Darling Downs-Moreton Rabbit Board

Submission to the Inquiry into Barrier Fences in Queensland

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Signed by: Acting Chief Executive Officer – David J. Stevenson

[redacted]

ABN: 44 509 080 794

26 Wood Street Warwick 4370
PO Box 332 Warwick 4370
Telephone: 07 4661 4076
Fax: 07 4661 4722
Email Address: ddmrbrd@bigpond.com
Website: www.ddmrb.org.au

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Terms of reference

The Agriculture and Environment Committee has resolved to investigate and report on the Queensland Governments barrier fences. The committee is undertaking the inquiry in accordance with its portfolio public works responsibilities of portfolio committees of the Legislative Assembly.

The terms of reference upon which the committee will investigate and report to Parliament on:

- The management of the Wild Dog Barrier Fence by Department of Agriculture and Fisheries (DAF)
- The management of the Darling Downs-Moreton Rabbit Fence by the Darling Downs-Moreton Rabbit Board (DDMRB)
- The effectiveness of barrier fences at protecting stock and crops from wild dogs, rabbits and other introduced species
- The unintended impacts of barrier fences on native species
- Recent upgrades to sections of the Wild Dog Barrier Fence by DAF, and
- Whether barrier fences should be expanded to other areas of the State to protect stock

Terms of reference addressed in this submission to the Inquiry

This submission will address the following terms of reference by the DDMRB:

- The management of the Darling Downs-Moreton Rabbit Fence by the Darling Downs-Moreton Rabbit Board (DDMRB)
- The effectiveness of barrier fences at protecting stock and crops from wild dogs, rabbits and other introduced species
- The unintended impacts of barrier fences on native species
- Whether barrier fences should be expanded to other areas of the State to protect stock

The management of the Darling Downs-Moreton Rabbit Fence by the Darling Downs-Moreton Rabbit Board

Background of Darling Downs-Moreton Rabbit Board (DDMRB)

The DDMRB was formed from the amalgamation of Darling Downs and Moreton Rabbit Boards in 1964.

Rabbits (*Oryctolagus cuniculus*) are a declared class 2 pest and are without doubt one of Australia's worst agricultural and environmental pests. They compete with native animals, destroy landscape and are a primary cause of soil erosion by preventing regeneration of native vegetation. [1]Rabbits have played a role in reduced numbers and extinction of many native animal species by competing for food and burrow space. The breeding capacity of rabbits far exceeds that of most native mammals and gives them a distinct competitive advantage. In addition, rabbits impact indirectly upon native fauna by attracting predators and this places heightened predation pressure on all wildlife in the vicinity. In drought times, rabbits climb trees to forage on foliage and often ringbark trees in their search for moisture. Rabbits affect the quantity and quality of pasture available for other animals. Nutritious plants are selectively grazed, and in times of drought rabbits can consume the majority of vegetation available. It is documented that the grazing ability of seven to ten rabbits is equivalent to one sheep. Rabbits grazing and burrowing reduces vegetation and leads to soil erosion. The exposed bare soil is washed and blown away, making areas less productive. Soil that is washed away then builds up and causes increased silting of aquatic ecosystems.

DDMRB is a pest operational board established under the *Land Protection (Pest and Stock Route Management) Regulation 2003* and is responsible for maintaining the ***rabbit district*** (as shown on map number RF01 held by the Department of Agriculture and Fisheries) free of rabbits.

The Board provides a rabbit control and eradication service to eight local governments and their rate payers within the 28,000 km^2 rabbit district (the board's operational area) of South East Queensland. The delivery of this service is achieved through the maintenance and upgrade of the 555km rabbit-proof fence and the provision of expertise and technical information to assist landholders to eradicate rabbits from their land.

Rabbit District "Rabbit Fence"

The Rabbit Fence requires staff to be engaged full time in both maintenance and replacement work. Given the age variations, terrain, climate, water, native and feral animal impacts along with naturally occurring events, the task is varied and the conditions difficult.

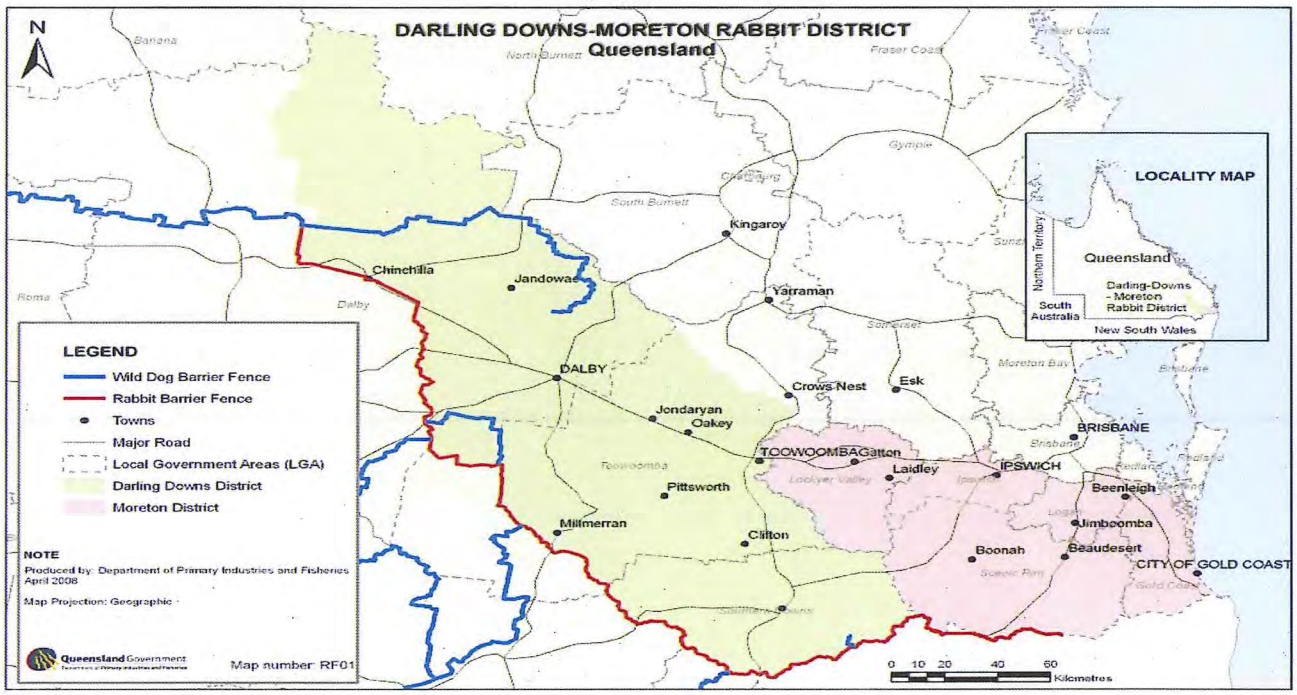
DDMRB plays an integral part in preventing the spread of rabbits. It maintains the declared pest fence known as the "rabbit fence" from Mt Gipps along the Queensland-New South Wales border until it reaches Cottonvale near Dalveen. From here it goes north-west along the Herries Range following the boundaries of the former Warwick-Stanthorpe, then Warwick-Inglewood Shires. It then passes through the former Millmerran Shire to the west of the township of Millmerran, through the Dunmore State Forest.

The fence then proceeds north-west through the State Forest on the western side of Cecil Plains onto the former Wambo Shire western boundary. From here it proceeds north-west through the Braemar Forest and then through the former Chinchilla Shire to Brigalow on the Warrego Highway. It then goes west following the Western Railway line to Goombi, between Chinchilla and Miles, and then proceeds north to link up with the Wild Dog Barrier Fence. At present there are 555 kms of rabbit fence, of which over a third (186 kms) is top netted to exclude wild dogs.

[1] Biosecurity QLD PA11 2008

The part of Queensland protected by the rabbit fence known as the "rabbit district" or "board area" is approximately 28,000 square kilometers in area and includes the local authority areas of:

- Western Downs Regional Council
- Toowoomba Regional Council
- Southern Downs Regional Council
- Lockyer Valley Regional Council
- Scenic Rim Regional Council
- Ipswich City Council
- Logan City Council
- City of Gold Coast Council



Finance

To provide the services prescribed under the *Land Protection (Pest and Stock Route Management) Act 2002 and Land Protection (Pest and Stock Route Management) Regulation 2003* the DDMRB receive contributions from eight local government authorities through the 'Rural Precept System'. Those local government authorities have either area, entirely or partly in the *rabbit district* or are benefited by the *declared pest fence*. The precept amount contributed by each of the local authorities within the board area is a decision of the State Government through the annual budget approval process. This process provides for independent review therefore applying a mechanism to protect local authorities from unreasonable increases in costs.

Statutory obligations

There is a three year business plan and five year works program reviewed annually to ensure a continuous improvement approach to work performed and forecast work to be completed.

DDMRB primary objectives remain;

1. Maintenance of the fence to a rabbit-proof standard.
2. Eradication of rabbits in the rabbit district.
3. Education of the community regarding the economic impacts caused by rabbits.

Compliance and extension

DDMRB undertakes compliance and extension work across the vastness of the rabbit district. Pest Survey work and addressing rabbit reports is an essential role of the compliance team. Each year there is extensive property visits to investigate rabbit sightings. There is not one absolute solution for the eradication of rabbits, a series of treatments are generally used depending upon the circumstances surrounding the area infected. The release of Rabbit Calicivirus Disease (RHD), burrow fumigation, destruction of burrows, trapping, baiting and shooting are all used to address each area identified. Effective rabbit control often relies on removing the harbour where rabbits are breeding and this is the responsibility of the landholder.

Disseminating information to landholders and the community is an important extension activity for compliance. Addressing the information gap in the community about rabbits and their devastating impact is a priority. DDMRB attend public meetings, shows, hold information sessions and are always available to attend special events to provide information to the public generally. Compliance staff presented at 10 public events in 2015.

The effectiveness of barrier fences at protecting stock and crops from wild dogs, rabbits and other introduced species

Barrier fences erected for pest control are the most effective management technique known, based on the premise of `prevention is better than cure'. The physical barrier as a preventative method surpasses all other forms and is still a nationally recognised technique for protecting high value assets. However, no such fence can be free of breaches over the span of more than a century, and no fence can prevent the deliberate or accidental introduction of rabbits by people. It is acknowledged that rabbits are now widespread across parts of the board area, but mostly associated with artificial harbour rather than established warrens. Rabbit abundance surveys conducted by Dr David Berman and Dr Peter Elsworth clearly show the rabbit population in areas controlled by the fence are lower than in uncontrolled areas (by a factor of 19:1 near Cottonvale).

Landholders are required to undertake control activities to remove rabbits from their property. Control methods primarily include harbour removal, trapping, burrow destruction, shooting and poisoning. Board compliance staff are not authorised to work on Federal or State lands and this can be limiting. It is incumbent upon all landholders, including all tiers of government, to remove rabbits from lands held by them.

The foresight of landholders and successive governments has played a vital role in helping mitigate the spread of rabbits and therefore the influence rabbits have had on the land, habitat, native animals and ultimately the economic value of important grazing and farming land.

Rabbit impacts are difficult to measure in real terms due to the changing nature of land uses. However, it is estimated that upward of $1 billion in damage and losses occurs annually as a consequence of rabbits nationally.

[2]The abundance of rabbits in the Board area is still low compared to nearby areas outside where rabbits have been allowed to establish and maintain large deep warrens. Outside the Board area, at Wallangarra, recent spotlight counts recorded 150 rabbits per kilometre (Elsworth pers.comm) of spotlight transect. At most inspection sites within the Board area the abundance score corresponds to fewer than 10 rabbits per kilometre of spotlight transect. Most rabbits within the Board area have breeding places far less suitable than the Wallangarra warrens and therefore their productivity is much suppressed. Where there are warrens in the Board area the rabbit abundance score was higher than where there are no warrens. Although some breeding places such as hay sheds can be very productive for rabbits it is crucial to prevent rabbits from establishing warrens. In most cases warrens are destroyed soon after they are discovered but occasionally when landholders are expected to do the work there are delays. During these delays rabbits produced in the warrens infest surrounding areas perhaps many kilometres from where they are born. Rabbits expelled from the warrens where they were born are likely to travel many kilometres searching for suitable breeding places.

Even without warrens rabbits appear to be breeding at a sustainable rate within the Board area. However, it is difficult to know whether rabbits are born at a site or whether they are immigrants. The presence of very young rabbits at a site certainly means breeding is occurring but the survival rate is unknown. Rabbits appear to be very productive in some non-warren breeding places. For example 50 to 150 rabbits can be found in a hay shed and 15 rabbits can live under a shipping container. These breeding places can potentially produce many rabbits that can spread out across the Board area. Future data collection should focus on scoring the breeding potential of breeding places at inspection sites. The sites with the highest breeding potential need to be treated first before moving to the next most productive site. Likewise regions need to be ranked according to the number of sites with productive breeding places not necessarily the number of sites with rabbits.

[2] QMDC Report by Dr David Berman to DDMRB Compliance Review

There were eight "hot spots" of varying size identified by Kernel analysis. The highest density of sites with rabbits and sites with the highest rabbit abundance score were at Highfields and Gatton. Highfields is certainly a productive place for rabbits and a potential source of rabbits for surrounding areas. The Kernal analysis of existing data is biased towards areas where there has been most compliance activity. This may have exaggerated the importance of the Gatton "hot spot" with regard to rabbit breeding potential. Compliance has been concentrated there because of the need to protect high value horticulture. Ideally data should allow identification of the most productive breeding areas for rabbits without bias. Classifying breeding places according to potential breeding productivity may reduce bias and provide a better way to identify and rank "hot spots".

The current compliance approach is almost certainly suppressing rabbit spread but there appears to be little progress in completely removing rabbits from the Board area. New site inspected, with rabbits make up 29% of all sites. Compliance staff will be over burdened by the total number of sites they are expected to inspect and provide rabbit control actions or advice. The rapidly increasing number of sites with rabbits is either because rabbits are rapidly spreading or because there are many sites with rabbits that are currently unknown. It is important to search properties surrounding each new site with rabbits to establish the full extent of the rabbit distribution. Surveys conducted randomly away from sites that are reported with rabbits will provide an estimate of the number of unknown sites with rabbits. The Fulcrum data collection form will include a field for input of an estimate of the date when rabbits first arrived at a site. This may help document the rate and pattern of spread of rabbits and help identify "source" areas.

Nevertheless many sites with rabbits are possible "sink" areas where birth rate is less than death rate. These areas are probably receiving rabbits from a few productive "source" areas, where birth rate is greater than death rate. These places need to be identified and treated to prevent the supply of rabbits to new sites. Just what level of rabbit productivity is required to produce excess rabbits at a site is as yet unknown. However, by taking the most productive sites out of the system and then moving to the next most productive sites the supply of rabbits to "sink" sites should eventually "dry up".

Rabbits in the Lockyer Valley are an important threat to the economy even at the low densities that already exist. These rabbits need to be eradicated or there will be an enormous ongoing cost of control to protect the high value horticultural crops. The source of these rabbits needs to be identified and treated as well to prevent re-invasion. Rabbits were assumed to be invading the Lockyer Valley from the north. However, results of Kernel analysis conducted here suggests that it is possible that rabbits from the Highfields area are the source of rabbits that invaded the Lockyer Valley. The headwaters of the Lockyer Creek are very close to Highfields and the creek maybe an invasion route. Also the habitat suitability modelling shows areas to the north of the Lockyer Valley are not very suitable for rabbits and may be a barrier to their movement. Genetic tests could check the source of rabbits that have invaded the Lockyer Valley.

Rabbits certainly appear to be colonising the areas of highest suitability but there are still many areas of high suitability with no rabbits. Rabbits may not have spread from Dalby because it is surrounded by less suitable habitat. However, there is suitable habitat to the south west of Dalby where the Dalby rabbits may be able to spread to.

Recent work by the DDMRB and CSIRO using the habitat suitability model provides a tool to estimate the economic damage that could be caused in various regions of the Board area.

In a recent review of fence management improvements, the DDMRB has measured the effectiveness of electric fences. The review concludes that where fences are electrified, the incidence of penetration are considered almost non-existent by rabbits. All future DDMRB fence replacement will include an assessment for the appropriateness for electrification of the fence. Where electric fences can be adequately managed, there is a significant reduction in management costs as the fence monitoring by patrols can be reduced. It is noteworthy that most damage caused to the fence is caused by feral animals (i.e. pigs, wild dogs, foxes). Some impacts are by echidnas, cattle and other farmed animals. Our review revealed electric fences reduce the incidence of damage by animals generally but importantly act as a deterrent to all animals.

The DDMRB rabbit fence provides significantly improved protection for vulnerable crops and stock. The very high standard of the rabbit fence reduces the incidence of rabbit penetration and the likelihood rabbits can establish themselves in prime agricultural land.

Improvements in protection have occurred in recent years where large sections of the rabbit fence have been replaced or substantially repaired, most particularly for stock where there has been wild dog impacts because the rabbit fence is "top netted" for wild dogs. Currently 186.6 km of the rabbit fence is top netted for wild dogs. Wool growing is more prolific inside the rabbit district due to lower numbers of rabbits and therefore lower numbers of wild dogs. Where there is a high abundance of rabbits there is often a higher abundance of wild dogs due to the natural food chain.

Unlike areas to the south and west of the rabbit district, the board has been recognised for avoiding rabbit plagues[3] and minimising rabbit impacts[4] within its boundaries. The general success of `the fence' has protected most landholders from rabbit impacts for over 100 years, but leaving them complacent and inexperienced to deal with rabbits. The rabbit district is not rabbit-free. Historical records show rabbits inside the fence in 1905 (near `The Head' of the Condamine River) before the eastern section of fence was completed, and reports of irresponsible people deliberately encouraging rabbits into the area[5] . Rabbits are now widespread in low numbers with some localised eruptions. Most infestations are associated with rabbits living in or under man-made harbour rather than in warrens, typical of the pest in the initial phase of colonisation. After other rabbit boards to the west were disbanded over 50 years ago, rabbits have also had the opportunity to enter the rabbit district from the north where there is no barrier fence. The extent of the problem is now a genuine concern.

Noteworthy are some of the other benefits barrier fences provide; wild dog trapping corridors, research, fire management and physical controls for the outbreak of disease.

[3] Brennan & Berman 2008
[4] Robertshaw 1994
[5] Pennycuick 1984

The unintended impacts of barrier fences on native species

Barrier fences restrict the movement of some wildlife species. However, not all wildlife is affected and any concerns were probably historical. When the fence was built it may have dissected the home range of highly mobile species such as the larger kangaroos and the emu, and these animals could have lost access to known watering and feeding sites at that time. With over a century to adjust, such species would have quickly adapted to the resources available to them in their post-fence range. Most small mammals, small reptiles and of course birds of flight are unimpeded by the fence. Wallabies are less inclined to move long distances like grey kangaroos might. DDMRB has not been alerted to any threatened species known to occur along the fence. Most species that may be blocked by the fence are common, such as echidnas and goannas. And of course a fence only restricts movement in one direction.

The rabbit fence and the associated low level of rabbit abundance inside the board area benefits wildlife through not attracting and establishing large populations of predators which in turn prey on wildlife. Unpublished research by Biosecurity Queensland near Cottonvale confirmed this.

Roadkill would seem a far greater concern to native fauna than long-standing structures such as the rabbit fence. The RSPCA estimated that over 2 million wild animals are killed on Queensland roads each year.

Whether barrier fences should be expanded to other areas of the State to protect stock

There is little doubt that fences would improve the protected areas from class 1 and 2 pests if they were erected to the north of the existing rabbit district. This would increase the opportunity for diversification of the areas that can be used for farming. Currently, there are very large areas where landholders are reluctant to farm due to the impacts of rabbits and other pest animals.

Research by Dr Peter Elsworth shows that DNA from rabbits to the South of the rabbit fence is different to that from rabbits to the West and North. DNA of rabbits from the South can also be found in the rabbit district and date back to before the rabbit fence was built.

DDMRB have undertaken some preliminary work in Councils areas to the North of the rabbit district and unfortunately concluded there is extensive rabbit populations established. DDMRB note that some Councils are generally inadequately resourced both in skills and expertise along with limited funding to control the increasing rabbit populations.

For the rabbit district to remain an area of low rabbit abundance increased compliance controls and/or a barrier fence to the north would be ideal.

DDMRB has recently introduced GIS mapping for maintenance of the rabbit fence and important mapping activities enable DDMRB to actively target rabbit populations. DDMRB are the first pest control Board in Australia to utilise this type of technology and mapping techniques for fencing and rabbits.

"Hot Spot" maps show abundance and fence control issues allowing improved management plans and strategies to be developed to target these areas. Each year DDMRB reviews its rabbit fence and compliance plans, part of the planning processes and data collection relate to "rabbit pressure" on the fence which can be then correlated with control and investigative issues for certain areas.

DDMRB has a continuous improvement philosophy aimed at developing improvements in efficiencies with fence replacement and pest surveys. To improve efficiencies and effectiveness DDMRB have identified the opportunity to provide fence services and maintenance to Local Government. This is aimed at reducing duplication while improving the condition of fences controlled by Local Government so that a higher standard condition and therefore level of pest control is an outcome. This maybe in the form of developing a "Shared Service" model with Local Councils.

On a national scale Queensland and most particularly the rabbit district has a much lower abundance of rabbits than other states. This is the result of the dedication of the Queensland Government to maintaining a rabbit fence to protect crops and stock while enabling the expansion of valuable land for other farming pursuits.

<u>In conclusion</u>

- Barrier Fences are the most effective means of protecting land, natural environment and native animals from invasion from rabbits and other feral / pest animals.
- The rabbit district and Queensland generally is substantially better off than other States as a consequence of barrier fences.
- DDMRB is a specialised rabbit control pest operational Board with a prime objective of maintaining the rabbit fence, it is an efficient low cost pest control Board supported widely by landholders, Local Government and stakeholder generally.