



mainroads
WESTERN AUSTRALIA

*We're working for
Western Australia.*

Annual Report 2023

Pastoral Animal Hazard Advisory Group

2022/2023

Printed copies are uncontrolled unless marked
otherwise. Refer to iRoads for current version.

D23#1060702
December 2023

Contents

1	EXECUTIVE SUMMARY	4
2	KEY FINDINGS AND STATISTICS	5
3	ADVISORY GROUP	5
3.1	History and Context	5
3.2	Terms of Reference	6
3.3	Membership	6
3.4	Areas of Focus.....	6
4	PROGRESS AND ACHIEVEMENTS.....	7
4.1	Data Analysis.....	7
4.1.1	Data Set Characteristics	7
4.1.2	State-wide Context	8
4.1.3	Crashes involving Cattle and Sheep per km of State Road Network	8
4.1.4	Number of Animal Related Crashes	9
4.1.5	Pastoral Animal Related Crash Severity	10
4.1.6	Monthly Crash Data for Each Region.....	11
4.2	Hotspot Identification	11
4.3	Budget Expenditure	11
4.4	Fencing Agreements.....	13
4.5	Communication with Pastoralists	14
4.5.1	Letter notifying of Hotspot	14
4.6	Advertising and Communication.....	14
4.6.1	Radio and Animations.....	14
4.6.2	Social Media	14
4.6.3	Billboards and Retail Panels	14
4.6.4	Posters and Flyers	15
4.6.5	Banners.....	15
4.6.6	Air Fresheners.....	15
5	CONCLUSIONS	16
5.1	Reduction of Animal Related Crashes.....	16
6	RECOMMENDATIONS	16
6.1	Completed recommendations	16
6.2	New and ongoing recommendations.....	16
7	REFERENCES AND RELATED DOCUMENTS	18
8	APPENDICES	18
	Appendix 1: Regional Responsibility Areas	19
	Appendix 2: Sample Hotspot Identification Figures	20
	Appendix 3: Regional Hotspot Maps, with July 2020 to June 2023 cattle strike data.....	21

Figures

Figure 1 - Comparison of animal related crashes per km of state road network in each region for cattle and sheep..... 8

Figure 2 - Crashes on state and local roads by pastoral animal type. 9

Figure 3 - Crashes on State and Local roads by pastoral region and all animal types (2018 to 2022). 9

Figure 4 - Severity of crashes involving cattle and sheep on state roads..... 10

Figure 5 - Monthly cattle and sheep related crash data for each region from 2018 to 2022. 11

Figure 6 - Spend Profile (\$M) of Animal Hazard Mitigation Program..... 12

Figure 7 - Regional breakdown of Animal Hazard Mitigation Program expenditure (\$M) for financial year 2022/23 and cumulative expenditure..... 12

Figure 8 - Cumulative spend (\$M) to 2022/23 and comparison between baseline and current cattle and sheep crashes..... 13

Figure 9 - Billboard imagery planned as part of the Straying Cattle advertising campaign. 15

Figure 10 - Air freshener..... 15

Figure 11 - 'Shut The Gate' Sign 17

Document Control

Owner	General Manager Regional Operations
Custodian	Director Network Management
Document Number	D23#1060702
Issue Date	22 December 2023
Review Frequency	Not applicable – annual report

Amendments

Revision Number	Revision Date	Description of Key Changes	Section / Page No.
1	22/12/2023	Final 2023 Report issued for publishing	New document

1 EXECUTIVE SUMMARY

The Pastoral Animal Hazard Advisory Group (PAHAG) was convened in October 2018 for the purpose of reviewing the current road reserve fencing responsibilities, legislative requirements, policies and management practices aimed at improving road safety in pastoral regions as well as evaluating the performance of the Animal Hazard Mitigation Program (AHMP).

In the Main Roads WA (Main Roads) the state road network in Kimberley; Pilbara; Mid-West Gascoyne and Goldfields-Esperance regions predominantly passes through, or adjacent to, pastoral leases where a large number of domestic stock such as cattle and sheep are present as well as feral animals such as camels, horses, goats, donkeys and pigs. A large amount of fencing bordering these leases is either inadequate or non-existent, allowing stock to stray onto the road reserve.

All animals that stray onto roads present a danger to road users as they can be difficult to see, particularly at night, and their movements can be unpredictable.

The Animal Hazard Mitigation Program commenced in 2013 and aims to reduce pastoral animal strike incidents across the pastoral regions through the implementation of the following initiatives:

- Funding subsidy for fencing where it is deemed a "hot spot";
- Installation of grids on side roads at road reserve fence-lines;
- Moving watering points further back from the road-side;
- Installation of one-way cattle gates;
- Improving Livestock Warning Signage and fencing standards along road reserves; and
- Radio safety campaigns throughout Regional WA.

Main Roads' current policy regarding the fencing of the road reserve in pastoral areas of Western Australia is contained in Operational Procedure No. 81 - Fencing Road Reserves on Highways and Main Roads in Pastoral Areas. This document was updated in 2020 at the request of the Fencing Road Reserves in Pastoral Regions Working Group.

Operation Procedure No. 101 was subsequently created with the purpose of assisting Regions in seeking funding from the Animal Hazard Mitigation Program, in order to address high-risk collision hotspots between vehicles and animals through the execution of fencing agreements or other mitigation strategies.

The Animal Hazard Mitigation Program was allocated \$12 million in funding primarily to subsidise new fencing in hotspot areas as well as other animal mitigation initiatives. Expenditure against the program sits at \$8.86 million at the end of the 2022/23 financial year, leaving \$3.14 million of funding available for future initiatives.

This report closes out the following recommendations

- Continue to administer the AHMP with guidance from the Pastoral Animal Hazard Advisory Group (PAHAG) and provide an annual report to the Minister for Transport (annual).
- Pastoral Animal Hazard Advisory Group meeting commitment (annual).
- Undertake review of former gravel pits that may be acting as livestock attractors.
- To develop a sign directing gate users to shut the gate.

This report includes the following recommendations

- To investigate other potential solutions, particularly with new and emerging technology.
- To draft a business case seeking funding to enable the continuation of the Animal Hazard Mitigation Program.

2 KEY FINDINGS AND STATISTICS

- The Main Roads regions encompassing pastoral areas of Western Australia are the Kimberley region; Pilbara region; Mid West-Gascoyne region and Goldfields-Esperance region.
- The state's pastoral region exceeds 860,000 square kilometres.
- According to reported crash records, crashes involving cattle and sheep in pastoral regions between 2018 and 2022 made up 5.57% of all crashes across the state road network in pastoral regions in that same time period.
- Comparison of crash figures on the state road network in pastoral regions from 2018 to 2022 against crash figures from 2006 to 2010 shows an approximate 48% reduction in pastoral animal related crashes, per kilometre of road, in pastoral regions. The changes in pastoral animal related crashes for each region for this period were:
 - Pilbara region 48% reduction.
 - Kimberley region 51% reduction.
 - Goldfields-Esperance region 343% increase (from 6 to 30 pastoral animal related crashes).
 - Mid-West Gascoyne region 77% reduction.
- The Pilbara has a consistent seasonal increase in the number of animal related crashes on state roads between April and July, whereas the Kimberley has an increase in April.

3 ADVISORY GROUP

3.1 History and Context

A large proportion of the state road network in northern Western Australia passes through or adjoins pastoral stations. Some of these pastoral stations are not adequately fenced to prevent cattle and other livestock from straying on to the road network resulting in a risk of collisions between animals and vehicles.

In 2011, the Fencing Road Reserve in Pastoral Regions Working Group was formed to address animal hazard issues on the state road network. The working group investigated initiatives to reduce the incidence of animal related crashes including improved signage, improved fencing standards, and radio safety campaigns. The working group provided the Fencing Road Reserves in Pastoral Regions Working Group Report to the Minister for Transport on 7 February 2012. The report recommended, *"An Advisory Group is established by Main Roads to facilitate effective management of the issues caused by straying stock on roads in pastoral regions."*

The Advisory Group for the Management of Straying Stock in Pastoral Regions was formed in 2012. The group provided recommendations to the Minister for Transport to manage straying stock on state roads in pastoral regions, which included the creation of the Animal Hazard Mitigation Program (AHMP) that had \$12 million of state funding allocated in 2013.

The AHMP specifically targets areas of the road network with a high risk of pastoral animal strikes as part of the State Government's commitment to road safety in pastoral regions. The AHMP also assists pastoralists to construct new fencing and undertake other mitigation works on the road reserve and pastoral lease boundary.

The issue of animal related crashes on the state road network, particularly in the Pilbara and Kimberley regions, became the subject of Parliamentary questions. As a result, the Pastoral Animal Hazard Advisory Group (PAH Advisory Group) was formed in October 2018 to investigate future initiatives to reduce the incidence of animal related crashes as well as review progress of the AHMP. Two sets of statistics are used in this report to quantify pastoral animal hazards:

- Audited annual Crash Data, all reported road crashes through Western Australia reported over a five-year time frame (2018-22) including crash location and type, from which pastoral animal-related crashes can be extracted; and

- Animal Strikes, drawn from Main Roads' Maintenance Management Information System recording instances of animal carcasses on the state road network, from which pastoral animal strikes can be extracted. This draws on a three-year period of data from July 2020 to June 2023 inclusive.
- Financial data for money invested in the Animal Hazard Mitigation Program between 2013/14 and 2022/23.

3.2 Terms of Reference

The purpose of the PAH Advisory Group is to review current road reserve fencing responsibilities, legislative requirements, policies and management practices aimed at improving road safety in pastoral regions. The PAH Advisory Group also considered strategies and actions to improve effectiveness and outcomes and make appropriate recommendations to State Government.

The PAH Advisory Group objectives are to:

- understand the safety performance and outcomes achieved from fencing;
- discuss and agree on the requirements for pastoral animal hazard mitigation measures in pastoral areas;
- explore supplementary and alternative approaches to pastoral animal hazard mitigation;
- examine and explore options for the provision and maintenance of pastoral animal hazard mitigation measures in pastoral regions;
- report on achievements as required; and
- provide a forum for discussion between key stakeholders.

3.3 Membership

Members consist of representatives from:

- Main Roads (Chair)
- Department of Primary Industries and Regional Development (DPIRD)
- Department of Biodiversity, Conservation and Attractions (DBCA)
- Royal Automobile Club of WA (RAC)
- Road Safety Commission (RSC)
- Pastoral Lands Board (PLB)
- Department of Planning, Lands and Heritage (DPLH)
- Pastoralists and Graziers Association (PGA)
- Western Australian Local Government Association (WALGA)
- WA Police Force (WAPOL)

3.4 Areas of Focus

The PAH Advisory Group focussed on reviewing current road reserve fencing responsibilities, legislative requirements, policies and management practices with the aim of improving road safety in pastoral regions through the development of strategies and actions for improved effectiveness and outcomes. The PAH Advisory Group's goal of improving road safety is primarily aimed at reducing the incidence of pastoral animal related crashes on the state's road network in the four pastoral regions.

The group aims to achieve this by establishing a collaborative approach between Main Roads, land managers/stock owners, road users and other stakeholders using an evidence and risk based approach to address known and potential pastoral animal strike hot spots as a shared responsibility.

Outcomes since the group formed include:

- Review of progress made with regard to number and severity of crashes involving pastoral animals;
- Information gathering with regard to reflective tag feasibility;
- Development of a communication strategy;
- Communication with pastoralists at hotspot locations;
- Review and update the pastoral fencing agreement;
- Research the viability of making animal related crash data publicly available;
- Investigate potential to muster stray cattle; and
- Investigate the potential of using an Indigenous Road Fencing Repair Crew.

4 PROGRESS AND ACHIEVEMENTS

4.1 Data Analysis

4.1.1 Data Set Characteristics

The latest pastoral animal related crash data (2018 to 2022) is compared with the data from the previous *Fencing Road Reserves in Pastoral Regions Working Group Report*, from 2012 (which used 2006 to 2010 data) to provide insight into the effectiveness of some actions and initiatives put into place since 2010.

Since the primary aim of this comparison was to evaluate the effect additional fencing had on the number of animal related crashes, data analysis excludes kangaroos and other native animals. While kangaroos are involved in many animal related crashes on the road network, fencing is an inadequate method to prevent kangaroos from straying onto state roads.

The pastoral regions of WA align with the Main Roads Kimberley, Pilbara, Mid West-Gascoyne, and Goldfields-Esperance regions. Please refer to block shaded areas in Appendix 1.

The Pilbara region experiences a relatively high proportion of heavy vehicle traffic due to mining operations. These heavy vehicles generally do not suffer major damage from pastoral animal related crashes, therefore many go unreported. This results in strike data based on found carcasses to be substantially higher than police crash data in these regions. This trend is now appearing in the Goldfields-Esperance concurrent with an increase in both overall traffic volume and proportion of heavy vehicle traffic. The Goldfields-Esperance region has seen an increase in mining operations which can lead to the containment of cattle being affected by damaged fences and / or gates that are not closed.

The crash severity rating for road crashes is based upon the most serious injury sustained by a person, or in the case of no injury, the severity of property damage, and is defined as follows:

- Fatal – Fatality, where death occurs within 30 days of crash event
- Hospital – Admission to hospital staying at least one night
- Medical – Medical attention required not involving hospitalisation
- Major PDO – Major Property Damage Only, greater than \$3,000 damage, with no medical attention required
- Minor PDO – Minor Property Damage Only with no medical attention required

4.1.2 State-wide Context

From 2018 to 2022, inclusive, there were 151 crashes involving cattle and sheep on state roads in the four pastoral regions; this represents 5.57% of the 2,710 crashes across the state road network in pastoral regions during the same period.

Table 1 - Proportion of pastoral animal crashes compared to all crashes on state road network in pastoral regions

	Fatal	Hospital	Medical	PDO Major	PDO Minor	Total
All Crashes on state roads in pastoral regions	135	352	224	1562	437	2710
Crashes involving cattle and sheep on state roads in pastoral regions	2	4	3	135	7	151
Percentage	1.48%	1.14%	1.34%	8.64%	1.60%	5.57%

4.1.3 Crashes involving Cattle and Sheep per km of State Road Network

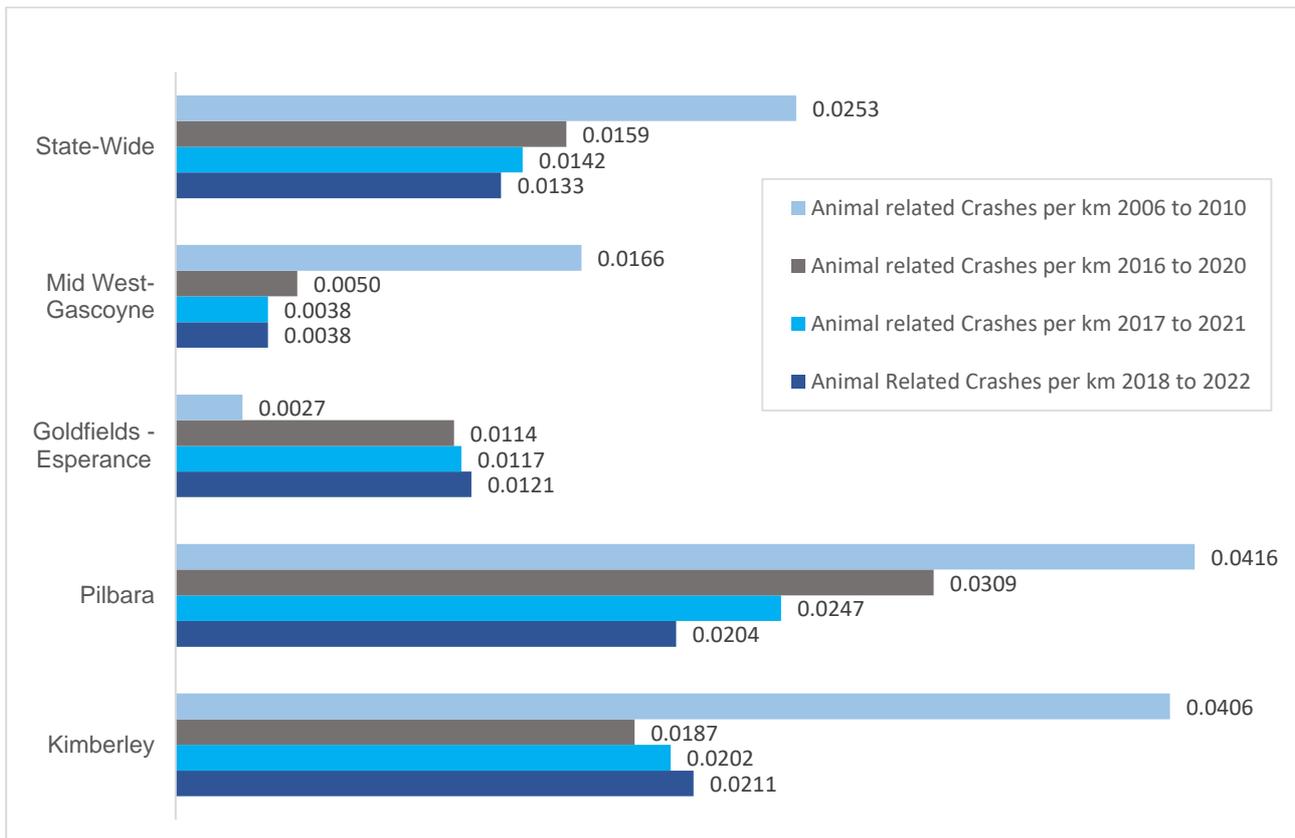


Figure 1 - Comparison of animal related crashes per km of state road network in each region for cattle and sheep

As shown in Figure 1, there is a continued decrease in animal related crashes in all but the Goldfields-Esperance region, which is holding consistently above the baseline 0.0027 at 0.0121 crashes per km of road. This equates to 24 additional crashes when comparing 2018 to 2022 against 2006 to 2010 periods.

The average cattle and sheep related crashes per km of state road for all the pastoral regions reduced from 0.0253 to 0.0133, or a drop of approximately 48%.

4.1.4 Number of Animal Related Crashes

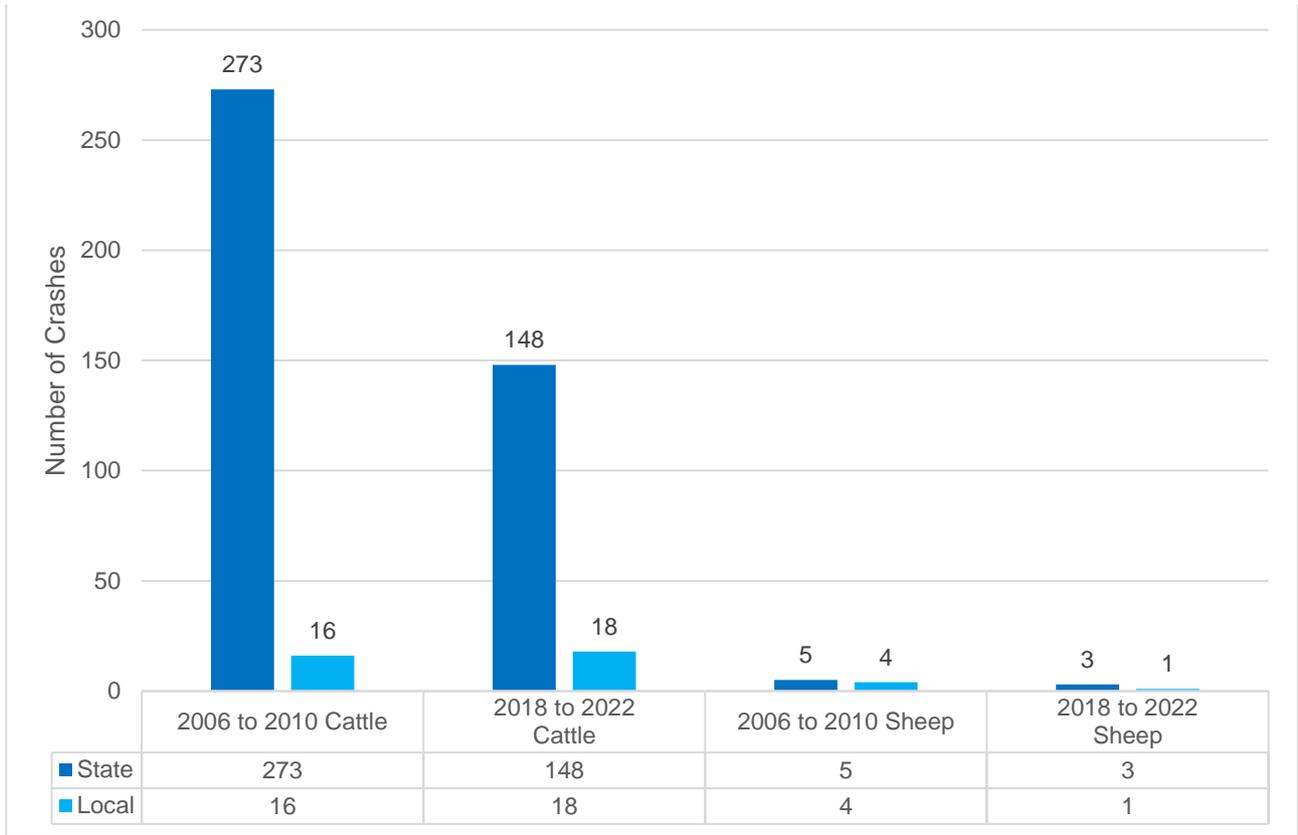


Figure 2 - Crashes on state and local roads by pastoral animal type.

Figure 2 shows that when comparing the 2006 to 2010 period against the 2018 to 2022 period, the number of cattle related crashes has reduced by 45.79% on state roads, however local roads remain fairly consistent. Crashes involving sheep remain relatively low and have consistently decreased on state and local roads.

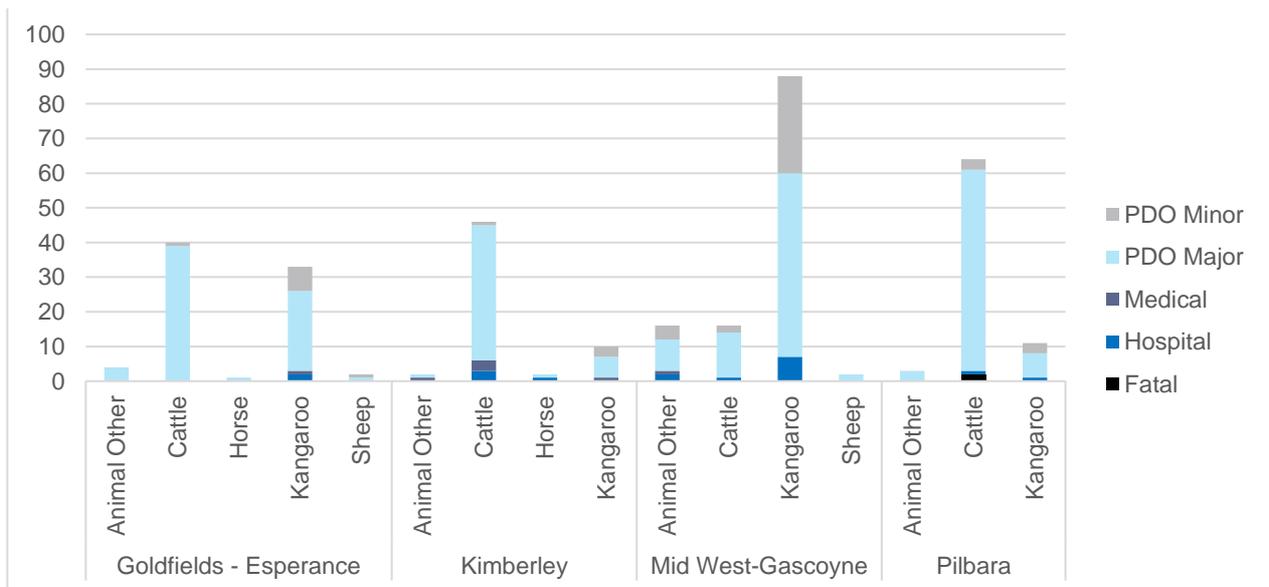


Figure 3 - Crashes on State and Local roads by pastoral region and all animal types (2018 to 2022).

Figure 3 shows that cattle represent 48.82% of all recorded Hit Animal crashes in pastoral regions of Western Australia and kangaroos represent 41.76%. Cattle related crashes are most prevalent in the

Pilbara, Kimberly and Goldfields-Esperance regions, and kangaroo related crashes are most prevalent in the Mid-West Gascoyne region, with a significant number of kangaroo related crashes also occurring in the Goldfields-Esperance region.

4.1.5 Pastoral Animal Related Crash Severity

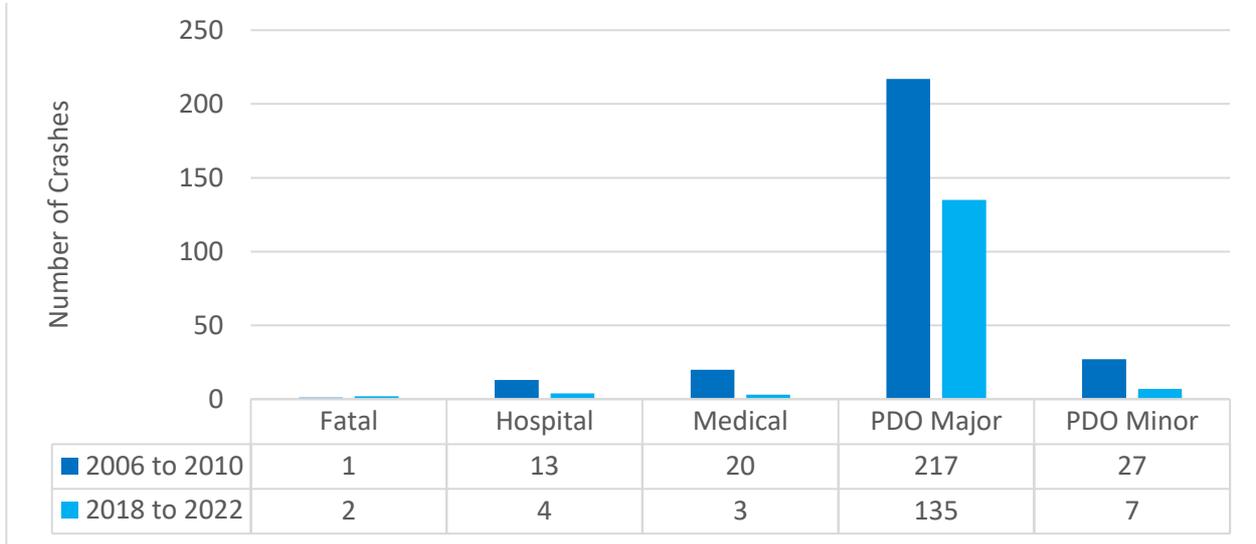


Figure 4 - Severity of crashes involving cattle and sheep on state road

The total number of cattle and sheep related crashes on state roads has increased for fatal crashes (from 1 to 2) and reduced significantly for all remaining crash severity types when compared to the figures from 2006 to 2010.

The data shows the state road network has seen a 73% casualty crash (fatal, hospital and medical) reduction for pastoral animal related crashes demonstrating a substantial improvement in road user safety, some of which would be attributable to animal hazard mitigation.

4.1.6 Monthly Crash Data for Each Region

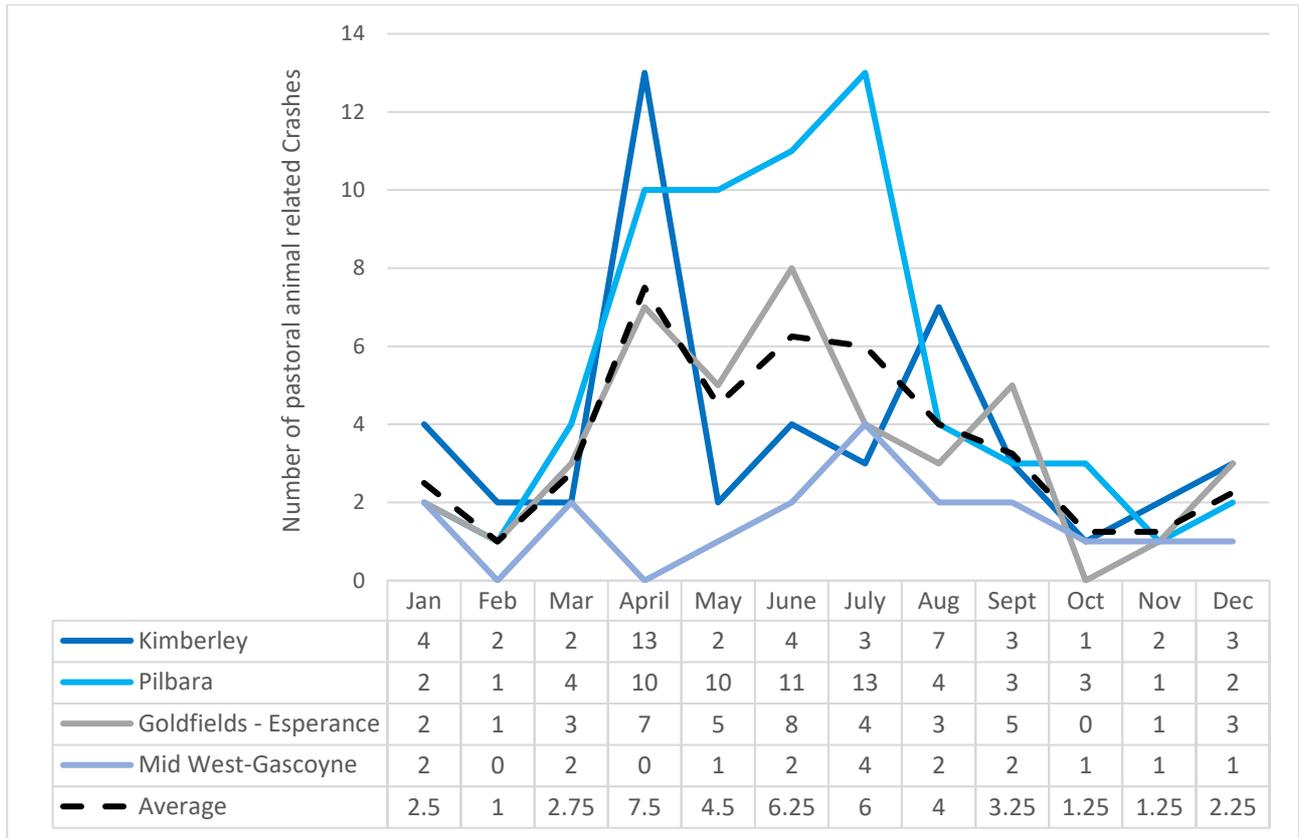


Figure 5 - Monthly cattle and sheep related crash data for each region from 2018 to 2022.

As shown in Figure 5, the Pilbara has a consistent seasonal increase in the number of cattle and sheep related crashes on state roads between April and July, whereas the Kimberley has an increase in April.

These peaks can determine when to deploy effective advertising campaigns to target road users to educate and raise awareness of roaming cattle during periods of increased risk such as the lead into Easter and school holidays.

4.2 Hotspot Identification

The state’s pastoral region exceeds 860,000 square kilometres. Identified areas of high incidence pastoral animal strikes are recorded using Main Roads’ Maintenance Management Information System.

A hotspot is a given stretch of road where pastoral animal strikes exceed 0.25 animal strikes/km/3 years. These hotspots allow Main Roads to effectively target the AHMP funding and support the decision-making process.

Example hotspot analysis is included in Appendix 2 with current hotspot maps in Appendix 3.

4.3 Budget Expenditure

The original budget for the AHMP was \$12 million and, as of the end of the 2022/2023 financial year, current expenditure is \$8.862 million as shown in Figure 6 below.

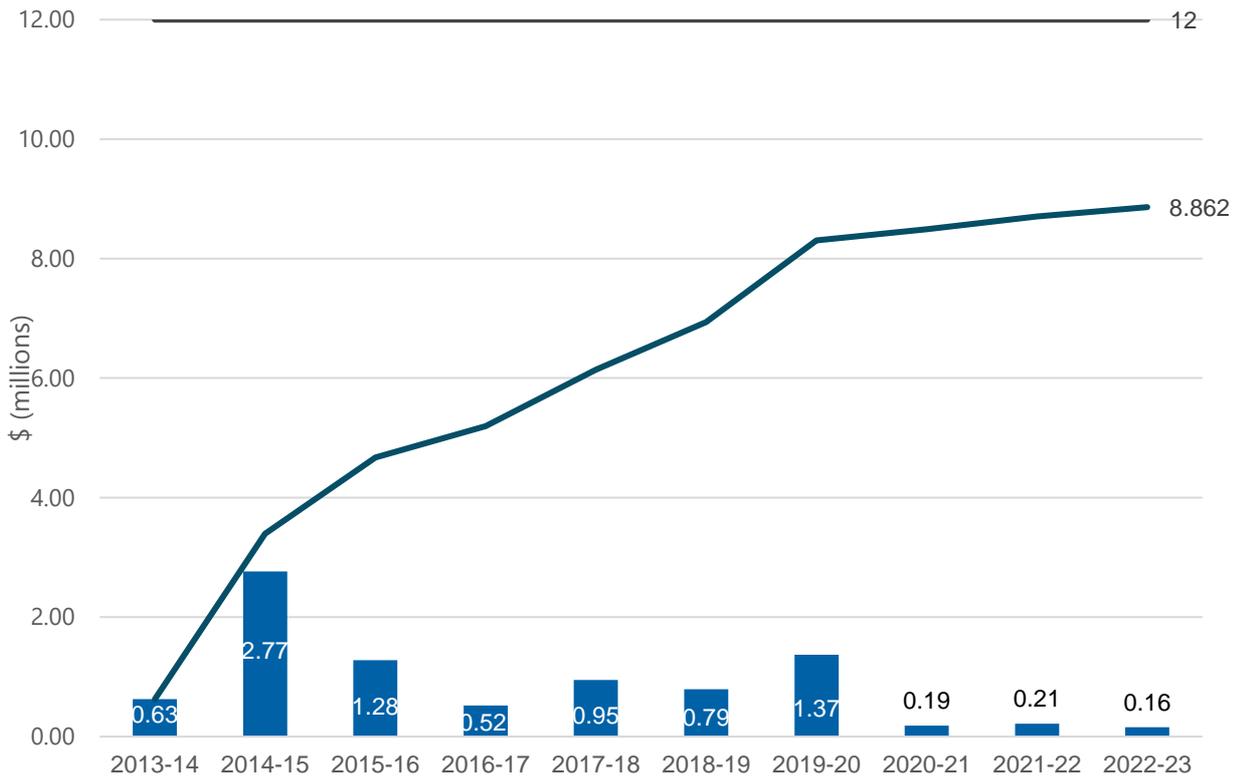


Figure 6 - Spend Profile (\$M) of Animal Hazard Mitigation Program.

Of the \$156,963 spent in 2022/23, \$64,122 was spent on state-wide initiatives, primarily a road safety campaign to raise awareness of straying livestock on roads. The majority of the remainder was spent in the Pilbara region to facilitate fencing.

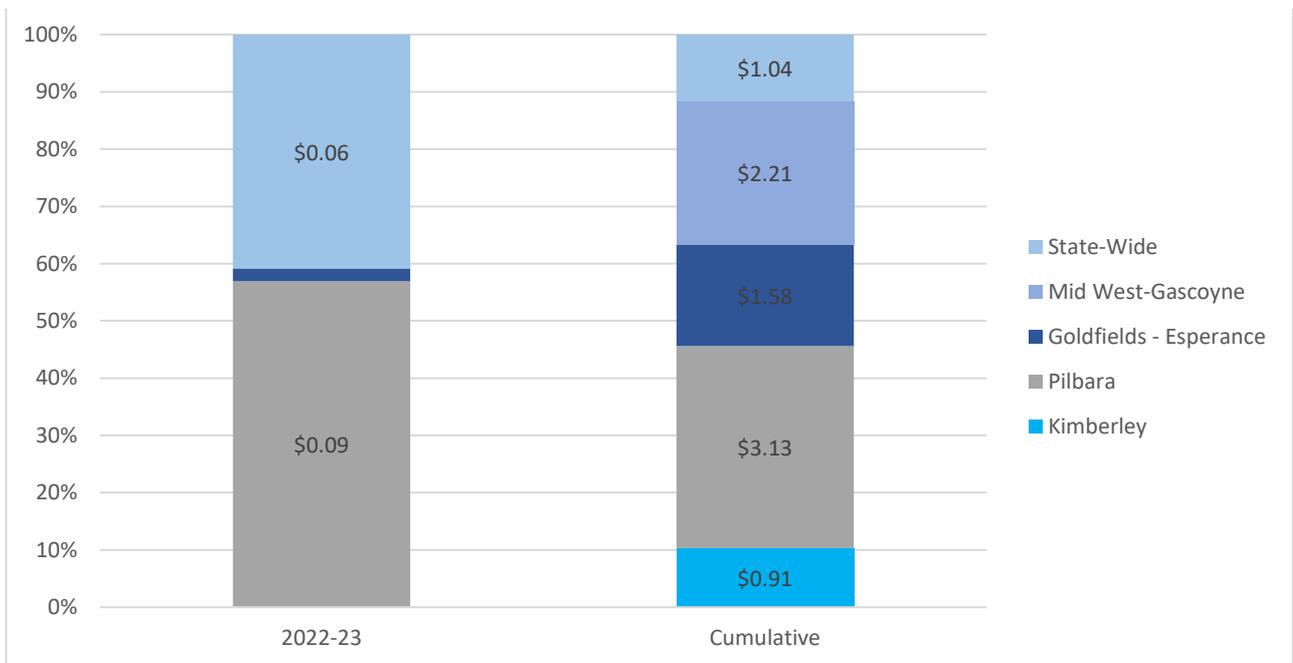


Figure 7 - Regional breakdown of Animal Hazard Mitigation Program expenditure (\$M) for financial year 2022/23 and cumulative expenditure

The breakdown of total expenditure for each region is shown in Figure 7 above, both for 2022/23 and cumulative 2013/14 to 2022/23.

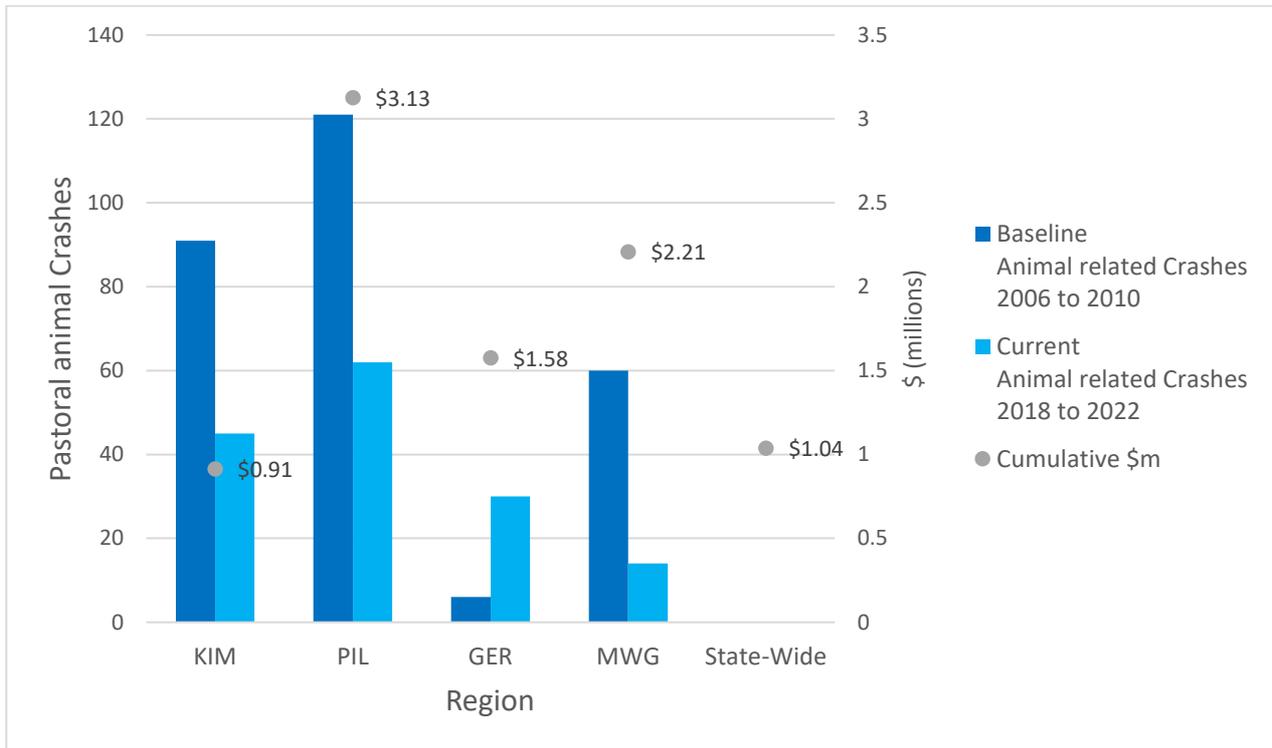


Figure 8 - Cumulative spend (\$M) to 2022/23 and comparison between baseline and current cattle and sheep crashes

Figure 8 indicates the best return on investment to date has occurred in the Kimberley region followed by Mid-West Gascoyne and Pilbara regions. Pastoral animal related crash rates are still below baseline in the Pilbara, Kimberley and Mid West-Gascoyne. The state-wide spending shown above refers primarily to road safety campaigns, which are not statistically measurable in terms of crash reductions.

4.4 Fencing Agreements

The Road Reserve Fencing Agreement is an agreement between the pastoral lessee and Main Roads to construct and maintain a boundary fence between the road reserve and the pastoral lease. Difficulty in securing fencing agreements with pastoralists is an important issue and improved fencing in high-risk areas is a key strategy of the PAHAG to improve driver safety.

Whilst the responsibility for stock control lies wholly with the pastoralist, the AHMP assists pastoralists in recognising the importance of road safety and animal welfare by subsidising fencing and other mitigation works.

The AHMP subsidises the installation of new pastoral fencing on a cost-sharing basis, subject to a signed fencing agreement, in which the state contributes 50% of the cost of the fence including materials and labour. The agreement requires pastoralists to maintain fencing into the future at their own cost.

To qualify for funding, the proposed fencing extent must coincide with an area identified as a hotspot and is further evaluated on a case by case basis based on other factors such as watering locations, type of stock to be fenced and, the state of roadside vegetation. Main Roads will not enter into a new agreement for an extent of road where a previous fencing agreement exists.

Both strike and crash data are used to evaluate pastoral animal related incidents and fence effectiveness.

Some of the remaining pastoralists at hotspot locations are reluctant to enter into agreement due to the ongoing maintenance and also in areas prone to cyclones, flooding and fire which could destroy fencing which would have to be replaced.

4.5 Communication with Pastoralists

4.5.1 Letter notifying of Hotspot

Main Roads wrote to pastoralists in hotspot areas in October 2021 to remind them of their responsibilities under the *Road Traffic Code 2000*. The letter also informed pastoralists of the AHMP and the opportunity to fund construction of new boundary fencing between the road and pastoral lease should they be willing to enter into a fencing agreement.

Main Roads also wrote to pastoralists in hotspot areas who have existing fencing agreements reminding them of their responsibilities under the agreement. The letter asked pastoralists to assess their fencing and undertake any repairs or replacements required. There was an immediate response from some pastoralists enquiring about entering fencing agreements with Main Roads.

4.6 Advertising and Communication

Road user education has been a key consideration for the PAHAG since its inception. Raising awareness of the risks associated with animals on the road network is a critical step in helping to reduce the rate of animal related crashes in pastoral regions.

Targeted advertising campaigns have been directed towards informing road users, including local residents, tourists, and mine site workers, of these risks, with the intent to change road user behaviour. Between 2022 and 2023, the following channels were used:

4.6.1 Radio and Animations

A 30-second radio advert was broadcast on 14 stations across the Southern Cross Austereo network in June and July 2022. The advert was broadcast over 460 times across Breakfast, Morning, Afternoon and Drive programs, Monday to Sunday.

A new animation was also developed for use during this period. The animation is of a group of friends who ask question whether or not one of them should drive home, tired and in the dark. The man decides to leave the group and while driving home, a dark cow appears in the distance causing him to slam on the brakes and swerve. It ends with the tag *"...You might know the road like the back of your hand, but you don't know when an animal might appear in front of your car. Be aware, when you dim your lights...slow down"*.

4.6.2 Social Media

A social media campaign continues to be run on Facebook during peak periods using slogans such as 'hitting here' (striking cattle) 'hits here hardest' (impacts your life, family etc.). The imagery component of this campaign was specifically designed to be geo-targeted in the regions.

4.6.3 Billboards and Retail Panels

Billboards remain a large part of the campaign featuring the slogans 'Give Animals a 'Brake' and 'Slow Down at Dusk and Dawn'.

Billboard panels ran across the Mid-West Gascoyne and Goldfields Esperance Regions throughout June and July 2022. Billboards were reinstated on North West Coastal Highway (in the Mid West Gascoyne Region) in April 2023 as travellers made their way to the Total Solar Eclipse.

Digital retail panels (in shopping centres, service stations, regional airports and hotels/bars) were used across the Mid-West Gascoyne, Goldfields Esperance, Pilbara and Kimberley Regions throughout 2023.

Throughout April 2023, the use of MotioGo retail screens was employed at four Service Stations in Karratha, Carnarvon, Geraldton and Port Hedland. Each screen played a 7.5 second animation 80 times per hour, with a total of 16 hours booked per screen, per week.

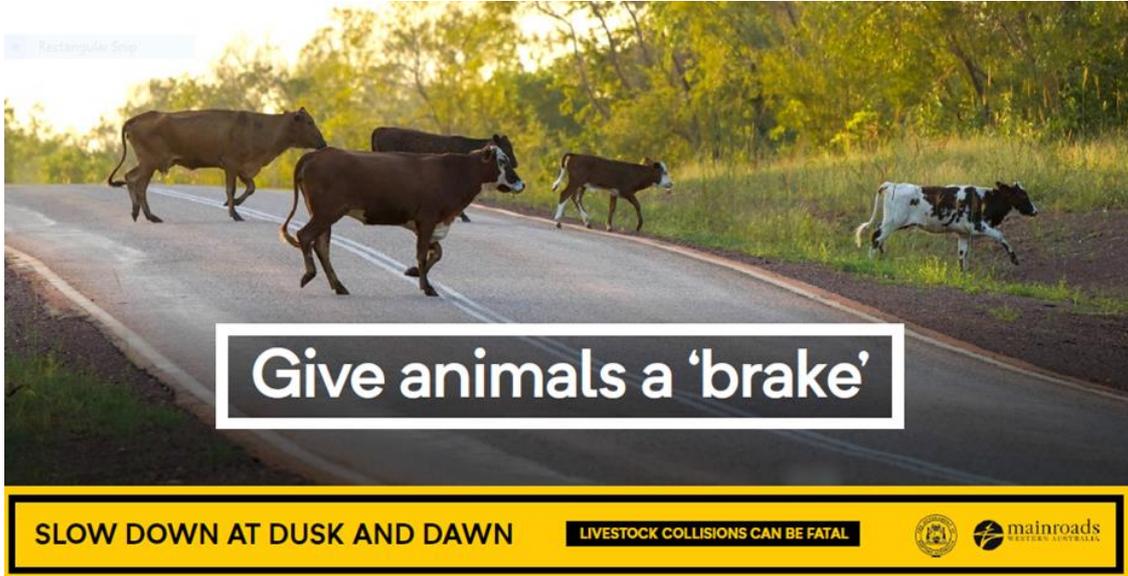


Figure 9 - Billboard imagery planned as part of the Straying Cattle advertising campaign.

4.6.4 Posters and Flyers

Posters and flyers featuring similar imagery to those intended for billboards continue to be distributed as part of the campaign. A2, A3, and A4 posters are available for use in tourist centres, service stations, caravan parks, post offices, local bakeries and Local Government offices for display.

4.6.5 Banners

Banners featuring a life size cut out of a cow are available in all regional offices for use in reception areas and at Agricultural shows. Each banner is 1.8 metres tall and 1 metre wide and designed to attract the attention of people and create conversation around the issue.

4.6.6 Air Fresheners

Cow shaped car air fresheners have been created to promote the campaign line 'Give Animals a Brake', and encourage road users to report hazards.



Figure 10 - Air freshener.

5 CONCLUSIONS

5.1 Reduction of Animal Related Crashes

Comparison of animal related crash data from 2006 to 2010 and from 2018 to 2022 shows the total rate of animal related crashes on the state road network has reduced. This is due, in part, to the execution of mitigation strategies such as fencing agreements developed through engagement with Main Roads and AHMP stakeholders.

Factors such as changing environments and traffic rates influence the rate of animal related crashes on the network. Further analysis is required to determine which factors influence pastoral animal related crash rates in order to improve the efficiency of mitigation measures and to potentially identify new areas for improvement.

6 RECOMMENDATIONS

6.1 Completed recommendations

Recommendation 1 (Annual) - Provide an annual report to the Minister for Transport on the Animal Hazard Mitigation Program.

Since the extension of the AHMP beyond its initial term period, an annual report should continue to be produced for the Minister for Transport detailing the program's progress including an evaluation of the program's effectiveness and expenditure.

Recommendation 2 (Annual) – Pastoral Animal Hazard Advisory Group meeting commitment

It is further recommended that the Pastoral Animal Hazard Advisory Group continue to function on the basis of cooperation between organisations, irrespective of AHMP funding, with meetings held at six-month intervals. Members are committed to improve data collation and analysis to improve road safety in pastoral regions as part of their normal business operations.

Recommendation 3 - Undertake review of former gravel pits that may be acting as attractors

Defunct gravel pits alongside the road reserve are common, unmaintained, and many are filled with rainwater, which may attract animals. Restricting access to these pits or preventing them from retaining water may reduce the number of animals attracted to the area nearby the road reserve.

Future management of these pits is being considered in order to reduce the number of animals in proximity to the road reserve, thereby reducing crashes involving animals in that area.

Close out comment: analysis was done to ascertain whether there was a correlation between the presence of gravel pits and recorded hot spots. The analysis found that approximately 12.4% of all pits and quarries fall within 5 km of identified hot spots, although 15% of the state road network is a hotspot or within 5 km of a hotspot. The group agreed there was no direct correlation between gravel pits and quarries and therefore the action has been closed, noting that there may be site specific locations that can be addressed on a case by case basis.

Recommendation 4 (Closed) - To develop a sign directing gate users to shut the gate

The group noted a number of issues with gates to pastoral stations being left open. It was noted a sign should be produced for installation at locations where gates are frequently left open.

Close out comment: Sign drawing [202331-000044](#) has been produced and published for this purpose. It reads 'shut the gate stray animals cause crashes'.

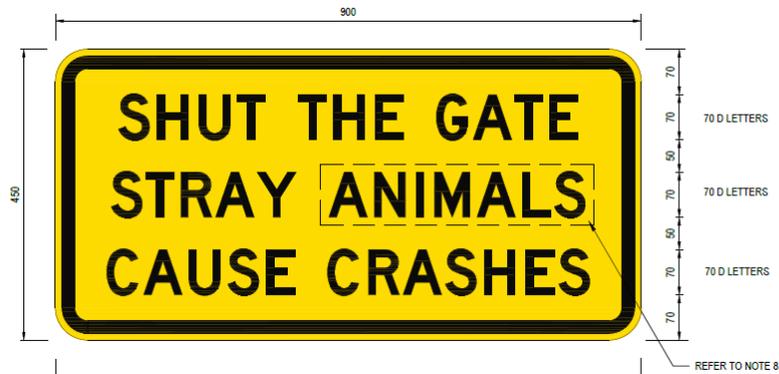


Figure 11 - 'Shut The Gate' Sign

6.2 New Recommendations

Recommendation 1 - To investigate other potential solutions, particularly with new and emerging technology

The PAHAG attendees recognise that as technology evolves there may be new technology that could be applied to improve the containment of livestock animals. Feasibility of technologies such as geofencing, automated gate and different grid solutions are being investigated.

Recommendation 2 - To draft a business case seeking funding for the continuation of the Animal Hazard Mitigation Program

The Animal Hazard Mitigation Program is reaching the end of its current allocated budget and a business case needs to be drafted to seek funding in future years.

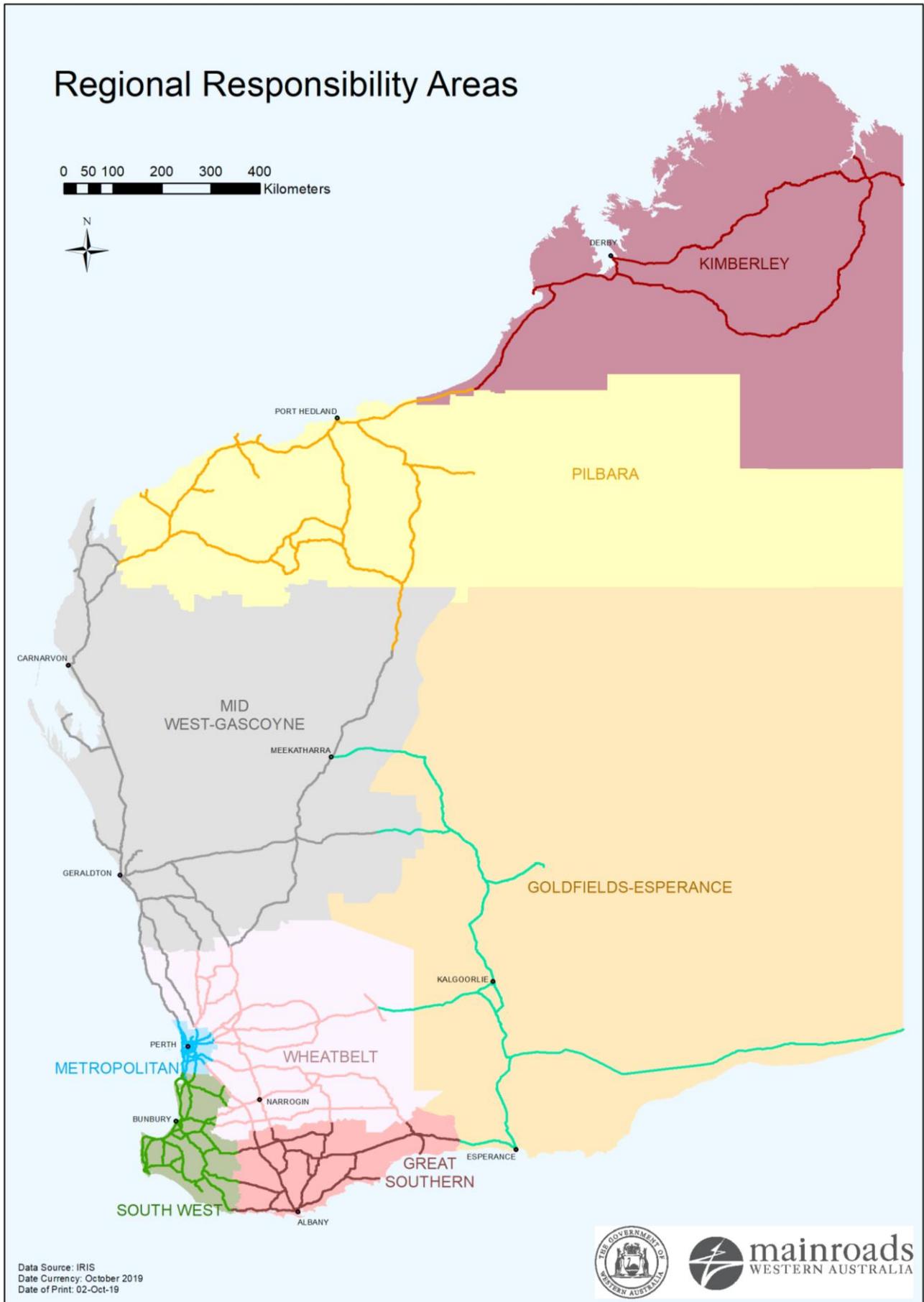
7 REFERENCES AND RELATED DOCUMENTS

Document Number	Description
D23#432479	PAHAG - Detailed Crash History - STATISTICS - Pastoral Areas – 2023 report – 31 October 2023
D12#55226	PFWG - Pastoral Regions - Fencing Road Reserves Working Group Report - Report for PFWG with Appendices - Signed - v6.0
11/3396-02	COMMUNITY RELATIONS - COMMITTEES - Fencing Road Reserves Pastoral Regions - Working Group
19/6646	ROAD ASSET MANAGEMENT - COMMITTEES - Pastoral Animal Hazard Advisory Group (PAHAG)
13/5849	ROAD SAFETY - ADVICE - Animal Hazard Mitigation Proposal and Funding

8 APPENDICES

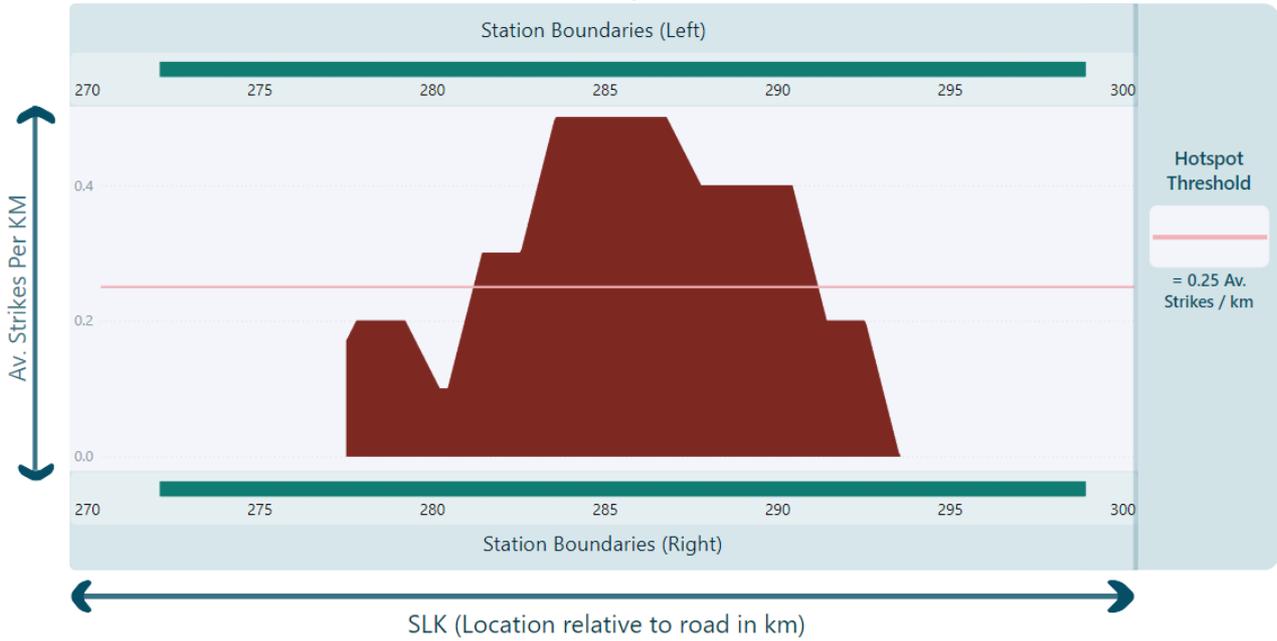
Appendix	Title
Appendix 1	Regional Responsibility Areas
Appendix 2	Sample Hotspot Identification Figures
Appendix 3	Regional Hotspot Maps, with July 2020 to June 2023 cattle strike data

Appendix 1: Regional Responsibility Areas

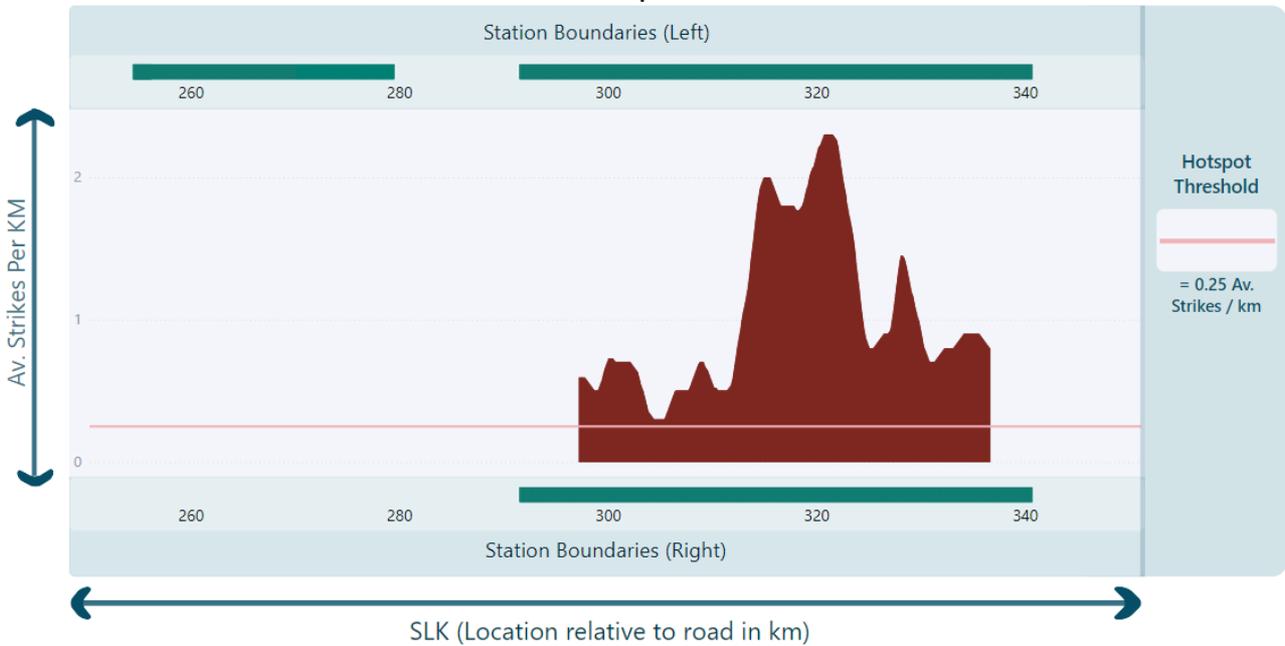


Appendix 2: Sample Hotspot Identification Figures

Sample Station Example Rd



Sample Station Example Rd



Appendix 3: Regional Hotspot Maps, with July 2020 to June 2023 cattle strike data

Hotspot Map: Goldfields-Esperance



Hotspot information consists of MMIS strike data involving cattle and sheep in pastoral regions from July 2020 to June 2023 inclusive.

Produced: 28/09/2023

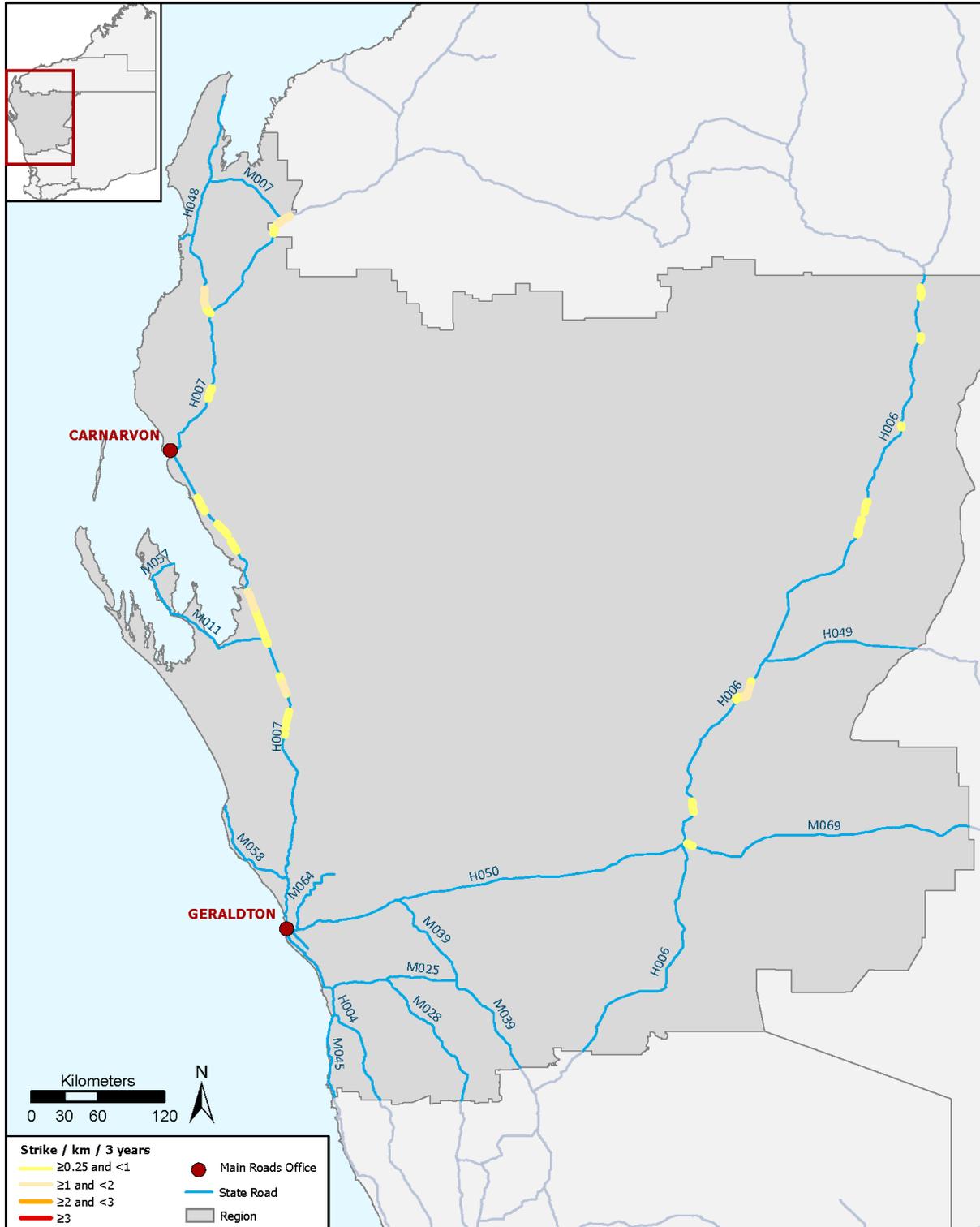


Hotspot Map: Mid West-Gascoyne



Hotspot information consists of MMIS strike data involving cattle and sheep in pastoral regions from July 2020 to June 2023 inclusive.

Produced: 28/09/2023



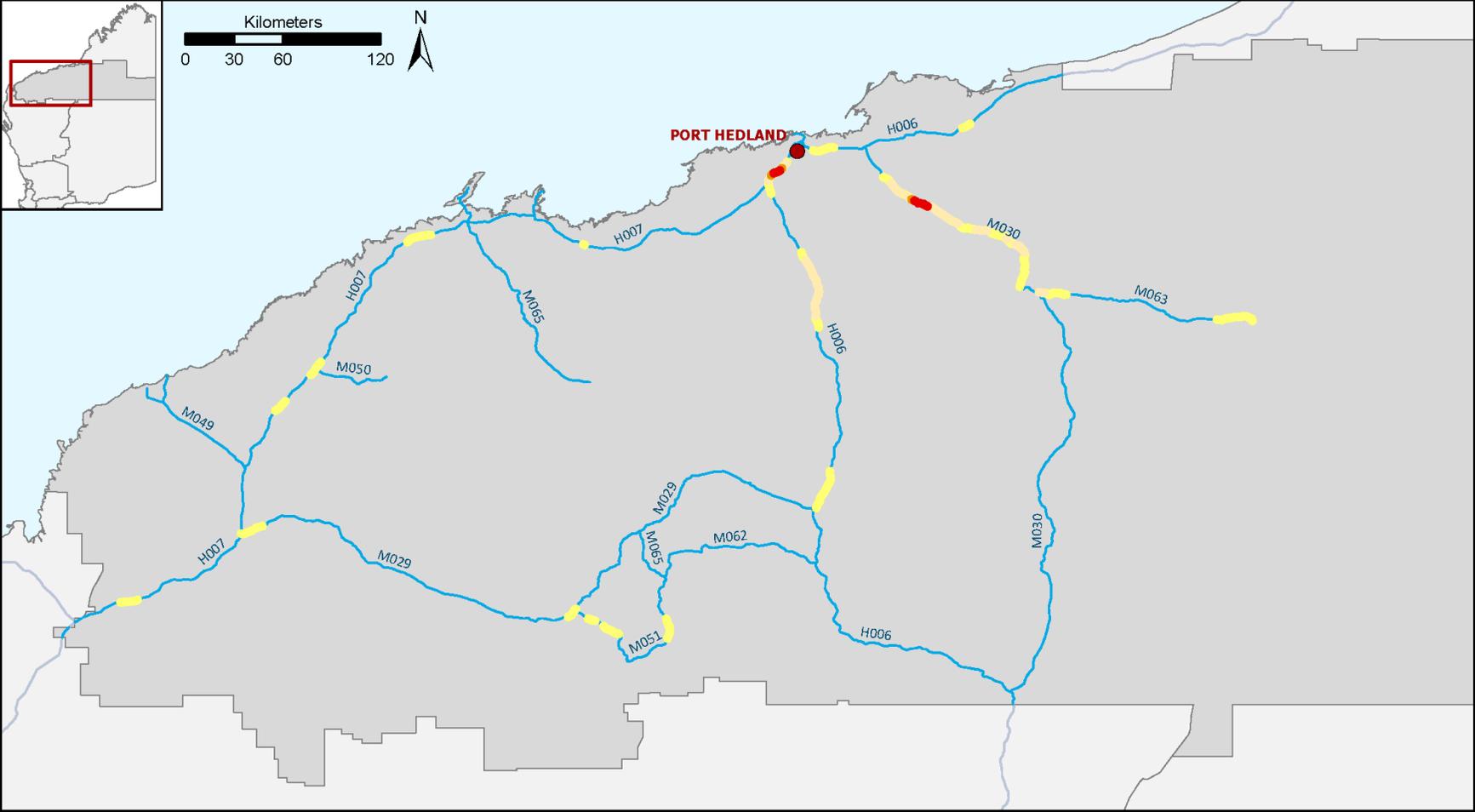
Hotspot Map: Pilbara



- Strike / km / 3 years
- ≥0.25 and <1
 - ≥1 and <2
 - ≥2 and <3
 - ≥3
- Main Roads Office
- State Road
- Region

Hotspot information consists of MMIS strike data involving cattle and sheep in pastoral regions from July 2020 to June 2023 inclusive.

Produced: 28/09/2023



Hotspot Map: Kimberley



- Strike / km / 3 years
 - ≥0.25 and <1
 - ≥1 and <2
 - ≥2 and <3
 - ≥3
- Main Roads Office
- State Road
- Region

Hotspot information consists of MMIS strike data involving cattle and sheep in pastoral regions from July 2020 to June 2023 inclusive.

Produced: 28/09/2023

