



Parliamentary Budget Office

Economic impact of native bird hunting

Submission to the inquiry into Victoria's
recreational native bird hunting
arrangements

Parliamentary Budget Office

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In brief

In this submission, we estimate the economic impact of native game bird hunting in Victoria. We also separately identify the impact of the industry on the Victorian Budget.

Economic impact of game bird hunting

Our estimate of the economic impact of native bird hunting draws on analysis contained in the RMCG report *Economic contribution of recreational hunting in Victoria* (2020) that was commissioned by the Victorian Department of Jobs, Precincts and Regions. RMCG's analysis measured both the direct contributions, such as hunters purchasing goods and services, as well as flow-on effects of direct expenditure, such as spending by retail providers used by hunters, to the Victorian economy.

Our analysis expands on RMCG's findings by estimating the (net) economic impact. We do this by:

- separating out the data on native game bird hunting
- escalating the economic contribution to estimate future economic impacts
- applying substitutability to find the net economic impact.

Figure 1 – Distribution of economic impact of native game bird hunting for 2023–24

	Regional Victoria	Metropolitan Victoria	Total
Net economic impact	\$8.6 million	\$3.4 million	\$12.0 million
Net employment impact	81.3 FTE	37.0 FTE	118.2 FTE

Note: Totals may not add up due to rounding. FTE means full-time equivalent jobs.

Source: Parliamentary Budget Office.

In 2023–24, we estimate the economic impact of native bird hunting would be:

- \$12.0 million, or 0.002% of Victoria's gross state product (GSP)
- the employment of 118.2 full time equivalents (FTE), or 0.003% of Victoria's employment.

Most of the economic impact of game bird hunting would accrue in regional Victoria which receives more than 70% of the benefit to economic growth and nearly 70% of the employment.

The economic impact of an activity is the difference between its gross economic impact and the gross economic impact of alternative activities. There are 4 main types of alternative activities to game bird hunting in Victoria:

- game bird hunters could hunt other animals
- game bird hunters could engage in other outdoor activities
- non-hunters could pursue activities in the locations and at the times game bird hunting currently operates
- interstate substitution of hunting activities.

The economic impact of native game bird hunting in Victoria depends on how substitutable it is for alternative activities and the nature of those activities. Hunting has relatively low import exposure – meaning the economic benefits from hunting expenditure in a jurisdiction tend to accrue to that region. Other activities, like general household consumption tend to have higher import exposure.

In the absence of game bird hunting, we expect that hunters would substitute to alternative activities, some of which have higher import exposure than game bird hunting. This means there is a net economic benefit from game bird hunting, that would not necessarily be replaced if hunters moved into alternative activities.

The economic impact of game bird hunting would be reduced further by including:

- game bird hunters shifting to other animal hunting
- non-hunters shifting to other activities in duck hunting locations.

Similarly, the net economic benefit would be lower if we assumed a stronger substitution effect for game bird hunters shifting to similar activities.

We note that while hunters may adopt similar activities in the absence of hunting, these may not occur in the same locations as game bird hunting currently does. This means the localised net impact of game bird hunting may be large for some areas, and the benefits from hunters switching to alternative activities may accrue in other areas.

The prevalence of interstate-based hunters who hold a Victorian game bird hunting licence may increase the economic impact. It indicates that some duck hunters are willing to travel interstate and that some Victorian hunters may choose to travel to another jurisdiction if they could not hunt locally. Currently duck hunting is legal in Victoria, South Australia, Tasmania and the Northern Territory.

Budget impact of game bird hunting

We also separately consider the impact of native game bird hunting on the Victorian Budget, including licencing revenue and test fees, and Game Management Authority staffing costs. We estimate that native game bird hunting is expected to increase the state's budgeted net position by \$2.7 million in 2023–24. This represents \$3.3 million in revenue, partially offset by \$0.5 million in staffing expenses.

The estimates for the economic impact and budget impact of game bird hunting are not additive. The estimate for the economic impact incorporates impacts from hunters redirecting their spending on game bird licenses to other expenditure.

Context

Request

On 10 May 2023, Mr Ryan Batchelor MP, Chair of the Legislative Council Select Committee on Victoria's Recreational Native Bird Hunting Arrangements (the Committee), asked the Parliamentary Budget Officer to provide an independent submission to the Inquiry on Victoria's Recreational Native Bird Hunting Arrangements (the Inquiry).

The submission request included:

1. High-level economic impact of recreational native bird hunting.
2. Regional/metropolitan breakdown of licence holders' location, noting where they
 - a. reside
 - b. engage in hunting
 - c. purchase or are likely to purchase ammunition, firearms and other equipment.
3. Substitutability between hunting and other activities, including:
 - a. use of a location and potential uses for other activities in the absence of hunting
 - b. as an activity and recreational activities hunters may engage with in the absence of hunting.
4. Review of economic or other relevant modelling.

Terms of Reference for the Inquiry

On 9 March 2023, the Legislative Council agreed to the following:

A select committee of nine members be established to inquire into, consider and report by 31 August 2023 on Victoria's recreational native bird hunting arrangements, including but not limited to—

- a. the operation of annual native bird hunting seasons;
- b. arrangements in other Australian jurisdictions;
- c. their environmental sustainability and impact on amenity;
- d. their social and economic impact.

Scope

In this submission we cover each point in the Select Committee's request. These relate primarily to part (d) of the Terms of Reference – the social and economic costs and benefits of bird hunting.

Attachment B provides page number references against the Select Committee's request and the Terms of Reference.

Background

Recreational game bird hunting in Victoria is permitted under the *Wildlife Act 1975*. Established on 1 July 2014, the Game Management Authority (GMA) regulates and manages recreational hunting in Victoria.

Licensed hunters in Victoria may hunt native birds (duck and stubble quail) and introduced game birds (quail, pheasant and partridge):

- Ducks and stubble quail may only be hunted during duck season, with a bag limit. Where game bird hunting is discussed in this submission, we are referring to hunting of native duck and native stubble quail.
- Introduced game birds can be hunted all year round, with no bag limit. There are no known wild populations of introduced game bird species, and hunting of introduced game birds is restricted to commercially licensed game bird farms. This submission does not consider this category of bird hunting.

There were 58,332 licenced game hunters in Victoria on 30 June 2022. Of these, 27,810 were licenced with an entitlement to hunt game birds, and of those 12,319 were licensed to hunt game birds only (no entitlement to hunt deer or other pest animals).

As game bird hunters commonly use shotguns, they also require firearm licences.

Figure 2 – Number of licenses for game bird hunting, 30 June 2022

Licence type	Number of licences
Game birds including duck	11,083
Game birds not including duck	1,089
Game birds including duck (provisional)	147
Game birds/duck and deer entitlement (various)	15,491
Total	27,810

Source: Game Management Authority, Game Licence Statistics Summary Report 2021–22.

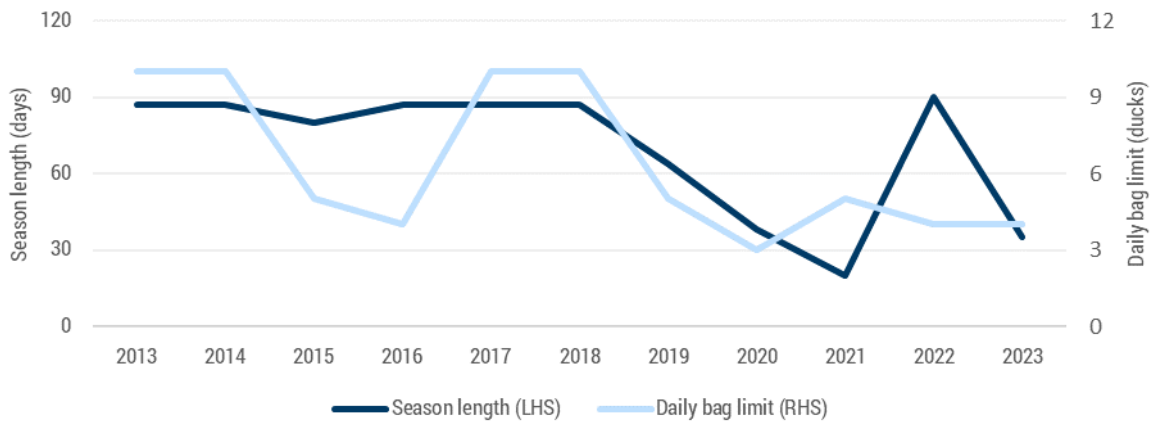
Game bird hunting is permitted on 199 state reserves, in some wilderness and coastal parks, and on private land with the permission of the landowner.

An open duck season lasts for 12 weeks between March and June. However, the GMA may shorten or cancel a season, set a daily bag limit for hunters, or prohibit shooting of specific game bird species for conservation purposes.

The last full (12 week) game bird hunting season occurred in 2022, and before that, in 2018. In 2023 the Victorian Government shortened the season to five weeks, with a bag limit of four birds per day.

For the decade 2013–2023, the average game bird hunting season was 69 days.

Figure 3 – Season length and bag limits for game bird hunting in Victoria



Note: Separate bag limit restrictions or prohibitions on hunting the Blue-winged Shoveler applied to all hunting seasons between 2013 and 2023. Different bag limits apply to native stubble quail.

Source: Game Management Authority.

Previous studies on game bird hunting

Australia Institute (2012) *Out for a duck: An analysis of the economics of duck hunting in Victoria*

The Australian Institute conducted an online survey of 503 Victorians about participation in hunting and travel in Victoria. The report found that 98% of duck hunters would substitute another outdoor activity for game bird hunting if it were banned, and argued on this basis that a ban on game bird hunting would have no significant impact to the Victorian economy. The report did not give detail on survey sampling methods.

RMCG (2014) *Estimating the economic impact of hunting in Victoria*

RMCG produced this report for the then Department of Environment and Primary Industries. RMCG conducted a survey of 1,000 Victorian hunters on their hunting activity and expenditure on hunting trips, and then analysed responses using the Regional Industry Structure and Employment (RISE) model to determine the economic impacts of hunting in Victoria. The report provided a breakdown of expenditure by the type of animal hunted.

RMCG (2019) *Economic and social impacts of recreational hunting and shooting*

In 2019 the Commonwealth Department of Health commissioned RMCG and several other consulting groups to produce a report using the 2014 RMCG survey methodology, but broadening the scope to:

- include target and sports shooting with firearms, and
- determine the economic impact of recreational hunting and shooting to all of Australia.

The survey received 16,576 responses, with 4,112 respondents from Victoria. The report did not break down expenditure between hunting and recreational shooting, and did not break down expenditure by the type of animal hunted.

RMCG (2020) *Economic contribution of recreational hunting in Victoria*

RMCG conducted and updated the 2014 survey on hunting in Victoria, this time receiving 1,671 responses. We found the 2020 RMCG survey results and methodology to be the most rigorous for Victorian native bird hunting, and used the data from that report to form the basis of our own analysis.

Economic impact analysis

The RMCG reports estimates the economic contribution from hunting activities.

Government agencies and lobby groups widely use economic impact analysis to estimate the economic benefits of a proposed policy or initiative. This type of analysis estimates direct expenditure and flow on effects to the economy, a specific region or industry. The RMCG studies we considered contain economic impact analysis of hunters' expenditure on hunting activities.

In Victoria, game bird hunters contribute to economic activity through direct expenditure, including:

- purchasing goods and services from businesses providing hunting and outdoor gear
- expenditure on transport, food, accommodation and membership fees.

This direct expenditure has a flow-on effect to the economy through secondary expenditure, including:

- spending by retail and accommodation providers used by hunters
- the provider's employees spending their income for their own consumption.

While economic impact analysis is widely used, it also has limitations.

Limitations

Economic impact analysis is commonly used to estimate the flow-on effects to the economy, regions or industries should a proposed policy or initiative be implemented. Limitation of this type of analysis include:

- an assumption that individuals and firms do not respond to, and economic impacts do not account for, changes in relative prices
- an assumption that the structure of the economy does not change, therefore increased demand for a good or service does not result in demand increasing for less costly alternatives
- that the impact does not account for alternative use of the resources impacted, or social and environmental impacts.

Consequently, our estimated economic impact of game bird hunting is a partial estimate. We have included qualitative analysis to draw attention to other major relevant benefits and costs.

Our estimates draw from the RMCG 2020 report, which means that any limitations in its survey data or analysis will impact our analysis. In particular, our submission is sensitive to:

- the definition of licensed hunters who are active – those who have engaged in hunting in the past 12 months
- the future length of game bird hunting seasons – the data underpinning this report was sampled from a shortened (64 day) season
- substitutability of hunting activity.

Our analysis makes a conservative estimate of substitutability of hunting activity with similar outdoor activities. While we discuss other forms of substitutability, we do not include quantitative estimates of their impacts.

We note that the Australian literature on the economic impacts of game bird hunting is dominated by a small number of participants.

We prepared this submission on 31 May 2023.

Overall economic impacts

In this section

This section considers the economic impact of game bird hunting in Victoria. It examines:

- direct economic impacts
- flow-on economic impacts.

This section also provides qualitative analysis of the benefits and costs of game bird hunting in Victoria.

Economic value of native game bird hunting in Victoria

The gross economic impact of game bird hunting captures the direct expenditure of hunters (e.g. equipment, ammunition and accommodation) as well as flow-on expenditure, such as employment in the businesses that supply accommodation or food in hunting regions. In 2020 RMCG estimated the gross economic impact (or 'contribution') of native game bird hunting in Victoria to be \$86.6 million.

This measure only describes the direct economic value of game bird hunting activity. It does not account for activities which game bird hunting displaces.

The economic impact is the difference between the gross economic impact and the gross economic impact of alternative activities that could replace hunting activity. That is, the economic impact accounts for the substitutability of native bird hunting.

This net measure is more defensible and useful as an estimate of the economic value or impact of game bird hunting. It accounts for the value of the existing game bird hunting activity and the opportunity cost of the activities game bird hunting displaces.

We estimate that in 2023–24, the economic impact of native game bird hunting would be:

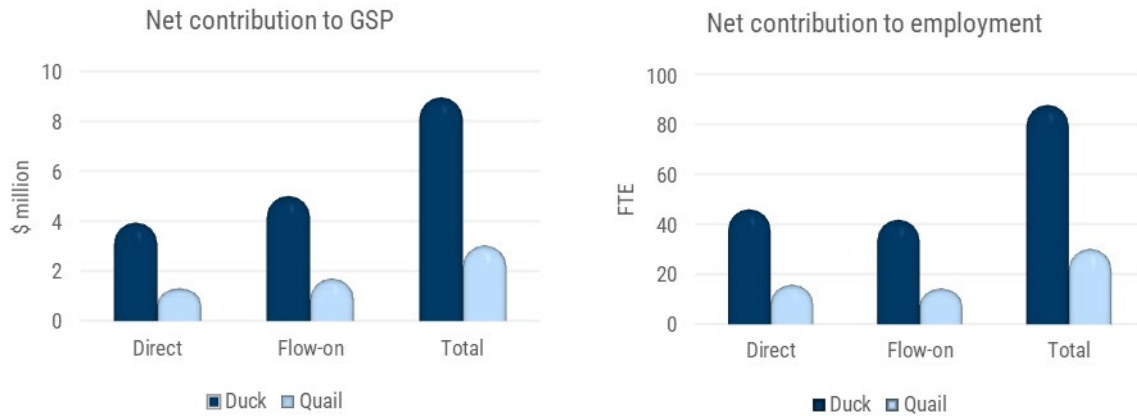
- \$12.0 million, or 0.002% of Victoria's gross state product (GSP)
- employment of 118.2 full time equivalents (FTE), or 0.003% of Victoria's employment.

Our estimate for Victoria draws on:

- assumptions about the share of active hunters and substitution activities from the RMCG report, *Economic contribution of recreational hunting in Victoria (2020)*, commissioned by the Victorian Department of Jobs, Precincts and Regions.
- detailed Victorian survey results and analysis in the RMCG 2020 report.

Figure 4 shows the direct and flow-on economic impacts on GSP and employment for game bird hunting.

Figure 4 – Economic impact of native game bird hunting for 2023–24



Note: Adapted from RMCG 2020 report estimates for banning quail hunting include non-indigenous pheasant, partridge and quail.

Source: Parliamentary Budget Office.

We estimate that the direct economic impact of game bird hunting – expenditure on hunting related activities – is:

- \$5.3 million to GSP
- 61.9 FTE to aggregate employment.

We estimate that the flow-on economic impact of game bird hunting – expenditure as a result of hunting but not on hunting activities or products (e.g. accommodation or dining) – is:

- \$6.7 million to GSP
- 56.3 FTE to aggregate employment.

Broader benefits and costs of game bird hunting

Our estimate of the economic value of game bird hunting in Victoria is a partial estimate. Figure 5 provides a broader outline of other costs and benefits of native game bird hunting. These costs and benefits were beyond the scope of this advice, but are important to consider.

Figure 5 – Benefits and costs of native game bird hunting in Victoria

Benefit	Cost	Stakeholders
Environmental		
<ul style="list-style-type: none"> ▪ Native game bird population management ▪ Adjusted season lengths and bag limits for population management 	<ul style="list-style-type: none"> ▪ Decline in native waterbirds ▪ Reduced protection of Victorian wetlands and state game reserves ▪ Reduced public use of wetlands and state game reserves 	<ul style="list-style-type: none"> ▪ Game Management Authority ▪ Game bird hunters ▪ Environmental conservationists and researchers ▪ Indigenous communities

Economic impact of native bird hunting

Benefit	Cost	Stakeholders
Community satisfaction		
<ul style="list-style-type: none"> ▪ Hunting as recreation ▪ Value of hunting as a social and familial past time 	<ul style="list-style-type: none"> ▪ People who live near game state reserves where hunting takes place may prefer less disturbance ▪ Missed opportunity for eco-tourism in hunting areas 	<ul style="list-style-type: none"> ▪ Game bird hunters ▪ Shooting clubs and associations ▪ Victorians who live near state game reserves

Source: Parliamentary Budget Office.

Regional and metropolitan impact

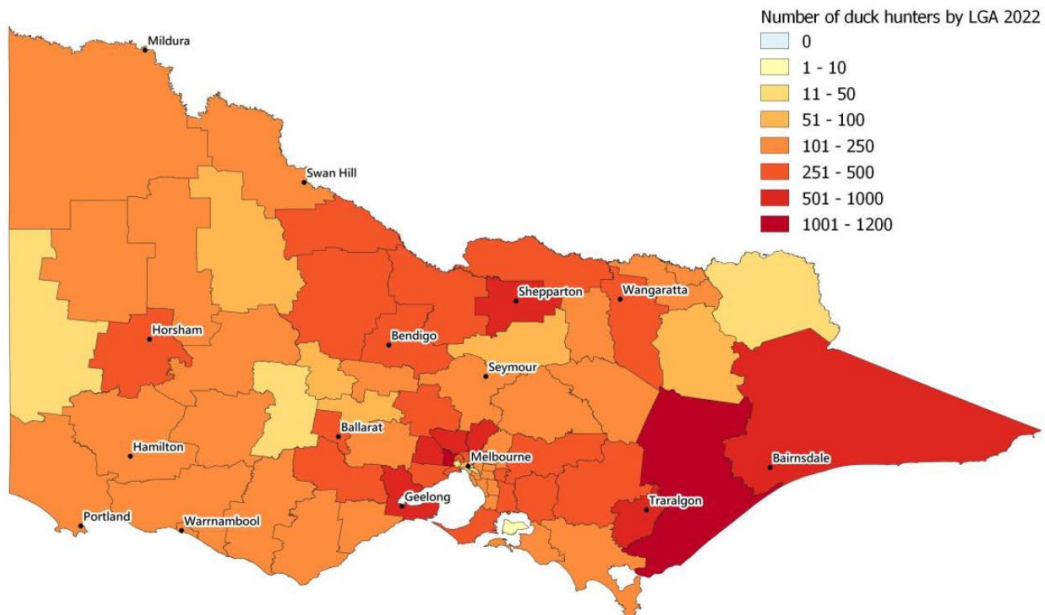
In this section This section considers the economic impact of game bird hunting on Victoria, by Local Government Area (LGA).

Profile of game bird licence holders

Of the 1,671 game licence holders (all licence types) surveyed in RMCG's 2020 report, 49% lived in Greater Melbourne, 40% in regional Victoria and 11% interstate.

The majority (68%) of licence holders hunted exclusively in Victoria.

Figure 6 – Duck hunters by Local Government Area



Source: Game Management Authority.

The regional LGAs with the highest percentage of hunters include:

- East Gippsland
- Wellington
- Traralgon
- Shepparton
- Geelong.

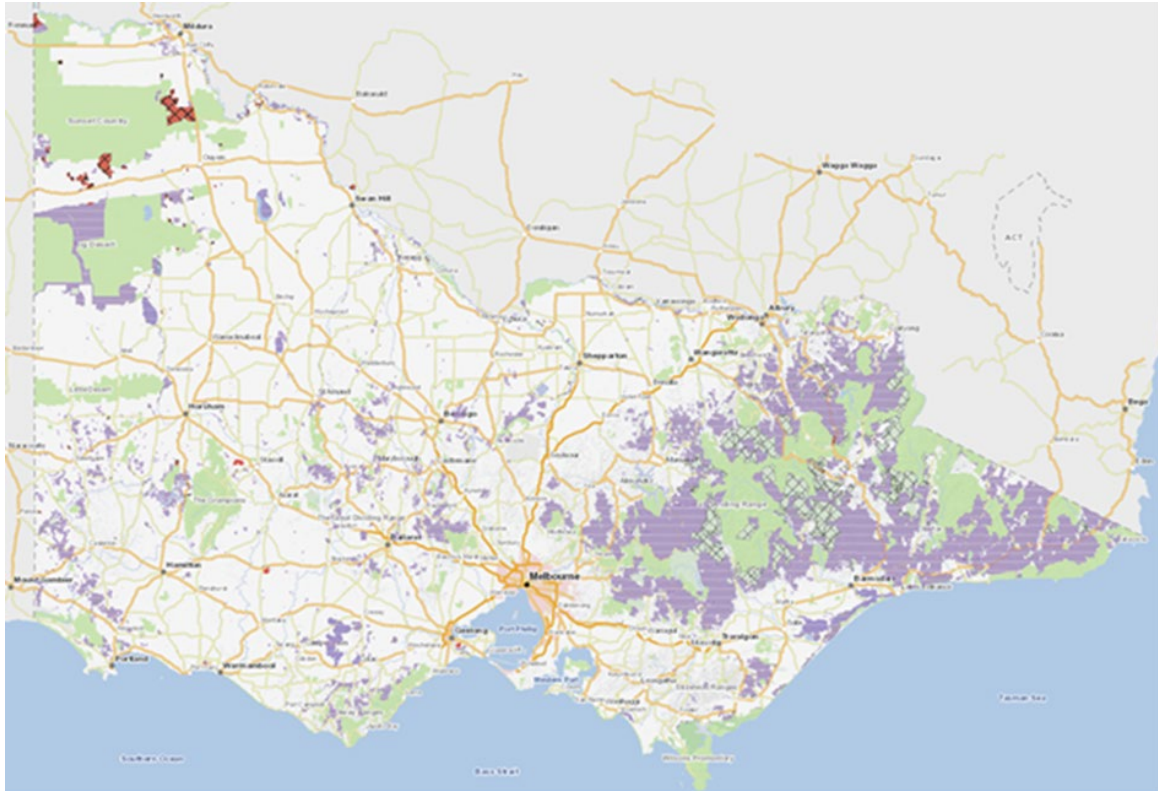
Within Melbourne, Brimbank City, Hume City and Melton Shire have a relatively high concentration of duck hunters.

Economic impact of native bird hunting

While some LGAs with high concentration of game bird hunters overlap with state reserves and parks where game bird hunting takes place, a substantial number of game bird hunters travel from metropolitan LGAs to take part in the activity.

Designated areas for game bird hunting are mainly concentrated in north-eastern Victoria, spanning different state forests.

Figure 7 – Designated areas for game bird hunting



Notes: Purple areas are where game bird hunting is allowed and gundogs are allowed for flushing and retrieval. Red areas are where firearm use requires permission from the licence holder.

Source: Game Management Authority.

Economic impacts by Victorian region

The economic impacts of native game bird hunting are larger in regional areas than metropolitan areas.

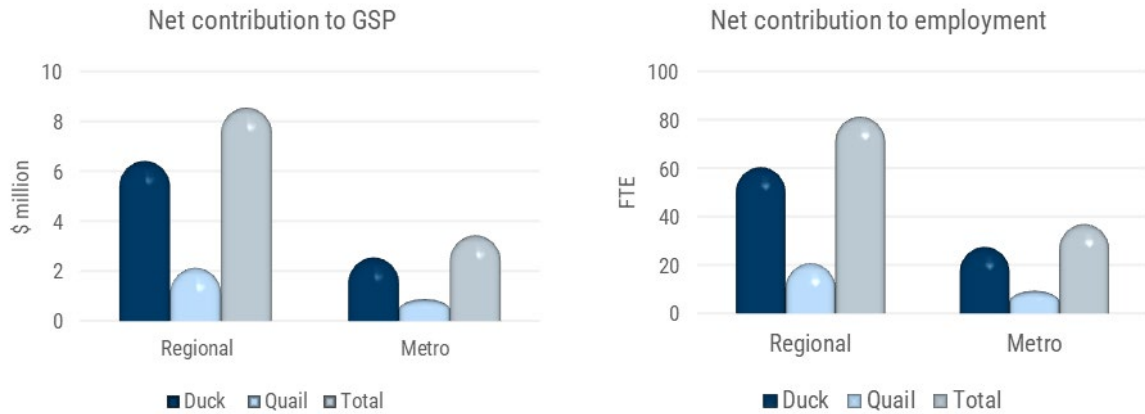
For regional areas, we estimate that the economic impact of game bird hunting in 2023–24 is:

- \$8.6 million to GSP
- 81.3 full time equivalents (FTE) to employment

For metropolitan areas, we estimate that the economic impact of game bird hunting in 2023–24 is:

- \$3.4 million to GSP
- 37.0 full time equivalents (FTE) to employment.

Figure 8 – Distribution of economic impact of native game bird hunting for 2023–24

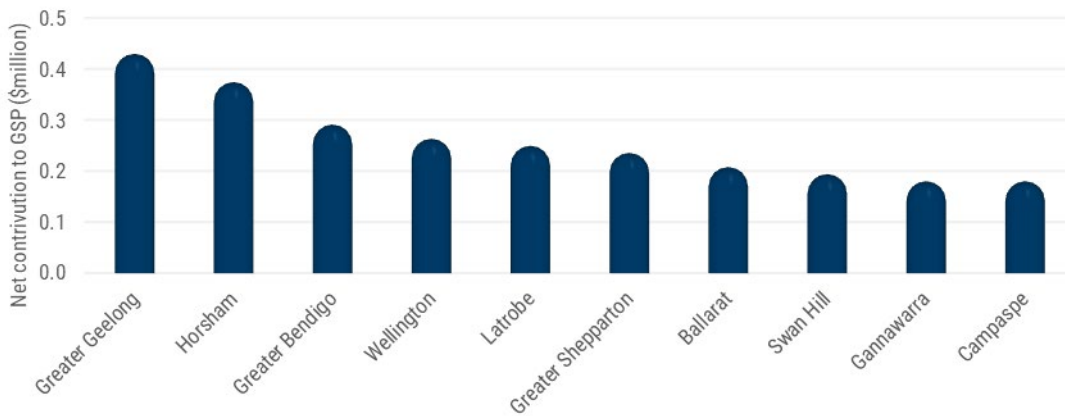


Note: Adapted from the RMCG 2020 estimates for banning quail hunting include non-indigenous pheasant, partridge and quail.

Source: Parliamentary Budget Office.

The impact on each local government area will vary based on the concentration of game bird hunting locations. Figure 9 shows the 10 regional local government areas where game bird hunting activity has the highest economic impact.

Figure 9 – Economic impact of game bird hunting in regional LGAs, 2023–24



Source: Parliamentary Budget Office.

Substitutability of hunting

In this section

This section considers the substitutability of hunting activity – that is, how hunters would spend their money if they were not able to hunt – and outlines how this is factored into our estimate of economic impacts.

We also discuss other forms of substitution that are not factored into our estimates:

- game bird hunters substituting to other hunting
- non-hunters substituting to other activities in designated hunting areas
- interstate substitution of hunting activities.

The (net) economic impact of an activity is the difference between its gross economic impact and the gross economic impact of alternative activities. There are 4 main types of alternative activities for game bird hunting in Victoria:

- game bird hunters could engage in non-hunting activities
- game bird hunters could hunt other animals
- non-hunters could pursue activities in locations and at the times game bird hunting currently operates
- interstate substitution of hunting activities.

The economic impact of native game bird hunting in Victoria depends on how substitutable it is for the alternative activities. In the absence of game bird hunting, we expect that hunters would substitute to alternative activities with higher import exposure than game bird hunting. This means there is a net economic benefit from game bird hunting, that would not necessarily be replaced if hunters moved into alternative activities.

Game bird hunters substituting to non-hunting activities

Hunters substituting to:

- other similar activities like camping and fishing does not have a material economic impact, as a similar proportion of expenditure would go to imports
- typical discretionary household consumption results in a negative economic impact, as a higher proportion of expenditure would go to imports.

RMCG findings

In the 2020 RMCG hunters survey, the top three reasons respondents gave for hunting were:

1. to spend time in a certain place
2. to spend time in the outdoors
3. to meet new people.

The survey indicated that, if all types of hunting were not available, respondents were likely to substitute hunting with another outdoor recreation activity. The most popular alternative activities were camping, recreation target shooting, and four-wheel driving. The majority (68%) of respondents confirmed that they value at least one or more outdoor recreational activities as highly or more highly than hunting.

The 2020 RMCG report modelled the net economic contribution of hunting activity with two scenarios:

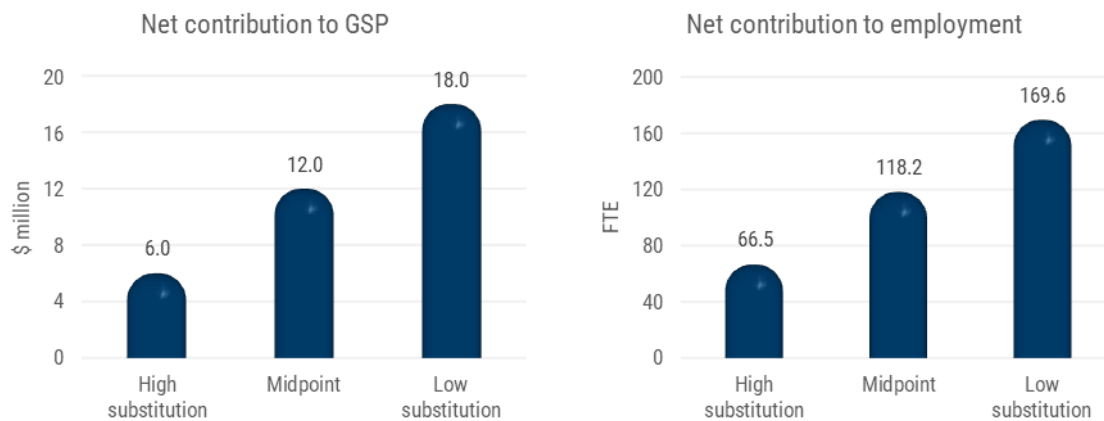
- High substitutability – where the bulk of hunting expenditure is diverted to substitute outdoor activities.
- Low substitutability – where a small proportion of hunting expenditure is diverted to substitute outdoor activities, with the bulk diverted to household expenditure.

Scenarios for substitutability of native game bird hunting with other outdoor activities

Based on the 2020 RMCG data, we extrapolated the substitutability of native game bird hunting with other (non-hunting) activities.

Figure 10 shows the total net economic impact (both direct and flow-on impacts) of game bird hunting to GSP and employment, with high substitution and low substitution scenarios.

Figure 10 – Economic impact of game bird hunting, substitution analysis



Source: Parliamentary Budget Office.

Depending on which activities are substituted for game bird hunting, there would be movement of expenditure between or out of certain regions in Victoria. For instance, 26% of RMCG survey respondents that recreational target shooting was a substitute activity, yet the majority of target shooting ranges in Victoria are currently located within Greater Melbourne.

Game bird hunters substituting to other hunting

There is some evidence to suggest that there is high substitutability of native game bird hunting with other types of hunting in Victoria.

Currently, 55.7% of hunters who hold licenses to hunt native game birds also hold an entitlement to hunt deer. This suggests that a significant proportion of hunters would shift their time and expenditure to deer hunting if they could not partake in native game bird hunting. Most deer can be hunted year round, other than sambar deer hunting using hounds which can be conducted between April and November.

Australia Institute's 2012 report found that 60% of hunters would substitute duck hunting with hunting of other animals. However, this report had a small sample size of respondents who were hunters who intended to hunt in future (17).

Due to the lack of data on the substitutability of native game bird hunting with other hunting in Victoria, we have based our substitutability analysis on data collected in the 2020 RMCG report, which examined the substitutability of all hunting types with similar outdoor activities.

Non-hunters substituting to other activities in designated hunting areas

If game bird hunting did not occur, the general public (not just hunters) may make use of the areas currently designated for hunting purposes. Alternative activities on hunting lands may include ecotourism, or camping.

There is limited available data on the substitutability of hunting activity on wetlands and State Game Reserves. Australia Institute's 2012 report found that 51% of respondents said that they would 'definitely' or 'probably' avoid duck hunting regions when choosing a holiday destination in Victoria. The report argued that while hunting contributed to the regional economy, there was some degree of substitutability with general tourism.

The extent to which tourism could replace the economic impact of hunting in Victoria remains unknown. Replacement activities such as tourism may generate different expenditure patterns based on the relative incomes of those participating. Hunting is a relatively expenditure-intense activity, requiring firearms, ammunition, requisite equipment and vehicles. Expenditure by hunters may be higher than expenditure from those pursuing outdoor activities such as camping and fishing.

Interstate substitution of hunting activities

The other substitution factors are likely to reduce the economic impact of Victorian game bird hunting. The prevalence of interstate-based hunters who hold a Victorian game bird hunting licence may increase the economic impact.

Currently duck hunting is legal in Victoria, South Australia, Tasmania and the Northern Territory. If game bird hunting was not permitted in Victoria:

1. hunters who travel from jurisdictions where game bird hunting is banned to Victoria may be unlikely to substitute from Victorian game bird hunting to other Victorian hunting activities
2. some Victorian game bird hunters may be willing travel interstate, rather than to fully substitute into alternative Victorian activities.

Where consumers are likely to shift their expenditure into another state Victoria would lose the entire economic contribution of game bird hunting.

Impacts on the Victorian Budget

In this section This section considers the impact of native bird hunting on the Victorian Budget through licensing revenue and staffing costs.

Our estimate of the impact of native game bird hunting on the Victorian Budget is not additive with our estimate of the economic impact. The estimate for the economic impact incorporates impacts from hunters redirecting their spending on game bird licenses to other expenditure.

We estimate that the impact of game bird hunting on the state's budgeted net position is:

- \$2.7 million in 2023–24, this reflects:
 - revenue of \$3.3 million due to license and test fees received by the GMA, partially offset by
 - operating expenses of \$0.5 million due to GMA staffing.
- \$11.1 million across 2023–24 to 2026–27, this reflects:
 - revenue of \$13.4 million due to license and test fees received by the GMA, partially offset by
 - operating expenses of \$2.2 million due to GMA staffing.
- \$32.5 million across 2023–24 to 2033–34, this reflects:
 - revenue of \$39.1 million due to license and test fees received by the GMA, partially offset by
 - operating expenses of \$6.6 million due to GMA staffing.

We do not consider any potential impact of duck and stubble quail hunting to revenue from firearms licences.

Additional funding to game bird hunting

In 2019–20 the Victorian Government provided \$14 million to 2022–23 to support recreational hunters and sporting shooters. We assume this funding has now been allocated or spent.

In 2020–21 the Victorian Government provided \$5.3 million to the Department of Jobs, Precincts and Regions to deliver a Sustainable Hunting Action Plan to promote responsible hunting in Victoria, with \$0.3 million in funding allocated for 2023–24.

In 2023–24 the Victorian Government provided \$2.3 million to the Game Management Authority to maintain local enforcement, compliance with hunting regulations and stakeholder engagement.

Attachment A – Assumptions and approach

Economic impact analysis

In this section we provide the assumptions and approach we used to estimate the economic impact of native game bird hunting in Victoria.

Assumptions

When preparing this submission, we made the following assumptions:

1. Expenditure on recreational hunting by animal types from 2018–19 to 2023–24 would grow at the same rate, indexed by Victorian nominal GSP.
2. The impact of duck and quail hunting on GSP and employment from 2018–19 to 2023–24 would grow with Victorian nominal GSP and employment growth respectively.

Approach

When preparing this submission, we:

- adopted the main data and assumptions in the RMCG 2020 report, including:
 - data including the surveyed expenditure by hunters, willingness to substitute other activities, substitution method and expenditure mix of average discretionary spending in the ABS Household Expenditure Survey, which includes a greater share of imports than the expenditure of the hunting group
 - the assumption that 16 per cent of registered hunters would be active in 2023–24.
- used the Victorian data to calculate the economic impact of duck and quail hunting in Victoria in metropolitan and regional local government areas
- escalated these impacts for 2023–24 based on Department of Treasury and Finance forecasts for Victorian nominal GSP and employment growth
- calculated the net economic impact of game hunting from the gross economic contribution, with both high substitutability and low substitutability case scenarios
- determined the mid-point within the range of substitutability case scenarios.

Budget impact analysis

In this section we provide the assumptions and approach we used to estimate the budget impact of native game bird hunting in Victoria.

Assumptions

When costing the impact to licence revenue and GMA staff, we made the following assumptions:

1. There is no cost impact to other agencies—such as Victoria Police and the Department of Energy, Environment and Climate Action—currently involved in compliance and enforcement activity related to duck, quail, pheasant, and partridge hunting.

2. The regulation and management of game bird hunting requires 4 full-time equivalent staff.
3. Staff salaries are indexed at 2.0%.

Costing approach

When costing licence revenue and GMA staff, we:

- obtained GMA data on licence and test fees associated with game licences for duck, quail, pheasant and partridge hunting, including commercial game bird farm licences
- estimated licence and test fee revenue by escalating license and test fee forecasts to 2033–34, based on historical growth rates and the consumer price index
- estimated the costs of required staff to 2033–34, based on the assumed salary growth rate.

Attachment B – Reconciliation against the request

Requested submission	Addressed in submission
1. The high-level economic impact of recreational native bird hunting	Overall economic impacts (pp. 11-13)
2. Regional/metropolitan breakdown of licence holders' location, noting where they: <ol style="list-style-type: none"> reside engage in hunting purchase or are likely to purchase ammunition, firearms or other equipment. 	Regional and metropolitan impact (pp. 14-16)
3. Substitutability between hunting and other activities, including: <ol style="list-style-type: none"> use of a location and potential uses for other activities in the absence of hunting as an activity and recreational activities hunters may engage in the absence of hunting. 	Substitutability of hunting activity (pp. 17-19)
4. Review of economic or other relevant modelling.	Context (p. 8)

Inquiry Terms of Reference	Addressed in submission
a. The operation of annual native bird hunting seasons;	Context (pp. 7-8)
b. Arrangements in other Australian jurisdictions;	Out of scope
c. Environmental sustainability and impact on amenity [of native bird hunting arrangements];	Out of scope
d. Social and economic impact [of native bird hunting arrangements].	Overall economic impacts (pp. 11-13) Regional and metropolitan impact (pp. 14-16)

Attachment C – Data sources

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- Australia Institute (2012) [Out for a duck – An analysis of the economics of duck hunting in Victoria](#), accessed 10 May 2023
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