

**Rockhampton Regional Council
Local Disaster Management Group
Bushfire Management
Mitigation
Plan (2021-2025)**



Rockhampton Region Bushfire Management Mitigation Plan (2021-25)

1	List of Acronyms	3
2	Bushfire Management Governance	4
3	Executive Summary	5
3.1	Summary of Mitigation Actions:	5
3.2	Mount Archer Area Specific Actions	7
3.3	Mount Morgan Area Specific Actions	7
3.4	Goosedulla - Morinish Area Specific Actions	8
4	Introduction	8
5	Mitigation as a Risk Treatment	9
6	Cost Benefit Analysis of Mitigation Options	9
7	Current Performance of Bushfire Management Mitigation Across the LDMG Agencies	11
7.1	Prevention	11
7.2	Preparedness	11
7.3	Response	12
7.4	Recovery	12
8	Mitigation Enhancement Plan	12
8.1	Mitigation Action Area 1: Legislation and Regulation	12
8.1.1	Current Situation:	13
8.1.2	Relevant Findings:	13
8.1.3	Future Risks and Opportunities:	13
8.2	Mitigation Action Area 2: Risk Based Planning	14
8.2.1	Current Situation:	14
8.2.2	Future Risks and Opportunities:	15
8.3	Mitigation Action Area 3: Fuel Reduction across the Region	15
8.3.1	Current Situation:	16
8.3.2	Relevant Findings:	16
8.3.3	Future Risks and Opportunities:	16
8.4	Mitigation Action Area 4: Fire Lines and Access Tracks	17
8.4.1	Current Situation:	17
8.4.2	Relevant Findings:	17
8.4.3	Future Opportunities and Risks:	17
8.5	Mitigation Action Area 5: Arson Reduction	18
8.5.1	Current Situation:	18
8.5.2	Future Opportunities and Risks:	18
9	Funding Options for Mitigation	19
10	Mitigation Enhancement Priority Locations	19
10.1	Priority Location 1 – Mount Archer	19
10.1.1	Mitigation Focus Areas Actions	19
10.2	Priority Location 2 – Mount Morgan	22
10.2.1	Mitigation Focus Areas Actions	22
10.3	Priority Location 3 – Goosedulla – Morinish	24
10.3.1	Mitigation Focus Area Actions:	24
11	Monitoring and Reporting	26
12	Annex A – References	27

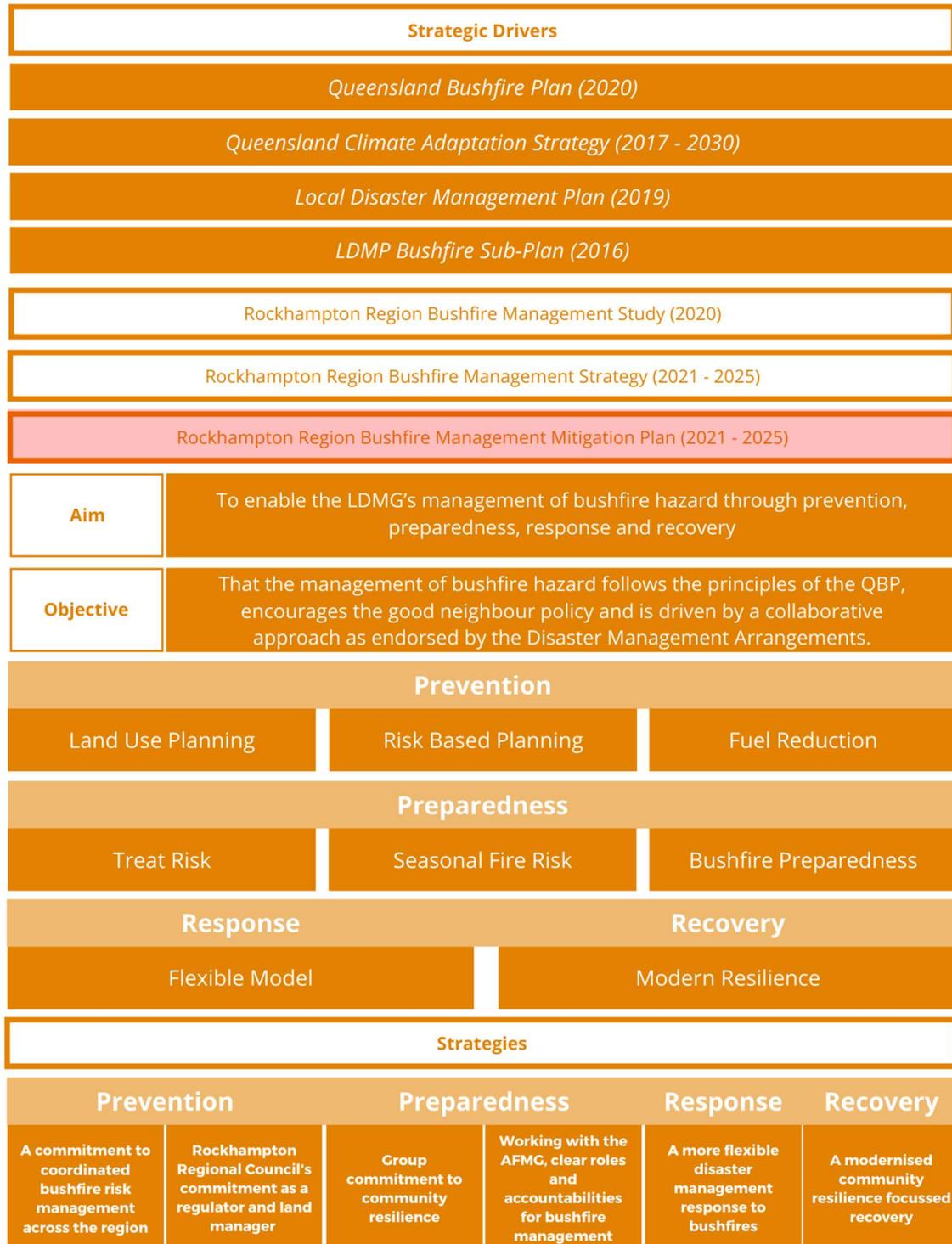
This document was endorsed by the Rockhampton LDMG on Friday 19th February 2021.

1 List of Acronyms

AFMG	Area Fire Management Group
BEP-MA	Bushfire Evacuation Plan – Mount Archer Area
BEP-MM	Bushfire Evacuation Plan – Mount Morgan Area
BMP	Bushfire Management Plan (for Development Applications)
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DCHDE	Department of Communities, Housing and Digital Economy
DDMG	District Disaster Management Group
DMU	Disaster Management Unit
DoR	Department of Resources
DTMR	Department of Transport and Main Roads
FRS	Fire and Rescue Service (QFES)
FFF	Fire Fighting Fascination Program (QFES)
IGEM	Inspector General Emergency Management
LDMG	Local Disaster Management Group
LDMP	Local Disaster Management Plan
QBP	Queensland Bushfire Plan
QERMF	Queensland Emergency Risk Management Framework
QFES	Queensland Fire and Emergency Services
QPS	Queensland Police Service
QPWS&P	Queensland Parks and Wildlife Service and Partnership
QRA	Queensland Reconstruction Authority
RFS	Rural Fire Service (QFES)
RRC	Rockhampton Regional Council
SPP	State Planning Policy

2 Bushfire Management Governance

The Rockhampton Region Bushfire Management Mitigation Plan (2021-2025) sits within the Rockhampton Region Local Disaster Management Group (LDMG) governance structure as outlined below.



Rockhampton Region LDMG Bushfire Management Governance Structure

3 Executive Summary

Since the early 2000s, the prevalence of bushfires across the Rockhampton region has changed. Whilst there has always been a bushfire threat, the frequency of events has increased, bringing with it heightened intensity, harsher impacts, and a shifting risk profile to local communities, never experienced before.

The 2009 fire, which impacted Mount Archer and the Berserker Ranges, followed in subsequent years with fires at Kabra, Stanwell, and Mount Morgan, highlighted the bushfire risk across the region. Most recently, the high level of fire activity during 2018-2019 has made the Rockhampton Region LDMG aware of the increasing threat of bushfire.

The Rockhampton Region Bushfire Management Mitigation Plan (2021-2025) provides 10 broad Mitigation Actions for the LDMG to consider across five Mitigation Enhancement Areas. These recommendations are considered at the LDMG level to continue to drive resilience across the community. By looking at strategic risk, combining it with the tactical agency plans we become better prepared as a Region. The recommendations are all linked to prevention, preparedness, response, and recovery.

3.1 Summary of Mitigation Actions:

Action Number	Mitigation Action	Responsible	Due Date
M1	That on years that present a bushfire risk, the Rockhampton Local Disaster Management Group (LDMG) encourage Queensland Fire and Emergency Services (QFES) and Rockhampton Regional Council (RRC) to conduct a focused campaign on preparedness and hazard removal around properties. In this campaign, as a last resort where engagement activities are not successful, RRC and QFES use regulation authority to issue notices on properties that pose a risk to fire starting or spreading from their land.	QFES and RRC	Annually on years with heightened bushfire risk
M2	The Area Fire Management Group (AFMG) provides a detailed list, by August each year, to the Local Disaster Management Group (LDMG) on the residual bushfire risk. Upon receipt, the LDMG determines to accept, share, or transfer the risk to the District Disaster Management Group (DDMG).	AFMG	August 2021 and then annually
M3	In March each year, the Local Disaster Management Group (LDMG) reviews the Operation Cool Burn Plan, and the review is conducted through the lens of ensuring that there is maximum resource sharing in a tenure-blind approach.	LDMG	March 2021 and then annually
M4	In line with Section 2.1 of the Queensland Bushfire Plan (QBP), the Area Fire Management Group (AFMG) provide an annual assurance statement to the Local Disaster Management Group (LDMG) that they are considering the application of the principals of the Queensland Parks and Wildlife Service and Partnerships (QPWS&P) Good Neighbour Policy across their work.	AFMG	June 2021 and then annually

Action Number	Mitigation Action	Responsible	Due Date
M5	That the Local Disaster Management Group (LDMG) reviews the Operation Cool Burn activities from a regional risk perspective and, as a group, ensures the activities are aligned to sustainable outcomes and considers any residual risk reporting to the District Disaster Management Group (DDMG).	LDMG	March 2021 and then annually
M6	That the Local Disaster Management Group (LDMG) considers establishing an annual reporting regime which reports on the number of properties protected through bushfire mitigation. Work is commenced with agencies using existing data and tools to form an acceptable methodology to collect and measure this.	LDMG	March 2021 and then annually
M7	That the Area Fire Management Group (AFMG) works with the member agencies to measure success of hazard reduction, post any significant fires, where mitigation works have affected the outcome. The results then inform the next Operation Cool Burn plan, based on how effective it was to reduce fire spread within that terrain structure.	ADMG	March 2021 and then annually
M8	The Area Fire Management Group (AFMG) works with landowners to classify all fire trails across the Region. The classification of fire trails is then mapped in a system which is accessible to all agencies.	AFMG	June 2025
M9	The Area Fire Management Group (AFMG) considers the impact that sourcing funding for fire lines and access track construction and maintenance (i.e., managing grant applications) has on volunteer capacity and looks for alternate solutions where able.	AFMG	March 2022 and then ongoing
M10	That the Local Disaster Management Group (LDMG) support Queensland Police Service (QPS) and Queensland Fire and Emergency Services (QFES) in local campaigns to reduce fire fascination and arson prevention across the region.	LDMG	June 2021 and then ongoing

This Mitigation Plan is linked to legislation, plans, policies and reports, and has been informed by the Rockhampton Region Bushfire Management Study (2020) (The Study) and the Rockhampton Region Bushfire Management Strategy (2021-2025) (The Strategy). It is one of the tools the LDMG may consider using to reduce risk across the Region so that the LDMG is well-placed to strengthen the local disaster management arrangements into the future.

In addition to the above broad Mitigative Actions, this Mitigation Plan has outlined specific actions during 2021-2025 to three identified areas of very high bushfire risk across the Region.

3.2 Mount Archer Area Specific Actions

Action Number	Mitigation Action	Responsible	Due Date
MA1	There is increased surveillance and clearing of the interface between the National Park and Residential Zones to stop the collection of additional fuel behind houses.	RRC	June 2021 and then ongoing
MA2	An annual bushfire education program is delivered focusing on preparation and evacuation priorities of the residents of Mount Archer, using the Bushfire Evacuation Plan – Mount Archer (BEP-MA).	QFES, supported by LDMG	June 2021 and then ongoing
MA3	Mount Archer has a range of fire trails, access tracks, and is accessible to larger amounts of resources on poor fire danger days. The amount of planning which has been done in this area for both fire mitigation, response and evacuation plan also reduces the risk profile of this area, and as such the current practices reduce the overall risk to the Mount Archer Area. These practices should continue.	QPWS&P and RRC	Annually as per current practice
MA4	Current fuel reduction programs are continued by Queensland Parks and Wildlife Service and Partnerships (QPWS&P).	QPWS&P	Annually as per current practice
MA5	Funding for fuel reduction burns behind the urban areas of Frenchville is considered by Rockhampton Regional Council (RRC) and carried out by Queensland Fire and Emergency Services (QFES).	QPWS&P	June 2021 and then ongoing

3.3 Mount Morgan Area Specific Actions

Action Number	Mitigation Action	Responsible	Due Date
MM1	There is an increase in the current burning program by the Department of Resources (DoR) and consideration is given to integrating with the Rockhampton Regional Council (RRC) slashing program.	DoR and RRC	June 2021 and then ongoing
MM2	Rockhampton Regional Council (RRC) should consider fire trail construction to access the new mountain bike trail, to support a balanced outcome to leisure activities and bushfire safety.	RRC	June 2022 and then ongoing
MM3	Continue to maintain and build the fire access trail network. In addition to this, the trails are classified, and mapping is updated.	DoR and RRC	June 2025
MM4	A targeted community education program on evacuation and arson prevention is delivered, based on seasonal risk.	QPS and QFES	June 2021 and then ongoing

3.4 Goodedulla - Morinish Area Specific Actions

Action Number	Mitigation Action	Responsible	Due Date
GM1	That the Local Disaster Management Group (LDMG) better understand the Queensland Parks and Wildlife and Partnerships (QPWS&P) parks closure process based on fire danger.	QPWS&P supported by LDMG	March 2021 and then ongoing
GM2	A targeted Community Education Program is delivered, based on seasonal risk.	QFES supported by LDMG	June 2021 and then ongoing
GM3	The Local Disaster Management Group (LDMG) further seeks to understand what local mitigation programs are being undertaken and link these into current agency plans.	QPWS&P, QFES, FMG and LDMG	June 2021 and then annually
GM4	In addition to the significant work conducted annually by the Queensland Parks and Wildlife Service and Partnerships (QPWS&P) for annual fire line maintenance at Goodedulla National Park, consideration be given to link this work with additional mitigation measures occurring outside of the park.	QFES	June 2021 and then annually
GM5	A greater focus be given to increase fuel reduction across both Goodedulla and Morinish State Forests, building on the work that exists already with local neighbours who proactively carry out fuel mitigation to minimise risk to pastures.	QPWS&P supported by SF lessee	June 2021 and then annually

4 Introduction

Bushfire risk reduction management has been considered holistically throughout this plan and focuses on:

- **Legislation and Regulation** – how an increase in compliance activities in relation to private and government land will lead to more resilient communities through the reduction of risk.
- **Risk Based Planning** – how the Area Fire Management Group (AFMG) and LDMG can work together to understand residual risk, and how to accept, share or transfer it to the District Disaster Management Group (DDMG).
- **Fuel Reduction across the Region** – how fuel can be reduced using a variety of techniques to reduce the overall risk to the Region. Where fires exist in the landscape, this also reduces their intensity and impact.
- **Fire Lines and Access Trails** – how the maintenance and further construction of fire lines and access trails will assist with mitigation. These provide firefighting options where there is a fire. In addition to this, they assist with breaks for crews to work off when performing hazard reductions.
- **Arson Reduction** – how a regional focus, but with specific attention on Mount Morgan, can assist with the reduction in ignition and fire spread.

A cost benefit analysis has been produced for each of these options across three main priority areas for this Mitigation Plan:

- **Mount Archer Area**– as the highest at-risk population, surrounded by very high potential bushfire danger areas, and fire history, there is an opportunity to leverage off the work currently being conducted by agencies in:
 - Increased regulation and surveillance of illegal dumping of materials
 - Increased hazard reduction on the bushland – urban interface
 - Increased Community Education.

- **Mount Morgan Area**– as the second highest at-risk population, surrounded by very high potential bushfire danger areas, fire history and in a valley system to:
 - Continue linking the current fire line and access trails
 - Target Community Education programs on evacuation and arson prevention
 - Increase in hazard reduction activities.
- **Goosedulla – Morinish Area** – while not a heavily populated area, the fuel loads are high, very high potential bushfire prone land areas, along with the riparian zones which link the National Park and the forest, may lead to suboptimal economic outcomes for the Region. There are opportunities to:
 - Increase Hazard Reduction
 - Increase fire line and access trails
 - Conduct Community Education Programs.

5 Mitigation as a Risk Treatment

Risk treatment strategies aim to implement the most appropriate actions against risk. These strategies treat by controlling or mitigating the identified inherent risk.

The actions typically undertaken at agency level comprise both short and longer-term strategies. These address immediate impacts and the resultant ongoing issues. When identifying strategies, it is important to prioritise responses to inform decisions and their priorities. They need to articulate who needs to do what, by when.

This approach requires the understanding of attributes such as urgency, controllability, and response effectiveness in order to execute the actions effectively and in a timely manner. By taking this result, the LDMG can get the best return with available resources.

Once treatment of risk measures has been identified, planned, or implemented, it is important to then consider the residual risk (QFES, 2018). The risk reporting relationship has changed with the release of the *Queensland Bushfire Plan (2020)* (QBP), where the LDMG is now responsible for managing residual bushfire risk.

Residual risk is the risk which is beyond the capability and/or capacity of the Local or District communities and existing disaster management arrangements to treat or mitigate. Residual risk must either be accepted as tolerable or should be transferred to and/or shared across the next level of the disaster management arrangement (upon consultation) (QFES, 2018).

The Rockhampton Area Fire Management Group, in line with the QBP and AFMG Terms of Reference will work collaboratively to ensure a robust process is in place to consider, prioritise and mitigate risk, and where appropriate report on the actions taken by this group in addressing the fire risk across the region.

6 Cost Benefit Analysis of Mitigation Options

Funding for mitigation across the Region comes from a range of sources and includes agency budgets, grants and fundraising by QFES Rural Fire Service (RFS) brigades.

Research and stakeholders showed that mitigation is conducted at the agency level. While there are strong signs that mitigation is discussed across agencies, little evidence was found to indicate that a tenure-blind approach was taken.

It is difficult to reach a true tenure-blind approach, as individual agencies, land managers and landowners all have legislative responsibilities to reduce fire on their land. Finite resources increase this challenge.

There is significant opportunity at the LDMG level to document this risk where, for example, an agency opts to provide resources to reduce the bushfire risk, but it may not be on their land. The application of a cost-benefit analysis of mitigation assists the AFMG and LDMG in selecting mitigation options with a more strategic approach.

The cost-benefit analysis looks at the following factors:

- Price of mitigation works
- Benefit which will be achieved in the first year
- Cost of ongoing maintenance in following years.

Cost-benefit analysis is provided for each of the priority areas outlined in this Mitigation Plan.

Baseline costs are provided based on current industry contractor research and are shown in *Table 1* below:

Mitigation Option	Costs	Annual Maintenance
Fire Trail Construction – Grader	\$75-\$160 per hour (12-16ft)	<ul style="list-style-type: none"> • Grader lines will generally require annual touch up work. • May require additional work including installing gates to limit access.
Fire Trail Construction – Dozer	\$180-\$519 per hour (D6-D9)	<ul style="list-style-type: none"> • Dozer lines will generally require annual touch up work. • May require additional work including installing gates to limit access.
Hazard Reduction - Slashing	\$100-120 per hour	<ul style="list-style-type: none"> • Generally effective as a point in time solution. • Largely dependent on climatic conditions post-slashing on regrowth.
Hazard Reduction – Burning	\$110-\$250 per hour per unit Average cost based on Queensland Government Awards (including on-costs) Costs of volunteer involvement is limited to fuel and minor costs and is negligible.	<ul style="list-style-type: none"> • Depending on prescription to burn, can be effective for 1-5 years. • Limited by mitigation window – when conditions are conducive to burn effectively but limits the chance of it becoming a wildfire.
Community Education	\$110-\$250 per hour per unit Average cost based on Queensland Government Awards (including on-costs) Costs of volunteer involvement is limited to fuel and minor costs and is negligible.	<ul style="list-style-type: none"> • Required annually due to community complacency and population change. • Does not consider collateral costs, as this is wide ranging.

Table 1: Indicative costs for Bushfire Mitigation

The average value of assets was determined by research across a variety of industry sites to determine current average asset values in each of the priority mitigation areas.

The estimated hours have been determined based on industry knowledge and feedback by stakeholders.

7 Current Performance of Bushfire Management Mitigation Across the LDMG Agencies

7.1 Prevention

The following is a summary of the current preventative measures contributing to bushfire risk mitigation across the Rockhampton Region.

- Rockhampton Regional Council (RRC) has an approved planning scheme which is compliant to the *State Planning Policy (SPP)*.
- Research shows, along with stakeholder input, that RRC refines the bushfire prone land mapping that QFES provides and enables it to be accessible to the public.
- Research and aerial inspection show that Queensland Parks and Wildlife Service and Partnerships (QPWS&P) conducts burns on its main estates across Mount Archer and surrounding areas and across the Region.
- RRC has a well-established development application process. Compliance of developments requiring approved Bushfire Management Plans (BMP) needs further attention, as detailed in recommendations S1, S3 and S5 in the Strategy. This requirement is also needed for title change.
- Research and aerial inspection show that the Department of Resources (DoR) actively manage unallocated state land by burning off in and around the Mount Morgan area.
- Aerial inspections show that the public, in many cases, look after their blocks of land in and around Mount Archer, however the issue of dumping vegetation over the property line remains an issue.
- Aerial inspections of many rural areas showed fire breaks and fencing lines were being used to prevent fire spread across the landscape.
- Stakeholders advised that RFS brigades and Fire and Rescue Service (FRS) stations regularly assist land managers to conduct hazard reduction.
- Hazard reduction considerations could extend to landholders to not only establish fire breaks, but to also re-plant fire retardant natives (such as semi-evergreen vine thicket vegetation) along fence lines along fence lines.
- Stakeholders discussed how the Department of Transport and Main Roads (DTMR) plan and fund hazard reduction works on their roads. RFS brigades undertake these burns, but it can be limited by budgets relating to traffic control.
- Stakeholders advise of difficulty in compliance activities in relation to issuing of notices under legislation. Difficulties were around agency appetite to do this, and frustration that Courts do not follow through with action from these notices.
- Research shows that Queensland Police Service (QPS) are active with the pursuit of arson activity, particularly in and around the Mount Morgan area.
- Research shows that all agencies engage and actively supply plans to QFES' annual Operation Cool Burn plan. This year's plan shows individual plans supplied by agencies, but no connected, tenure-blind approach to mitigation work occurring. This is further addressed in recommendations S7 of the Strategy.
- The spatial data and observations support RRC activity with the supply of resources and constructing fire lines and trails. Research suggests that fire trails are not being built or mapped to an agreed standard.
- Stakeholders advise that RFS brigades apply for grants for fire trails, however as they are volunteer based, often have difficulty having time. This is also impacted by the lack of volunteer time into local sector and land manager relationships to gain approvals to get these done.

7.2 Preparedness

The following is a summary of the current preparedness measures contributing to mitigating risk across the Rockhampton Region:

- The LDMG has an approved current *Local Disaster Management Plan (2019)* (LDMP).
- The LDMG has an approved:
 - *Bushfire Sub-Plan (2016)*
 - *Local Disaster Coordination Centre (LDCC) Activation Sub-Plan (2016)*and both are being reviewed and updated to the new standards.
- Research shows that the intelligence feed between QFES and RRC is not well established or maintained during fire events. This was evidenced during the 2018 Gracemere fires, which subsequently caused confusion in the planning of the evacuation (Inspector General

Emergency Management (IGEM), 2018). Recommendations S11 and S19 in the Strategy seek to address these matters.

- Stakeholders advised that the LDMG has a standing agenda item for bushfire management and this allows the group to be more prepared.
- Stakeholders advised that from a risk and mitigation perspective the relationship exists between the AFMG and LDMG at a basic level and that there would be value in strengthening. Recommendation S6 and S7 in the Strategy further explores this relationship.
- Stakeholders advised that Community Education is conducted by RRC, QPWS&P and QFES in relation to bushfire. These sometimes occur in isolation and recommendation S12 in the Strategy addresses this. Examples of existing programs are:
 - Get Ready Program
 - QFES rolling Community Education Program – attending events etc.
 - QPWS&P Good Neighbour Policy and Smoke Advisories
 - RRC Disaster Management Unit (DMU) Community Education Trailer.

7.3 Response

- Evidence shows that QFES have a structured, well-practiced tiered system of response to bushfires.
- The QBP proposes an increased level of interaction between QFES and the LDMG. This provides significant opportunities to enhance the link between bushfire incident management and community impact.
- The LDCC has participated in exercises in 2020 and showed a high level of capability to deal with multiple impacts (flood and COVID-19), which could extend to a bushfire support operation, as addressed in Recommendation S15 in the Strategy.
- Research shows there is currently no annual exercise for LDCC planned, when it is responding in a non-lead capacity. An example of this is a bushfire event, where QFES is the lead agency and the LDCC is managing community consequence.
- Research shows that the current plans are not clear on the transition between a bushfire event, and one where a disaster declaration is made. Transitional timings and arrangements, as led by the content of the QBP, are currently lacking.

7.4 Recovery

- There was little evidence shown in relation to recovery and mitigation works and that Environmental Recovery is a consideration which could be explored further. The practice of improving fire breaks into fire lines and trails is a good example on where recovery can lead to mitigation into the future.

8 Mitigation Enhancement Plan

8.1 Mitigation Action Area 1: Legislation and Regulation

Action Number	Mitigation Action	Responsible	Due Date
M1	That on years that present a bushfire risk, the Rockhampton Local Disaster Management Group (LDMG) encourage Queensland Fire and Emergency Services (QFES) and Rockhampton Regional Council (RRC) to conduct a focused campaign on preparedness and hazard removal around properties. In this campaign, as a last resort where engagement activities are not successful, RRC and QFES use regulation authority to issue notices on properties that pose a risk to fire starting or spreading from their land.	QFES and RRC	Annually on years with heightened bushfire risk

Action Number	Mitigation Action	Responsible	Due Date
M2	The Area Fire Management Group (AFMG) provides a detailed list, by August each year, to the Local Disaster Management Group (LDMG) on the residual bushfire risk. Upon receipt, the LDMG determines to accept, share, or transfer the risk to the District Disaster Management Group (DDMG).	AFMG	August 2021 and then annually

8.1.1 Current Situation:

Agencies have a range of regulatory functions to support mitigation across the Rockhampton Region including:

Queensland Fire and Emergency Services

Queensland Fire and Emergency Services Act, 1990 s.69 – “the Commissioner may require any occupier of premises to take measures for the purpose of reducing the risk of a fire occurring on the premises or reducing potential danger to persons, property or the environment in the event of a fire occurring on the premises.”

Department of Resources

Land Act, 1994 s.404 – “a person must not unlawfully do any of the following things (a trespass-related act) in relation to non-freehold or trust land; occupy or live on it, enclose it, build, place or maintain any structure, improvement, work or thing on it, clear, dig up or cultivate it, de-pasture stock or cause stock to be de-pastured on it.”

Rockhampton Regional Council

Local Law 3 (Community and Environmental Damage) s.15 (2) – “The authorised person may, by compliance notice given to the responsible person for the allotment, require the responsible person to take specified action to reduce or remove the fire hazard. Officers work across the region issuing Permit to Light Fire notices, under the guidance of the Chief Warden, as appointed by the Commissioner, QFES.”

There is opportunity to further exercise these powers, particularly on private land. For example, the risk that exists around Mount Morgan where property-to-property fire occurs as many yards are overgrown and littered with flammable materials. Powers exist, from a bushfire mitigation perspective, for both QFES and RRC to issue notices each year to clean up yards.

Stakeholders advised of their frustrations as there is evidence of little appetite to pursue the use of regulation at agency level. The frustration stems from where notices are issued, that they are not upheld. This should not detract from the application of the legislation in a targeted manner.

Local Disaster Management Group

The LDMG has the responsibility to:

- Coordinate bushfire risk-mitigation strategies for the local government area in consultation with the AFMG.
- Manage residual bushfire risk.
- Report residual bushfire risk to the Rockhampton DDMG, where appropriate. (QFES, 2020).

8.1.2 Relevant Findings:

As part of the QFES Bushfire Prevention & Preparedness Report (2019), QFES has committed to working with local Councils to develop and communicate local bushfire plans for communities located in high risk, bushfire-prone areas. This enables QFES to strengthen its oversight role, as lead agency for mitigating Queensland’s bushfire risk to acceptable levels.

8.1.3 Future Risks and Opportunities:

The legislation exists for compliance activities to occur. The QFES and RCC legislation is straight forward, whereas the DoR legislation moves the responsibility to the State for ownership of the risk.

There is opportunity to target the bushland interface of Mount Morgan in the first year of implementation of the plan. Subsequent years can be informed by agencies surveillance throughout the year.

The opportunity exists for the AFMG to articulate residual bushfire risk to the LDMG in the form of community consequence. That is, identifying the potential impact of the residual hazard on the community, as opposed to the technical bushfire hazard.

8.2 Mitigation Action Area 2: Risk Based Planning

Action Number	Mitigation Action	Responsible	Due Date
M3	In March each year, the Local Disaster Management Group (LDMG) reviews the Operation Cool Burn Plan, and the review is conducted through the lens of ensuring that there is maximum resource sharing in a tenure-blind approach.	LDMG	March 2021 and then annually
M4	In line with Section 2.1 of the Queensland Bushfire Plan (QBP), the Area Fire Management Group (AFMG) provide an annual assurance statement to the Local Disaster Management Group (LDMG) that they are considering the application of the principals of the Queensland Parks and Wildlife Service and Partnerships (QPWS&P) Good Neighbour Policy across their work.	AFMG	June 2021 and then annually

8.2.1 Current Situation:

The AFMG coordinates an annual bushfire mitigation program across all agencies. This is known as Operation Cool Burn. Operation Cool Burn is where agencies consolidate their bushfire management mitigation plans and determine high risk areas to treat. Evidence showed that the Operation Cool Burn Plan shows the combination of hazard reduction via a range of means together in one plan. The progress of Operation Cool Burn is reported across stakeholder groups by QFES.

Research shows that the current Operation Cool Burn Plan is a combination of agency mitigation plans. While comprehensive, there appears to be little consideration to the connectivity of each plan, activity and potential sharing of agency resources.

Direct observations, and researching the relationships across the Region, shows there is already a platform of mutual respect between the agency stakeholders. The next progression of this relationship is to now extend to collaboration and sharing of resources.

This relationship setting provides a significant opportunity to increase a tenure-blind approach to mitigation. This approach is where, led by the AFMGs annual risk assessment, a more cooperative resource model is considered. Where there are areas across the Region determined as high or very high-risk, the AFMG may consider requesting all agencies to focus on the issue.

This is a complex concept, as most members of the AFMG have land management responsibilities. Therefore, careful documenting on decision making on why an agency may elect to assist another agency, over its own area is important. With resources scarce across the Region however, this provides a more cooperative approach to positive community outcomes.

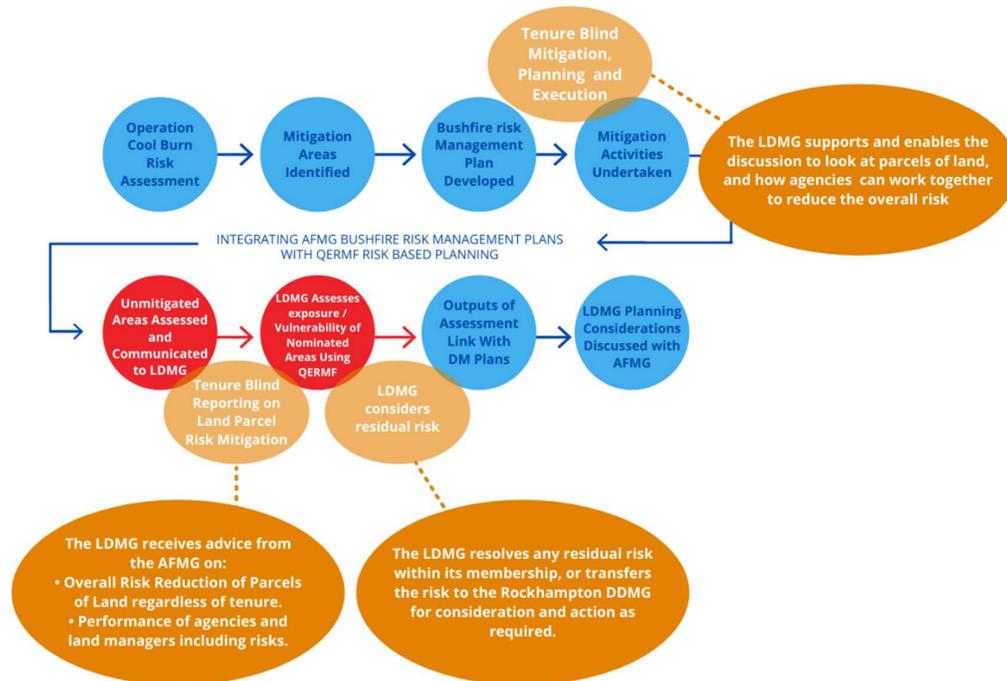
QPWS&P have a *Good Neighbour Policy* which defines principles for bushfire management. QFES have adopted this as a policy that AFMGs should adopt and be guided by (Inspector General Emergency Management (IGEM), 2018). Continuing into the future, it is important that the LDMG is provided assurance that this is occurring.

8.2.2 Future Risks and Opportunities:

Stakeholders advised of examples where contractors or RRC equipment are deployed within days or weeks of other agency resources. There is significant opportunity for collaboration and sharing of resources. This will achieve mutual outcomes and provides for a better resource use model and stronger mitigation activities.

The choice of mitigation work should consider cost-benefit outcomes with an environmental focus.

Stakeholders were clear that, with the regional risk management and mitigation approach, the AFMG and LDMG needs to move towards a tenure-blind approach, led by the Queensland Emergency Risk Management Framework (QERMF), with outcomes as shown below:



Rockhampton region QBP Risk Implementation. Developed from the QBP

8.3 Mitigation Action Area 3: Fuel Reduction across the Region

Action Number	Mitigation Action	Responsible	Due Date
M5	That the Local Disaster Management Group (LDMG) reviews the Operation Cool Burn activities from a regional risk perspective and, as a group, ensures the activities are aligned to sustainable outcomes and considers any residual risk reporting to the District Disaster Management Group (DDMG).	LDMG	March 2021 and then annually
M6	That the Local Disaster Management Group (LDMG) considers establishing an annual reporting regime which reports on the number of properties protected through bushfire mitigation. Work is commenced with agencies using existing data and tools to form an acceptable methodology to collect and measure this.	LDMG	March 2021 and then annually

Action Number	Mitigation Action	Responsible	Due Date
M7	That the Area Fire Management Group (AFMG) works with the member agencies to measure success of hazard reduction, post any significant fires, where mitigation works have affected the outcome. The results then inform the next Operation Cool Burn plan, based on how effective it was to reduce fire spread within that terrain structure.	ADMG	March 2021 and then annually

8.3.1 Current Situation:

Research shows that fuel reduction occurs across the Region at both the community and agency level. Examples of this include:

- Urban Community
 - Urban Interface – community members advising that they actively clean up around their yard and boundary to reduce their own risk. This is validated by random inspections by QFES or RRC.
- Rural Community
 - Farmers using land management techniques, including organic use of vegetation for grazing and other purposes, in line with relevant state legislation for clearing of land.
- Agency Level
 - QPWS&P and DoR, supported by the FRS and RFS, conduct both broad-scale and asset-protection mitigation burning, and slash high biomass exotic grass areas.
 - DTMR, with RRC, reduce roadside vegetation through slashing and coordinating with RFS brigades to undertake hazard reduction burns.

The AFMG coordinates the hazard reduction reporting across the Region. A summary is provided to the LDMG periodically. There is no current methodology to report on the value of hazard reduction. Agencies map hazard reduction work, however, unless it is a designated “hot spot” in Catalyst, there is no central repository of information.

Stakeholders advised that there is little analysis done at the regional level on performance of hazard reduction on fire outcomes. QFES has developed the capability to apply bushfire simulation tools to evaluate potential hazard reduction burning effectiveness (QFES, 2019) however it is not apparent that this is being utilised across the Region.

8.3.2 Relevant Findings:

“Bushfire hazard reduction measures refer to the ways in which bushfire risk is reduced prior to an unplanned fire event. Hazard reduction measures are directed to efforts where land managers are able to influence future fire behaviour - mainly by fuel management. Other factors also influence fire behaviour, such as weather and terrain, but these cannot be modified easily.” (The Royal Commission, 2020)

8.3.3 Future Risks and Opportunities:

By measuring assets protected through hazard reduction this may allow for funding opportunities in the future.

Agencies should work with QFES, using the available technology, to look at the effectiveness of hazard reduction following a fire.

Further examples of this occurring is found on page 21 of the [IGEM Bushfires Review 2019-2020](#) which shows the impact of hazard reduction on fires in the Stanthorpe Area.

8.4 Mitigation Action Area 4: Fire Lines and Access Tracks

Action Number	Mitigation Action	Responsible	Due Date
M8	The Area Fire Management Group (AFMG) works with landowners to classify all fire trails across the Region. The classification of fire trails is then mapped in a system which is accessible to all agencies.	AFMG	June 2025
M9	The Area Fire Management Group (AFMG) considers the impact that sourcing funding for fire lines and access track construction and maintenance (i.e., managing grant applications) has on volunteer capacity and looks for alternate solutions where able.	AFMG	March 2022 and then ongoing

8.4.1 Current Situation:

Research and aerial inspection show the many examples of work by QPWS&P and RRC to establish and maintain fire lines and access tracks, particularly in the Mount Archer and Mount Morgan area.

Stakeholders demonstrated how RRC works in close consultation with DoR to provide a network of access trails to segment the urban interface from the very high-risk bushland.

In close consultation again with QPWS&P, RRC establishes and maintains a fire line and access network for high-risk areas across the region, including Mount Archer, Long Island, Struck Oil and Bajool.

RRC and QPWS&P have previously received funding to construct fire lines around vulnerable residential areas. This resulted in major fire lines being constructed along the eastern edge of Rockhampton, around Mount Morgan, and in West Bajool. This has been led by QPWS&P, the primary landholder who coordinates local government's activities, and QFES – FRS and RFS.

Research showed that there is no consistent categorisation applied for fire line or access tracks in Queensland. The NSW Soil Conservation Council has worked with the NSW Rural Fire Service to develop a *Fire Trail Design, Construction and Maintenance Manual*. This provides guidance on the construction levels required for fire lines and access tracks to be designed to achieve maximum advantage for firefighting purposes. In addition to this, QPWS&P has also developed a *Procedural Guide on Fireline Classification, Marking and Identification*.

Stakeholders advised that rural fire groups currently apply for funding and manage the construction of fire trails within their group area. This is problematic as they are then required to liaise with land managers and owners and manage the contract process. By doing so, volunteer time, which ordinarily could be dedicated to firefighting, is being used. The opportunity exists for the FMG agencies to apply and manage this funding into the future.

8.4.2 Relevant Findings:

"Fuel management activities are only one of a number of strategies employed by state and territory fire and land management agencies to mitigate risk from bushfire. Other activities include, for example, community engagement, preparedness and education programs (for example targeting ignition prevention) and construction and maintenance of fire trails." (The Royal Commission, 2020)

8.4.3 Future Opportunities and Risks:

There is opportunity to continue the work between RRC, DoR and QPWS&P to enhance the trail structure, directly informed by agency mitigation plans.

Having classification work being undertaken provides an enhanced response capability to understand what type of appliances can be deployed on tracks.

Having tracks built to a standard, allows for accurate budgets, as there are known costs in each classification based on internal charges of RRC or use of contractors.

8.5 Mitigation Action Area 5: Arson Reduction

Action Number	Mitigation Action	Responsible	Due Date
M10	That the Local Disaster Management Group (LDMG) support Queensland Police Service (QPS) and Queensland Fire and Emergency Services (QFES) in local campaigns to reduce fire fascination and arson prevention across the region.	LDMG	June 2021 and then ongoing

8.5.1 Current Situation:

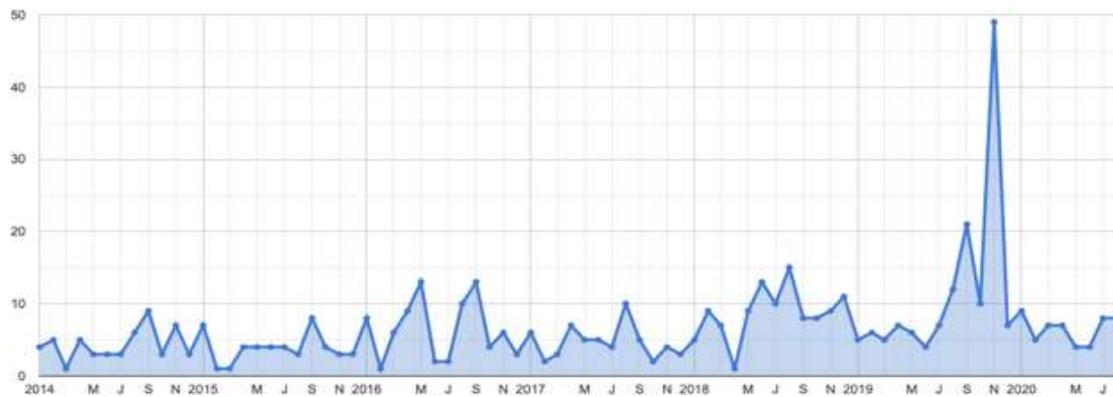
Deliberately lit bushfires and arson incidents are a major threat to the Rockhampton Region. Reducing and preventing these incidents will be undertaken by QFES and QPS through instigating a range of initiatives that foster an innovative approach.

Evidence suggests that a significant number of fires in the high-risk areas of Mount Archer and Mount Morgan have been caused by arson.

QPS is the primary agency responsible for addressing arson. QFES is a key partner in protecting communities from this crime and supports QPS with fire investigation expertise.

The QFES Fire Investigation Unit, and a network of Fire Investigation Officers across Queensland, provide expertise to determine the cause and origin of fires or explosions involving bushfire as well as structures, transportation, marine or hazardous materials.

QFES provides QPS with information on fires detected and also delivers the Fight Fire Fascination (FFF) education program aimed at deterring young people from engaging in arson. The FFF program was reinstated in 2016 and is a carefully designed education program for children (3-17 years) whose parents or guardians are concerned about their unsafe fire behaviour. FFF is delivered through a series of visits to the home by specially trained firefighters (QFES, 2019).



Arson Statistics - Capricorn District - 2014 - 2020.
Source: QPS

8.5.2 Future Opportunities and Risks:

The Rockhampton Region LDMG has the opportunity to support QPS and QFES with promoting messaging in achieving an overall arson reduction trend across the Region.

The LDMG in consultation with QFES should consider a target to increase the delivery of the FFF Program, with the Mount Morgan area targeted in the first year of this Plan.

9 Funding Options for Mitigation

Mitigation budgets will always be allocated from agencies across the LDMG to meet their legislative needs. In addition to agency funding, members of the LDMG can apply for funding grants, as they become available, to undertake bushfire mitigation programs.

They consist of:

- Category C – Queensland bushfires flexible funding grants, available through the Department of Communities, Housing and Digital Economy (DCHDE).
- Queensland Disaster Resilience Fund, available through the Queensland Reconstruction Authority (QRA).
- Get Ready Queensland – a funding program for councils to build community resilience.
- Other local grant programs as advertised periodically.

10 Mitigation Enhancement Priority Locations

The following priority locations are the highest risk geographical areas in the Region to be addressed in the period 2021-2025. It is designed so these locations become focal areas for **enhanced** mitigation works. That is, targeted bushfire mitigation in addition to the work that already occurs across the Region.

10.1 Priority Location 1 – Mount Archer

10.1.1 Mitigation Focus Areas Actions

Action Number	Mitigation Action	Responsible	Due Date
MA1	There is increased surveillance and clearing of the interface between the National Park and Residential Zones to stop the collection of additional fuel behind houses.	RRC	June 2021 and then ongoing
MA2	An annual bushfire education program is delivered focusing on preparation and evacuation priorities of the residents of Mount Archer, using the Bushfire Evacuation Plan – Mount Archer (BEP-MA).	QFES, supported by LDMG	June 2021 and then ongoing
MA3	Mount Archer has a range of fire trails, access tracks, and is accessible to larger amounts of resources on poor fire danger days. The amount of planning which has been done in this area for both fire mitigation, response and evacuation plan also reduces the risk profile of this area, and as such the current practices reduce the overall risk to the Mount Archer Area. These practices should continue.	QPWS&P and RRC	Annually as per current practice
MA4	Current fuel reduction programs are continued by Queensland Parks and Wildlife Service and Partnerships (QPWS&P).	QPWS&P	Annually as per current practice
MA5	Funding for fuel reduction burns behind the urban areas of Frenchville is considered by RRC and carried out by Queensland Fire and Emergency Services (QFES).	QFES, RRC and supported by QPWS&P	June 2021 and then ongoing

10.1.1.1 Mitigation Feasibility

Mitigation Option	Feasible?	Notes
Land Use Planning	Yes	Areas surrounding most properties are connected to QPWS&P estate. Given the proximity to the Livingstone Shire Council border, consider connected Land Use Planning at a regional level.
Resilient Development	Yes	Most of the at-risk area bordering Mount Archer, including the suburbs of Frenchville, Koongal, Norman Gardens and Lakes Creek, are bordered by Medium – Very High Fire Prone Land and therefore are subject to the considerations of the Rockhampton Region Planning Scheme.
Risk Based Planning	Yes	QFES and QPWS&P facilitate joint planning for both mitigation and response activities and are working on a common sector naming convention. The Bushfire Evacuation Plan – Mount Archer (BEP-MA) provides strategic advice on community resilience levels, and the risks associated with evacuation of the area.
Fuel Reduction Hazard Reduction	Yes	Mosaic and small parcel asset protection occurs on a scheduled basis by a number of key land managers throughout the year. The area has fire management plans for prescribed burning.
Mechanical	Yes	Mechanical and manual slashing etc. is feasible given the work that has been completed by RRC in creating and maintaining access to the areas.
Grazing	Yes	The last grazing lease over Mount Archer National Park expired in 1974. Grazing authorities have previously been granted for Mount Archer State Forest. Future grazing will be considered, particularly in the New Zealand gully area, as a pest plant control tool.
Vegetation Management	Yes	The area contains large areas of dry rainforest in excellent condition and is rich in biodiversity. Vegetation Management is as per approved environmental approvals through DoR (refer <i>Vegetation Management Act 1999</i>).
Regulatory	Yes	Any hazard reduction burning is subject to permit allocation. Any permit conditions are suspended upon the declaration of a Total Fire Ban or State of Fire Emergency by the Commissioner, QFES. RRC and QPWS should further plan together to look at regulatory functions in relation to the dumping of green waste etc. over fence boundaries in the buffer zone.
Fire Lines and Trails	Yes	Fire lines and access trails are established and maintained by RRC under the general direction of QPWS&P. Opportunity exists for a more cohesive use of RRC plant through joint planning between QPWS&P and RRC.
Arson Prevention	Yes	There has been arson detected in the area of Norman Creek and New Zealand Gully in the past, which could be the subject of strategies for arson prevention.

Table 2: Bushfire Mitigation Feasibility – Mount Archer

10.1.1.2 Cost Benefit Analysis

Option	Costs (per annum)	Benefit	Annual Maintenance	Average Value of Assets Protected	Approx. Number of Houses Protected	Cost Benefit Analysis (per annum per value of property protected)	Resp
Fire Trail Construction – Grader	\$75-\$160 per hour (12-16ft)	Grader lines will protect interface properties in the Koongal, Mount Archer and Parts of the Norman Gardens suburbs.	Required	\$320,000	250	0.00009 – 0.0002 (Based on maintenance of existing trails)	RRC and QPWS&P
Fire Trail Construction – Dozer	\$180-\$519 per hour (D6-D9)	Strategic Trails have the potential to provide breaks to reduce impact to the summit and provides strategic options for fire control in general.	Required		250	0.000225 – 0.0006 (Based on maintenance of existing trails)	RRC and QPWS&P
Hazard Reduction – Burning	\$110-\$250 per hour per unit	Burning the vegetation across the western interface will protect the suburbs of Norman Gardens, Frenchville and Koongal.	Required for Grasslands, every 3-4 areas for bushland areas.		3500	0.0-0.0004 (Based on existing QPWS&P program and enhanced interface burning program)	RRC, QFES
Hazard Reduction – Slashing	\$100-120 per hour	Slashing will protect residents in and around the Lakes Creek and Koongal Areas.	Generally effective for a point in time. Largely dependent on climatic conditions post slashing on re-growth		450	0.00013 – 0.0016	RRC
Community Education	\$110-\$250 per hour		Required annually due to community complacency and population change. Does not consider collateral costs.		4000	0.00002 -0.0005 (Based on an enhanced Community Education Program)	RRC, QFES

Table 3: Bushfire Mitigation Cost vs. Benefit Ratio – Mount Archer

10.2 Priority Location 2 – Mount Morgan

10.2.1 Mitigation Focus Areas Actions

Action Number	Mitigation Action	Responsible	Due Date
MM1	There is an increase in the current burning program by the Department of Resources (DoR) and consideration is given to integrating with the Rockhampton Regional Council (RRC) slashing program.	DoR and RRC	June 2021 and then ongoing
MM2	Rockhampton Regional Council (RRC) should consider fire trail construction to access the new mountain bike trail, to support a balanced outcome to leisure activities and bushfire safety.	RRC	June 2022 and then ongoing
MM3	Continue to maintain and build the fire access trail network. In addition to this, the trails are classified, and mapping is updated.	DoR and RRC	June 2025
MM4	A targeted community education program on evacuation and arson prevention is delivered, based on seasonal risk.	QPS and QFES	June 2021 and then ongoing

10.2.1.1 Mitigation Feasibility:

Mitigation Option	Feasible	Notes
Land Use Planning	Yes	Areas surrounding most properties are connected to either RRC or DoR land. Given a significant area is surrounded by freehold and/or unallocated state land, there is good flexibility in Land Use Planning moving forward
Resilient Development	Yes	Most of the at-risk areas bordering Mount Morgan including the localities of Barea, Struck Oil, Nine Mile, Moongan all border on Medium – Very High Fire Prone Land and therefore are subject to the considerations of the Rockhampton Planning Scheme. Of particular concern is that the majority of houses were built prior to the Code taking effect.
Risk Based Planning	Yes	DoR and RRC facilitate joint planning for both mitigation and response activities and are working on a common sector naming convention. The Bushfire Evacuation Plan – Mount Morgan (BEP-MM) provides strategic advice on community resilience levels, and the risks associated with evacuation.
Fuel Reduction Hazard Reduction	Yes	Generally small parcel asset protection occurs on a scheduled basis by DoR with the support of the local RFS brigade and FRS station. This provides a good protective overlay for the travel of fire between properties.
Mechanical	Yes	Mechanical and manual slashing etc. is feasible given the work which has been completed by RRC in creating and maintaining access to the areas.
Grazing	Yes	Grazing occurs both within the township on small blocks, and along freehold leases which border the town. There are minimal barriers in place for this to occur, once relevant permissions have been received by graziers.
Vegetation Management	Yes	The area is largely either private, freehold, RRC or unallocated state land (managed by DoR). Vegetation monitoring occurs by DoR in relation to changes to vegetation type.
Regulatory	Yes	Any hazard reduction burning is subject to permit allocation. Any permit conditions are suspended upon the declaration of a Total Fire Ban. There is a significant opportunity for RRC to undertake regulatory actions in relation to yard maintenance given the significant risk of property-to-property fire progression.
Fire Lines and Trails	Yes	Fire lines and access trails are established and maintained by RRC under a joint planning approach with DoR. Opportunity exists for a more cohesive use of RRC plant through joint planning between DoR and RRC.

Table 4: Bushfire Mitigation Feasibility – Mount Morgan

10.2.1.2 Cost Benefit Analysis

Option	Costs (per annum)	Benefit	Annual Maintenance	Average Value of Assets Protected	Approx. Number of Houses Protected	Cost Benefit Analysis	Resp
Fire Trail Construction – Grader	\$75-\$160 per hour (12-16ft)	The connecting of existing grader and dozer lines will form a “ring” around Mount Morgan to provide additional protection. Additional work be considered for the access to the Mountain Bike Track.	Required	\$100,000	450	0.00016 – 0.0003 (Based on maintenance of existing trails)	RRC and QPWS&P
Fire Trail Construction – Dozer	\$180-\$519 per hour (D6-D9)	The connecting of existing grader and dozer lines will form a “ring” around Mount Morgan to provide additional protection. Additional work be considered for access for the Mountain Bike Track.	Required		250	0.00064 – 0.0018 (Based on maintenance of existing trails)	RRC and QPWS&P
Hazard Reduction – Burning	\$110-\$250 per hour per unit	DoR conducts burning to a program, which is budgeted for. Additional budget allocation would allow for a more enhanced protection of assets.	Required for Grasslands, every 3-4 areas for bushland areas.		3500	0.00064 – 0.0018 (Based on existing QPWS&P program and enhanced interface burning program)	RRC, QFES
Hazard Reduction – Slashing	\$100-120 per hour	Slashing will protect residents in and around much of the interface given the grassland areas which interface with forested area.	Generally effective for a point in time. Largely dependent on climatic conditions post slashing on re-growth		700	0.0004 – 0.0005	RRC
Community Education	\$110-\$250 per hour	Community education based around evacuation and arson-prevention to reduce ignition rate	Required annually due to community complacency and population change. Does not consider collateral costs, as this is wide ranging.		1000	0.0003 – 0.0007 (Based on an enhanced Community Education Program)	QFES

Table 5: Bushfire Mitigation Cost vs. Benefit Ratio – Mount Morgan

10.2.1.3 Applying the Cost vs. Benefit Ratio

The cost of applying a cost benefit ration to bushfire mitigation is a complex measure. It often relies

on wildfire to impact an area to truly test the effectiveness of the mitigation. What comes with this is the complexity of measuring community education programs. Linked to Mitigation Action Item M7, using the QFES predictive services unit to provide data post major wildfires, this can demonstrate the effect. From there, a detailed analysis on the cost of the mitigation activity can be applied vs. those properties which were protected.

As a general rule, the Cost Benefit Analysis would be measurement applying the formula below:

$$\frac{\text{Cost of Mitigation activity} \times \text{Number of Years}}{\text{Value of properties **directly** protected}}$$

The number of years is important, as annual works are often needed to maintain mitigation activities such as slashing and burning. The Mitigation activities should include all those actions taken to protect those properties – for example the protection of properties in Lakes Creek could include the maintenance of fire trails for fire appliances to access, hazard reduction, slashing and community education programs completed.

Direct properties protected can be achieved through analysis of the QFES predictive services data. This considers the direct impact of the fire should the mitigation activities have not occurred, along with buffer properties which could have been impacted from spot fires.

10.3 Priority Location 3 – Goodedulla – Morinish

10.3.1 Mitigation Focus Area Actions:

Action Number	Mitigation Action	Responsible	Due Date
GM1	That the Local Disaster Management Group (LDMG) better understand the Queensland Parks and Wildlife and Partnerships (QPWS&P) parks closure process based on fire danger.	QPWS&P supported by LDMG	March 2021 and then ongoing
GM2	A targeted Community Education Program is delivered, based on seasonal risk.	QFES supported by LDMG	June 2021 and then ongoing
GM3	The Local Disaster Management Group (LDMG) further seeks to understand what local mitigation programs are being undertaken and link these into current agency plans.	QPWS&P, QFES, FMG and LDMG	June 2021 and then annually
GM4	In addition to the significant work conducted annually by the Queensland Parks and Wildlife Service and Partnerships (QPWS&P) for annual fire line maintenance at Goodedulla National Park, consideration be given to link this work with additional mitigation measures occurring outside of the park.	QFES	June 2021 and then annually
GM5	A greater focus be given to increase fuel reduction across both Goodedulla and Morinish State Forests, building on the work that exists already with local neighbours who proactively carry out fuel mitigation to minimise risk to pastures.	QPWS&P supported by SF lessee	June 2021 and then annually

10.3.1.1 Mitigation Feasibility

Mitigation Option	Feasible?	Notes
Land Use Planning	Yes	Most of the rural properties in and around the area are defined under bushfire prone land in themselves and are subject to the considerations of the Rockhampton Planning Scheme. Of particular concern is that a majority of houses were built prior to the Code taking effect.
Resilient Development	Yes	Most of the at-risk area bordering the National Park and Forestry areas is remote or rural remote. This reduces the people at risk ratio of other areas, however, provides a landscape conducive to large and fast-moving fire spread.
Risk Based Planning	Yes	The area is prone to lightning strikes, and fires could easily start in the Central Highlands Local Government Area and travel into Rockhampton. The risk exists that fires could grow to 25,000+ha in the park, and if significant spotting occurred, it could have a 'wicking' effect through the Fitzroy River Riparian zones.
Fuel Reduction	Yes	QPWS&P are responsible for hazard reduction across the area. Opportunities exist to work between the Central Highlands AFMG and the Rockhampton AFMG to look at the parcel of land with an LGA-blind approach given the boundary traverses the park.
Hazard Reduction	Yes	Mechanical and manual slashing etc. is feasible with the terrain in some areas, however resourcing for this will always compete for higher risk areas in the area.
Mechanical	Yes	
Grazing	Yes	A grazing authority exists under the provisions of the Land Act 1994 for Develin State Forest, it is valid until 2037 issued in accordance with the <i>Nature Conservation Act, 1992</i> and the <i>Forestry Act, 1959</i> .
Vegetation Management	Yes	The park vegetation is diverse and includes rosewood and vine forest. Other areas are a combination of private property and the state forests of Develin, Aricia and Morinish.
Regulatory	Yes	Any hazard reduction burning is subject to permit allocation. Any permit conditions are suspended upon the declaration of a Total Fire Ban.
Fire Lines and Trails	Yes	Fire Lines are maintained by QPWS&P. Opportunity exists for a more cohesive use of RRC plant through joint planning between QPWS&P and RRC.
Arson Prevention	Yes	There is no evidence to suggest arson in the area, and QPWS&P provides good tips for campers for fire management and awareness in the park.

Table 6: Bushfire Mitigation Feasibility – Goodedulla - Morinish

10.3.1.2 Cost Benefit Analysis

Option	Costs	Benefit	Annual Maintenance	Average Value of Assets Protected	Approx. Number of Farms Protected	Cost Benefit Analysis (per annum per value of property protected)	Resp
Fire Trail Construction – Grader	\$75-\$160 per hour (12-16ft)	Grader and Dozer lines have the potential to break up the park further to create further mitigation and fire management options	Required	\$850,000 (Total Farm Value)	250	0-0.0002 (Based on constructing new trails)	RRC and QPWS&P
Fire Trail Construction – Dozer	\$180-\$519 per hour (D6-D9)	Grader and Dozer lines have the potential to break up the park further to create further mitigation and fire management options.	Required		250	0.0003-0.0008 (Based on constructing new trails)	RRC and QPWS&P

Option	Costs	Benefit	Annual Maintenance	Average Value of Assets Protected	Approx. Number of Farms Protected	Cost Benefit Analysis (per annum per value of property protected)	Resp
Hazard Reduction – Burning	\$110-\$250 per hour per unit	Burning the vegetation across both the National Park and State Forest will reduce fire spread into the landscape	Required for Grasslands, every 3-4 areas for bushland areas.		3500	0.0–0.0004 (Based on an increased Hazard Reduction Program)	RRC, QFES
Hazard Reduction – Slashing	\$100-120 per hour	Slashing will protect residents in and around the Lakes Creek and Koongal Areas.	Generally effective for a point in time. Largely dependent on climatic conditions post slashing on re-growth		450	0.0–0.0004	RRC
Community Education	\$110-\$250 per hour		Targeted outreach program that also collects the mitigation activities which are happening on Private Land		4000	0-0.0002	RRC, QFES

Table 7: Bushfire Mitigation Cost vs. Benefit Ratio – Goodeedulla - Morinish

11 Monitoring and Reporting

The monitoring and reporting of this Mitigation Plan is conducted by RRC DMU on behalf of the LDMG.

Following the principles of the *IGEM Lessons Management Framework*, an approach is followed where recommendations, once accepted by the LDMG, are reported regularly to the LDMG until completion.

The closing of any recommendation should consider the leading factors that were discovered as part of The Study, along with any associated strategies which are recommended in the Bushfire Management Strategy (2021-2025).

The recommendations within this Plan are designed to be achieved within the 2021-2025 period. They are also designed to be followed with further recommendations to continue the enhancements for the next timeframe, where the same monitoring and reporting framework is implemented.

It would be beneficial to conduct an evaluation of this Plan and overall Strategy at the end of this period to determine what has been achieved, what needs to be continued, and the effectiveness. Any lessons from the evaluation can be applied to the next phase, as required.

12 Annex A – References

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