Small Mammals

(Bandicoots, Native Rodents and Small Carnivorous Marsupials)

Species Information Sheet

Natural History / Behaviour

- Bandicoots, antechinus and phascogales are marsupials – always check females for pouch young
- Rodents are placental mammals and give birth to developed young (they do not have a pouch)
- Most species are nocturnal and terrestrial although antechinus and phascogales are arboreal
- All species have strong home ranges – essential to obtain accurate details of rescue location
- Most species are solitary
- Rodents - very difficult to distinguish between native and non-native/feral species (particularly when young) – refer to Identification Key for assistance

Common Species of South-east Queensland

(*) Non-native species. Weights are average only and are for sub-adult to adult animals.

Rodents		
Fawn-footed Melomys	*Melomys cervinipes*	45g - 120g
Grassland Melomys	*Melomys burtoni*	30g - 100g
Bush Rat	*Rattus fuscipes*	40g - 2.25kg
Swamp Rat	*Rattus lutreolus*	50g - 200g
Pale Field Rat	*Rattus tunneyi*	45g - 165g
Ship Rat or Black Rat *	*Rattus rattus*	95g - 340g
Sewer Rat or Brown Rat *	*Rattus norvegicus*	200g - 400g
House Mouse *	*Mus musculus*	15g - 30g
Marsupials		
Brush-tailed Phascogale	*Phascogale tapoatafa*	100g - 250g
Yellow-footed Antechinus	*Antechinus flavipes*	25g - 75g
Brown Antechinus	*Antechinus stuartii*	20g - 70g
Buff-footed Antechinus	*Antechinus mysticus*	20g - 45g
Northern Brown Bandicoot	*Isoodon macrourus*	800g - 3kg
Long-nosed Bandicoot	*Perameles nasuta*	500g - 1.5kg

For a more comprehensive list of local mammal species refer to a field guide such as *Field Companion to The Mammals of Australia* by Van Dyck et al.

Basic Rescue Equipment and Emergency Housing

Adults / Sub-Adults

- **Bandicoots**: Small carry basket (top-opening) with secure lid lined with soft towels (do not use a wire cage);
- **Rodents**: Plastic terrarium or smooth sided plastic tub with ventilated, well-secured lid lined with a soft towel
- Towels to cover carrier
- Cotton pillowcase or large pouch with tie (place animal into pillowcase before placing into carrier)
- Leather gloves or small towel for handling/capture

Orphaned Joeys

- Warm outer pouch (feather pouch, thick wool or cotton pouch)
- Inner pouches (liners) x 3 (lined within themselves)
- Plastic terrarium lined with soft cotton baby blanket
- Heat source: Hot water bottle, instant heat packs, Snugglesafe, electric heat pad or ICU
- Probe thermometer to monitor ambient pouch temperature

Note: Bandicoots must be housed in such a way as to not damage their nose which is very sensitive and is used to detect food.

OHS Considerations / Zoonoses

Beware of

- Teeth
- Hind legs (bandicoots)

Known Zoonotic Diseases

- **Rats**: Leptospirosis
- **Bandicoots**: Are natural hosts for ticks (*Ixodes spp*. and *Haemaphysalis spp*.)

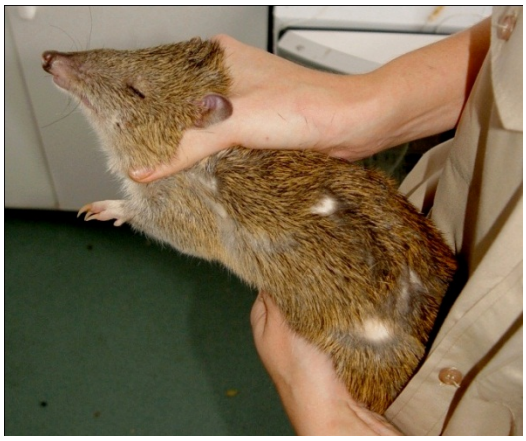
Handling

Adult Bandicoots

Grip around the back of the head/skull and hold the hind legs with your other hand. Use towel to protect from being bitten or scratched.

Note:- Do not restrain by their tail; it is very fragile and easily degloved.

Make a 'V' with your fingers around the head and shoulders and hold the hind legs with your other hand.



Adult Rodents

Use the 'V' technique above.
Use a cotton pouch or small pillowcase if you are not confident as they can be difficult to restrain and exceptionally quick to bite.

Photo: AZWH

Photos above and below: CWS

Orphans

Hold in the palm of your hand with your other hand securing to prevent them falling or jumping.

Photo above: Karen Scott

Assessment Checklist – Bandicoots & Small Mammals

Clinical Signs	Healthy / Normal	Sick / Injured
Demeanour	• Bright, alert and looking around • Responsive (struggles strongly when handled) • Responsive to stimuli (e.g. noises) • Conscious • Vocalises aggressively • Tries to bite, scratch and kick • Tries to flee	• Quiet / depressed • Distressed • Reduced response when handled • Not responding to stimuli • Unconscious • Teeth grinding • Crying (orphans) *(Indicative of shock, dehydration, injury)*
Mobility / Limbs	• Able to move all limbs • No bruising or swelling • No obvious abnormalities or lack of symmetry • Bounds away quickly	• Abnormalities in movement (e.g. only using front legs, dragging a limb, falling over, swaying) • Head tilted to one side • Circling • Paralysis *(trauma)* *(Indicative of trauma related injury)*
Body Condition	• Good body condition • Good muscle tone • Fur in good condition • Non-odorous smell	• Open wounds • Puncture wounds • Poor body condition *(malnourished)* • Lack of muscle tone • Offensive odour (chronic disease or old wounds) • Missing fur *(trauma)* • Bruising *(trauma)* • Flaky, dry skin (chronic illness) *(Indicative of trauma or chronic illness/disease)*
Breathing	• Normal (handling may result in increased respiration rate)	• Open-mouthed breathing • Laboured (noticeable effort to breath) • Audible breathing sounds (clicking, ticking, gurgling sounds) • Sneezing or coughing • Shaking head *(possible obstruction or head injury)* *(Indicative of trauma related injury, poisoning)*
Head	• Symmetrical	• Abnormal symmetry • Indentations • Swelling • Crepitation • Lacerations/abrasions *(Indicative of trauma related injury)*
Eyes	• Bright and clear • Shiny	• Dull *(pain/dehydration)* • Sunken (*dehydrated*) • Closed *(pain/dehydration)* • Protrusion *(trauma)* • Swelling *(trauma)* • Clear fluid *(trauma)* • Nystagmus *(head trauma)* • Unequal pupil(s) *(trauma)* • Unreactive pupil(s) *(trauma)* • Purulent discharge *(infection)* • Missing one or both eyes

Assessment Checklist – Bandicoots etc (continued)

Clinical Signs	Healthy / Normal	Sick / Injured
Nose	• Straight • No discharge or bleeding	• Distorted (*trauma - fracture*) • Blood or other discharge (purulent infection) from nostrils (*trauma*) • Abrasions (*trauma*) • Swelling (*trauma*)
Mouth	• No discharge • Symmetrical • Teeth and tongue undamaged	• Misaligned jaw (*trauma*) • Broken teeth (trauma) • Blood (*trauma*) • Swelling (*trauma*) • Crepitation (*trauma*) • Pale mucous membrane *(shock/dehydration)* • Slow capillary refill time *(shock/dehydration)*
Ears	• No discharge • Pinnae complete or with small tears	• Blood • Clear fluid *(Indicative of trauma related injury)*
Fur	• Shiny and in good condition	• Patchy or missing fur *(dog/cat attack)* • Wet patches of fur *(dog/cat attack)* • Fungal infections *(chronic illness)*
Cloaca (vent) **Pouch / Scrotum**	• Clean • Free from discharge • Penis not protruding	• Blood *(trauma)* • Lacerations *(trauma)* • Swelling *(trauma)* • Pouch – check for joeys • Penis – protruding *(trauma)* *(Indicative of trauma related injury)*
Tail	• Straight • Missing tail (old injury)	• Swelling • Lack of movement • Missing tail (fresh injury) *(Indicative of trauma related injury)*
Parasites	• Some ticks are normal (bandicoots are a natural host for ticks)	• Overabundance of *ticks (chronic illness)* • Fly blown / Maggots *(trauma)*

Assessment Parameters

Vital Signs	Heart Rate	Variable
	Respiration Rate	31-37 breaths per minute (bandicoots) Variable in other species – can be rapid in small sp.
	Core Body Temperature	33°C - 34°C (bandicoots) 35°C - 36.5°C (dasyurids)
Preferred Ambient Temperature	Adults and Sub-Adults	28°C
	Orphans – Just furred to furred	28°C - 30°C
	Orphans – Unfurred	32°C

Signs of Stress

- Biting
- Kicking (bandicoots)
- Attempting to escape
- Acute alopecia
- Urination, defecation
- Trembling

Signs of Pain

- Teeth grinding
- Laying in lateral or dorsal recumbency
- Reduced level of alertness
- Sitting hunched/fluffed
- Loss of appetite
- Closed eyes
- Heavy breathing
- Repetitive behaviour
- Shaking head
- Trembling
- Unable to maintain body temperature

Signs of Dehydration

- Dry tacky mucous membranes
- Dull eyes
- Sunken eyes
- Lack of urination
- Lack of skin elasticity
- Lethargy

Assessment of Body Condition

Scapula (shoulder blade) and spine – feel for good muscle coverage
Rump – should be well muscled in bandicoots
Temporal region (skull) – feel for good coverage, depression could indicate poor body condition
Fur – uniform thick fur, no missing fur

Emergency Diet

Do not offer any food or water to an animal suffering from injury (e.g. vehicle hit, dog/cat encounter). Injured wildlife must be presented to a veterinarian for treatment before offering food or water. Alternatively, please consult with your relevant Species Coordinator.

Adults

Species dependent but includes:

- **Insects** (earthworms, crickets, grasshoppers, wood cockroaches, mealworms)
- **Good quality fruit** (e.g. apple, banana, corn, sweet potato, grapes, rockmelon)
- **Bird seed** – for rodents only
- **Fresh water**

Orphans

- **Water and Glucodin** (initially for first 2 feeds); then
- **Suitable milk replacer** (Divetelact®, Biolac M100® or Wombaroo® Kangaroo Milk Replacer > 0.7)
- **Insects and fruit** (as for adults)

Note: Small mammals have a high metabolic rate – important that fluids are provided orally or subcutaneously if not self-feeding (both adults and orphans)

Common Injuries, Diseases and Conditions

Adults

- **Road trauma injuries** – Bandicoots (head injury, fractured jaw, fractured limbs, internal injuries)
- **Dog or cat attack** (puncture wounds, open wounds, evisceration, internal injuries) ***Note***: cat attack injuries often difficult to visualise
- **Near drowning** – Found in swimming pools or ponds and unable to exit (respiratory distress, pneumonia, exhaustion, hypothermia)
- **Poisoning** – usually from pesticides (lawn-grubs) or rodenticide (rat bait)

Orphans

- **Dehydration** – (level dependent upon length of time without maternal nutrition)
- **Hypothermia** (particularly unfurred joeys and in colder months)
- **Hypoglycaemia**
- **Cat attack** (puncture wounds, internal bleeding)
- **Wounds** (from being thrown from pouch, associated with road trauma or dog/cat attack)
- **Fractures** (from dog/cat attacks and road trauma)

Photos Above: Road trauma and domestic attack injuries are the most common found in bandicoots. Bandicoot's skin is easily 'torn' when bitten by cats and dogs and requires thorough cleaning, debridement and often suturing under a general anaesthetic.
Photos: Karen Scott

Drug Administration (preferred routes)

Oral	Adults:	Use a 1mL or 2.5mL syringe
	Sub-Adults:	Use a 1mL syringe
	Orphans:	Use a 1mL syringe with a 24g or 22g cannula attached
Intramuscular	Cranial and caudal thigh, dorsal lumbar and gluteal muscles, posterior pectorals	
Subcutaneous	Loose skin at dorsal neck/shoulders, cranial thigh area.	
Intravenous	Cephalic or saphenous (difficult in small animals, possible in adult bandicoots), lateral caudal (coccygeal)	

Euthanasia (preferred methods)

Euthanasia methods stated to assist veterinary staff.
Wildlife volunteers must not euthanise unless trained to do so or they hold appropriate approvals.

- Injection of sodium pentobarbitone (Lethabarb) after induction with Isoflurane (strongly preferred):-
  - Intravenous
  - Intracardiac (must be anaesthetised first)
  - Intraperitoneal (dilute with water 50:50)
- Blunt force trauma to the head (small rodents and joeys only) – **only if trained to do so**

Suggested Drugs and Dose Rates

This information is provided for **VETERINARY USE ONLY** to assist veterinary staff with the **initial assessment** and **emergency treatment** of sick, injured and orphaned wildlife. Suggested drugs and doses are those commonly used by the wildlife hospitals in South-east Queensland and are for routine treatment only. Recommendations may vary between individual veterinarians. Culture and sensitivity results would indicate the most appropriate antibiotic regime. Most drugs are used off-label.

For more information see 'Current Therapy in Medicine of Australian Mammals' by Vogelnest and Portas (2019).

Anaesthetic

Drug	Composition	Dose Rates
Isoflurane ®	Isoflurane 100%	5% for induction and 2-3% for maintenance with oxygen flow rate of 1-2 litres per minute
Alfaxan CD RTU ®	Alphaxalone 10mg/mL	3 to 5mg/kg (IM)
Pamlin ®	Diazepam 5mg/mL	0.5 to 1mg/kg (IM)

Analgesic

Drug	Composition	Dose Rates
Methone ®	Methadone hydrochloride	0.2 to 0.5 mg/kg - 4 to 6 hourly (SC)
Temgesic ®	Buprenorphine hydrochloride	0.01mg/kg - 8 to 12 hourly (SC)
Rimadyl ®	Carprofen	**Day 1** - 4mg/kg SID (SC) **Days 2 – 5** - 2mg/kg SID (SC)
Metacam ®	Meloxicam 5mg/mL	**Day 1** - 0.2mg/kg SID (SC) **Days 2 – 5** - 0.1mg/kg SID (SC)
Painstop ®	Paracetamol 24mg/mL Codeine 1mg/mL	15mg/kg of Paracetamol component 8 hourly (PO)
Infant Panadol Drops ® (1 month to 2 years)	Paracetamol 100mg/mL	15mg/kg - 4-6 hourly (PO)

Antibiotics

Drug	Composition	Dose Rates
Clavulox® Augmentin ® Amoxyclav ®	Clavulanic acid 35mg/mL Amoxycillin 140mg/mL	12.5 to15mg per kg combined drugs SID (SC) or (IM) or BID (PO)
Baytril ®	Enrofloxacin	5 to 10mg/kg (PO) or (SC or IM diluted with sterile water)
Septrin ® / Bactrim ®	Trimethoprim and Sulfamethoxazole Suspension	3 to 5 mg/kg of Trimethoprim component BID

Anatomy

Diagram Below: Skeleton of Brown Rat.
***Source**: O'Malley 2005. Clinical Anatomy and Physiology of Exotic Species.*
Popesko P, Ratjova V., & Horak, J (1990). A colour atlas of anatomy and small laboratory animals. Vol 2. Aylesbury, UK.

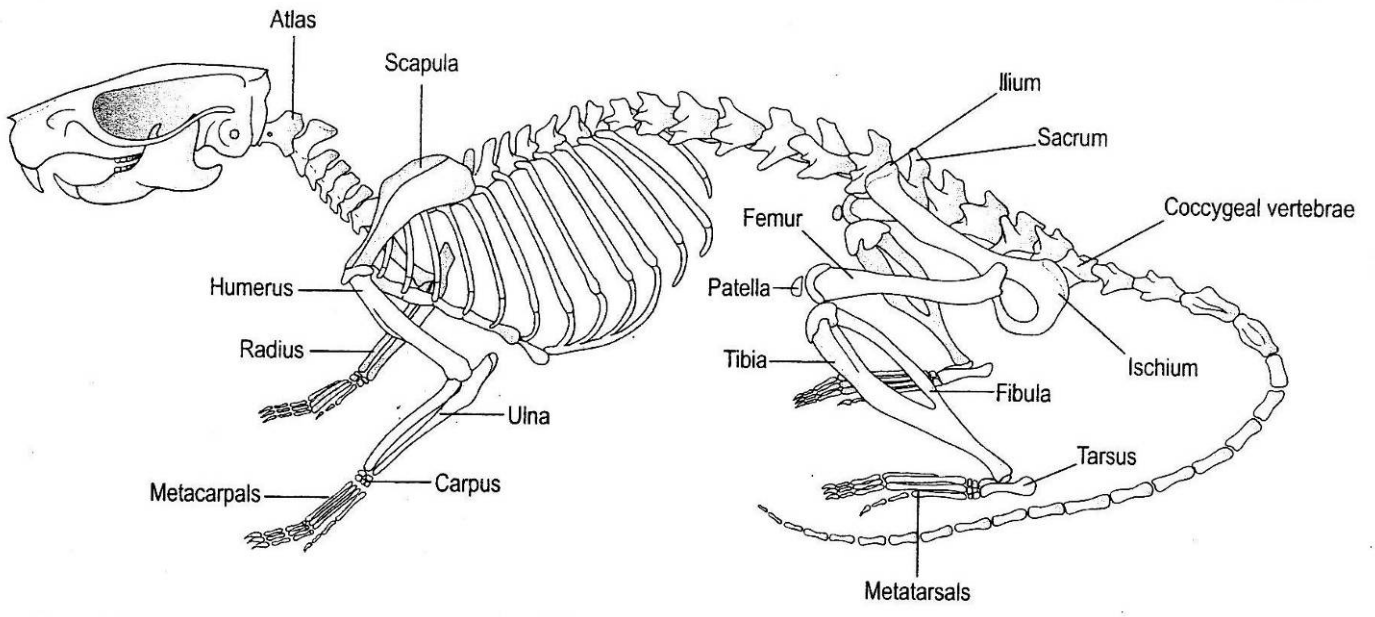
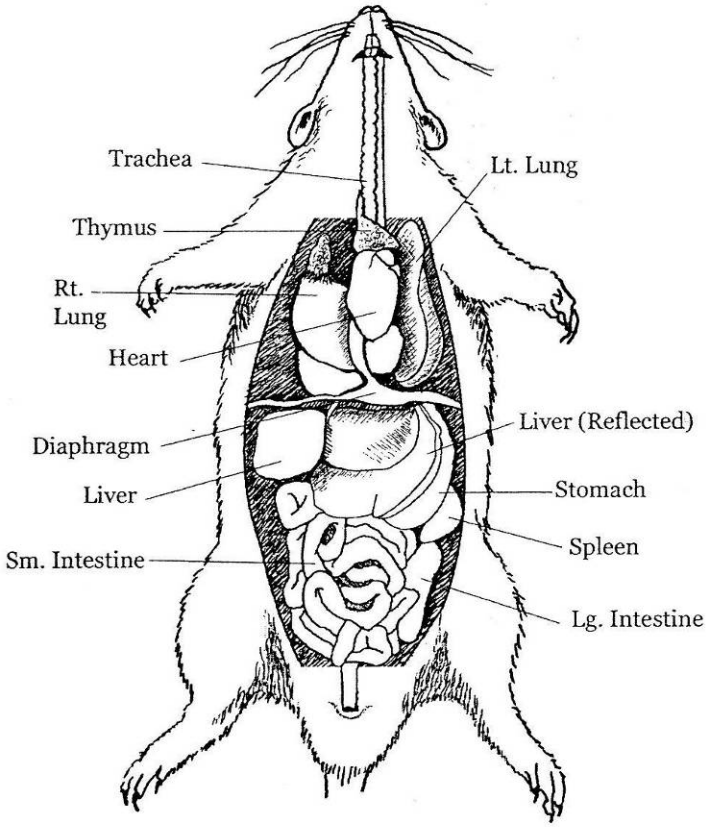


Diagram Right:
Visceral anatomy of a rat.

***Source**: Exotic Animal Medicine for the Veterinary Technician* (Ballard & Cheek)

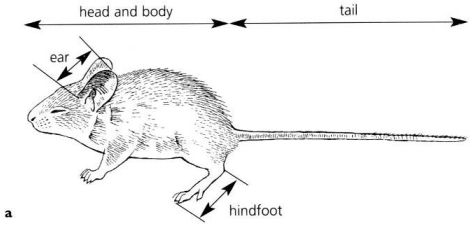


Identification Keys

Measuring Small Mammals

Use a pair of callipers or a ruler for the tail.

Source: A Field Guide to Mammals of Australia.



Head-Body Length	Measured from the tip of the nose to the base of the tail with the body relaxed.
Tail length	Measured to the tip (excluding the thermal hairs).
Hind Foot Length	Measured from back of the heel to the tip of the longest toe (excluding the claw).
Length of Ear	Measured from the lowest point of the bottom notch to the farthest point of the ear.

Diagram Right
Description of teeth formation.

Source: A Field Guide to Mammals of Australia.

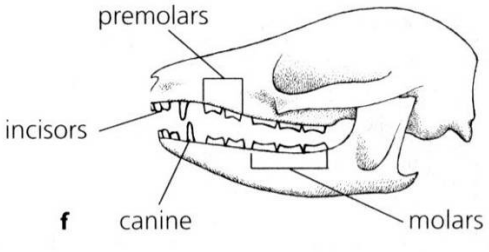


Diagram Right
Features of the hind-foot of small terrestrial mammals.

Source: A Field Guide to Mammals of Australia.

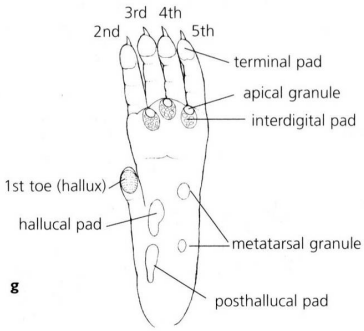
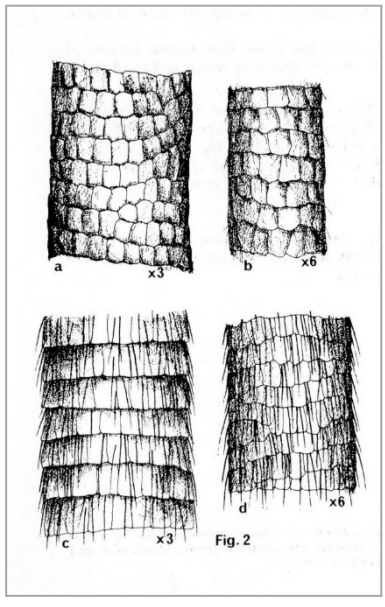


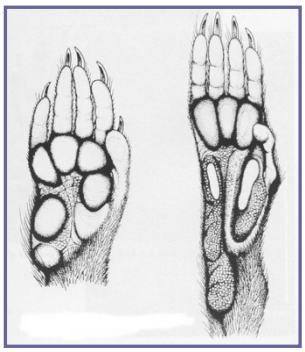
Diagram Right
Different variations in tail.
A – tail naked with scales in mosaic pattern
B – tail almost naked with scales in mosaic pattern
C – tail with short hair and scales arranged to regular well-defined rings
D – tail with long hair and scales in regular rings.

Source: Queensland Museum, 1974. Rats and Mice in Queensland Booklet.



Dasyurids

General Identification Tips



- Tails are either wholly or partially covered in fur.
- Distinctive pointed snouts.
- The forefeet have five clawed toes.
- Palms of the forefeet are roughly circular.
- All have four clawed toes and most species also have a small clawless inner toe but in some species this first toe is absent.
- Pinnae are wide and have horseshoe shape or widened lobe caudally

Source: Tracks, Scats and Other Traces. A Field Guide to Australian Mammals (Triggs)

Brush-tailed Phascogale

Weight: Males average 231 grams and females average 156 grams.
Head-body length: Males average 199mm and females average 181mm.
Tail: Males average 207mm and females average 194mm.
Uniform grizzled grey above.
Cream to white below.
Long, thin, naked, grey-pink ears.
Bushy black tail with hairs up to 55mm long.

Photo: Museum Victoria website

Yellow-footed Antechinus

Weight: Males average 56 grams and females average 34 grams.
Head-body length: Males average 121mm and females average 105mm.
Tail length: Males average 100mm and females average 86mm.
Distinguished by distinct change in fur colour from slate-grey head to warm rufous rump, feet, belly and sides.
Prominent light-eye rings.
Black tail tip.

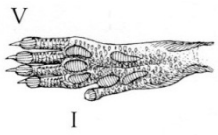


Photo: Queensland Museum website

Brown Antechinus

Weight: Males average 35grams and females average 20 grams.
Head-body length: Males average 106mm and female average 94mm.
Tail length: Males average 94mm and females average 85mm.
Uniform greyish-brown above, paler below.
Head broad and flat, coming to a point at the nose.
Eyes moderately prominent but without surrounding ring of pale fur.
Tail moderately hairy and thin, almost as long as head and body.

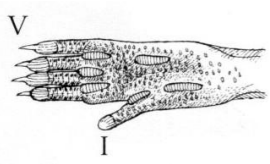
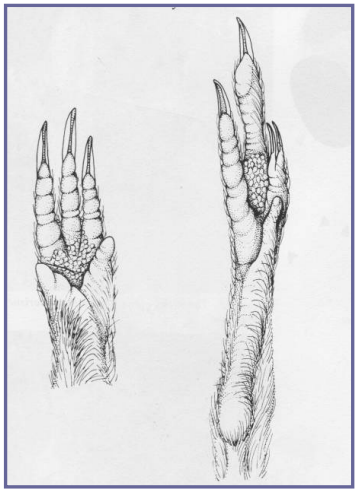


Photo: The Mammals of Australia (Van Dyck & Strahan)

Bandicoots

General Identification Tips



- Strictly terrestrial and all have long, pointed heads and compact bodies.
- Generally solitary animals which rest during the day in well concealed nests.
- The forelimbs have strong curved claws on long feet.
- The hind feet are long with a very large, strongly-clawed fourth toe; the second and third toes are fused with a double claw used for grooming.
- The tail is short in typical bandicoots.
- Their long, sensitive snouts detect food in the form of insects, worms, seeds and berries.

Source: Tracks, Scats and Other Traces. A Field Guide to Australian Mammals (Triggs)

Northern Brown Bandicoot

Weight: 500 grams to 3kg.
Head-body length: Up to 470mm.
Tail Length: Up to 170mm.
Spectacled brown-black above.
Whitish below.
Ears shorter and less elongated than Long-nosed Bandicoot.

Source: Queensland Museum website

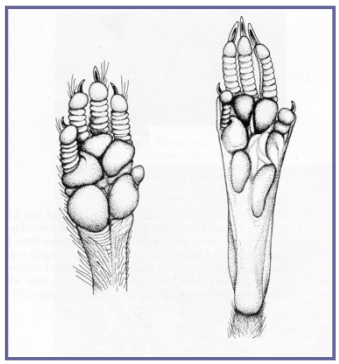
Long-nosed Bandicoot

Weight: 520 grams to 1330 grams.
Head-body length: 310mm to 445mm.
Tail length: 120-160mm.
Drab greyish brown above, creamy white below.
Forefeet and upper surface of hindfeet creamy white.
Distinguished from other bandicoot species by absence of distinct dark and light bars on rump, except in some juveniles and fewer adults which show a faint barred pattern.
Muzzle long and pointed and ears distinctly longer and more pointed than in Northern Brown Bandicoot.

Source: Queensland Museum website

Rodents

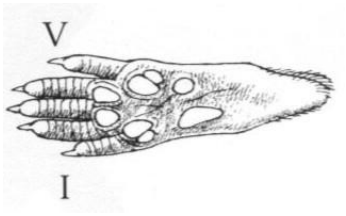
General Identification Tips



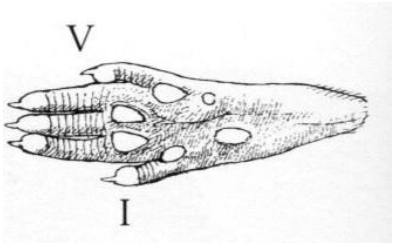
- All rodents have four clawed toes on the front feet and a very small, unclawed 'thumb'.
- The hind feet have five clawed toes, the inner three of which are considerably longer than the outer two.
- The Water Rat has partially webbed hind feet.
- Hopping-mice have narrow, elongated hind feet.
- Rodents possess only a single pair of incisors in each of the upper and lower jaws.
- They lack canine teeth.
- All Australian species lack premolars.
- Three molars are usually present in each cheek-tooth row.
- Between the incisors and cheek teeth there is a long gap.

Source: Tracks, Scats and Other Traces. A Field Guide to Australian Mammals (Triggs)

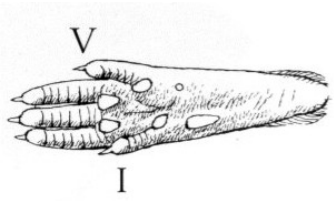
Rodents – Native Species



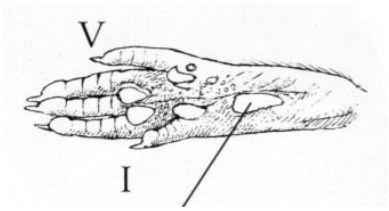
Above
Grassland Melomy



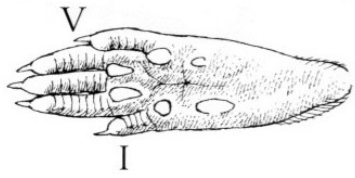
Above
Eastern Chestnut Mouse



Above
Swamp Rat

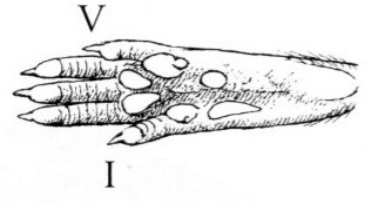


Above
Bush Rat

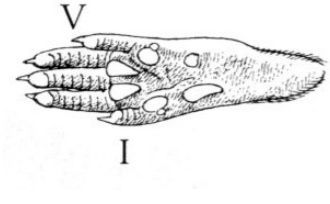


Above
Pale Field Rat

Rodents - Introduced Species



Above
Black Rat



Above
Brown Rat

***Source**: A Field Guide to the Mammals of Australia (Menkhorst & Knight, 2001)*