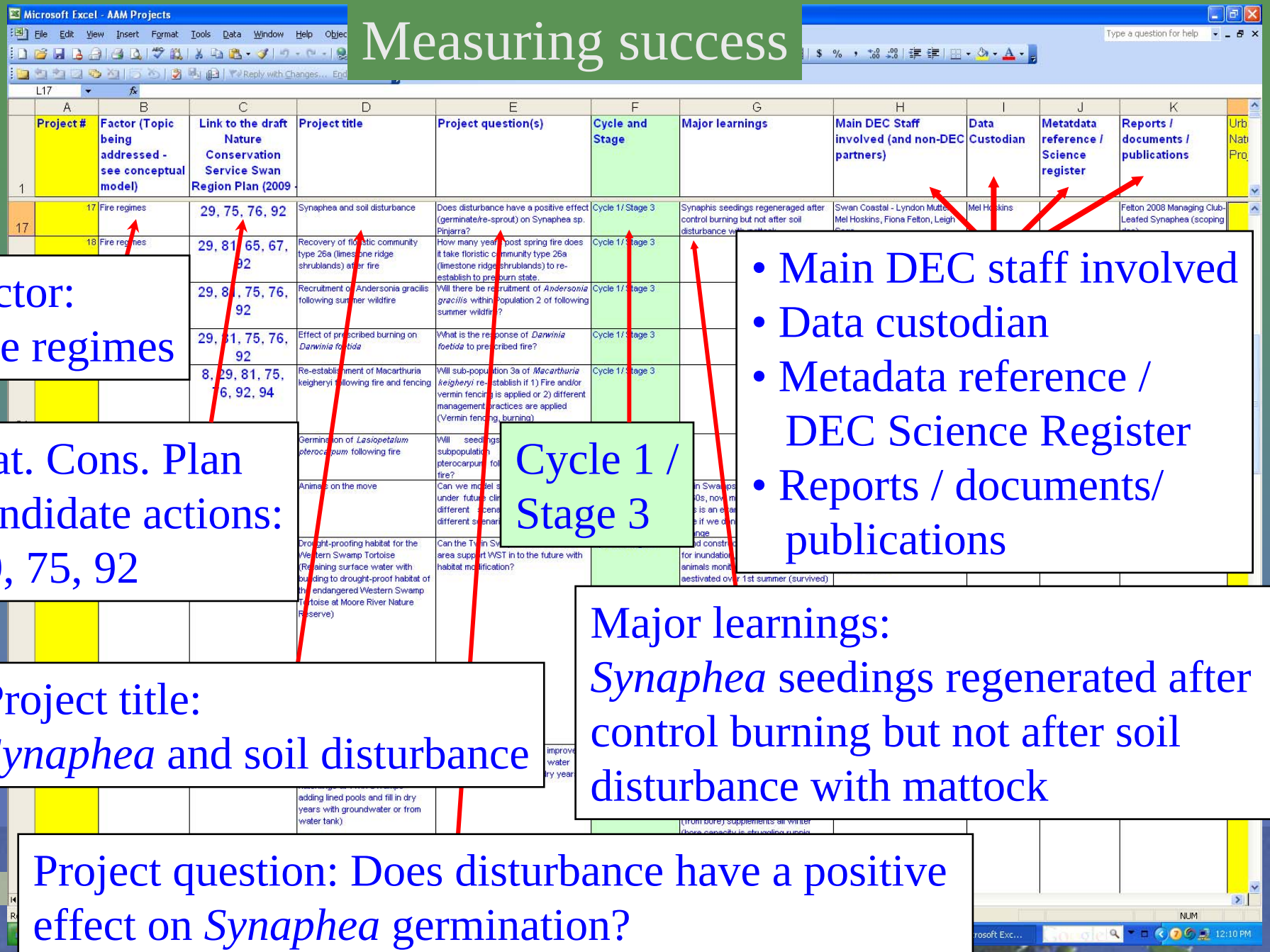
- data are being collected
- time frame has been defined (visualise final message)
- analysis is underway

Stage 4: Know the story, who to tell and how to tell it

- final analysis done and report written
- main message identified as well as learnings and implications for management
- communication with stakeholders underway

Also a tool for measuring success and building a culture of adaptive management

Measuring success



Factor:
Fire regimes

Nat. Cons. Plan candidate actions:
29, 75, 92

Cycle 1 / Stage 3

- Main DEC staff involved
- Data custodian
- Metadata reference / DEC Science Register
- Reports / documents/ publications

Major learnings:
Synaphea seedings regenerated after control burning but not after soil disturbance with mattock

Project title:
Synaphea and soil disturbance

Project question: Does disturbance have a positive effect on *Synaphea* germination?

Measures of success:

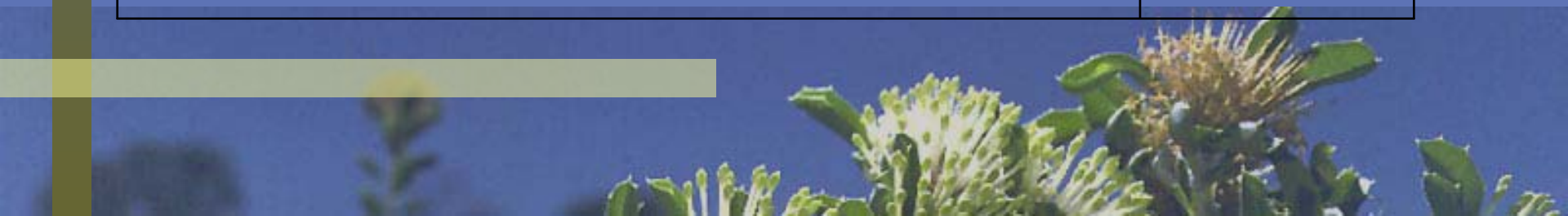
Adaptive management projects in Swan Region (December 2009)

Success criteria	**Total**
# Projects	70
# Pending projects	19
# Projects that have progressed at least one *stage* in Adaptive Management Cycle (since May 2009)	24
# Times a project progressed at least one *stage* (since May 2009)	38
# DEC staff in regular communication regarding their projects	20

Success criteria	Total
# Candidate actions in Swan Region Nat. Cons. Plan (June 2009)	43
# Candidate actions addressed (60% of projects address 20% of candidate actions)	32

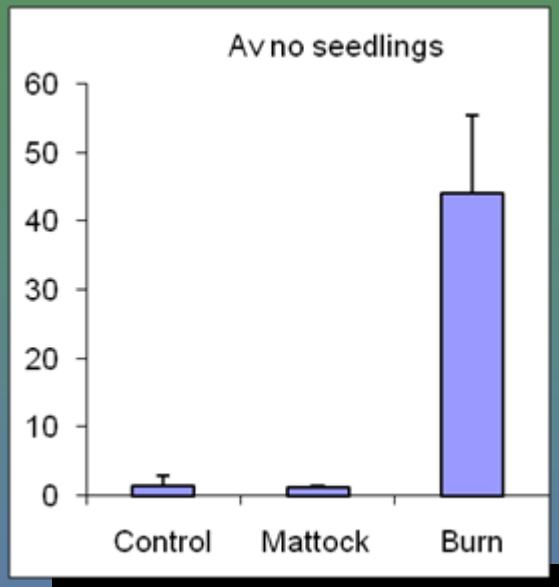
Urban Nature program January to June 2009:

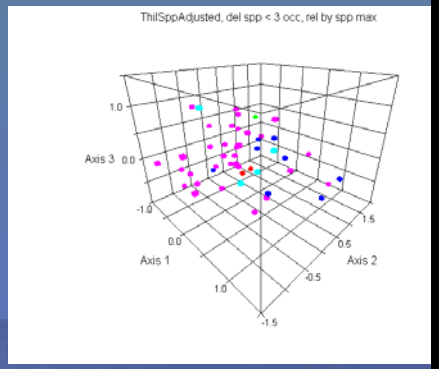
Success criteria	Total
# Urban Nature adaptive management projects	19
# organised onground activities	81
# stakeholders in close working relationships	37
# times technical advice was provided	18
# Newsletters or brochures printed with relevant articles	3,730

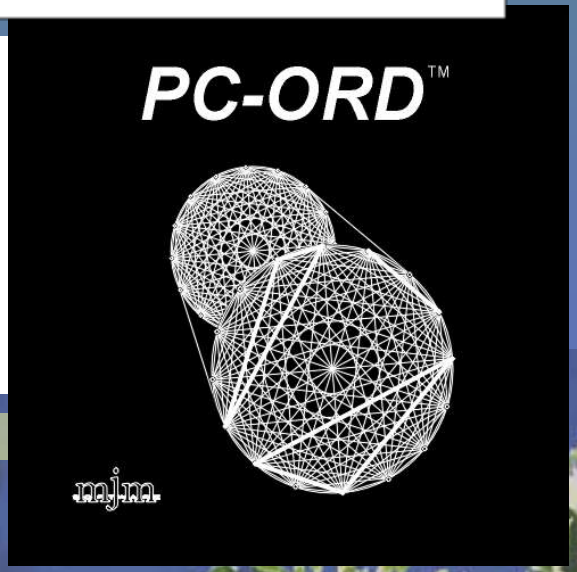


Building an adaptive management culture

Choosing the analysis







Access to stats programs http://www.statistixl.com/

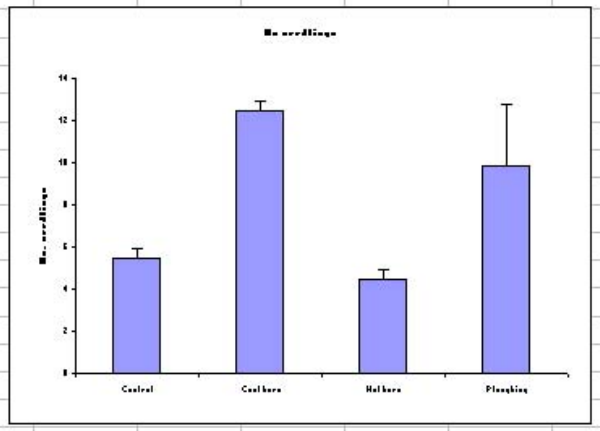
Microsoft Excel - Example calculations

File Edit View Insert Format Tools Data Window Help Objective statistiXL

Reply with Changes... End Review...

Q41

	A	B	C	D	E	F	G	H
1	Treatment	No Seedlings		Treatment	Mean	SD	n	SE
2	Control	5		Control	5.5	1.048809	6	0.437004
3	Control	6		Cool burn	12.5	1.048809	6	0.437004
4	Control	7		Hot burn	4.5	1.048809	6	0.437004
5	Control	4		Ploughing	9.833333	6.968979	6	2.903741
6	Control	5						
7	Control	6						
8	Cool burn	12						
9	Cool burn	11						
10	Cool burn	13						
11	Cool burn	14						
12	Cool burn	12						
13	Cool burn	13						
14	Hot burn	5						
15	Hot burn	6						
16	Hot burn	4						
17	Hot burn	5						
18	Hot burn	3						
19	Hot burn	4						
20	Ploughing	7						
21	Ploughing	23						
22	Ploughing	12						
23	Ploughing	4						
24	Ploughing	6						
25	Ploughing	7						
26								



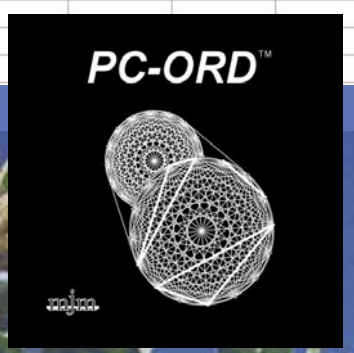
Analysis of Variance results for:
Y Variable Range = $B$1:$B$25
Factor Range = $A$1:$A$25

Analysis of Variance for Y=No Seedlings

Source	Type III SS	Df	Mean Sq.	F	Prob.
Model	252.500	3	84.167	6.491	0.003
Error	259.333	20	12.967		
Total	511.833	23			

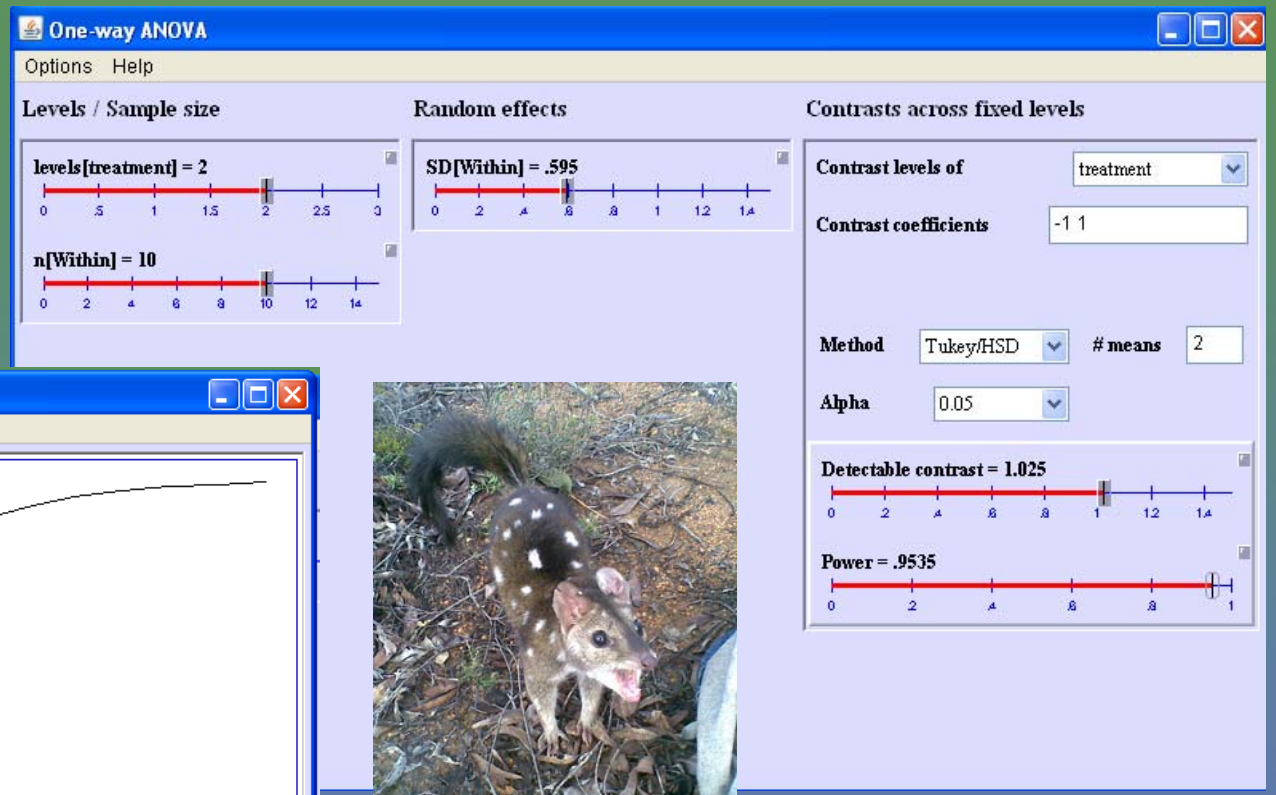
Post Hoc tests for Factor = Treatment

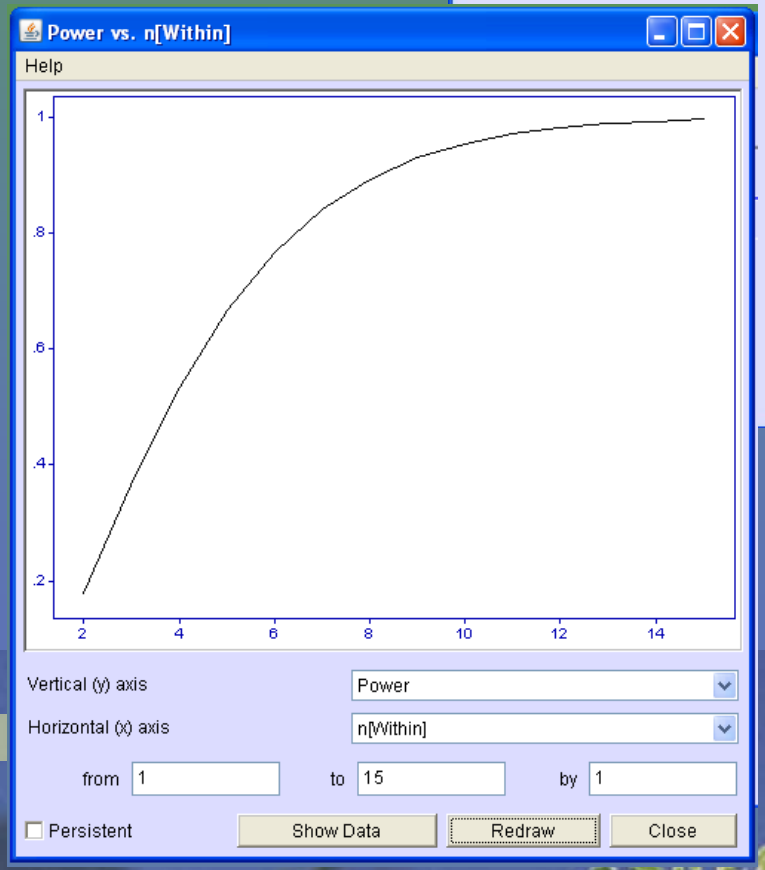
Test	Group 1	Group 2	Mean Diff.	SE	q	Prob.
Tukey	Control	Cool burn	-7.000	1.470	4.762	0.015
		Hot burn	1.000	1.470	0.680	0.962
		Ploughing	-4.333	1.470	2.948	0.192
	Cool burn	Hot burn	8.000	1.470	5.442	0.005
		Ploughing	2.667	1.470	1.814	0.584
	Hot burn	Ploughing	-5.333	1.470	3.628	0.080



Experimental design:

e.g. Power Analysis



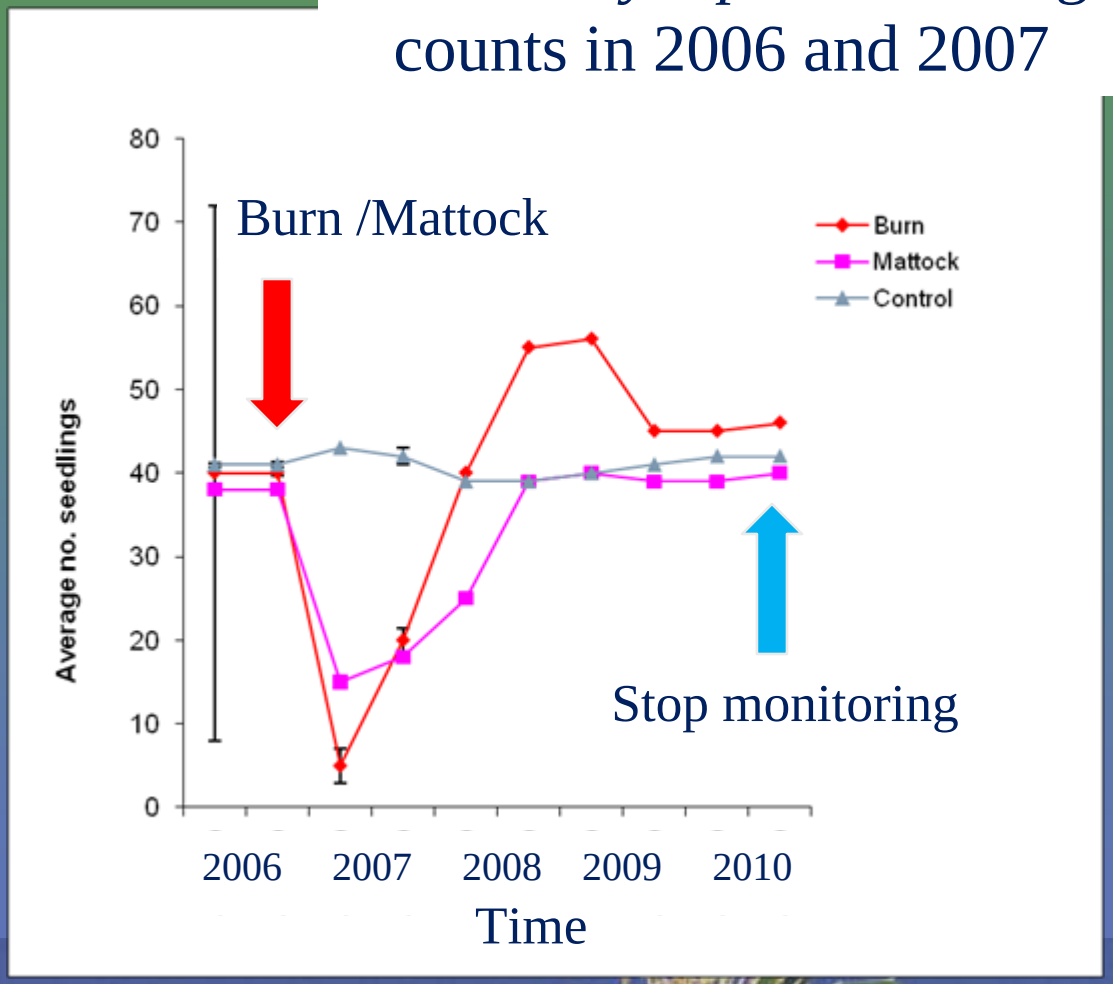


http://www.stat.uiowa.edu/~rlenth/Power/

When to stop monitoring?

Usually stop monitoring when control and treatment converge or when treatments plateau

Hypothetical scenario based on *Synaphea* seedling counts in 2006 and 2007



Conclusions

DEC has expectations regarding the uptake of adaptive management

Adaptive management is possible but need to build capacity

Working towards a workforce that understands adaptive management concepts and can implement them within their works program

Regional staff have responded well to the process

Thank you

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