Feasibility of the management of the *Peroryctidae* family in Papua New Guinea

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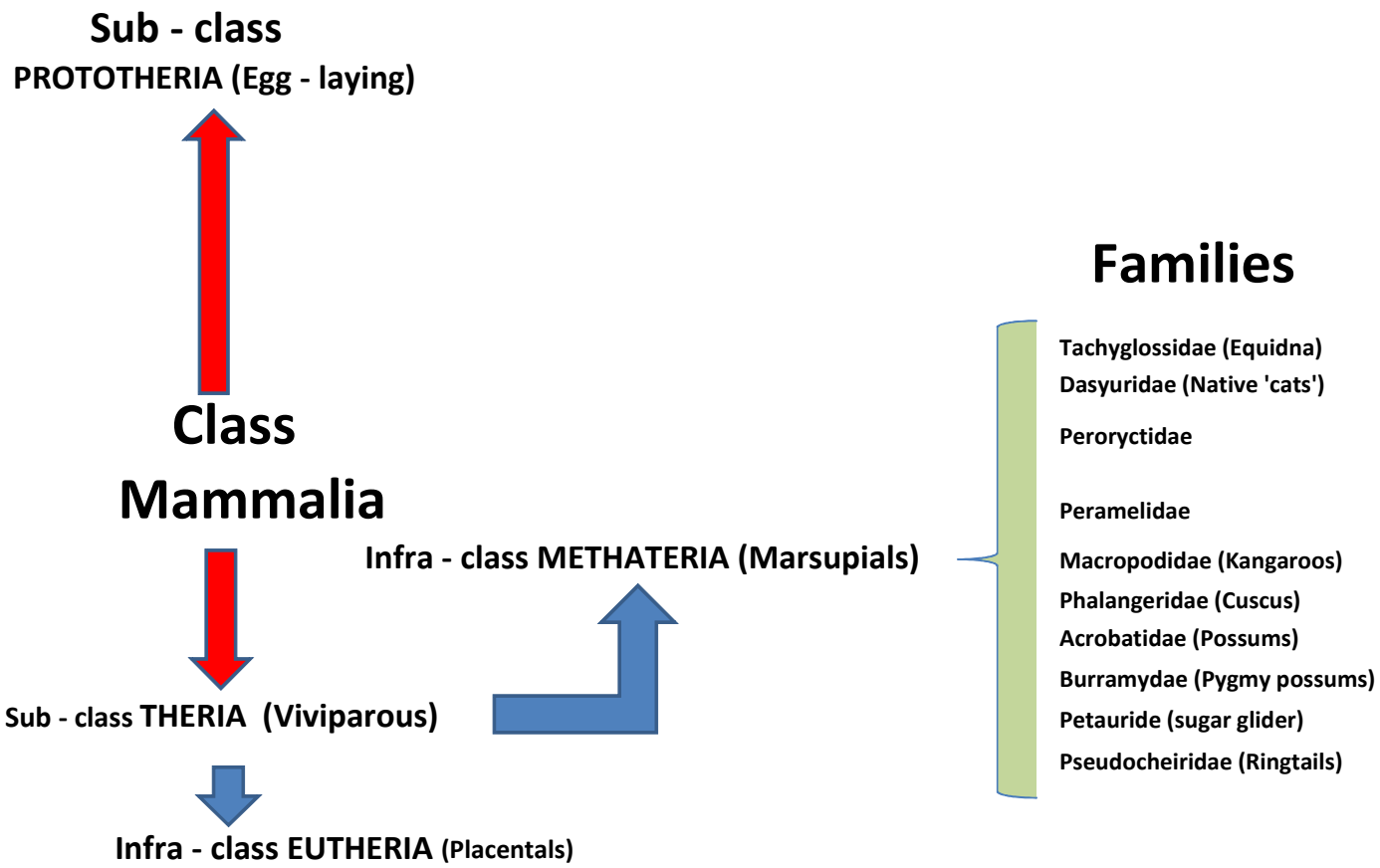
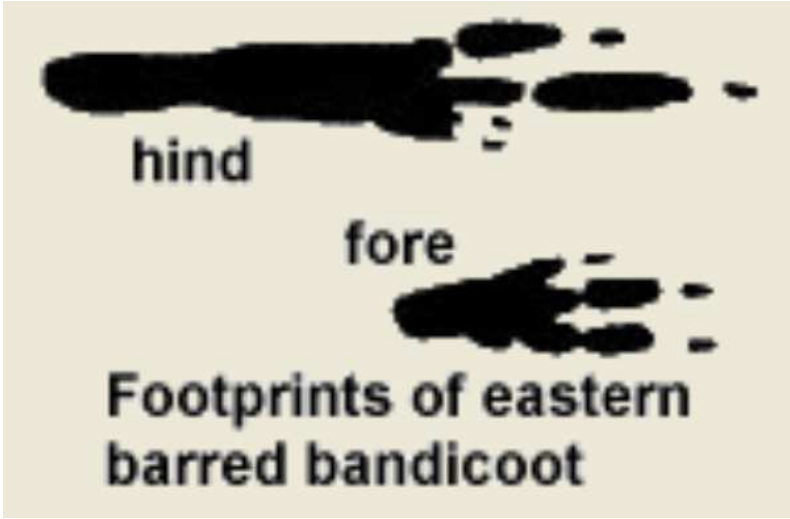
What are they

Class Mammalia
Order Peramelemorphia
Family Peramelidae and Peroryctidae
Sub fossorial marsupials
Different sizes
Omnivorous
Prolific
Many endangered
At least one sp. In most habitats

Grouping of New Guinea Marsupial Families and their relationship to other mammals





Echymipera kalubu

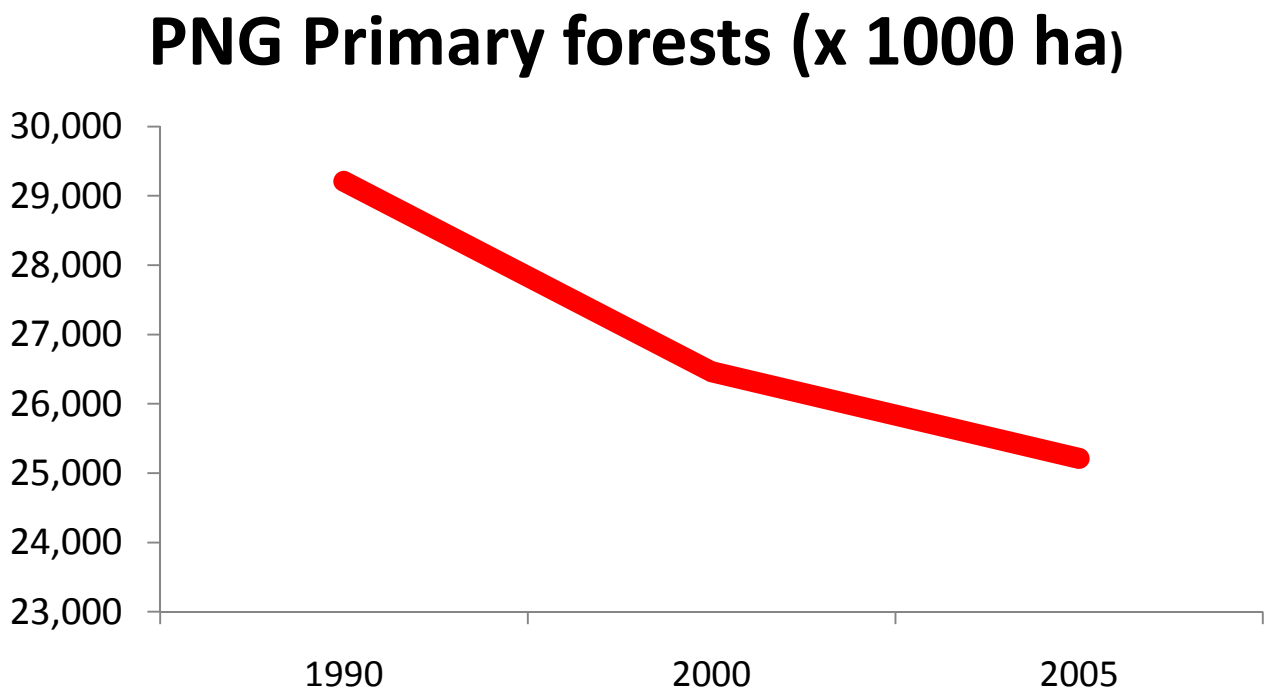
Specie	Status	Adult male Average weight (gr)	Altitudinal range (masl)	Local names
Family Peroryctidae				
Echymipera clara	vulnerable	1140-1700	300 - 1700	Kiyok (Sandaun Pr.) Meya (Madang Pr.)
Echymipera echinista	unknown	1000	40 - 80	Wek / Mahai sobo (Western Pr.)
Echymipera kalubu	secure	840-1500	0 - 2000	Aiyal / Mowyaw(Sandaun Pr.) Gesia / Hou (Chimbu Pr.)
Echymipera rufescens	secure	……	0 - 1200	Pe gesia / Hou (Chimbu Pr), Aiyal (Sandaun Pr.)
Microperoryctes longicauda	secure	350-660	1000 - 3950	Asege / Koiyo gesia (Chimbu Pr.) Bonabe (Chimbu Pr.) Warem (Sandaun Pr.) Pularvee (Cental Pr.) Kumbu (Irian Jaya)
Microperoryctes murina	unknown	…….	1900 - 2500	None known
Microperoryctes papuensis	unknown	150-184	1200 - 2650	None known
Peroryctes broadbenti	unknown	up to 4800	0 - unknown upper limit	None known
Peroryctes raffrayana	secure	865	60 - 3900	Koiyo (Central Pr.) Duwin (Sandaun Pr.) Ibin (Sandaun Pr.) Wablo (Irian Jaya)
Family Peramelidae				
Isoodon macrourus	secure	……	0 - 1200	None known in PNG Austr: Northern Brown Bandicoot

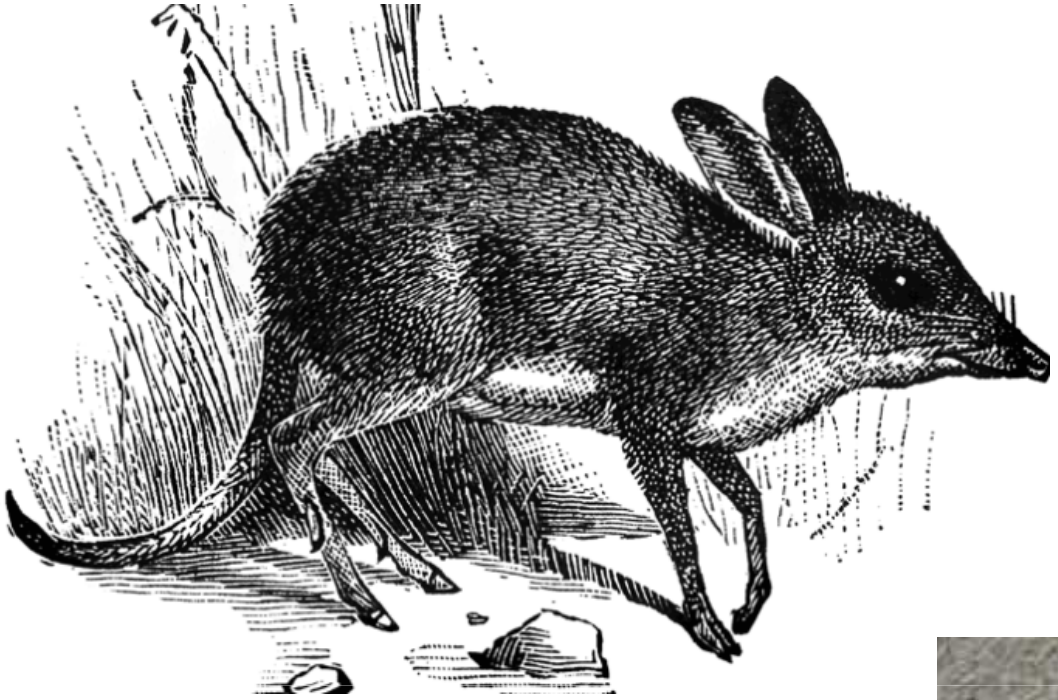
Source: Flannery (1995)

Where are they

- Echymipera clara
- Echymipera echinista
- Echymipera kalubu
- Echymipera rufescens
- Microperoryctes longicauda
- Microperoryctes papuensis
- Peroryctes broadbenti
- Peroryctes raffrayana
- Isoodon macrourus

Threats


PNG Primary forests (x 1000 ha)
30,000
29,000
28,000
27,000
26,000
25,000
24,000
23,000
1990
2000
2005

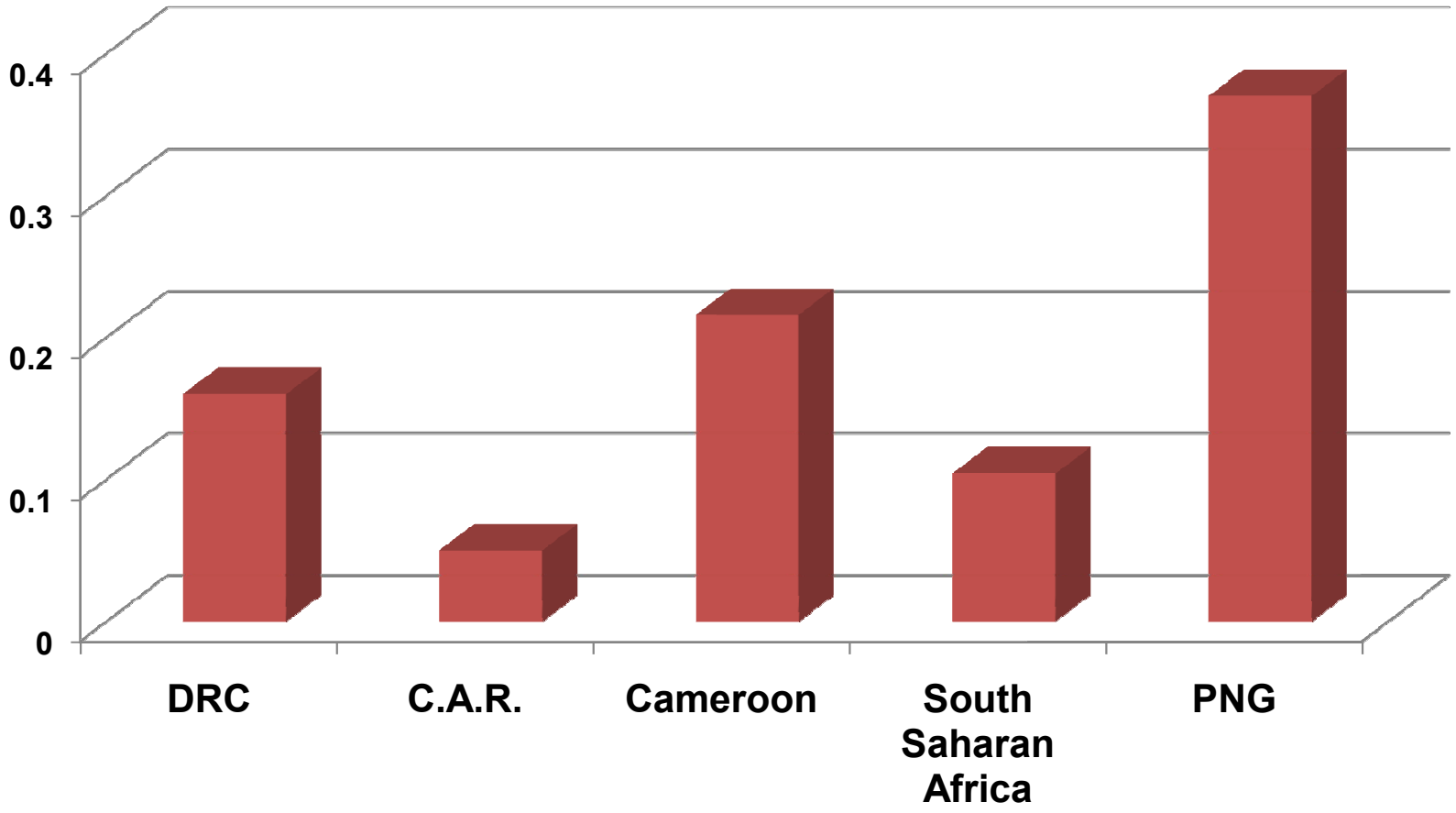


Chaeropus echaudatus

Bush meat trade

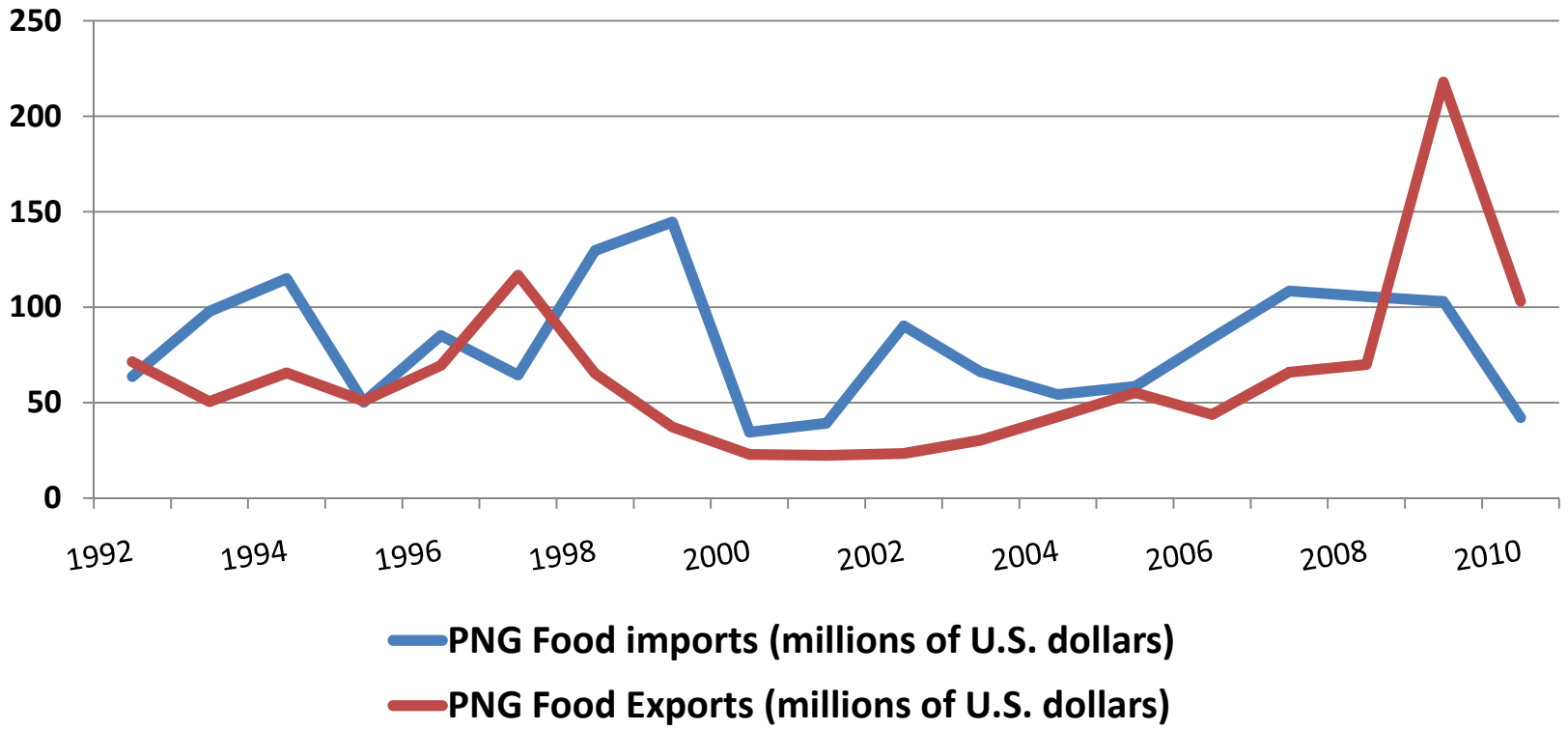
- Gabon: US$25 million/year
- West and Central Africa: $42 - $205 million/year.
- Amazon basin: $175 million/year.
- In at least 62 countries: Hunting provides 20%-80% of overall protein intake of rural households in Central Africa.
- Overall international trade: **US$3.9 billion**.

Average daily wild meat consumption (kg/day)



Meat imports Substitution ?

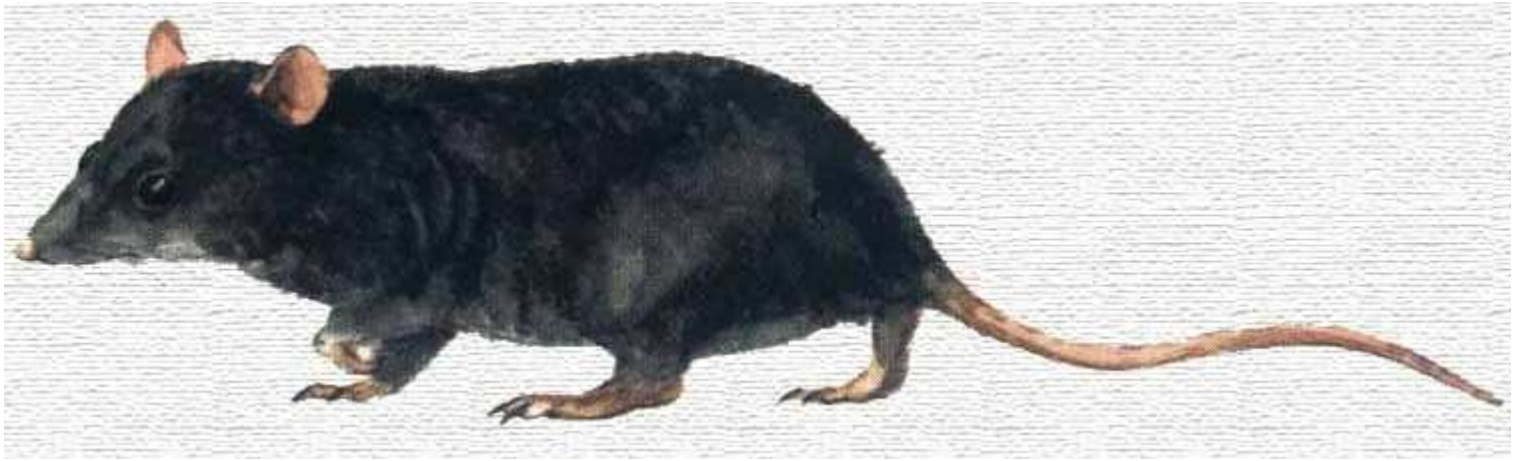
* 1998: 41,800 tons of red meat imported (K130 million)



Source: FTD WebMaster, Foreign Trade Division, U.S. Census Bureau, Washington, D.C. 20233

Peroryctes raffrayana

Microperoryctes



Echymipera rufescens

Isoodon macrourus

Isoodon macrourus

A comparison

Variable	*Bandicoots*	Domestic rabbits
Habitat	Widespread in New Guinea,	ntroduced to Irian Jaya 50 years ag
	maximum diversity in mid-montane rainforest	
Mating	year round	year round
Adult size range	l (Microperoryctes murina) - 5kg (Peroryctes broadben	4-5 kg
Average litter size	2.3	in PNG: 3.8-5.9 (surviving: 1.3-4.0)
Gestation period	12.5 - 15 days	28-31 days
Litters/year	3 to 4	3 to 4
Life expectancy	up to 2.5 years (wild)	5-15 years
	up to 3 years (captivity)	
Diet	insects, leaves, fruits, roots, fungi	fodder, concentrates, vitamins
Diseases	Toxoplasmosis	lmonella, Coccidiosis, Myxomatos
Threats	Bush burning, overhunting,	High temperatures in lowlands,
	dogs, rats, snakes	lack of concentrates
		lack of wire for cages
		cold, theft, rats, snakes
Secondary benefits	Improvement of soil properties by burrowing	Skins, manure
	and debris traslocation	

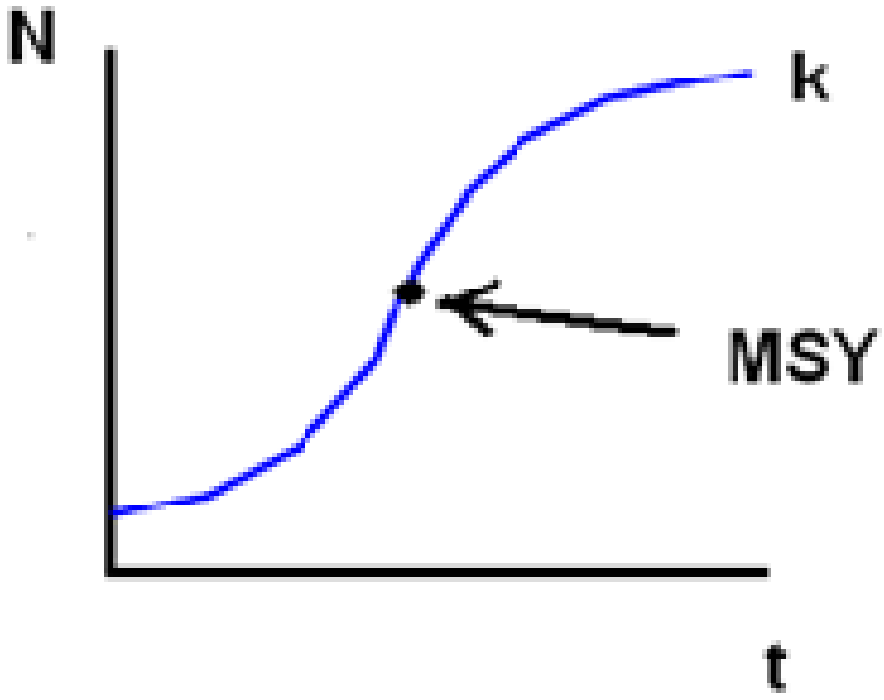
How many are there

N = (M + 1)(C + 1) / (R + 1) – 1

Where

- N = Estimate of total population size
- M = Total number of animals captured and marked on the first visit
- C = Total number of animals captured on the second visit
- R = Number of animals captured on the first visit that were then recaptured on the second visit

How many can we “Harvest”



The Logistic Equation

$$\Delta N / \Delta t = rN (K - N) / K - H$$

ΔN = change in number

Δt = change in time

r = rate of population increase

N = number of individuals in a population

K = Maximum number of individuals the environment can sustain (carrying capacity)

H = Number of individuals being removed from the population (harvesting rate) continuously

A trial

- Spotlight and search for signs to confirm presence/absence, scale of movement and nesting activity.
- Check daily eight baited traps at 50x50m. Carry four trapping sessions (of five nights each) during dry and rainy seasons. Trapped animals will be identified, ear-punched (or toe clipped), sexed, weighed, measured and released.
- Trappings will determine the size of the population at Markham valley through the *Petersen Lincoln Index.*
- Breeding trial at Rainforest Habitat –Unitech during 2011.
- Number of animals, increases on weight and Indexes of Habitat Structure will be compared with one factor ANOVAs and Kruskal-Wallis test.

Recommendations

Policy & Administration

- Pursue cooperative arrangements with conservation bodies.
- Review/reactivate existing Wildlife Management Areas. Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.
- Integrate wildlife management in (mandatory) forest management and Carbon Trade plans; including conservation education, an agreed system of law enforcement, and an intensive monitoring program.

Research

- Assess population sizes, distribution, ecological requirements and the relative impacts of threatening processes.
- Identify populations of high conservation priority.
- Collect data on bush meat and animal products at LLG, provincial and national levels to better understand its role in the country's economy, food security and local livelihoods.

Traditional practices

- Restrict Slash and burn practices to agricultural fallowing.
- Persuade landowners on the risks of bush burning as a hunting practice.
- Regulate minimum sizes and sex of prey
- Restrict the number of domestic dogs and cats to the minimum necessary.

End

Or the beginning with their
Re-introduction….