

WILD ICON OR FERAL PEST? Australia has the largest population of wild horses in the world. Generations of wild-living has allowed them to adapt to unpredictable resources and climatic extremes. They have captured the popular imagination, and may be Australia's most contentious invasive species. This is the stallion 'Snowy Nose' from harem 5, one of 72 harems studied by the author. *Photo: Magdalena Zabek*

A MILLION *wild* HORSES

Passionate about both horses and the Australian environment, ecologist **Magdalena Zabek** has been studying one of the most adaptable and contentious invasive animals.

Success! After a long day of walking horse trails, I have 'ambushed' a group of wild horses without alerting them. They are grazing, and only one horse is attentively looking around. He is stocky and covered in scars from fights with other stallions. His mane and tail are tangled with seeds. I recognised him instantly as 'Snowy Nose' by the long, white stripe on his face and short tail, probably chewed by one of his foals.

I have been observing Snowy Nose and the mares and offspring of 'harem 5' for over three years, recording them 56 times since my first survey of feral horses in these forests.

Snowy Nose is ferocious in defending his harem. I have seen him emerge victorious from numerous encounters with stallions from other harems and bachelors trying to steal his mares, but he has been injured a couple of times. No wonder he is constantly on the lookout. Three years is a long tenure for an older male in this forest, where the horse density and competition for mares is high. The horses of harem 5 share their 20 square kilometre home range with at least 80 others.

Despite their prowess, stallions tend to be followers rather than leaders in their harem. The lead mare makes most decisions about when and where to go for water and food. In harem 5, the lead mare and another mare remained loyal to Snowy Nose for the duration of my study, but a younger mare left to join another harem.

The two older mares each foaled twice over three years. This rate is about average for the feral horses around here but low compared to those in more fertile regions. Of the three offspring that survived, one colt joined a bachelor group in the neighbourhood, one female left when she was three years old, and her younger sibling remained with the harem.

Southeast Queensland's forest horses

The Snowy Nose harem and 1400 or so other feral horses live among the exotic pine trees of a plantation in southeast Queensland covering 1000 square kilometres. They are probably descended from horses used to drag forestry equipment until mechanisation in the 1940s, as well as from unwanted domestic horses.

My task was to investigate their population ecology to provide information essential for managing them. The plantation managers were concerned about the high risks of cars and logging trucks colliding with them. My broader goal was to better understand the extraordinary adaptations and increase in numbers of feral horses in Australia.

Feral horses are shy and typically run away at the slightest perception of threat. This makes them difficult to study, and it has taken me several years to learn how to approach them in the various landscapes they occupy in Australia.

From 2011 to 2014 I tracked the fortunes of more than a third of the forest horses by surveying them monthly. I identified – by size, colour, markings, mane length and other features – 522 individuals living in 72 harems and 29 bachelor groups. Harems typically consisted of one stallion, two to three mares and two offspring. About half the mares stayed loyal to their harem over the three years. The bachelor groups of two to six horses were much more fluid in their membership, often changing over days to weeks.

Most foals were born in spring to summer, when food was most abundant. At this time older siblings, by then 2 years old, would usually leave their harems, the colts joining a bachelor group and the fillies another harem or a lone bachelor.

The mares were not in great condition, because pregnancy and lactation are energetically demanding, and probably because their forage is of low quality. The soils in these forests are infertile and the monoculture of pines increases soil acidity and limits the germination of grass, so most mares foaled only every second year. Although the rate of reproduction was low, the population was nonetheless growing by about 9% a year, with the potential to double within a decade.

Strong as a horse

I have spent most of my life working with horses – as a horse rider, trainer and equestrian coach – and trying to understand their behaviour. Only when I started studying the social life of wild horses did I realise just how adaptive and tough they are.

Domestic horses are selectively bred for speed, height and high rates of reproduction. In wild horses natural selection has favoured different attributes. Flexible behaviour allows them to survive and reproduce under a wide range of ecological conditions and withstand climatic extremes. The vastly different climates they experience, ranging from the extreme heat and aridity of the central deserts, the high humidity of the north, and the intense cold in the Australian Alps, attest to their adaptability. In the deserts, where pasture diversity is low and water is limited, horses often have to travel long distances ▶

Flexible behaviour allows them to survive and reproduce under a wide range of ecological conditions and withstand climatic extremes.



The horses in the pine forests prefer open habitats, such as where pine trees have been harvested. These offer more diverse and more palatable undergrowth vegetation, and allow them to more easily detect danger. Photo: Magdalena Zabek



Their hard hoofs and big appetites can cause great damage.

A harem walks in single file among saltbush and mulga shrub in central Australia towards the only permanent waterhole in the vicinity. Photo: Magdalena Zabek



and drink sporadically. During winter in the Australian Alps they eat snow to quench their thirst and dig in snow for plants. In the coastal southeast, where food and water are more plentiful, they lead a more sedentary lifestyle. Although feral horses generally select high quality pasture, and prefer grasslands and heathlands, they also browse on bushes and shrubs, and even nibble on eucalypt bark.

Australia's feral horses are generally shorter and stockier than their domestic counterparts. On the east coast they are mostly bay or chestnut, colours which help them blend into woodlands. Elsewhere, they can also be tan, cream or have large white patches. Alarmed horses often freeze behind trees and bushes, where they are well camouflaged.

A feral problem

Each state and territory except Tasmania has large feral horse populations. With almost no predators – dingoes are thought to prey on young foals only – and little or no human management, numbers have been increasing. From ground and aerial surveys in the early 1990s, it was estimated there were 400,000 to 600,000 feral horses. There has been no census since but there may be as many as 1 million now. This figure is based on a population growth rate of 9%, the average rate of growth from studies in four locations, including my study in southeast Queensland.

The main barrier faced by feral horses in some areas is the unpredictability of forage and water, particularly in arid regions, which can drastically affect the survival rate, particularly of foals and older horses. In 2009-2010, during a prolonged drought in central Australia, I witnessed horses queuing at a permanent spring after they had travelled up to 50 kilometres from where

they fed. They returned on well worn tracks to the spring every one or two days, past the carcasses of others dead from thirst, starvation or ingestion of toxic plants. Each time they were skinnier and slower.

Big rains at the end of 2010 transformed the landscape. The waterholes and creeks filled and the land was green with new growth. The spring, degraded from so many thirsty animals, was abandoned as the horses spread out to find the best feed. Their body condition improved, and a few months later the foaling season was in full swing. They would soon regain the lost numbers.

Ecologists and conservationists are deeply worried about the increasing wild horse populations in Australia, particularly in arid and alpine regions and national parks. Their hard hoofs and big appetites can cause great damage, through plants being trampled and overgrazed, soil compaction and erosion, and the spread of weeds. Creek and river banks are particularly sensitive to erosion. Horses may compete with native wildlife such as kangaroos, particularly in heavily grazed areas or during droughts, and deplete scarce water supplies. After wild horses were removed from the Finke Gorge National Park and the MacDonnell Ranges, numbers of black-footed rock wallabies and rock-rats rebounded.

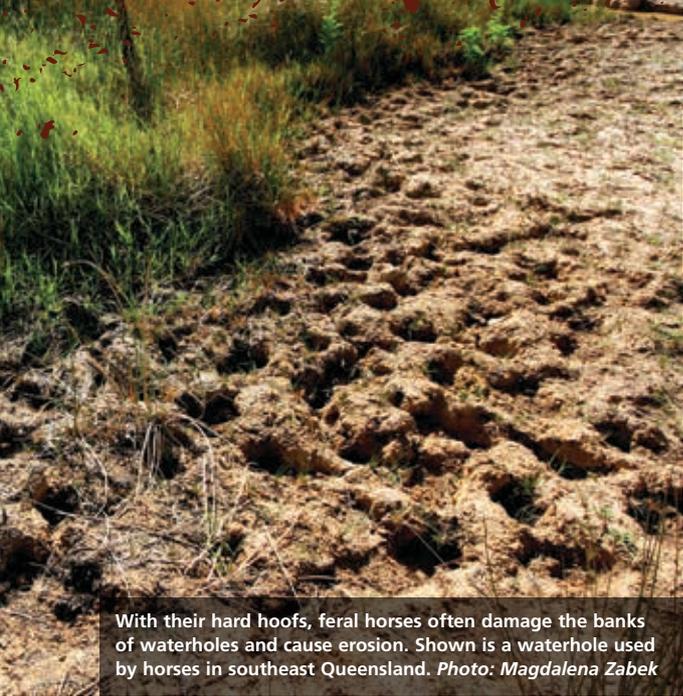
Not all their impacts are necessarily negative. In landscapes where fire needs to be managed, horses may help reduce the fuel load. And they may enhance the growth of some native plants by grazing competing vegetation. This is the case in some European environments but has not been tested in Australia. Semi-wild Konik horses in northern Europe are used to restore natural ecological processes in grassland, marshland and wetland environments, by reducing the density of shrubs to the benefit of rare birds.



Photo: Magdalena Zabek

DISPUTES BETWEEN WILD STALLIONS

A stallion spends a lot of time and energy defending his harem, but most challenges are settled without a fight. When he spots an intruder, he usually runs authoritatively towards him, and they follow a 'showing-off' ritual. Standing shoulder to shoulder, they sniff each other, then toss their heads, lift the front legs and kick the hind legs while whinnying and snorting loudly. Then each of them defecates. Unless the intruder decides to escalate the encounter into a fight, they then shove and push before separating and retreating. Such 'meetings' occur daily and rarely lead to aggression. The ritualised display is thought to be a safe way for stallions to assess the ability of each other to defend or take over a harem.



With their hard hoofs, feral horses often damage the banks of waterholes and cause erosion. Shown is a waterhole used by horses in southeast Queensland. Photo: Magdalena Zabek



Aerial mustering of wild horses is often done in conjunction with management of other feral animals. In this central Australian muster, horses, camels and cattle were captured, loaded onto a transporter and taken to an abattoir. Photo: Magdalena Zabek

Management dilemmas

Australia has by far the largest wild horse populations in the world. While this is celebrated by some and rued by others, there are also sizeable populations in many other countries. North America has over 40,000 and Spain over 15,000. Wild horses occur in all except the polar climate zones.

The management of wild horses is controversial almost everywhere, with many people opposed to killing them. North American mustangs are managed by removal and in certain areas by immunocontraception. In Galicia, Spain, there is an annual roundup and removal of foals, with some adopted but most going to abattoirs. In New Zealand the Kaimanawa wild horses in the mountains of the north island are rounded up every second year and 'excess' horses are either rehomed or sent to the abattoir.

There is no consistent approach to feral horse management in Australia. Control methods include trapping, ground and aerial mustering, and ground and aerial shooting. Some trapped and mustered horses are relocated or taken to abattoirs, while sick and old individuals are usually shot. Aerial shooting has occurred in remote or inaccessible areas, often with culling of other feral herbivores.

Animal welfare groups and horse groups often promote capture and adoption as the most humane method of suppressing wild horse populations. But the adoption rate is

very low, totalling only 200 or so animals each year. Most horse-lovers lack the interest or skills to train a wild horse and the domestic horse market is oversaturated.

Environmentally harmful but also beautiful and culturally valued, feral horses are one of Australia's biggest conservation challenges. The existing management approaches are not a panacea, but they are much better than doing nothing and allowing populations to grow. They can be kinder for horses than letting them die from starvation or thirst. Feral horses are escaped or released livestock, and perhaps they should be treated like that. ■

READING: Dawson MJ, Hone J. 2012. Demography and dynamics of three wild horse populations in the Australian Alps. *Austral Ecology* 37:97-109 ■ Dobbie W, Berman D. 1993. *Managing Vertebrate Pests: Feral Horses*. Australian Government Publishing Service ■ Zabek M. 2015. *Understanding population dynamics of feral horses in Toolara State Forest for successful long-term population management*. PhD thesis. The University of Queensland.

DR MAGDALENA ZABEK is an ecologist in the School of Veterinary Science at the University of Queensland. Her research focus is on how environmental conditions influence the population dynamics of wild animals. Her work demonstrates the value of better understanding the ecology of animals to formulate effective wildlife management programs. As a photographer, film maker, and horse lover, her passion is capturing the social interactions and behaviours of wild horses.

AUSTRALIAN MARES USE FERTILITY CONTROL

Animal welfare groups advocate fertility control as the most logical and humane solution to the problem of wild horses in Australia. But many international studies have shown it is only feasible in small, contained and accessible populations where every individual can be identified. This is not possible in Australia, where horses are widely dispersed across remote and rugged landscapes. To administer immunocontraceptives usually requires capturing or darting a horse and several doses are required to induce infertility for 2-3 years.

Moreover, Australian horses practise their own method of fertility control, which would undermine its use as a management method. Here, mares invest heavily in their young, leading to a high rate of survival for their offspring. But the high energy costs of pregnancy and lactation limits their fertility. In many Australian environments they are able to foal only every second year.



Photo: Magdalena Zabek