

The effect of predation by rabbits on regenerating Eastern Suburbs Banksia scrub



North Head
Sanctuary
Foundation



Site 3

Sites 1&2

Regeneration after fire

- **06-Sep-2012**
- **Three controlled burn sites**
- **Surveys at 6 and 12 months post fire**



EASTERN SUBURBS BANKSIA SCRUB

- a.k.a. Coastal Sand Mantle Heath
- First described by Banks in 1770
- Defined by an assemblage of 54 species
- Total species count approx. 173
- Large proportion of fire-tolerant and fire-requiring species
- High diversity which is adversely affected by soil disturbance
- Endangered Ecological Community (Federal and NSW)
- Coverage has decreased from 5,300 ha to 146 ha since 1788
- Area of North Head which is ESBS: 69 ha (47% of remaining)

AIMS

- Assess regeneration after fire and after other disturbance
- Asses the impact of predation by rabbits on regeneration

Site 2 ... before

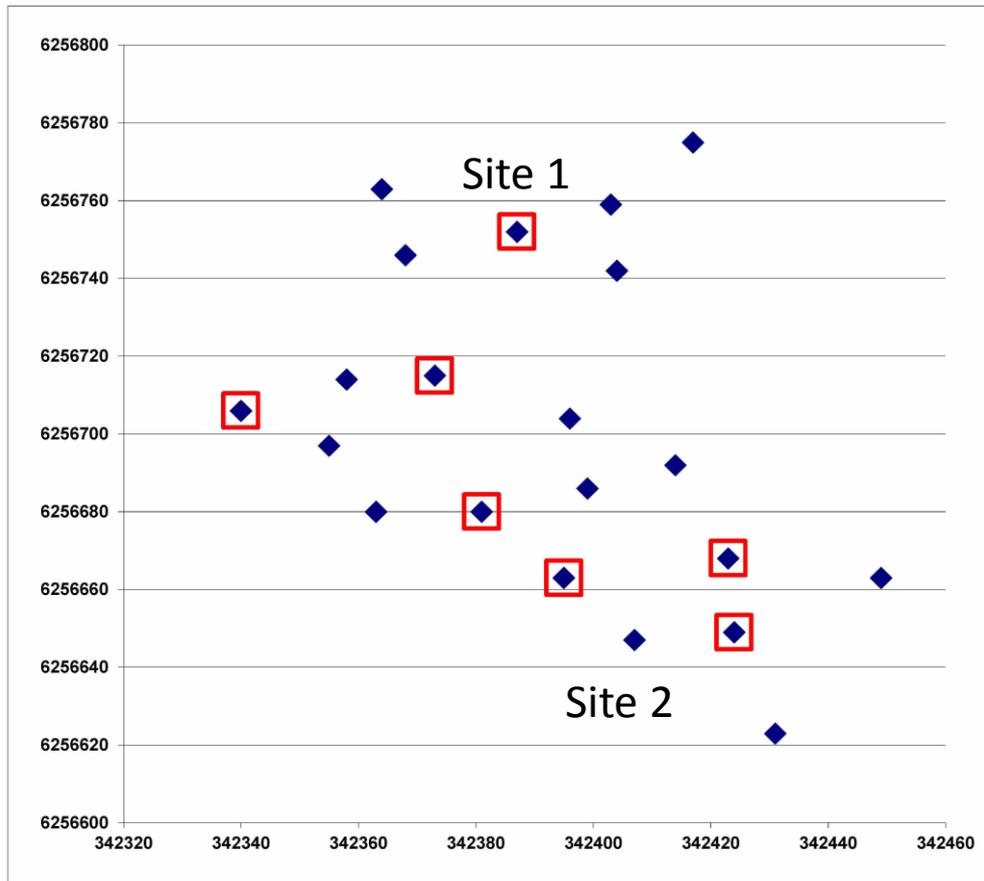


... and after



Study Design

- Three sites totalling 1.73 ha on North Head, Sydney
- Subjected to a controlled burn 6-Sep-2012
- Vegetation primarily Eastern Suburbs Banksia Scrub
- Intact core (green line), surrounded by *Leptospermum*-invaded annulus



Study Design

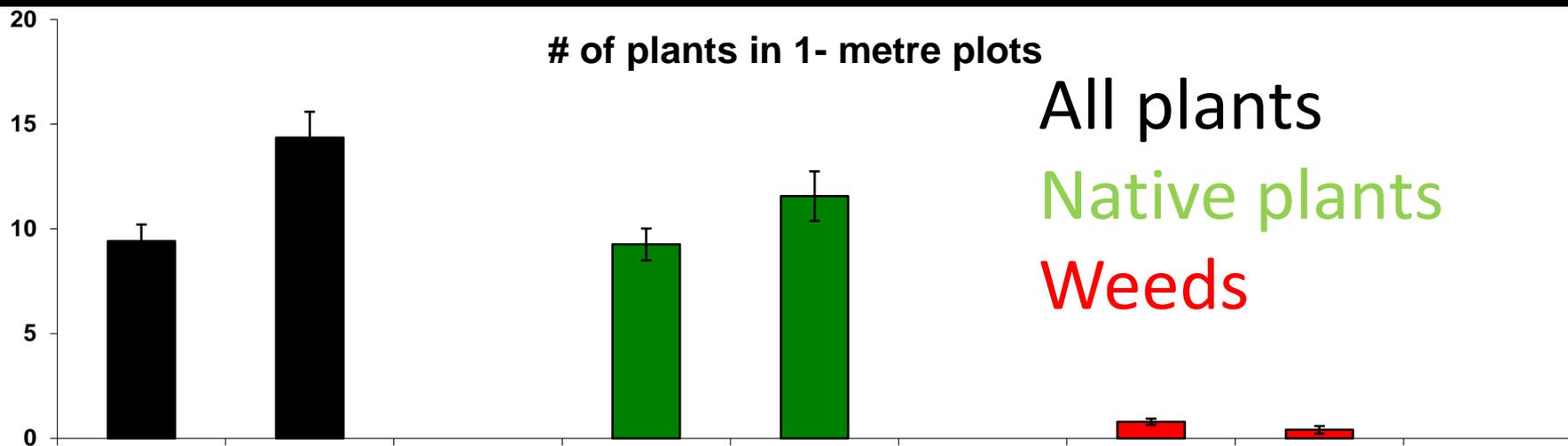
- 33 quadrats 7 x7 metres, each containing 4 randomly-allocated 1x1 metre survey plots
- 11 quadrats fenced to exclude rabbits 
- Plots surveyed for species and plant numbers at 6 and 12 months
- Plots surveyed at 5 to 8-week intervals for rabbit droppings
- North Head surveyed for rabbits by spotlighting and warren counts

RESULTS

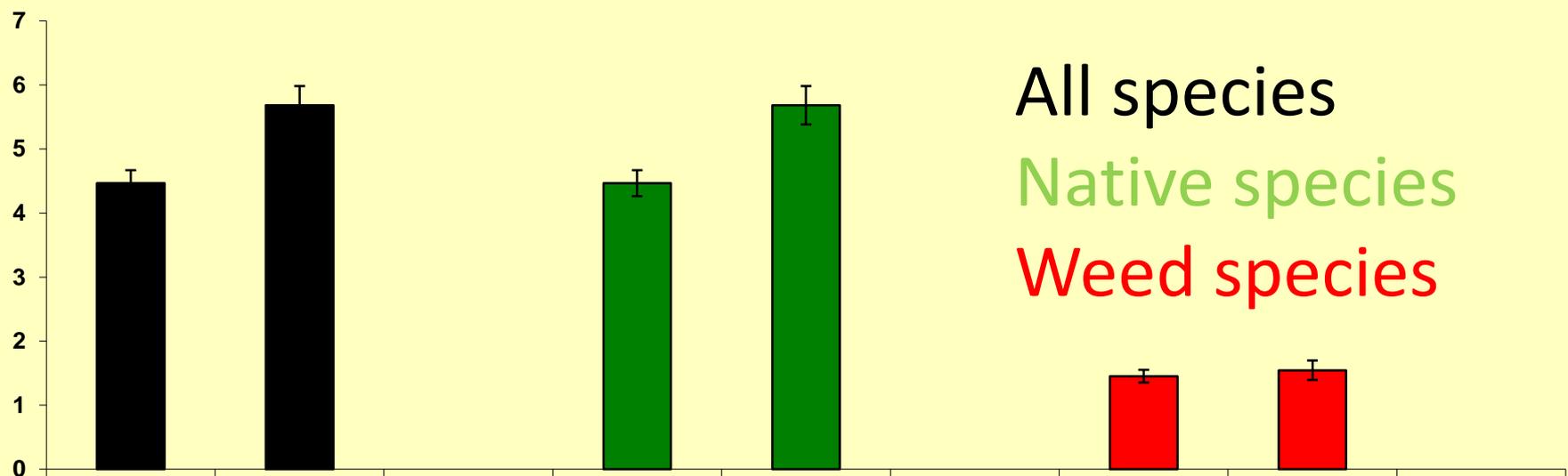
Seedling and resprouting survival
higher in fenced areas



of plants in 1- metre plots

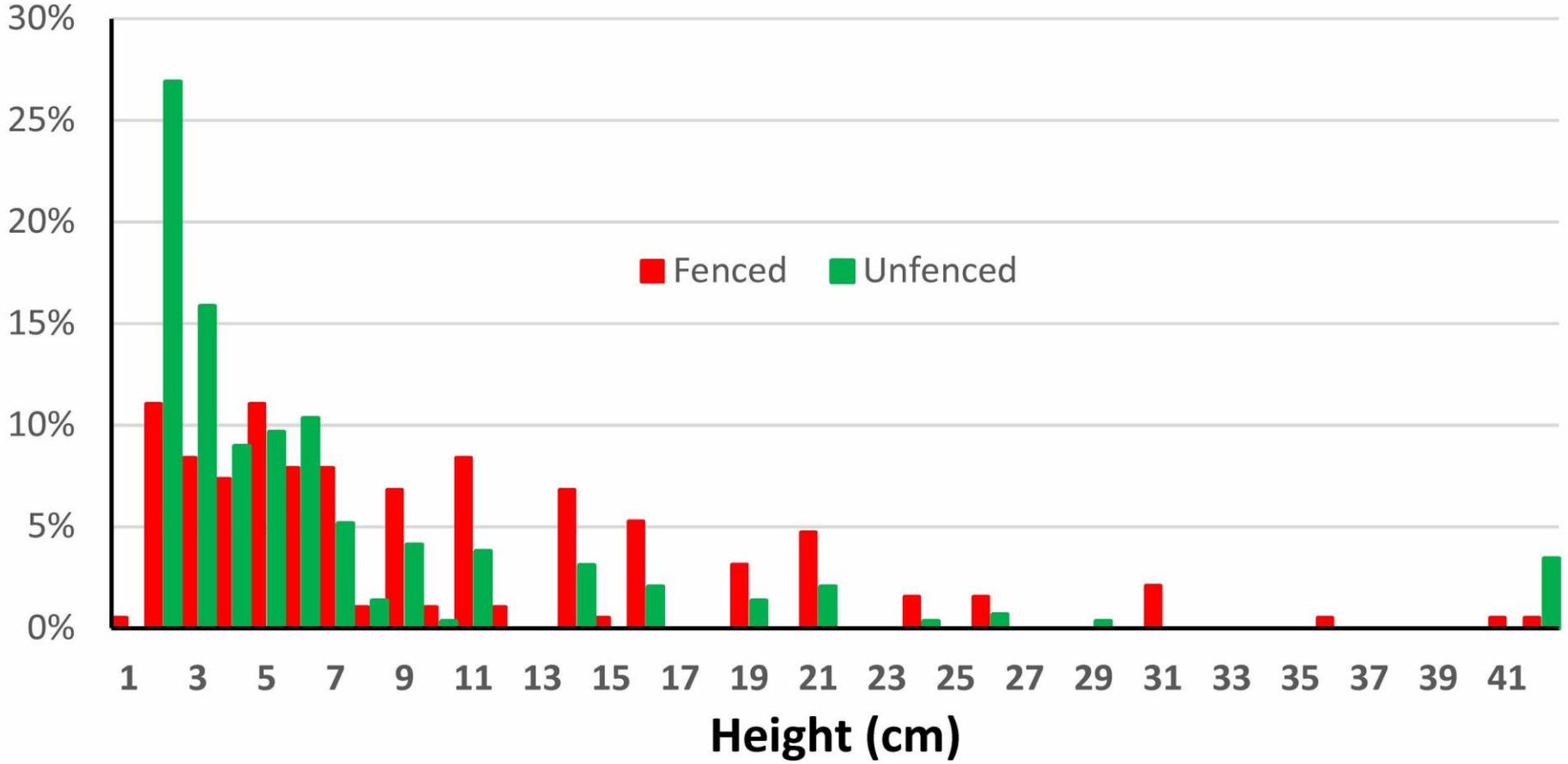


of species in 1 metre plots 12-month

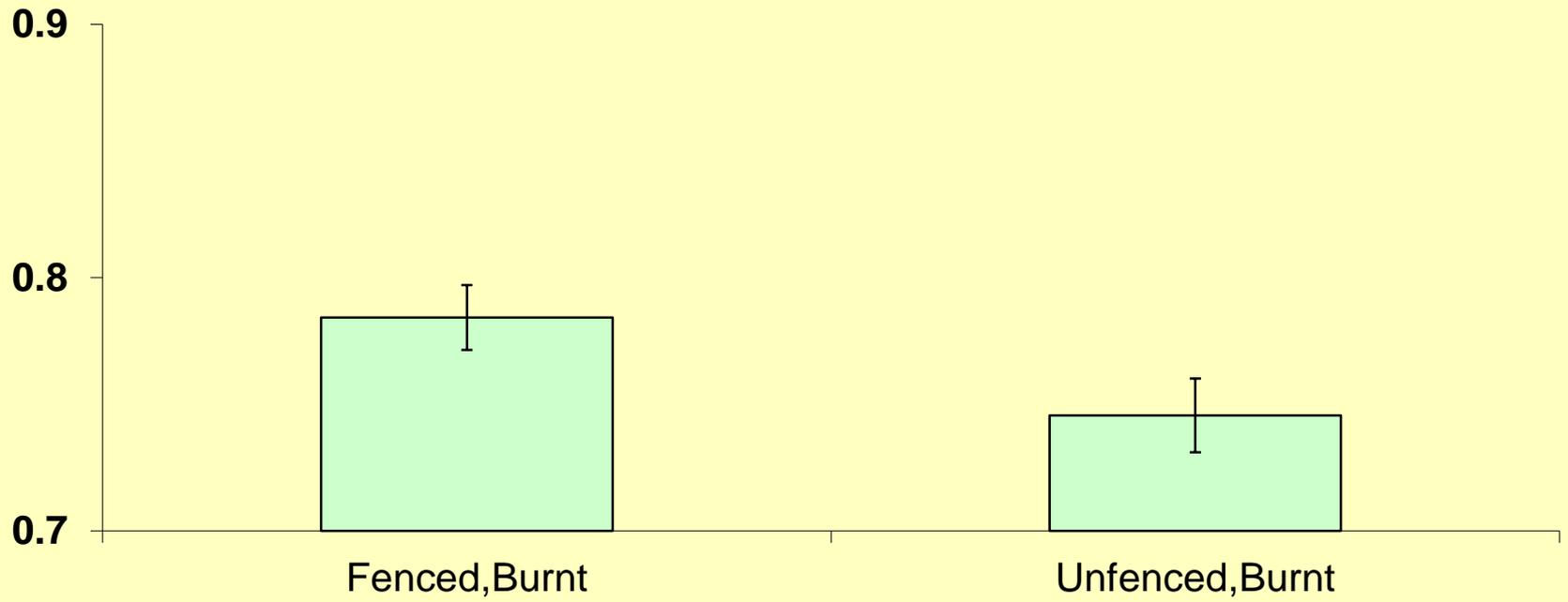


Frequency

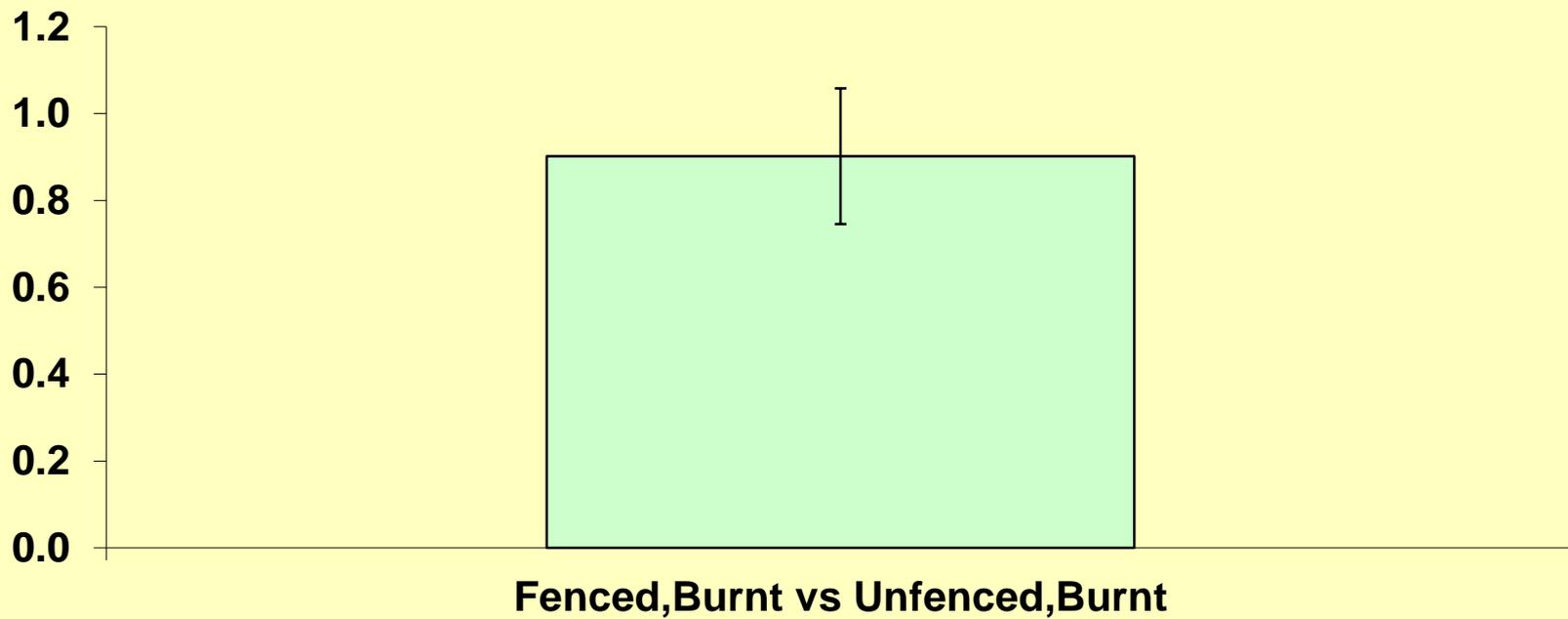
6- month height frequency distributions



Simpson Diversity



Morisita-Horn similarity Indices ("Overlap")

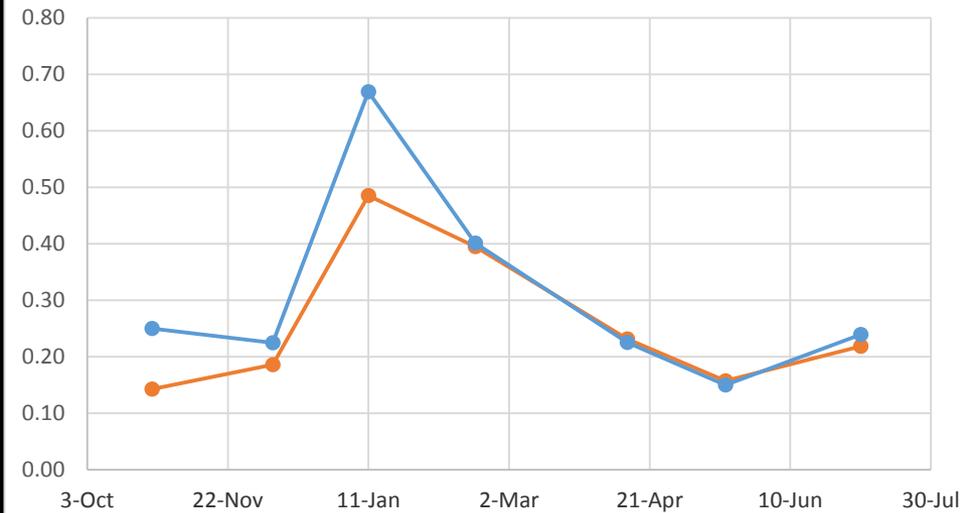


Rabbit Surveys

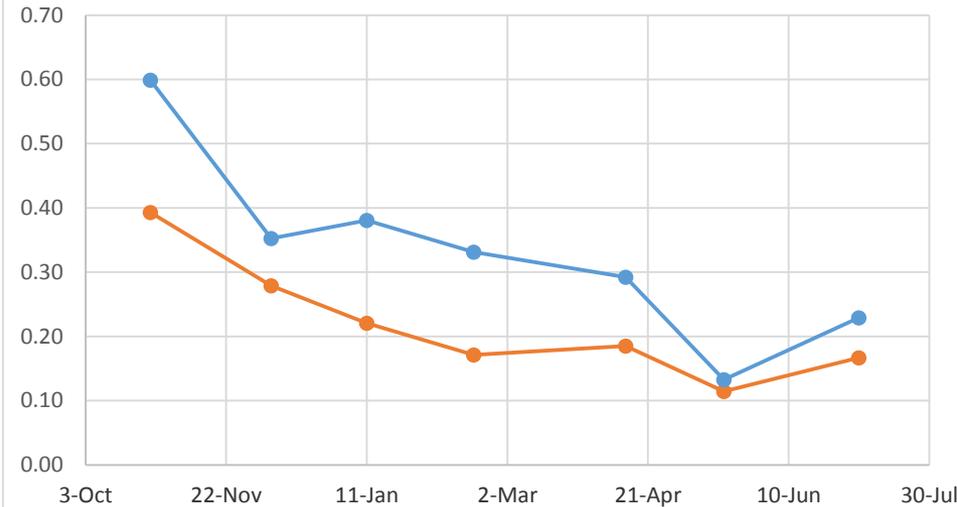
- **Critical level for regeneration** **1 - 2 rabbits per hectare**
- By spotlighting (all of North Head) 8.5 rabbits per hectare
- By active warren entrances (Sites 1&2) 5.8 rabbits per hectare
- By dropping counts (survey plots only) 4.7 rabbits per hectare

Rabbit droppings (pellets per sq m per day)

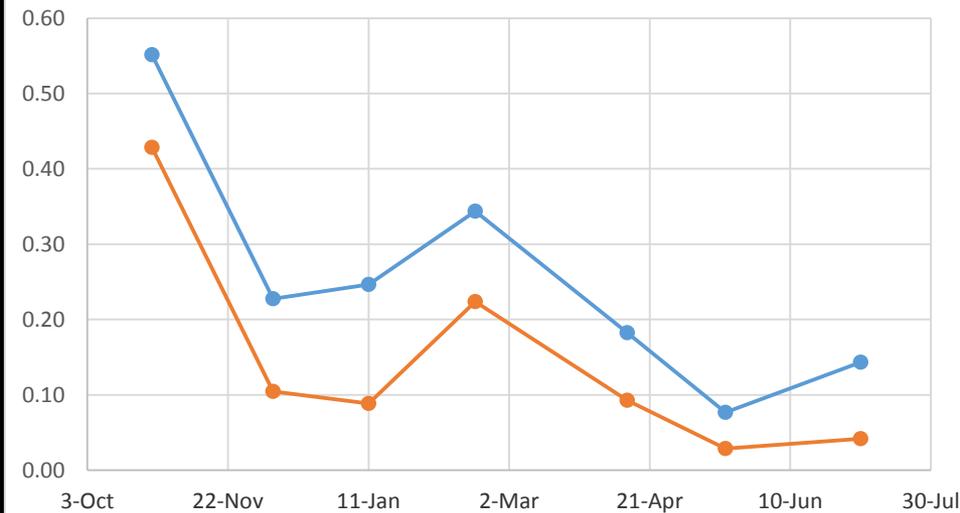
Site1



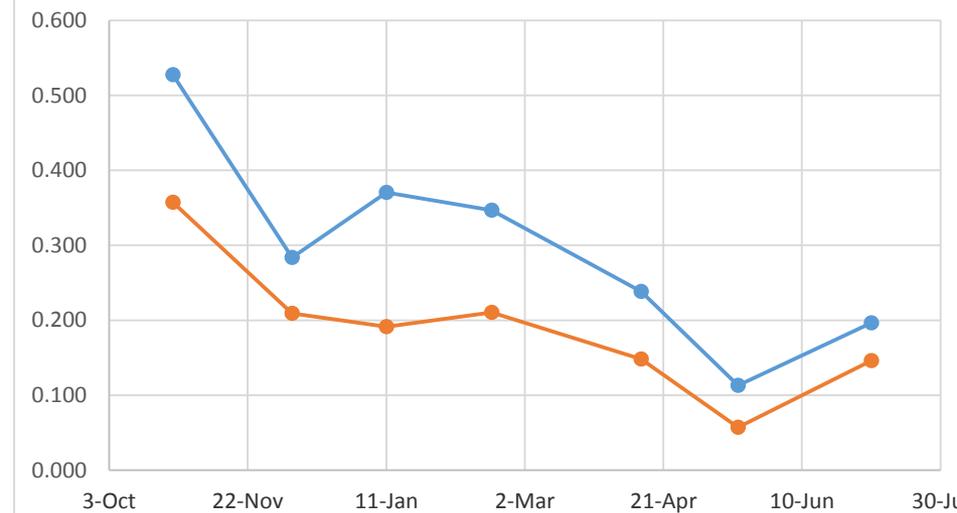
Site2



Site3

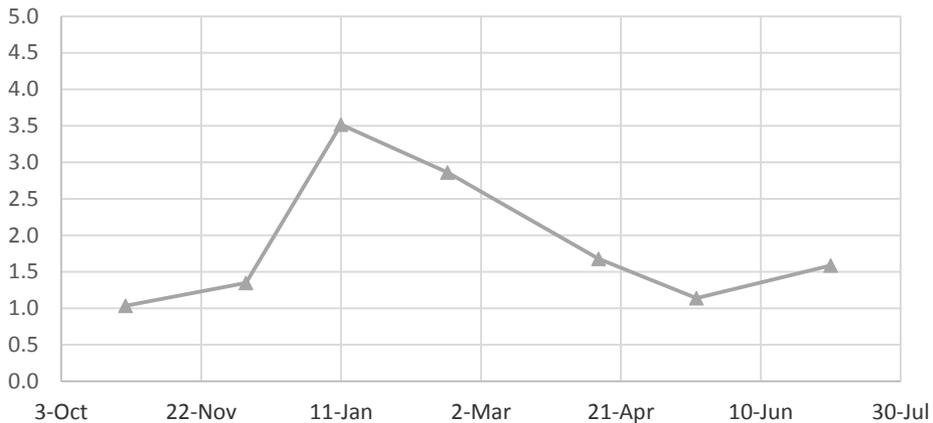


All 3 sites

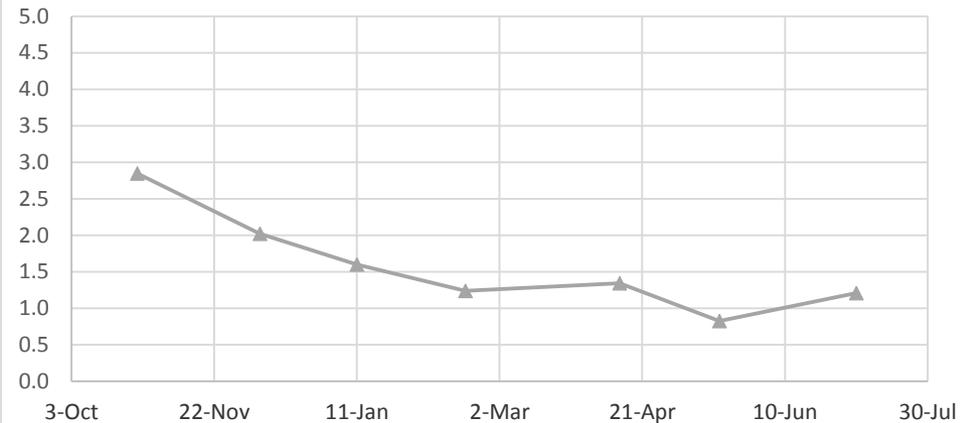


Rabbit counts per site; per hectare

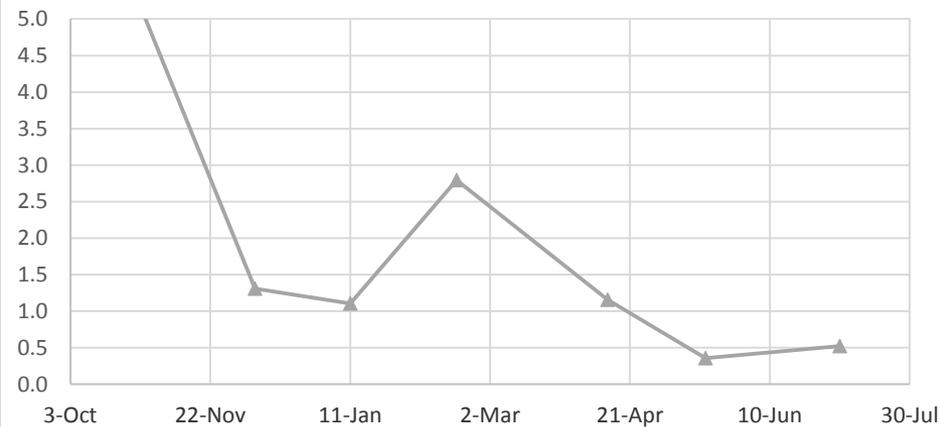
Rabbit numbers
Site1



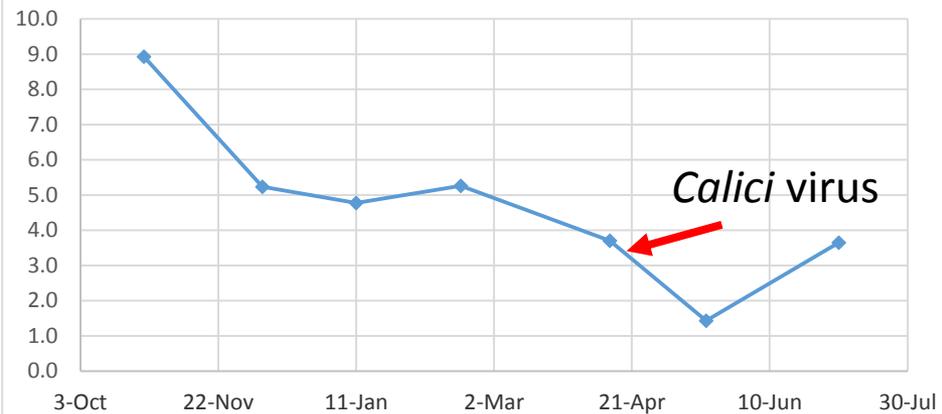
Rabbit numbers
Site2



Rabbit numbers
Site3



Rabbits per hectare
All 3 sites



EFFECT OF RABBITS

- Fewer plants
- Fewer species
- Shorter plants
- More weeds
- Lower diversity

CONCLUSION

- **Exclude rabbits from regenerating ESBS**

Thanks to:

- Australian Wildlife Conservancy
- Fire and Rescue NSW
- NSW NPWS
- NSW RFS
- Sydney Harbour Federation Trust

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