Deer in Australia

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THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

In 18th & 19th Centuries 6 spp. deer successfully introduced into Australia

- Red (*Cervus elaphus*)
- Sambar (*C. unicolour)*
- Rusa (*C. timorensis*)
- Fallow (*Dama dama*)
- Chital (*Axis axis*)
- Hog (*A. porcinus*)

In 18th & 19th Centuries 12 spp. deer unsuccessfully introduced into Australia

- Swamp Deer (*Cervus duvaucelli*)
- Sika (*C. nippon*)
- Eld's (*C. eldi*)
- Wapiti/elk (*C. canadensis*)
- Bawean (*Axis kuhlii*)
- Chinese water (*Hydropotes inermis*)
- Mule (*Odocoileus hemionus*)
- Musk (*Moschus sibericus*)
- Reindeer (*Rangifer tarandus*)
- White-tailed (*O. virginianus*)
- Muntjac (*Muntiacus muntjak*)
- Roe (*Capreolus capreolus*)

In 2004 it was estimated:

- 218 wild herds, with
  - 7% from acclimatisation society releases
  - 35% from deer farm releases/ escapes
  - 58% from deliberate releases

Moriarty 2004

In 2004 it was estimated:

- 200,000 wild deer, with
  - 85% being from acclimatisation society herds
  - 6% being deer farm releases/ escapes
  - 9% being deliberate releases

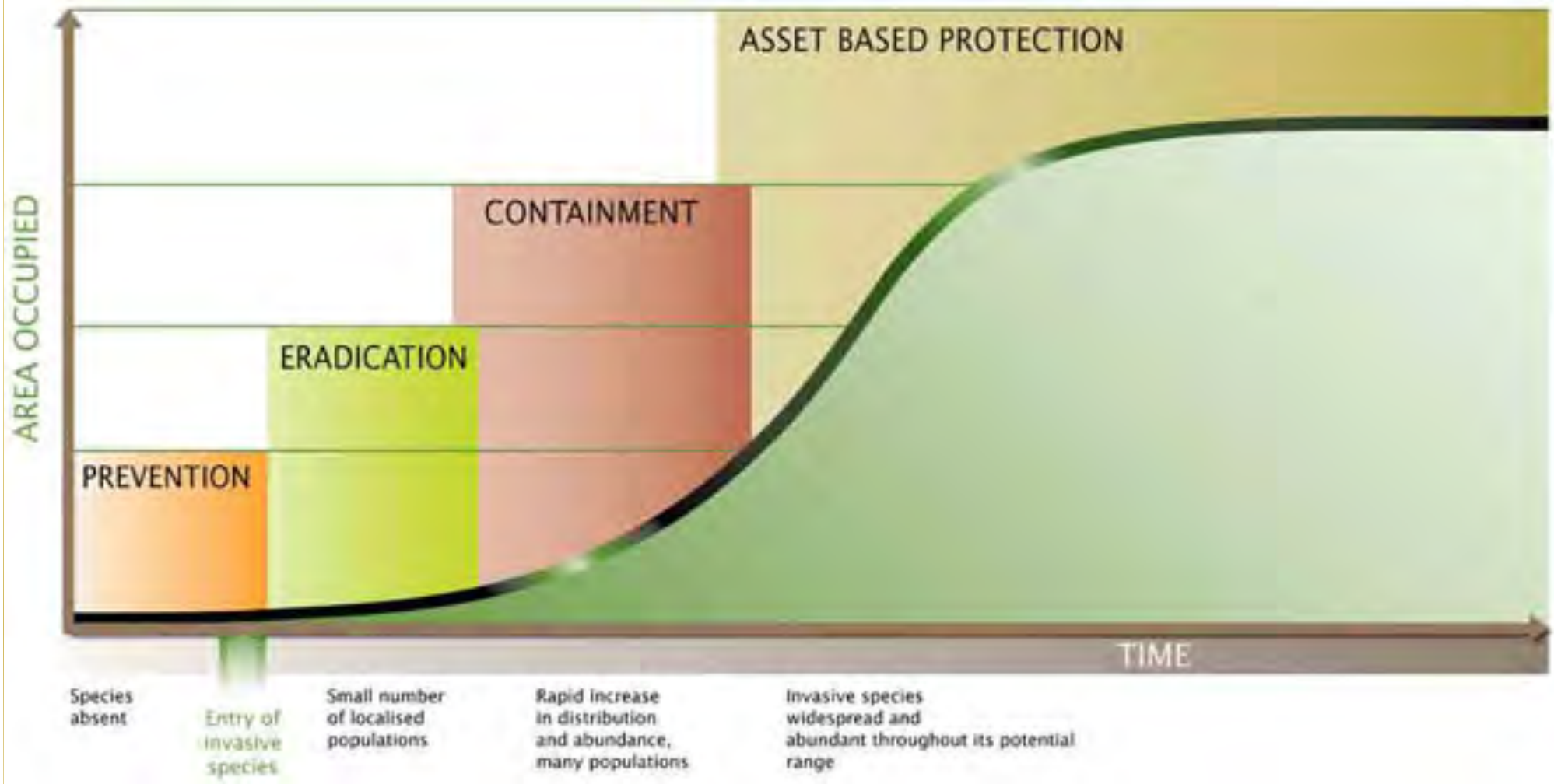
Moriarty 2004

In 2004 it was estimated:

- acclimatisation society herds being > 100 yrs old
- deer farm releases/escapes > 9 yrs old
- deliberate releases > 6 yrs old

Moriarty 2004

Window for Eradication is Limited… On a Continent



Courtesy Mike Braysher

How Do Deer Compare with Other Ferals?

- Camels ≈ 500 000
- Goats ≈ 3 million
- Donkeys ≈ 5 million
- Pigs ≈ 20 million

Strahan 1995

Table 2. The number of wild herds of each deer species in Australia

Type of release	Fallow	Red	Sambar	Chital	Rusa	Hog	Total
Acclimatisation society	4	4	2	1	2	1	14
Deer farms	39	23	1	5	7	2	77
Translocations	42	38	5	22	14	6	127
Total	85	65	8	28	23	9	218

Moriarty 2004

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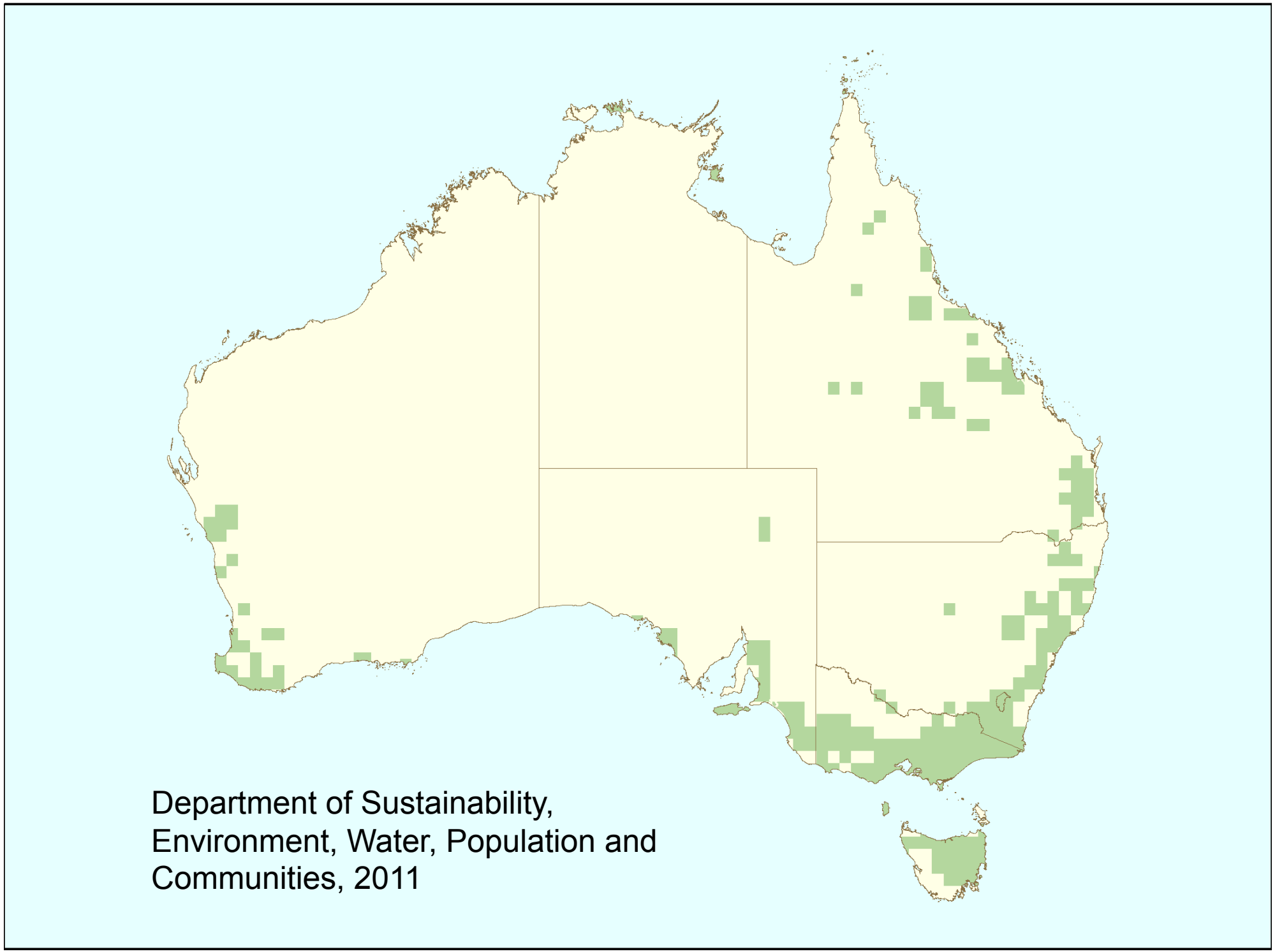
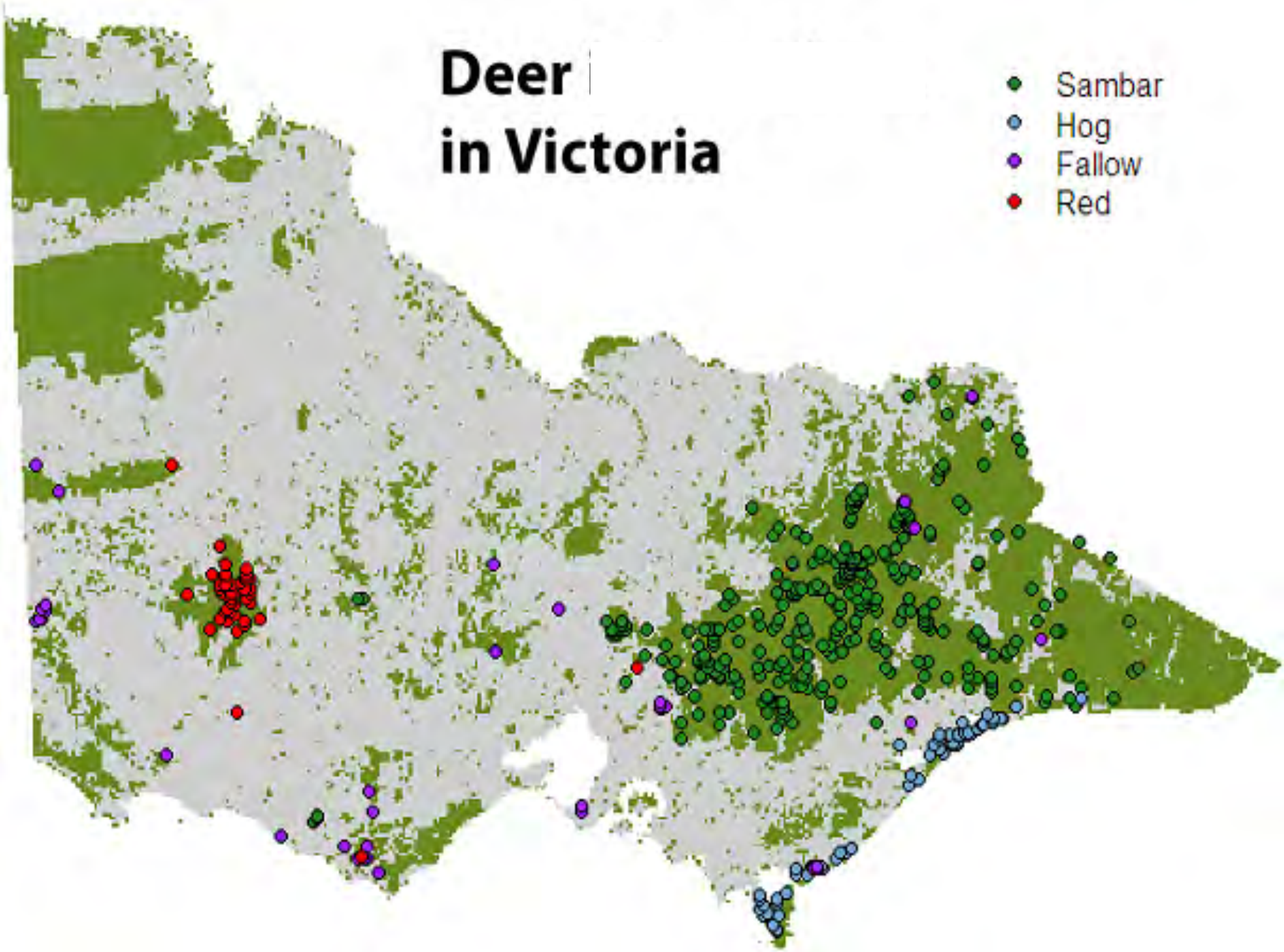
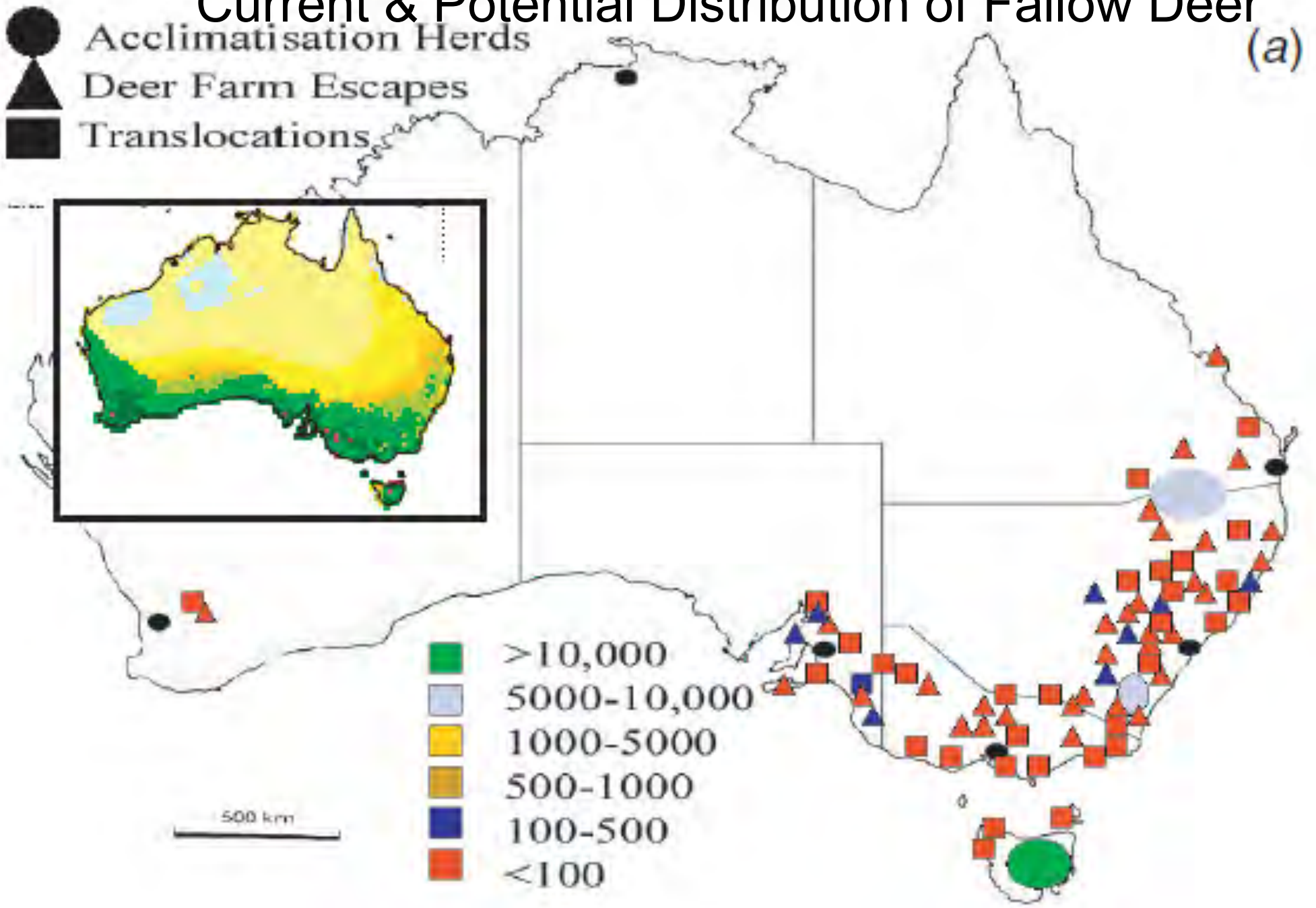
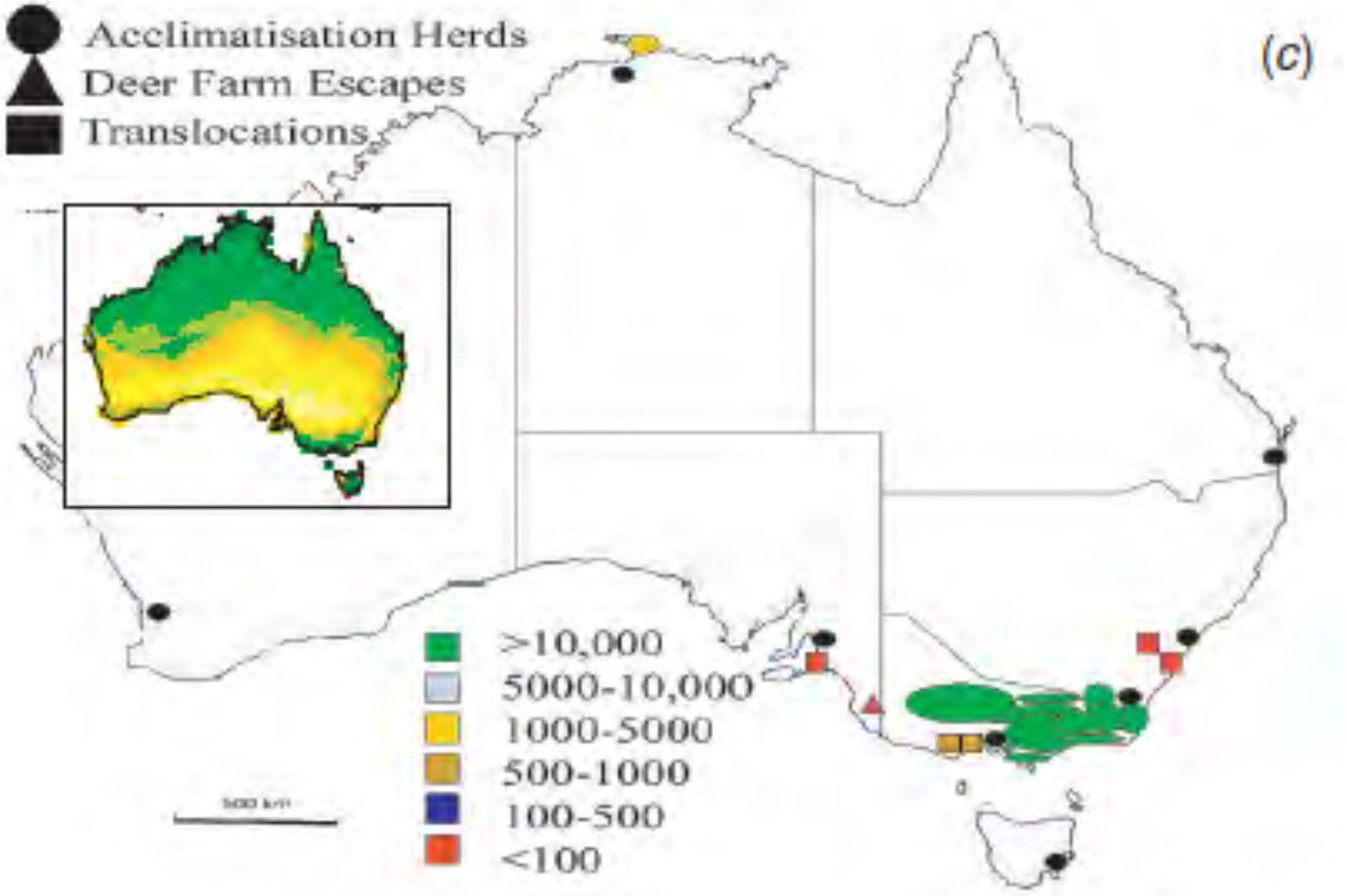

Department of Sustainability,
Environment, Water, Population and
Communities, 2011


Deer
in Victoria
Sambar
Hog
Fallow
Red

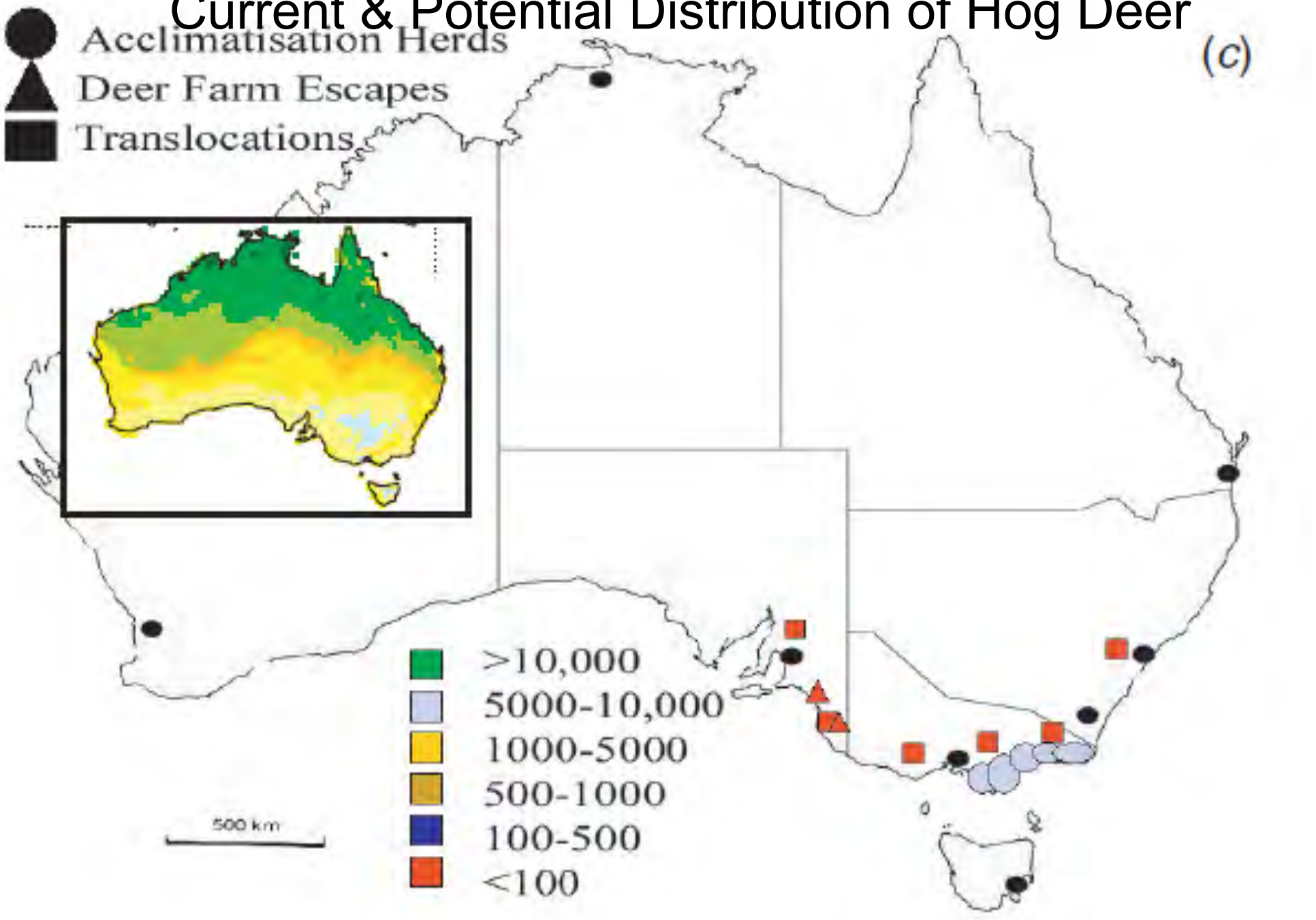
Current & Potential Distribution of Fallow Deer



Current & Potential Distribution of Sambar Deer



Current & Potential Distribution of Hog Deer

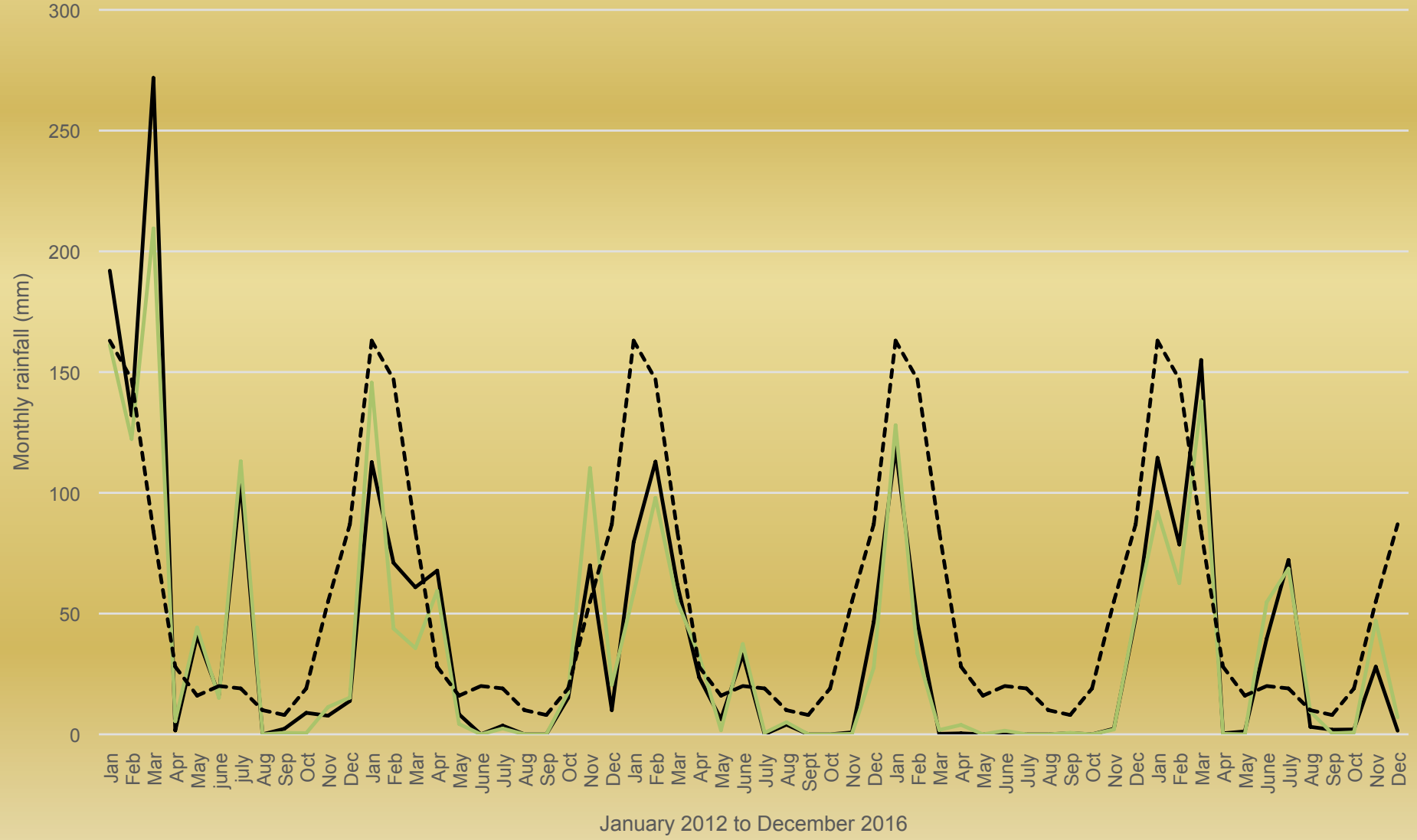


A note of caution about models

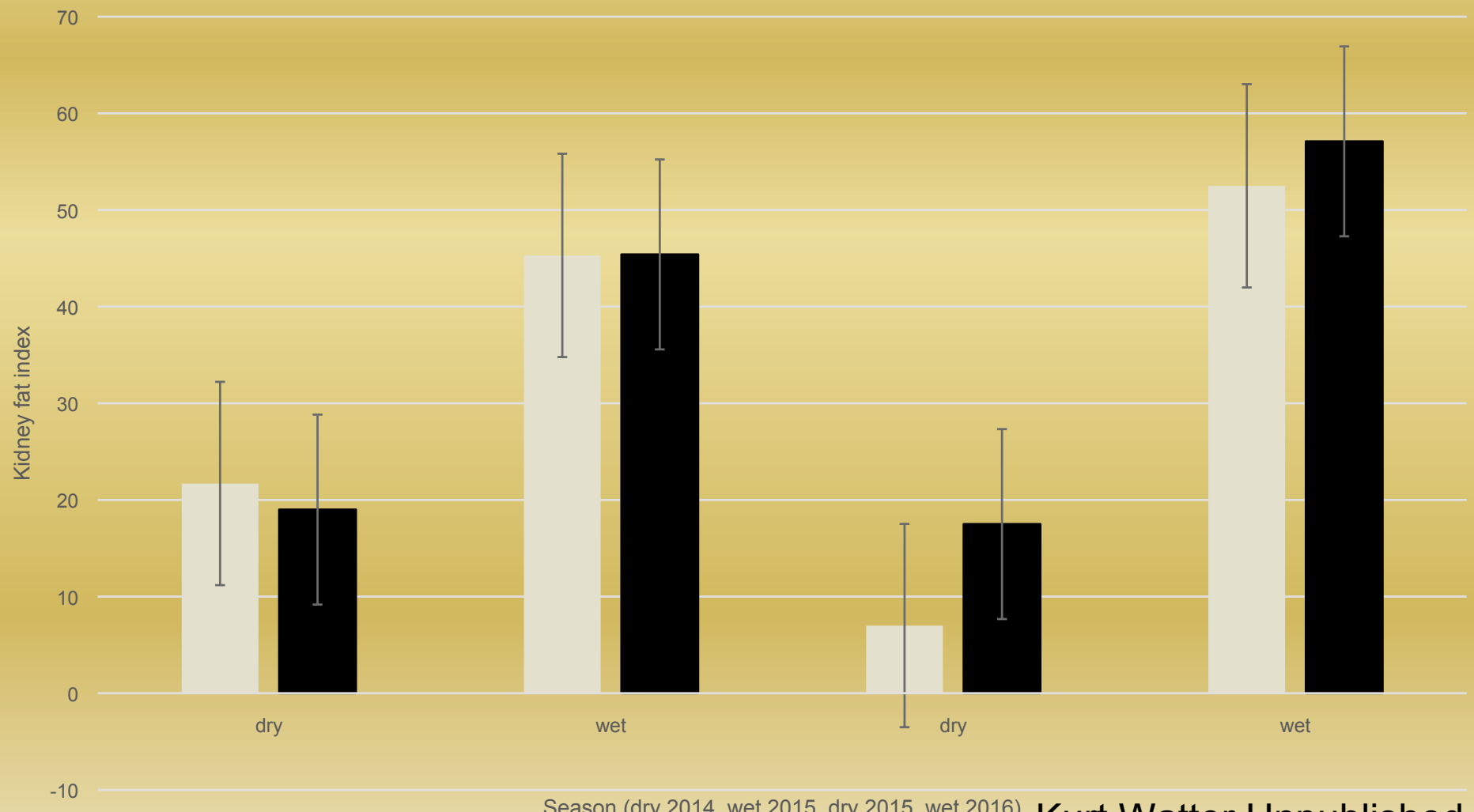
THE QLD CHITAL DEER EXPERIENCE


Queensland
Charters Towers
Cape York
Lockhart River
Coen
Gulf of Carpentaria
Cooktown
Dunbar
Port Douglas
Cairns
Coral Sea
Innisfail
Ingham
Townsville
Mt Isa
Mackay
Rockhampton
Gladstone
Bundaberg
Roma
Longreach
Blackall
Emerald
Charleville
Cunnamulla
Toowoomba
Northern Territory
South Australia
New South Wales

Rainfall in Charters Towers Region

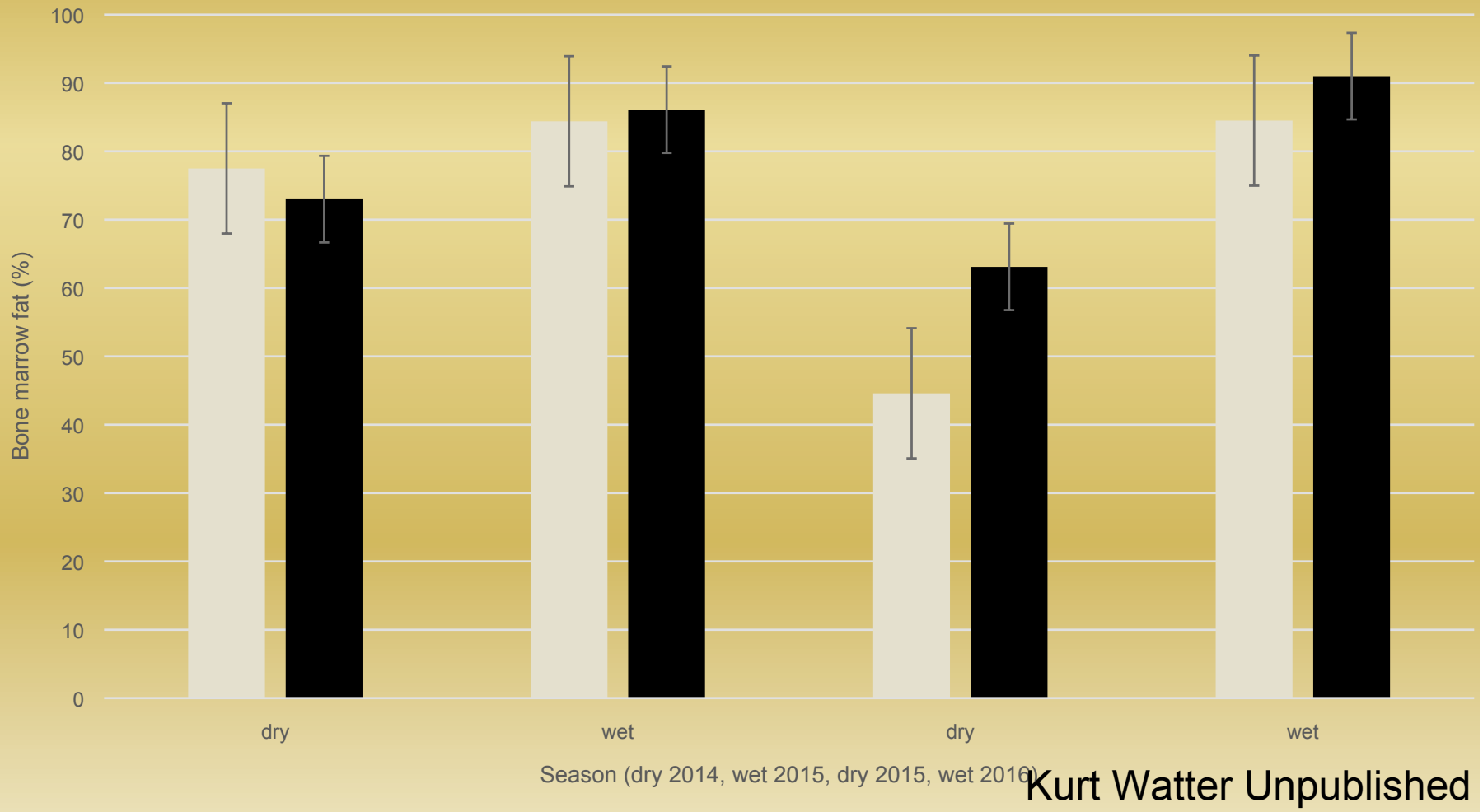


Measures of Body Condition
1. Kidney Fat Index



Kurt Watter Unpublished

Measures of Body Condition
2. Bone Marrow Fat (%)



Kurt Watter Unpublished

Deer Populations are Expanding

e.g. for Red Deer

In 1995 = 4 populations nation-wide

In 2007 = 65 populations nation-wide

Department of Sustainability, Environment, Water, Population and Communities, 2011

Deer Have Unwanted Impacts

- Browse native trees and shrubs
- Graze native grasses and forbs

Red Deer at Cressbrook

Erected exclosures to keep out different herbivores

1. Exclude all herbivores
2. Exclude deer
3. Exclude deer and macropods
4. Exclude none

No significant effect of exclosure type
Significant effects of time & place

Baxter et al unpublished data

Red Deer at Cressbrook

Estimated red deer eat 20 – 60% grass

Potential to spread weeds

Finch 2000

Red Deer at Cressbrook

Examined 2,013 trees on 49, 50 X 4 m transects
49 trees rubbed (2.4%)

Spongy barked trees (bloodwoods) highly preferred

Baxter et al unpublished data

Red Deer at Cressbrook

Examined 60 deer culled in July 2001

9/60 had any ectoparasites (15 %)

None had > 10 ticks
Half were cattle ticks (*Boophilus microplus*)
Half were paralysis ticks (*Ixodes holocyclus*)

Finch, unpublished

State	Legislation	Status
Tasmania	Nature Conservation Act (2002) Wildlife (General) Regulations 2010	Game
Victoria	Wildlife Act 1975 (game) Flora and Fauna Guarantee Act 1988 (Sambar specific)	Game (public lands) Unprotected (private lands) Sambar are a listed key threatening process
New South Wales	Game and Feral Animal Control Act 2002 Threatened Species Conservation Act 1995 Biosecurity Act 2015	Game Key threatening process
Queensland	Land Protection (Pest and Stock Route Management) Act 2002	Pest
South Australia	Natural Resource Management Act 2004 National Parks and Wildlife Act 1972	Pest
Western Australia	Biosecurity and Agriculture Management Act (2007) and Regulations (2012) Wildlife Conservation Act 1950 Wildlife Conservation Regulations 1970	Pest
Northern Territory	Territory Parks and Wildlife Conservation Act	Pest
Australian Capital Territory	Pest Plants and Animals Act 2005 Pest Plants and Animals (Pest Animals) Declaration 2005	Pest

Modelling Effects of Management

Assumptions

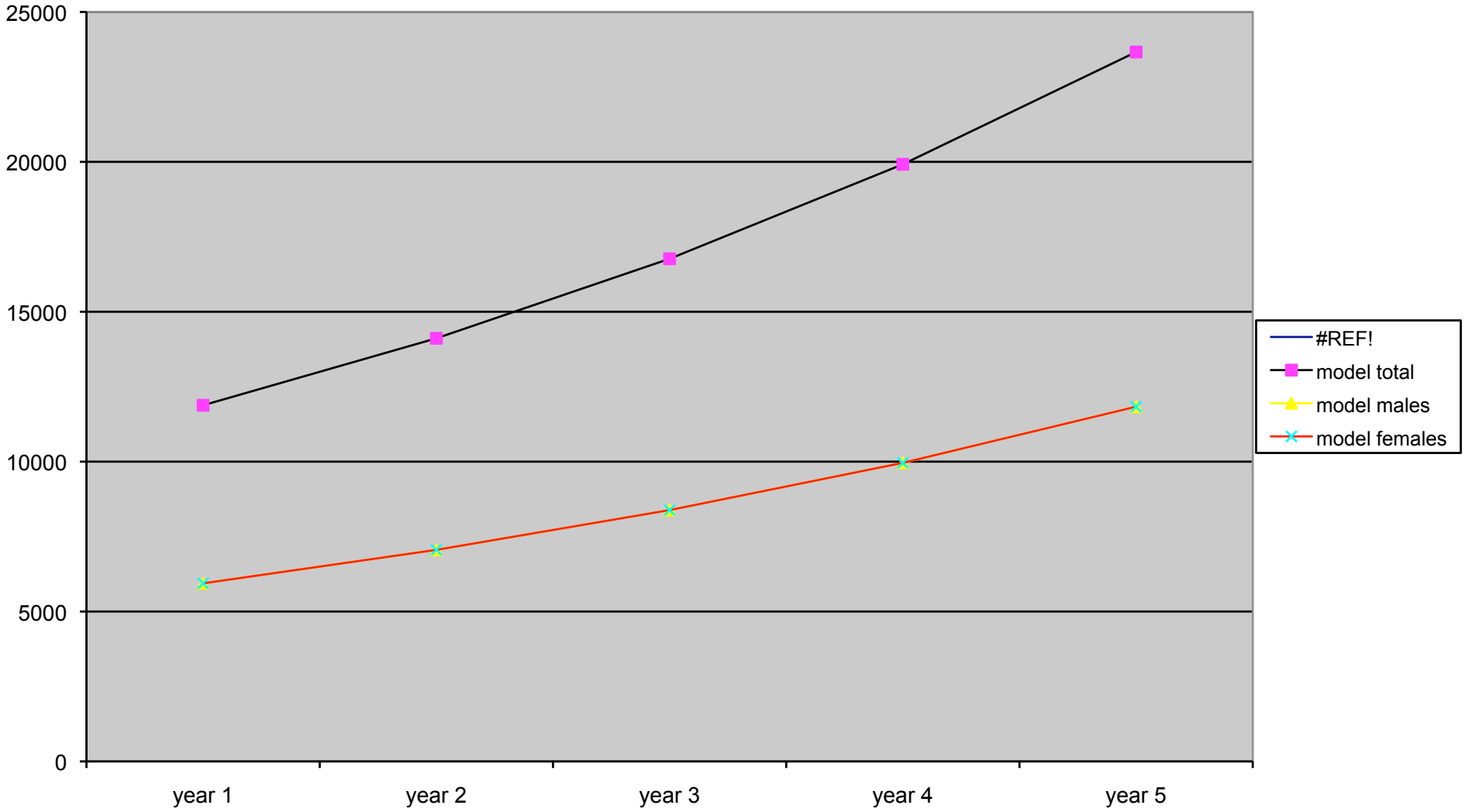
- 1:1 sex ratio
- 1 young annually / female
- Age to sexual maturity 2 yrs
- Proportion of females breeding 80%
- Life expectancy 10 yrs
- Natural mortality 10% / yr for both males and females
- Begin with 5000 males and 5000 females

Management Options

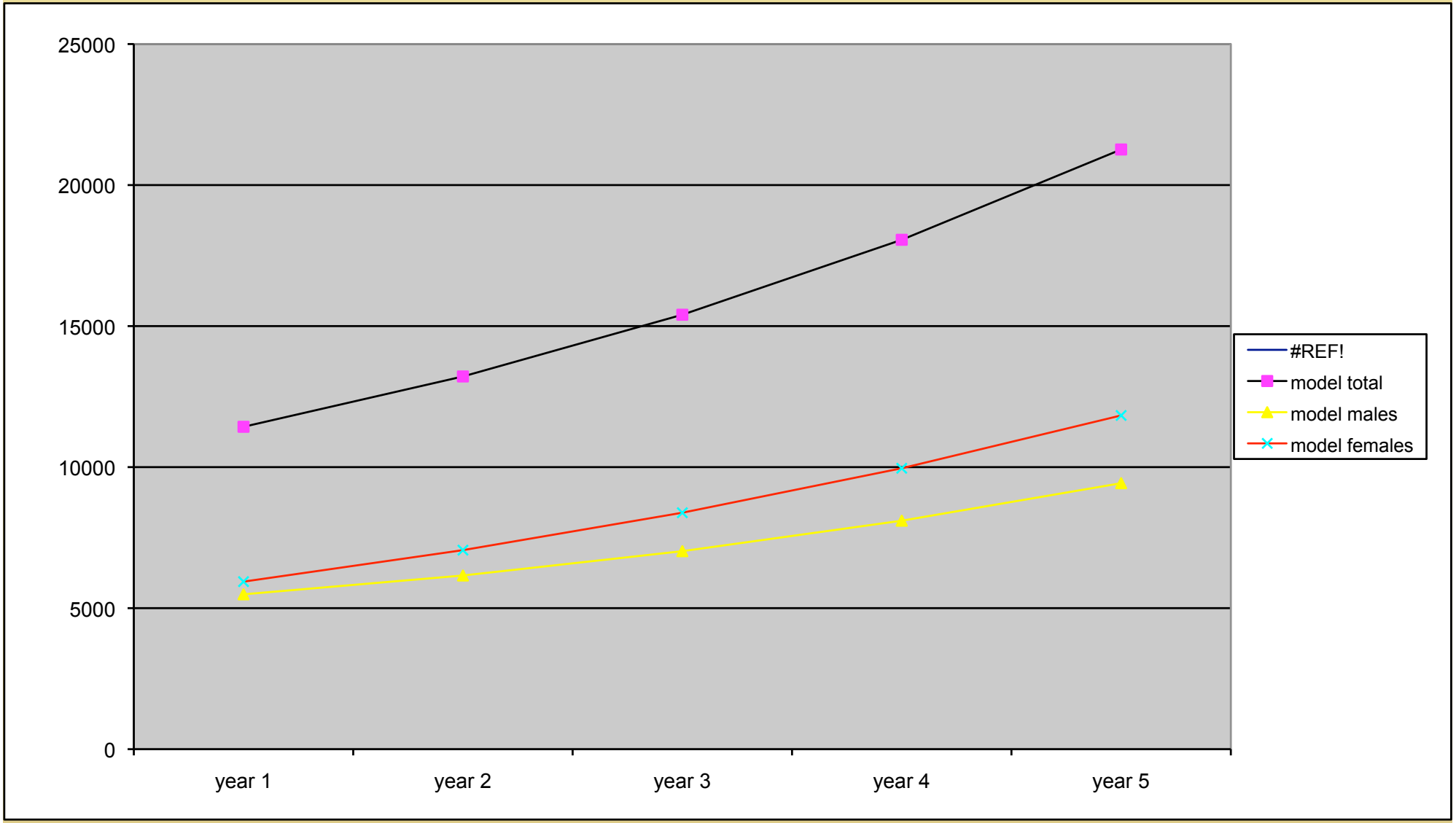
Predator management
Professional culling
Commercial harvesting
Recreational harvesting
Trapping
Contraception
Poisoning

Management by Lethal Removal

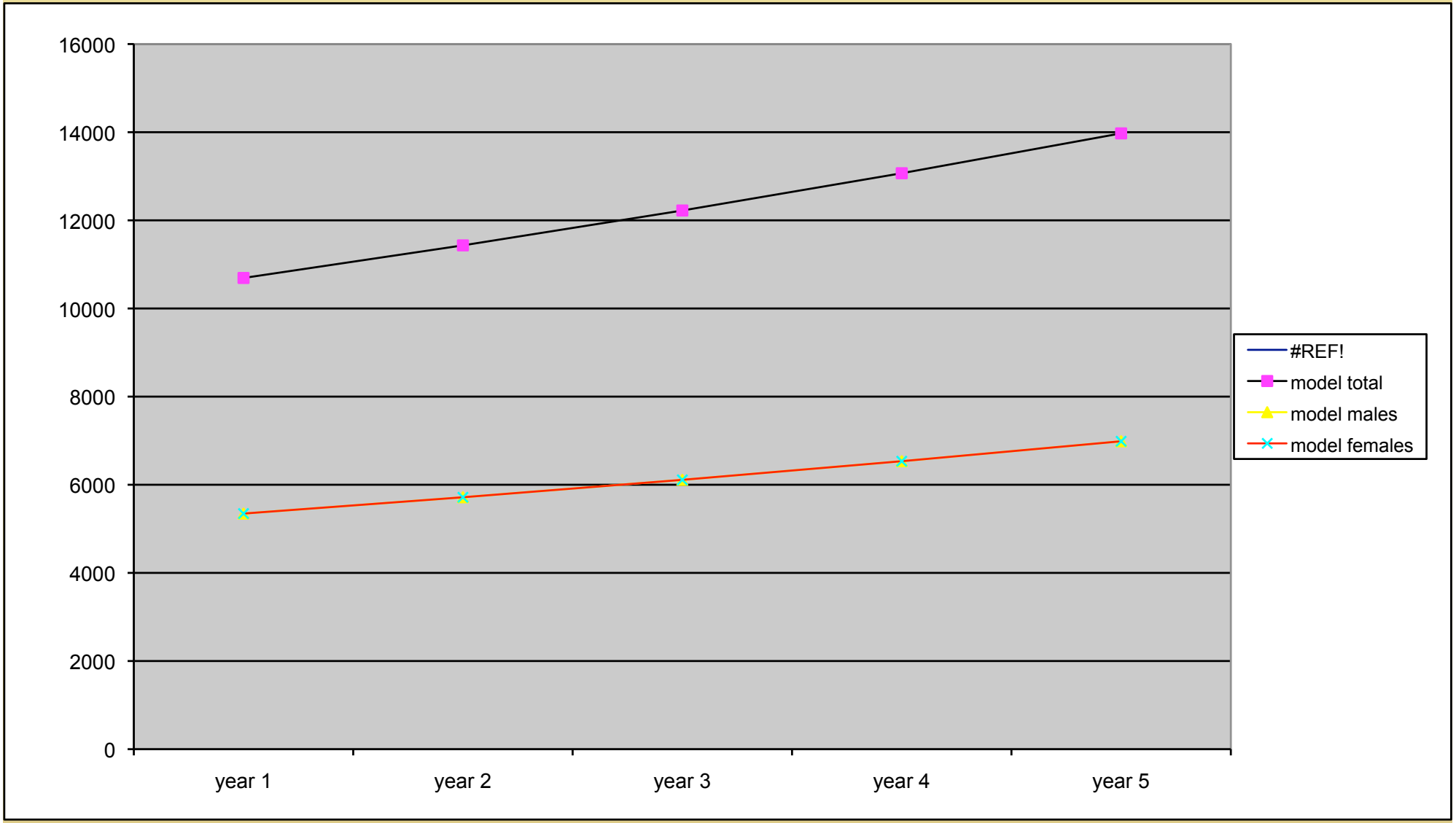
No Harvest – Natural Mortality Only



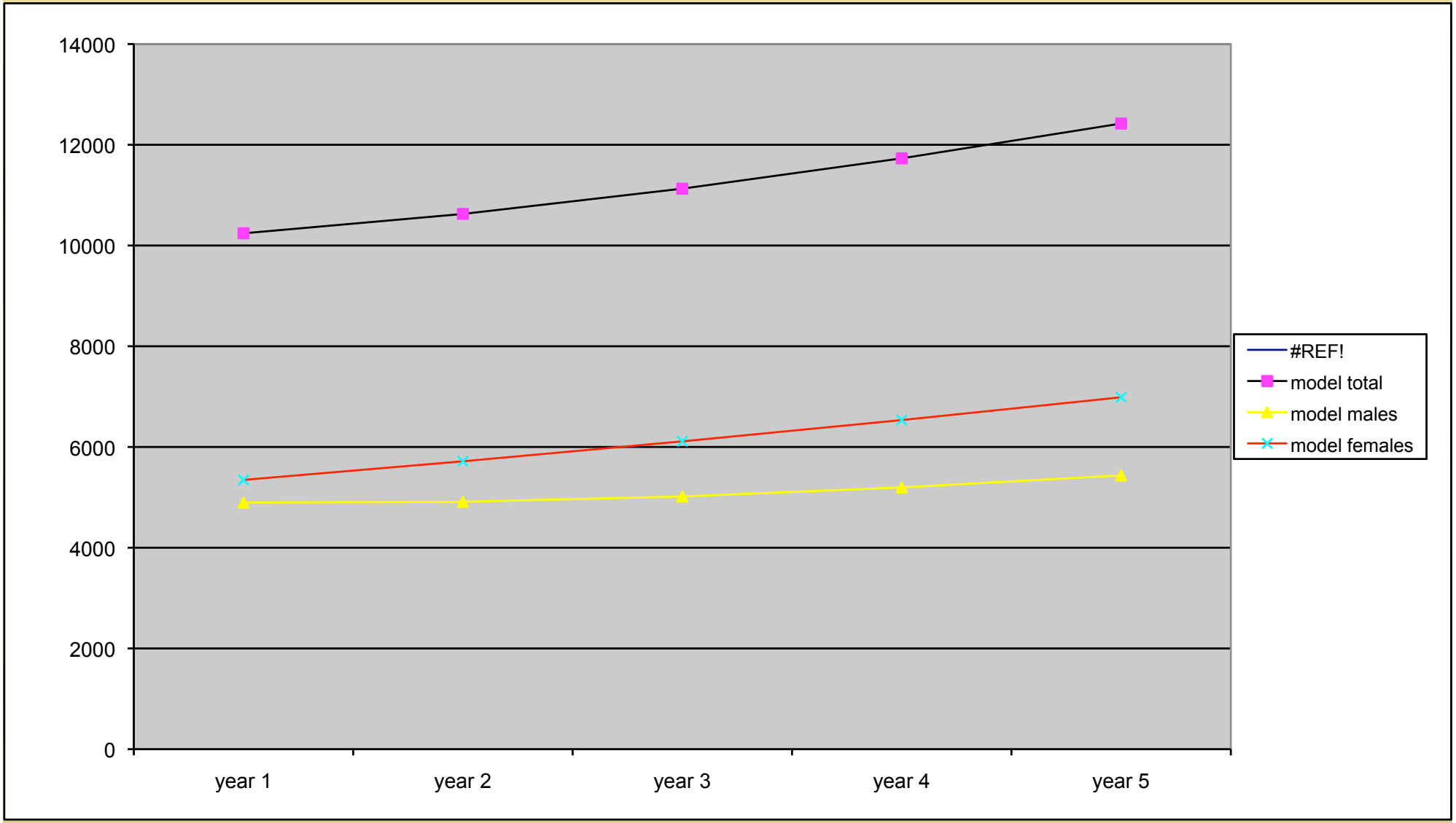
10 % Male Only Harvest



10 % Male & Female Harvest



20 % Male & 10 % Female Harvest



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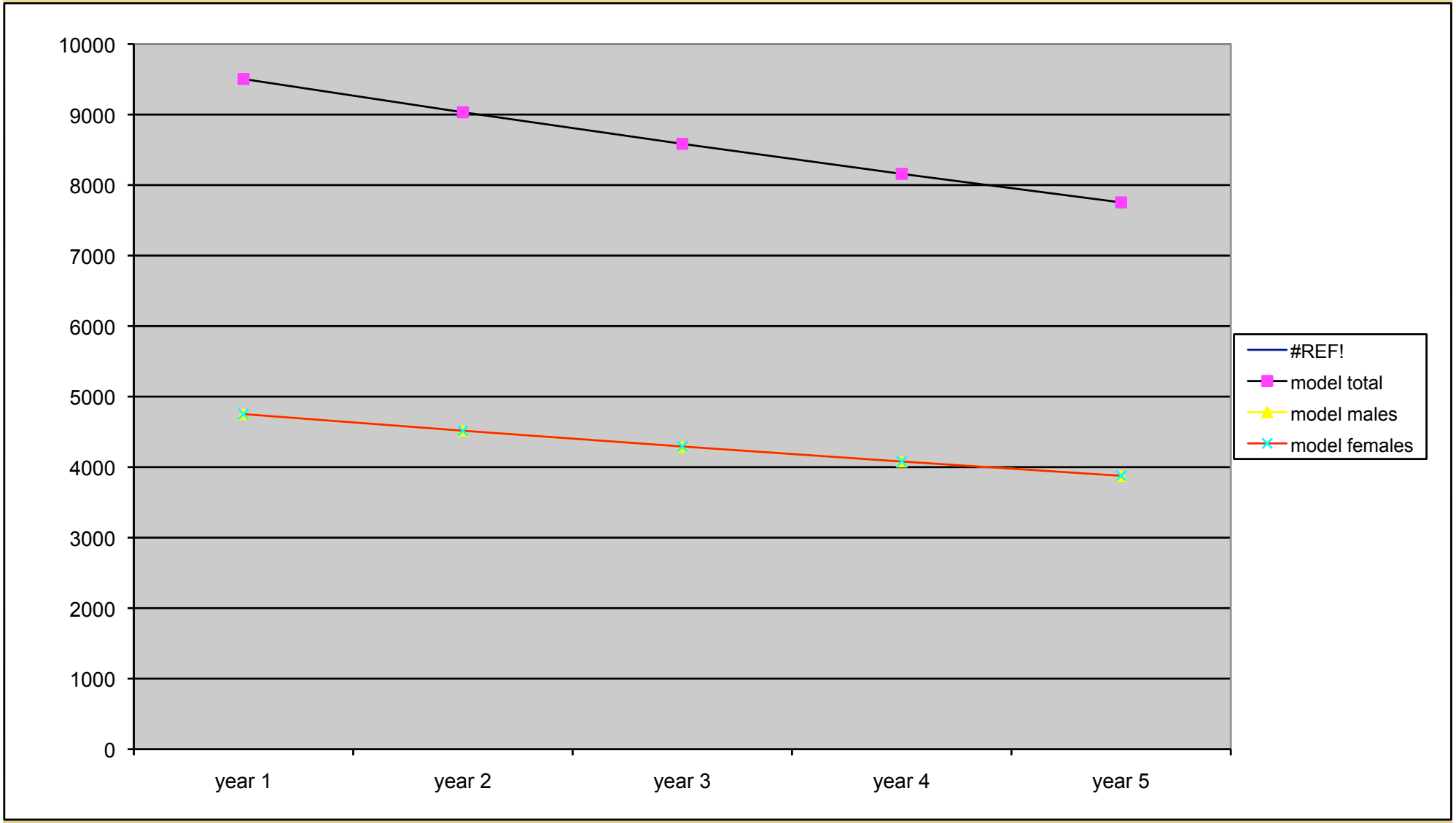
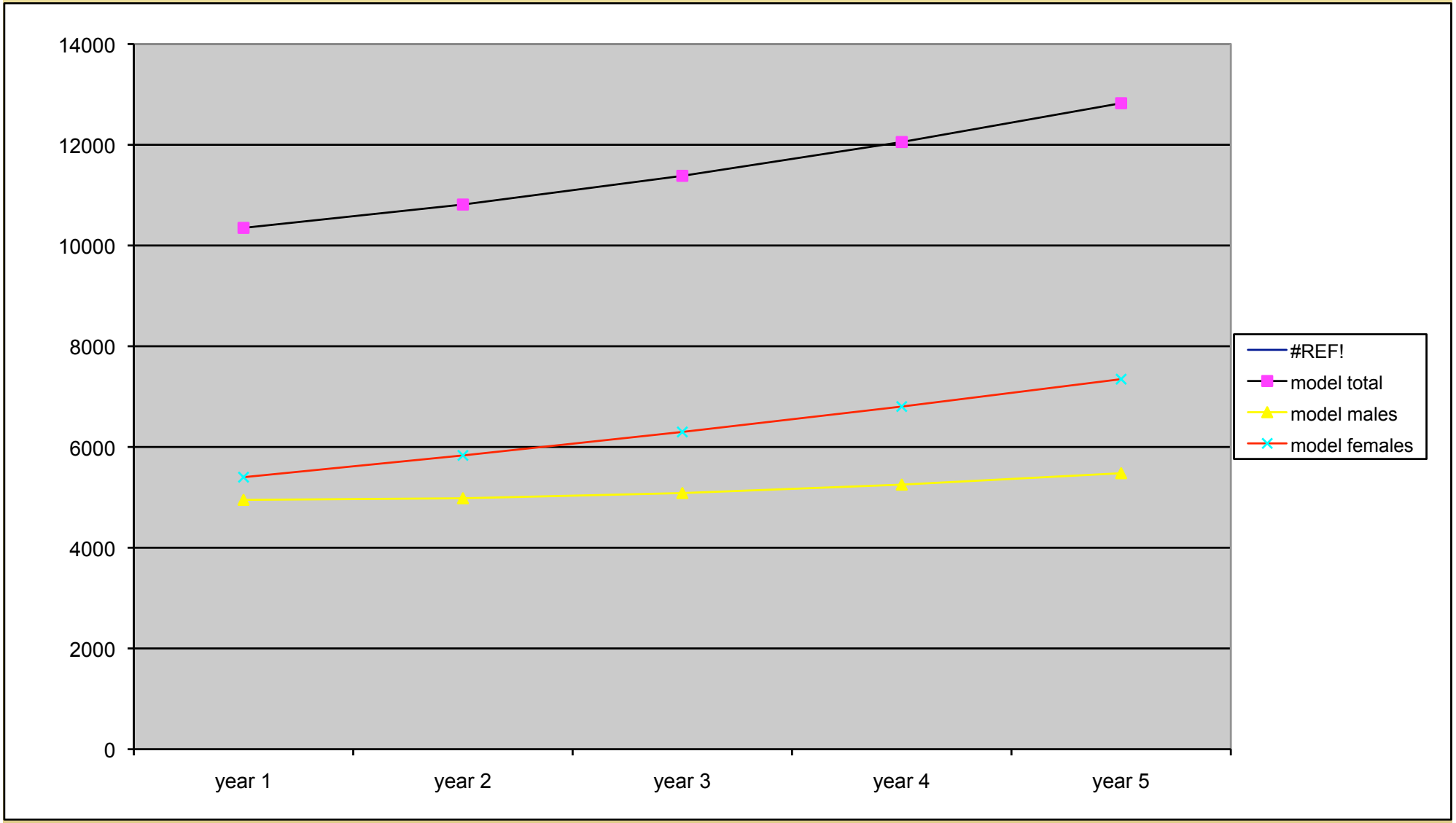
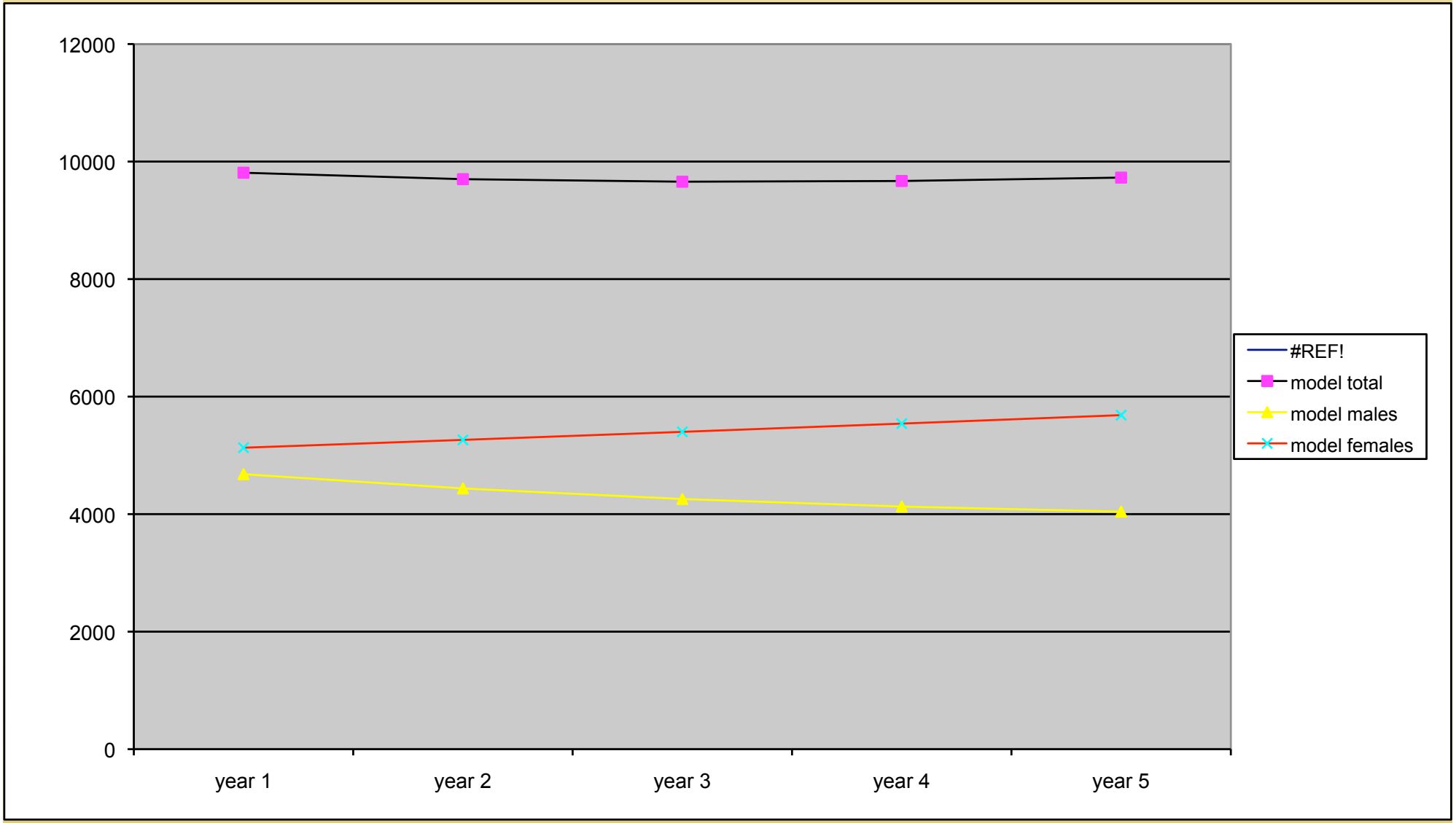


Non-lethal Fertility Control

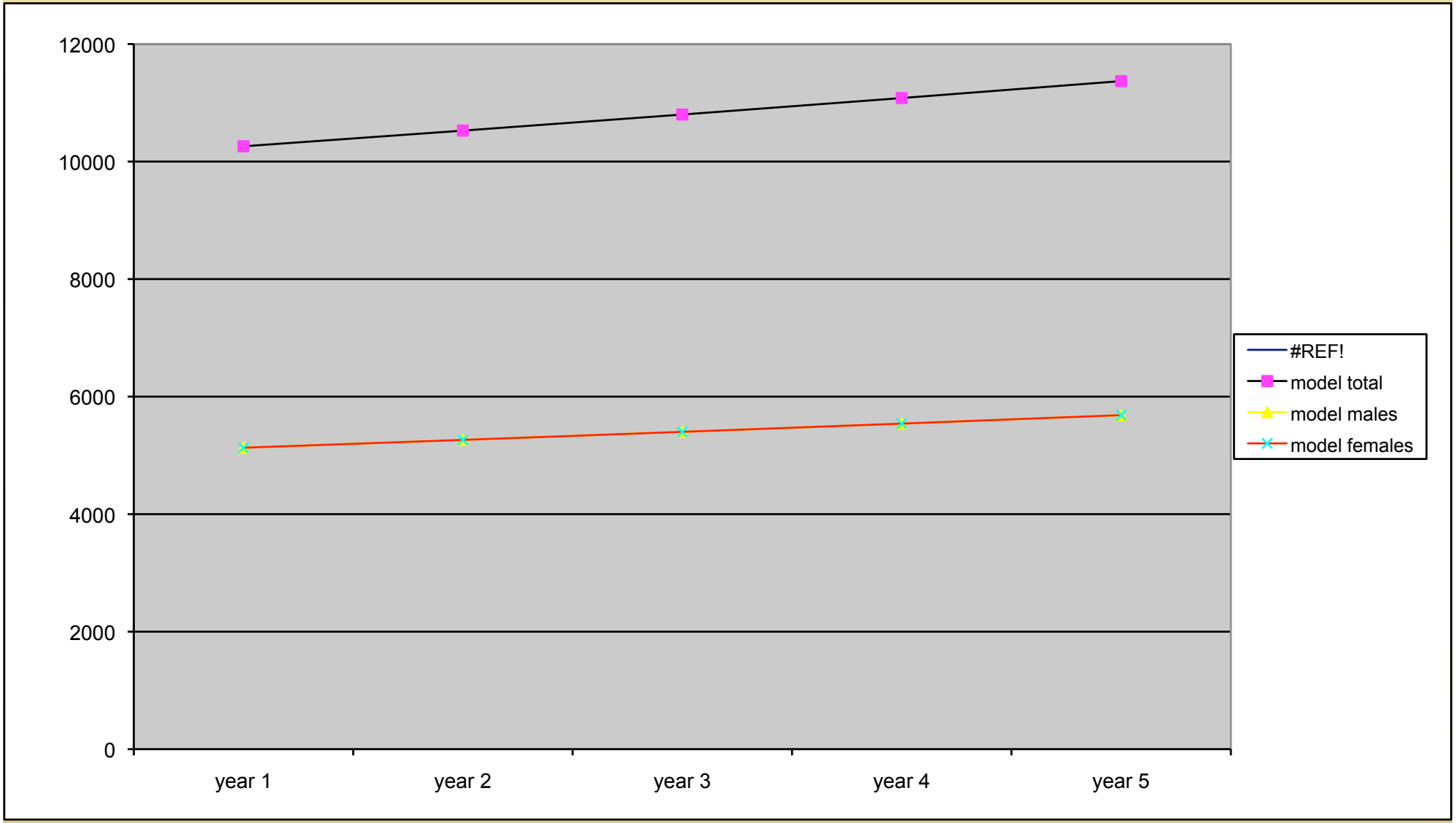
10% Male Harvest & 50 % Female Fecundity



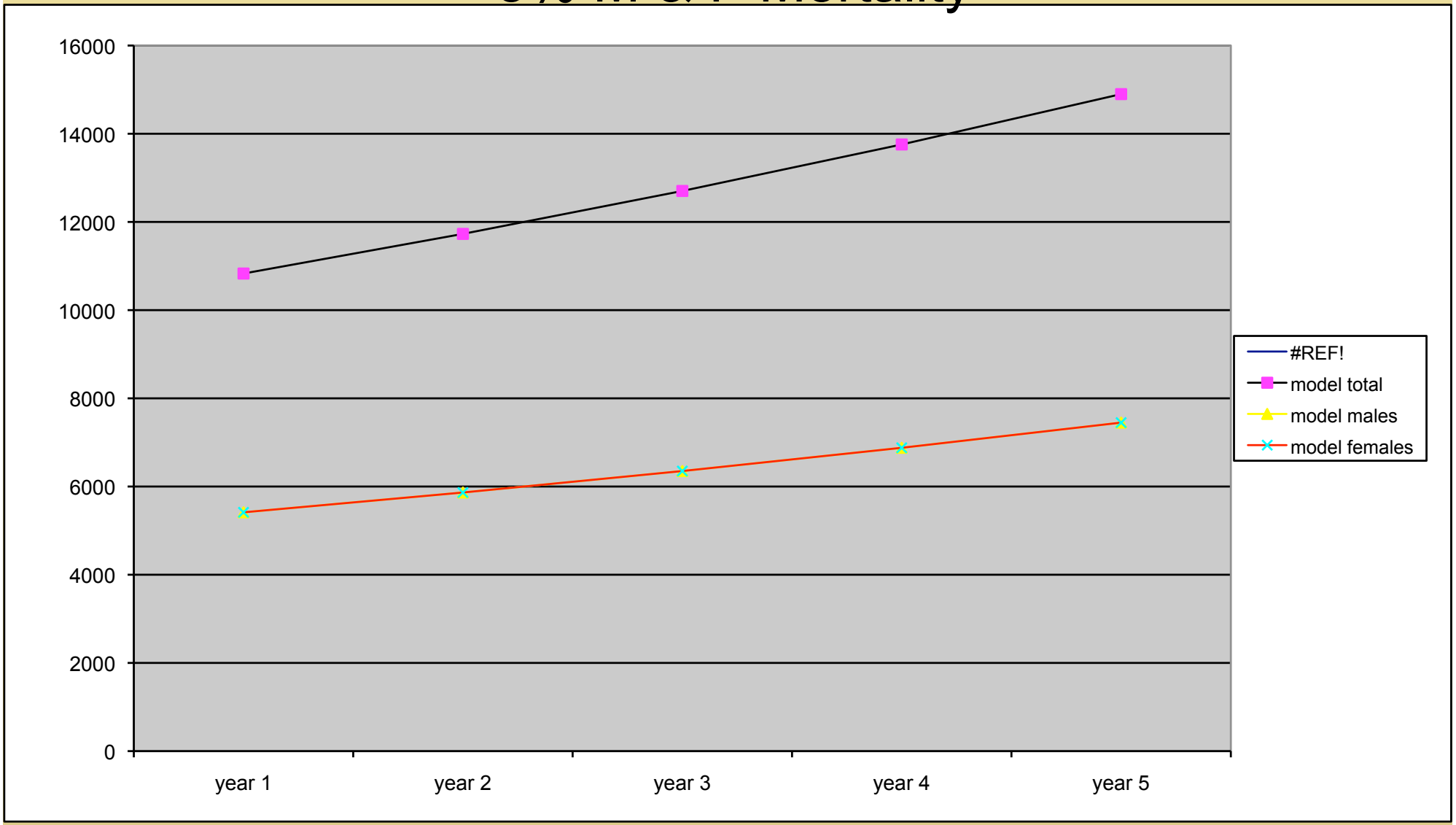
10% Male Harvest & 35 % Female Fecundity



0 % Male Harvest & 35 % Female Fecundity



0 % Male Harvest & 35 % Female Fecundity
5% M & F Mortality



Eradication ONLY possible when:

1. Pest can be killed faster than it replaces itself, **<u>at all densities</u>**
2. Immigration is zero
3. All individuals in population must be at risk
4. Pest must be able to be monitored at VERY low densities
5. Socio-economic environment must be suitable
6. Discounted benefit/cost analysis must favour control

Current Eradications

An Established Vertebrate Pest Has NEVER been eradicated from a continent

Mule deer (*Odocoileus hemionus*) Have been eradicated from Santa Rosa, Californian Channel Islands USA by shooting

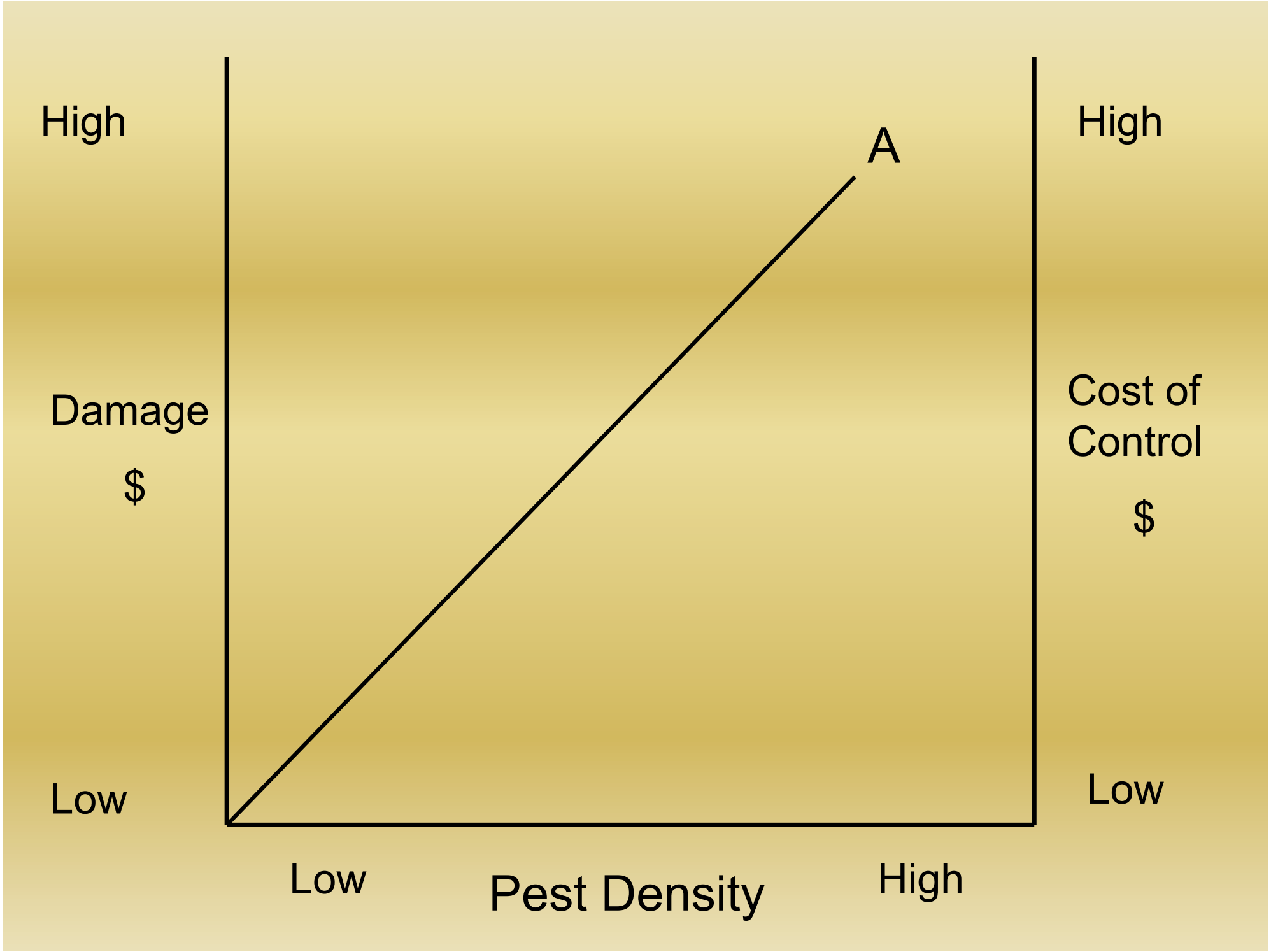
Enhancements to Shooting

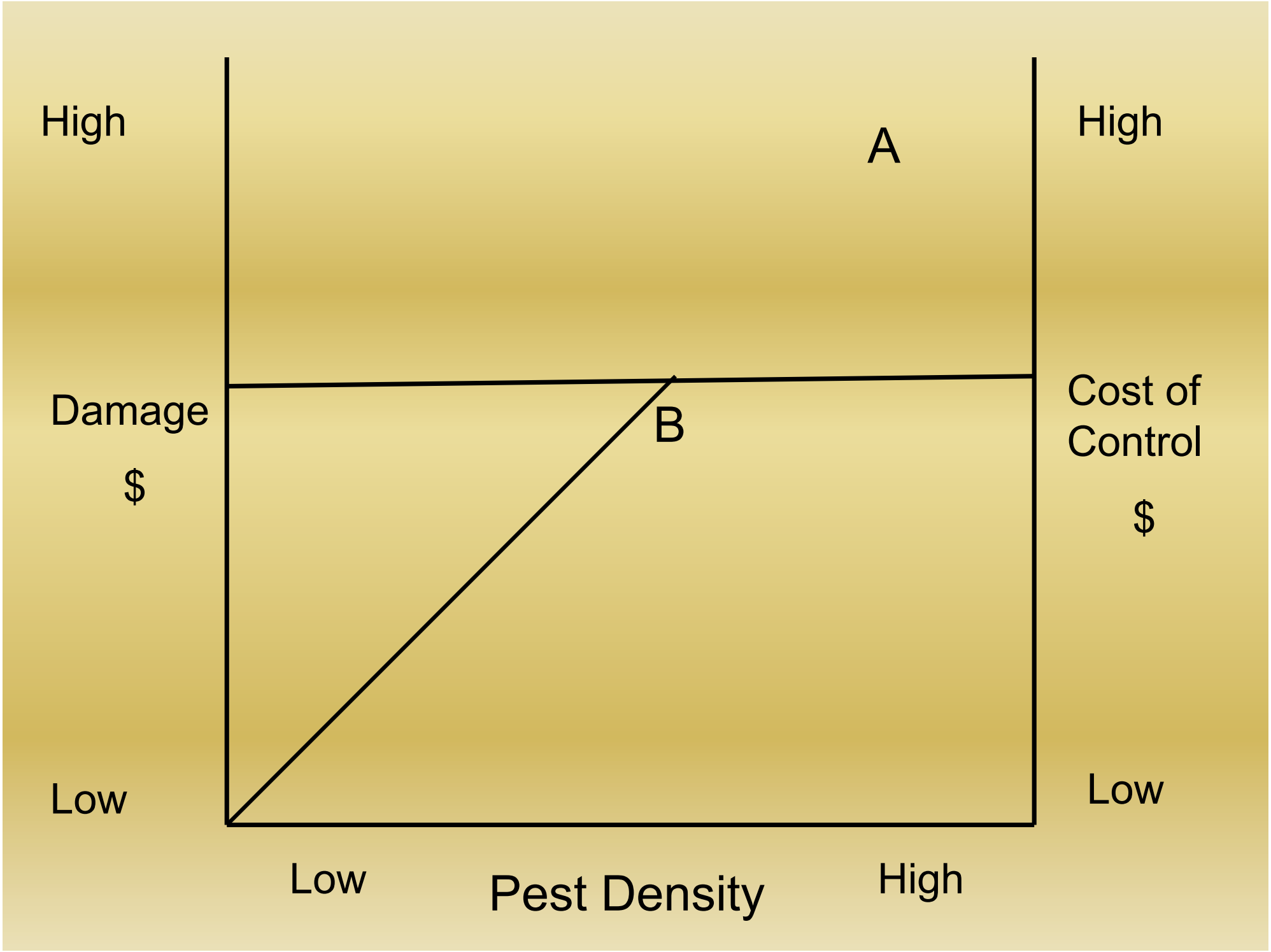
- Platform (e.g. helicopter)
- Retaining naivety
- Detection (e.g. cameras or dogs)
- Judas animal technology
- Mata Hari Animal technology

Control

- One off
- Sustained
- Sporadic
- Commercial Harvest
- Managed as Game Species

Choice Largely Depends on Relationship Between Pest Density & Damage


High
A
High
Damage
$
Cost of
Control
$
Low
Low
Low
Pest Density
High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A
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B
Cost of
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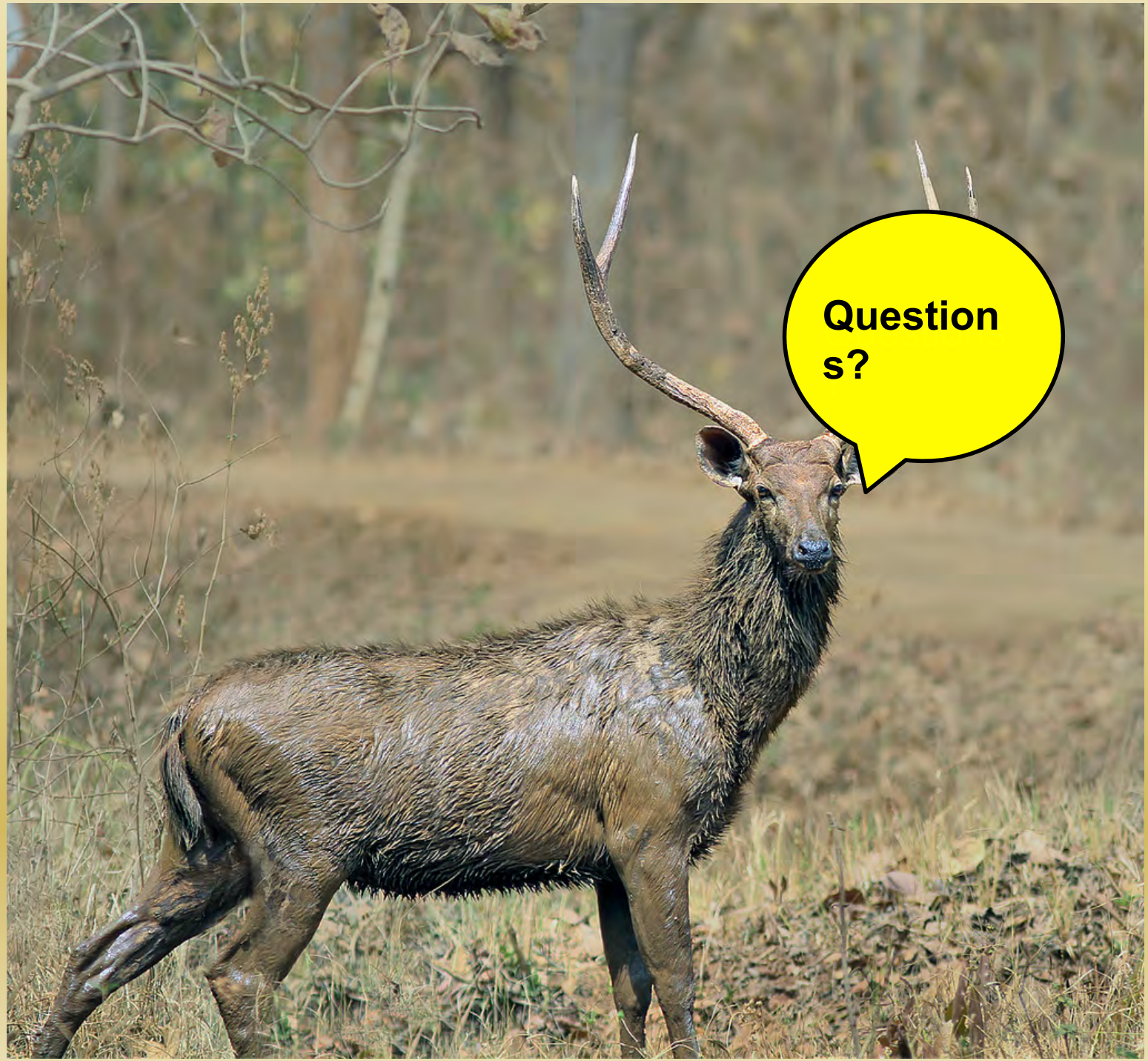
Questions?

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