Bushfire Management Plan

Mango Tree Estate
2020-2030

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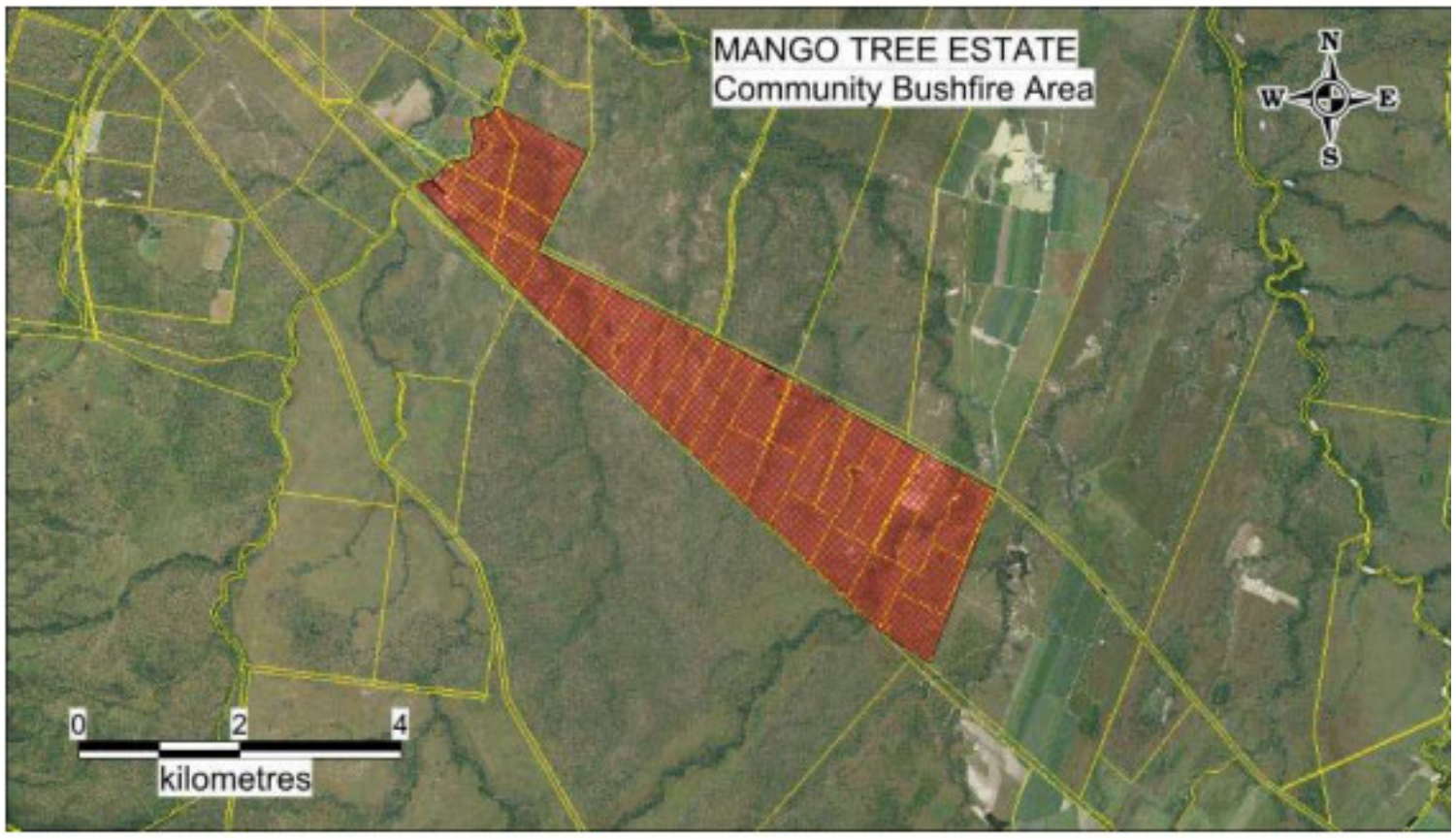

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Executive Summary

The purpose of the Mango Tree Estate Community Bushfire Management Plan is to document bushfire hazard and describe how this hazard will be managed for the next 10 years (2020-2030). This Bushfire Plan is specifically written for the Mango Tree Estate residents and stakeholders. The Mango Tree Estate fire plan area covers the land between Greta Creek to the north to ten-mile Creek to the south and the western boundary as the railway line and the eastern boundary is the Bruce Highway. This Plan covers 1210 ha with the Council owning or managing 0 ha. This Community Bushfire Plan covers approximately 26 rural residential properties and lots. The main land owner are private lot owners which hold lifestyle lots between 30 and 40ha.

The reason why this Bushfire Management Plan has been developed is the large number of residential and rural-residential dwellings occurring in and adjacent to high bushfire hazard areas in the localities of Mango Tree Estate. Fire management agencies are concerned that wild fires in the Mango Tree Estate area could threaten numerous residential properties.

The Mango Tree Estate Bushfire Plan seeks the following outcomes:

- Describe the extent of bushfire hazard.
- Describe the location of existing and potential fire control lines and fire breaks.
- List the roles and responsibilities for bushfire management.
- List the proposed schedule of bushfire mitigation tasks.

While this proposed Community Bushfire Management Plan provides guidelines on how the Mango Tree Estate bushfire hazard could be managed. Each landholder is responsible under legislation to manage their own bushfire hazard. The Council encourages landholders to discuss their bushfire planning and management with their neighbours.

The Council has developed this Community Bushfire Management Plan in consultation with the Queensland Fire and Emergency Services (QFES), Queensland Parks and Wildlife Service (QPWS), Reef Catchment, and representatives of the local Rural Fire Brigade. The information contained in this Bushfire Plan is based on data collected from stakeholders over recent years and information available on the Queensland Rural Fire Brigade website.

Acknowledgements
The Whitsunday Regional Council would like to thank the following stakeholders who have contributed to the Mango Tree Estate Community Bushfire Management Plan;

- Queensland Fire and Emergency Services (QFES)
- Queensland Parks and Wildlife Service (QPWS)
- Up River Rural Fire Brigade
- Reef Catchments Natural Resource Management Group

Document Control

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1. Introduction

The Mango Tree Estate area has been identified as having a high bushfire hazard due to the vegetation type, slope and aspect. The rural residential lots between Greta Creek and Ten-mile Creek is commonly referred to as Mango Tree Estate. The locality of Mango Tree Estate has a history of bushfire threatening properties. The rural locality has a moderate to high risk for loss of life and/or property if the bushfire hazard is not managed appropriately. There are numerous residential dwellings located in and adjacent to flammable vegetation. Fire Management agencies are concerned that wildfires in the Mango Tree Estate area could cause damage to a number of properties which are surrounded by unmanaged Eucalypt and tea-tree (Melaleuca) woodland.

The Council, together with the Queensland Fire and Emergency Services have defined an area in the Mango Tree Estate locality which has vegetation and topographic conditions which warrant more detailed community bushfire planning. The Mango Tree Estate Fire Plan area covers 26 rural residential lots and covers over 1210ha. The Whitsunday Regional Council owns or manages 0ha of land in this area. The Queensland government owns 0ha. The Mango Tree Estate Fire Plan area has been defined based on the likelihood of bushfires occurring and the residential lots which could be affected.

The purpose of this Community Bushfire Management Plan is to identify the actions required to reduce bushfire hazard in the Mango Tree Estate township and surrounding area for the next 10 years (2020-2030) (Figure 1). The objectives of this Plan include;

- Identify where fire lines are required to protect life and property from fire,
- Maintain an ecologically appropriate controlled burn program,
- Improve community awareness,
- Maintain coordination and communication between landowners,
- Description of a maintenance program to manage bushfire hazard and risk.

It is envisaged that this Community Bushfire Management Plan will be used as a communication tool to inform stakeholders and the community of the bushfire hazard within Mango Tree Estate and how it could be managed. Ultimately, each landholder will be responsible for managing bushfire hazard on their own land. The Council encourages a coordinated and cooperative approach to community bushfire hazard management.

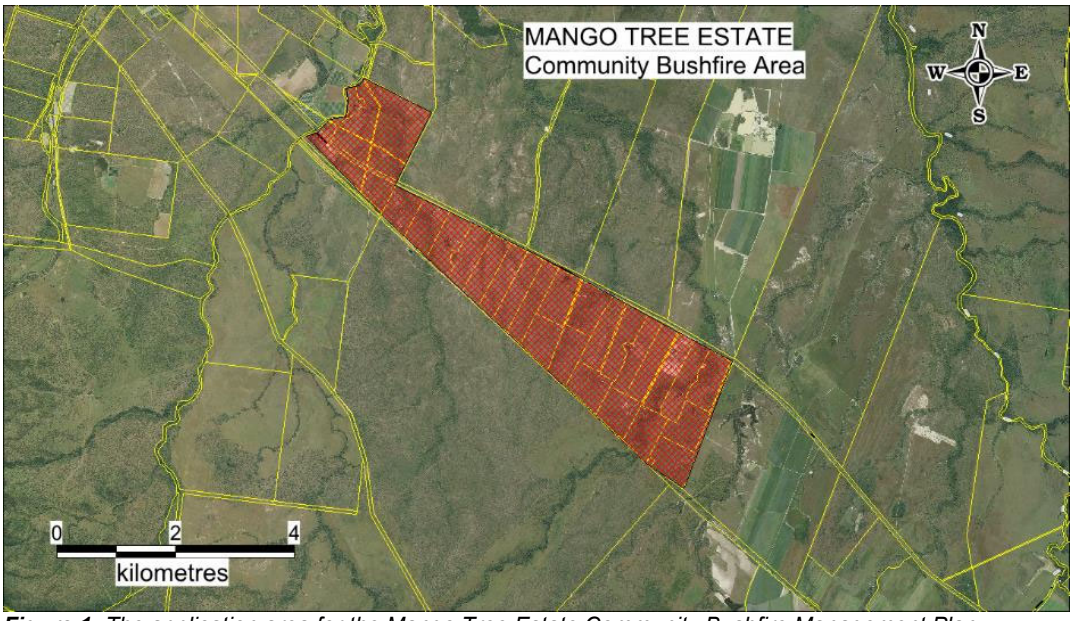

Figure 1: *The application area for the Mango Tree Estate Community Bushfire Management Plan*

2. Background

2.1 Land Tenure and Ownership

The Mango Tree Estate Community Bushfire planning area covers approximately 1210ha with 0ha being owned or managed by the Whitsunday Regional Council and 0 ha owned by the Queensland State government. There are 26 lifestyle lots which cover between 30 and 40ha.

2.2 Site Description

Geology, Landform and Soils

The geology of the Mango Tree Estate area was mapped by the Queensland government in 1972. An extract of the Proserpine geology map is shown in Figure 2. The undulating rises of the Mango Tree Estate area are predominantly formed on Tertiary sandstone sediments (To). The geology influences the fertility of the soils and also the type of vegetation which occurs.

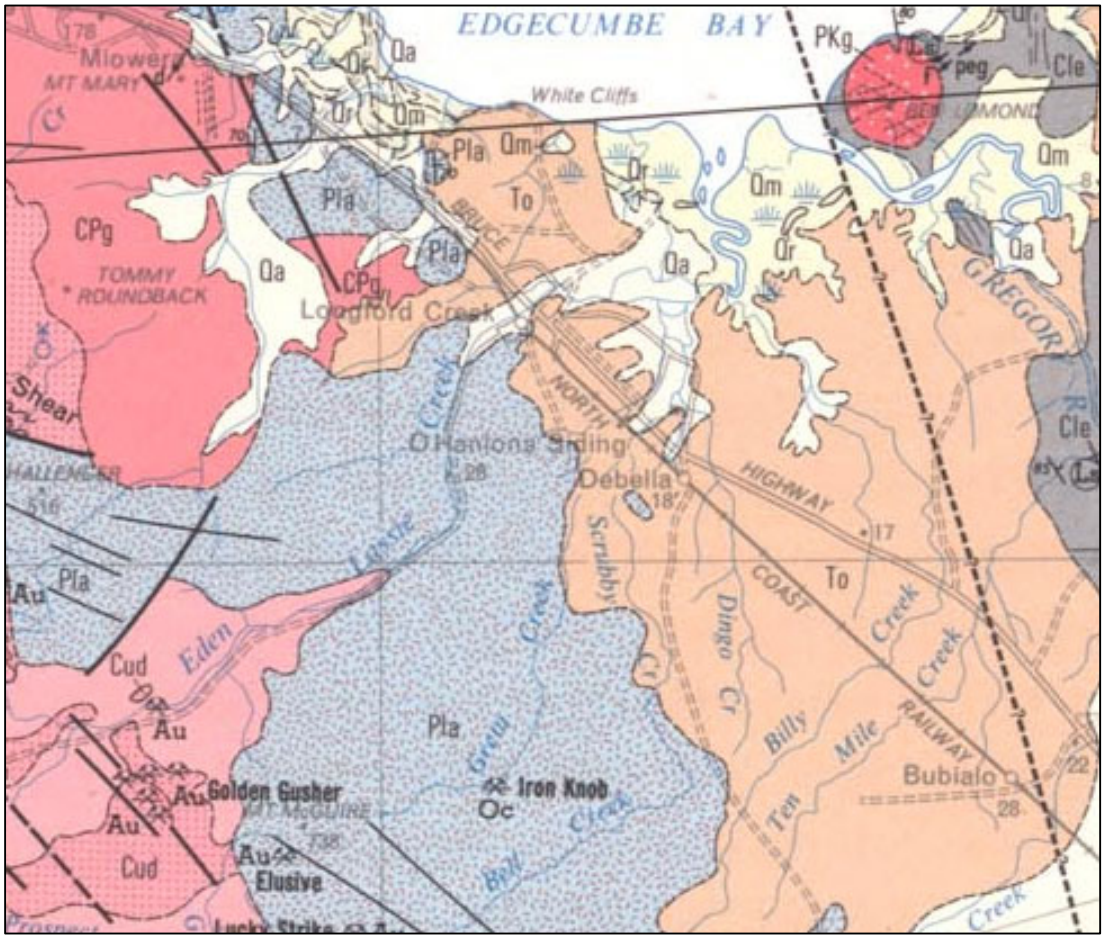

Figure 2: *Geology Map covering the Mango Tree Estate Area (Paine and Cameron, 1972)*

The soils of the Mango Tree estate area was mapped by Hardy (2003). The main soils in the Mango Tree estate area are sandy, dispersive duplex soils with low fertility.

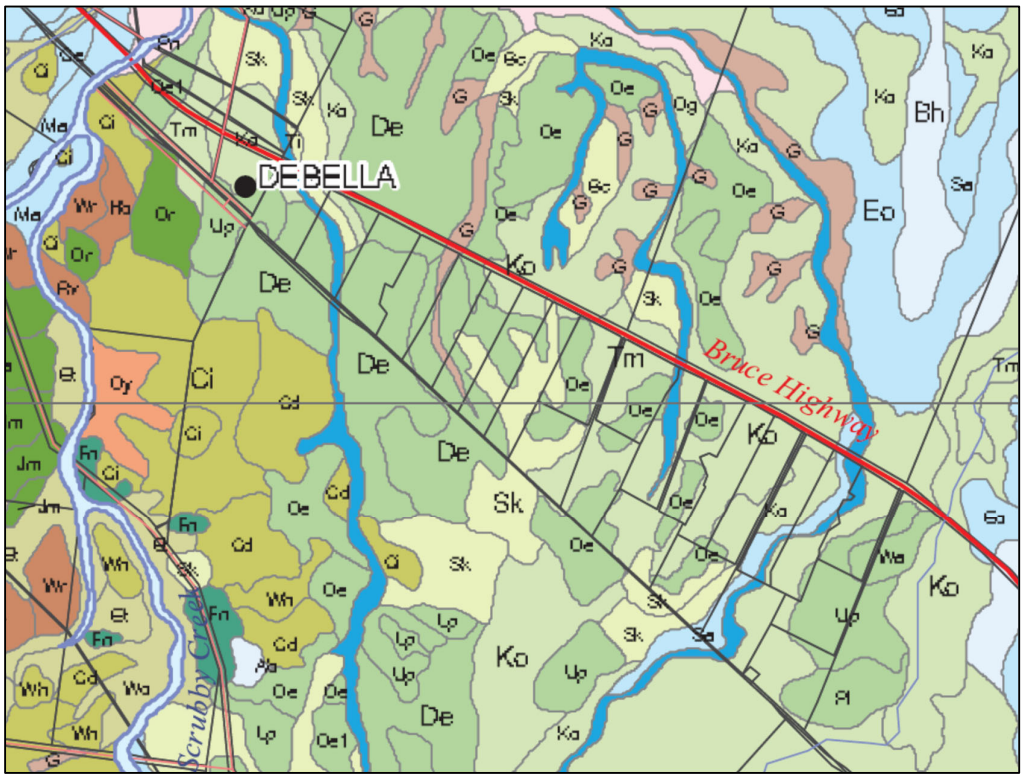

Figure 3: *Soils of the Mango Tree Estate Area*

Vegetation

The vegetation of the Mango Tree Estate area has been mapped by the State government. The regional ecosystem map for the Mango Tree Estate area can be found in the appendix of this report. The geology, fertility of the soils and rainfall patterns influence the vegetation of the Mango Tree Estate area. The dominant vegetation surrounding the Mango Tree Estate area is open eucalypt forest and woodland. The dominant regional ecosystems are:

- Regional ecosystem 8.3.5. Eucalyptus platyphylla and/or Lophostemon suaveolens and/or Corymbia clarksoniana woodland on alluvial plains
- Regional ecosystem 8.5.1. Corymbia clarksoniana and/or C. intermedia open forest on Tertiary sand plains and rises including small areas of shale (mainly subregion 6)
- Regional ecosystem RE 8.3.3.. Melaleuca leucadendra and/or M. fluviatilis and/or Casuarina cunninghamiana +/- Syncarpia glomulifera open forest, on creek banks.
- Regional ecosystem Re 8.5.6. Melaleuca viridiflora +/- Allocasuarina littoralis woodland on Tertiary sand plains.

The regional ecosystem map for the Mango Tree Estate area can be found in the appendix.

2.3 Bushfire Legislation and Policy

Australia and Queensland

All levels of government have a responsibility and role in bushfire management. In 2014, the Council of Australian Governments approved the National Bushfire Management Policy Statement (National Forest Fire Management Group, 2014). The National Policy identifies Local government and other landholders having an important role in bushfire management and planning. The National Bushfire Policy identifies four main strategic objectives and 14 bushfire management goals. The four strategic National bushfire management objectives are:

- Effectively managing the land with fire
- Involved and capable communities
- Strong land, fire and emergency partnerships and capability
- Actively and adaptively managing risk

There is a legislative requirement under Common Law and the *Queensland Fire and Emergency Services Act 1990* for Local Government and residents as owners and occupiers of land to prevent fires escaping from their land and damaging property (Tran and Peacock, 2002). Councils and other landholders have an obligation to manage their land responsibly to prevent the loss of life or property and reduce the 'human' impacts of bushfires. Landholders are also required however to achieve this and still maintain their obligations under other legislation. Obligations under the *Nature Conservation Act 1992* for example require local authorities to protect and conserve rare or threatened species, biodiversity and ecological processes.

The *Fire and Emergency Services Act 1990* is the principle legislation that deals with lighting fires in the open in Queensland. The Act makes it illegal to light a fire without a 'Permit to Light Fire' issued by a fire warden.

The *Queensland Vegetation Management Act (1999)* regulates vegetation clearing. However, there are exemptions available to clear vegetation to develop and maintain fire breaks and fire control lines. The exemptions are found in the appendix of this report.

Whitsunday Regional Council

The Whitsunday Regional Council developed a Bushfire Management Policy and Bushfire Management Plan in 2018. The purpose of the Policy is to define Council's intension in bushfire management, planning and on-ground actions. The purpose of the Council's Bushfire Plan is to identify high risk Council lots for bushfire risk and outline a program of works to better manage bushfire risk on Council managed lots. The Council Bushfire Management Plan lists community education and awareness concerning bushfire hazard as an important action and outcome.

The Whitsunday Regional Council has developed a local law which includes the regulation of fires.

2.4 Bushfire Hazard and Risk

Bushfire Hazard

Bushfire hazard refers to the conditions which could support the presence of a fire. There are a number of methods that can be used to assess bushfire hazard. One of the most commonly used bushfire hazard assessment tool is documented in the Queensland State Planning Policy 1/03. According to Risk Frontiers (2011) the Queensland Fire and Rescue Service have used the SPP 1/03 bushfire hazard methodology and the Interface Zone (I Zone) methodology to identify bushfire hazard areas. The I-Zone is where the urban-rural residential land use meet flammable vegetation (Risk Frontiers, 2011).

More recently the CSIRO have developed a slightly different approach to determining and mapping bushfire hazard (Leonard, 2014). The methods developed by Leonard *et al.,* (2014) have been used to develop the current Queensland bushfire hazard mapping. The CSIRO method uses vegetation type, slope and estimated fuel load to allocate land to 20 Vegetation Hazard Classes.

The Queensland State Planning Policy bushfire hazard process involves the assessment of vegetation, slope and aspect. Scores are allocated to vegetation, slope and aspect. The bushfire attribute scores are then added to determine the total hazard score. The vegetation communities hazard assessment is shown in Table 1, the slope assessment is shown in Table 2 and the aspect assessment is shown in Table 3. The classification of bushfire hazard is shown in Table 4.

Table 1: *Vegetation Communities assessment table used to determine vegetation hazard score.*

Vegetation Communities	Fire Behaviour	Hazard Score
Wet sclerophyll forest, tall eucalypts (>30m), with grass and mixed shrub understorey	Infrequent fires under severe conditions, flame lengths may exceed 40m, floating embers attack structures for 1 hour, radiant heat and direct flame are destructive for 30 minutes.	10
Paperbark heath and swamps, eucalypt forest with dry-shrub ladder fuels.	Fire intensity depends on fuel accumulation, but can be severe, with flame lengths to 20m, spot fires frequent across firebreaks, radiant heat and direct flame for 15 minutes.	8
Grassy eucalypt and acacia forest, exotic pine plantations, cypress pine forests, wallum heath	Fire intensity may be severe with flam lengths to 20m, but less attack from embers	6
Native grasslands (ungrazed), open woodlands, canefields	Fast moving fires, available to fire annually to 4 years. Usually no ember attack, radiant heat for >10m, duration < 2minutes.	5
Intact acacia forests, with light grass to leaf litter, disturbed rainforests.	Fires infrequent, usually burn only under severe conditions, relatively slow fires, usually little ember attack.	4
Orchards, farmlands, kikuyu pastures	Fires very infrequent, slow moving, may be difficult to extinguish, frequent fire breaks.	2
Grazed grassland, slashed grass	Grazing reduces intensity and rate of spread of fire, duration < 2 minutes.	2
Desert lands (sparse fuels), mowed grass	Gaps in fuel, usually slow fire spread.	1
Intact rainforest, mangrove forest, intact riverine rainforest	Virtually fire proof.	0

Table 2: *The slope assessment table used to determine the slope hazard score.*

Slope	Hazard Score
Gorges and Mountains (>30%)	5
Steep Hills (20% - 30%)	4
Rolling Hills (10% to 20%)	3
Undulating (5% to 10%)	2
Plain (0% to 5%)	1

Table 3: *The aspect assessment table used to determine the aspect hazard score.*

Aspect	Hazard Score
North to North-west	3.5
North-west to West	3
West to South	2
North to East	1
East to South and all land under 5% slope	0

Table 4: *The determination of bushfire hazard using the Queensland SPP 1/03 system.*

Total Hazard Score	Severity of Bushfire Hazard
13 or greater	High
6 to 12.5	Medium
1 to 5.5	Low

Fuel load is a main contributor to bushfire hazard (Middelmann, 2007). There are a number of methods used to estimate, measure and assess fuel loads. Hines *et al.* (2010) have developed a system of measuring forest fuel loads in Victoria. The method developed by Hines *et al.,* (2010) for estimating fuel loads is based on separating the forest into fuel layers and then estimating or measuring the potential fuel within each of these layers. The amount of fuel contained in these layers is measured in terms of tonnes per hectare.

The Queensland Fire Emergency Service (QFES) have produced bushfire hazard rating maps for Queensland. Bushfire hazard is rated as either low, medium or high based on vegetation type, aspect, topography and climate. The QFES bushfire hazard rating maps are usually produced at a scale of 1:250,000 or 1:100,000. Bushfire hazard areas rated as low on the QFES maps mostly relate to rainforest areas, while high risk areas relate to Eucalypt and wattle areas. The bushfire hazard maps can be a useful guide to bushfire hazard and the likely risk of bushfire occurring in a locality. However, these bushfire hazard maps may not be accurate on properties less than 20ha. Land with a high or medium bushfire hazard rating should have some bushfire management plan or process in place.

Bushfire Risk

Bushfire risk refers to the likely occurrence or frequency of a bushfire. Middlemann (2007) states that "the likelihood of bushfire hazard can be summarised in terms of the probability of a fire arriving at a point in the landscape and the intensity of the fire at that point ". Risk can be increased due to a number of factors including a high bushfire hazard and proximity to ignition sources such as roadsides and populated areas. Bushfire planning and mitigation measures can reduce bushfire hazard and risk.

Local governments are involved in bushfire risk reduction measures such as the development of local laws regulating fires, development planning, development of disaster management plans and implementation of bushfire mitigation measures (Middlemann, 2010).

There are a number of methods used to measure risk. The NSW Rural Fire Service (2008) have developed a matrix to describe bushfire risk (Figure 4). The NSW Rural Fire Service risk matrix requires the determination of the likelihood of a bushfire occurring and the likely consequences.

Consequence / Likelihood	Minor	Moderate	Major	Catastrophic
Almost certain	High	Very High	Extreme	Extreme
Likely	Medium	High	Very High	Extreme
Possible	Low	Medium	High	Very High
Unlikely	Low	Low	Medium	High

Figure 4: *The determination of bushfire risk (NSW Rural Fire Service 2008).*

The likelihood of a bushfire occurring will depend largely on the bushfire hazard. The consequence of a bushfire occurring at a given location will depend on the environmental values and development present (NSW Rural Fire Service, 2008).

Mango Tree Estate Bushfire Hazard

The Queensland State government have mapped the bushfire hazard in the Mango Tree Estate area (Figure 5). The lifestyle blocks of the Mango Tree Estate have been mapped as having no bushfire hazard which does not reflect the fire history of the area. The majority of the regional ecosystem in this area is recognised by fire authorities and the Queensland herbarium as having a medium fire hazard.

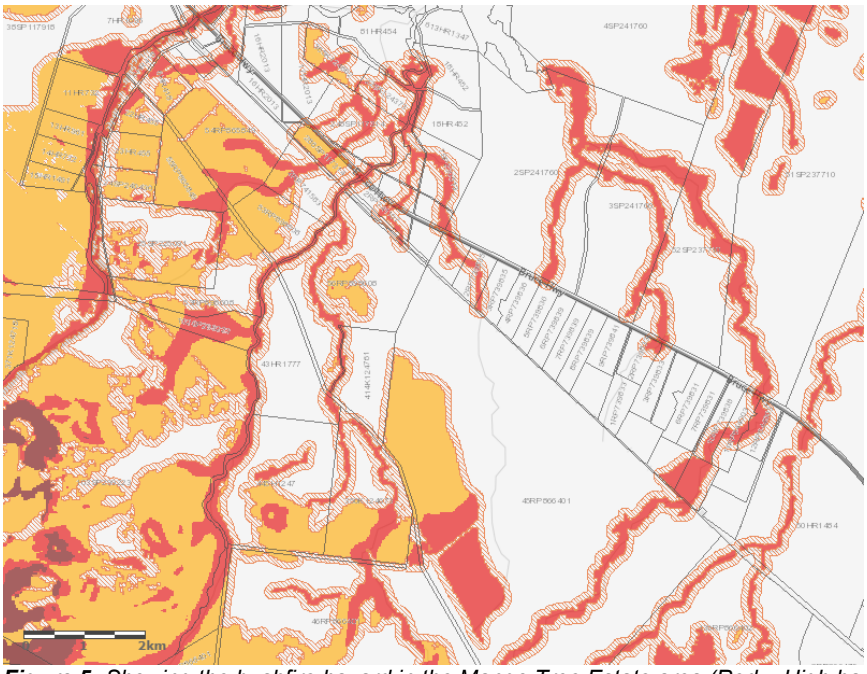

Figure 5: *Showing the bushfire hazard in the Mango Tree Estate area (Red = High hazard, Orange = Medium hazard).*

2.5 Bushfire Management Guidelines

Bushfire Guidelines for Regional Ecosystems

The regional ecosystem characteristics can provide information which can guide bushfire management and planning. The Whitsunday Regional Council is partially included in the Central Queensland Coast and Northern Brigalow Belt bioregions. There are 83 individual regional ecosystems in the Central Queensland Coast bioregion and 172 regional ecosystems found in the Northern Brigalow Belt bioregion.

The type of vegetation community, it's fire requirements and hazard can be used for bushfire planning. Bushfire management advice for a selected number of regional ecosystems are listed in Table 5. The bushfire management advice provided by the Queensland State government for each regional ecosystem is found at: https://publications.qld.gov.au/dataset/redd/resource/c77196df-7af9-4c09-ac88-256867c39806

Table 5: *Showing the bushfire management advice for selected regional ecosystems in the Pauls Pocket – Mango Tree Estate Area.*

Bioregion	Regional Ecosystem	Description	Bushfire Advice
CQC	8.5.1	Corymbia clarksoniana and/or C. intermedia open forest on Tertiary sand plains and rises including small areas of shale (mainly subregion 6)	SEASON: Late wet to early dry season, with occasional storm burns (Nov-Dec). Winter burns may be acceptable if conditions have not been appropriate for burning until winter. INTENSITY: Mainly low, but with some moderate and high. INTERVAL: 3-7 years. STRATEGY: Apply mosaic burns across the landscape at a range of intervals. At a fine scale attempt to create a spatial mosaic with multiple burn patches 20 ha or less; aim for a 30-50% burnt area. At the bioregion scale do not burn more than 20% within the same year. ISSUES: Lack of fire promotes overabundant pioneer rainforest species. Too frequent fire or inappropriately timed fire promotes weeds, including high-biomass grasses that lead to inappropriate fires. At least 7 years between burns is required to permit obligate seeding shrubs to reproduce.
CQC	8.5.3	Eucalyptus drepanophylla +/- Corymbia clarksoniana, +/- E. platyphylla +/- C. dallachiana +/- Melaleuca viridiflora woodland on broad low rises and gently sloping Tertiary sand plains	ISSUES: Generally, drier climate and low fertility precludes large fuel accumulations. Any fire applied should be considered experimental.
CQC	8.5.6.	Melaleuca viridiflora +/- Allocasuarina littoralis woodland on Tertiary sand plains	SEASON: Late wet to early dry season, with occasional storm burns. INTENSITY: Low to moderate with most burns moderate. INTERVAL: 6-10 years. STRATEGY: Apply mosaic burns across the target area; aim for 40-60% of area burnt. No more than 20% of Melaleuca communities should be burnt within the bioregion in any one year. ISSUES: Presence of high biomass grasses, lantana and rubbervine can increase fire severity and/or shade ground layer plants making burning difficult. Peat layers can be vulnerable in drier months; burn when peat layer water logged.

Other Regional Fire Management Guidelines

The Reef Catchments Natural Resource Management Group together with the Clarke Connors Range Bush Fire Consortium developed fire management guidelines for the Central Queensland coast region (Reef Catchments, 2009). The fire guidelines have been developed for 12 landscape types. For each of the 12 landscape types recommendations are made for fire frequency, fire intensity, season and whether mosaic burns are required.

The purpose of the guidelines is to reduce unplanned burns (wildfires). The landscape types and the recommended guidelines are shown in Table 6.

Table 6: *Clarke - Connors range fire management guidelines.*

Landscape Type	Fire Frequency	Fire Intensity	Preferred Season for Hazard Reduction	Mosaic Burning
Mangroves and estuaries	Not burnt	Nil	Nil	No
Beaches and foreshores	Not burnt	Nil	Nil	No
Hind dunes	Not burnt	Nil	Nil	No
Riverine and wetlands	Not burnt	Nil	Nil	No
Alluvial flat country	Every 5 years	Medium	Winter	50%
Grassy woodlands and open forests	Every 5 years	Medium	Winter	50%
Tall wet eucalypt forests	Every 3-5 years	Medium	Winter	50%
Eucalypt forest and woodlands on hills	Every 5 years	Medium	Winter	25%
Rainforest and vine thickets	Not burnt	Nil	Nil	No
Island and rocky headlands	Every 3-5 years	Medium	Winter	50%

The Queensland State government have developed Planned Burn Guidelines for Central Queensland Coast Bioregion of Queensland (DNPRSR, 2012). The planned burn guidelines are used to plan and implement prescribed burns in National Parks and State land. The State government guidelines are also applicable to Council owned and managed bushland lots.

2.6 Whitsunday Bushfire Management Planning Framework

The bushfire management and planning structure and workflow between organisations is reflected in Figure 6. The Whitsunday Regional Council has a Bushfire Management Policy and a Bushfire Management Plan to guide the management of bushfire hazard and risk on Council managed lots.

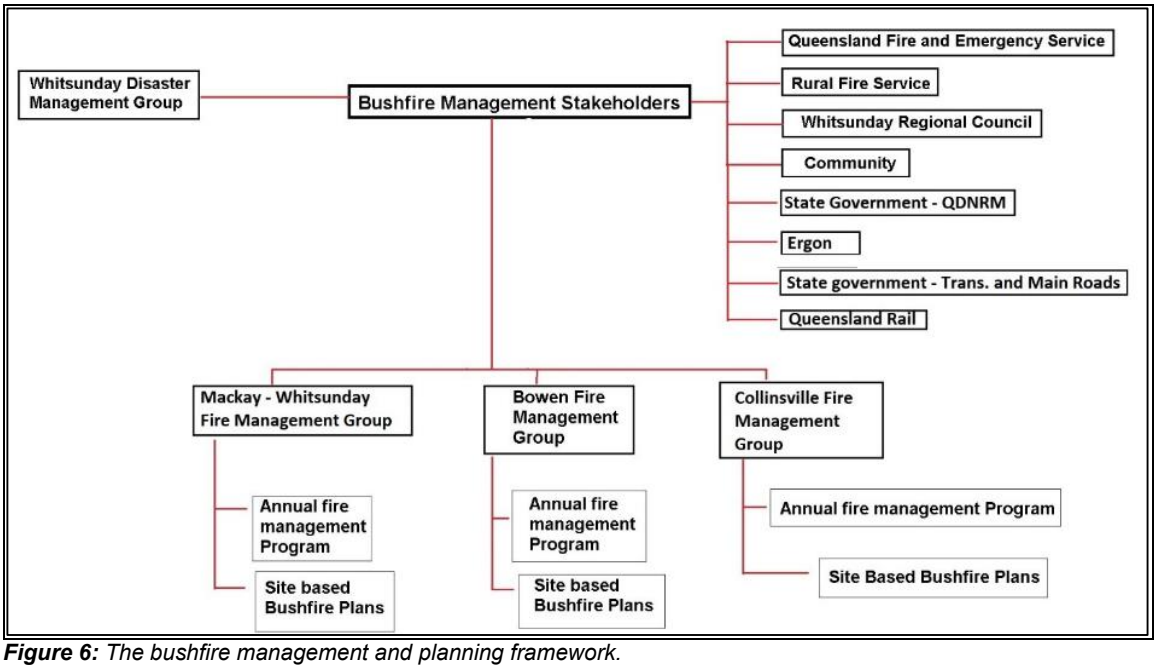

Figure 6: *The bushfire management and planning framework.*

2.7 Bushfire Mitigation and Management Strategies

There are a number of strategies that can be undertaken to reduce bushfire hazard and risk. Table 7 lists the bushfire risk factors and some of the mitigation measures that can be used to reduce the occurrence of bushfires.

Table 7: *Common bushfire mitigation strategies.*

Bushfire Factor	Mitigation Strategy or Measure
Litter build up from Eucalypt vegetation communities	• Obtain a permit to light fire from the local fire warden to reduce fuel loads. • Liaise with a local Rural Fire Brigade to undertake a fuel reduction burn. Subsequent burns may need to be conducted every 3 years. • Clear juvenile gum tree samplings from areas near the house and property. • Gum trees (such as Iron barks and Blue gums) should be removed from within 30 m of the house and properties. This may require an application to Council for permission. If in doubt contact the Council for advice.
Grass build up	• Grass species such as Guinea grass (*Megathyrsus maximus*) respond well to fire. This species needs to be chemically controlled, kept short through mowing or slashing, or grazed. • Revegetate areas with rainforest species to shade out grass and therefore reduce fuel loads. • Grass should be kept to a minimal height around houses and property using mowing, brush cutting or use of approved herbicides depending on site conditions. • Establish separation zones between buildings and grassy fuel by installing hard areas e.g. paving and gravel etc.
Aspect	• Northerly aspects are worse for fires. The siting or positioning of houses on a property should consider aspect. • The head of gullies should also be avoided • East to south facing slopes generally have a low hazard rating.
Slope	• Updraughts assist fire movement upslope. There should be a sufficient distance down slope of houses and properties that are free of fire prone vegetation. • Slopes above 30% have a higher hazard score opposed to flat to undulating land. • Installation of hard areas of gravel and paving may be necessary. • To reduce erosion on steep slopes, these areas could be revegetated using rainforest shrubs or low growing grasses that are easily controlled and are less flammable.
Climate	• Hot dry climates assist fire. Beware of climatic conditions that increase fire risk severity such as the dry season in the Whitsunday's, especially between the months of July and December.
Proximity to land uses that use fire	• Fire breaks could be used to reduce spread of fire, provide access for fire fighters, a secure line from which to burn from or back burn from. • Sugarcane land has a moderate to high bushfire risk
Vegetation communities that have a high fire risk	• Fire breaks could be used to reduce the spread of fire. The SPP recommends that perimeter roads be constructed that are cleared for 20 m AND comply with local government standards. • Fire maintenance trails should only be accepted if it is not practicable to provide firebreaks in the form of a road due to topographic conditions or vegetation constraints. • The construction of the fire breaks should consider plants protected under the *Nature Conservation Act (1992)* or communities protected under the Vegetation Management legislation. • Site the house in the lowest risk area on the property. • For lots greater than 2500m2, buildings and structures should be set back from hazardous vegetation by at least 1.5 times the height of the canopy vegetation (particularly if they are Eucalypt) or a minimum of 10 m. • Retention of rainforest in drainage lines and creeks will assist in reducing bushfire risk. • Design subdivisions without cul-de-sacs and provide access for a conventional drive vehicle (e.g. fire engine).

2.8 Previous Bushfire Management

This Bushfire Plan is the first formal Bushfire Plan for the Mango Tree Estate area. The QFES and local rural fire brigade report planned and unplanned bushfires in the area over the last 20 years.

The following is a brief summary of previous planned and un-planned burns in the Mango Tree Estate area:

- Mango Tree Estate – Greta Creek northern section – October 2019 (unplanned) - 274ha (see appendix).
- Mango Tree Estate – Greta Creek northern section – approximately 2014 (unplanned).

2.9 Community Consultation

The Whitsunday Regional Council placed the Mango Tree estate Community Bushfire Management Plan out for community comment from 14 September 2020 to 15 November 2020. There was one on-line community meeting which was held on 6 October 2020. The main discussion points from the meeting were:

- Four people attended the meeting.
- One Queensland Fire and Emergency Services staff attended.
- One property owner attended the on-line meeting.
- The road to Billy's Creek acting as a firebreak, but the nearby paddocks are not stocked or grazed and so there is a fire hazard.
- Concern after the 2019 fire is the area along the Bruce Highway road verge, between the Prawn farm and Billy's Creek, which is high vegetation and fuel load.
- Possible removal of trees in the Bruce highway road reserve.
- Developing strategies for landowners on private property.
- The strategy outlines planned burns in the Mango Creek area every 5 -10 years,
- The creek vegetation is flammable. Creeks can be a fire 'corridor'.
- Storm burns were discussed.
- More training for property owners would be appreciated in hazard management including how to safely do planned burns.
- The ultimate aim being for all property owners to have their own bushfire plan.
- There was a general discussion around the nearby prawn farm and confirmed they have significant fire breaks around their infrastructure.

3. Management Plan

3.1 Bushfire Plan Goals

The goals of this Bushfire Management Plan are:

- To protect life and property as a priority then ensure the bushfire management practises maximise biodiversity values.
- To ensure all stakeholders support a common bushfire management direction.
- To pro-actively manage the bushfire hazard within and surrounding Mango Tree Estate.
- To develop and maintain good relationships between the stakeholders and landholders and encourage cooperative approaches to manage bushfire hazard in the area.

3.2 Stakeholder General Roles and Responsibilities

The general roles and responsibilities for bushfire management, planning and mitigation are summarised in Table 8.

Table 8: *The main tasks for each stakeholder.*

Task	Council	Rural Fire	QFES	QPWS and QDNRM	Landholder
Legal control of the fire					✓
Conduct hazard reduction burns		✓			✓
Applying for permits					✓
Supervising the hazard reduction burn		✓			✓
Informing the community		✓			✓
Monitoring fuel loads					✓
Maintaining the fire breaks					✓
Developing and updating the bushfire plan	✓	✓	✓		✓
Reporting hazard reduction burns		✓			✓
Regulating and control of illegal dumping	✓				✓
Manage accumulation of green waste					✓

3.3 Bushfire Management Areas and Mitigation Measures

The landscape of the Mango Tree Estate area needs to be prioritised in terms of bushfire management and planning. Areas close to residential areas need a higher level of monitoring and fuel management than areas further away. The Victorian state government has developed a system of prioritising bushfire management activities (DSE, 2012). The Victorian government have developed fire management zones as a means of prioritising land areas for bushfire management:

- APZ – Asset Protection zone - Areas close to residential areas – high priority for management.
- BMZ – Bushfire Moderation zone – aim to achieve asset protection and achieve some ecological outcomes.
- LMZ – Landscape management zone – planned burns are primarily undertaken for fuel reduction to maintain ecological processes.
- PBEZ – Planned burning exclusion zone – no fire permitted.

In theory, each of the 26 landholders should have a bushfire management plan for their block of land. However, due to the landscape, vegetation types and landform, fire may be better managed across a number of properties. If boundary fences are ignored, and creek areas and well defined roads used as fire breaks,

then a different number of fire management areas can be defined. One issue is whether the creek line vegetation are highly flammable or whether they act as “green breaks”.

There are 12 fire management areas identified for the Mango Tree Estate Fires Area. The bushfire management areas have been classified for bushfire hazard (Figure 8). Most of the woodland area have a bushfire hazard rating of “Medium”.

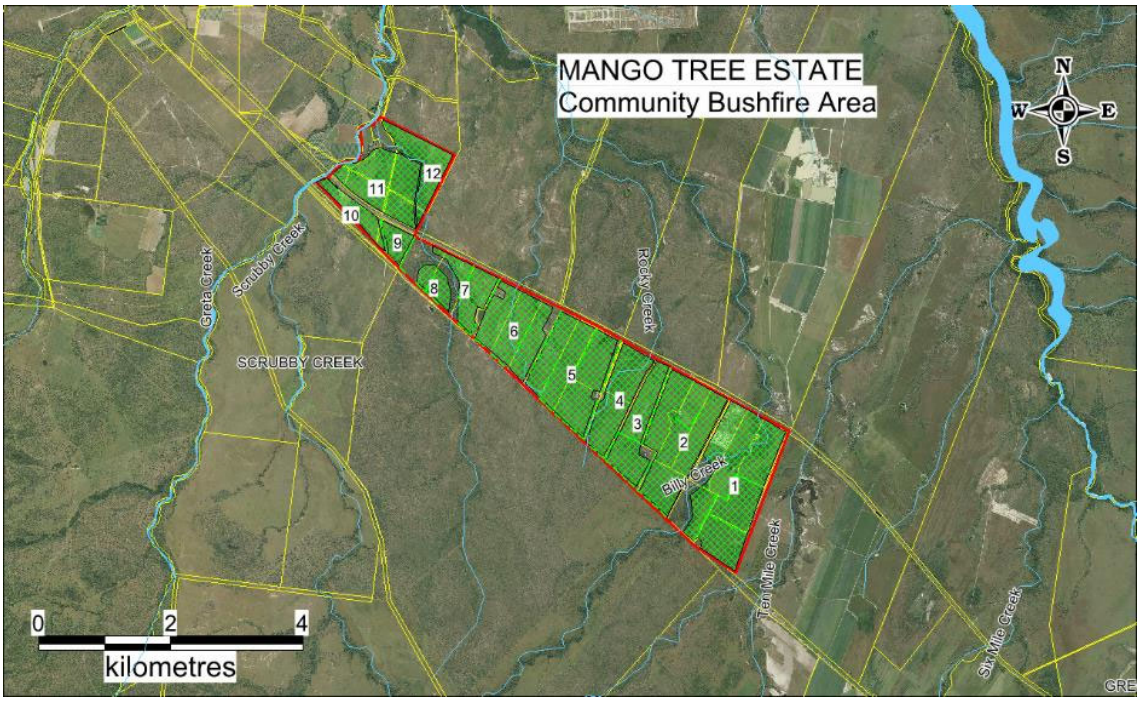

Figure 7: *The Mango Tree Estate fire management areas.*

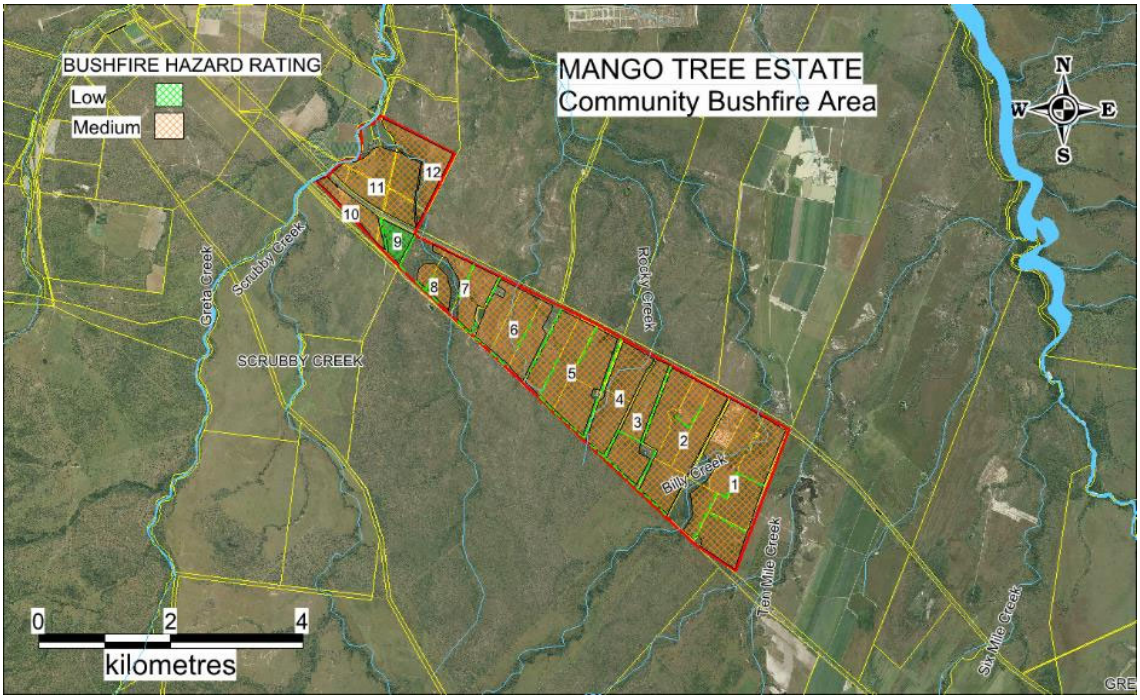

Figure 8: *Revised Bushfire hazard rating.*

The priority for bushfire management activities have been reviewed to reflect the bushfire hazard rating. It is noted that there are individual residential properties on most of the 26 lots. In many cases there is cleared around the residential houses. It is also noted that the dominant wind direction is from the south-east, consequently, if a wild-fire did occur it is unlikely to affect all lots. The majority of the Mango Tree Estate area has been mapped as “Landscape Management Zone” (LMZ) (Figure 9). The LMZ areas are land units where planned burns may be necessary to reduce fuel loads and maintain ecological processes. The fire management areas can be further summarised as:

- Red = APZ (high hazard and high priority),
- Orange = BMZ (medium hazard and medium priority)
- Yellow = LMZ (medium hazard and low - medium priority)
- Green = PBEZ (low-medium hazard and lower priority).

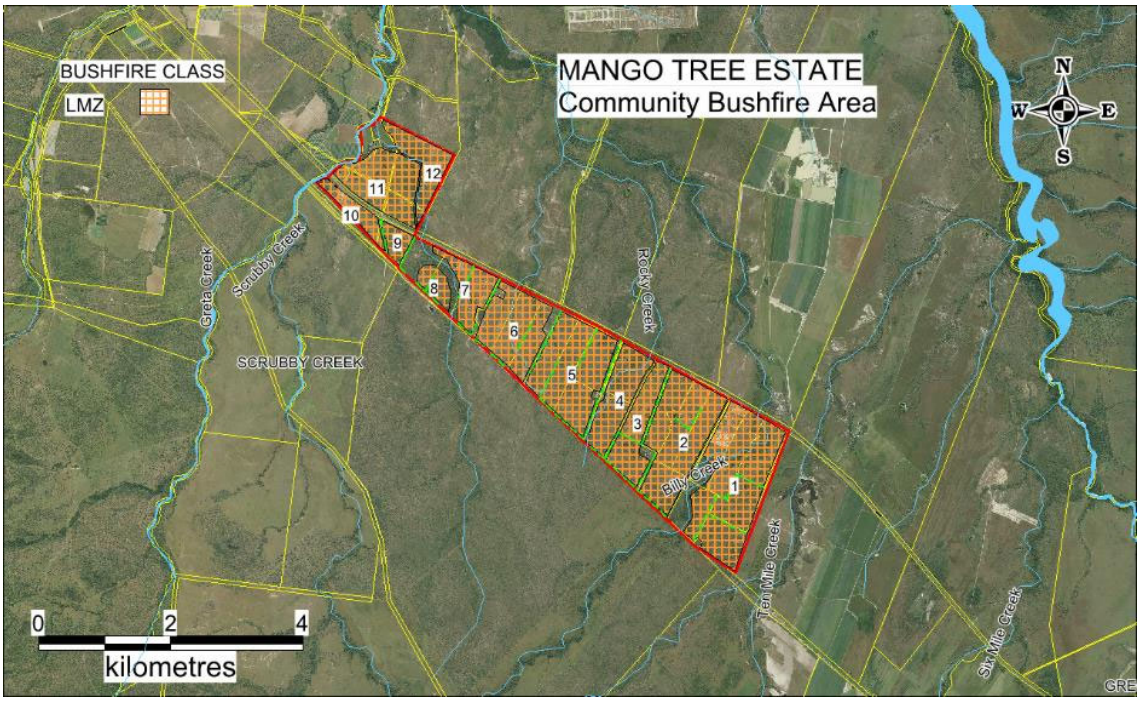

Figure 9: *The fire management areas and fire management class.*

The LMZ management units have the potential for wildfires to threaten residential properties. The bushfire hazard, risk to property and possible bushfire mitigation measures are suggested in Table 9.

Table 9: *The bushfire hazard and mitigation measures for fire management units in the Mango Tree Estate area.*

Fire Area	Hazard	Mitigation options
1	Medium bushfire hazard. Risk of wildfire starting near the railway line or near residential house.	Create and maintain fire breaks between the lots and at strategic locations so that planned burns can be managed.
2	Medium bushfire hazard. Risk of wildfire starting near the railway line or near residential house.	Create and maintain fire breaks between the lots and at strategic locations so that planned burns can be managed.
3	Medium bushfire hazard. Risk of wildfire starting near the railway line or near residential house.	Create and maintain fire breaks between the lots and at strategic locations so that planned burns can be managed.
4	Medium bushfire hazard. Risk of wildfire starting near the railway line or near residential house.	Create and maintain fire breaks between the lots and at strategic locations so that planned burns can be managed.
5	Medium bushfire hazard. Risk of wildfire starting near the railway line or near residential house.	Create and maintain fire breaks between the lots and at strategic locations so that planned burns can be managed.
6	Medium bushfire hazard. Risk of wildfire starting near the railway line or near residential house.	Create and maintain fire breaks between the lots and at strategic locations so that planned burns can be managed.
7	Medium bushfire hazard. Risk of wildfire starting near the railway line or near residential house.	Create and maintain fire breaks between the lots and at strategic locations so that planned burns can be managed.
8	Medium bushfire hazard. Risk of wildfire starting near the railway line or near residential house.	Create and maintain fire breaks between the lots and at strategic locations so that planned burns can be managed.
9	Low bushfire hazard. Risk of wildfire starting near the railway line	Create and maintain fire breaks between the lots and at strategic locations so that planned burns can be managed.
10	Medium bushfire hazard. Risk of wildfire starting near the railway line or near residential house.	Create and maintain fire breaks between the lots and at strategic locations so that planned burns can be managed.
11	Medium bushfire hazard. Risk of wildfire starting near the railway line or near residential house.	Create and maintain fire breaks between the lots and at strategic locations so that planned burns can be managed.

3.4 Hazard Reduction Burning Frequencies and Methods

The prescribed burn program for Mango Tree Estate area will be programmed around the site vegetation, seasonal fuel load and timed for optimum climatic conditions. The timing of prescribed burns will be based on recommendations as given at the time of annual hazard assessments. The frequency of prescribed burns will be guided by the recommendations set out in “Fire Management Guidelines” by Reef Catchments 2009, recommendations from the Queensland government and from site specific annual fuel load assessments. Ultimately, it will be up to individual landholders to decide whether they are willing and prepared to undertake planned burns.

The fire management areas will also be used to determine hazard reduction burn frequencies. The proposed planned burn frequencies for each vegetation type is shown in Table 10. The frequency of hazard reduction burns for the Mango Tree Estate orange areas (LMZ) will be generally every 4 to 7 years.

Table 10: *Vegetation communities and hazard reduction burn frequencies.*

Vegetation Community	RE	Hazard Reduction Burn Frequency	Fire Management Areas	Fire Zones
Corymbia clarksoniana and/or C. intermedia open forest on Tertiary sand plains and rises including small areas of shale (mainly subregion 6)	8.5.1	3-7 years	1,2,	LMZ
Eucalyptus drepanophylla +/- Corymbia clarksoniana, +/- E. platyphylla +/- C. dallachiana +/- Melaleuca viridiflora woodland on broad low rises and gently sloping Tertiary sand plains	8.5.3	5-10 years	7,8,9,	LMZ
Melaleuca viridiflora +/- Allocasuarina littoralis woodland on Tertiary sand plains	8.5.6	5-10 years	3,4,5,6,	LMZ

3.5 Schedule of Bushfire Management and Mitigation Tasks

The schedule of bushfire management and maintenance tasks is summarised in Table 11.

Table 11: *Schedule of bushfire management actions.*

No	Task	Who is responsible	Timing
1	Assess fuel loads	Landholders and Rural Fire Brigade	May
2	Develop an annual fire plan	Rural fire brigade and residents	June
3	Approve the annual fire plan	Rural fire brigade	June
4	Slash fire lines/fire breaks	Landholders	May and October
5	Inspect condition of fire lines	Landholders	May
5	Earthworks for fire lines/breaks	Landholders	As required
6	Coordinate planned burns	Rural fire brigade/QFES and residents	As per approved plan
7	Community awareness	Rural fire brigade/QFES and residents	Use of media in May
8	Seeking fire permit	Landholders	AS required

The draft schedule of planned burns for the various fire management areas are shown in Table 12.

Table 12: *The proposed timing of future planned burns for Mango Tree Estate management areas.*

Fire Management Area	Description	Zone	Planned Burn Frequency	2019 (Unplanned Burn Areas)	2020	2021	2022	2023	2024	2025	2026	2027
1	Mango Tree Estate Ten-mile	LMZ	3-7									
2	Mango Tree Estate Ten-mile	LMZ	3-7									
3	Mango Tree Estate Ten-mile	LMZ	5-10									
4	Mango Tree Estate Central	LMZ	5-10									
5	Mango Tree Estate Central	LMZ	5-10									
6	Mango Tree Estate Central	LMZ	5-10									
7	Mango Tree Estate Central	LMZ	5-10									
8	Mango Tree Estate	LMZ	5-10									
9	Mango Tree Estate Greta Ck	LMZ	5-10									
10	Mango Tree Estate Greta Ck	LMZ	3-7									
11	Mango Tree Estate Greta Ck	LMZ	3-7									

The development of fire breaks and fire control lines are a landholder's responsibility. Ideally the breaks should be created along property boundaries, or along contours, or between different forest types (e.g. rainforest- Eucalypt forest). Fire breaks or control line tracks located on steep slopes will be subject to erosion and will cost more to maintain. The existing and proposed fire control lines and fire breaks are located in the appendix of this report.

3.6 Fire Fighting – Response and Resources

The responsibility of responding to fires in the Mango Tree Estate area is the primary role of the Proserpine West and Dryander rural fire brigade. The Proserpine West and Dryander rural fire brigade both have slip-on units for 4wd vehicles.

The water for fighting unplanned fires is sourced from:

- Rural fire brigade –slip-on units for 4wd.
- Small rural dams in the Mango Tree Estate area (see appendix).
- Rural residential water tanks and swimming pools.

4. Conclusion

The Mango Tree Estate Community Bushfire Management Plan has been developed to document stakeholder responsibilities, guide mitigation measures and communicate the main bushfire priorities for this area. The Mango Tree Estate area is divided up into 11 fire management areas based on land within similar land use and bushfire hazard. Each fire management unit has a set of recommendations to reduce the bushfire hazard and risk to property.

This Plan was placed on public notice from September to November 2020. During the public consultation period the following were the main points noted:

- More training is required for land managers on bushfire hazard management.
- How to assist landholders to fund the machinery needed to put in fire breaks and control lines and maintain them.
- The need for property bushfire plans.
- There is a need for property bushfire plans which are shared between neighbours.
- Some landholders are not sure how to coordinate planned burns – who and how to contact people to assist.
- This area would benefit from an annual community meeting to develop agreed planned burn areas and get neighbours assisting with planned burns to reduce fuel loads and hazard.

The intension of this Bushfire Plan is to enable bushfire management mitigation to occur under agreed conditions and to maximise community safety whilst recognising the importance of the areas ecological values.

5. References

Forest Fire Management Group, 2014. National Bushfire Management Policy Statement for Forest and Rangelands. COAG, Canberra.

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Middelmann, M. H. (Editor), 2007. *Natural Hazards in Australia: Identifying Risk Analysis Requirements.* Geoscience Australia, Canberra.

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Queensland Government Planning Department (2003) Sustainable Planning Policy 1/03 (2003) Guideline. Queensland Government, Brisbane.

Ramsay, C. and Rudolf, L., 2003. *Landscape and building design for bushfire areas*. CSIRO publishing, Melbourne.

Paine, A.G.L. and Cameron, R.L., (1972). *1:250,000 geological series explanatory notes for Proserpine, Queensland* (Sheet SF/55-3 international index). Australian Government Publishing service, Canberra.

Reef Catchments, 2009. Clarke Connor Range Fire Management Guidelines. Reef Catchments, Mackay.

Risk Frontiers, 2011. State-wide Natural Hazard Risk Assessment: Report 3: Current exposure of property addresses to natural hazards. Project report for the Queensland Department of Community Safety, Brisbane.

Tran. C & Peacock. C (2002) Fire Management Strategic Manual; Guidelines for planning and implementing a council or shire wide fire management strategy. SEQ Fire and Biodiversity Consortium Queensland Australia.

6. Appendix

6.1 Hydrant and Water Resources Map

Hydrant – No map

(Note – most of Mango Tree Estate does not have town water, hence no water hydrants)
A hydrant could be developed at the Eden Lassie Creek petrol station, approximately 1km north of the fire management area.

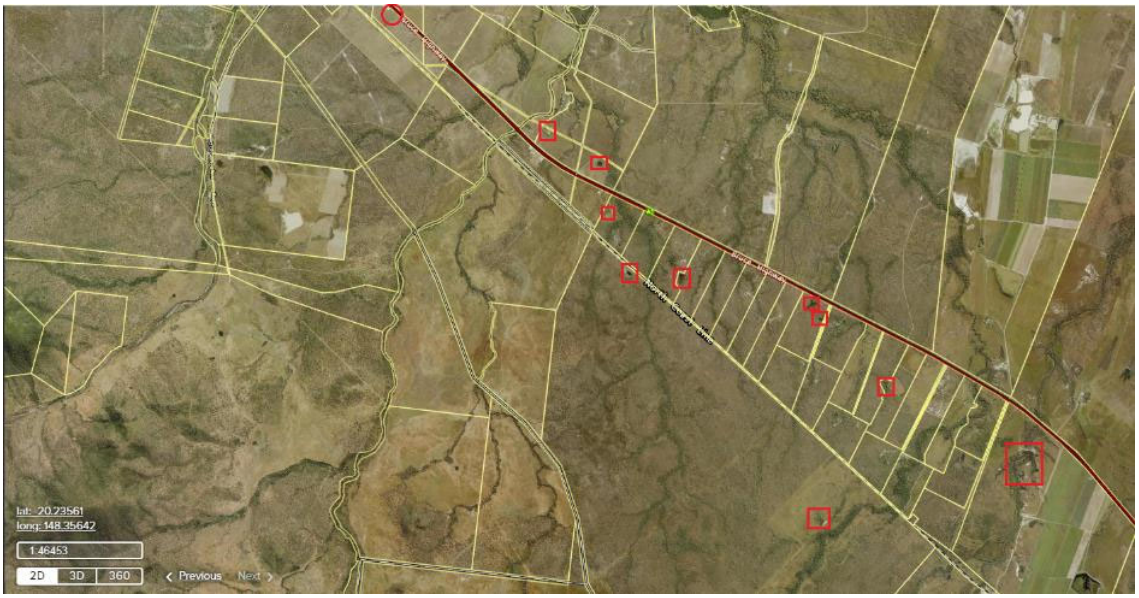
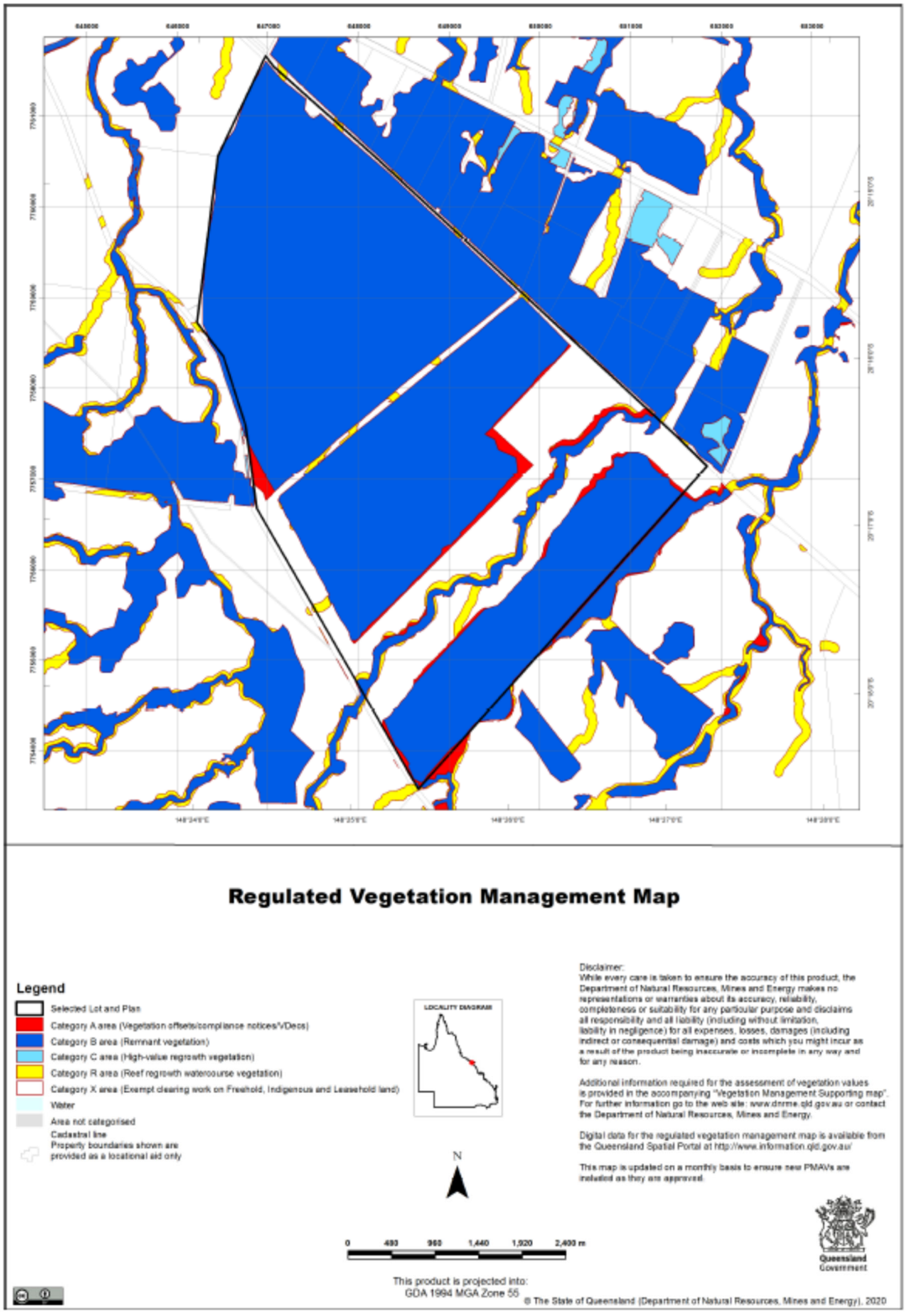
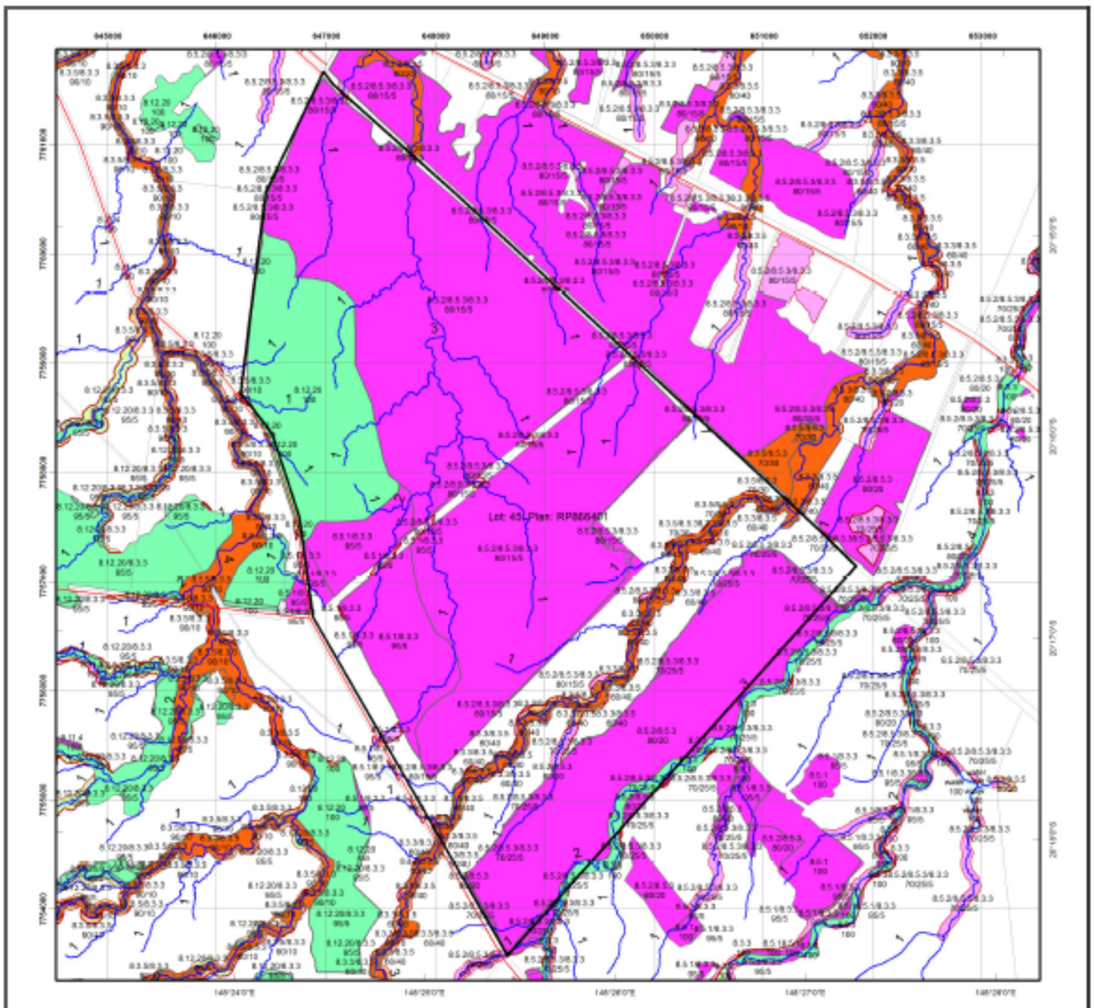


Figure 10: *Location of Rural Dams*

6.2 Regional Ecosystem Maps





Vegetation Management Supporting Map

Legend

- Selected Lot and Plan
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category A or B area under Section 20AH
  These areas are edged in yellow and filled with the remnant RE Status
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- Category C area under Section 20AI
  These areas are edged in purple and filled with the remnant RE Status
- Category X area
- Water
- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
- Essential habitat species record
- Watercourses and drainage features on the vegetation management watercourse and drainage features map
  (Stream order shown as black number against stream where available)
- Roads
- National Parks, State Forest and other reserves
- Cadastral line
  Property boundaries shown are provided as a locational aid only

Queensland Government

LOCALITY DIAGRAM

N

0 350 700 1,050 1,400 1,750 m

This product is projected into:
GDA 1994 MGA Zone 55

Labels for Essential Habitat are centred on the area of enquiry.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:30 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/- 100 metres.

Disclaimer:
While every care is taken to ensure the accuracy of this product, the Department of Natural Resources, Mines and Energy makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

Additional information may be required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.dnrme.qld.gov.au or contact the Department of Natural Resources, Mines and Energy.

Digital data for the vegetation management watercourse and drainage feature map, vegetation management wetlands map, essential habitat map and the vegetation management remnant and regional ecosystem map are available from the Queensland Spatial Portal at http://www.information.qld.gov.au/

6.3 Bushfire Management Control Lines and Fire Breaks

Bushfire Control lines and access tracks should be located along property boundaries and/or along the contour.

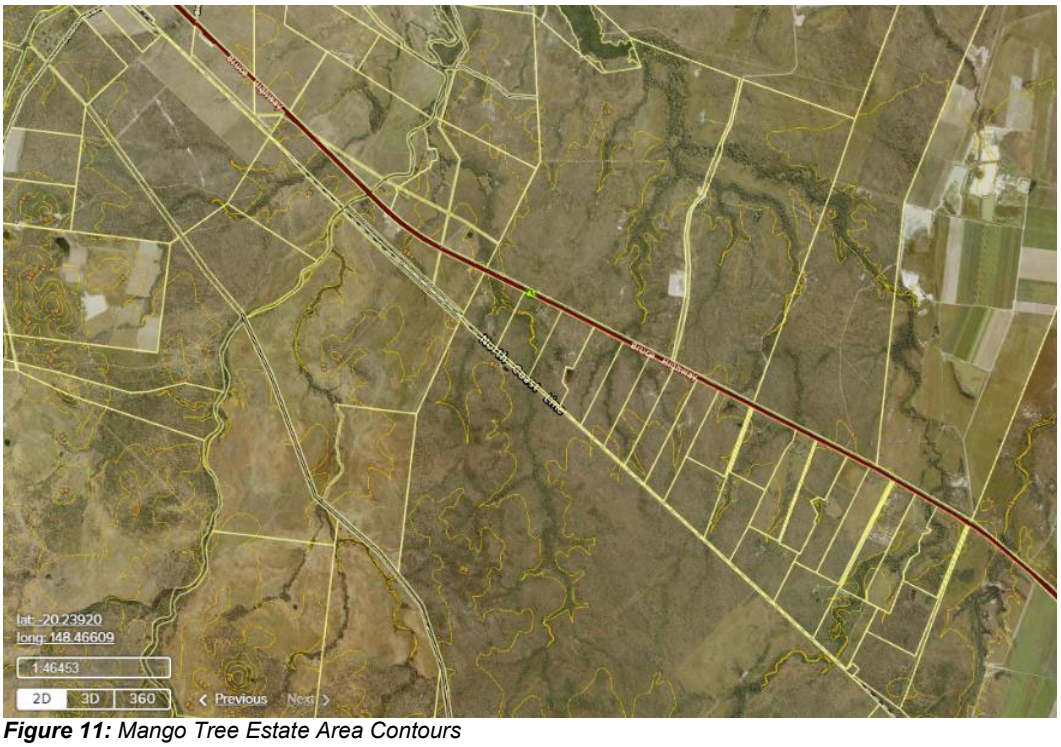


Figure 11: *Mango Tree Estate Area Contours*

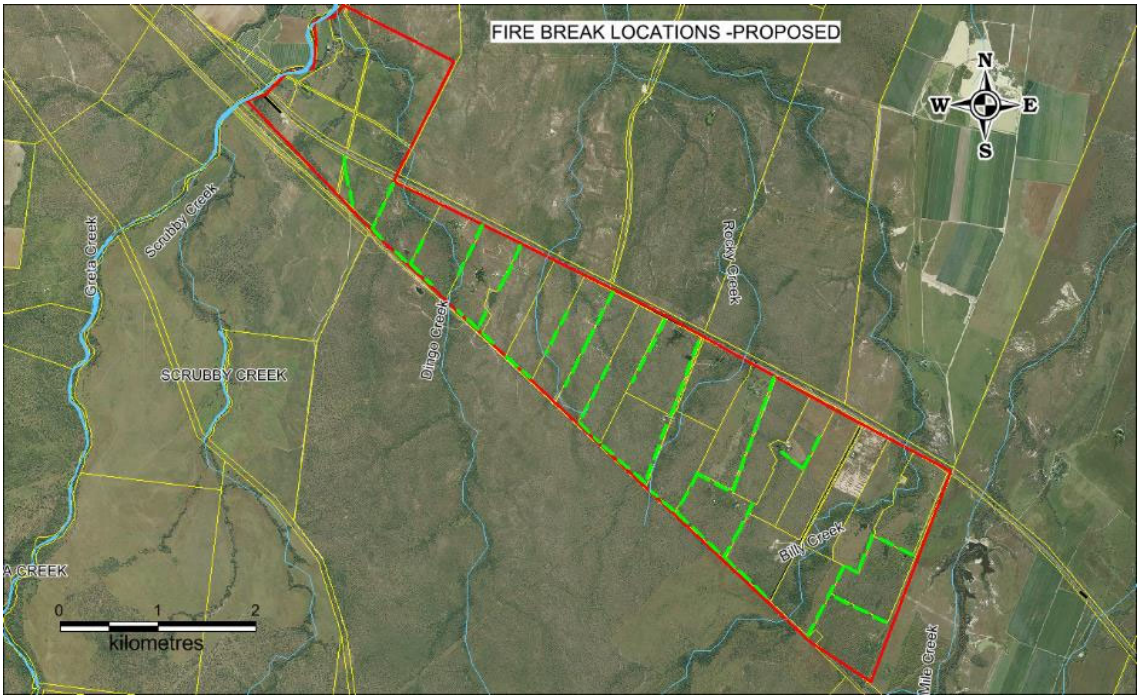


Figure 12: *Mango Tree Estate Fire Breaks*

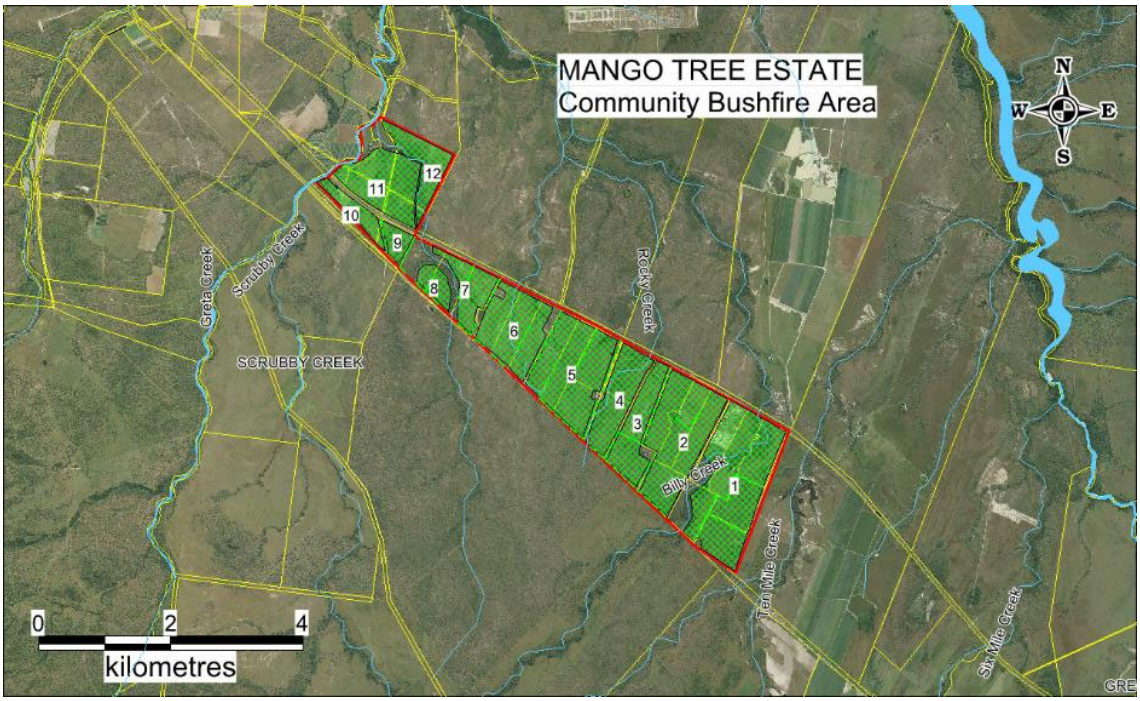


Figure 13: *Showing Fire Management Areas*

6.4 Objectives for Bushfire Hazard Reduction Burning

Source: NSW Rural Fire Service
www.rfs.nsw.gov.au

A successful low intensity hazard reduction burn will reduce fuel load so that it creates a safe defensible area around an asset. It should also minimise the impact from the burn on the environment.

In carrying out a burn, you need to consider:

1) The fuel load and structure
2) The effects on the environment and the community
3) The specific zone objectives
4) If there are adequate fire breaks and control lines
5) The season and weather conditions
6) The topography and fire behaviour
7) What lighting patterns to use
8) Conducting a test burn
9) What safety measures may be needed
10) Mopping up afterwards
11) If you need to report the results

6.5 Checklist for Hazard Reduction Burns

The following is a checklist of tasks and activities that should be followed prior to hazard reduction burns:

Table 13: *Checklist for Hazard Reduction Burns*

No.	Task	✓
1	Fuel load assessment conducted	
2	Bushfire fire hazard sufficient to warrant a hazard reduction burn	
3	Fire breaks and control lines are in good condition	
4	Burn plan developed – identifying where the burn will occur, timing and personnel availability	
5	Ensure adequately trained personnel are on hand for planned burn	
6	Fire permit gained for proposed burn plan	
7	Proposed hazard reduction burn is approved by Conway / Mango Tree Estate Fire Brigade	
8	Community awareness plan is developed and activated prior to burn	
9	Bushfire stakeholders advised of hazard reduction burn timing	
10	Machinery and trucks are in good working order. Water available.	
11	Contingency plan developed in case fire escapes the target area	
12	Hazard reduction burn is undertaken in accordance with QFES guidelines	
13	Fire control personnel ensure fire is out before leaving fire control area.	
14	A brief account of the hazard reduction burn submitted to QFES and Council.	

6.6 Stakeholder Contacts

- Whitsunday Regional Council – Scott Hardy – 0428 722 236 / (07) 4945 0245.
- QDNRM – Dan Burndred – 0472 847 894, Tim Koch – 0418 970 097
- QPWS – Ross Perry – (07) 4962 5206
- Fire Warden – Proserpine West – 0427 413 495
- Fire Warden – Kelsey Creek – 0407 984 139

For more information regarding the Queensland Rural Fire Brigade:
https://www.ruralfire.qld.gov.au/Pages/fw_finder.aspx

6.7 Map of Rural Fire Areas

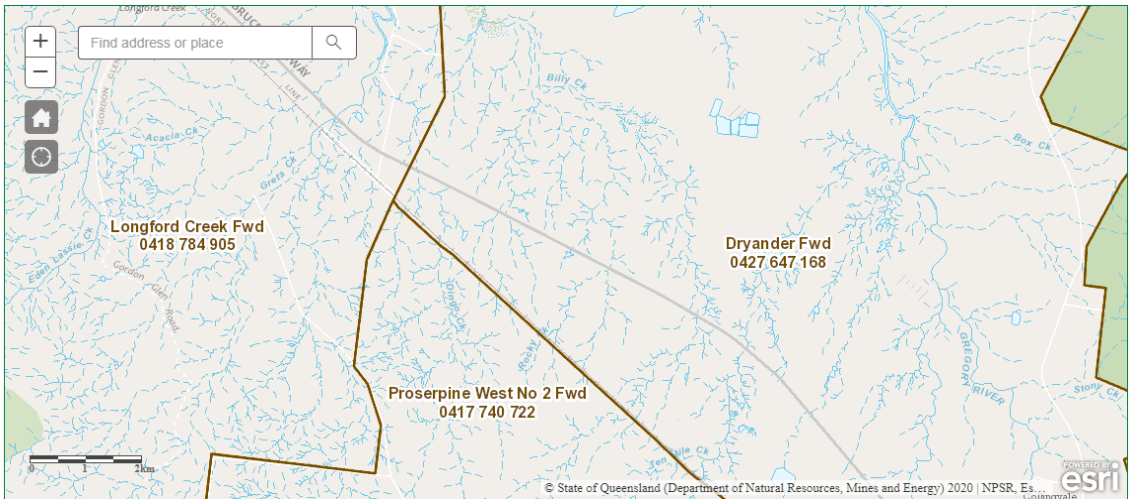


Figure 14: *Showing the rural fire areas and warden contact numbers.*

6.8 Unplanned Burn Area Map

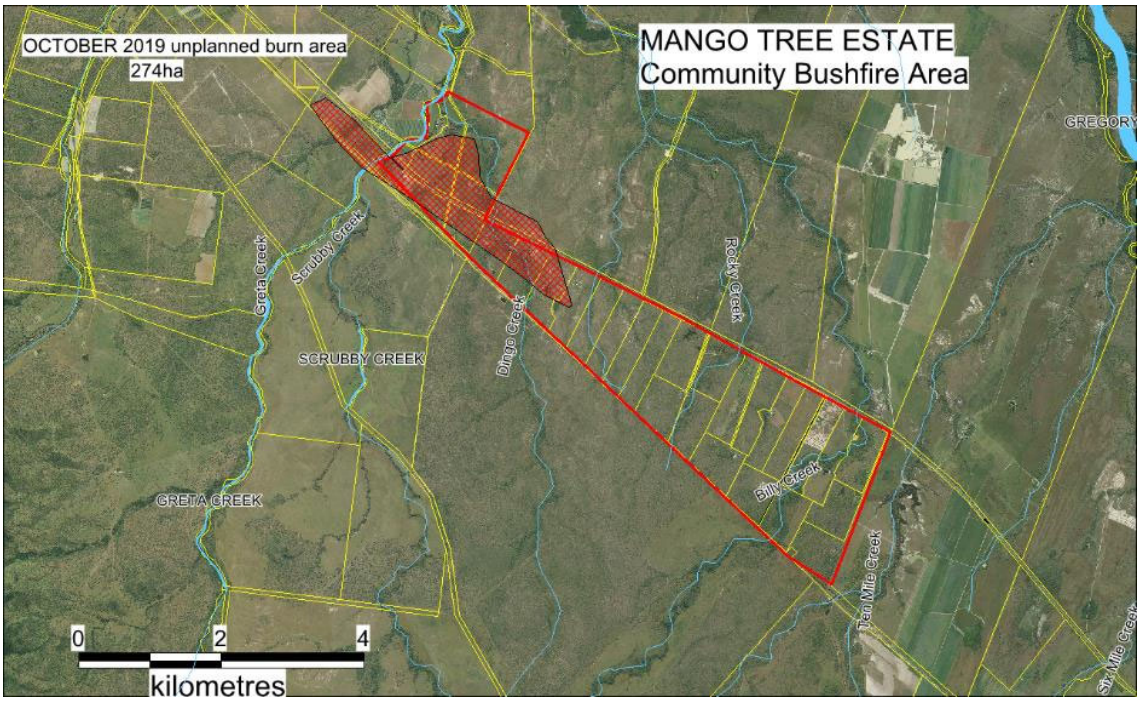


Figure 15: *The October 2019 un-planned burn area.*

6.9 Landholder Bushfire Planning Checklist

The following checklist can be used by residential landholders to plan and manage their bushfire hazard:

Table 14: *Landholder Bushfire Planning Checklist*

Task	Checked
Structure	
Clear leaves, twigs, bark and other debris from the roof and gutters.	
Purchase and test the effectiveness of gutter plugs.	
Enclose open areas under decks and floors.	
Install fine steel wire mesh screens on all windows, doors, vents and weep holes	
Point LPG cylinder relief valves away from the house.	
Conduct maintenance checks on pumps, generators and water systems.	
Seal all gaps in external roof and wall cladding.	
Access	
Display a prominent house or lot number, in case it is required in an emergency.	
Ensure there is adequate access to your property for fire trucks - 4 metres wide by 4 metres high, with a turn-around area.	
Vegetation	
Reduce vegetation loads along the access path.	
Mow your grass regularly.	
Remove excess ground fuels and combustible material (long dry grass, dead leaves and branches).	
Trim low-lying branches two metres from the ground surrounding your home.	
Consider removing flammable trees near residential buildings (e.g. removal of eucalypt trees) and replace with non-flammable rainforest species.	
Personal	
Check that you have sufficient personal protective clothing and equipment. Relocate flammable items away from your home, including woodpiles, paper, boxes, crates, hanging baskets and garden furniture.	
Check the first aid kit is fully stocked.	
Make sure you have appropriate insurance for your home and vehicles.	
Find out if there is a nearby **Neighbourhood Safer Place**.	
Review and update your household **Bushfire Survival Plan**.	
Other	
Consider the location of water points and possible direction of bushfire threats. In rural residential areas ensure water tanks are more than half full in bushfire season.	
Keep swimming pool full of water.	

Source: https://www.ruralfire.qld.gov.au/BushFire_Safety/Pages/Prepare-for-bushfire-season.aspx

6.10 Vegetation Clearing Rules

Exemptions apply to some clearing activities permitted under other legislation, including the *Forestry Act 1959*, *Fire and Emergency Services Act 1990*, *Electricity Act 1994*, *Electricity Regulation 2006* and *Disaster Management Act 2003.* Visit the Department of Environment and Science website for more information.

Exempt clearing work for fire management sourced from the Queensland government websites:

- You can undertake certain clearing activities to protect your property from bushfires without getting approval or notifying the Queensland government. These exemptions are summarised in the Table below.
- If you need to clear a wider area, you might be able to clear using a vegetation clearing code or apply for a development approval.
- **Firebreaks** are low-fuel areas located immediately adjacent to existing infrastructure (including a building, or other structure, built or used for any purpose) that are cleared and maintained to slow or stop the progress of a fire, or to perform back-burning.
- **Fire management lines** are roads, fence line clearings or tracks (including existing property tracks) used to access water for firefighting or divide the property for fuel reduction burning or back-burning.

Table 15: *Vegetation Clearing Rules*

Purpose for Clearing	Vegetation Category	Clearing Allowances
Fences, roads and tracks	Least concern regional ecosystems	Clearing to establish a necessary fence, road or vehicular track to a maximum width of 10m
Fire management line	All	Clearing for a necessary for management line to a maximum width of 10m
Firebreaks	All	For a fire necessary to protect buildings and other structures (other than a fence line); to a width of up to 1.5 times the height of the tallest vegetation or 20m (whichever is the widest)
Hazardous fuel load reduction	All	Fuel reduction burns can be done under a permit issued by the local fire warden
Maintain existing infrastructure	All	Clearing necessary to maintain existing buildings and other structures, fences, roads and watering points.
Risk to people and infrastructure	All	Clearing necessary to remove or reduce imminent risk the vegetation poses to people or buildings and other structures.

https://www.qld.gov.au/environment/land/management/vegetation/disasters/fire/code

https://www.dnrme.qld.gov.au/__data/assets/pdf_file/0009/847800/vegetation-clearing-exemptions.pdf