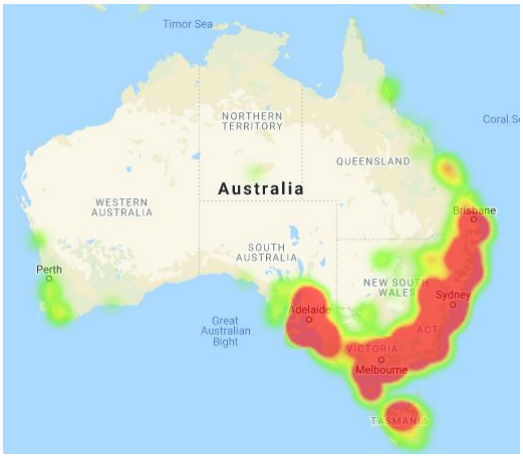
# IDENTIFYING FERAL DEER FIELD GUIDE

**This guide will help you identify feral deer species and their signs so you can report them to FeralScan.**

# PURPOSE OF THE FIELD GUIDE

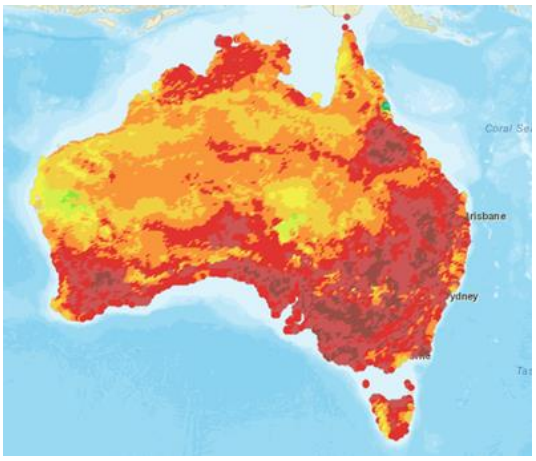
Feral deer pose a serious threat to agriculture, biodiversity, cultural heritage and our societies. Deer were first introduced to Australia in the 1800s for acclimatisation, hunting and farming. Today, established feral deer populations are exploding and spreading through Australia.




***Current reporting of feral deer***

*Dark red areas indicate areas with higher reporting levels, with green indicating lower reporting levels*

**map attributed to Feral Scan*



***Predicted spread of feral deer***

*Potential distribution of deer (six species) estimated using the Climatch algorithm. Dark red shows the areas where the habitat and climate are most suitable for one or more species of deer. Green shows areas less suitable for deer.*

Monitoring the spread of deer is an essential aspect to management. Reporting of deer sightings and evidence of damage to Deer Scan, a component of Feral Scan, is key to developing an understanding of population dynamics, where to best implement control measures, and to notify local councils of oncoming issues.

***We need your help to monitor feral deer.***

This guide outlines identification of feral deer species and their signs in the environment so that you are equipped to report them to Deer Scan.

feralSCAN

Information on how to use Deer Scan is provided at the end of the Field Guide.

DEER SCAN

***Remember – Report, report, report!***

# PART 1: IDENTIFYING THE DEER

Six species of feral deer are established in Australia.

**Fallow deer**

**Chital deer**

**Hog deer**

**Red deer**

**Rusa deer**

**Sambar deer**

The different species can have varying impacts to the environment, different population densities and are associated with different control measures. Therefore, it is important that, where possible, the correct deer species is identified. If the species cannot be identified, it is not an issue.

***A reported deer is better than a non-reported deer.***

# Fallow Deer (Dama dama)

| | Male (Buck) | Female (Doe) |
|---|---|---|
| **Height** | Up to 95cm | Up to 80cm |
| **Weight** | 60-100kg | 40-50kg |
| **Antlers** | Multi-tined, upper half palmate or flattened. Cast in October, reformed by February. Up to 50cm. | |
| **Description** | Coat colour highly variable, from black, to reddish brown with white spots, to lighter brown (menil) with white spots to white. Coat colour variants can be universally present in a single herd. Black and white markings on tail and buttocks prominent. While feeding tail is flicked continuously. 'Adam's Apple' strikingly prominent in throat of adult stags. In rut, the buck makes an unmistakable croak, similar to a grunting pig. The calls vary from high pitched bleating to deep grunts. | |
| **Location in Australia** | QLD, NSW, VIC, TAS and SA. The most widespread and established feral deer species in Australia. | |
| **Preferred habitat** | Open forest and woodland with grassy understorey. Woodland edge adjacent to grassland | |
| **Social Habit** | Outside breeding season (mid-April through to August) herds segregate into groups containing females and their offspring and groups containing bachelor males. | |

# Chital Deer (Axis axis)

| | Male (Buck) | Female (Doe) |
|---|---|---|
| **Height** | Up to 95cm | Up to 80cm |
| **Weight** | 60-100kg | 40-50kg |
| **Antlers** | Flattened antlers up 50cm with numerous points | |
| **Description** | Reddish brown to chestnut brown coat with dark brown/black muzzle white spots. Heart shaped pale rump patch with black outline. Males have a striking white throat patch. Long tail. Have a distinctive high-pitch alarm call when disturbed. | |
| **Location in Australia** | QLD, NSW, SA and VIC. | |
| **Preferred Habitat** | Chital deer graze on a variety of grasses, fruit and leaves | |
| **Social Habits** | They can form herds of more than 100. Females separate from the herd during birthing and rearing of their young | |

# Hog Deer (Axis porcinus)

| | Male (Buck) | Female (Doe) |
|---|---|---|
| **Height** | Up to 70cm | Up to 60cm |
| **Weight** | 55kg | 30kg |
| **Antlers** | Typically short, only 30-35 cm long. Usually three points on each side. Additional tines may be present in older animals.<br>Do not cast their antlers in a regular fashion; however, around August to October is most common. | |
| **Description** | Smallest deer species in Australia. In summer the coat colour is a uniform yellowish brown to reddish-brown. Sometimes pale cream spots may be present. In winter, coat colour is dark brown. Newborn calves have white spots. Tail rather long in proportion to body, white underneath and at tip. | |
| **Location in Australia** | VIC and NSW. | |
| **Preferred Habitat** | Typically found along the coast in freshwater and saltwater marshlands, heathland, woodlands and forests, often adjacent to farmland. The nearby presence of thickets of dense understorey, used for shelter, is a feature common to locations where the species occurs. | |
| **Social Habit** | Typically solitary or in small groups. Larger congregations of animals may occur where food is locally abundant | |

# Rusa Deer (Rusa timorensis)

| | Male (Buck) | Female (Doe) |
|---|---|---|
| **Height** | Up to 110cm | Up to 95cm |
| **Weight** | 135kg | 90kg |
| **Antlers** | Three lyre-like tines. Rear tine on forked pair is always longer than front tine. Round in section. Up to 96cm | |
| **Description** | Coat colour varies seasonally. Summer coat colour reddish-brown, darkening on hindquarters and lightening on chest with white throat spots. Winter coat is thicker and upper parts are greyer. Stags often develop thick mane. Newborn calves have a rich red coat colour. | |
| **Location in Australia** | NSW, QLD and SA, only isolated populations are found in VIC. | |
| **Preferred Habitat** | Cleared grassy areas but also heathlands, woodlands, forests and rainforest | |
| **Social Habit** | Outside breeding season stags remain segregated from hinds and their offspring. Often seen in small groups | |

# Red Deer (Cervus elaphus)

| | Male (Buck) | Female (Doe) |
|---|---|---|
| **Height** | Up to 120cm | Up to 90cm |
| **Weight** | 135-220kg | 95kg |
| **Antlers** | Multi-tined, six to eight tines common, 10-12 less frequent. Round in section. Cast in October or November, reformed by February. Up to 90cm | |
| **Description** | Coat colour changes seasonally, being reddish in summer and greyish brown in winter. Regardless of time of year, a lighter yellow-coloured rump patch is prominent. Calves have white spots along flanks when first-born, which tend to fade within a few months. Tail is small and indistinct. Ears long and pointed | |
| **Location in Australia** | VIC, NSW and QLD. | |
| **Preferred Habitat** | Open forest and woodland with grassy understorey. Woodland edge adjacent to grassland. They may be seen in open areas but usually only when it's close to thick, timbered vegetation | |
| **Social Habit** | Outside breeding season (mainly April) stags remain segregated from hinds and their offspring, with hinds forming matriarchal herds. Males are often territorial during mating season and roar to attract receptive females | |

# Sambar Deer (Cervus unicolor)

| | Male (Buck) | Female (Doe) |
|---|---|---|
| **Height** | Up to 160cm | Up to 115cm |
| **Weight** | 300kg | 230kg |
| **Antlers** | Lyre-like with three tines per antler – a single brow tine and a terminal forked set of tines. Round in section. The front tine of the forked pair may be an extension of the main antler beam and can sometimes be longer than the rear tine. This is different from the Rusa Deer where the rear tine of the fork is always the longest. Up to 70cm.<br>Antlers can be cast at differing times, though typically late-spring through early summer. | |
| **Description** | Largest wild deer species in Australia. Coat colour is uniformly dark brown, though lighter coloured on the belly and the inner sides of each leg. Characteristic large rounded ears, about half the length of the head. When disturbed, individuals will raise bushy tail over back and rump-hair will flare. | |
| **Location in Australia** | SA, NSW and VIC | |
| **Preferred Habitat** | Widespread and adaptable species. Though often associated with tall wet eucalypt forest, often occurs at the edges of farmlands, and is known to inhabit heathland, woodland, dry forest and rainforest. | |
| **Social Habit** | Solitary or in small groups. Outside breeding season stags remain segregated from hinds and their offspring. During breeding cycle, adult stags attract multiple hinds by the use of an elaborate array of ‘signposts’ – including wallows, scrapes and preaching trees that are routinely scent-marked. | |

# PART 2: IDENTIFYING SIGNS IN THE ENVIRONMENT

Deer evolved in harsh conditions with many predators. Due to a lifetime of remaining hidden, they are natural experts at avoiding detection. Their aversive behaviour leads to the common misconception that deer are not in an environment. Camera traps and thermal surveys; however, repeatedly reveal shocking results on high densities of deer in regions with a lack of sightings.

Fortunately, while feral deer are aversive and difficult to sight, they will leave obvious signs in the environment. Signs include scats and tracks, rub trees, browsing, wallowing and scrape trees. See below to learn how to identify deer signs.

*Feral deer exclusion fence in Yellingbo, VIC demonstrating the impact to understorey vegetation density.*

# DEER SCAT

Deer produce rounded, oval, or oblong scats that may be deposited singly or in clumps containing large numbers of pellets. Clumps of deer scat usually break down into separate pellets upon contact with the ground.

The size and form of scats may vary within and between different species of deer but are roughly 1cm.

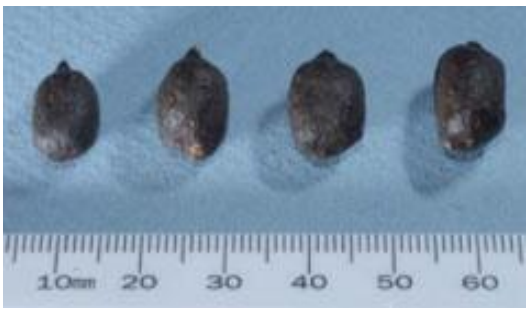
In a field situation, deer scats can be most easily confused with those produced by other introduced herbivores such as goats and sheep.

Compared to deer; goat scat is irregular in shape and has a distinct pointed end and sheep scat is cylindrical in shape and the end is dimpled or rounded.

**Fallow Deer**


**Red Deer**


**Goat**

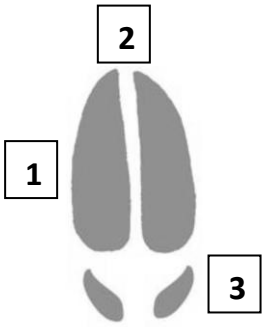



**Sheep**

# DEER PRINTS

**Distinguishing features:**

1. Two elongated toes make up the hoof
2. Slight gap between toes on both feet
3. In soft soil, can leave impression of dew claws behind print




Red deer male front and rear hooves in mud

Red deer male front hoof

Red deer female front hoof

Multiple red deer tracks

Deer tracks are not easily distinguished from goat, sheep or pig but are generally larger

**Deer**

**Goat**

**Sheep**

**Pig**

# RUB TREES / RINGBARKING

A

B

C

**Behaviour:** During growth, deer antlers are covered in a sensitive skin coated with hair, known as velvet. Deer may rub off the velvet by rubbing their antlers on vegetation, causing thrashing and removal of bark from trees.

**Impact to the environment:** Removal of bark can cause weakness or death of the tree by interfering with the transport of nutrients from the soil.

**What to look for:** Rub trees will be found throughout a deer's home range but will likely occur in areas that are the focus of their activities – on game trails, around wallows or rutting areas and around feeding areas. Once you know the signs, deer rubs can be easy to identify and are a good indication for presence of deer within a region.

Deer rubs can be on a range of vegetation types, from annual weeds, to tussocks, shrubs, saplings and all the way through to large trees. Some species of vegetation appear to be preferred over others, and this will vary across regions.

Saplings and shrubs will be 'thrashed' looking twisted and broken, and depending on type, with bark removed (Picture A). Trees offer more resistance and may show gouges in the bark, often exposing the underlying sapwood (Pictures B and C). Rub trees may be covered in mud by stags following wallowing.

Very old rubs will be obvious – any exposed sapwood will be grey, and any damaged bark will have either healed completely or have turned dark brown. For more recent rubs, damaged bark, and shavings at the foot of the tree may have started to turn brown. A simple test that gives an indication of how fresh a rub is involves making your own mark next to the genuine article.

# WALLOWING

**Behaviour:** Male deer create muddy pools or wallows by rolling around in a damp or wet patch of earth, in the process covering themselves in mud. Wallowing is to mark scent and attract females. Female deer will commonly visit a wallow.

**Impact to environment:** Wallowing causes excess water to become trapped which negatively impacts plant growth and seedling establishment. During wallowing behaviour deer can spread diseases into the water leading to increased spread of disease from deer to fresh flowing streams and rivers. Frequent trampling on surrounding ground by visiting females causes increased damage.

**What to look for:** Wallows are usually found in the middle of dense cover or in the semi-open where ground cover is cleared for a radius about them. Typically, wallows are in drainage lines, in swampy ground or seepage areas.

When a wallow is in use it will look like a muddy hole, often with water in it, and lots of tracks around it. Often, indents or scrapes made by legs and antlers will be present. Wallows vary in size but are typically a couple of metres across and perhaps 30 or 40 centimetres deep. Even when dry, not recently used, or grassed over, a wallow can be identified from its shape, old deer tracks and location in or next to a drainage line, on a damp bench or in a tree-stump hole.

# BROWSING

**Behaviour:** Deer are medium to large herbivores that are required to consume extensive volumes of plant matter. Diet modelling showed that the feral deer population consumes around 36 million litres of native plant material per year. That's 14 and a half Olympic sized swimming pools. The same study estimated that a single feral deer consumes as much plant material as nearly four adult swamp wallabies daily (Moriarty 2004).

**Impact to environment:** Feral deer are described as ecosystem engineers due to their ability to completely alter ecosystems. For example, feral deer are associated with simplified vegetation communities, both through reduction in species diversity and density. Native vegetation is particularly impacted by feral deer because they may not have coevolved specific defences to resist impacts. Selective browsing of plants impacts ecosystem composition and can favour growth of invasive plants. Simplified vegetation communities have been demonstrated to have significant flow-on consequences for animals such as the Malleefowl and Helmeted Honeyeater. In other countries, flow on effects have been demonstrated to impact the mycorrhizal network below ground.

**What to look for:** It can be difficult to differentiate browsing by deer compared to other herbivores. To be sure, it is best to look for other signs of feral deer presence such as scats and tracks. Plant browsing signs by deer include excessive hedging of plants, or obvious browse lines at a height not possible by other animals (around 1.5-2m high). Deer only have teeth on the front bottom of their jaw, so they tend to crush branches rather than have clean cuts. Feral deer browse on essentially all vegetation.

# TRACKING

**Behaviour:** Tracking refers to the formation of tracks due to constant movement of deer.

**Impact to the environment:** The process of tracking destroys ground covering plants leading to increased soil erosion. Treading of deer hooves breaks up the soil structure, encouraging the trapping of water and formation of soft mud, known as soil pugging. Plants are unable to grow in soil that has been subject to pugging, causing negative impact to plant survival. Tracking by deer opens areas to other herbivores. Lastly, deer can spread weeds along the track.

**What to look for:** Tracks that have formed in an otherwise vegetation covered landscape. Look for deer prints as described in the previous page.

Areas with increasing populations of feral deer will show an increased number and density of track formation.

# SCRAPES AND PREACHING TREES

**Behaviour:** Scrapes and preaching trees are used as a place for social communication between bucks and hinds leading into the rut.

**Impact to the environment:** Similar impacts to both ringbarking and tracking.

**What to look for:** Male deer mark a tree with their antlers and scrape the earth patch at the base of the tree with its front hooves. Typically, it is under an overhanging branch or beneath a tree with protruding limbs that are within reach of a stag when he stands up on his hind legs.

The actual scrape can vary from just a shallow bowl in hard ground to a very pronounced hole in more easily worked soil.

Scrapes and preaching trees are not common, compared to ringbarking and tracks.

# RECORD YOUR DATA ON DEER SCAN

DeerScan (a component of FeralScan), is a free community resource for recording sightings of feral deer, reporting the damage they cause, and documenting control actions you undertake – www.deerscan.org.au

Information you enter about feral deer and their impacts in your local area will help local biosecurity authorities to manage feral deer populations to reduce the damage they are causing. Feral deer are becoming a major pest throughout Australia – your help is important!!

## How to get started

1. **Register your details**

Register your details in DeerScan by going to www.deerscan.org.au. You do not need to register but it will make it easier for you to view your own data and enable the FeralScan team to contact you about deer information in your local area.

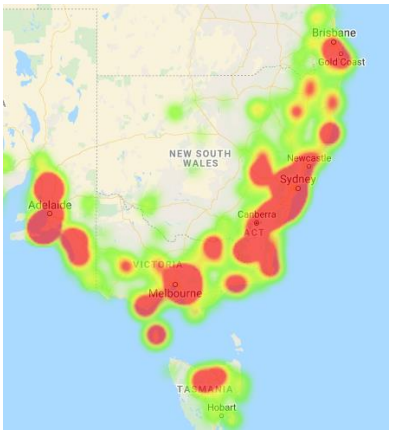
2. **Download the Feral Scan app**

Feral scan can be downloaded from the Apple Store or from Google Play.

3. **Record your observations**

Record sightings or signs of feral deer either using the Feral Scan app or on the website. Fill in as much detail as you can e.g., species, number and/or extent of damage. To enter location, zoom to your current location and place a marker on the map.

4. **Submit your record**



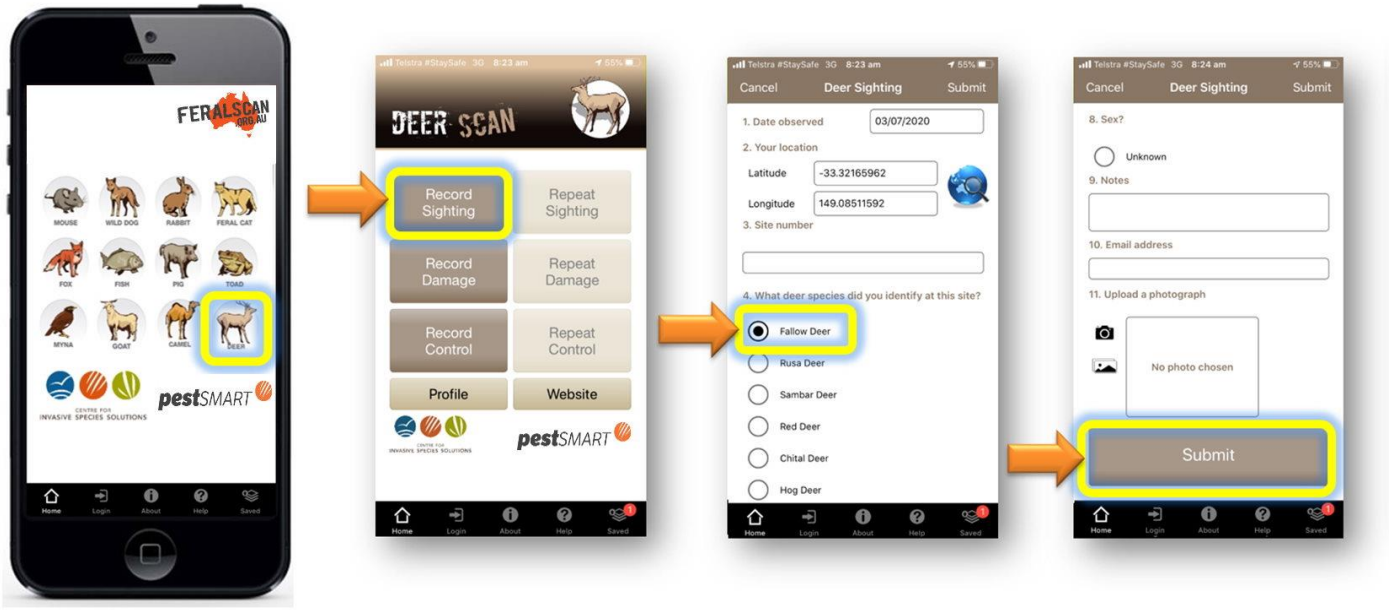

Submit your record and view the details in the All Sightings or My Data tabs. You can also upload your photos to the Photo Gallery, and they will display on the website.

**Please note:** All deer information you enter will be managed securely and discretely. The highest resolution of publicly available data on the location of your sighting is the heat map seen on the left. It is kept at this resolution for privacy reasons.

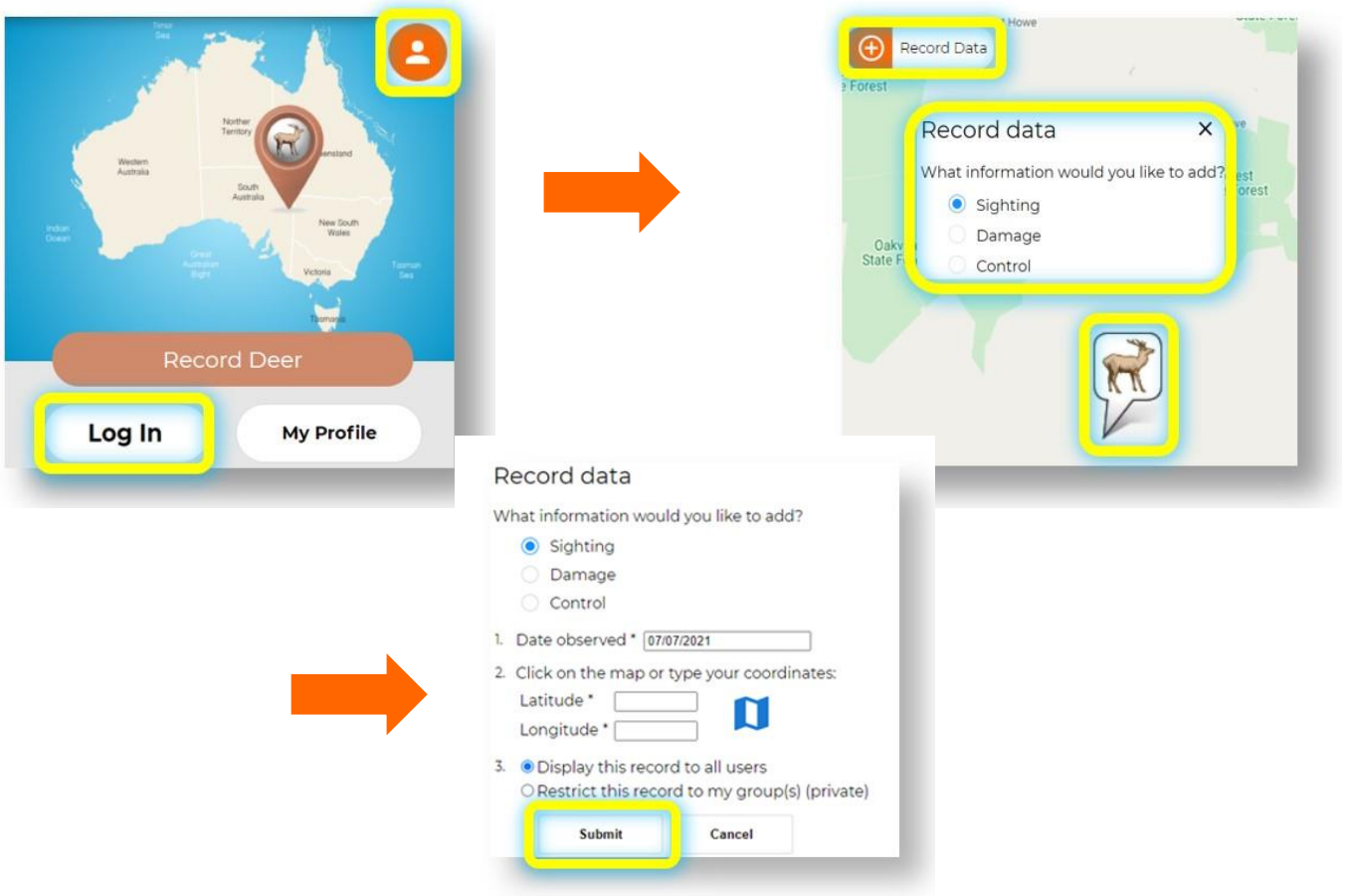
Please contact Feral Scan if you have any questions:

# RECORD YOUR DATA ON DEER SCAN

## On your phone application:




## On your computer:



**Credits**

Images of feral deer impacts, and signs attributed to Luke Woodford, Gaye Gadsden, Jane McKenzie and Auscape International, Mel Schroder/DPIE

Image of feral deer heat map attributed to Feral Scan

Images of feral deer attributed to the Victorian Game Management Authority.

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Tweed Shire Council, Nillumbik Shire Council.

**References**

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Game Management Authority, Victoria. May 2019 www.gma.vic.gov.au/hunting/deer/deer-species

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