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A buck too far: an analysis of the economic, social & environmental cost of deer in Tasmania

A report for the Invasive Species Council | May 2026

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Contents

Tables

Figures

Boxes

Executive summary

Fallow deer (*Dama dama*) are an introduced invasive species in Tasmania whose population and distribution have increased rapidly in recent years. The most recent aerial survey (2024) estimated there to be 71,655 deer in the surveyed range, up from 53,660 in 2019[1]. This number is likely to increase as the area of climatically and environmentally suitable habitat for fallow deer expands over time[2]. This risks spread into new regions, including areas of high conservation value.

While there is broad recognition that deer can impose a variety of economic, social, cultural and environmental costs on the community, the impacts of deer in Tasmania have not been well-quantified. This can hinder decision-makers' ability to make informed decisions about deer management and control.

This report, prepared by Frontier Economics for the Invasive Species Council, examines the economic, social and environmental costs imposed by deer in Tasmania. In doing so, this report aims to highlight the likely benefits of reducing deer numbers to a more sustainable level. The analysis is intended to support decision-makers by providing an evidence-based estimate of the costs of inaction.

Why the costs of inaction matter

Deer can impose a wide range of costs on the Tasmanian community. These include:

- **Economic costs,** such as reduced agricultural production (through grazing competition and crop damage), reduced forestry production (through browsing, rubbing and ringbarking), private landholder costs of managing deer (time and resources), increased risks of disease transmission to livestock, and deer-related vehicle incidents.
- **Social costs,** including reduced recreation and amenity values in parks and reserves, road safety impacts, and impacts on Indigenous cultural heritage.
- **Environmental costs,** including damage to native vegetation and habitats through browsing, trampling and soil disturbance, facilitation of weed spread, and increased restoration and conservation costs.

Not all of these impacts can be readily expressed in dollar terms. For this reason, this report applies an economic framework to identify, quantify and, where possible, and monetises changes in real resource outcomes associated with deer presence in Tasmania.

Approach

Consistent with best practice economic evaluation and the Infrastructure Australia[3] guidance, our analysis estimates the costs of deer in Tasmania over a 30-year period (2025–2054). It is based on:

[1] Lethbridge M & Shute E (2025). The 2024 aerial survey of fallow deer in Tasmania. Report to the Department of Natural Resources and Environment Tasmania.

[2] Potts, J. M., Beeton, N. J., Bowman, D. M. J. S., Williamson, G. J., Lefroy, E. C., & Johnson, C. N. (2015). Predicting the future range and abundance of fallow deer in Tasmania, Australia. Wildlife Research, 41(8), 633-640.

[3] Infrastructure Australia (2021) *Assessment Framework 2021: Guide to economic appraisal*. Canberra: Infrastructure Australia.

1. Forecasting deer numbers under current management settings, using inputs including starting deer density, a population growth rate, an assumed carrying capacity, and the geographic area of Tasmania (with deer densities differentiated across management zones). Note due to data constraints, deer numbers were not forecasted across the whole state but only for the Midlands and eastern regions with a known population estimate.
2. Reviewing available literature and evidence on deer impacts in Tasmania and elsewhere in Australia.
3. Estimating changes in economic, social and environmental outcomes as a result of deer presence in Tasmania.
4. Valuing key impacts by applying relevant unit values and discounting future costs using a 7% social discount rate (central case).

Given data constraints, the report focuses on the impacts most likely to be material and for which there is sufficient information to support defensible quantification and valuation. Other impacts are included qualitatively.

Estimated costs of deer in Tasmania

Under the central estimate, the total accumulated cost of deer in Tasmania over the next 30 years, assuming no escalation in the costs of impacts, is estimated to be around $754.1 million ($FY25m, PV terms, 7% discount rate). This cost is made up of:

- $98.2 million in the cost of deer-related vehicle accidents
- $23.4 million in the cost of lost cropping production due to deer-related grazing
- $360.8 million in the cost of animal husbandry
- $22.5 million in costs from days spent managing deer by private landholders
- $30.1 million in resource costs from managing deer by private landholders
- $196.5 million in the cost of lost forestry production
- $22.7 million in the cost of environmental restoration

The distribution of costs is not evenly distributed across Tasmania. Costs are estimated to be highest in areas with the greatest deer densities. Under the central estimate, zone 1 accounts for the largest share of total costs (around $604.0 million), reflecting higher assumed deer densities and populations, while zone 2 and zone 3 account for around $107.0 million and $43.1 million, respectively.

Scenario analysis

To reflect uncertainty in key assumptions, the analysis tested 'low impact' and 'high impact' scenarios around the central estimate. These scenarios flex or vary the main drivers of costs, most importantly the deer population forecast and the assumed magnitude of impact on key cost categories (including vehicle incidents, agricultural and forestry impacts, and landholder management effort).

The results indicate that total costs over the modelling period range from around $482.2m under the 'low impact' scenario to around $1,035.0 million under the 'high impact' scenario ($FY25m, 7% discount rate).

While it can be assumed that as the deer population increases, so too does the intensity of the impact, the relationship between an increase in the deer population and the corresponding increase in intensity to the impacts is not well understood. Failure to consider this relationship is

likely to understate the true cost of deer in Tasmania[4]. Given the exact relationship is not known, we applied two scenarios as part of our analysis:

- a very conservative 1% escalation rate in impacts over time with population growth
- 6% escalation rate, which matches the current annual growth rate of the deer population identified in the 2024 population survey[5].

Under these two scenarios, costs could increase from around $55.0 million per year in 2025 to:

- $88.7 million per year in 2054 factor ($FY25m, undiscounted) or $823.2 million in PV terms over the modelling period (7% discount rate) under a 1% escalation.
- $298.3 million per year in 2054 ($FY25m, undiscounted) or $1,395.9 million in PV terms over the modelling period (7% discount rate) under a 6% escalation factor.

This highlights that, without stronger control, the annual costs borne by the community are likely to rise materially over time.

Implications

The findings indicate that deer already impose sizeable costs on Tasmania and that, without a significant increase in the effectiveness and scale of management, these costs are likely to grow. Importantly, this analysis has only considered estimates of deer population likely to occupy the Midlands and eastern regions (i.e. not the entire state) and therefore represents a conservative estimate of the cost of fallow deer on the Tasmania community.

While this report does not assess specific policy packages in detail, given the significant costs to the economy imposed by maintaining the status quo on deer management, decisive action to rapidly reduce deer numbers and prevent further spread is likely to deliver substantial long-term benefits. The scale and approach to deer management will influence the benefits realised, because different strategies will affect deer populations at different rates and at different costs. However, given current population growth and the risk of further spread into high-value agricultural, environmental and cultural areas, earlier and more substantial action is likely to deliver greater value to the community.

At the same time, the analysis highlights the value of further research and improved data collection to strengthen future decision-making, including better information on the relationship between deer density and damages, and valuation evidence for cultural and biodiversity impacts that are not readily monetised.

[4] Yokomizo, H., Possingham, H. P., Thomas, M. B., & Buckley, Y. M. (2009). Managing the impact of invasive species: the value of knowing the density–impact curve. Ecological Applications, 19(2), 376-386.

[5] noting the relationship between deer numbers and costs is uncertain and may not be linear.

1 Introduction

Key points

- In recent years the population and distribution of introduced fallow deer in Tasmania has rapidly increased[6]. Studies suggest that the area of 'suitable habitat' for deer in Tasmania is also likely to increase under a changing climate[7]. Thus, there is scope for the deer population in Tasmania to continue to increase.
- While it is broadly acknowledged that deer can impose a number of economic, social, cultural and environmental costs on the community, the impact of deer in Tasmania has not historically been well-quantified. This can hinder decision-makers ability to make informed decisions about deer management and control.
- Frontier Economics was engaged by the Invasive Species Council to conduct an economic analysis of the impacts and benefits of managing deer in Tasmania. Our analysis sought to identify, quantify and where possible, monetise the economic, social and environmental impacts of the presence of deer in Tasmania on the community.
- Our analysis has not sought to value all economic, social, cultural and environmental costs imposed by deer. Given the data constraints, we have focused on those impacts that are likely to be most material and have adopted conservative cost estimates. Should information become available to enable the quantification and valuation of other economic costs, this will likely strengthen the case for decisive action.

1.1 Understanding the costs of inaction requires an economic framework

In the last 50 years, the fallow deer (*Dama dama*) population in Tasmania has been increasing, driven in part, by favourable changes in habitat and climate, escapes from farms, and intentional releases[5]. The 2024 aerial survey of fallow deer in Tasmania reporting an estimated 71,655 deer were present in the Midlands and eastern regions of Tasmania in 2024; a notable increase from prior population estimates of 53,660 just 5 years earlier in 2019[8].

While there is broad recognition that deer can impose a variety of economic, social, cultural and environmental costs on the community, the impacts of deer in Tasmania have not been well-quantified.

To make more informed decisions about the nature and extent of any intervention to manage deer in Tasmania, it is critical to understand the broad range of costs and benefits that arise from an intervention or conversely, inaction.

Converting the full range of costs and benefits imposed on the community into dollar values can help decision-makers compare deer management options and assist them to determine whether and how to act. Disregarding the full range of economic, social and environmental costs and

[6] Lethbridge M & Shute E (2025). The 2024 aerial survey of fallow deer in Tasmania. Report to the Department of Natural Resources and Environment Tasmania.

[7] Cunningham et al. (2022). Dynamics and predicted distribution of an irrupting 'sleeper' population: fallow deer in Tasmania. Biological Invasions, 24(4), pp.1131–1147.

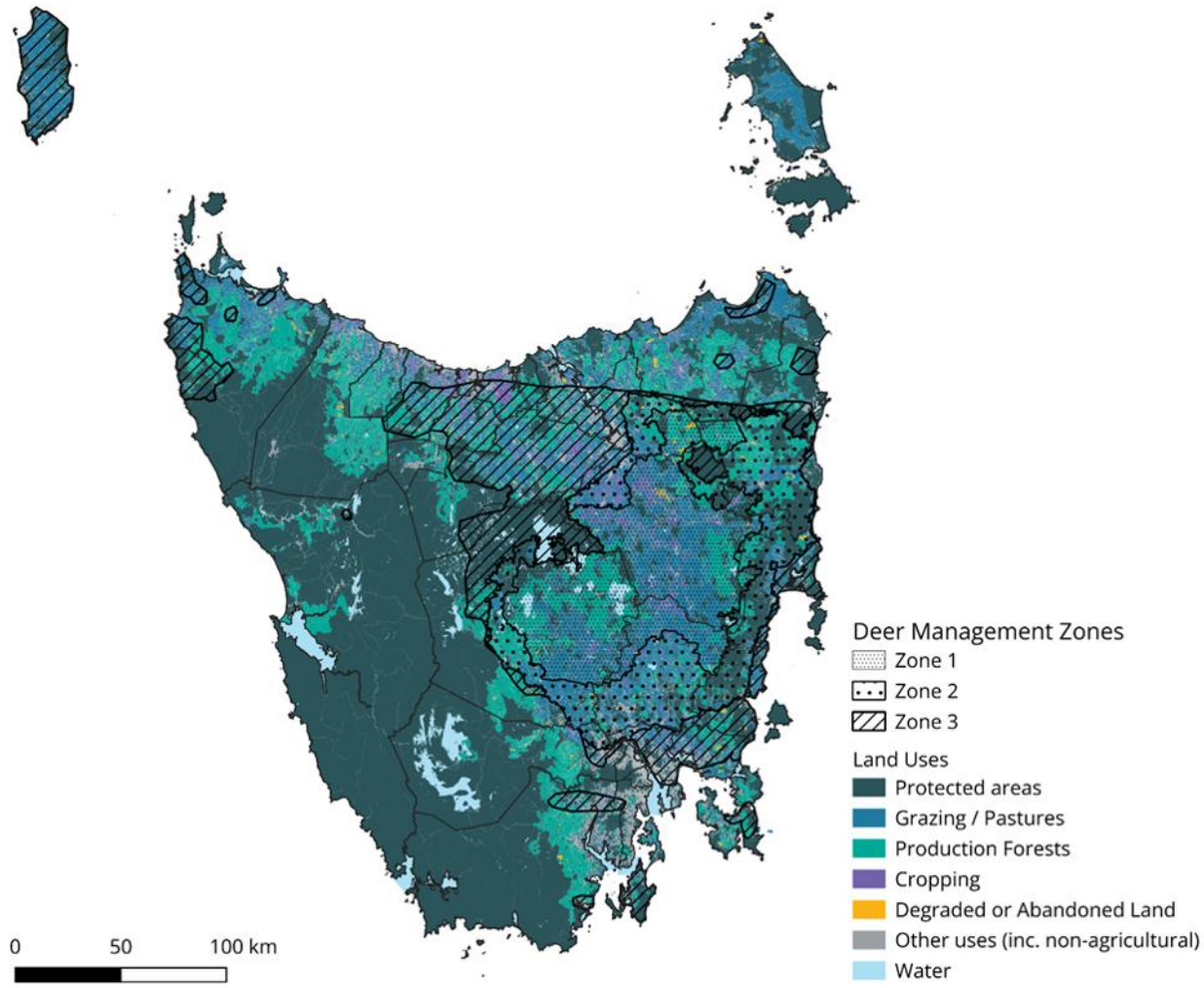
[8] Lethbridge, M.R. and Shute, E.R. 2025. The 2024 aerial survey of fallow deer in Tasmania. Report to Tasmanian Department of Primary Industries, Parks, Water and Environment.

benefits can risk key impacts not being considered in decision-making, contributing to suboptimal management outcomes.

Against this background, Frontier Economics was engaged by the Invasive Species Council to examine the current and potential future economic impacts of deer in Tasmania.

As part of this analysis, we have identified, and where possible valued, the economic, social, cultural and environmental impacts on the community of failing to effectively manage deer to a more sustainable level across three zones (i.e. at a level at which they are likely to have limited impact on the economic, social, cultural and environmental outcomes in Tasmania) (see Figure 1).

Figure 1: Geographic coverage of deer management zones adopted in this analysis



Source: Frontier Economics, using the following data: LGAs from Australian Bureau of Statistics, Local Government Areas – 2025 – Shapefile, accessed https://www.abs.gov.au/statistics/standards/australian-statistical-geography-standard-asgs-edition-3/jul2021-jun2026/access-and-downloads/digital-boundary-files.;Land use from LIST data, NCH Land Use 2021, Tasmanian Government, accessed https://listdata.thelist.tas.gov.au/opendata/; zone 1 and 2 from LIST data, Deer Management Zones, Tasmanian Government, accessed https://listdata.thelist.tas.gov.au/opendata/; zone 3 from LIST data

We note, that although the definitions of zone 1 and 2 align with the definitions and geographic specifications contained in the Wild Fallow Deer Management Plan 2022-2027[9], the definition of zone 3 as it relates to our analysis is considered to be the area of Tasmania outside of zone 1 and 2 where deer have been recorded or are likely to exist based on estimates of the 2024 deer range

1.2 Overview of approach

Consistent with the approach undertaken in Victoria[10], as shown in Figure 2, our approach to evaluating the cost of deer in Tasmania involved the following key steps:

- **Forecasting future deer population within the 2024 survey region over the period of 2025 to 2054.** It is important to note that this does not represent the statewide population as statewide numbers are not currently known. Thus all forecasting presented in this report are under-estimations of the true population.
- **Reviewing existing literature examining the impact of deer in Tasmania on economic, social and environmental outcomes.** This includes:
  - **use-values** – these accrue to users, for example, land-holders, road users, etc.
  - **non-use values** – these values arise from the knowledge that the Tasmanian environment (including its habitats and the species it supports) exist and will continue to exist. They are different from use values because they arise whether or not the environment is used and as such, can be attributed to the population beyond just those who use and visit the area (e.g. the broader Tasmanian community).
- **Identifying the change in economic, social and environmental outcomes** that could arise as a result of deer in Tasmania, over the period of 2025-2054. Again it is important to note that estimates were derived from within the 2024 survey area and thus all estimates in this report are an under-estimation of the true costs of deer into the future.
- **Valuing the key costs associated with the current deer management levels.** At a high level, this involves multiplying the change in outcomes by the appropriate price and discounting the costs using the social discount rate of 7% under the central estimate[11]. Consistent with the approach taken in the previous Victorian study, we have adopted a benefit transfer approach (see **Box 1).** This involves drawing on existing literature to value impacts (and making any necessary adjustments to reflect the Tasmanian context), rather than undertaking primary research.
- **Understand how the cost of deer vary under alternative states of the world,** for example under a 'high population growth impact' and 'low population impact' scenario as well as under two escalation of impact scenarios: a conservative 1% escalation in the annual costs of the growing deer population and a 6% escalation rate, which assumes a linear relationship between the deer population growth rate and the increase in impact.

[9] Department of Natural Resources and Environment Tasmania (2025). Wild Fallow Deer Management Plan | Department of Natural Resources and Environment Tasmania. [online] nre.tas.gov.au.

[10] Frontier Economics (2022). Counting the doe, and analysis of the economic, social & environmental cost of feral deer in Victoria. A report for the Invasive Species Council. 10 June 2022.

[11] Infrastructure Australia 2021, Guide to economic appraisal, Technical guide of the Assessment Framework, Infrastructure Australia, Australian Government, p.23, accessed https://www.infrastructureaustralia.gov.au/sites/default/files/2024-02/Assessment%20Framework%202021%20Guide%20to%20economic%20appraisal.pdf.

Figure 2: Approach to evaluating the cost of deer in Tasmania

Source: Frontier Economics

Importantly**,** our analysis has not sought to value all economic, social, cultural and environmental costs of deer, rather, we have focused on those likely to be most material and where data is readily available. Should information become available to enable the quantification and valuation of other economic costs, this will likely strengthen the case for decisive action.

It is also important to note that given the constraints of the data available (e.g. statewide deer population numbers, environmental costs), all estimations and forecasting in this analysis are an underestimation of the true costs of deer in Tasmania.

Box1: Applying benefit transfer to value key economic, social, cultural and environmental impacts of fallow deer in Tasmania

Benefit transfer involves using values estimated in a source study and transferring these for use in the case of interest. For this approach to be valid, the following conditions need to be satisfied:

- The source study should be rigorous and valid.
- The context and conditions pertaining in the case of interest should be similar to those occurring in the source study.
- The demographic and economic characteristics of any sampled population sampled in the source study should be similar to those in the target study.
- The extent of the changes being investigated should be similar.

A benefit of this approach is that it does not require original empirical study (scientific, survey, econometric, or other) design and execution, benefit transfer can be rapidly applied. However, the applicability will be limited to outcomes with a large body of research (where the original research is robust and the study sites are sufficiently similar) and, in this case, there are very few applicable primary studies that are well suited for use, particularly around the specific environmental impacts of fallow deer in Tasmania.

Source: Frontier Economics

1.3 Structure of this report

The remainder of this report is structured as follows:

- **Section 2** provides an outline of the context and background of this report.
- **Section 3** provides an overview of the economic and social impacts of deer.
- **Section 4** provides an overview of the environmental impacts of deer.
- **Section 5** provide a summary of our key findings and results.

2 Context and background

Key points

- In recent years, the Tasmanian deer population within its core range around the Midlands has been rapidly increasing from an estimated 53,660 in 2020 to an estimated 71,655 in 2024. With the population estimated to be increasing on average by 6% each year under current management pressures, the deer population will continue to increase and spread[12].
- Without a significant change in the intensity of deer control, population growth will continue as the number of deer removed is outpaced by natural reproduction. Our analysis suggests that deer numbers within the core range could grow from around 71,655 to around 667,000 by 2054 under the central estimate (i.e. applying a 6% growth rate).
- Deer can impose substantial economic (agriculture, forestry, disease), social (, road safety, cultural heritage) and environmental (biodiversity loss) impacts.
- Current methods such as recreational hunting and landowner ground shooting have been insufficient to curb deer population growth. Effective long-term population control requires large-scale, coordinated management, regulatory reform and sustained government support.

2.1 Deer in Tasmania

In the early 19th century, fallow deer were introduced to Tasmania as a hunting resource[13]. For over a century, deer existed in relatively small numbers and primarily within the Midlands and eastern regions. By 1972, there was an estimated population of 7000-8000 fallow deer occupying approximately 400,000 hectares in Tasmania[14]. Around this time, the deer population began to grow more substantially. Between 1985 and 2023, the distribution of deer across Tasmania increased by 290%[15]. By 2020, the deer population within the Midlands and eastern regions had grown to 53,660[16], occupying over 27% of the state[15]. The deer population within the Midlands and eastern regions has continued to grow sharply to now an estimated 71,655 in 2024[16]. It is important to note that this estimate does not represent the statewide population as only the core deer population was surveyed. It is established that there are several populations of deer outside this region, however, the number is currently unknown.

[12] Lethbridge, M.R. and Shute, E.R. 2025. The 2024 aerial survey of fallow deer in Tasmania. Report to Tasmanian Department of Primary Industries, Parks, Water and Environment.

[13] CHAPMAN, N.G. and CHAPMAN, D.I. (1980). The distribution of fallow deer: a worldwide review. Mammal Review, 10(2-3), pp.61–138.

[14] Wapstra, H. and Tasmania. National Parks and Wildlife Service (1973). Fallow deer in Tasmania.

[15] Cunningham et al. (2022). Dynamics and predicted distribution of an irrupting 'sleeper' population: fallow deer in Tasmania. Biological Invasions, 24(4), pp.1131–1147.

[16] Department of Natural Resources and Environment Tasmania (2025). The 2024 aerial survey of fallow deer in Tasmania. Summary Report.

The rapid population increase in recent decades has been attributed to escapes and releases from deer farms, illegal translocations by hunters, changes in habitat and climate, and natural expansion[15].

2.2 Deer Management in Tasmania

Deer in Tasmania are managed under the Tasmanian government's Wild Fallow Deer Management Plan 2022-2027[17]. This plan introduces a three-zone model, which divides the state across:

- Zone 1 is the 'sustainable hunting' zone. This zone encompasses regions considered as a "traditional deer range", where managing deer for continued recreational hunting is the primary objective.
- Zone 2 surrounds the traditional deer range and is a mixed management zone. Management is aimed at reducing the geographical spread of deer into zone 3, while still allowing properties to choose to maintain or introduce hunting.
- Zone 3 contains the Tasmanian Wilderness World Heritage Area, National Parks, and peri-urban areas, where no deer is the objective.

With the exception of aerial shooting operations in the Tasmanian Wilderness World Heritage Area between 2023 and 2024[18], deer management in Tasmania relies mostly on recreational hunting and private landowners to manage deer numbers[19]. Deer are listed as 'Partly Protected Wildlife' under the Nature Conservation Act 2002, which limits culling of deer in certain zones to people with hunting licences and property protection permits.

To reduce the number of fallow deer, more than 35% of the total population or more than 25% of the female population must be removed annually[20]. Given the continued increase in deer numbers across the state, it is clear that the number of deer being removed through hunting and property protection permits is insufficient to counter natural births each year and thus, the number of deer continues to grow.

2.3 In the absence of greater action, deer numbers will continue to grow

Fallow deer can occupy a variety of habitats, including forests, open grasslands, scrublands, sub-alpine vegetation and arable lands[21]. As of 2021, 27% of Tasmania was occupied by deer, primarily concentrated in the central and eastern regions. Based on climate and habitat suitability modelling, it is predicted that up to 56% of Tasmania is suitable for fallow deer[21]. That coupled

[17] Department of Natural Resources and Environment Tasmania (2025). *Wild Fallow Deer Management Plan | Department of Natural Resources and Environment Tasmania*. [online] nre.tas.gov.au.

[18] Tasmania Parks and Wildlife Service (n.d.) TWWHA deer control project. Department of Natural Resources and Environment Tasmania. Available at: https://parks.tas.gov.au/about-us/managing-our-parks-and-reserves/twwha-deer-control-project

[19] Comte, S., Bengsen, A. J., Botterill-James, T., Brausch, C., Bryant, S. L., Dickson, C. R., ... & Forsyth, D. M. (2025). Impacts of recreational hunting on an introduced population of fallow deer (Dama dama) in Tasmania, Australia. Ecological Management & Restoration, 26(1), e70001

[20] Botterill-James, Thomas, et al. (2026). Using a spatially explicit population model to evaluate management scenarios for an invasive deer population. *NeoBiota, 86*, 1–31. https://neobiota.pensoft.net/article/173542/

[21] Cunningham et al. (2022). Dynamics and predicted distribution of an irrupting 'sleeper' population: fallow deer in Tasmania. Biological Invasions, 24(4), pp.1131–1147

with the annual population growth rate suggests that the deer population will continue to grow and spread.

Applying the assumptions outlined in Box 2, under the central estimate, deer numbers in the Midlands and eastern regions are forecast to grow from around 71,655 to around 667,000 by the end of the modelling period (assuming a 6% growth rate[26]).

Box 2: Forecasting deer populations

In order to calculate the costs of deer in Tasmania, it is important to understand how the population of deer is likely to grow in future. To forecast deer population, we drew on data provided in the Department of Natural Resources and Environment Tasmania's 2024 aerial survey of fallow deer in Tasmania. As shown below, our forecast utilises estimates of:

- **Estimate deer population** (No.), equal to 71,655 as reported in the 2024 aerial survey of fallow deer in Tasmania. This is not a statewide population estimate but is assumed to incorporate the majority of the state's deer population.
- **Carrying capacity across Tasmania** (deer/km2); an upper limiting 'maximum deer density' to ensure that the forecast population does not exceed a deer population density that is ecologically feasible within a given area. The carrying capacity applied in this analysis is drawn from Potts et al. (2015) which sought to apply a conservative carrying capacity estimate of 50 deer per km2 for the most suitable habitats in Tasmania . Consistent with the deer densities applied, we have assumed zone 1 constitutes the most suitable habitat for deer in Tasmania and scaled the carrying capacity across zones 2 and 3 relative to these assumptions.
- **Proportion of estimated deer population across management zones** (%), derived from the estimated deer within each management zone recorded in the 2024 aerial survey of fallow deer in Tasmania.
- **Population growth rate** (%), accounting for current management and hunting.

Table 1: Forecasting deer population – input assumptions

Assumption	Zone 1	Zone 2	Zone 3
Estimated total deer population (No.)		71,655	
Proportion of population[22]	86%	9%	5%
Population (2025)[23]	61,506	6,777	3,372
Area (km2)[24]	15,382	14,058	21,598
Carrying capacity (Deer/km2)[25]	50	8.16	2.80

[22] The proportion of estimated deer population across each of the zones has been derived based on information in the 2024 aerial survey of fallow deer in Tasmania in order to determine the carrying capacity at the start of the modelling period based on estimated area of each of the management zones.

[23] For simplicity, these estimate has been presented as whole numbers

[24] For the purposes of calculating deer numbers, we have applied the estimated area of Zone 3 where deer are likely to be located as per the 2025 deer extent provided by the Invasive Species Council.

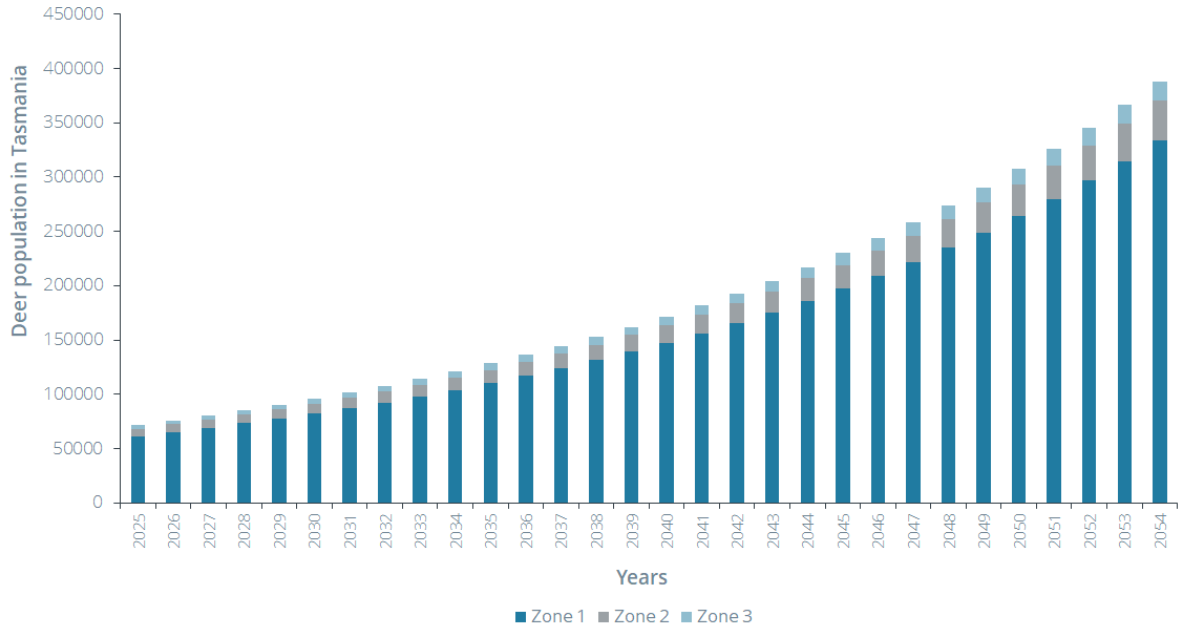
[25] Potts, J. M., et al. (2015). Predicting the future range and abundance of fallow deer in Tasmania, Australia. Research report. Retrieved from https://www.researchgate.net/profile/Edward-Lefroy/publication/275346789

Population growth rate (%)[26]	Low: 4% Central: 6% High: 8%

Source: Frontier Economics

As illustrated in Figure 3 below, zone 1 holds the largest proportion of deer, with zones 2 and 3 holding a marginal proportion of the assumed population.

Figure 3: Forecasted deer populations – central estimate



Source: Frontier Economics

As forecasting is inherently uncertain, we have provided a central, low and high growth scenario. In particular the low and high population estimates are driven by changes in the assumed growth rate, as specified in Figure 1. As shown below:

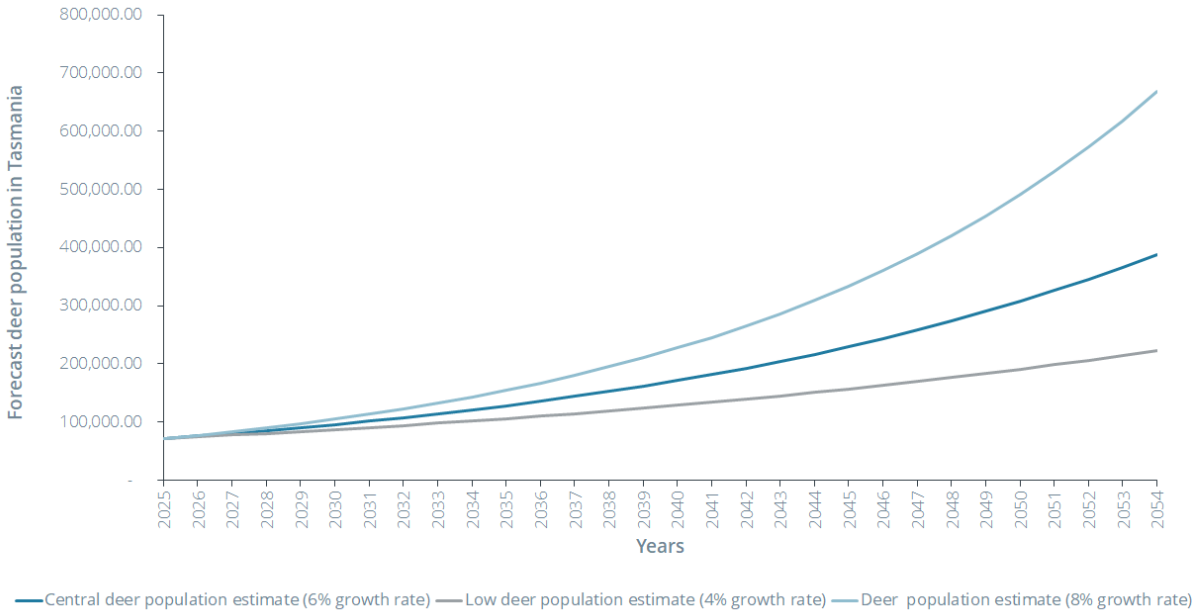
- Low population scenario, deer numbers in the Midlands and eastern regions are forecast to grow from around 71,655 to around 223,000 over 30 years (4% growth rate).
- High population scenario, deer numbers in the Midlands and eastern regions are forecast to grow from around 71,655 to 667,000 over 30 years (8% growth rate).

It should be noted that this analysis does not intend to provide a definitive forecast of future deer populations in Tasmania. Instead, we have sought to provide an indication of the possible range the future deer populations may fall within, to provide insights into the overall costs of deer placed on the Tasmanian community. Relatedly, the population estimates forecast do not consider the entire state of Tasmania and instead have just focused on identified zones. This

[26] Lethbridge M & Shute E (2025). The 2024 aerial survey of fallow deer in Tasmania. Report to the Department of Natural Resources and Environment Tasmania.

means the true population of fallow deer in Tasmania, and their associated impact on the community is understated.

Figure 4: Forecasted deer populations



Source: Frontier Economics

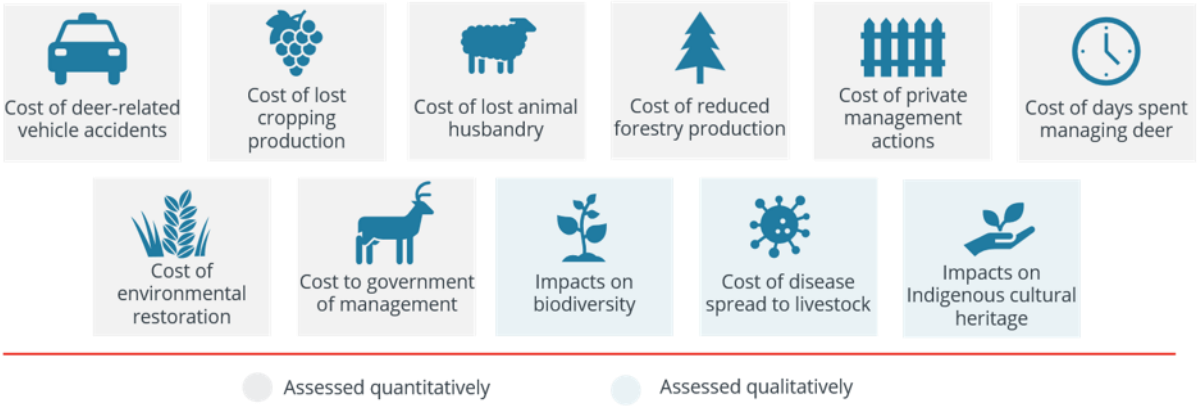
2.4 Deer impose a range of economic, social, cultural and environmental costs on the Tasmanian community

As the population of deer continues to grow**,** as shown in Figure 5**,** they pose increasing and more severe costs including:

- **Economic-related costs, such as:**
  - **Impacts to the agricultural sector**, including damage to crops and primary production, costs to landholders of managing deer and competition with livestock for grazing.
  - **Impacts to forestry production**, where ringbarking, browsing and rubbing antlers against trees cause a decrease in the quality and total volume of timber produced by Tasmania's forestry industry.
  - **Impact of increased disease transmission to livestock**: diseases such as bovine tuberculosis and foot and mouth disease have been assessed as having a high risk of transmission from deer to Australian livestock, which can impact market prices of exported livestock products.
  - **Impact of deer-related vehicle incidents**, such as motor vehicle accidents and fatalities.
- **Social-related costs, such as:**
  - **Impacts on Indigenous cultural heritage**, such as physically disturbing Country and degrading places of cultural significance, including culturally modified trees or culturally significant floral and fauna groups.
- **Environmental-related costs, such as:**

- **Negative impacts on biodiversity**, including overgrazing, browsing on branches, trampling, ringbarking, spreading weeds, concentrating nutrients and spreading weeds.
- **Increased costs of restoration and conservation work**, due to deer caused damage to revegetation or riparian zone repair.

Figure 5: Economic, social and environmental impacts of deer in Tasmania



Source: Frontier Economics

2.5 Current management of deer is insufficient

There are a variety of methods available to assist in the management of deer, many of which are applied in Tasmania[27]. These include:

- **Ground shooting** carried out by licensed hunters, professional pest controllers, landowners or by accredited volunteers
  - **Recreational hunting:** Most recreational hunting is done on an ad-hoc basis by licensed hunters with no defined objective, monitoring or assessment of effectiveness of pest control[28]. The contribution of recreational hunters to the removal of deer in most circumstances is generally not sufficient to reduce deer numbers, particularly at a landscape scale[29] .
  - **Professional pest controllers** can be engaged in controlled and targeted programs to manage a deer herd. These programs are costly, requiring the employment of highly skilled pest controllers, but are generally far more effective than recreational hunting[30].
  - **Landowners** are also individually engaged with managing deer populations by ground shooting. Typically, the landowner may not have the capacity to remove large numbers of deer and are instead primarily involved with control and containment of deer and asset protection within their property.

[27] Department of Natural Resources and Environment Tasmania (2025). Wild Fallow Deer Management Plan | Department of Natural Resources and Environment Tasmania. [online] nre.tas.gov.au..

[28] RSPCA (2020). *Is recreational hunting an effective form of pest animal management? – RSPCA Knowledgebase*. [online] RSPCA Knowledge Base.

[29] Comte, S., Bengsen, A. J., Botterill-James, T., Brausch, C., Bryant, S. L., Dickson, C. R., ... & Forsyth, D. M. (2025). Impacts of recreational hunting on an introduced population of fallow deer (Dama dama) in Tasmania, Australia. Ecological Management & Restoration, 26(1), e70001

[30] Comte, S., Thomas, E., Bengsen, A. J., Bennett, A., Davis, N. E., Brown, D., & Forsyth, D. M. (2022). Cost-effectiveness of volunteer and contract ground-based shooting of sambar deer in Australia. Wildlife Research, 50(9), 642-656.

- **Aerial shooting:** Aerial shooting requires high costs of helicopters and shooting equipment but is one of the most effective methods for dramatically reducing deer numbers. Aerial shooting is currently being used to remove deer from the Walls of Jerusalem National Park and Central Plateau Conservation Area. Between 2023-2024, two aerial deer eradication operations were successfully completed in the Tasmanian World Heritage Wilderness Area and the Walls of Jerusalem National Park, removing 1017 deer over 40 days[31].
- **Exclusion fencing:** Primarily used by farmers and landowners, fencing is used to attempt to exclude deer from browsing and grazing on crops and pastures and from accessing high value assets. Exclusion fencing is only suitable for small areas of land, involves high capital and maintenance costs, and does not reduce the deer population.
- **Trapping** can be used to capture small numbers of deer where they have become wary due to shooting activity or in more densely populated areas, such as peri-urban regions. It involves the high costs of erecting and monitoring yards and is not commonly adopted.
- **Other techniques** include fertility control, poison baiting and repellents (including scare devices). These techniques are not currently being used in Australia, and as such there has been minimal evaluation of the efficacy[32].

Tasmanian deer management to date has largely relied on recreational hunting and private land owner management. Given these tools tend to be applied on an ad hoc basis and small scale, their impact on the population at the landscape scale has proven limited[33]. Given that the population continues to grow and spread, it is clear that the current level of management intensity for fallow deer in Tasmania has proven inadequate in curbing population growth, let alone reducing deer numbers, and thereby failing to mitigate the costs associated with increasing deer numbers.

[31] Department of Natural Resources and Environment Tasmania (2024). *Department of Natural Resources and Environment Tasmania Tasmanian Wild Fallow Deer Implementation Strategy Progress Report*. [online]

[32] NSW Department of Primary Industries (2022). *NSW Code of Practice and Standard Operating Procedures for the Effective and Humane Management of Feral Deer*. [online] Available at: https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0006/1394646/Code-of-Practice-and-Standard-Operating-Procedures-for-the-Effective-and-Humane-Management-of-feral-deer.PDF.

[33] Lethbridge M & Shute E (2025). The 2024 aerial survey of fallow deer in Tasmania. Report to the Department of Natural Resources and Environment Tasmania

3 Economic and social cost of deer

3.1 The relationship between deer and economic costs

Various studies have demonstrated a relationship between deer and a range of economic outcomes. These include:

- **Costs to the agricultural sector, including:**
  - **Loss gross margin** associated with damage to crops (such as cereal, nut fruit, vegetables, vineyards and plantations) and primary production because of deer fouling pasture[34].
  - **Competition with livestock for feed[34].**
  - **Cost to landholders of managing deer**, such as the cost of ground shooting, fencing of property, and replacing damaged property[35].
- **Costs of reduced forestry production**, where ringbarking, browsing, and rubbing antlers against trees can cause a decrease in the quality and volume of timber produced by Tasmania's forestry industry[31].
- **Cost of increased disease transmission to livestock**, where diseases such as bovine tuberculosis and foot and mouth disease have been assessed as having a high risk of transmission from deer to Australian livestock, which can impact market prices of exported livestock products[34].
- **Costs of deer-related vehicle incidents**, such as motor vehicle fatalities. Between 2021-2025 there were estimated to be 122 vehicle incidents involving deer in Tasmania[36].

3.2 Estimating the agricultural cost of deer

It is widely acknowledged that deer impact agricultural production values by damaging crops, competing with livestock for feed, and causing damage to agricultural properties[34]. Relatedly, landholders often incur costs (both financial and time) in managing deer by either undertaking ground shooting, fencing of property, and replacing damaged property.

This section provides further detail on our approach to quantify the monetary costs of lost margin due to grazing, lost cropping production, and the costs to agricultural landowners of managing deer.

Given the lack of information on the impact of deer on other costs, such as increased disease transmission to livestock, we have not been able to robustly value the other broader economic impacts listed above. As discussed below, there is likely to be benefit of further research on the impacts of deer in Tasmania.

[34] McLeod, R. (2023). Annual costs of feral deer in Australia. Centre for Invasive Species Solutions. https://pestsmart.org.au/wp-content/uploads/sites/3/2023/07/Invasives-Cost-of-Feral-Deer-Final-Report.pdf

[35] ABARES (2022). Pest animals and weed management survey - DAFF. [online] Agriculture.gov.au. Available at: https://www.agriculture.gov.au/abares/research-topics/social-sciences/pest-animals-weed-management-survey

[36] Based on data provided by the Royal Automobile Club of Tasmania on the number of deer-related vehicle accidents between 2021 and 2025

3.2.1 Cost of lost animal husbandry

Fallow deer are known to graze on farmlands in Tasmania. As a result, deer compete with livestock for feed, which reduces the availability of feed for livestock, reducing gross margin for farmers in Tasmania.

Box 3: stakeholder evidence of deer grazing on farmlands

"Wild deer are opportunistic and highly adaptable feeders that both graze and browse. Their diet is largely determined by what is locally available, but because they require a diet twice as high in protein content than cattle - and with significantly higher quantities of digestible vegetable matter - they will normally feed selectively on the highest quality plants in a pasture. Because of this, deer can impose substantial costs on primary producers. Wild deer have been reported to cause damage to a wide variety of agricultural crops, pastures, and forestry plantations through competition with cattle and other livestock pasture."

Simon Cameron, Tasmanian wool grower

Source: Cameron, S. (2018). Impact of feral deer, pigs and goats in Australia - Submission 3. [online] Parliament of Australia. Available at:https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/FeralDeerPigGoat2019/Submissions.

As shown in Figure 6, to estimate the lost margin due to the grazing of deer on property, we multiplied together:

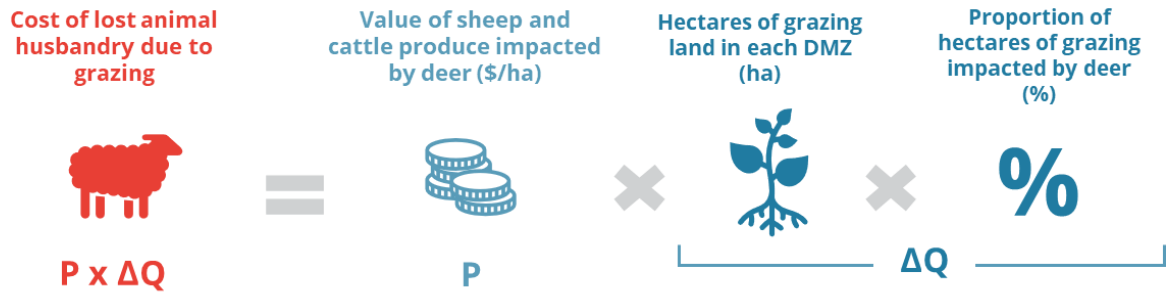
- **Estimated area of grazing area across each of the zones in Tasmania** which includes native vegetation, modified pastures, irrigated modified pastures and nature/exotic pasture mosaic.
- **Proportion of grazing area impacted by the presence of deer (**Figure 7**)** which was derived from the estimated crop and livestock production lost as a result of deer as recorded for Tasmania by the Centre for Invasive Species Solutions[37]. Under the central estimate, this is assumed to be equal to 5% for zone 1. Consistent with our approach to understanding the relative impact of deer within each of the zones, we have scaled to the proportion of grazing area impacted by the presence of deer by the relevant deer densities across each of the zones. That is, the proportion of grazing area impacted by the presence of deer in zone 1 is assumed to be greater than zones 2 and 3 due to zone 1 having the highest densities of deer.
- **Value of cropping output** was applied as a per hectare estimate of the value of grazing livestock, including livestock products such as wool and milk and livestock slaughter including sheep and lambs, cattle and calves. This per hectare value was derived from

[37] McLeod, R. (2023). Annual costs of feral deer in Australia. Centre for Invasive Species Solutions. Tabel 3, Sheep and cattle products. https://pestsmart.org.au/wp-content/uploads/sites/3/2023/07/Invasives-Cost-of-Feral-Deer-Final-Report.pdf

the gross value of agricultural commodities produced 2022-23[38] divided by the area of grazing area in Tasmania[39].

To be conservative, we have assumed that the cost of lost gross margin in animal husbandry due to grazing in Tasmania is held constant over the modelling period.

Figure 6: Approach to valuing the cost of lost gross margin in animal husbandry due to grazing

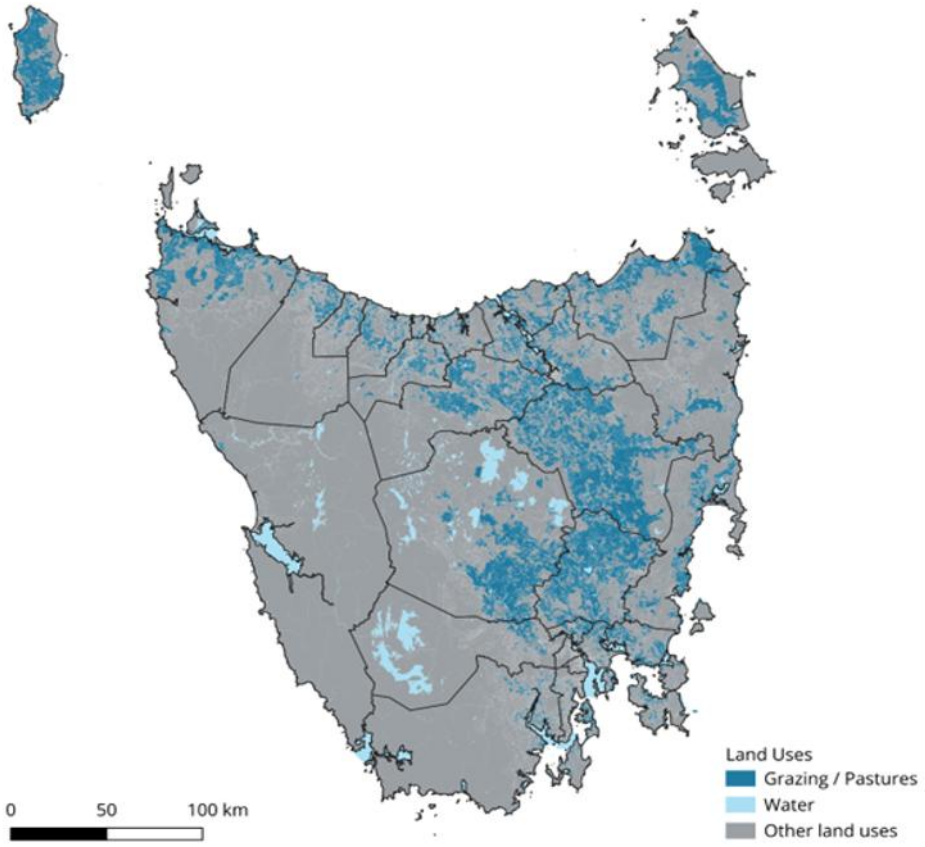


Source: Frontier Economics

[38] Department of Natural Resources and Environment Tasmania & AgriGrowth Tasmania. (2025).Tasmanian Agri-Food Scorecard 2022–23. Tasmanian Government. https://nre.tas.gov.au/Documents/Tasmanian%20Agri-Food%20ScoreCard%202022-23.pdf

[39] "NCH Land Use 2021", List data, The list, Tasmanian Government, accessed https://listdata.thelist.tas.gov.au/opendata/.

Figure 7: Map of grazing areas across Tasmania



Source: Frontier Economics

3.2.2 Cost of lost cropping production

Alongside lost grazing production from deer competition, the presence of deer within Tasmanian farmlands can also impact cropping production through damage to crops and other primary production. As reported by the Centre for Invasive Species Solutions, an estimated 15% of Australian farmers indicted deer were a major problem in 2022[40]. Given the deer population has spread, it is likely that the proportion of impacted farmers is now higher[41].

As shown in Figure 8, to estimate the cost of lost cropping production due to deer-related grazing, we multiplied together the:

- **Estimated cropping area across each of the zones in Tasmania** (assumed to be equal to the area of land associated with cropping and other plant production for human use). This included, but is not limited to, production activities such as cropping and irrigated cropping, perennial horticulture, tree fruits, olives and grapes. For the purposes of valuing lost cropping production due to deer-related grazing, land uses were categorised based on their primary output into fruits and nuts (not grapes), vegetables, viticulture and other.
- **Proportion of cropping area impacted by the presence of deer (**Figure 9**)** was derived from the estimated crop and livestock production lost as a result of deer, as recorded in the

[40] McLeod, R. (2023). Annual costs of feral deer in Australia. Centre for Invasive Species Solutions. https://pestsmart.org.au/wp-content/uploads/sites/3/2023/07/Invasives-Cost-of-Feral-Deer-Final-Report.pdf

[41] Lethbridge M & Shute E (2025). The 2024 aerial survey of fallow deer in Tasmania. Report to the Department of Natural Resources and Environment Tasmania.

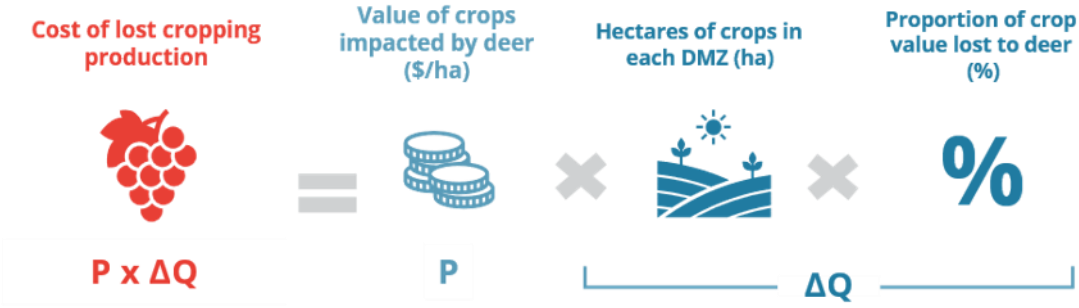
Centre for Invasive Species Solutions[40]. Under the central estimate, this is assumed to be equal to:

- Fruits and nuts (not grapes) = 5%
- Vegetables = 5%
- Viticulture = 7%

Given the deer densities and thus the intensity of impacts vary between the three management zones, we have scaled the proportion of cropping area impacted by the presence of deer by the relevant deer densities for each of the zones.

- **Value of cropping output** per hectare estimate derived from estimates of the gross value of agricultural production 2022-23[42] divided by the area of agricultural production per hectare 2021-22[43].

Figure 8: Approach to valuing the cost of lost cropping production

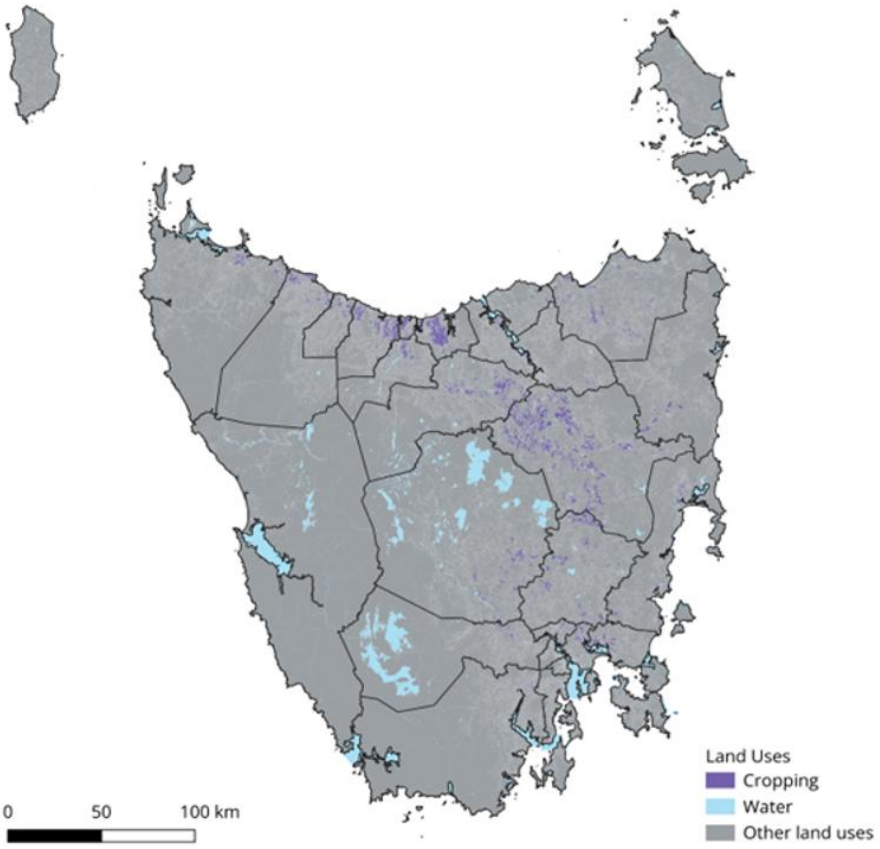


Source: Frontier Economics

[42] Department of Natural Resources and Environment Tasmania & AgriGrowth Tasmania. (2025).Tasmanian Agri-Food Scorecard 2022–23. Tasmanian Government. https://nre.tas.gov.au/Documents/Tasmanian%20Agri-Food%20ScoreCard%202022-23.pdf

[43] Australian Bureau of Statistics 2023, "Agricultural Commodities, Australia--2021-22".

Figure 9: Map of cropping area in Tasmania



Source: Frontier Economics

3.2.3 Cost of private landholders managing deer

The national Pest Animal and Weed Management Survey conducted in 2021 by the ABARES found that many land managers in Tasmania have incurred expenses managing deer. Expenditure on deer can include costs of ground shooting, fuel, fencing materials and labour including costs of contractors[44].

Given that deer have increased since 2021, the costs to private landholders from managing deer is likely to be higher than the 2021 estimates. However, in absence of more recent estimates, the 2021 values have been applied and thus results are likely to represent a conservative estimate of the costs

As shown in Figure 10, to estimate the cost of managing deer, we multiplied together:

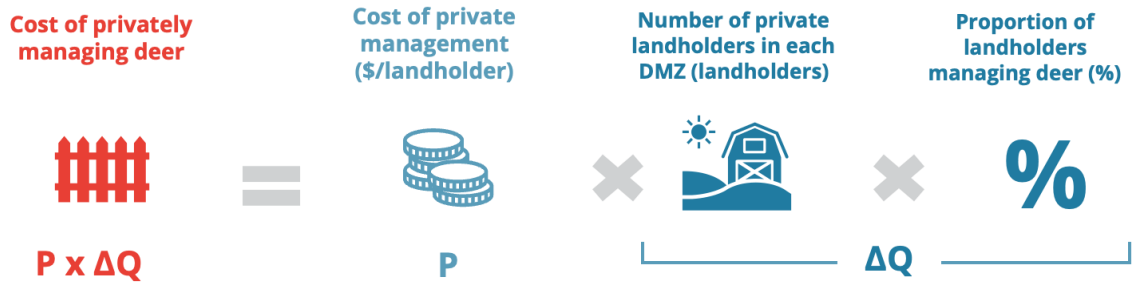
- **The number of private properties likely to engage in deer management by management zone**, which was estimated based on the number of land parcels classified as private whose centre overlays a "production" land use in each zone. Of identified properties, a proportion were assumed to engage in managing deer based on the average proportion of properties reporting expenditure for deer management in north (13%) and south (12%) Tasmania, equal to 12.5%, as reported by the Centre for Invasive Species Solutions[45].

[44] ABARES (2022). *Pest animals and weed management survey - DAFF*. [online] Agriculture.gov.au. Available at: https://www.agriculture.gov.au/abares/research-topics/social-sciences/pest-animals-weed-management-survey.

[45] McLeod, R. (2023). Annual costs of feral deer in Australia. Centre for Invasive Species Solutions. https://pestsmart.org.au/wp-content/uploads/sites/3/2023/07/Invasives-Cost-of-Feral-Deer-Final-Report.pdf

- **Estimated resource cost of managing deer per property,** including the cost of fencing, setting traps, firearms and ammunition. A report by the Centre for Invasive Species Solutions[47] estimated the cost of farmer-reported annual deer control expenditures to be between $1,972 in the north of Tasmania and $6,850 in the south[46]. For the purposes of this analysis, we have applied the average of these two estimates, equal to $4,411 per property, per year.

Figure 10: Approach to valuing the resource cost of managing deer



Source: Frontier Economics

3.2.4 Cost of days spent managing deer

Alongside the resource cost of managing deer, many private landholders incur an additional time cost associated with managing deer on their property. The Centre for Invasive Species Solutions[47] reported that in 2021, Tasmanian farmers spend between 18 and 22 days managing deer annually. This aligns with ABARE's 2021 estimate of 20 days per year spent managing deer by affected landholders[48].

Again, given that the deer population in Tasmania have increased beyond 2021 estimates[49], the number of days spent by private landholders managing deer is likely to be higher than the 2021 estimates. In absence of more recent estimates, the 2021 values have been applied and thus results are likely to represent a conservative estimate of the costs.

As illustrated in Figure 11, to estimate the cost of days spent by farmers of managing deer, we multiplied together:

- **Days per year spent managing deer per property**, assumed to be 20 days per year (the average of the studies above).
- **Value of a farmer's day**, as based on Transport for NSW Economic parameter values for the value of travel time, equal to $164.96 per day[50].

[46] Original figures provided in $FY19, equal to $1,605 and $5,575.

[47] McLeod, R. (2023). Annual costs of feral deer in Australia. Centre for Invasive Species Solutions. https://pestsmart.org.au/wp-content/uploads/sites/3/2023/07/Invasives-Cost-of-Feral-Deer-Final-Report.pdf

[48] Stenekes N and Kancans, R (2021) 'Pest animal and weed management survey 2016-19: national landholder survey results' Australian Bureau of Agricultural and Resource Economics and Sciences, Department of Agriculture, Canberra 2019, 33

[49] Lethbridge, M.R. and Shute, E.R. 2025. The 2024 aerial survey of fallow deer in Tasmania. Report to Tasmanian Department of Primary Industries, Parks, Water and Environment.

[50] Transport for NSW, 2025, TFNSW Economic parameter values, p.12. available at https://www.transport.nsw.gov.au/system/files/media/documents/2025/tfnsw-economic-parameter-values-jan-

- **The number of private properties likely to engage in deer management by management zone,** consistent with the methodology described in section 3.2.3.

Figure 11: Approach to valuing the cost of days spent managing deer

Source: Frontier Economics

3.3 Cost of reduced forestry production

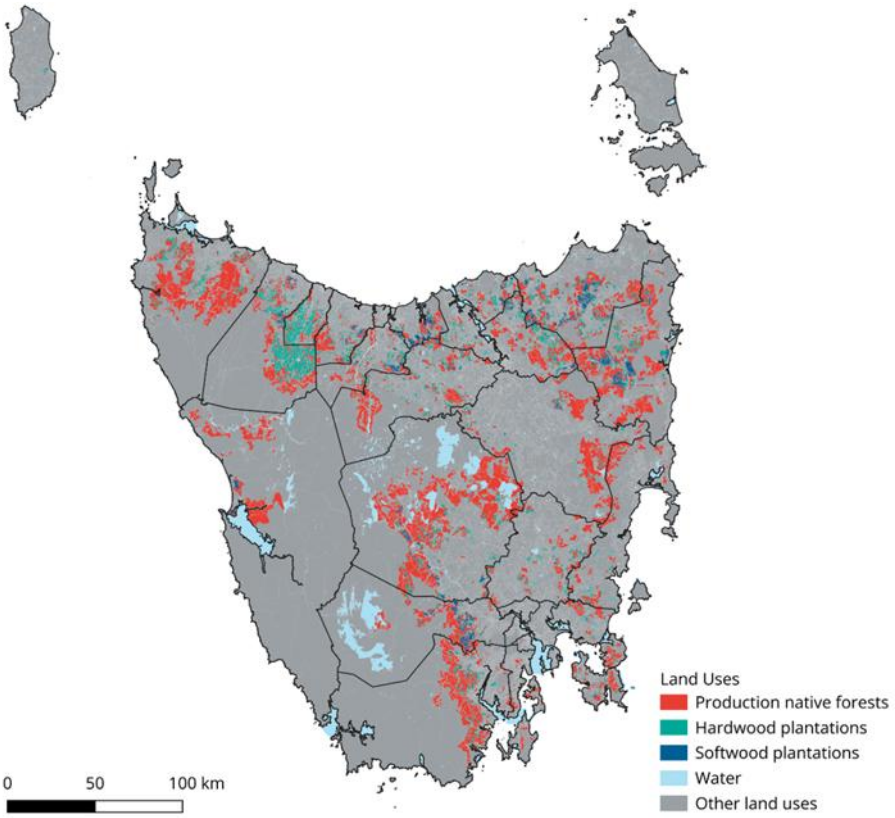
Fallow deer can reduce the quality and total volume of timber producer by Tasmania's forestry industry, primarily as result of browsing on branches, trampling, ringbarking, and rubbing their antlers against trees[51]. The current distribution of deer populations across Tasmania highlights that there are likely to be material impacts to the commercial forestry industry (including production of native forests, softwood and hardwood plantations. Figure 12).

In the absence of published reports on the impact of deer on forestry, surveys were sent to the major forestry operations in Tasmania, which collectively manage 1.14 million hectares of forestry land in Tasmania (summarised in Box 4). Responses to the survey, which was administered by the Invasive Species Council, suggest that deer are likely to cover between 8% and 29% of forestry properties active within the Tasmania forestry industry, contributing to losses in productivity.

2025.pdf. In absence of a Tasmania specific values, we have applied estimates from Transport NSW Economic parameter values.

[51] Costa e Silva, J., Potts, B. M., & Harrison, P. A. (2025). Mammalian Browsers Disrupt Eco-Evolutionary Dynamics in a Forest Tree Restoration Planting. Evolutionary Applications, 18(5), e70099..

Figure 12: Map of forestry areas in Tasmania



Source: Frontier Economics

Box 4: Forestry and Deer Impact Survey

As part of undertaking this analysis, the Invasive Species Council issued a 'Forestry and Deer Impact Survey' to collect data on the impact of deer on forestry activity and production in Tasmania. The survey asked respondents to answer a range of questions, including:

- What is the approximate size of your estate (in hectares)?
- Which Deer Management Zone is your property located in?
- What is your main enterprise (across softwood plantation, hardwood plantation and native forestry)?
- How many days, approximately, have you spent managing deer in the last year?

The survey also asked respondents to describe the presence of deer on their properties across:

- Rare (1-5% of area impacted) – e.g. 0.4% reduction in productivity
- Limited (2-25% of area impacted) – e.g. 2.4% reduction in productivity
- Extensive (25-100% of area impacted) – e.g. 10% reduction in productivity

There were 9 responses to the survey with the cumulative area covered by survey respondents being equal to 1.14 million hectares.

Responses to the *Forestry and Deer Impact Survey* were used to inform underlying assumptions in the valuation of the cost of deer in Tasmania, specifically the proportion of

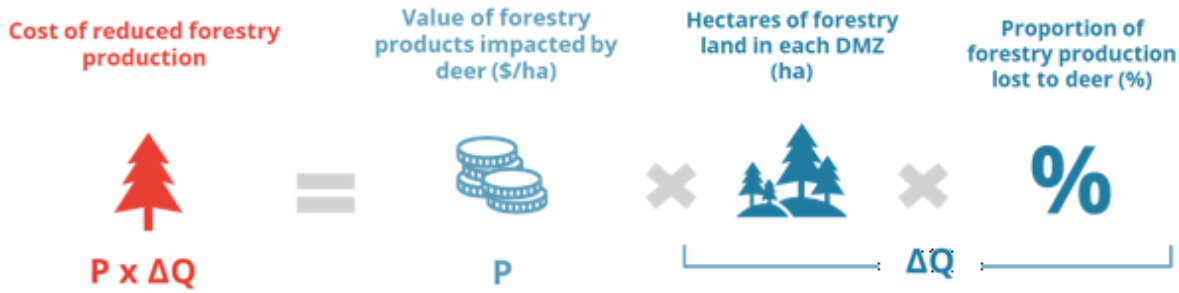
forestry areas impacted by the presence of deer in the valuation of the cost of reduced forestry productions.

Source: Based on the 'Forestry and Deer Impact Survey' issues by the Invasive Species Council

As illustrated in Figure 13**,** to estimate the cost of reduced forestry production, we multiplied together:

- **Estimated area of softwood plantations, hardwood plantations and production of native forests across each of the zones**
- **Proportion of forestry areas impacted by the presence of deer.** We adjusted the average proportion of forestry area impacted by deer (from the *'Forestry and Deer Impact Survey'*) by the density of deer across each of the regions. Across the zones, deer population were estimated to impact:
  - Between 2% and 29% of softwood plantations
  - Between 1% and 19% of hardwood plantations
  - Between 1% and 8% of production native forests
- **Estimated value of forestry production per hectare of land.** The value of forestry per hectare was determined by taking the average of the value of forestry production in Tasmania between 2020 and 2024 and divided by the estimated hectares of land used for forestry in Tasmania between 2020 and 2024. This resulted in the following values:
  - Softwood production: $1,609/hectare
  - Hardwood production: $1,224/hectare
  - Production native forestry: $115/hectare

Figure 13: Approach to valuing the cost of reduced forestry production

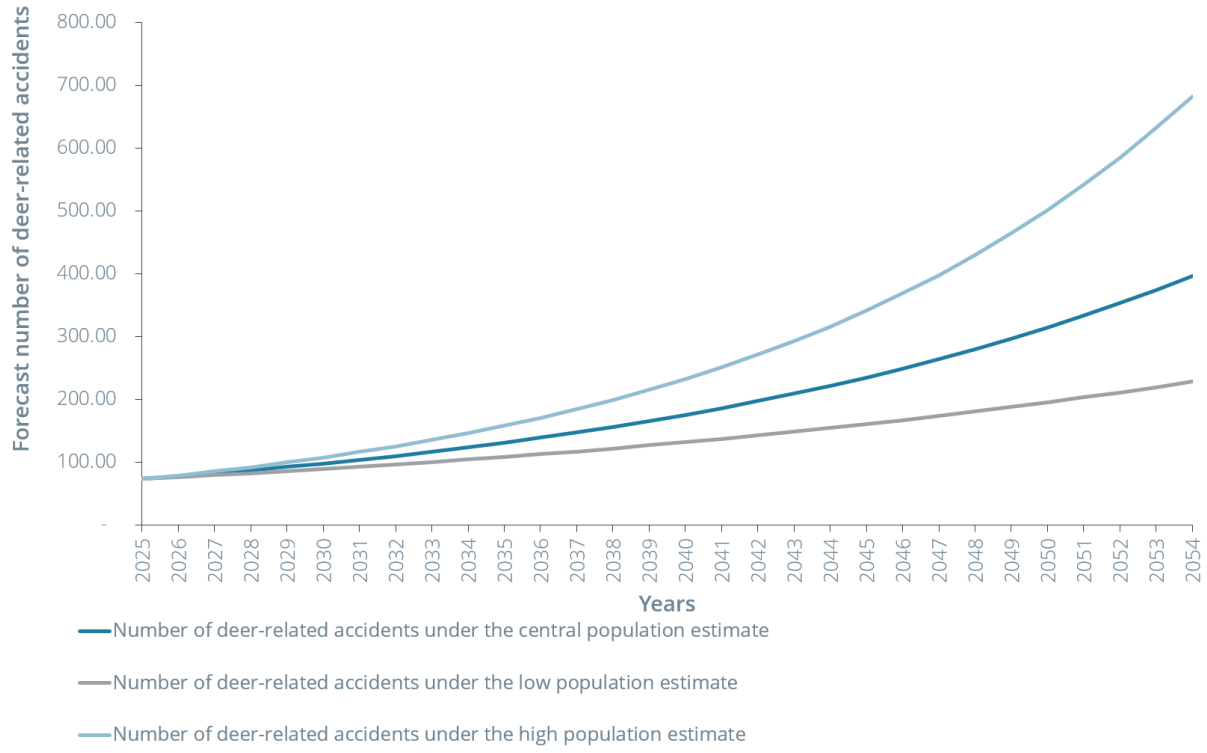


Source: Frontier Economics

3.4 Cost of deer-related vehicle incidents

The presence of deer in Tasmania has contributed to several vehicle crashes and accidents. Based on data provided by the Royal Automobile Club of Tasmania (RACT), between 2021 and 2025 there were estimated to be 122 vehicle crashes and road accidents associated deer in Tasmania[52].

These incidents have become more frequent and are likely to grow as deer populations increase. As shown in Figure 14, based on our forecast deer population and assumed rate of road utilisation, deer accidents could be higher than 397 per year by the end of the modelling period under the central population forecast.



Source: Frontier Economics

As such, as shown in Figure 15, to estimate the cost of deer-related vehicle incidents, we multiplied together:

- **The average number of deer-related vehicle accidents per year by severity of accident** (split across property damage only, minor injury and fatal accidents) based on data provided by RACT on the estimated number of deer-related vehicle accidents between 2021 and 2025 and the population estimate from 2025:
    - The RACT data suggests that there are an average of 24 deer-related vehicle accidents reported annually. However, this figure is likely to be understated due to the data only capturing deer-related vehicle accidents reported to RACT (i.e. it does not capture deer-related accidents reported to other insurance providers). Additionally, there are likely to be several deer-related vehicle accidents that go unreported. To account for this, we have increased the average number of deer-related accidents by a factor of three to

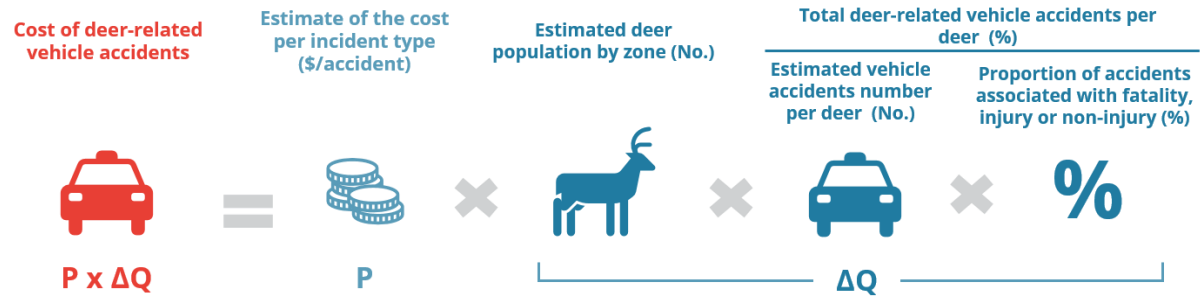
[52] Based on data provided by the Royal Automobile Club of Tasmania on the number of deer-related vehicle accidents between 2021 and 2025

capture accidents likely to reported to other insurers as well as accidents that are likely to go unreported[53].

- Due to an absence of a comprehensive database on the proportion of accidents of each severity type in Tasmania, we have drawn on Victorian data as reported by VicRoads[54].

- **The forecasted future deer population** as per our estimates outlined above
- **The average cost of property-only, minor, serious and fatal crashes** using data from Australian Transport Assessment and Planning[55]. These estimates consider the human costs and the financial costs of vehicle accidents, including:
  - Human costs such as ambulances costs, labour in the workplace and household costs, and quality of life costs.
  - Vehicle costs such as repairs, unavailability of vehicles and towing.
  - General costs including travel delays, insurance administration and emergency services.

Figure 15: Approach to valuing deer-related accidents per year



Source: Frontier Economics

[53] Based on discussions with the Invasive Species Council increasing the number of deer-related vehicle accidents by factor of three was decided based on the relevant market share of the RACT as well as the estimated number of deer-related vehicle accidents that go unreported in Tasmania .

[54] VicRoads (2019). Interactive crash stats 2014-2019. https://public.tableau.com/views/CrashstatMainlandingpage/Mainpage?:embed=y&:display_count=yes&:showTabs=y&:showVizHome=no&%3Adisplay_count=yes&%3Atoolbar=no&%3Arender=false#1

[55] Australian Transport Assessment and Planning (2013). *4. Crash costs*. [online] Australian Transport Assessment and Planning. Available at: https://www.atap.gov.au/parameter-values/road-transport/4-crash-costs.

4 Environmental cost of deer

4.1 Cost of environmental restoration

Damage cause to the natural environment as a result of deer are widely known. Alongside the physical trampling native vegetation, grazing and ring-barking young trees and fouling of waterholes, deer contribute to a number of biosecurity risks associated with the spreading of weeds and diseases, including foot in mouth disease, amongst Australian's native animal population. Alongside degrading the quality of the natural environment and habitat, deer often directly compete with native herbivores for food[56].

As reported by Greening Australia[57], as an introduced hunting resource in the 1830's, the presence of deer is likely to:

> *"Serve no positive ecological functions in Tasmania. The only purpose of protection is to maintain a hunting resource"*

The presence of deer in Tasmania is now becoming a concern in some of the state's world-famous Wilderness World Heritage Areas. Reports suggesting deer population are migrating outside of their historical range and into new areas across Tasmania, including Bruny Island, the outskirts of Launceston and Hobart, Mole Creek, Deloraine and Dover[56].

Expanding fallow deer populations are likely to undermine environmental and ecological restoration by browsing and trampling revegetation, damaging seedlings and young trees, disturbing soils and riparian areas, and creating conditions that favour weed spread, effects that can require ongoing protection.

These impacts are already diverting restoration budgets. Greening Australia have planted more than 300,000 trees and shrubs in the Midlands, the region with the highest concentration of deer. In 2016, they reported that between 12% and 45% of those trees had been damaged by deer and that 1-5% had been killed. Protecting plantings from deer damage added an estimated 10% to the cost of planting, not including the many hours of volunteers.

As shown in Figure 16, we have estimated the cost of environmental restoration associated with deer-related damage to the natural environment by multiplying together:

- Estimated annual cost of environmental damage associated with deer-related ecological damage, based on Greening Australia's estimated on the Midlands Restoration Program; assumed to be $1.7 million per year[59].

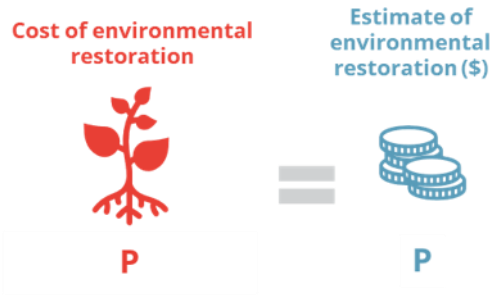
[56] Invasive species council. Feral deer in Tasmania. https://invasives.org.au/our-work/feral-animals/feral-deer/feral-deer-in-tasmania/

[57] Greening Australia (2016). Inquiry into Deer Management in Tasmania. Submission by Greening Australian Tasmania to the Legislative Council Government Administration Committee A.

[58] Invasive Species Council, Feral deer in Tasmania. https://invasives.org.au/our-work/feral-animals/feral-deer/feral-deer-in-tasmania/

[59] Original figure in $FY15 equal to $1.3 million

Figure 16: Approach to valuing the cost of environmental restoration



Source: Frontier Economics

5 Results

Key points

- Our analysis indicates that there are likely to be material benefits associated with substantive reduction in the number of deer in Tasmania, with our analysis indicating the cost of deer could be up to $754.1 million under the central estimate ($FY25m, 7% discount rate).
- When reported as an annual figure, the cost of the presence of deer in Tasmania could be between $55.0 million per year up to $88.7 million ($FY25m, undiscounted, 1% escalation) per year over the next thirty years. If costs continue to grow in line with the estimated population growth rates, annual costs could reach $298.3 million ($FY25m, undiscounted, 6% escalation).
- The largest cost is likely to be incurred in zone 1, up to $604.0 million under the central estimate ($FY25m, 7% discount rate). This is driven by the assumed deer density and corresponding deer population being the highest zone 1.
- The results of the sensitivity and scenario analysis show that under a 'high impact' scenario, the cost of deer could be up to $1,035.0 million ($FY25m, 7% discount rate).
- Although our analysis has sought to value, as much as is practicable, the costs associated with the presence of deer in Tasmania, there are a range of unquantified impacts in this analysis. This, alongside with the relevant impacts being valued conservatively, suggests that the true cost to the community of deer in Tasmania could be much larger.

5.1 Approach to economic analysis

Consistent with Infrastructure Australia Guidance, the economic analysis seeks to identify, quantify and monetise (using the methodologies outlined earlier) a broad range of costs associated with the presence of deer in Tasmania. These costs are estimated over a 30 year modelling period and discounted using a 7% social discount rate to determine the value of these costs in present value (PV) terms.

We have also presented the undiscounted results of the economic analysis in order to illustrate the escalation in the costs over time as forecast deer population rise (see Section 5.3).

5.2 There are significant benefits of reducing the deer population

As shown in Figure 17**,** under our central estimate the economic, social and environmental cost of deer in Tasmania could be **$754.1 million** over the next 30 years ($FY25m, 7% discount rate). This is made up of:

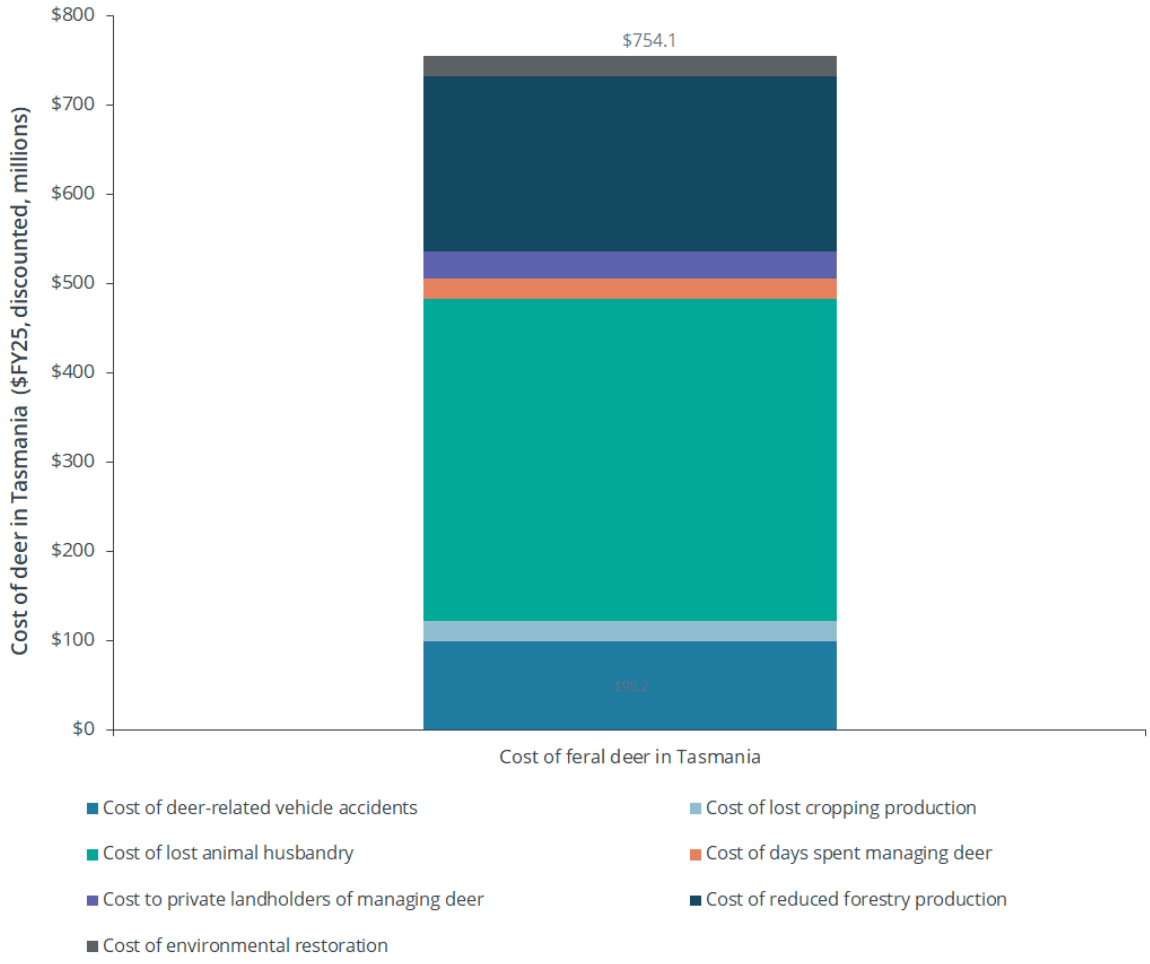
- **$98.2 million** in the cost of deer-related vehicle accidents
- **$23.4 million** in the cost of lost cropping production due to deer-related grazing
- **$360.8 million** in the cost of animal husbandry
- **$22.5 million** in costs from days spent managing deer by private landholders

- **$30.1m** in resource costs from managing deer by private landholders
- **$196.5m** in the cost of lost forestry production
- **$22.7m** in the cost of environmental restoration

The largest cost is likely to be incurred in, zone 1; up to **$604.0 million** under the central estimate ($FY25m, 7% discount rate). This is driven by the assumed deer density and corresponding deer population being the highest zone 1 (see Figure 18).

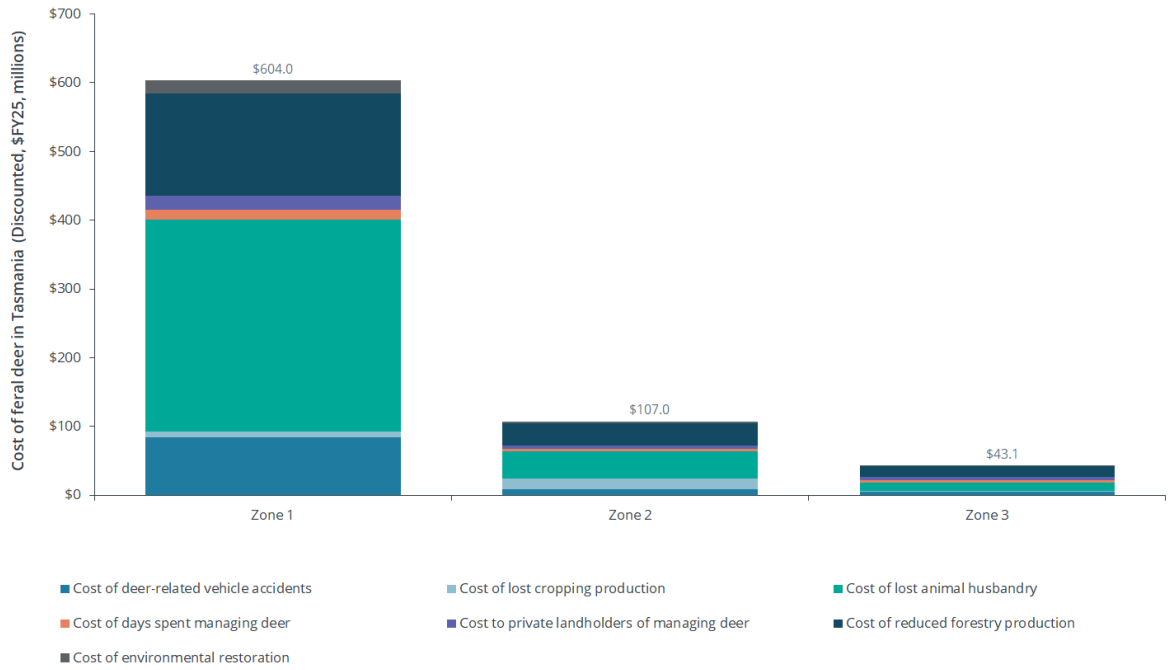
The cost of deer in zone 2 and zone 3 was estimated to be **$107.0 million** and **$43.1 million**, respectively ($FY25m, 7% discount rate) (see Figure 18).

Figure 17: Economic, social and environmental costs of deer in the Midlands and eastern regions of Tasmania over the period 2025-2054 ($FY25m, PV terms, 7% discount rate)



Source: Frontier Economics

Figure 18: Economic, social and environmental costs of deer in the Midlands and eastern regions of Tasmania over the period 2025-2054 – split across deer management zones ($FY25m, PV terms, 7% discount rate)



Note: for graphing purposes we have 'weighted' the cost of environmental restoration relative to the proportion of forecast deer population in each of the zones.

Source: Frontier Economics

Table 2: Economic, social and environmental costs of deer in Tasmania over the period 2025-2054 – split across deer management zones ($FY25m, PV terms, 7% discount rate)

Impact	Zone 1	Zone 2	Zone 3	Total
Cost of deer-related vehicle accidents	$84.3	$9.3	$4.6	**$98.2**
Cost of lost cropping production due to deer-related grazing	$7.9	$14.4	$1.1	**$23.4**
Cost of lost gross margin in animal husbandry due to grazing	$308.7	$39.6	$12.5	**$360.8**
Cost of days spent managing deer	$14.9	$3.7	$3.9	**$22.5**
Cost to private landholder managing deer	$19.9	$5.0	$5.2	**$30.1**
Cost of reduced forestry production	$148.9	$32.8	$14.7	**$196.5**
Cost of environmental restoration	$19.4	$2.1	$1.1	**$22.7**
Total	**$604.0**	**$107.0**	**$43.1**	**$754.1**

Note: for purposes of the table above we have 'weighted' the cost of environmental restoration relative to the proportion of forecast deer population in each of the Zones.

Source: Frontier Economics

5.2.1 Under a 'high impact' scenario, the economic social and environmental cost of deer on the community is likely to increase significantly

As discussed above, given information ability, our analysis is subject to a range of uncertainties. Consistent with best practice, to account for this uncertainty, our analysis includes sensitivity and scenario analysis around the key assumptions. The key assumptions tested as part of the 'low impact' and 'high impact' are specified in Table 3.

Table 3: 'Low impact' and 'high impact' scenario assumptions

Impact	Key assumption tested	'Low impact' scenario	'High impact scenario'
Cost of deer-related vehicle accidents	Estimated deer population	Low population scenario	High population scenario
Cost of lost cropping production due to deer-related grazing	Proportion of cropping area impacted by the presence of deer	5.0% - 7.0%	7.5% - 10.0%
Cost of lost gross margin in animal husbandry due to grazing	Proportion of grazing area impacted by the presence of deer	2.5%	7.5%
Cost of days spent managing deer	Estimated number of days spent managing deer by impacted landholders	18 days	22 days
Cost to private landholder managing deer	Estimated resource cost to impacted landholders associated with management of deer	$1,972.1	$6,850.0
Cost of reduced forestry production	Proportion of forestry area impacted by the presence of deer	7.0% - 23%	10.0% - 35.0%

Note: for the purposes of the sensitivity analysis, we have held the estimated cost of environmental restoration constant.

Note: several of the assumptions listed in the table above are subject to variation across each of the deer management zones considered in this analysis. Where this is the case, for simplicity we have presented a range of possible inputs applied within the estimate of key assumptions.

Source: Frontier Economics

The results of the sensitivity and scenario analysis are presented in Table 4 below. The findings of our scenario analysis suggest that the accumulated cost of deer over the next 30 years could be between $482.2 million to $1,035.0 million ($FY25m, 7% discount rate).

Table 4: Economic, social and environmental costs of deer in the Midlands and eastern regions of Tasmania over the period 2025-2054 'low impact' and 'high impact' scenario ($FY25m, 7% discount)

	'Low impact' scenario	Central estimate	'High impact scenario'
Cost of deer-related vehicle accidents	$76.5	$98.2	$128.8
Cost of lost cropping production	$11.7	$23.4	$35.1
Cost of lost animal husbandry	$180.4	$386.1	$541.2
Cost of days spent managing deer	$20.2	$22.5	$24.7
Cost to private landholder managing deer	$13.4	$30.1	$46.7
Cost of reduced forestry production	$157.2	$196.5	$235.8
Cost of environmental restoration	$22.7	$22.7	$22.7
Total	**$482.2**	**$779.5**	**$1,035.0**

Note: for the purposes of the sensitivity analysis, we have held the assumed environmental restoration is held constant.

Source: Frontier Economics

5.3 Over the next 30 years, the per year cost of deer in Tasmania is likely to grow in line with population numbers

Over the next 30 years as deer populations increase, costs to the community are expected to rise (holding current management practices constant). Forecasting these costs over time is inherently uncertain given the relationship between deer numbers and costs to the community is not well understood. However, assuming there is no increase in the materiality of their impacts as deer numbers increase, is likely to understate their true costs in future[60].

To account for the fact that there is a relationship between deer numbers and deer impacts (albeit an uncertain relationship), we have applied a simple 'escalating factor' to demonstrate how costs could increase over the modelling period in line with deer numbers[61]. For the purposes of this analysis, we tested two escalation scenarios. The first was a very conservative 1% increase per year. The second assumed a linear relationship between deer numbers and

[60] Yokomizo, H., Possingham, H. P., Thomas, M. B., & Buckley, Y. M. (2009). Managing the impact of invasive species: the value of knowing the density–impact curve. Ecological Applications, 19(2), 376-386.

[61] Note, this escalating factor was only applied to impacts that could not be valued relative to the forecast deer population; this includes the cost of lost cropping production, lost animal husbandry, days spent managing deer, cost to private landholders of managing deer, cost of reduced forestry production and the cost of environmental restoration.

deer impacts and thus applied a 6% escalation factor (consistent with current estimated deer population growth rate)[62].

When applying a:

- 1% escalation factor to the annual estimated cost of deer in Tasmania, as shown in Figure 19, costs could increase from $55.0 million per year up to $88.7 million ($FY25m, undiscounted). When discounted, the annual estimated cost is likely to go from $51.5 million per year to $12.5 million ($FY25m, 7% discount rate).
- 6% escalation factor to the annual estimated cost of deer in Tasmania, as shown in Figure 19, costs could increase from $55.0 million per year up to $298.3 million ($FY25m, undiscounted). When discounted, the annual estimated cost is likely to go from $55.0 million per year to $41.9 million ($FY25m, 7% discount rate).

Cumulatively, the cost of deer in Tasmania could increase up to **$823.2 million** (with a 1% escalation factor) or **$1,395.9 million** (with a 6% escalation figure, $FY25m, discounted).

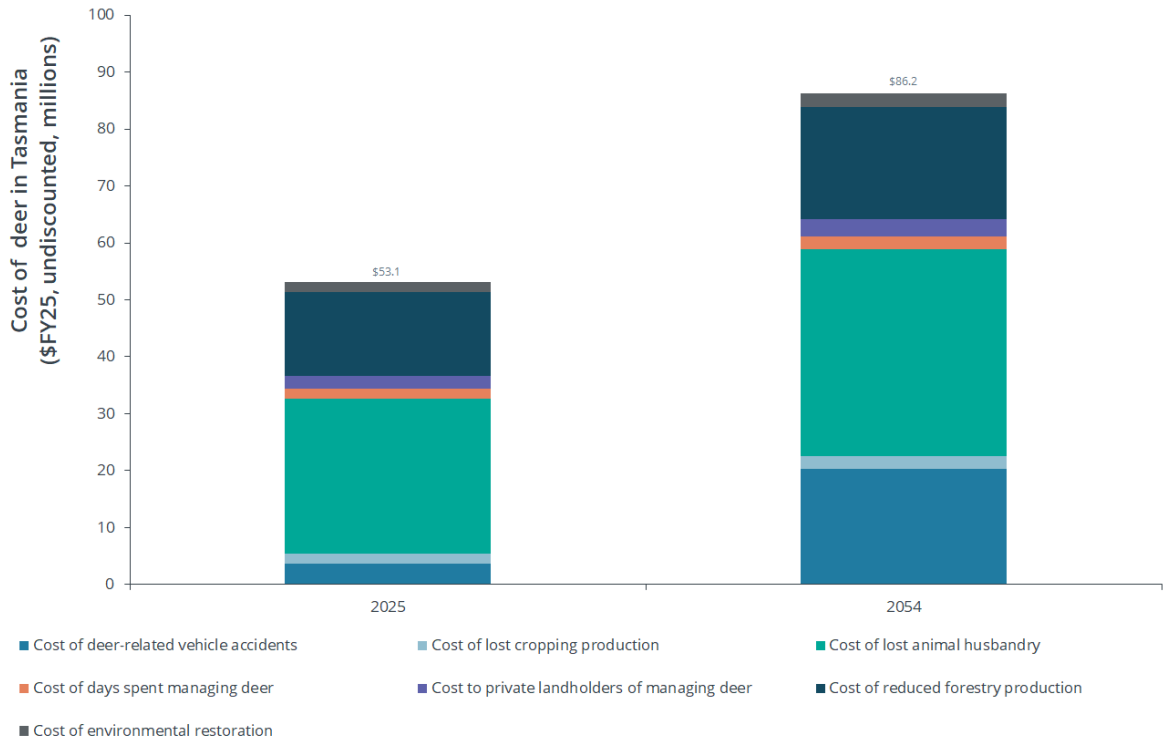
Table 5: Economic, social and environmental costs of deer in Tasmania per year over the period 2025-2054 ($FY25m, undiscounted, 1% escalation factor)

Impact	Annual cost – 2025	Annual cost -2054
Cost of deer related vehicle accidents	$3.7	$20.3
Cost of lost cropping production	$1.8	$2.4
Cost of lost animal husbandry	$27.2	$36.3
Cost of days spent managing deer	$1.7	$2.3
Cost to private landholders of managing deer	$2.3	$3.0
Cost of reduced forestry production	$14.8	$19.7
Cost of environmental restoration	$1.7	$2.3
Total	**$53.1**	**$86.2**

Source: Frontier Economics

[62] Based on Primary Industries and Regions South Australia (PIRSA) applying a proportional loss to predicted annual productivity losses based on the increase or decrease of feral deer in the landscape. See Primary Industries and Regions South Australia (PIRSA) (2022). *Feral deer control economic analysis*. Government of South Australia. https://pir.sa.gov.au/__data/assets/pdf_file/0003/422175/feral-deer-control-economic-analysis.pdf

Figure 19: Economic, social and environmental costs of deer in the Midlands and eastern regions of Tasmania per year over the period 2025-2054 ($FY25m, undiscounted, 1% escalation factor)



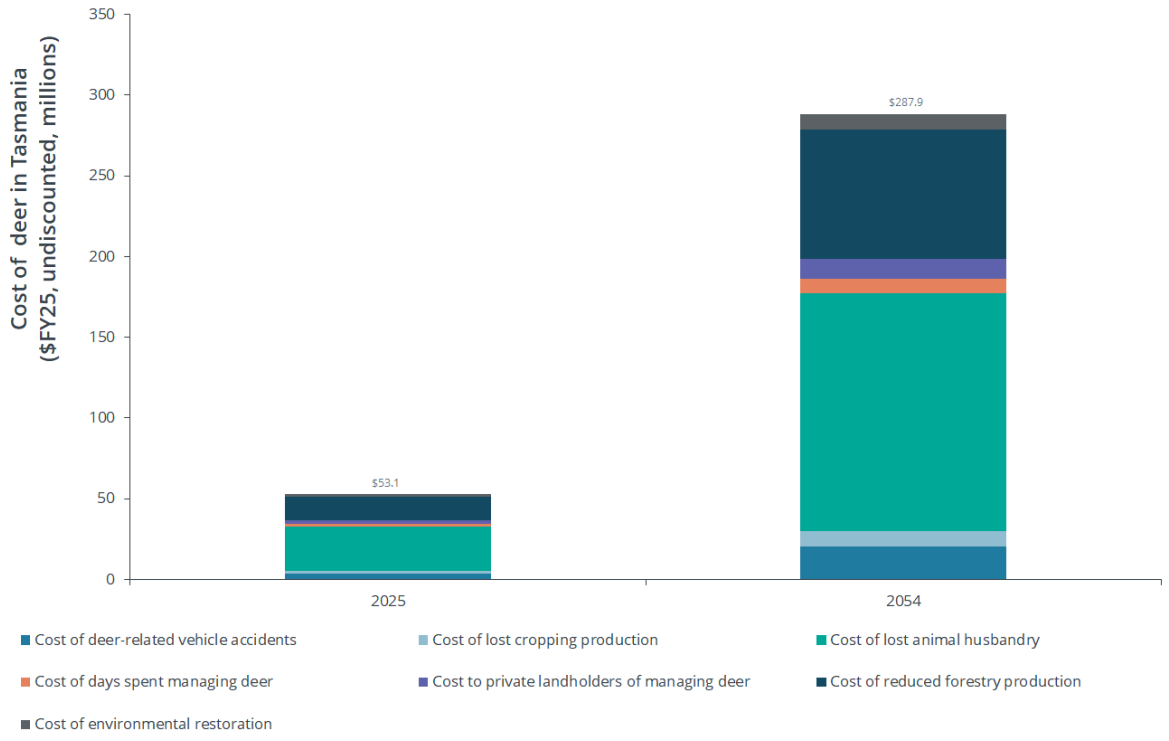
Source: Frontier Economics

Table 6: Economic, social and environmental costs of deer in the Midlands and eastern regions of Tasmania per year over the period 2025-2054 ($FY25m, undiscounted, 6% escalation factor)

Impact	Annual cost – 2025	Annual cost -2054
Cost of deer related vehicle accidents	$3.7	$20.3
Cost of lost cropping production	$1.8	$9.6
Cost of lost animal husbandry	$27.2	$147.2
Cost of days spent managing deer	$1.7	$9.2
Cost to private landholders of managing deer	$2.3	$12.3
Cost of reduced forestry production	$14.8	$80.2
Cost of environmental restoration	$1.7	$9.2
Total	**$53.1**	**$287.9**

Source: Frontier Economics

Figure 20: Economic, social and environmental costs of deer in Tasmania per year over the period 2025-2054 ($FY25m, undiscounted, 6% escalation factor)



Source: Frontier Economics

Table 7: Economic, social and environmental costs of deer in the Midlands and eastern regions of Tasmania–with escalation ($FY25m, 7% discount)

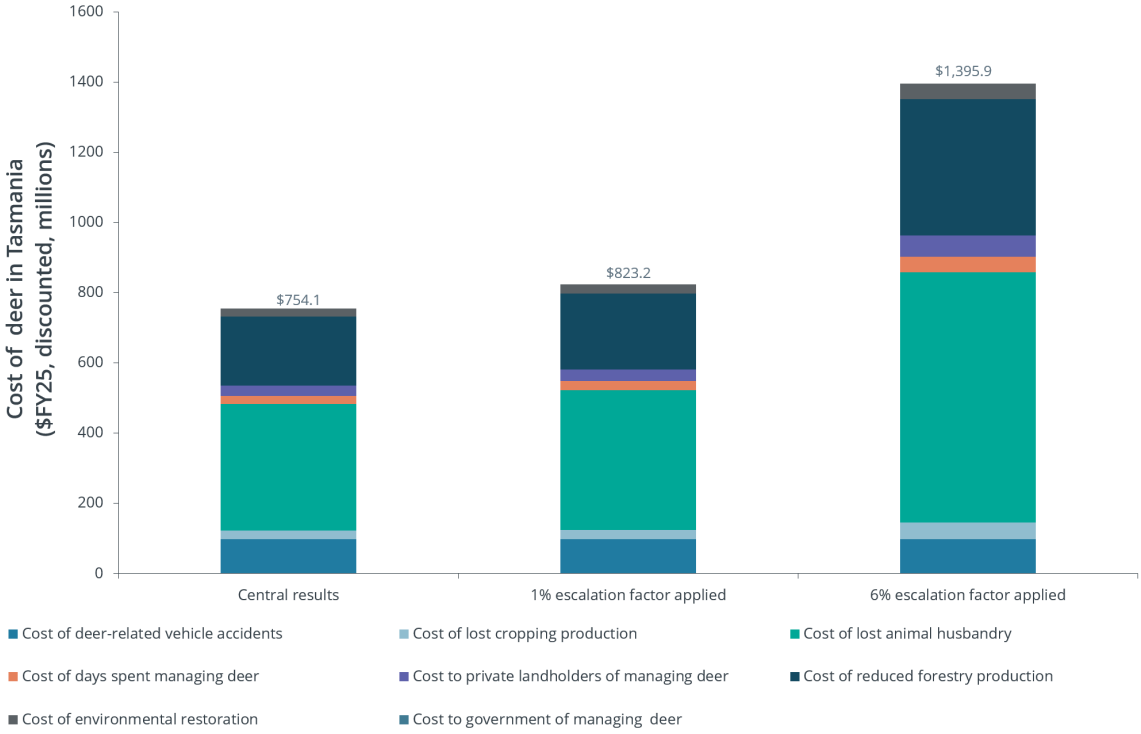
Impact	Central results	1% escalation factor applied	6% escalation factor applied
Cost of deer related vehicle accidents[63]	$98.2	$98.2	$98.2
Cost of lost cropping production	$23.4	$25.9	$46.3
Cost of lost animal husbandry	$360.8	$398.8	$713.7
Cost of days spent managing deer	$22.5	$24.9	$44.5
Cost to private landholders of managing deer	$30.1	$33.2	$59.5

[63] We note, as noted in Section 3.4, the cost of deer-related vehicle accidents accounts of increases in deer population over the 30year modelling period. For this reason, the cost of deer-related vehicle accidents does not change under the '1% escalation' and '6% escalation' scenarios as this cost category already accounts for changes in deer population in line with forecast assumptions.

Cost of reduced forestry production	$196.5	$217.2	$388.7
Cost of environmental restoration	$22.7	$25.0	$44.8
Total	**$754.1**	**$823.2**	**$1,395.9**

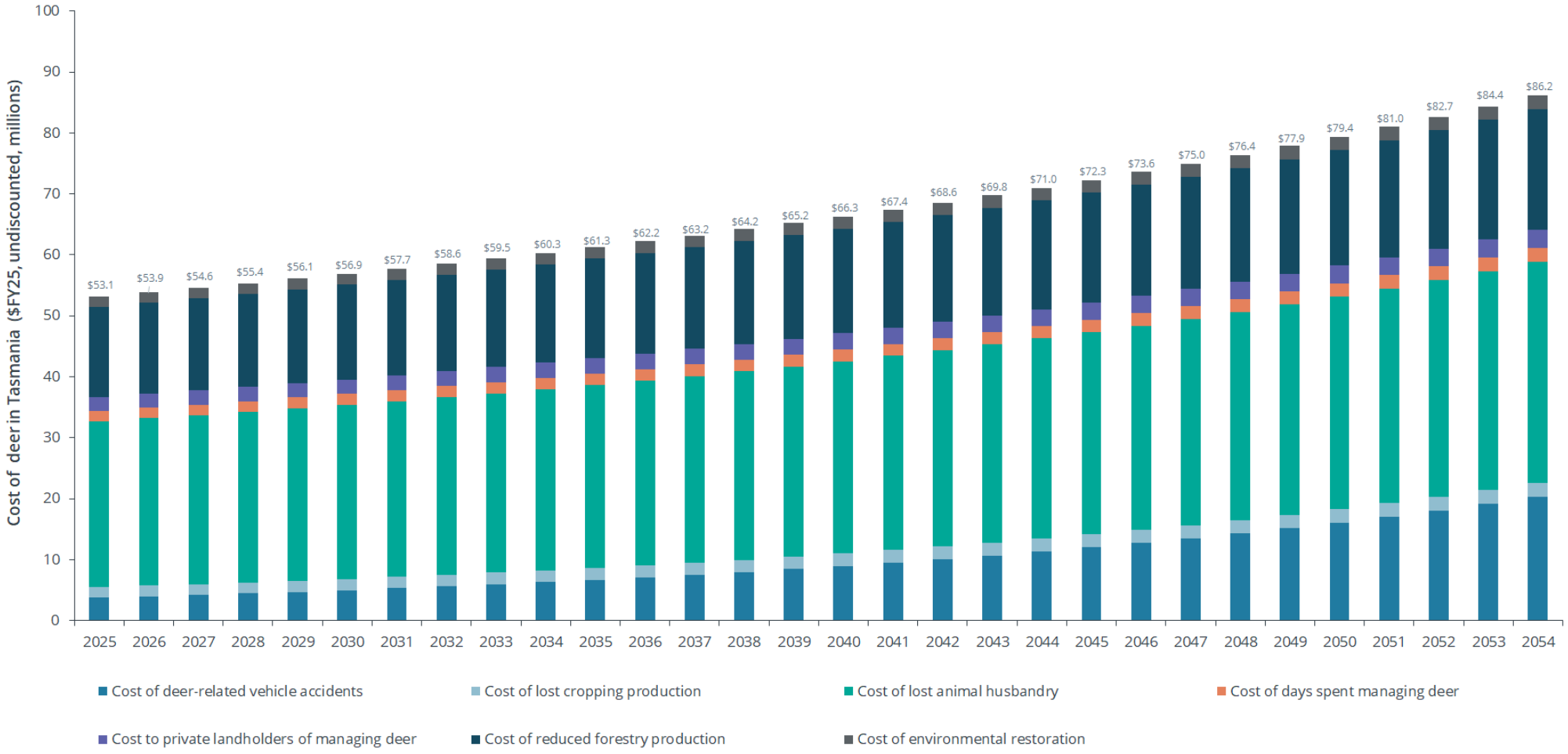
Source: Frontier Economics

Figure 21: Economic, social and environmental costs of deer in the Midlands and eastern regions of Tasmania – with escalation ($FY25m, 7% discount)



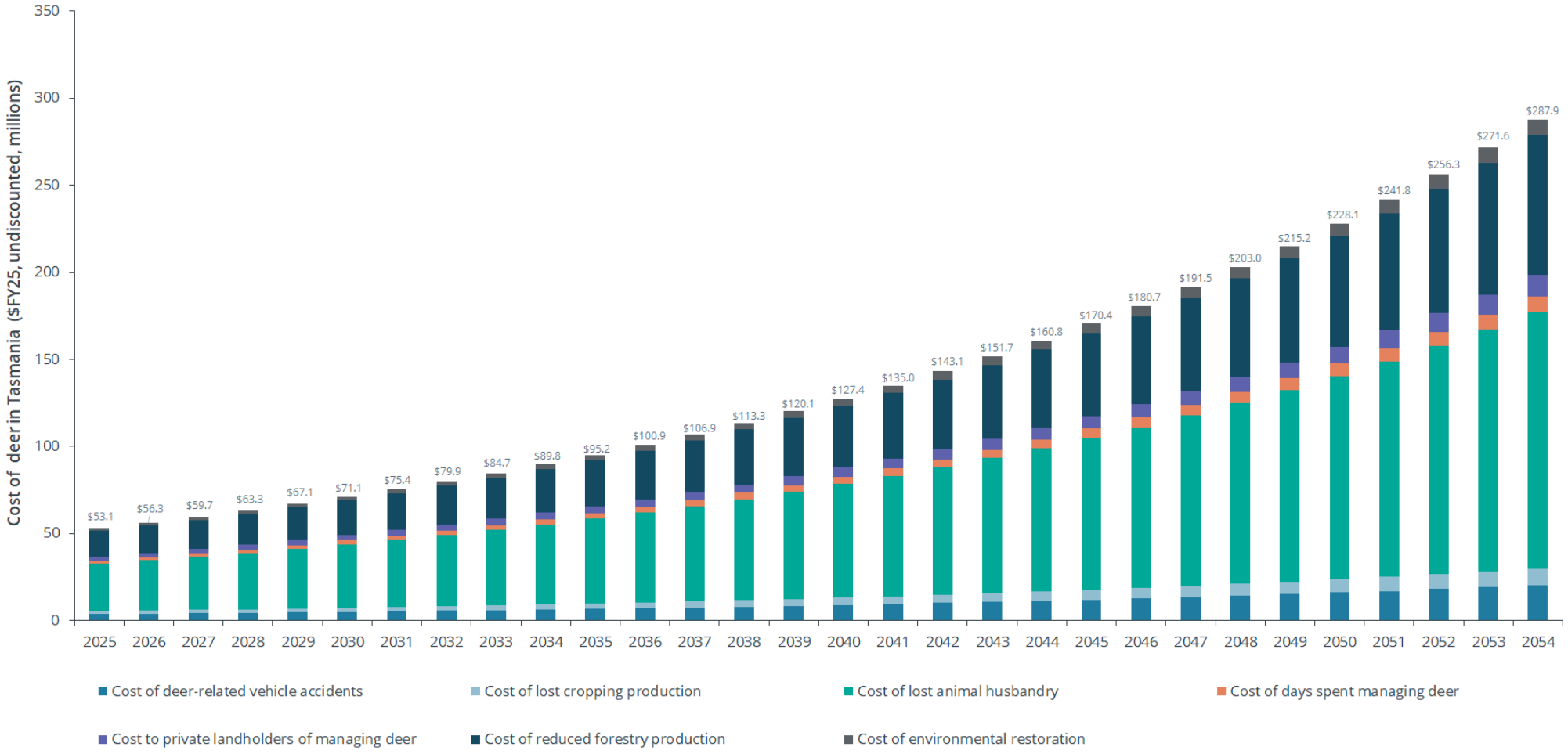
Source: Frontier Economics

Figure 22: Economic, social and environmental costs of deer in Tasmania per year over the period 2025-2054 ($FY25m, undiscounted, 1% escalation factor)



Source: Frontier Economics

Figure 23: Economic, social and environmental costs of deer in Tasmania per year over the period 2025-2054 ($FY25m, undiscounted, 6% escalation factor)



Source: Frontier Economics

5.4 The unquantified impacts mean that the cost of deer may be higher than estimated

Although our analysis has sought to value as many of the costs of deer as practicable, as discussed above, given data availability, this figure does not capture a range of potentially significant costs of deer. These include the impact of deer on:

- increased disease transmission to livestock
- impacts on biodiversity and the environment
- impacts on indigenous cultural heritage

We discuss each in further detail below.

1.3.1 Cost of increased disease transmission to livestock

Fallow deer are known to be carriers of a variety of pathogens and therefore, represent a biosecurity risk due to their ability to transmit diseases to livestock[64].

For example, evidence suggests fallow deer have been infected by a variety of pathogens of significant concern to the agricultural industry, such as bovine tuberculosis[65], Johne's disease, foot-and-mouth disease[66], and leptospirosis. In the *Tasmanian Livestock Health Report* conducted by Animal Health Australia, it was suggested that over 50% of deer in Central Tasmania show evidence of liver fluke, a parasitic worm also common in sheep and cattle[67].

Box 5: Stakeholder evidence of biosecurity risks of deer

"Recent research has shown some parasites of sheep and cattle, for example liver fluke, are co-hosted by deer which re-contaminate improved pastures after control by farmers. There are at least 15 diseases common to deer and domestic livestock including Johanne's and Foot and Mouth disease. The continued presence of deer amongst domestic herd animals also increases the difficulties in maintaining herd and business 'bio secure status'. Bio secure status declarations are required by marketing authorities, processors and supply chains for meat and fibre products. Meat and fibre market value chain stakeholders are increasingly mandating 'bio secure' supply chains where quality of product and disease/contaminate standards have to be proven to be maintained at a high level. As a farmer, we need to make statutory declarations that biosecurity plans have been developed and implemented, and this is becoming increasingly difficult as the presence of deer becomes more entrenched in the landscape."

Ted Rowley and Jo Oddie, farmer from Jindabyne NSW

Source: Rowley, T. (2018). Impact of feral deer, pigs and goats in Australia - Submission 7. [online] Parliament of Australia. Available at: https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/FeralDeerPigGoat2019/Submissions.

[64] Huaman, J.L., Helbig, K.J., Carvalho, T.G., Doyle, M., Hampton, J.O., Forsyth, D.M., Pople, A. and Pacioni, C. (2023). A review of viral and parasitic infections in wild deer in Australia with relevance to livestock and human health. *Wildlife Research*, 50(9), pp.593–602. doi:https://doi.org/10.1071/wr22118.

[65] English A (1982) Serological survey of wild fallow deer (Dama dama) in New South Wales, Australia. Veterinary Record 110, 153–154.

[66] Forman, A.J. and Gibbs, E.P.J. (1974). Studies with foot-and-mouth disease virus in British deer (red, fallow and roe). *Journal of Comparative Pathology*, 84(2), pp.215–220. doi:https://doi.org/10.1016/0021-9975(74)90062-0.

[67] TasFarmers (2025). Tasmania Livestock Health Report – May 2025. https://tasfodder.com.au/uploads/documents/News-item-docs/May-2025-Tasmanian-Livestock-Health-Report.pdf

Globally, fallow deer have been found to carry other pathogens, such as pinkeye (infectious bovine keratoconjunctivitis), lungworm infection (cattle strain), and Streptococcus bacteria. These findings reinforce concerns that deer populations can serve as reservoirs for multiple livestock diseases, particularly in geographical areas where agricultural sites and deer distributions overlap[68].

However, there is currently limited direct evidence of disease transmission from deer to livestock within Australia [69].

While the transmission rate of infectious disease in question is relatively low, deer can be responsible for outbreaks in livestock that can have substantial economic impact[70], for example, a large-scale outbreak of a highly contagious disease such as foot-and-mouth (FMD) disease. Although Australia is currently free of FMD, modelling by the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) found if a large-scale multi-state outbreak were to occur, it would cost the Australian economy between $49.3 billion to $51.8 billion in revenue losses, such as due to loss of exports and depressed domestic prices[71].

Due to the lack of reliable data on the transmission of diseases from fallow deer to livestock in Australia, we have not sought to estimate the monetary costs of this. However, since the costs of transmission of diseases to livestock must be non-negative, this strengthens the case that the agricultural costs of deer in Tasmania in this analysis are likely to be understated.

5.4.1 Cost of impacts on biodiversity

Alongside inflicting physical damage associated with trampling, grazing and ring-barking young trees, the presence of fallow deer in Tasmania can contribute to a far wider net of environmental impacts[72] [74], including:

- fouling of waterholes
- dispersing and spreading of weeds through faecal matter or hair, contributing to a broader biosecurity risks
- disturbing soil and riparian vegetation leading to erosion
- herbivory leading deer to compete with other native species for food
- damaging or destroying habitat for ground dwelling species

[68] Pacioni C, Huaman J, Ramsey D, Carvalho T and Helbig K (2022). The Role of Wild Deer in The Transmission of Diseases Of Livestock: Final Report For Project P01- L-002. Report for the Centre for Invasive Species Solutions.

[69] Forsyth, D.M., Pople, A. and Nugent, G. (2023). Ecology, impacts and management of wild deer in Australia. *Wildlife Research*, 50(9), pp.i–vii. doi:https://doi.org/10.1071/wr23092.

[70] Pacioni C, Huaman J, Ramsey D, Carvalho T and Helbig K (2022). The Role of Wild Deer in The Transmission of Diseases Of Livestock: Final Report For Project P01- L-002. Report for the Centre for Invasive Species Solutions.

[71] Buetre, B., Wicks, S., Kruger, H., Millist, N., Yainshet, A., Garner, G., Duncan, A., Abdalla, A., Trestrail, C., Hatt, M., Thompson, L.-J. and Symes, M. (2013). *Potential socio-economic impacts of an outbreak of foot-and-mouth disease in Australia*. [online] Available at: https://daff.ent.sirsidynix.net.au/client/en_AU/search/asset/1027354/0.

[72] Invasive species council. Feral deer in Tasmania. https://invasives.org.au/our-work/feral-animals/feral-deer/feral-deer-in-tasmania/

[73] Greening Australia (2016). Inquiry into Deer Management in Tasmania. Submission by Greening Australian Tasmania to the Legislative Council Government Administration Committee A.

Alongside the cost of environmental restoration associated with physical damage caused by fallow deer, there are additional impacts on Tasmania's native flora and fauna that were not able to be monetised in this report.

Whilst recorded observations and qualitative descriptions of the impact of fallow deer on biodiversity are widely cited in current literature[74], there are limited publicly available studies that quantify and monetise the impact of fallow deer on key ecological processes and biodiversity more broadly. Due to these present data limitations, we have chosen to capture the broader cost of impacts on biodiversity qualitatively.

Deer have a wide range of environmental impacts, primarily due to their broad dietary niche and the ability to occupy a wide range of habitats[75]. Impacts include spreading weeds, trampling understory, stripping and ring barking (as a result of rubbing antlers on trees, competing with native herbivores for food, and significant browsing pressure on native vegetation, including threatened orchids, daisies, grasses, and trees[75]. Of particular concern is the high prevalence of browsing on *Eucalyptus* species and diverse shrubs in highland areas, which include the World Heritage Area[75] [76]. For example, many of the deer culled in the Walls of Jerusalem aerial control program were found to have been feeding on Miena cider gums, an endangered species already under stress from climate-induced dieback[76]. Beyond direct consumption, deer cause extensive physical damage by smashing branches and ringbarking stems; in some restoration trials, up to 45% of trees have been damaged and 1% to 5% killed by these activities[73] [75].

Deer can also pose a major risk to ecosystem recovery and facilitate the spread of invasive species. In the aftermath of bushfires on the Central Plateau, monitoring recorded a 19-fold increase in deer activity within burnt areas [77]. Even low numbers of deer can inhibit the recruitment of woody plants and tree species, and could potentially permanently alter these unique habitats. This risk will increase into the future as fire frequency and severity increase.

These environmental impacts represent additional environmental cost to the community that have not been quantified. For this reason, the quantified cost of environmental restoration associated with deer impacts is an understatement, with the true cost to the environment being larger.

5.4.2 Cost of impacts on indigenous cultural heritage

Deer can damage Indigenous cultural heritage by physically disturbing Country and degrading places of cultural significance. As described in Section 5.5.2, where environmental damage caused by deer impacts culturally modified trees, displaces cultural artefacts or impacts, culturally significant floral and fauna groups, this can impose additional social and cultural costs on the community.

[74] Davis, N. E., Bennett, A., Forsyth, D. M., Bowman, D. M., Lefroy, E. C., Wood, S. W., ... & Johnson, C. N. (2016). A systematic review of the impacts and management of introduced deer (family Cervidae) in Australia. Wildlife Research, 43(6), 515-532.

[75] Guy, T. R., Kirkpatrick, J. B., Cunningham, C. X., Berry, T. E., Dawkins, K. L., Driessen, M. M., & Johnson, C. N. (2024). Diet of fallow deer suggests potential for invasion of novel habitats in Tasmania. Wildlife Research, 51(2), WR23124.

[76] Tasmania Parks and Wildlife Service. (2024). TWWHA deer control project – End of project update: Summary update, June 2024. https://parks.tas.gov.au/Documents/TWWHA%20Deer%20Control%20-%20Summary%20Update%20-%20June%202024.pdf

[77] Driessen, M., Dewar, E., Leonard, S., Visoiu, M., Bonham, K., & Gales, R. (2022). Monitoring priority wildlife in the Tasmanian Wilderness World Heritage Area: Central Plateau. Department of Natural Resources and Environment Tasmania.

Quantifying and monetising Indigenous cultural heritage has fundamental limitations because cultural values are often site or context specific and often hold intangible value associated with spiritual significance, connection to Country and/or intergenerational knowledge. This can make it difficult when attempting to 'quantify' changes in community outcomes for the purposes of economic analysis. For these reasons, alongside limited publicly available studies quantifying and monetising the impact of fallow deer on indigenous cultural heritage, we have chosen to consider this impact qualitatively.

5.5 The cost of acting quickly and decisively to remove deer will be lower than the cost of deer on the Tasmania community

Fallow deer in Tasmania are imposing significant economic, social and environmental costs on the community. Our analysis shows that those costs are likely to grow substantially over coming decades unless management becomes more effective and more ambitious. The quantified costs are dominated by losses to Tasmania's primary industries. If we assume a linear relationship between the increase in deer numbers and the increase in their impacts:

- Deer grazing is estimated to cost the livestock sector $384.2 million over the next 30 years.
- Damage to forestry production is estimated to cost $196.5 million.
- Deer-related vehicle incidents is estimated to estimated at $98.2 million.
- Private landholders bear additional costs through both direct management expenses and time spent dealing with deer, together estimated at more than $52.6 million.

This analysis suggests that the Tasmanian community could be bearing $754.1 million in quantified costs over 30 years; with scope of costs to increase up $1,035.0 million under a 'high impact' scenario before accounting for several major unquantified impacts.

This analysis does not account for the statewide population of deer, nor does it capture the full cost of deer impacts on biodiversity, cultural heritage, water quality, disease risk and the wider condition of Tasmania's natural places. Therefore, the true cost of deer today and into the future is much higher than the estimates presented here.

In comparison to the costs imposed by the current deer population, the likely benefit created by having deer in the landscape through recreational hunting is far less. Deer hunting has been estimated to contribute around $29 million per year to Tasmania[78], which is less than the annual costs of deer (when considering the costs in this report are an underestimate of the true cost. Given that the number of licensed hunters in Tasmania has not grown significantly in recent years[79], the revenue from deer hunting is not likely to increase substantially (in contrast to the costs.

[78] Department of Natural Resources and Environment Tasmania. (2023). Economic contribution of recreational hunting and shooting to the Tasmanian economy. https://nre.tas.gov.au/Documents/Recreational%20Hunting%20Tasmania%20Contribution.pdf

[79] Department of Natural Resources and Environment Tasmania. Tasmanian annual deer take numbers. https://nre.tas.gov.au/Documents/Tasmanian%20Annual%20Deer%20Take%20Numbers.pdf

This report does not investigate or recommend a preferred method (or mix of methods) for managing deer. Instead, it provides an economic perspective on the costs and benefits of improved deer management in Tasmania.

However, lessons around the net benefit of management can be taken from South Australia's 11-year deer eradication program[80]. Eradicating the deer population was estimated to provide a net present value of $517.8 million and a benefit-cost ratio of 2.7, meaning every dollar invested was estimated to return $2.70 to the South Australian community[80]. This highlights the potential net benefit of reducing Tasmania's deer population, particularly in the Midlands and eastern region where the costs to productivity are the highest.

Tasmania still has an opportunity to prevent deer from becoming a much larger and more entrenched pest problem. Given the significant costs to the economy imposed by maintaining the status quo on deer management, decisive action to rapidly reduce deer numbers and prevent further spread is likely to deliver substantial long-term benefits.

The scale and approach to deer management will influence the benefits realised, because different strategies will affect deer populations at different rates and at different costs. However, given current population growth and the risk of further spread into high-value agricultural, environmental and cultural areas, earlier and more substantial action is likely to deliver greater value to the community.

The cost of stronger control should not be considered as only an expense. It should be viewed as an investment in avoiding far greater future costs to farmers, foresters, motorists, land managers, taxpayers, Aboriginal cultural values and Tasmania's environment.

[80] Primary Industries and Regions South Australia. (2022). Feral deer control economic analysis. https://pir.sa.gov.au/__data/assets/pdf_file/0003/422175/feral-deer-control-economic-analysis.pdf

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