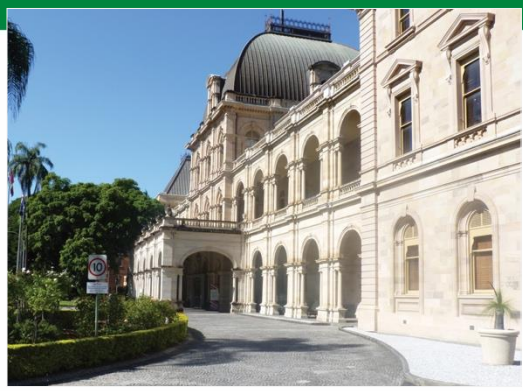
Parliamentary Committees





Barrier Fences in Queensland

Report No. 35, 55th Parliament

Agriculture and Environment Committee

June 2017

Agriculture and Environment Committee:

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Acknowledgements

The committee thanks the officers from the Department of Agriculture and Fisheries and the Darling Downs-Moreton Rabbit Board for their assistance during the inquiry.

Contents

Abbreviations

Biosecurity Act	*Biosecurity Act 2014*
Board review	Independent Review of Government Boards, Committees and Statutory Authorities
BSC	Balonne Shire Council
CAG	Condamine Action Group
DAF	Department of Agriculture and Fisheries
DDMRB	Darling Downs-Moreton Rabbit Board
DEEDI	Department of Employment, Economic Development and Innovation (as it was then)
Dog fence	Wild Dog Barrier Fence
CCGC	Council of the City of Gold Coast
GIS	Geographic information system
Hyder	Hyder Consulting
ICC	Ipswich City Council
NPAQ	National Parks Association of Queensland
NSW Board	Wild Dog Destruction Board for the Western Division of New South Wales
SDRC	Southern Downs Regional Council
Stock Route Act	*Stock Route Management Act 2002*
TRC	Toowoomba Regional Council
Wild dog strategy	Wild Dog Management Strategy 2011-16

Chair's foreword

This report presents a summary of the Agriculture and Environment Committee's inquiry into barrier fences in Queensland. The committee's task was to consider the policy outcomes to be achieved by the Wild Dog Barrier Fence and the Rabbit Fence, and to a lesser extent to examine the operation of local government-administered check fences and the construction of fencing clusters.

On behalf of the committee, I thank those individuals and organisations who lodged written submissions, and those peak bodies and individuals who took the time to share their views with the committee at its public hearings. I also thank the organisations and landholders who kindly accommodated the committee on its site visits. The committee benefitted greatly from witnessing first-hand the issues landholders are facing and the efforts that are undertaken on a daily basis to keep the barrier fences in working order.

I thank committee members for their work on the inquiry. In particular, I would like to extend my thanks to the three previous Chairs of the committee, Ms Jennifer Howard, Mr Glenn Butcher and Mr Duncan Pegg, who contributed to the investigations that underpin this report.

I commend this report to the House.

Joe Kelly MP
Chair

Recommendations

1. Introduction

Role of the committee

The Agriculture and Environment Committee is a portfolio committee appointed by a resolution of the Legislative Assembly on 27 March 2015. The committee's primary areas of responsibility are: Agriculture, Fisheries, Environment, Heritage Protection, National Parks and the Great Barrier Reef.[1]

In relation to its areas of responsibility, the committee:

- examines Bills to consider the policy to be enacted
- examines the estimates of each department
- examines Bills for the application of the fundamental legislative principles set out in section 4 of the *Legislative Standards Act 1992*
- considers the lawfulness of subordinate legislation
- assesses the public accounts of each department in regard to the integrity, economy, efficiency and effectiveness of financial management by examining government financial documents, and considering the annual and other reports of the Auditor-General, and
- considers departments' public works in light of matters including, but not limited to, the suitability of the works for the purpose, necessity for the works, value for money of the works, revenue produced by, and recurrent costs of, the works, or estimates of revenue and costs, present and prospective public value of the works, procurement methods used for the works, and actual suitability of the works in meeting the needs in and achieving the stated purpose of the works.

Inquiry into barrier fences in Queensland

The committee resolved to hold an inquiry into barrier fences in Queensland on 28 October 2015, in accordance with its public works power under section 94 of the *Parliament of Queensland Act 2001*. The inquiry examined:

- the costs to maintain existing barrier fences
- the effectiveness of barrier fences at protecting stock and crops from attacks by wild dogs, rabbits and other introduced species
- their unintended impacts on native species
- recent upgrades to sections of the wild dog fence by the Department of Agriculture and Fisheries (DAF), and
- whether barrier fences should be expanded to other areas of the State to protect stock.

[1] Schedule 6 of the Standing Rules and Orders of the Legislative Assembly of Queensland.

The committee's processes

For its inquiry into barrier fences in Queensland, the committee:

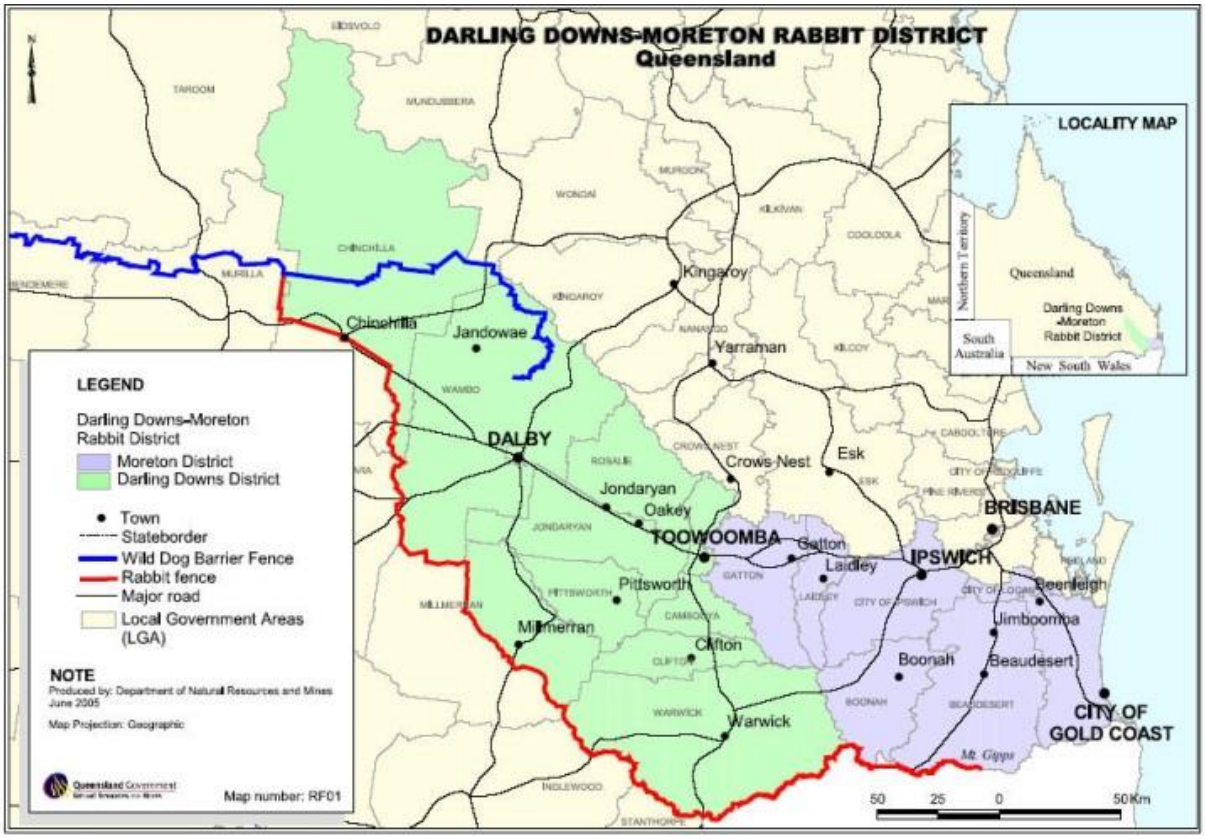
- wrote to stakeholders inviting written submissions. A list of submitters is at **Appendix A**
- sought briefings from DAF and the Darling Downs-Moreton Rabbit Board (DDMRB). The officers who provided these briefings are listed at **Appendix B**
- visited sections of the Wild Dog Fence near Tambo on 27 November 2015
- met in Roma on 27 November 2015 with members of the Wild Dog Fence Panel and other stakeholders, and received briefings from officers of the Department of Agriculture and Fisheries Roma who maintain the Wild Dog Fence
- met with officers of the DDMRB at Warwick and visited sections of the rabbit fence in surrounding areas on 27 May 2016
- met with councils and other stakeholder groups at Longreach and inspected cluster fence projects on 25 and 26 July 2016
- held a public hearing in Brisbane on 11 May 2016 to seek further information. A list of witnesses who appeared at the hearing is at **Appendix C**, and
- sought further written advice from DAF on specific issues for the review.

2. Background

History of barrier fences in Queensland

Barrier fences began as a response to the rapid northward spread of wild rabbits following their initial introduction into Victoria in 1859. The first state-level response to the issue, the *Rabbit Nuisance Act 1880*, established a tender process for construction of a rabbit-proof fence. Unfortunately, delays in implementing this process meant that construction did not begin until 1886, and was not completed until 1903, by which time rabbits were already well-established in the state's west.

Furthermore, responsibility for maintenance of the fence was allocated to a network of nine rabbit board districts. Some of these allowed their sections of the fence to degrade due to inadequate resourcing, whether financially or in technical expertise. Others went bankrupt and ceased operation entirely. By 1930, while the rabbit fence extended from approximately 25 kilometres west of the Warrego river to Mungindi, and on to Haddon Corner in the far north-east of South Australia, large sections were of questionable effectiveness.[2]

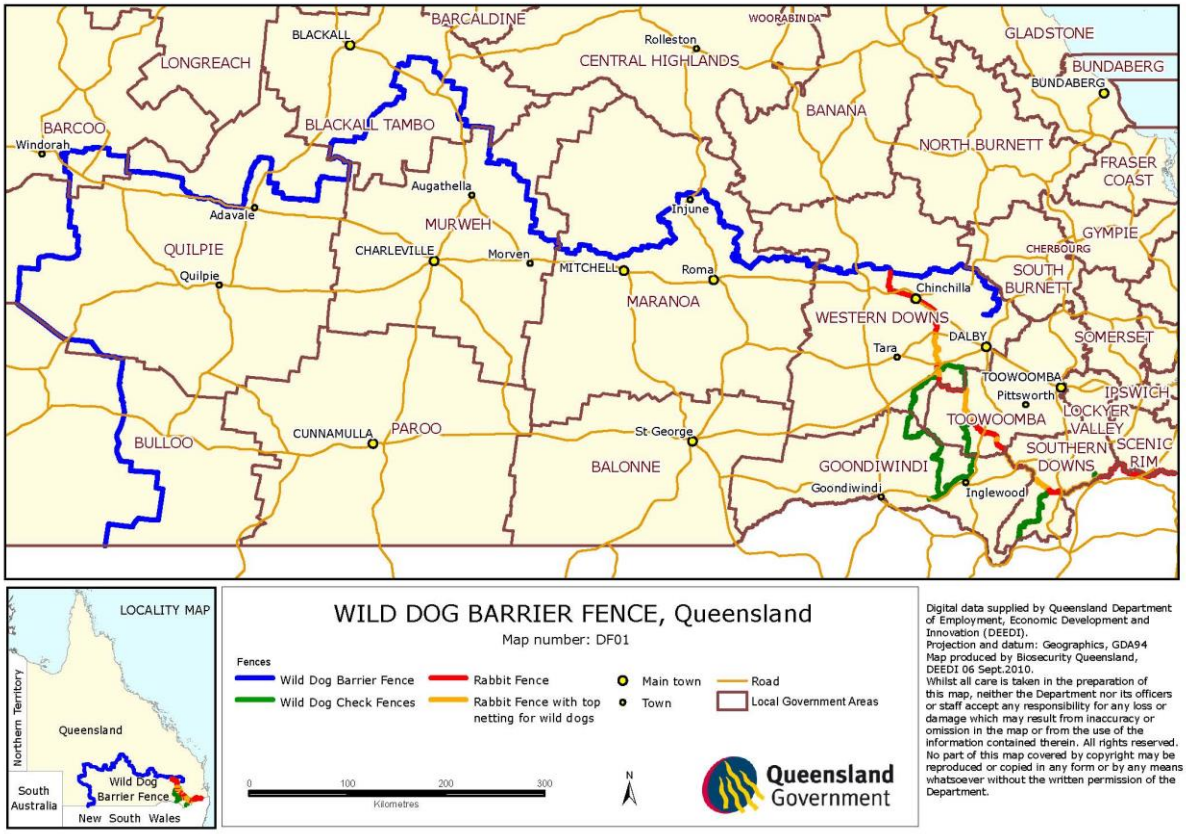


Source: DDMRB – www.ddmrb.org.au , accessed 17 November 2016

[2] DAF, *Fact Sheet: History of Barrier Fences in Queensland*, (Queensland Government, 2007), pp 1-2.

Since a readjustment of organisational responsibility in 1964 (see below), the fence west of Goombi (near Chinchilla) has been allowed to degrade. However, the remaining 555 kilometres of fence continues to be actively maintained. Approximately 186 kilometres of this length has been 'top netted' to exclude wild dogs.[3]

Individual landholders had already constructed dog-proof fences around certain areas by 1930, and some local governments had added netting on to their sections of the rabbit fence of sufficient height to render it dog-proof. However, the current wild dog fence stems from a proposal in 1948 to establish a barrier fence in order to protect actual or potential sheep-producing regions. The fence was subsequently built by landholders (using government-supplied materials) under the direction and supervision of government inspectors.



Source: DAF – www.daf.qld.gov.au, accessed 29 October 2015

Similarly to the rabbit fence, the government did not then assume responsibility for the fence's maintenance, instead delegating the function to the landholders who had constructed it. This

[3] DDMRB, 2015, *Submission to the Inquiry into Barrier Fences in Queensland,* p 4.

produced the same issue of inconsistent maintenance standards, and by 1975 it was estimated that returning the entire fence to a dog-proof condition would cost $915,000.[4]

Support for repairing the existing fence being scant, the government determined in 1982 to maintain some areas of the existing fence and realign others. Simultaneously, check fences were constructed in the Darling Downs region. The wild dog check fences were built to protect animals in the adjacent cropping and grazing lands. Although the check fences do not physically link up to the wild dog barrier fence, they play an important role in wild dog control in southern Queensland.[5]

The realignment reduced the length of the fence from approximately 5,600 kilometres to approximately 2,500 kilometres, but left previously-protected areas in the central- and north-west on the unprotected 'dirty' side of the fence.

The most recent development of the fences was in 1997, when the 24 kilometre gap between the two fences (near Goombi) was fenced, linking the two fences into an unbroken barrier. [6]

Responsible organisations

As described above, nine regional boards were originally established to control rabbit populations and maintain the rabbit fence. However, by 1962, only the Darling Downs, Leichardt and Moreton Rabbit Boards continued to perform their functions. The Leichardt board was the last to cease operation, closing in 1963. The following year, the government passed the *Rabbit Act 1964*, which abolished the two remaining boards and established the DDMRB.

The DDMRB's functions were to:

- ensure that the owners of holdings situated in the District maintain free from rabbits their holdings (sic), and
- at all times maintain the rabbit check fence so that such fence is rabbit proof (sic).[7]

The DDMRB was funded by precepts paid by the local governments in its area of operation.[8] Since the amalgamations in 2008, these have been:

- Western Downs Regional Council
- Council of the City of Gold Coast (CCGC)
- Ipswich City Council (ICC)

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4 DAF, 2007, p 3.

5 DAF, 2016, *Wild Dog Check Fences*.

6 DAF, 2007, p 2.

7 *Rabbit Act 1964*, s 20(1).

8 *Rabbit Act 1964*, ss 25(2)(v), 29.

- Lockyer Valley Regional Council
- Logan City Council
- Scenic Rim Regional Council
- Southern Downs Regional Council (SDRC), and
- Toowoomba Regional Council (TRC).

The subsequent *Rural Lands Protection Act 1985,* the *Stock Route Management Act 2002* (the Stock Route Act), and relevant subordinate legislation, have maintained these functions without alteration.[9]

Since the realignment in 1982, the wild dog fence has been maintained by DAF and its predecessors. However, the adoption of the Wild Dog Management Strategy 2011-16 (the wild dog strategy) has integrated maintenance of the dog fence into the control plans of local wild dog committees. This approach will be discussed in greater detail elsewhere in this report.

The maintenance of the dog fence is funded by precepts paid by local governments receiving the benefit of the fence, with these precepts being equally matched by DAF. The local governments paying precepts are:

- Balonne Shire Council (BSC)
- Barcoo Shire Council
- Maranoa Regional Council
- Blackall Tambo Regional Council
- Bulloo Shire Council
- Western Downs Regional Council
- Murweh Shire Council
- Paroo Shire Council, and
- Quilpie Shire Council.

Previous investigations

The two barrier fences, and their responsible organisations, were considered by two reviews which issued their reports in 2009. The Independent Review of Government Boards, Committees and Statutory Authorities (the Board review) considered the DDMRB as part of its comprehensive review of government advisory bodies. Simultaneously, Hyder Consulting (Hyder) reviewed the management of both barrier fences for the then-Department of Employment, Economic Development and Innovation (DEEDI).

The reports from these reviews, issued in March and June 2009 respectively, reached different conclusions regarding the appropriate future for management of the rabbit fence. Both recommended

[9] *Rural Lands Protection Act 1985,* s 44, Land Protection (Stock Route Management) Regulation 2003, s 11.

that the DDMRB should be abolished. However, the Board review took the position that, following local government amalgamations the previous year:

> *… local government … should be in a strong position to provide regional strategic approaches to certain issues … those eight councils in whose area the rabbit-proof fence exists should become responsible for its upkeep, if they decide the function is necessary. Whether or not the local governments choose to retain the Board should be their responsibility and not a matter for the State Government.*[10]

Consistent with this position, the Board review recommended that responsibility for management of the rabbit fence be transferred to the local governments in whose area the fence existed.[11]

Hyder agreed that continued maintenance of the rabbit fence was worthwhile, but found that:

> *… the abolition of the [DDMRB] and handing its functions wholly to local government may not secure its future. If the rabbit fence was handed to local government to manage and maintain it would still need a system of coordinating management responsibilities. This would be cumbersome and could easily lead to difficult negotiations about decision-making and equitable contribution and allocation of funds. This would place the fence at risk.*[12]

Hyder also concluded that the dog fence and check fences provided an important public good function, despite the serious issue of dogs being present within the protected area, and ought to continue to be maintained.[13] In contrast to the Board review, however, Hyder recommended centralisation of fence management functions. It concluded that:

> *… the separate management of the three fences leads to less efficient and effective use of funds and resources. An improvement will take place if all the three fences are linked and managed as one unit. This is because while some sections are still effective they will not remain that way without attention. Efficiency will increase through economies of scale.*[14]

Ultimately, the government did not adopt the recommendations of either report. The 2009 status quo is therefore the situation at the time of writing.

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[10] Webb, Simone & Weller, Patrick AO, *Brokering Balance: A Public Interest Map for Queensland Government Bodies,* (Queensland Government, 2009), p 97.

[11] As above.

[12] Hyder Consulting, *The Management of the Pest Animal Barrier Fences in Queensland – Final Report*, (Hyder Consulting, 2009), p 41.

[13] Hyder, 2009, pp 26, 66.

[14] Hyder, 2009, p 66.

3. Issues considered by the committee

Efficacy of barrier fences as a pest control method

Both DAF and the DDMRB supplied evidence to the committee that the barrier fences continue to be an effective method of controlling the movement of targeted pest species. In its submission to the inquiry, the DDMRB stated:

> *The physical barrier as a preventative method surpasses all other forms and is still a nationally-recognised technique for the protection of high value assets.*[15]

The DDMRB also stated that:

> *Queensland and most particularly the rabbit district has a much lower abundance of rabbits than other states.*[16]

This statement was confirmed by DAF, which noted that:

> *[t]he DDMRB area is one of the few areas in Australia which is highly suitable for rabbits but has not been colonised to the degree seen in other areas. This is due to the* [rabbit] *fence and the actions of the DDMRB.*[17]

The DDMRB acknowledged that rabbits have been sighted in various locations across its area of responsibility. However, it noted that spotlight surveys showed a 15:1 population difference between the clean and dirty sides of the fence.[18] The rabbit population that does exist inside the protected area is considered to be less well-established. This can largely be attributed to the non-availability of ideal habitats. Hyder's 2009 report stated that, at a target site at Dalveen, 70 active warrens were identified on the dirty side of the fence and none on the clean side. Rabbits inhabiting the DDMRB's area of responsibility depend on more transitory cover, such as log piles.[19]

Testimony from local governments in the DDMRB's operational area has been positive, with a representative of the Southern Downs Regional Council describing the rabbit fence as an 'absolute requirement.'[20]

There is, however, evidence to suggest that rabbit populations to the north of the DDMRB's area of responsibility are not being controlled with the same rigour as those closer to the rabbit fence. The committee heard that significant populations have been identified in the Wide Bay-Burnett and South

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15 DDMRB, *Submission 34*, p 7.

16 As above, p 11.

17 DAF, *Correspondence,* 15 June 2016, p 5.

18 DDMRB, *Submission 34*, p 7.

19 Hyder, 2009, p 31.

20 Cr Cameron Gow, Rural, Environment and Sustainability Portfolio Manager, Southern Downs Regional Council, *Public Hearing Transcript*, 11 May 2016, p 3.

Burnett regions, and that rabbits appear to be spreading southward from here into the Toowoomba region.[21]

Opinions on the effectiveness of the dog fence, by comparison, were distinctly mixed. This is largely due to the fact that an unknown, but significant, population of wild dogs already exists within the protected area.[22] Representatives of the Condamine Alliance Group called the usefulness of the fence into question:

> *We did have some particular confusion on the dog issue as to whether there is still a clean or a dirty side of the dog fence. … [I]t is not clear from our operations whether there is a … change in density either side of the dog fence in particular.*[23]

Focus groups conducted by Hyder during the preparation of its report suggested the following potential reasons for this:

- *the decline of the sheep industry has resulted in fewer sheep properties inside the [dog fence] with the result that there are less people who have a direct interest in controlling wild dogs*
- *properties, including those with sheep enterprises, have become larger while employing less people*
- *the declining terms of trade in agriculture has resulted in larger properties with the replacement of staff who could undertake dog control with mechanisation*
- *the high cost of labour has seen the increased use of dogs on cattle properties. … The high value of a good working dog means that there is a reluctance to use 1080 baits*
- *the many private dog fences inside the [dog fence] that once restricted dog movements … have been abandoned*
- *the difficulty of achieving cross-tenure control involving landholders and the managers of national parks and equivalent reserves and State Forests*
- *fewer people carrying guns.*[24]

This view, however, has been directly disputed by DAF, which stated:

> *It has been well documented that there are marked differences in the abundance of wild dogs … on either side of the [dog fence] in Queensland and in other states. These differences cannot be readily explained by differences in habitat, such as vegetation and water point density.*[25]

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21 Mark Ready, Principal for Conservation and Pest Management, Toowoomba Regional Council, *Public Hearing Transcript*, 11 May 2016, p 22.

22 Wild Dog Destruction Board, *Submission 11*, p 2; Hyder, 2009 p 21.

23 Jayne Thorpe, General Manager, Business Growth, Condamine Alliance Group, *Public Hearing Transcript,* 11 May 2016, p 7.

24 Hyder, 2009, p 21.

25 DAF, *Correspondence,* 11 November 2016, p 6.

Regardless of the actual state of wild dog populations, it appears that the dog fence is an effective barrier to pest animal movement. Studies using radio telemetry have recorded dogs moving many kilometres along the dog fence and check fences without breaching them. DAF notes that this has only been observed when a pack disperses, and that dogs tend to remain within particular territories. [26]

Cluster fencing, in which high-value areas within the unprotected majority of the state are enclosed, uses the same construction methods as the dog fence, and has proven effective in excluding wild dogs from enclosed areas.[27] The barrier and check fences are effective in preventing pest animals from re-entering 'clean' areas in which existing populations have been destroyed.[28]

The department along with several other commentators, took pains to point out that the barrier and check fences are only one part of an integrated suite of pest control methods, and cannot be expected to control the problem in isolation.[29]

Committee comment

The committee supports the view that the barrier and check fences are important and effective components of active pest management programs for controlling wild dogs and rabbits within the protected areas.

Economic importance of the barrier fences

Given that the barrier fences are effective for controlling the movement of pest species, it is logical that, if they were allowed to decay, the prevalence of wild dogs and rabbits in pastoral and agricultural areas would increase. This was supported by witness testimony during the committee's hearings.[30]

Estimates of the potential value of increased pastoral production in areas free from wild dogs range from $22.28 million to $67 million per year.[31] However, it should be noted that this would require the use of complementary control methods to significantly reduce, or eliminate, the wild dog population within the protected area of the dog fence.

The impact of rabbits on horticultural production has proven difficult to quantify. However, the DDMRB has estimated that the total impact Australia-wide to be in excess of $1 billion per year.[32]

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[26] As above, p 5.

[27] BSC, *Submission 4*, p 1; South-West NRM, *Submission 36*, pp 1-2.

[28] DAF, *Correspondence,* 11 November 2016, p 3; AgForce, *Submission 20*, p 3.

[29] DAF, *Correspondence,* 11 November 2016, p 7; Hyder, 2009, p 64; National Parks Association of Queensland, *Submission 30*, p 2.

[30] Jayne Thorpe, *Public Hearing Transcript,* 11 May 2016, p 8;

[31] Biosecurity Queensland, *Wild Dog Management Strategy 2011-16*, (Queensland Government, 2011), p 3.

[32] DDMRB, *Submission 34*, p 7.

The most recent cost-benefit analysis of the barrier fences was undertaken in 2009 by Hyder for DEEDI. This analysis found a net present value of the barrier fences of $21.7 million.[33] However, although the same review found that the dog fence produced a return of $1.84 for every dollar spent on its administration and maintenance, [34] most of the value was produced by the rabbit fence.[35] This can be largely attributed to the ongoing presence of an established dog population within the protected area of the dog fence.

In its report, Hyder noted that the dog fence has enabled the existence of a goat industry within its protected area, which supports a dedicated meatworks in Charleville, and that this would not be possible without the existence of the fence. It also noted that the fence acts to protect the sheep-producing areas of New South Wales.[36]

Were there a greater disparity between the numbers of dogs on the clean and dirty sides of the dog fence, it would no doubt be of greater benefit to sheep producers. This benefit could be expected to be highly significant, as each sheep adds an estimated $12 to the local economy over cattle grazing.[37] However, it appears that the recent increase in Queensland's sheep herd has occurred on the dirty side of the dog fence, and that this can be attributed largely to cluster fencing rather than ongoing management of the dog population.[38]

Committee comment

The committee notes that, on the most recent available information, both barrier fences appear to have a significant, positive economic impact. The committee also notes that producers in New South Wales also benefit from the dog fence.

Recommendation 1

The committee recommends that the Wild Dog Barrier Fence and the Rabbit Fence continue to be actively maintained as major components of Queensland's control strategies for wild dogs and rabbits.

Impact on native species

The committee sought to understand the impacts of barrier fences on native species. Problems with barrier fences in other jurisdictions are well known, including interference with the migration of emus along the rabbit fence in Western Australia.

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33 Hyder, 2009, p 53.

34 Biosecurity Queensland, 2011, p 18.

35 Hyder, 2009, p 53.

36 Hyder, 2009, p 20.

37 Longreach Regional Council, *Submission 3*, p 1; BSC, *Submission* 4, p 2; David Moreton, Chairman, Rural Lands Advisory Committee, Longreach Regional Council, *Public Hearing Transcript*, 11 May 2016, p 26.

38 BSC, *Submission* 4, p 2; Michael Parker, A/Chief Executive Officer, BSC, *Public Hearing Transcript*, 11 May 2016, p 5.

The impact of the barrier fences, check fences and cluster fencing on threatened native species was considered in 2013 by the Senate Inquiry into Effectiveness of Threatened Species and Ecological Communities Protection in Australia. The Senate inquiry heard evidence regarding the importance of fenced 'mainland islands' as a conservation measure.[39] The inquiry's final report recommended that:

> … in developing action plans, and allocating program funding, the Department of Sustainability, Environment, Water, Population and Communities consider greater use of predator exclusion fences and other forms of 'mainland island sanctuaries' for threatened species.[40]

This is supported by anecdotal evidence gathered from landholders, suggesting that species preyed upon by wild dogs have benefited from fencing.[41]

Concerns were raised, however, that the fences fragment native species' habitats and can impede migration. The National Parks Association of Queensland (NPAQ) stated:

> *Erecting barrier fences may … serve to create 'island communities of native species, hindering movement for foraging and mating. In time, this may result in a geographically isolated population which may become prone to overpopulation and inbreeding. This may have a negative impact on both the health and long-term viability of the populations of native species.*[42]

The DDMRB noted, however, that the rabbit fence has been in existence for over 100 years, and that species affected by its construction would have rapidly adjusted to the new constraint on their available resources.[43] The DDMRB also noted that:

- small mammals, reptiles and flying birds are unimpeded by the fence
- species that would be blocked by the fence, such as wallabies, goannas and echidnas, are relatively common
- wallabies are less inclined towards long-distance migration than other macropods, and
- since its inception, the DDMRB has not been alerted to the existence of any threatened native species in the vicinity of the fence.[44]

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[39] Australian Senate Environment and Communications References Committee, *Effectiveness of Threatened Species and Ecological Communities Protection in Australia*, (Commonwealth Government, 2013), p 86.

[40] As above, p ix.

[41] BSC, *Submission* 4, p 1.

[42] NPAQ, *Submission 30*, p 3.

[43] DDMRB, *Submission 34,* p 10.

[44] DDMRB, *Submission 34*, p 10.

In its advice to the committee, DAF explained that no native migratory species exist in eastern Queensland. The department's own research has shown increased wildlife in areas inside the rabbit fence compared to outside.[45]

The DDMRB argued that, rather than adversely affecting native species, the rabbit fence has benefited conservation outcomes, as it prevented a hypothetical large rabbit population on the southern downs. Such a hypothetical population could be expected to attract and support larger numbers of predators (e.g. feral cats), which would also prey on native wildlife.[46]

This point was indirectly supported by the NPAQ when it described the perverse outcomes that occurred at Currawinya National Park, where fencing did not effectively exclude predators from a native species' habitat:

> *A fence was put up to keep cats away from bilbies and in essence what it did was kind of corralled all the bilbies, which are pretty defenceless little things, into one area and then it was a bit of a massacre of bilbies.*[47]

The view that the presence of wild dogs helps to control populations of foxes and cats was echoed by the RSPCA.[48]

The RSPCA and NPAQ also noted that animals attempting to move through the fence will, from time to time, be trapped. Unless these animals are lucky enough to be encountered by a human (typically a landholder or fence maintenance worker) while still healthy, they will die either from thirst, predation or humane destruction.[49]

Committee comment

The committee acknowledges the risks that effective barrier fences can have unintended impacts on native species. Queensland's barrier fences appear to benefit smaller species, but are a potential threat to larger species such as kangaroos. The committee considers that barrier fences should not be erected or maintained in the absence of a strategy to control second-order predators (i.e. cats and foxes), which would otherwise be controlled by the presence of wild dogs.

45 DAF, *Correspondence,* 15 June 2016, pp 13-14.

46 As above.

47 Kirsty Leckie, Conservation Principal, NPAQ, *Public Hearing Transcript*, 11 May 2016, p 13.

48 Dr Mandy Paterson, Principal Scientist, RSPCA Queensland, *Public Hearing Transcript*, 11 May 2016, p 16; RSPCA Queensland, *Submission 25*, p 1.

49 Kirsty Leckie, Conservation Principal, NPAQ, *Public Hearing Transcript*, 11 May 2016, p 13; RSPCA Queensland, *Submission 25*, p 2.

Effectiveness of DAF and the DDMRB

Since the adoption of the wild dog strategy, DAF has adopted a partnership approach, supporting the formation of local wild dog committees driven largely by local governments. The department has also adopted a 'nil tenure' approach to dog management, whereby:

- GIS mapping is used to identify areas of wild dog habitat and movement corridors, historical and recent stock loss and current control
- all boundaries are disregarded during this information-gathering process
- a control strategy is developed from a 'landscape' perspective (i.e. not focusing on any particular property), in consultation with local landholders, and
- boundaries are re-inserted into the plan following the information-gathering phase, allowing identification of individual areas of responsibility.[50]

Maintenance of the dog fence is, where applicable, incorporated into the control plans of wild dog committees. Other measures used are detailed in Appendix D.

Stakeholders expressed satisfaction with the department's approach. The local partnerships have been noted as improving processes and management of the fence, including asset maintenance and equipment availability.[51] Other local governments explicitly called for DAF to continue its role in coordinating the maintenance of the dog fence, citing the initiative displayed by DAF officers '… to meet the needs of an evolving, holistic environment.'[52] The design and materials of the dog fence are continually upgraded (where possible) during reconstruction and maintenance work.

None of the local governments making precept payments for maintenance of the dog fence expressed any dissatisfaction, either with the amount of precept paid, or with the operations that they funded.

Hyder in 2009 was also supportive of DAF's management of the dog fence, noting at the time that each kilometre of the dog fence cost approximately $750 per year to maintain.[53] The drive in recent years for responsibility for day-to-day control operations to be devolved to landholders and local wild dog committees (driven by local governments)[54] is not expected to significantly alter the cost of fence maintenance.

Although contractors have been used for fence reconstruction work, DAF's own workforce has proven capable of performing the same work at lower cost. In 2015/16, reconstruction contractors averaged a cost of $24,735 per kilometre of fence, compared with $22,923 per kilometre for DAF officers.

50 Biosecurity Queensland, 2011, p 42.

51 BSC, *Submission 4*, p 1.

52 Maranoa Regional Council, *Submission 9*, p 2; Quilpie Shire Council, *Submission 7*, p 1.

53 Hyder, 2009, p 15.

54 Biosecurity Queensland, 2011, p 5.

Despite this, DAF's ongoing strategy is for contractors to assume a greater proportion of reconstruction work, leaving DAF's officers to concentrate on fence maintenance.[55]

DAF has noted that its operations are able to take advantage of its greater purchasing power, and its pre-existing infrastructure, both of which are impossible for private contractors to match. Accordingly, DAF is beginning to purchase materials for supply to contractors, which is expected to reduce the cost of privately-conducted reconstruction.[56]

In contrast to the support for DAF's management of the dog fence, the DDMRB has been a target of criticism from several directions, particularly with regard to its funding via precepts required of local governments. This arrangement has been hotly debated since the initial construction of the rabbit fence over a century ago, and dissatisfaction with the precepts continues. The Council of Mayors (South East Queensland) has expressed its dissatisfaction with what it views as the provision of a public good to the state generally by a limited subsection of local governments:

> *The rabbit fence, which is generally seen to provide a greater economic benefit measured as Gross State Product than the … dog fence, is more reliant on local funding. … [I]t is the position of the Council of Mayors (SEQ) that even a more equitable distribution between state funding and local levies going forward is inadequate.*[57]

This view was echoed by the TRC, which considers that its contribution to the rabbit fence is disproportionate to the benefit received. The TRC has called for the cost of the rabbit fence to be shared '…equitably across all Queenslanders who benefit from reduced losses in agricultural production.'[58]

Not coincidentally, dissatisfaction with the precept system appears to correlate with the level of urbanisation within a given local government area.[59] The CCGC, for example, has its population concentrated in a major city and there is little horticultural production in its hinterland areas. The CCGC has stated that it:

> *… considers the function, operation and activities of the* [DDMRB] *to be outside its obligation. Council would like to request that its involvement and funding contribution to the* [DDMRB] *is discontinued.*[60]

Meanwhile, the SDRC, in which significant horticultural production areas are located, regarded its precept as '…money … well spent.'[61]

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55 DAF, *Correspondence,* 11 November 2016, p 8.

56 As above.

57 Council of Mayors (South East Queensland), *Submission 35*, p 3.

58 TRC, *Submission 22*, pp 1, 3.

59 Cr Cameron Gow, *Public Hearing Transcript*, 11 May 2016, p 2.

60 CCGC, *Submission 18*, p 1.

61 SDRC, *Submission 5*, p 2.

The CCGC also points out that, while its area is not protected by the rabbit fence, others that do receive protection from the rabbit fence are not required to pay precepts.[62] Somerset Regional Council (SRC) was cited by another submitter as an example of this.[63] While not part of the DDMRB's area of responsibility, it lies adjacent to the ICC and TRC areas. It is thus reasonable to assume that the presence of the rabbit fence, and ongoing rabbit control activities, in those local government areas results in a lower population in the Somerset region.

The department, in its advice to the committee, noted that the *Biosecurity Act 2014* (the Biosecurity Act) allows for payments being required from local governments where:

> *… land in the area may benefit from action taken by … an invasive animal board, including, for example … action to keep in good order any part of the barrier fence included in, or that benefits, the local government's area.*[64]

The nature of the benefit to the local government's area alluded to in this section of the Biosecurity Act is unclear. It is also unclear whether case law exists setting out a requirement for a certain level of proximity to the rabbit fence in order for it to be considered to 'benefit' a local government's area.

The other chief criticism of the DDMRB raised by councils is that the board focuses on maintenance of the fence at the expense of its pest control function.[65] In their submission, the ICC commented that:

> *[a]s is often the case, Council Officers have to intervene and follow up identified issues as the level of on the ground service by the DDMRB is lacking. … [I]t is often Council who have to drive the DDMRB into action over protracted periods of time …*[66]

The ICC suggested that it be permitted to retain its precept payments, and put the money towards pest control activities conducted by its own officers.[67]

In defence of the DDMRB, Hyder noted that:

> *… there is not a uniform awareness of the* [DDMRB] *activities and results within the local government areas. The local governments receive* [DDMRB] *annual reports but these may be read by staff or elected councillors. The line of responsibility for rabbit control between local government and the* [DDMRB] *is not clear to many stakeholders.*[68]

There is also evidence to suggest that increasing rabbit numbers on the clean side of the fence may be due to factors well beyond the control of the DDMRB. One expert explained the situation facing

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62 As above

63 Daly, Glen, *Submission 2*, p 1.

64 Biosecurity Act, s 60(3)(b).

65 CCGC, *Submission 18*, p 2.

66 ICC, *Submission 13*, pp 1-2.

67 As above, p 1.

68 Hyder, 2009, p 39.

the DDMRB with reference to the prevalence of rabbit haemorrhagic disease (calicivirus) circulating among the Australian rabbit population:

> *The* [DDMRB] *for most of its time just had to cope with a small number of outbreaks. One staff member could do that: run around and knock them out. Just in the last 15 years there has been an increase in the number of outbreaks inside and I believe that is due to rabbit calicivirus virus knocking out the large populations of rabbits outside and reducing the amount of disease that is floating up across the country. There are external factors like that that have made it more difficult for the* [DDMRB] *and they have not been able to cope with the increase in numbers. … They have not kept up with it due to possibly lack of resources, but possibly a lack of understanding of the threat of the things that were happening.*[69]

It was also brought to the attention of the committee that the DDMRB is unable to operate on land owned by government agencies (chiefly the Department of Transport and Main Roads), or in the Queensland Rail corridors.[70] Lack of personnel may also be locking the DDMRB into a responsive mode of operations, preventing it from taking sustained action in key areas.[71]

Whatever the reason, it appears that a lack of focus on population control within the protected area of the rabbit fence is preventing eradication, which otherwise appears feasible.[72]

DAF's advice to the committee is that, although other bodies (including the DDMRB and local governments) may carry out pest control activities, the legal obligation to control pests continues to rest with the landholder.[73]

Hyder in 2009 noted that the annual cost of maintenance of the rabbit fence was $1,606 per kilometre. It recognised, however, that this figure was not directly comparable to that for maintenance of the dog fence, due to the differences in terrain in their areas of construction.[74]

Committee Comment

The committee notes that:

- local governments are organisationally effective, but frequently lack the will or capacity to control pest animals in their areas
- local governments' attitudes toward pest animal control appear to vary with their level of urbanisation
- precept payments for barrier fence maintenance are unpopular among many of the local governments that support the rabbit fence
- payments to DAF to maintain the dog fence are less controversial

[69] Dr David Brennan, Pest Animal Technician, Queensland Murray-Darling Committee, *Public Hearing Transcript, 11 May 2016*, p 19.

[70] As above, p 20; SDRC, *Submission 5*, p 2.

[71] Dr David Brennan, *Public Hearing Transcript, 11 May 2016*, p 20.

[72] As above, p 19.

[73] DAF, *Correspondence,* 15 June 2016, p 6.

[74] As above, pp 37, 61.

- the DDMRB capably maintains the rabbit fence in difficult terrain and circumstances, but has proven less capable of controlling the rabbit population in its area of responsibility, and
- no state-wide attempts have been made at rabbit control in a century or more, despite the ongoing presence of rabbit populations well beyond the DDMRB's area of responsibility.

Proposals for reallocation of responsibility

As discussed in section 2, the Board review and Hyder both recommended dissolving the DDMRB and reallocating administrative responsibility for the rabbit fence. The Board review took the position that local governments were the appropriate bodies, and that the rabbit fence could be maintained in sections according to each local government's perception of its importance. Conversely, Hyder recommended that responsibility for the rabbit fence be located with DAF, as is the case with the dog fence.

Stakeholders adopted a variety of views on the subject. Some, such as the SDRC, were in favour of the status quo. The SDRC agreed that assigning responsibility for the rabbit fence to local governments would result in inconsistent maintenance standards. However, it also stated that having a single organisation responsible for over 3,000 kilometres of fencing could lead to administrative inefficiencies.[75]

Others supported the proposal to bring responsibility for the rabbit fence under the control of DAF. In particular, the Condamine Alliance notes that, as the DDMRB's funding level is controlled by the Minister, but that it does not appear in the DAF budget, there has been little incentive to increase local government precepts in line with the rising cost of the DDMRB's administration. Direct government responsibility for the rabbit fence would remove this issue, and eliminate administrative duplication.[76]

As discussed in the previous heading, there appears to be ample evidence to suggest that different local governments regard maintenance of the rabbit fence as a greater or lesser priority. Communication between local governments regarding the rabbit fence is informal and has not been coordinated by organisation such as the Local Government Association of Queensland,[77] though the Council of Mayors (SEQ) has addressed the issue from time to time. The level of expertise available to local governments for pest animal control also seems to vary,[78] with high levels of competence in ICC (for example)[79] and perhaps less expertise in SRC.[80]

On the other hand, there appears to be little evidence for the proposition that combining management of the two fences would lead to administrative inefficiency. Hyder calculated that disbanding the

[75] SDRC, *Submission 5*, p 1.

[76] Condamine Alliance, *Submission 12*, pp 1-3.

[77] Cr Cameron Gow, *Public Hearing Transcript*, 11 May 2016, p 3.

[78] DDMRB, *Submission 34*, p 11.

[79] ICC, *Submission 13*, p 2.

[80] Daly, Glen, *Submission 2*, p 1.

DDMRB and reallocating its responsibilities to DAF would result in an immediate saving of $102,049 per year in pure administrative costs (i.e. insurance premiums, audit fees etc.). This figure does not include any reduction in salary costs. It also estimated that a further $157,500 in maintenance costs could be saved by abandoning the Chinchilla to Jandowae section of the dog fence (which it assumed would become unnecessary). It did, however, note that new amounts for local government precepts would need to be negotiated.[81]

DAF has advised the committee that the merger of the function of maintaining the rabbit and dog fences was proposed in the Biosecurity Bill 2011. The Bill proposed that the DDMRB and elements of DAF responsible for the dog fence would be replaced by a single Invasive Animals Barrier Fence Board. The Invasive Animals Barrier Fence Board function was proposed to ensure that both the rabbit fence and the wild dog barrier fences were maintained as effective barriers.[82] However, the Biosecurity Bill 2011 lapsed with the dissolution of the 53rd Parliament, and the arrangement was not included in the Biosecurity Bill 2013 (which became the Biosecurity Act).

Committee comment

It appears to the committee that an opportunity exists to implement a rabbit control strategy based on a similar approach to the wild dog strategy. That is, to have management of the rabbit fence form part of control programs implemented by local rabbit committees, based on a nil tenure approach. This methodology has proven both popular and effective in areas populated by wild dogs, and may provide a solution to the ongoing problem of local governments' resentment of their required precept payments to the DDMRB (via DAF). It also has the potential to make rabbit control an issue of state-wide significance. The inclusion of the rabbit fence functions within DAF would also help to ensure that a broad range of skills and expertise in relation to animal control matters, gained from work across all pest species, would be available to contribute to the continuing effective control of rabbits.

The committee also believes that economies of scale could be achieved by disbanding the DDMRB and transferring its responsibility for maintenance of the rabbit fence to DAF, and its responsibility for enforcement of the relevant provisions of the Biosecurity Act to local rabbit committees.

Recommendation 2

That the organisation responsible for the Rabbit Fence develop a strategy for state-wide control of rabbit populations, with an approach similar to the Wild Dog Management Strategy 2011-16.

Recommendation 3

That the Government review the management structure of the Darling Downs Moreton Rabbit Board and its capacity to meet the objectives of the organisation.

81 Hyder, 2009, pp 62-63.

82 DAF, *Correspondence,* 15 June 2016, p 6.

Proposals for fence extension

During the inquiry, the committee received a number of proposals to extend the barrier fences where doing so would benefit graziers and agriculturalists. In particular, AgForce recommended that priority be given to sheep-producing areas.[83] The Longreach Regional Council has requested that the dog fence be extended northwards from the area near Windorah.[84] This could, in theory, be achieved relatively economically by linking existing areas of cluster fencing to the dog fence.[85] However, no estimates of the cost of such a project have been provided to the committee.

The DDMRB has also noted that its efforts to control rabbit populations would be more effective if a second rabbit fence was erected at the northern edge of its area of responsibility, though it stopped short of actively recommending such a measure.[86]

DAF has, however, noted that the Biosecurity Act contains no provisions that would allow the dog fence to be extended. As such, it does not consider that it is in a position to do so.

The relevant sections of the Biosecurity Act read:

> *89. What is the barrier fence*
>
> *(1) The barrier fence is the fence made up of the sections of fencing built along the following lines—*
>
> *(a) the line shown as the 'wild dog barrier fence' on the barrier fence map;*
>
> *(b) the lines shown as the 'wild dog check fence' on the barrier fence map;*
>
> *(c) the line shown as the 'rabbit fence' on the barrier fence map.*
>
> *…*
>
> *91. Barrier fence map and amendment of map*
>
> *…*
>
> *(2) The chief executive may amend the barrier fence map to more accurately show the location of the barrier fence* ***or of any adjustment of the fence*** [committee's emphasis].

Committee comment

DAF's statement regarding the Biosecurity Act seems incongruous when considered alongside the text of the Biosecurity Act itself. Section 91(2) appears to make explicit provision for repositioning of a barrier fence and, by implication, allow for the extension of a barrier fence. The committee is concerned that these sections of the Biosecurity Act may not be operating as intended by Parliament.

The committee has no view regarding the merits of extending the barrier fences but is concerned that any serious proposals can be duly considered. DAF is well-placed to consider the merits of doing so, but appears to be hampered by its interpretation of the Biosecurity Act.

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83 AgForce, *Submission 20*, p 7.

84 Longreach Regional Council, *Submission 3*, p 2.

85 BSC, *Submission 4*, p 1.

86 DDMRB, *Submission 34*, p 11.

Recommendation 4

That the Department of Agriculture and Fisheries consider the merits and a cost-benefit analysis of the proposal to extend the wild dog barrier fence northwards from the Windorah area to within the area of the Longreach Regional Council.

Recommendation 5

That the Queensland Government maintain the Feral Pest Initiative Committee, including its capacity to consider how cluster fencing fits into the broader dog management scheme, and whether there is any merit in repositioning or extending barrier fencing.

Cluster fencing

As described above, cluster fencing is a method whereby high-value areas are surrounded with exclusion fencing to prevent incursions by pest animals. The main method by which this has been achieved in Queensland is through private syndicates, consisting of the holders of several adjoining properties, receiving subsidies from DAF to construct a fence. DAF has advised that clusters must be of a size sufficient to satisfy the Chief Executive that the benefits will not flow to a single landholder, and that the subsidy is capped at 25 per cent of the cost of construction.[87] To date, 37 clusters have received funding from DAF, and most have commenced construction of their fences.[88]

There is almost universal support for cluster fencing from regions where it is in use, as properties within clusters have observed significant increases in lambing rates and lamb survival, with consequent benefits for the local economies.[89] An analysis performed for BSC estimates that the productivity of cattle grazing land would increase from $47.80 to $60.67 per hectare, sheep grazing land from $79.89 to $117.99 per hectare, and crop land from $228.00 to $244.43 per hectare.[90]

However, it is important to note that cluster fencing can only benefit landholders who have the resources available to construct fences. Landholders who are unable to construct fences will, in fact, find the dog populations on their properties increasing, as they receive the 'runoff' from fenced properties.[91] This would have the secondary effect of simultaneously raising the value of the fenced properties while lowering that of their neighbours.[92]

This phenomenon has already been recorded on a macro-scale by the Wild Dog Destruction Board for the Western Division of New South Wales (as it was then) (the NSW Board). The NSW Board reported

87 DAF, *Correspondence,* 15 June 2016, p 11.

88 DAF, *Correspondence,* 11 November 2016, p 10.

89 e.g. BSC, *Submission 4*, p 1; McClymont, Paul, *Submission 16*, pp 1-2; South West NRM Ltd, *Submission 36*, pp 1-2.

90 Grant Consultants, *Economic Feasibility Analysis on the Implementation of a Cluster Exclusion Fencing Model in the Balonne Region*, (BSC, 2015), pp 31-33.

91 Pratt, Michael, *Submission 23*, pp 3-4; Alexander, Maureen, *Submission 40*, p 1.

92 Alexander, Maureen, *Submission 40*, p 1.

an increased presence of wild dogs in the Bourke, Brewarrina and Walgett local government areas. The NSW Board was unable to estimate the impact on producers in these areas. However, it advised that the Brewarrina Shire Council has requested that the New South Wales dog fence be extended eastward approximately 300 kilometres to Mungindi, at a cost of several million dollars, to address the issue.[93]

The RSPCA has suggested that cluster fencing has led to significant animal welfare concerns for macropods, as landholders have used the fences to isolate macropod populations from the water sources on which they depend.[94] DAF has advised the committee, however, that:

> *Macropods are dependent upon free water, but are capable of travelling several kilometres to drink. The actual maximum distance and water requirements vary with species. … There is rarely more than 5 kilometres separating water points in the semi-arid rangelands of Queensland, which is well within travelling range of red and eastern grey kangaroos. … Water point closures have reduced kangaroo abundance in areas of Western Australia where stock have been permanently removed, but there are large distances (>20 kilometres) between water points in these areas and the environment is more arid.*[95]

Committee comment

The committee is satisfied that cluster fencing is providing the intended benefit to graziers, and is doing so cost-effectively and without undue hindrance to native species. However, it has been repeatedly stressed to the committee that exclusion fencing of any kind is ineffective without ongoing efforts to control the population of pest animals. The committee also has concerns that the ongoing construction of exclusion fencing is placing the burden of wild dog predation on those producers who are least able to absorb its impact. This includes producers in New South Wales, who do not appear to have been consulted in the development of the barrier fencing strategy.

Recommendation 6

That the Department of Agriculture and Fisheries include the New South Wales Border Fence Maintenance Board in any future consultation regarding wild dog control strategy and barrier fence construction.

93 Wild Dog Destruction Board for the Western Division of New South Wales, *Submission 11*, p 2.

94 RSPCA, *Submission 25*, p 2.

95 DAF, *Correspondence,* 11 November 2016, p 9.

Appendix A: List of submitters

1. Foundation for a Rabbit-Free Australia Inc.	22. Toowoomba Regional Council
2. Mr Glen Daly	23. Mr Michael Pratt
3. Longreach Regional Council	24. Fassifern Field Naturalists Club Inc.
4. Balonne Shire Council	25. RSPCA Queensland
5. Southern Downs Regional Council	26. Bremer Catchment Association Inc.
6. Mr Ian Douglas	27. Pakton Technologies
7. Quilpie Shire Council	28. Ms Catherine Drynan
8. Dingo Australia	29. RSPCA Australia
9. Maranoa Regional Council	30. National Parks Association of Queensland
10. Ledknapper Wild Dog Action Group Inc.	31. Brewarrina Shire Council
11. Wild Dog Destruction Board for the Western Division of New South Wales	32. Ms Nadia O'Carroll
12. Condamine Alliance Group	33. Mr and Ms Neil and Mary Rogers
13. Ipswich City Council	34. Darling Downs-Moreton Rabbit Board
14. Western Queensland Landholder Group	35. Council of Mayors (SEQ)
15. Mr John te Kloot	36. South West NRM
16. Mr Paul McClymont	37. Dr David Berman
17. Mr David Mims	38. Local Government Association of Queensland
18. Mr Richard Zoomers	39. Mr John Milne
19. Gold Coast City Council	40. Ms Maureen Alexander
20. AgForce	41. Mrs Joanne Milne
21. Mr John Fearby	42. 42Mr Paul Hodson

Appendix B: Briefing officers

Private Briefing 28 October 2015

Department of Agriculture and Fisheries

- Dr Jim Thompson – Chief Biosecurity Officer, Queensland
- Dr John Robertson – General Manager, Invasive Plants and Animals

Appendix C: Public hearing witnesses

11 May 2016

Southern Downs Regional Council

- Councillor Cameron Gow - Rural Environment and Sustainability Portfolio Manager
- Mr Tim O'Brien - Manager, Environmental Services

Balonne Shire Council

- Mr Michael Parker - Acting Chief Executive Officer

Condamine Alliance Group

- Mr Andrew McCartney - General Manager, Program Delivery
- Ms Jayne Thorpe – General Manager, Business Growth

New South Wales Dog Destruction Board

- Mr Ken Turner – Member

National Parks Association of Queensland

- Ms Kirsty Leckie – Conservation Principal

RSPCA Queensland

- Dr Mandy Paterson – Principal Scientist

Queensland Murray-Darling Committee

- Dr David Berman – Pest Animal Technician

Toowoomba Regional Council

- Mr Mark Ready – Principal for Conservation and Pest Management

Longreach Regional Council

- Mr Greg Bowden – Chairman, Wild Dog Control Advisory Committee
- Mr Paul Hockings – Director, Corporate Services
- Mr David Morton – Chairman, Rural Lands Advisory Committee
- Mr Jeff Newton – Local Laws Team Leader

Appendix D: Alternative and complementary control methods

Wild dogs

Control Option	Features
Aversion techniques	*Advantages:* • may be effective in some areas and situations such as gates or grids in dog fences. *Disadvantages:* • dogs can become habituated to aversion techniques • maintenance of solar panels and batteries is required • theft of materials is common, as gates and grids are on public thoroughfares.
Baiting - 1080	*Advantages:* • low cost under current supply arrangements, as it is heavily subsidised by State and local governments • efficient, and more humane than strychnine • allows for a flexible approach depending on the location – baits can be distributed by land or air and buried and/or tied to reduce the impact on non-target species. *Disadvantages:* • non-target species can be affected • difficult in or near rural subdivisions is difficult and sometimes not permitted when the requirements of the 1080 guide cannot be fulfilled due to the risk of poisoning domestic animals – landholders may have to obtain hundreds of written permissions in order to bait. • wild dogs are beginning to teach pups to avoid baits • working dogs may be affected if improperly used
Baiting - Strychnine	*Advantages:* • fewer restrictions than 1080 • may be used in conjunction with traps to ensure quick destruction of captured dogs • quicker death than 1080. *Disadvantages:* • less humane than 1080 • working dogs may be affected if improperly used • wild dogs are beginning to teach pups to avoid baits • non-target animals can be affected.
Guardian animals (e.g. dogs, llamas, donkeys)	*Advantages:* • provides an appropriate wild dog deterrent measure • provides continuous protection to livestock • guardian dogs can provide an effective barrier to wild dog movement • can be cost effective when used to protect commercial sheep flocks • guardian dogs may also repel macropods from sheep areas resulting in less grazing competition. *Disadvantages:* • initially expensive to purchase and train

	• limitations in closely settled areas due to noise restrictions (e.g. barking) • dogs must be appropriately selected, bonded to the sheep or goats and trained • if used in appropriately, guardian dogs can perpetuate wild dog problems or consume livestock • even well-trained dogs may impact on native wildlife.
Shooting	*Advantages:* • suited to control of small populations or problem individuals • effective when used as part of an integrated approach • has no effect on non-target species. *Disadvantages:* • time-consuming and labour intensive.
Trapping	*Advantages:* • effective when used as part of an integrated approach • especially suited to the control of small populations or problem individuals • can be used in peri-urban areas • can be used successfully following baiting programs to catch shy dogs missed by baiting • minimal impact on non-target species if used correctly. *Disadvantages:* • time-consuming and labour intensive • requires a certain level of expertise.

Rabbits

Control Option	Features
Baiting – 1080	*Advantages:* • effective when used in conjunction with warren ripping • low cost under current supply arrangements, as it is heavily subsidised by State and local governments • efficient, and more humane than pindone. *Disadvantages:* • non-target species can be affected • difficult in or near rural subdivisions is difficult and sometimes not permitted when the requirements of the 1080 guide cannot be fulfilled due to the risk of poisoning domestic animals – landholders may have to obtain hundreds of written permissions in order to bait. • working dogs may be affected if improperly used
Baiting – Pindone	*Advantages:* • effective when used in conjunction with warren ripping • antidote available. *Disadvantages:* • less humane than 1080 • will only provide short-term control if used in isolation.

Biological controls (i.e. mysomatosis & calicivirus)	*Advantages:* • spread by natural vectors • outbreaks occur naturally when conditions are suitable • no landholder input required • both myxomatosis and calicivirus persist in the environment • effective when used in conjunction with warren ripping. *Disadvantages:* • natural resistance and immunity occurs in some populations, and will persist • requires a minimum population level to be effective.
Habitat modification	*Advantages:* • very effective in new populations where warrens have not been established. *Disadvantages:* • not effective where warrens have been established.
Shooting/trapping	*Advantages:* • useful for control of small numbers after warren ripping. *Disadvantages:* • ineffective when used in isolation.
Warren destruction	*Advantages:* • most effective method of long term control, due to: – increased vulnerability to predation – denial of suitable breeding locations – difficulty of re-establishing in the same area • most cost-effective method of long term control. *Disadvantages:* • high initial costs • limited use of riparian areas, rocky ground and periurban areas.
Warren fumigation	*Advantages:* • effective when used prior to warren ripping to reduce numbers • can be used where warrens cannot be ripped. *Disadvantages:* • will only provide short-term control if used in isolation.