

WILDLIFE CAMERA ID GUIDE

Greater Blue Mountains World
Heritage Area



Science for
Wildlife



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scienceforwildlife.org

This guide has been developed to help with the identification of animals photographed on wildlife detection camera image sequences and focuses on fauna found in the Greater Blue Mountains World Heritage Area for the Wildlife Recovery Count project on Zooniverse.

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Introduction

Australian wildlife is remarkably diverse and includes both native and introduced species. While some native animals are instantly recognisable, such as the koala and the echidna, many others are difficult to recognise and tell apart.

This guide has been created to help you identify the species most commonly recorded on Science for Wildlife's wildlife cameras, along with tips for distinguishing between similar-looking animals. Photographs from these wildlife cameras are provided for most animals, however, for some rarer species, the only images available are by wildlife photographers.

Science for Wildlife's cameras are set within the Greater Blue Mountains World Heritage Area (GBMWH), which spans over one million hectares, around 90 kilometres West of Sydney, New South Wales, Australia.

These wildlife cameras are set up in a standardised way, with a bait station positioned 2.5 m from the camera. The PVC pipe is 20 cm long, with the top sitting approximately 50 cm from the ground. This is done so that animals are equally likely to be detected across all survey sites. The bait station contains a scent lure (inaccessible for consumption) made from peanut butter and oats; however, types of lures can change in different studies.

The bait station can serve as a useful size reference when identifying animals. However, please note that terrain and camera angle can affect perspective, meaning size estimation is not always straightforward. Animals positioned further from the camera than the bait station will often appear considerably smaller than their actual size, while animals that are closer to the camera lens will appear much bigger than their actual size. A diagram illustrating the wildlife camera setup is provided below.

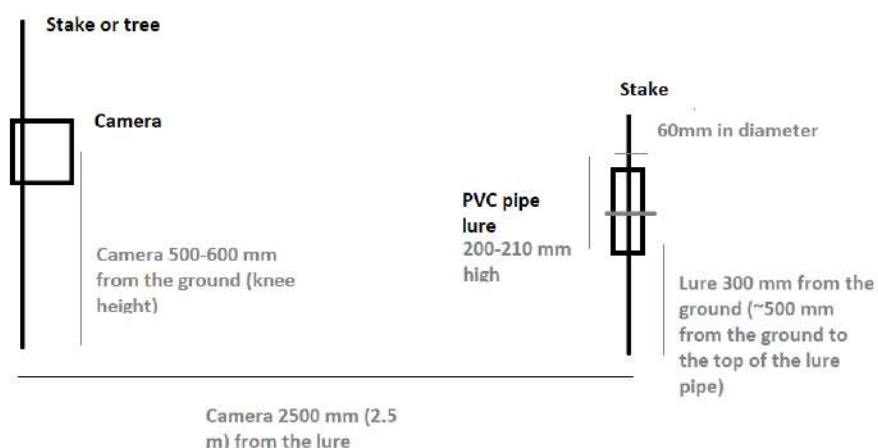


Figure 1. Wildlife camera setup.

Tips and tricks for identifying wildlife camera photos

Science for Wildlife set up a Zooniverse project for our volunteers to identify wildlife camera photos. This has a useful tutorial in how to tag pictures within that platform (<https://www.zooniverse.org/projects/drkellie/wildlife-recovery-count>). Regardless of the platform used, here we are providing some general tips to help identify wildlife camera photos in Australia.

General tips

- Replay a sequence multiple times or go backwards and forwards using the navigation arrows. This allows you to detect anything moving in the frame.
- Zoom in and out as needed to enlarge the picture. It helps particularly with small animals or animals that have good camouflage.
- If you are unsure or feel like you need to guess the animal, always choose a more general grouping of the animal you are looking at.
- Even in a blurry or partial shot, relative leg length, ear size, or tail length can help ID the animal.
- If you can only see a tiny piece of fur, or a part of an animal takes up the entire image with no identifiable features as the animal is too close to the camera, don't try to guess, just tag it as "Unidentifiable".

Nighttime photos

Nighttime photos can be harder to identify as they tend to be more grainy and are in grayscale (looks black and white), therefore you cannot always rely on colour markings for ID, as they may not show up. There are a few helpful tricks to help make animals in the photos clearer.

- Increase screen brightness, or play with contrast
- Where available use the "**invert photo**" feature on Zooniverse to invert colours and see silhouettes more clearly

Macropods (kangaroos, wallabies and similar)

Macropods - from the Greek meaning "large foot" - are a family of marsupials (Macropodidae) uniquely adapted to the Australian landscape, characterised by their distinctive large hind feet, powerful tails used for balance, and mode of locomotion by hopping. This group includes kangaroos, wallabies, wallaroos, and pademelons, among others.

In the Greater Blue Mountains World Heritage Area (GBMWhA), you are likely to see three of these groups, i.e. kangaroos, wallaroos, and wallabies.

Eastern grey kangaroos are the largest of these, and wallaroos are smaller than kangaroos but larger than wallabies, hence the portmanteau of the two names, which is derived from a Dharug word (*walaru*).

Kangaroos have proportionally longer and more powerful hind legs, a narrower chest, and a smaller, more elongated head compared to wallaroos and wallabies. This gives them a lean, athletic silhouette optimised for covering vast distances at speed. In terms of behaviour visible on camera, kangaroos are more likely to appear in open clearings or paddock edges, often in groups, whereas wallabies may appear more solitary and are more frequently captured close to dense vegetation or at the treeline.

Kangaroos and wallaroos tend to have uniformly coloured fur (although the chest and belly may be lighter), with colours in various shades of grey and/or brown. Wallabies often display more varied and striking coat patterns, including distinct facial stripes, cheek patches, or rufous (reddish-brown) colouring along the neck and shoulders.

Wallaroos and wallabies have a more compact frame compared to kangaroos, and typically favour denser bush, forest edges, and rocky escarpments. Wallabies also have relatively broader, more rounded heads and shorter muzzles.

*If you are finding it hard to know which species to select, we recommend applying the general "**Macropod**" tag.*

More details on the species found within the GBMWhA are below.

Please **DO NOT** add comments with species names for the macropods beyond identifying as kangaroo, wallaroo or wallaby, unless you want clarification in distinguishing between these categories.

Kangaroos

Kangaroos are large marsupials belonging to the family Macropodidae and are characterised by their powerful hindlimbs, long muscular tails used for balance, and the iconic hopping locomotion that sets the entire macropod group apart from most other mammals¹.

True kangaroos can be separated from other macropods by their scale, ecological niche and locomotory efficiency. Whilst wallabies and pademelons are adapted to dense scrub and forest understorey, kangaroos are built for open grasslands and semi-arid environments. This means kangaroos hopping gait becomes increasingly energy-efficient at higher speeds - a biomechanical advantage not seen to the same degree in smaller macropods².

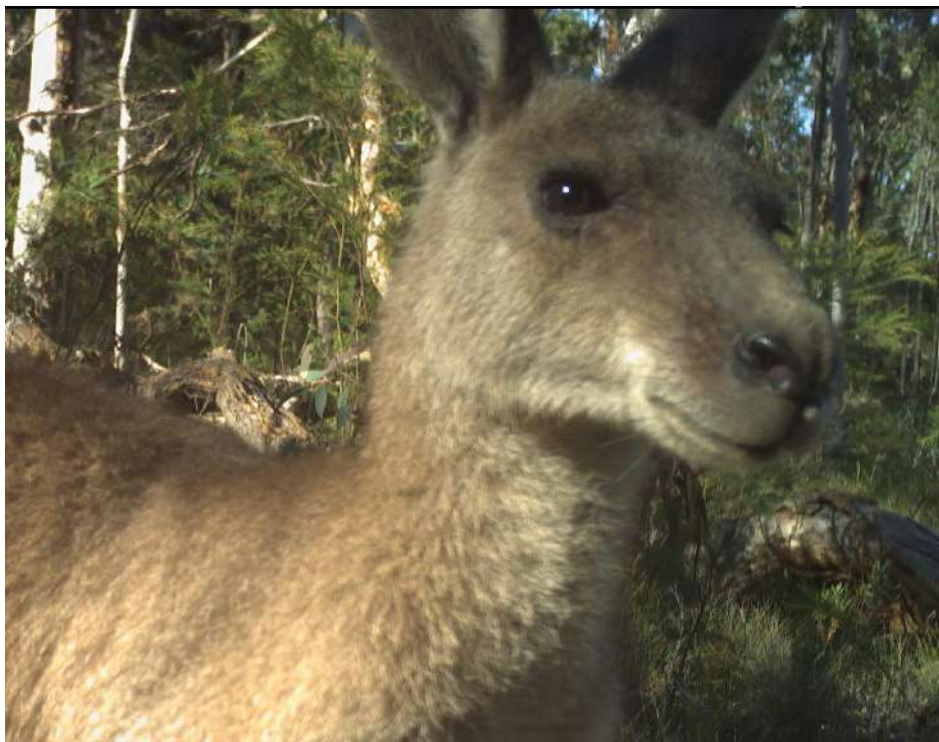
On Zooniverse for this project you will be classifying to kangaroo category, rather than to the species level. See the below information for images and information to distinguish the kangaroo species for help comparing to wallaroo and wallaby species.

The **eastern grey kangaroo** (*Macropus giganteus*) is a medium to large-sized macropod with grey to grey-brown fur and paler grey colouring underneath. Some colour morphs can be very dark. The tail is often black at the tip, and the nose is covered in fur. It hops with its head held high and tail curved upwards and often stands in a very upright posture with large ears. Gregarious, so will frequently be seen in groups. Short hair.

A standing male may reach up to 2.2m in height. Males are larger than females.



Above: Large male eastern grey kangaroo, with two young individuals. **Identifying characteristics:** very large hind limbs compared to the rest of the body, muscular but lean build, furry nose.



Above: Photo of the nose, which shows fur over the top of it (the scientific name for the body part is the "rhinarium"). It is important to note this characteristic as it can help you distinguish between a kangaroo and a wallaroo.



Above: Nighttime photos of eastern grey kangaroo. Notice the size compared to the bait station. While the nose appears darker than the rest of the head, it is a darker grey, not black. It has fur over the top of it. Uniform in colour and appears with light fur on the infrared camera.

Wallaroos

Wallaroos occupy a middle ground within the macropod family, sitting morphologically and ecologically between the large open-country kangaroos and the smaller scrub-adapted wallabies. Wallaroos are characterised by their stocky, heavily muscled build, shaggy fur, and a notably bare, granular muzzle that distinguishes them visually from all other macropods³. Unlike the long-limbed, speed-optimised body plan of true kangaroos, wallaroos have proportionally shorter hindlimbs and a broader chest, suiting their preferred habitat of rocky escarpments and boulder fields where agility matters far more than open-ground speed⁴.

On Zooniverse for this project you will be classifying to wallaroo category, rather than to the species level. See the below information for images and information to distinguish the wallaroo species for help comparing to kangaroo and wallaby species.

The **common wallaroo** (*Osphranter robustus subspecies robustus*) is a large macropod, smaller than a kangaroo but shaggier, and more heavily built than a wallaby, with a distinctive dark, furless nose that has a wet appearance similar to a dog's nose. Body fur colour varies from light brown to black, with dark lower legs, feet, and paws. It has a more hunched posture than a kangaroo and a more squared jaw compared to the eastern grey kangaroo. Body length up to 1.1 m, tail up to 90 cm.





Above: Large male wallaroo. Dark colour morph with cream-coloured underside.



Above: Female wallaroo. Longer fur evident on the sides, nose without fur.



Above: Nighttime photo of a wallaroo. Black nose is evident, face shape is wide, and jaw and muzzle are squared.

Comparison between eastern grey kangaroo and common wallaroo



Above: Eastern grey kangaroo (left), common wallaroo (right): the kangaroo has very large hind legs compared to the rest of the body, and shorter fur. The ears are longer and compared to the wallaroo. The wallaroo is stockier overall and has longer fur. The ears are rounder and a bit smaller, and the nose has no fur on it, in contrast to the eastern grey kangaroo which has fur over the top part of the nose. As a consequence, the wallaroo's nose appears as darker and more "wet", like a dog's nose. The face shape is different too; the wallaroo has a much wider and squarer face compared to an eastern grey kangaroo.



Above: Eastern grey kangaroo (left) and common wallaroo (right). Comparison of the nose, which has fur for the kangaroo, and does not have any fur on it for the wallaroo (right).



Above: A wallaroo hopping. You can see how the animal is holding a low profile while hopping.



Above: Eastern grey kangaroos hold their head and chest higher as they are hopping.

Wallabies

Wallabies are a diverse and ecologically varied group within Macropodidae. The group encompasses numerous genera including *Notamacropus*, *Petrogale* (rock-wallabies), and *Thylogale* (pademelons) - with the term "wallaby" broadly applied to any macropod smaller than a kangaroo or wallaroo that doesn't fit another specific category³.

Compared to kangaroos and wallaroos, wallabies are considerably smaller and more morphologically varied. The most distinguishable feature of wallabies against other macropods is their ecological plasticity. While kangaroos are largely constrained to open grasslands and wallaroos to rocky ranges, wallabies have radiated into a wide range of environments - dense rainforest, coastal heath, dry woodland, and alpine shrubland - making them the most habitat-diverse group within Macropodidae⁴.

On Zooniverse for this project you will be classifying to wallaby category, rather than to the species level. See the below information for images and information to distinguish the wallaby species for help comparing to kangaroo and wallaroo species.

If you are finding these photos hard to ID, it is fine to tag them as "Macropod"

In the following pages, you will be presented with examples of the different species of wallaby for your reference.

The **brush-tailed rock wallaby** (*Petrogale penicillata*) is a less common small wallaby, with dark brown fur that has a rufous tinge on the rump and grey neck and shoulders. The belly is paler, with some individuals showing a distinct white blaze on the chest. It has a pale cheek stripe and a dark dorsal stripe on the head. The tail is normally longer than the body, and it is dark brown to black with a prominent terminal brush. Feet and paws are dark, and some individuals show a black axillary patch extending into an indistinct side stripe. Distinguished from the larger swamp wallaby by its much narrower, rugby ball-shaped snout and distinct black ear tips. Generally found on rocky slopes.

Can be confused with: swamp wallaby, red-necked wallaby, parma wallaby.



Above: Brush-tailed rock wallaby. Identifying features: black marks on the ears, greyish shoulders, white cheek patch, and narrow, football-shaped head.





Above: Nighttime pictures of a brush-tailed rock wallaby: note the long, black, bushy tail, the black marks on the ear, and the narrow, rugby ball-shaped face.

The **red-necked wallaby** (*Notamacropus rufogriseus*) is a more common small to medium-sized macropod with distinctive rufous (aka reddish) fur on the back of the neck and often on the rump. It has a black nose and paws, with a white stripe along the face. May be seen alone or in groups.

Can be confused with: brush-tailed rock wallaby, swamp wallaby.



Above: Adult red-necked wallabies. **Identifying features:** evident rufous patch across shoulders and across rump. Black paws and nose, white cheek stripe. Overall colour is greyish with rufous patches.



Above: Red-necked wallaby joey. **Identifying features:** evident rufous patch across shoulders and across rump. Black paws and nose, white cheek stripe. Overall colour is greyish with rufous patches.



Above: Nighttime photos of a red-necked wallaby.

The **swamp wallaby** (*Wallabia bicolor*) is a more common small to medium-sized macropod with dark brown fur. It often stands more hunched than red-necked wallabies, with a relatively smaller-looking head, and a dark face often with a white cheek stripe. It hops with its head and shoulders held low and its tail horizontal. Usually solitary. Body length up to 85 cm, tail up to 86 cm.

Can be confused with: brush-tailed rock wallaby, red-necked wallaby, parma wallaby.



Above: Swamp wallaby. **Identifying characteristics:** Top half of face is dark with a pale cheek stripe, rufous ring around the base of the ears, overall, very dark brown appearance, with rufous belly and chest. Very dark brown paws and feet. Round and wide face. Tail is long, not very fluffy, and is a very dark brown, sometimes with a white tip.



Above: Nighttime photos of swamp wallabies

Small/medium sized mammals (ground dwelling)

Small and medium-sized mammals can be tricky to identify, because they tend to be nocturnal, and the image resolution is often grainy. Small animals can be tagged as "**small mammal**". Medium-sized animals in this category will be easier to identify.

Bandicoots of the Peramelidae family

Bandicoots have a general tag called "**bandicoot**" if you cannot tell exactly what species it is. Long-nosed bandicoot will be the most likely, while the southern brown bandicoot is rare. Bandicoots are medium-sized marsupials belonging to the family Peramelidae and are found throughout Australia and Papua New Guinea⁵. They are immediately recognisable by their pointed, elongated snouts, short-compact bodies, a mix of features that places them in a unique evolutionary position among marsupials - sharing some characteristics with carnivorous marsupials and others with herbivores like macropods⁶.

On Zooniverse for this project you will be classifying to 'bandicoot' category, rather than to the species level. See the below information for images and information to distinguish the bandicoot species for help comparing to potoroos, small macropods, possums and other small mammal species.

The **long-nosed bandicoot** (*Perameles nasuta*) is a medium-sized nocturnal marsupial with a long, narrow nose, rounded posture, and grey to brown fur with a short, skinny tail. The long-nosed bandicoot has large ears that stand tall on the head, pale colouring with barring on the rump, and a narrow tail base.

This is the bandicoot species most commonly seen on Science for Wildlife's cameras.

The **southern brown bandicoot** (*Isodon obesulus*) is a short-nosed nocturnal marsupial with coarse brown-grey fur on the back and paler colouring underneath. It has a stocky body with a short snout, short rounded ears, and a cone-shaped face. Short forelegs and long hindlegs, with a short, skinny tail. Body length up to 35 cm, tail up to 13 cm. Their posture is more closed, with their bodies closer to the ground, and they generally keep all four feet on the ground.

See example images on the next page:



Above: Nighttime pictures of the long-nosed bandicoot.



Above: Southern brown bandicoot

Image credit: both images above by John O'Neill

Carnivorous marsupials of the Dasyuridae family

Dasyuridae is the largest family of carnivorous marsupials, encompassing over 70 species including quolls, dunnarts, antechinuses, the Tasmanian Devil, and the Numbat-like ningauis - ranging in size from 2g to 14kg. All dasyurids share a defining polyprotodont dentition - multiple sharp, non-specialised incisors and well-developed canines - reflecting their fundamentally carnivorous or insectivorous diet, and retaining a relatively unspecialised but highly efficient body plan built for pursuing, capturing, and consuming animal prey⁷.

Combined with a lack of a true pouch in many smaller species (replaced instead by a shallow skin fold), and young that are among the most altricial of any mammal at birth, dasyurids represent one of the most physiologically and behaviourally extreme radiations within Marsupials - small in stature but outsized in ecological and evolutionary significance.

Antechinus (*Antechinus* sp.)

An antechinus is a small carnivorous marsupial with similar features to mice but with distinctively notched ears. Antechinus can be distinguished from rodents as they have a notably triangular-shaped face with a very pointy and narrow muzzle compared to black rats or brown (Norwegian) rats. They will have relatively pale fur, wide ears, and a tail approximately the same length as their body. Distinguished from the similar dunnarts by their distinctive multi-lobed, crinkled ears, smaller and less prominent eyes, and more robust build. The head is broader and less delicate-looking than a dunnart.



Above: Picture of an antechinus. You can see how it has a pointed snout and crinkly ears.



Above: Another antechinus. You can see the size of this animal better compared to the bait station. The crinkly ears and pointed snout are visible in this picture.

Nighttime images of dasyurids are extremely hard to identify, so it is recommended they are tagged as a "small mammal" and to seek expert opinion on the ID.



Above: Nighttime photos of antechinus: you can see the crinkly ear and pointy snout.

Common dunnart (*Sminthopsis murina*)

A small carnivorous marsupial with a broad head and narrow tail. Fur is light brown to grey, with darker fur on the head and neck, and lighter colouring on the underparts and feet. It has large, rounded ears and a thin tail almost the same length as its body. Dunnarts have big, bulging black eyes and slightly shorter snout compared to the antechinus, which has smaller eyes. Body length up to 12 cm.

Nighttime images of dasyurids are extremely hard to identify, so it is recommended they are tagged as a "small mammal" and to seek expert opinion on the ID.



Above: Common dunnart wildlife camera images. Identifying characteristics: large, upright ears without crinkles, short, pointy snout and big eyes.

Spotted-tailed quoll (*Dasyurus maculatus*)

A medium-sized carnivorous marsupial with distinctive spotted patterning. Colouration ranges from light blonde to black, but most commonly coarse red brown to dark brown fur with white spots on the body extending to the tail. It is the largest of the quolls, with relatively short legs, and its tail is as long as its body and head combined. It has a thick head and neck with a slightly rounded and elongated/pointed snout. It is the only quoll species with spots on its tail in addition to its body.



Above: photo of a spotted-tailed quoll showing its distinctive spot pattern extending along its tail.



Above: Night-time image of spotted tail quoll
Image credit: the Ecological Society of Australia

Monotremes

Monotremes are the most evolutionarily ancient lineage of living mammals, comprising just five surviving species - the platypus and four echidna species. What immediately sets monotremes apart from every other mammal is that they lay eggs rather than giving birth to live young - a trait found nowhere else in the class Mammalia. Unlike dasyurids or bandicoots, which have well-developed dentition suited to capturing and processing prey, echidnas rely on a long, sticky tongue to extract ants and termites with no teeth whatsoever⁹.

Short-beaked echidna (*Tachyglossus aculeatus*)

A small to medium-sized burrowing monotreme covered in fur and spines, which are called "quills" with a distinctive long, thin snout and a specialised tongue for catching insects. They walk with their bellies close to the ground and have a rounded posture.

It is the only spiky-looking animal present in Australia, so you can't go wrong with this one!



Above: photo of a short beaked echidna, showing its distinctive quills.



Above: Nighttime photos of a short-beaked echidna, showing that its quills are still very clearly distinguishable in the dark.

Potoroos (Potoroidae family)

Potoroos, bettongs, and rat-kangaroos comprise the family Potoroidae - a group of small, cryptic marsupials that, despite their superficial resemblance to rodents, are in fact the closest relatives of the true kangaroos and wallaroos within the order Diprotodontia³. Ranging from 500g to 2.5kg, potoroos are distinguished from other small marsupials by their macropod-like hindlimb morphology and bounding gait, yet they occupy dense understorey habitat rather than open country, and unlike dasyurids or bandicoots, many species have evolved a remarkable dependence on hypogeal fungi (truffles and false truffles) as a primary food source - making them critical vectors for fungal spore dispersal and therefore keystone species in maintaining soil and forest health¹⁰.

Long-nosed potoroo (*Potorous tridactylus*)

A small marsupial of a rat-like appearance, with a long-pointed snout, rounded back, and a partially prehensile tail. The long-nosed potoroo has rounded ears, a shorter nose than the bandicoots, a broad tail base, and often sits up in a kangaroo-like posture.



Above: Wildlife camera images of a long-nosed potoroo, showing its rounded ears and moderately long nose, along with its upright sitting posture.

Image credit: Dr Bronwyn Hradsky

Another good reference for wildlife camera IDs of potoroos is <https://wildzoologist.wordpress.com/camera-trap-id/>

Rodents (Muridae family)

Rodents (rats and mice) can be very hard to identify even for experts! If you do not know what you're looking at, we recommend using the general tag "small mammal". If you know it's a rat but not what species, then put "rat".

Please note it is generally not expected for volunteers to be able to tag rodents to species level.

Rat (*Rattus sp.*)

On Zooniverse for this project you will be classifying to rat category, rather than to the species level. See the below information for images and information to distinguish the rat species for help comparing to mice, antechinus, dunnarts and dasyurid species. If you are confident on the image classification down to the species level then please add this in the comments for the Science for Wildlife team to add to the data.

Reference colour pictures are provided, although animals will most likely be on grainy nighttime photos. Rats are generally nocturnal; it is very unusual to see them out during the day.

The **black rat** (*Rattus rattus*) is an introduced rat with a notably elongated head, large narrow ears that protrude prominently above the head profile, and a very long, dark tail that is longer than the body. Fur colour is variable.



Above: Photo of a black/house rat.

Image credit: Davidvraju





Above: Nighttime wildlife camera photos of black rats. Note the extremely long tail compared to the body length, the large narrow ears that stick up above the head, and the pointed snout.

The **brown rat** (*Rattus norvegicus*) is also an introduced rat with a straight and blunt snout, and a short, scaly tail that is completely naked and shorter than the body length. Fur is brown or grey with a body length up to 28 cm and pink-grey feet.



Above: Photo of a brown rat.
Image credit: AnemoneProjectors





Above: Nighttime wildlife camera images of a brown rat. Note the small ears, the tail which is shorter than the body length, and the straight, blunt muzzle

The **bush rat** (*Rattus fuscipes*) is a rat native to Australia. Bush rats have grey-brown fur with rounded ears that protrude above the head profile. The tail is approximately the same length as the body, tapering at the end and generally brown, grey or black in colour. The snout tapers like a roman nose.



Above: Nighttime wildlife camera images of a bush rat.

The **swamp rat** (*Rattus lutreolus*) is a native species of rat with dark brown body fur, usually lighter underneath. The feet, ears, and tail are dark brown. The ears are very short and round, and do not reach the eyes when folded forward. The tail is shorter than the head and body combined. It has a blunt nose and is very dark in colour generally.

Body length up to 20 cm, tail up to 14 cm.



Above: Nighttime wildlife camera images of a swamp rat, showing its very blunt nose and dark fur.



Above: Daytime picture of a swamp rat on a wildlife camera. Note the short tail, blunt nose and very dark fur. Please note that the image has been cropped to highlight the animal's features.

Image credit: DCCEEW Ecological Health Unit

Mouse (*Mus sp.*)

On Zooniverse for this project you will be classifying to mouse category, rather than to the species level. See the below information for images and information to distinguish the mouse species for help comparing to rats, antechinus, dunnarts and dasyurid species. Please tag as **small mammal** if you are unsure, as these can be very hard to tell apart from other small mammals.

The **house mouse** (*Mus musculus*) is a small rodent with relatively large, long ears (no notch), skinny feet, a wide snout, small beady eyes, and a long tail relative to body length. Body length up to 9 cm¹¹.



Above: Photo of a house mouse.

Image credit: Xocolatl



Above: Nighttime wildlife camera images of a house mouse.

Small/medium sized mammals (arboreal)

Arboreal small to medium-sized mammals represent a group of species that have independently evolved tree-dwelling lifestyles across several distantly related marsupial lineages. These include possums and gliders of the family Petauridae and Pseudocheiridae, the common brushtail possum and common ringtail possum, and the iconic sugar glider - all of which are united by prehensile or semi-prehensile tails, strong curved claws, and specialised dentition for processing plant material⁴.

What most distinguishes these species from their terrestrial marsupial counterparts is their suite of arboreal adaptations. For example:

- Gliders possess a patagium - a thin membrane stretching from wrist to ankle - enabling them to travel up to 50 metres between trees with minimal energy expenditure
- Ringtail possums have evolved a truly prehensile tail capable of gripping branches, a trait rare among Australian mammals¹².

Carnivorous marsupials of the Dasyuridae family

The Dasyuridae family is the largest of carnivorous marsupials in Australia, where all dasyurids share a polyprotodont reflecting their carnivorous or insectivorous diet⁷. This means they have multiple pairs of small, similar lower incisors and usually four or more upper incisors on each side of the jaw.

The genus *Phascogale* stands apart from all other dasyurids as truly arboreal carnivores. They possess sharp, non-retractile claws and highly flexible ankle joints capable of rotation - allowing them to descend tree trunks headfirst with the same agility that most small mammals reserve for the ground.

Brush-tailed phascogale (*Phascogale tapoatafa*)

A rat-sized arboreal carnivorous marsupial characterised by a tuft of black silky hairs on the terminal portion of its tail. Body fur is grey, ears are grey-pink, and it has a long pointed nose. The tail is grey at the base, becoming black and brush-like at the end. Body length up to 26 cm, tail up to 23 cm.



Above: A coloured wildlife camera image of a brush-tailed phascogale showing its distinctly bottle-brush like tail.

Image credit: Museums Victoria



Left: Nighttime wildlife camera image of a brush-tailed phascogale.

Image credit: Erin Thomas



Above: Brush-tailed phascogale, image showing the large eyes, pointed head and snout with the distinct brush tail behind.

Image credit: Ken Stepnell/DCCEEW

Gliders

On Zooniverse for this project you will be classifying to glider category, rather than to the species level. See the below information for images and information to distinguish some of the glider species that appear most commonly on camera traps, which are normally the feathertail glider (*Acrobates pygmaeus*), squirrel (*Petaurus norfolcensis*) and sugar (*Petaurus breviceps*) or Krefft's glider (*Petaurus notatus*).

Gliders possess a skin membraned called "patagium", which stretches from wrist to ankle enabling gliding flights of up to 100 metres, making forest connectivity a direct survival requirement³. Gliders have a broadly omnivorous diet of nectar, pollen, sap, and invertebrates. Larger species of glider in particular can indicate whether a forest is structurally healthy, because they depend on old-growth hollows to survive¹².

For this project, you will only be required to tag these as "glider", as these can be difficult to tell from each other.

In the next few pages, we will provide examples of some of the glider species that tend to turn up on wildlife cameras.

Feathertail glider (*Acrobates pygmaeus*)

The feathertail glider is a very small mammal (mouse-sized), which is distinguished from all other gliding marsupials by a unique feather-like tail of stiff, bilaterally projecting hairs functioning as both rudder and climbing aid¹³.

It is the world's smallest gliding mammal, with a grey coat and a distinctive long, feather-shaped tail. Upper body parts are grey and underparts are white. It has a gliding membrane of skin between the elbow and the ankle. Body length up to 8 cm, tail up to 10 cm.



Above: Wildlife camera photo of a feathertail glider showing its almost flattened, feather shaped tail. The photo has been cropped to highlight the animal.

Image credit: DCCEEW Ecological Health Unit



Above: Nighttime wildlife camera image of a feathertail glider, with the flat looking feather shaped tail visible.

Image credit: brettmitchard

Squirrel glider (*Petaurus norfolcensis*)

A small arboreal, omnivorous gliding marsupial with grey body fur, a dark stripe along the middle of the head and back, and white underparts. The tail is long and bushy, as wide as the body at the base, with a distinctive dark tip. Roughly twice the size of the related sugar glider, with a longer and pointier muzzle. It has a gliding membrane of skin between the elbow and ankle. Body length up to 23 cm, tail up to 30 cm.



Above: photos of a squirrel glider. Note the wide tail base and the folds of skin that correspond to the gliding membrane.

Image credit: Ecosystem Dynamics Lab, The University of Sydney



Above: photo of a squirrel glider. Note the wide tail base and the folds of skin that correspond to the gliding membrane (the patagium).

Image credit: Ecosystem Dynamics Lab, The University of Sydney

Sugar glider (*Petaurus breviceps*) / Krefft's glider (*Petaurus notatus*)

A small arboreal, omnivorous, nocturnal gliding marsupial with distinctive striped patterning on the head and a gliding membrane of skin between the elbow and ankle. Body fur is grey with a dark stripe along the middle of the head and back, and underparts are pale grey to cream. The tail tip is black, sometimes with a white tip. The two species are extremely similar and often impossible to distinguish from wildlife camera photos alone. Krefft's glider tends to have a more clearly defined mid-dorsal stripe, a more attenuated tail with longer fur at the base shortening towards the tip, and may show a white tail tip¹⁴. Body length up to 20 cm, tail up to 21 cm.



Above: Wildlife camera image of a sugar glider showing the striped patterning on its head.



Above: Wildlife camera image of a Krefft's glider showing the slimmer tail, with the white tip visible in the right-hand photo.



Above: Wildlife camera image of a sugar glider. The gliding membrane is visible in this photo as wrinkly folds of skins on the side of the animal.

Possums of the family Burramidae

The family Burramyidae known as the **pygmy possums** - comprises of five small, mostly arboreal marsupials representing one of the most ancient possum lineages in Australia and distinguished from all other arboreal marsupials by their remarkably small size, ranging from just 7g to 45g³. Unlike the larger ringtail and brushtail possums sharing their forest habitat, burramyids possess a semi-prehensile tail used for gripping fine branches and flower stems and are highly specialised nectar and pollen feeders. Most remarkably, several burramyid species enter torpor during cold periods - a physiological state of reduced metabolism and body temperature rare among marsupials.

Eastern pygmy possum (*Cercartetus nanus*)

A very small nectivorous marsupial with very bright eyeshine if detected on camera. It has a short, rounded snout, big eyes, large forward-pointing ears, and a long, thin prehensile tail with a wide base that tapers sharply. Its snout is shorter than a mouse's and the eyes appear proportionally much larger in wildlife camera photos. Body length is usually 7-10cm, with a body weight of 15-38g¹¹.



Above: A white flash wildlife camera colour image of an eastern pygmy possum.
Image credit: Dr Kevin C Rowe



Above: Nighttime wildlife camera images of an eastern pygmy possum, showing its long thin tail and rounded snout. Note that the tail is thicker at the base.
Right image credit: Ecosystem Dynamics Lab, University of Sydney.



Above: Nighttime wildlife camera images of an eastern pygmy possum, showing its large ears, eyes and pointy snout.
Image credit: Ecosystems Dynamics Lab, University of Sydney

Possums of the family Phalangeridae

Possums of the family Phalangeridae are more commonly known as brushtail possums. They are nocturnal mammals, with two species present in the Greater Blue Mountains World Heritage Area: the common brushtail possum and the short-eared or mountain brushtail possum (the latter are virtually indistinguishable on camera traps). You need a good picture of the face and ears to determine the species.

We recommend both species should be tagged as simply **“brushtail possum”**. In the following pages, we will provide some examples of what the two species of brushtail possum look like.

Common brushtail possum (*Trichosurus vulpecula*): this is an omnivorous, nocturnal, medium-sized arboreal marsupial with a very fluffy, bushy prehensile tail, pale ankles, a pale patch beneath the large, pointed ears, and a long, pointed face with dark markings on the snout. Cannot be reliably identified without a clear shot of the head, as it can be confused with the short-eared brushtail possum. Body length 35-50cm, tail length up to 40cm, and weight up to 4kg¹¹.



Above: Nighttime wildlife camera images of a common brushtail possum showing its large, pointed ears.

Short-eared or mountain brushtail possum (*Trichosurus caninus*): this is a nocturnal marsupial, larger than the common brushtail possum, with thick, woolly, dark grey to black fur, a bushy prehensile tail, and small rounded ears. It has black feet, which the common brushtail possum does not have. Cannot be reliably identified without a clear shot of the head and/or feet. Body length 40-55cm, tail length up to 40cm, and weights up to 4.5kg¹¹.



Above: Nighttime wildlife camera images of a short-eared brushtail possum, showing its rounded ears and dark feet.

Possums of the Family Pseudocheiridae

Some possum and glider species are more closely related to each other than to other species of possum and gliders, which is why they are grouped together. The family Pseudocheiridae in the GBMWA includes ringtail possums and greater gliders.

Common ringtail possum (*Pseudocheirus peregrinus*)

A herbivorous, small to medium-sized, nocturnal, arboreal marsupial with a slim, dual-coloured, often curled tail. It has large, rounded ears, grey or brown fur, a pale cream-coloured belly, and a smooth, white-tipped prehensile tail. Body length up to 38cm, tail also up to 38cm, weight can be up to 1kg¹¹.





Above: Nighttime wildlife camera image of a ringtail possum showing thin, smooth, white tipped tail.

Other medium/large-sized marsupials

Other common medium to large sized mammals which can be seen on camera traps are koalas and wombats. Genetically speaking, koalas and wombats are more closely related to each other than other mammal groups in Australia, even though they look very different, with koalas being arboreal, and wombats having the habit of burrowing underground.

Common wombat (*Vombatus ursinus*)

A large, thick set, herbivorous, burrowing marsupial with a naked nose, short, rounded ears, coarse, thick grey fur and short powerful limbs. Weighs up to 35kg¹¹.



Above: Nighttime wildlife camera images of a wombat.

Koala (*Phascolarctos cinereus*)

An arboreal, herbivorous marsupial with thick grey fur, a large head, round fluffy ears, and a large spoon-shaped bare nose. While seen walking on the ground, the legs look somewhat disproportionately long compared to the body. Up to 14kg¹¹.



Above: Colour and nighttime images of a koala, showing its very distinctive features.

Large predators (native)

Australia's large ground-dwelling native predators are strikingly few, with the dingo representing the continent's sole remaining apex terrestrial mammalian predator following the Thylacine's extinction¹⁵.

Dingo/Dog (*Canis familiaris*, *Canis dingo*, *Canis lupus dingo*¹⁶)

Dingoes and dogs can interbreed and create dog-dingo hybrids; however, the amount of hybridisation varies based on area. These can be virtually undistinguishable from dingoes. However, according to recent research, hybridisation rates are much lower than previously thought¹⁶. The wildlife camera tag Science for Wildlife uses are "dog/dingo" and therefore cover all possibilities.

If you see a dog that clearly looks like a domestic breed, we recommend it is flagged in the comments.

Dingoes are a native canid, with distinctive pointed ears, slim build, and thick fluffy tail. Coloration may vary, with blonde, dark, patchy, white, brindle and other combinations possible. Body length up to 100cm, weight can be up to 25kg¹¹.



Above: Wildlife camera picture of a domestic dog, most likely a boxer breed.



Above: Nighttime wildlife camera image of a blonde dingo.



Above: Wildlife camera images showing a black and tan dingo.

Introduced predators

Introduced mammalian predators in NSW - principally the red fox (*Vulpes vulpes*) and feral cat (*Felis catus*) - are fundamentally distinct from Australia's native predator guild in that they evolved alongside a diverse assemblage of prey species on other continents, producing highly refined predatory behaviours, that native Australian mammals did not co-evolve with and therefore have no innate behavioural defences against¹⁷.

Unlike marsupial predators such as quolls, which share a long evolutionary history with native prey and exist within established ecological relationships, foxes and feral cats are opportunistic, highly adaptable hunters capable of switching between prey types and persisting across nearly every habitat in NSW. What makes these species so ecologically destructive compared to other introduced mammals is not just their predatory efficiency, but the naivety of their prey; small native mammals evolved under predation pressure from largely ambush-style or aerial predators, leaving them catastrophically vulnerable to the pursuit-style hunting strategies of placental carnivores that can track, chase, and kill with a speed and persistence entirely outside their evolutionary experience¹⁵.

Domestic/feral Cat (*Felis catus*)

An introduced feline with varying fur patterns and colouration. A thin body, with a long pointed tail, varying fur length, broad pointed ears. Body length up to 60cm, weight around 5kg, not much more in feral cats¹¹. Feral cats in Australia are unfortunately the cause of many small mammal extinctions as they are excellent hunters and have adapted to hunting our native wildlife. It is therefore important to monitor their numbers and activity to ensure appropriate management.



Above: Wildlife camera images showing the variation of colour and pattern in feral cats.

European fox (*Vulpes vulpes*)

An introduced canid, now widespread across NSW, with a distinctive reddish-orange fur, a long-pointed snout, and a thick, fluffy tail. Mostly nocturnal. Can sometimes be tricky to identify at nighttime, as they are often running in the background of the photo but please look out for the distinctive tail shape which is normally pointing down rather than up like a dog's tail when they're running. Body length 60-75cm, weighing from 3.5 – 8kg¹¹.

TIP: Adjust the screen brightness to be able to see the animal's shape better



Above: Wildlife camera images of a red fox, showing distinct colour and appearance.



Above: Nighttime picture of a fox running in the background of the photo.

Other introduced species

Deer (Cervidae family)

Deer are not native to Australia. They were originally introduced as part of the deer farming industry, which produces Chinese traditional medicine and other deer-related products. Animals escaped or were deliberately released from deer farms, and quickly established feral populations throughout eastern Australia¹⁸. They have increased in number due to the lack of a natural predator. There are overall eight introduced species in Australia, however it is thought only five of them (chital, fallow, rusa, red, sambar) are potentially encroaching on the GBMWA¹⁸. In general, males have antlers, which fall and are regrown every year, while females do not have antlers.

On Zooniverse for this project you will be classifying them as **'deer'** rather than identifying them to the species level.

In the following pages, we will provide examples of the different deer species present in Australia.

The **chital deer** (*Axis axis*) is a medium-sized deer with a dark to rusty red coat uniformly marked with white spots in lines along the body. It has a distinctive white throat patch, dark muzzle, dark dorsal stripe, and a noticeably long tail compared to other deer species. The inner legs and belly are white to beige. Mature males have smooth, slender antlers usually with three tines each, up to 89 cm in length. Males stand around 90 cm at the shoulder and weigh up to 85 kg; females stand around 80 cm and weigh up to 60 kg¹¹.



Above: Left photo showing a chital fawn. Right photo showing a mature chital buck.

Image credit: Charles J. Sharp

Can be confused with fallow deer however a few characteristics are important to distinguish them: the chital deer has round antlers, while the fallow deer has flattened, "palmated" antlers (see next page). In the chital deer, the tail is relatively thick, and the rump is a uniform reddish colour at the base, while the fallow deer has a thinner, and at the base it is surrounded by a white patch and black outline in the shape of a heart on the rump.

Fallow deer (*Dama dama*) are a medium-sized deer with light underparts, generally gold to reddish fur on the back, and white spots. However, fallow deer can show coat colour variation, going from very dark brown to almost white. It has a distinctive white heart-shaped rump patch outlined in black, and a tail that is black on top and white underneath. Mature males have flattened, palmated antlers with numerous points. Adult males stand around 90–95 cm at the shoulder and weigh 50–100 kg; females stand around 80–83 cm and weigh 35–55 kg. Females lack antlers¹¹.



Above: wildlife camera images showing young fallow deer, during the day and night. Identifying characteristics: mottled coat, medium size (for a deer), pointed ears rather than rounded (see sambar deer description).



Above: Wildlife camera images showing a dark morph of a fallow deer with growing antlers. This animal is a young adult. Fallow deer have great coat colour variation, going from very dark brown to almost white.

Javan rusa deer (*Rusa timorensis*) is a medium-sized deer with a coarse coat that varies from reddish-brown in summer, with light chest and throat spots, to heavy dark grey-brown in winter, sometimes with a rough, broom-like appearance. Males develop a dark, heavy mane, and calves are distinctly reddish. Mature males have lyre-shaped antlers with three tines each, up to 96 cm in length. Males stand up to 110 cm at the shoulder and weigh up to 135 kg; females stand up to 95 cm and weigh up to 90 kg¹¹.



Above: Photo showing a female/doe javan/rusa Deer.

Image credit: DCCEEW Ecological Health Unit, licensed under CC BY-NC 4.0



Above: Photo showing three large buck/male javan/rusa Deer.

Image credit: Candra Firmansyah



Above: Wildlife camera image of a rusa deer male that has lost its antlers. Note the large and wide fluffy tail, and the light/cream colouring on the throat
Image credit: DCCEEW Ecological Health Unit



Above: Wildlife camera image of a large male rusa deer with antlers. Note the large and wide fluffy tail, and the light/cream colouring on the throat. Note the shape of the antlers, which are wider than sambar deer, and grow further back towards the neck rather than straight up above the head.
Image credit: DCCEEW Ecological Health Unit

Red deer (*Cervus elaphus*) are a large deer with a reddish-brown summer coat and a longer, dark grey-brown winter coat. It has a distinctive pale rump patch, long pointed ears, and a light buff colour under the chin. Calves are born with white spots that disappear by around three months of age. Mature males usually have antlers with three tines, which may grow to 90 cm, though tine number varies with condition. Males weigh 135–220 kg; females weigh 90–95 kg.



Above: Wildlife camera image showing the very short, cream coloured tail with a light creamy patch around it.



Above: Photo showing a large male in centre back, a female to the left, and a juvenile in the foreground.

Image credit: Lviatour

Sambar deer (*Rusa unicolor*) are a large deer species, with a coarse, uniform coat ranging from red-brown to almost black, predominantly dark brown. It has a light buff colour under the chin, a black tail with a paler rufous underside, and coarse, mane-like hair around the neck, particularly on mature males. The ears have large, broad, rounded lobes. When alarmed, the tail is raised. Mature males usually have three-tined antlers up to 75 cm in length¹¹.

Males may reach 2.4 m in length and weigh up to 300 kg; females may reach 2.4 m and weigh up to 230 kg. Unlikely to get picked up by our cameras, as it is not optimised for the detection of animals as large as a sambar deer.



Above: Wildlife camera images of an adult male sambar deer during the day (top) and during the night (bottom). Identifying characteristics: large, heavy-set body, mostly uniform in colour. Rufous underside to the tail, however no evidently lighter patch around it. The tail is thick rather than pointy.



Above: Wildlife camera images of a sambar deer doe at night. **Identifying characteristics:** Uniform dark colour, very heavy and thick frame, rounded earlobes.

Livestock and poultry

Cattle

Domestic cows and other cattle species. Not common on our wildlife cameras, but occasionally some lost animals may wander through from nearby private property.



Above: Photo of a classic cow. While many breeds exist, all have similar, rectangular body shapes and appearances.

Goat (*Capra hircus*)

Feral or domestic goat. In many areas of Australia goats have become a feral species, due to their adaptability to harsh conditions and ability to breed quickly.



Above: Wildlife camera images of feral/domestic goats, with distinctive faces, raised tails, and horns.

Horse (*Equus caballus*)

Introduced feral or domestic horse. In some areas of NSW horses have become feral, due to the lack of a predator species that can control their numbers naturally.



Above: Photo of a horse. While there are many breeds, sizes and colour variation, the body shape is distinctive.

Pig (*Sus scrofa*)

Introduced pigs, which are the same species as what is considered livestock in the agricultural industry. In national parks, and also on private lands, these have become a feral species, due to their adaptability to harsh conditions and ability to breed quickly. Feral pigs can show colour variation. You will see black, brown, reddish, patchy coloration.



Above: Photos of feral pigs. While there are many sizes and colour variation, the body shape is distinctive.

Sheep (*Ovis aries*)

Domestic sheep. Not common on our wildlife cameras, but occasionally some lost animals may wander from nearby private property.



Above: Photo showing a small flock of sheep.

Image credit: Wikimedia Commons

Rabbits and hares (Family Leporidae)

Rabbits and hares were introduced in Australia during the 19th century. Leporids are grazers that thrive on the same sparse groundcover that native fauna depend upon, often outcompeting them directly and causing damage to native vegetation ¹⁹.

For this project, we have **a rabbit or hare** tag, which does not require you to distinguish between the two species

European hare (*Lepus europaeus*): An introduced species with distinctive long ears, a broad nose, and long, strong hind legs giving it an upright, lanky posture. Can be confused with the European rabbit, but is distinguished by its longer legs, longer ears, and a longer tail that generally points downward when the animal is sitting.



Above: Photos of European hares showing colour variation but a distinct upright posture with long legs and ears.

Image credit: Wikimedia Commons

European rabbit (*Oryctolagus cuniculus*): An introduced species with distinctive long ears, strong hind legs, and a hunched posture. Can be confused with the European hare, but is distinguished by its stockier body, shorter ears, and a short white tail that points upward, generally visible when the animal is sitting.



Above: Photos showing a European rabbit with its rounded or hunched posture, and long ears.

Image credit: Wikimedia Commons

Reptiles and amphibians

There are very few reptiles that will be picked up by wildlife cameras, as they are cold-blooded. Varanid lizards are the ones that show up on cameras more reliably and can be identified to species in our area, anything else should be tagged as **"reptile"** regardless of whether it is a lizard or a snake.

Amphibians will not generally show up on wildlife cameras, however there is a **"frog"** tag as frogs occasionally show up in the background when other animals are present.



Above: Wildlife camera image of an eastern bearded dragon.

Monitor lizards

Monitor lizards (goannas) belong to the family Varanidae and genus Varanus. They can be distinguished from most Australian reptiles in three ways: they actively chase for prey rather than sit and ambush, they show more flexible and adaptable learning behaviours compared to most lizards, and have forked tongues similar to those of snakes, which they use to pick up scents²⁰.

On Zooniverse for this project you will have a **'monitor lizard'** category to tag these.

The following pages include some information about the two species of monitor lizards present at our study sites.

The **heath monitor** (*Varanus rosenbergi*) is a large monitor lizard, reaching up to 1.5 metres in combined length (head, body, and tail). Distinguished from the lace monitor by its darker overall colouration, particularly the distinct black banding at the back and neck, very dark feet and limbs spotted with creamy or brownish colour, and a dark head marked with yellow dots above the mouth. Dull, vaguely defined yellow stripes appear across most of the tail's length, sometimes interrupted by the blackish colouration toward the tip.



Above: Wildlife camera image of a heath monitor showing the slightly flattened sides at the beginning of the tail. Yellow bands on tail have regular width.

The **lace monitor** (*Varanus varius*) is a large monitor lizard native to eastern Australia, reaching up to 2 metres in total length and 14 kilograms in weight. Body colouration varies but typically consists of black with yellow markings, including spots and narrow stripes across the body.



Above: Wildlife camera image showing the evident yellow band all around the snout. On the tail, yellow banding of different widths.

Common birds

As the main focus of Science for Wildlife's projects is small mammals, the following list of birds are the ones that most commonly appear on wildlife cameras in the GBMWA.

Please note that this list is therefore not comprehensive and many additional species may be present. It's therefore recommended that if you know a bird species not present in the list below that you supply the species name in the comments of the Zooniverse projects classification.

Australian brush-turkey (*Alectura lathami*)

A large, mound-building turkey-like bird with black feathers, a bare red head, yellow throat wattle (pale blue in northern birds), a laterally flattened tail, and large feet. Body length up to 75 cm.





Above: Wildlife camera images showing a brush-turkey in daylight (top) with the red head and yellow throat wattle visible, and at dusk in a night-time black and white image (bottom).

Australian magpie (*Gymnorhina tibicen*)

A medium-sized passerine bird with distinctive black and white plumage, gold-brown eyes, and a solid wedge-shaped bluish-white and black bill. Body length up to 45 cm.



Above: Wildlife camera images showing the distinctive white neck patch along with white and black plumage of the Australian magpie.

Australian owlet nightjar (*Aegotheles cristatus*)

Australia's smallest nocturnal bird (night-active bird). Looks like a miniature owl with cat-like whiskers. In northern Australia they have reddish-brown wings, back, tail, head and breast and an off-white belly. In southern Australia the reddish-brown is more greyish brown. A dark brown crescent curves from the top of the eye, over the head and returns around the side of the head to under the eye. Dainty pink feet. Underside of tail is barred. Body length up to 22cm²².



Above: Wildlife camera image of an Australian owlet nightjar showing its large eyes and owl-like appearance.

Bassian thrush (*Zoothera lunulata*)

A medium-sized bird with a brown to copper-coloured body, scalloped black breast, flank and throat feathers, dark brown eyes, a white ring around the eye, and black bars on the back. Pale wing bars are visible in flight. Females are slightly smaller than males. Body length 29 cm.

Extremely difficult to spot amongst the leaf litter

TIP: go back and forth in the image sequence to detect movement in the leaf litter.



Above: Wildlife camera image cropped and zoomed in to show a Bassian thrush.

Corvus species: Australian raven (*Corvus coronoides*) or little raven (*Corvus mellori*)

A medium-sized passerine bird with all-black, shiny plumage, beak, and grey-black legs and feet. In contrast to the European raven, it also has a white eye.

For the Australian raven, the throat feathers are long and extend outward, forming a visible fan around the neck when calling. Body length up to 55 cm. If throat hackles are not obviously visible, it is virtually impossible to distinguish from the little raven.

The little raven is a little smaller, with body length of 49cm²². It can be distinguished from the Australian raven by its call (which you cannot hear on wildlife camera images), or by its white base feathers. However, please note that these are extremely difficult to spot on wildlife camera images.



Above: Wildlife camera images showing a raven of unknown species, with distinct black feathers and a white eye.

Crimson rosella (*Platycercus elegans*)

A parrot with mostly crimson plumage and bright blue cheeks, a blue tail that is pale blue below and on the outer feathers. Juveniles are mostly green with red on the forehead, breast, and undertail. Body length up to 40 cm.

Please note that this parrot species has a lot of colour variation



Above: Wildlife camera images showing the distinctive crimson plumage of crimson rosellas, as well as the colour variation between individuals as well as between mature and immature individuals.

Eastern spinebill (*Acanthorhynchus tenuirostris*)

A medium-sized bird up to 15cm long with a dark brown body. Throat white with a central brown patch. Back of neck red-brown. Top of head black (male) or grey-black (female), this colour extending along the side of the neck to the breast. Their call is a rapid trill. It has a distinctive black, white and chestnut plumage, a red eye, and a long downcurved bill.



Above: Wildlife camera image zoomed in to show the clear colour white markings on the side of the throat, with the dark outline, and rufous underparts.

Eastern whipbird (*Psophodes olivaceus*)

A medium-sized, largely terrestrial bird with a black head, breast, and conspicuous crest, with a broad white patch on the side of the face that increases in size as the bird matures. It is dark olive-green, with a long tail, and a grey-white belly. The eye is pale cream and the bill is black. Young birds are generally duller in colour and have a smaller crest. Body length 26cm²².



Above: Wildlife camera images showing the olive plumage and conspicuous crest.

Grey currawong (*Strepera versicolor*)

A robust, magpie-like bird with variably grey to grey-brown plumage, a white tail tip, white undertail and wing patches, and yellow eyes. Body length 52 cm, wingspan 78 cm.



Above: Wildlife camera images showing the magpie-like appearance but with grey-brown plumage and no white feathers.

Grey shrike-thrush (*Colluricincla harmonica*)

Medium-large bird; grey or grey-brown above. Paler, off-white underparts, with slightly streaked throat. Patch between eye and bill pale. Robust bill, with slightly hooked tip. Length 25 cm; wingspan 36 cm.



Above: Wildlife camera images showing the darker upper parts contrasting to the paler underparts, with white flecked/streaked throat.

Honeyeater Family (*Meliphagidae*)

Any Honeyeater that cannot be identified to species level. The Honeyeater family is a highly variable family, distinguished by a slender and often downcurved bill with a brush-tipped tongue for nectar feeding, and plumage ranging from plain olive-green, grey or brown to birds marked with yellow, white or bare-skin facial patches and wattles. Body length ranges from around 10-32 cm across the family, with wingspan varying accordingly.



Above: Honeyeater camera trap image, showing colouring and size next to bait station.

Kookaburra (*Dacelo novaeguineae*)

A large, robust kingfisher with a whitish head, dark brown upperparts with a light-blue wing patch, cream-white underparts, a black barred tail, and a dark brown eye-stripe. Body length of 44cm²².



Above: Wildlife camera images showing the distinctive kookaburra with its large beak, very light underparts, and dark wings with blue flecks. The brown eye band and barred tail are also visible.

Painted button-quail (*Turnix varius*)

A small, plump, ground-dwelling quail with mottled rufous, black and white upperparts providing excellent camouflage, and pale underparts marked with bold black spotting along the flanks. Body length around 17-20 cm, wingspan approximately 27-32 cm.



Above: Image of painted button-quail from camera trap images, showing camouflaging into the leaf litter.

Pied currawong (*Strepera graculina*)

A large, robust, magpie-like bird with predominantly black to sooty grey-black plumage, with patchy white undertail and wings, yellow irises, and a heavy bill. Body length up to 50 cm.



Above: Wildlife camera images of a pied currawong showing the magpie-like appearance with a broader beak, and lack of white plumage on the back of the neck.

Satin bowerbird (*Ptilonorhynchus violaceus*)

A large songbird with striking sexual dimorphism. Adult males have distinctive iridescent blue feathers that shimmer with a satin-like lustre in direct sunlight; where females are olive green with brown wings. Both sexes have blue eyes. Body length 27–33 cm²². Subadult males have similar colouration to females but are smaller.



Above: Wildlife camera image of a female or subadult male bowerbird with distinctive olive-greens plumage on the underparts, with brown wings and blue eyes.



Above: Photo of a male satin bowerbird showing its glossy blue plumage and blue eye, close to its bower.

Image credit: Joseph C Boone.

Spotted quail-thrush (*Cinclosoma punctatum*)

A small, ground-dwelling bird with mottled brown plumage, rendering it exceptionally difficult to detect against leaf litter. Males have a black face and throat, white eyebrow and throat patch, grey breast, and spotted flanks. Females have a yellow-ochre throat patch. Both sexes up to 27cm long²².

TIP: They blend in with the leaf litter very well, so you should look out for movement in the photo sequence by running back and forth through the sequence. They are often seen in groups so watch out for multiple animals!



Above: Wildlife camera image of two spotted quail-thrushes – can you see both of them?



Above: Wildlife camera image zoomed in to show the rusty plumage around the neck, and the mottled upper parts.

Superb lyrebird (*Menura novaehollandiae*)

A large, pheasant-sized terrestrial (ground dwelling) passerine with dark brown plumage, greyish-brown underparts, and red-tinged flight feathers. Adult males have an elaborate tail assemblage of long, silvery feathers, along with ornate orange, brown and grey feathers in the shape of a lyre when fully opened, reminiscent of a peacock's display.



Above: Wildlife camera images of female/juvenile male superb lyrebirds (top) showing their grey-brown and rufous colouration, and the distinctive long banded tailfeathers of a male superb lyrebird (bottom).

White-eared honeyeater (*Nesoptilotis leucotis*)

A medium-sized honeyeater 19–22 centimetres in length, found in Australia which has an olive-green upper and lower body; its wings and tail are a mix of brown, yellow and olive; the crown is dark grey with black streaks; its cheeks and throat are black; its ear-coverts are white. Its iris is red or brown (juvenile); its bill is black and its legs are dark grey. There is no sexual dimorphism, with males and females looking alike in plumage and size. They weigh approximately 20 g and have a beak length of approximately 17 mm.



Above: Wildlife camera image of a white-eared honeyeater on the back of a swamp wallaby, with its white feathers on the side of its head clearly visible, along with the black head and olive-green upper parts.

White-winged chough (*Corcorax melanorhamphos*)

A large, distinctive passerine as almost completely black with red eyes, a large white wing patch, long legs with feathered thighs, and a fairly slender, down-curved bill. Body length is usually 45 cm, with wingspan 65 cm²². These birds are gregarious and generally seen in groups.



Above: Wildlife camera images of white winged choughs, showing the almost uniform colour when their wings are tucked (top), and large white feathers when their wings are extended (bottom).

Wonga pigeon (*Leucosarcia melanoleuca*)

A large, stocky ground-feeding pigeon with slate-grey upperparts, a white forehead and throat, and bold black-and-white scalloped markings across the underparts. Body length around 36-40 cm, wingspan approximately 50-60 cm.



Above: Camera trap image of a wonga pigeon showing size and colouration against the lure.

Yellow-tufted honeyeater (*Lichenostomus melanops*)

The yellow-tufted honeyeater is a medium-sized passerine measuring 17–23 cm long, with females usually smaller²². It has a bright yellow plumage on the forehead, crown and throat, contrasted sharply by a glossy black facial mask and vivid golden ear-tufts that give the species its name. The back is olive-green to olive-brown on wings and tail, while the underparts are more olive-yellow. The bill and gape are black, eyes are brown, and the legs are a grey-brown.



Above: Wildlife camera images showing a yellow-tufted honeyeater with the yellow ear tuft visible in both, along with the other yellow markings around the face, with a dark patch around the eye.

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