



Fallow Deer at Five Rivers Reserve in Tasmania's Central Highlands. As deer numbers increase, livestock production is likely to suffer substantially. Photo: Tasmanian Land Conservancy

Fallow Deer in Tasmania: a population set to explode

Tasmania's population of Fallow Deer has more than tripled since the 1970s and in the next 10 years (2014–2023) it is likely to grow further by about 40%. By mid-century, the population could exceed one million.

Fallow Deer damage the environment and are a biosecurity risk, but in Tasmania they are partly protected for recreational hunting.

As deer numbers increase, livestock production is likely to suffer substantially. Deer will compete with sheep for food, potentially displacing much of Tasmania's sheep production, and the risk of disease being transmitted to livestock will increase with deer density.

Impacts on natural vegetation, especially in the Tasmanian Wilderness World Heritage Area, will become progressively larger.

Policymakers should increase the rate of removal of deer to prevent the population from growing further, and reduce numbers in locations where conflict with agriculture and/or the environment is greatest.

Research summary

Tasmania's population of Fallow Deer is growing. Fallow Deer damage the environment and conflict with agriculture, but in Tasmania the species is partly protected for recreational hunting.

We conservatively estimate that in 10 years (2014–2023) the population will increase by about 40% and by mid-century could exceed one million.

Livestock production is likely to suffer substantially as deer compete with sheep for food and the risk of deer transmitting disease to livestock increases.

As deer spread into central and northern Tasmania, the Tasmanian Wilderness World Heritage Area is likely to be damaged.

Fallow Deer damage the environment and spread disease

Fallow Deer are recognised as an invasive pest species for two main reasons:

- They damage agricultural land and native vegetation by overgrazing, eating branches (browsing), trampling, ring-barking, rubbing their antlers against trees, spreading weeds, creating trails, concentrating nutrients, causing erosion and, consequently, degrading water quality in creeks and rivers.
- They can transmit diseases to domestic livestock because they are biologically similar to domesticated hoofed mammals. They carry diseases such as cattle tick, Leptospirosis, Johne's disease, brucellosis, bovine tuberculosis, rabies, and foot-and-mouth disease.

Deer numbers and range have grown fast

Fallow Deer (*Dama dama*), the only deer species in Tasmania, were introduced to the state in the 1830s. In recent times, deer have escaped from deer farms and some have been illegally relocated. In the 1970s, an estimated 7000–8000 deer occupied a region of about 400,000 hectares. By the early 2000s, the population had more than tripled to at least 20,000–30,000 deer occupying 2.1 million hectares.

The species is partly protected for hunting

In Tasmania, the Fallow Deer is partly protected under legislation as a recreational hunting resource; during open season, licensed hunters may kill a specified number of deer. Landholders can also get permits to kill deer to protect their crops and pastures. However, our analysis suggests that current levels of hunting are too low to control the growing numbers of deer. Calls to cull the animal in Tasmania have increased.



Fallow Deer at Five Rivers Reserve in Tasmania's Central Highlands. Fallow Deer can transmit diseases to domestic livestock. Photo: Tasmanian Land Conservancy



A Fallow Deer stag at Five Rivers Reserve in Tasmania's Central Highlands. Photo: Tasmanian Land Conservancy

What does the future hold?

To balance the conflicting management goals of preserving deer for recreational hunting and limiting their damage to the environment, policymakers need estimates of the future deer population under different management scenarios. Making these estimates is difficult because no systematic survey of deer distribution and abundance has been done for Tasmania.

We developed a population model for Fallow Deer in Tasmania, using the best available estimates of population size, range, distribution and population growth rates. We estimated the number of deer, and their geographic spread, through the next 100 years, and considered the effects of several possible management strategies. We conservatively estimated the carrying capacity in optimal habitat at 50 deer per square kilometre, adjusting this number in relation to the climatic suitability of habitats at a 5-kilometre scale.

The population is set to explode

Under the current management regime of licensed hunting, we conservatively estimate that in the next 10 years (2014–2023) the deer population in Tasmania will increase by about 40%. Uncontrolled, the population could exceed one million by the middle of this century. The population could grow even larger if the climate becomes more suitable and more habitat becomes available.

The current rate of killing of Fallow Deer by licensed hunters and landholders will make almost no difference to the likely size of the population 20 or 30 years from now.

Uncontrolled, Tasmania's Fallow Deer population is expected to exceed one million animals by the middle of this century.

Livestock production is likely to suffer

A large deer population would compete with sheep for food and could displace much of Tasmania's sheep production. The probability of deer transmitting disease to livestock would increase with deer density.

The Tasmanian Wilderness World Heritage Area is at high risk

While Fallow Deer favour areas where forest is interspersed with grassland, they are found in a wide variety of habitats from forests to open grasslands and including scrublands, sub-alpine vegetation and arable lands. This flexibility suggests that, as long as the climate is suitable, Fallow Deer could live almost anywhere in Tasmania except, perhaps, the densest and wettest forests.

In the near future, deer are likely to spread into central and northern Tasmania where now few deer are found. Some of these areas are highly sensitive to environmental impacts from deer, especially the central highlands of the Tasmanian Wilderness World Heritage Area which has a high density of bogs that could be trampled.

Recommendations for policymakers

To prevent deer from damaging natural vegetation and impacting on livestock production, policymakers should increase the rate of removal of deer to prevent the population from growing further, and reduce numbers in locations where conflict with agriculture and/or the environment is greatest.

Where to from here?

We are collaborating with the Tasmanian Land Conservancy and other land managers to better define the impacts of deer and run field trials to develop approaches for effectively reducing deer populations. New research is also needed to develop more detailed models to further test the impacts of alternative management scenarios.

Who are the researchers?

Professor Chris Johnson



Chris leads the hub's Wildlife Project which is developing distribution models for species of mammals, birds, frogs and reptiles; examining habitat-climate patterns for Tasmania; and modelling distributions of invasive animals in the Australian Alps.

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Collaborators

Nick Beeton, David Bowman, Grant Williamson, Ted Lefroy (University of Tasmania).

Further reading

Potts JM, Beeton NJ, Bowman DMJS, Williamson GJ, Lefroy EC & Johnson CN (in press) The historic, current and potential status of introduced Fallow Deer (*Dama dama*) in Tasmania, Australia. *Wildlife Research*.

About the NERP Landscapes and Policy Hub

The Landscapes and Policy Hub is one of five research hubs funded by the National Environmental Research Program (NERP) for four years (2011–2014) to study biodiversity conservation.

We integrate ecology and social science to provide guidance for policymakers on planning and managing biodiversity at a regional scale. We develop tools, techniques and policy options to integrate biodiversity into regional-scale planning.

The University of Tasmania hosts the hub.

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