



MT NINDERRY CO-ORDINATED FIRE MANAGEMENT PLAN

December 2015

Table of Contents

1. Mt Ninderry Co-ordinated Fire Management Plan Maps.....	2
1.1 Map 1 Mt Ninderry Coordinated Fire Management Area	
1.2 Map 2 Infrastructure in bounded fire management area	
1.3 Map 3 Landscape connectivity – natural assets	
1.4 Map 4 Areas of risk	
2. Mt Ninderry Co-ordinated Fire Management Plan	6
2.1 Mission Statement	
2.2 Introduction	
2.3 Goals of Mt Ninderry Co-ordinated Fire Management Plan	
2.4 History of fire in Mt Ninderry area	
2.4.1 Changing values and landscape	
2.5 Fire risk at Mt Ninderry	
2.5.1 Characteristics of a bushfire in SEQ	
2.5.2 The difference between hazard and risk	
2.5.3 The impact of climate change on risk	
2.5.4 Encouraging adequate insurance	
2.6 Preparation to minimise fire risk	
2.6.1 What is the Bushfire Survival Plan?	
2.6.2 Sunshine Coast Council management of fire risk	
2.7 Communications strategy	
2.8 Community fire management activities	
2.8.1 Establish vulnerable people register - Identify who is vulnerable	
2.8.2 Property water access signage for fire vehicles	
2.8.3 Reducing fire risk on private property	
2.8.4 Education package development	
2.8.5 Delivery of Mt Ninderry Community Fire Management Education Package	
2.8.6 Physical activities landholders can undertake	
2.9 Conclusions	
2.10 Fire Management is both an individual and community responsibility	
2.11 Accessing the Mt Ninderry Co-ordinated Fire Management Plan	
3. Appendices.....	17
3.1 Tips for planting to reduce fire risk	

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1 Mt Ninderry Co-ordinated Fire Management Plan Maps

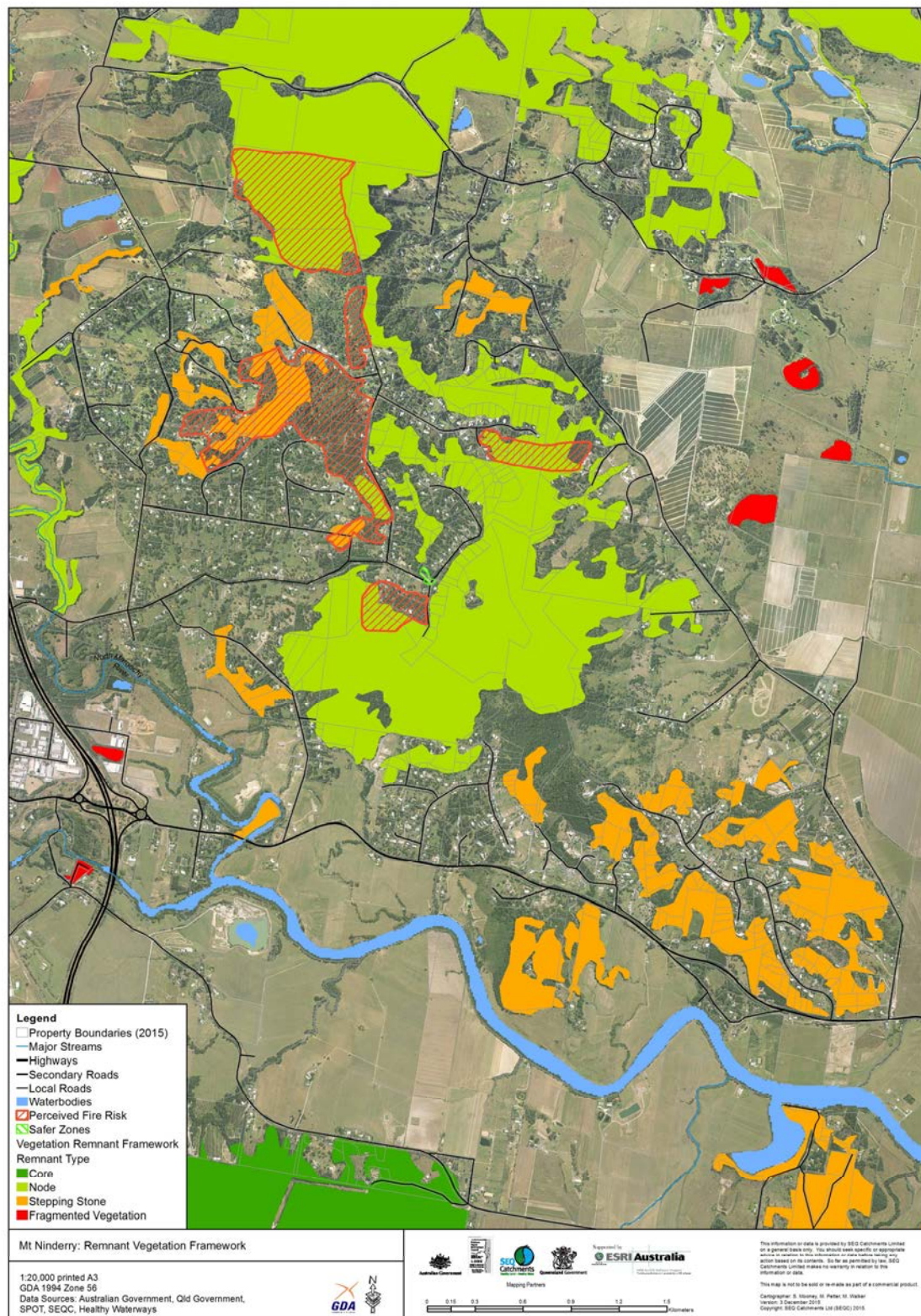
1.1 Map 1 Mt Ninderry Co-ordinated Fire Management Area



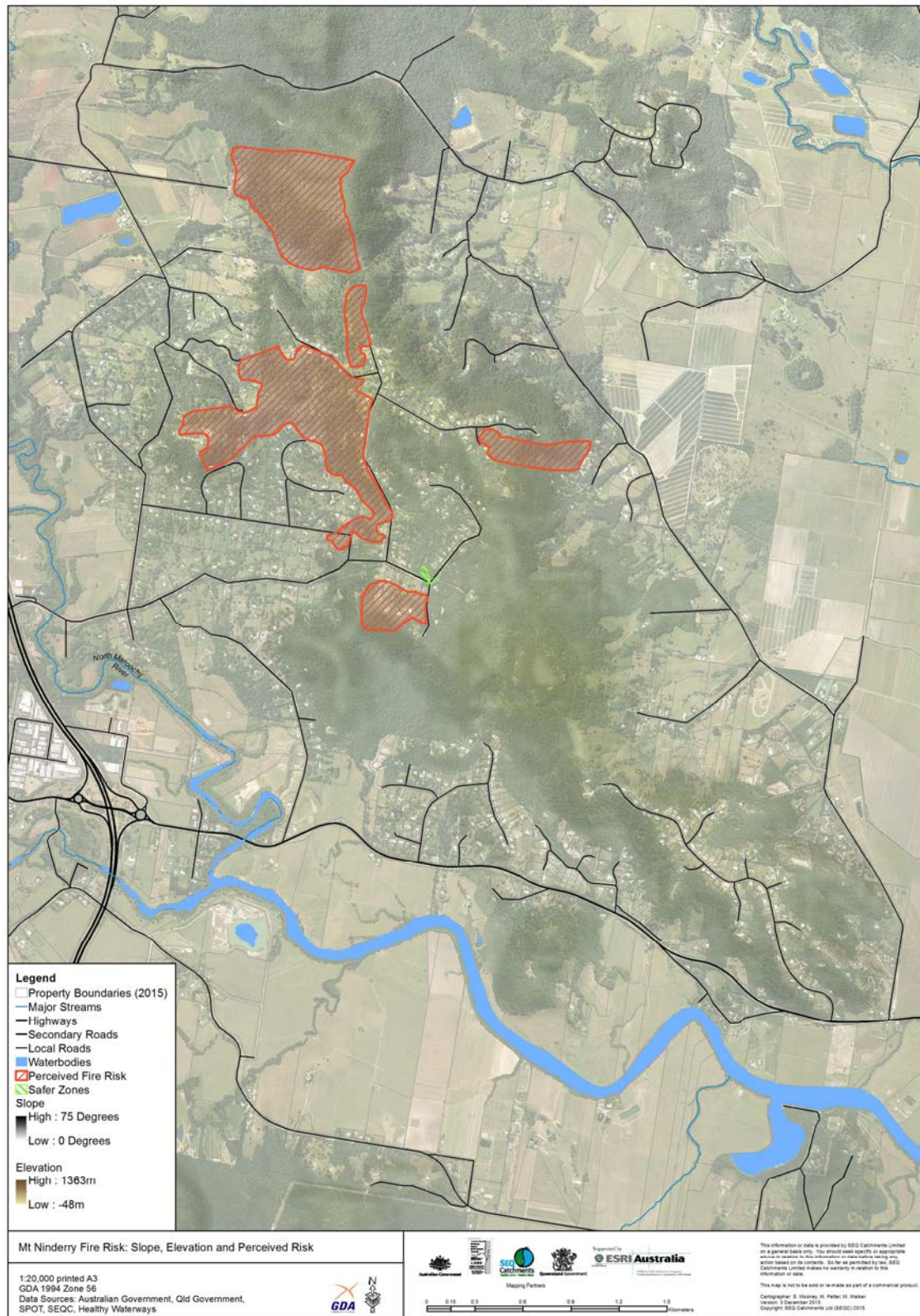
1.2 Map 2 Infrastructure



1.3 Map 3 Landscape connectivity – natural assets



1.4 Map 4 Areas of risk



1. Mt Ninderry Co-ordinated Fire Management Plan

2.1 Mission Statement

Mt Ninderry residents support good communication channels within community and with agencies and share responsibilities for managing fire risk through understanding, preparedness and coordinated response.

2.2 Introduction

Mt Ninderry is an iconic landform of Triassic North Arm Volcanics rising 304 metres from the Maroochy floodplain near Yandina on the Sunshine Coast. It bears great cultural significance for the Traditional Custodians of the area, the Kabi Kabi or Gubbi Gubbi people, immortalised in local legend as the warrior who chopped off Coolum's head.

The area is also significant ecologically, with Matters of National Environmental Significance (MNES) and Matters of State Environmental Significance (MSES) found there, including Lowland Subtropical Rainforest, native macadamia species and the Powerful Owl. The area is cherished by its residents for many reasons, including the abundant birdlife, the exquisite views and a developing sense of community.

In 2013, a few active residents and Maroochy Landcare began the process of galvanising energy around a collective approach to managing bushfire risk with the dissemination of information packs, a well-attended community information day and a number of meetings with relevant authorities. This was supported by the Sunshine Coast Council and the three local Rural Fire Brigades whose responsibility includes parts of the area.

In 2014, SEQ Catchments, the regional body for natural resource management in South East Queensland, became involved in developing a Co-ordinated Fire Management Plan for Ninderry at the invitation of Maroochy Landcare. Such a plan brings together neighbouring landholders and Rural Fire Brigades in a bounded fire management area to develop an agreed risk reduction plan in the event of bushfire.

Two public meetings were held in late 2014 with particularly good attendance at the second. All attendees were given an aerial photograph of their property to assist them in planning their management. A small working group of residents and agency staff volunteered their services to develop a draft plan. After two meetings in early 2015, the draft plan was taken back to the full public meeting in mid-2015 for further discussion. An individual property planning workshop for priority areas on the west was to be organised by the SEQ Fire and Biodiversity Consortium, and this will take place in early 2016.

Organisations assisting residents in this collaborative process have been: Qld Fire and Emergency Services, Rural Fire Brigades (Maroochy River, North Arm and Valdora), Sunshine Coast Council, Maroochy Landcare, SEQ Fire & Biodiversity Consortium and SEQ Catchments.

2.3 Goals of the Ninderry Co-ordinated Fire Management Plan

LONG TERM GOALS - 10 years +	
1	Preservation of Life and Property
2	Protection of Flora and Fauna
MEDIUM TERM GOALS - 6 months to 2 years +	
1	<p>Reduce Fire Risk – Identify, control and manage fire risks and hazards within 12 months</p> <ul style="list-style-type: none"> a) Identify fire risks and hazards within 3 months b) Control fire risks and hazards within 6 months (including community fuel reduction activity to protect assets, flora and fauna) c) Priority reduction in high risk fuel areas each year
2	<p>Establish contingencies in the event of an emergency</p> <ul style="list-style-type: none"> a) Complete exit plans for fire events within 3 months b) Designation of Safer Zones within 3 months c) Implement agreed on-ground works within 12 months
3	<p>Develop good communication channels</p> <ul style="list-style-type: none"> a) Develop communication strategy within 2 months – expectations, how-to and responsibilities (including absentee landholders) b) Knowledge development about fire at Mt Ninderry – Education, awareness and preparedness meetings within 6 months



2.4 History of fire in Mt Ninderry area

2.4.1 Changing values and landscape

Land use has changed through recent decades from agriculture to rural residential or peri-urban in the Mt Ninderry area. The community profile, including property and infrastructure values, have also transitioned from a more agrarian to one based more strongly on environmental and lifestyle values

Numerous events have influenced the current situation for fire management at Mt Ninderry. A chronological history of some of the significant recollections contributed by local historian and Ninderry resident Mrs Esma Armstrong includes:

Date	Historical account
1850	Products from the cattle industry were tallow and hides. The same year rich timber resources of the Yandina district were sought by the early timber getters.
1888	Agriculture villages of Ninderry and Gneering were opened for selection
1890's	Most of the land remaining in Yandina and district was selected
1900	the only large acreage remaining for selection was swampland east of Ninderry Range
1905	Silky Oak Settlement- 19 Blocks were made available to settlers
1905	Maroochy River Fire
1928	North Arm Fire: Mr Flynn's banana farm destroyed. Flames menaced the house and other buildings. Fires set alight many dead trees causing them to crash over the roads while green trees were burnt to the top. Roads and tracks were cleared to allow the fire fighters to return home
1930	the district had become a mosaic of small farms on which were growing agriculture crops maize, cane, bananas etc, grazing and dairy, saw milling
1935	Frost and Bush Fires: Bush fires were raging in many places due to the strong westerly winds. Tonight on all highlands close to Yandina the many lights from the bushfires and blazing stumps and dry timber gave the appearance of the lights of a city. Farmers are taking precaution to burn breaks close to the cane plantations
1936	Forestry Department's Worry: Dry weather and warm days have affected all North Coast crops and bush fires have broken out in Noosa Shire district Beerburum, Glass House and Beerwah districts. Fires have also been reported from Ninderry Range near Yandina and another started at Eumundi.
1948	Nambour-Yandina Fire Board constituted: Maroochy Shire set up a fire Board, consisting of two appointed by Governor-in- Council, two by Maroochy Shire Council and three by the contributory Insurance companies.
1951	Yandina Creek Bush Fires: An unoccupied house and a banana plantation with packing shed were destroyed by the bush fires. Fire fighters prevented the destruction of homes crops and pastures of other farmers. The fires were fanned by strong south-westerly winds. On the slopes of Ninderry, three miles east of Yandina the fires reached serious proportions. Fire fighters from Nambour /Yandina brigades and farmers fought the flames with spray pumps and wet bags. It was midnight before the fire was under control
1966	Hugh Jensen Ninderry road owned 607 acres on twelve deeds.
2008	Maroochy River Bush Fire Brigade opened new fire station.
2009	Yandina-North Arm Rural Fire Brigade opened new fire station opened. 50th anniversary of the brigade.

2.5 Fire risk at Mt Ninderry

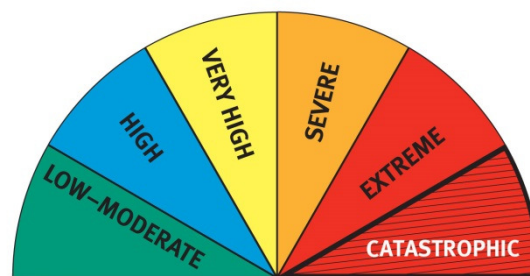
2.5.1 Characteristics of a bushfire in SEQ

There are 3 elements required for fire to occur. These are oxygen (in air), fuel and heat. When these elements are in correct proportion with each other, fire will easily propagate and spread. When vegetation burns as a bush fire the main factors affecting the fire's behaviour are the weather, the terrain, and of course the vegetation.

The weather that precedes a bush fire will determine how much moisture is in the environment. This moisture plays a critical key role in fire behaviour. When moisture is present, some of the fire's energy will be spent on heating and steaming off the moisture so combustion can occur. When less moisture is present, the fire has more energy available to generate higher flames and produce more heat. The climate in South East Queensland is temperate with often good levels of moisture in the vegetation and air. Periods of prolonged dry are possible but less common in South East Queensland when compared with Western Queensland or the southern Australian States.

Normal seasonal variation to weather on the Sunshine Coast will usually produce drier periods in winter that often extend into spring. While bushfires can occur at any time throughout the year, these fires will be more severe when moisture levels in the air (humidity) is lower and the vegetation curing is higher. Environmental dryness is checked regularly and is a main consideration when determining the local fire danger rating. The fire danger rating is a semi-circular sign that displays a rating for that particular time at a given locality.

FIRE DANGER RATING



The fire danger rating is colour coded and based on the Fire Danger Index (FDI) scoring system as shown below. The FDI score is calculated using the McArthur Forest Fire Danger Meter.

FIRE DANGER RATING	
Category	Fire Danger Index
CATASTROPHIC	100+
EXTREME	75 – 99
SEVERE	50 – 74
VERY HIGH	25 – 49
HIGH	12 – 24
LOW – MODERATE	0 – 11

As the fire danger rating increases so too does the level of preparation and alertness that should be in place if fire were to occur. There are as yet no plans to erect a rating sign at Ninderry as it requires constant updating to maintain currency and at this time there is no provision to do that. It is deemed

better to not have the signs than to have signs with an incorrect rating. Community should check local radio and TV and follow the advice of the Rural Fire Brigade website at this link:

https://ruralfire.qld.gov.au/Fire_Safety_and_You/Community_Warnings

Typical weather that will lead to an elevated Fire Danger Rating will be when wind blows from the NW to SW and humidity is low (less than 25%). The danger posed is further increased as wind strength and temperatures rise.

Local terrain is another key factor in how a bushfire will travel and behave. Fire will travel faster up a slope than along level ground. Likewise fire burns slower down a slope than along level ground. The hills and ridges in Mt Ninderry will affect rates of bushfire spread.

Vegetation is the remaining factor affecting bushfire behaviour that needs consideration. While all vegetation could burn in a bushfire, it is much more common that only some of the vegetation is consumed when a fire occurs. There are numerous reasons for this variation including moisture content, size and arrangement of the vegetation, and the prevailing weather at the time of the fire.

Available fuel is a term used to describe what vegetation will burn during a bushfire and the availability of fuel can change just like moisture levels can change. The diameter of twigs, sticks and branches plays a very important part on how available they will be to a fire. Fine fuel is the term used to describe grasses, shrubs, leaves, twigs, and sticks. But the twigs and sticks need to have a diameter of approximately 10mm or less. Fine fuel is the predominant fuel for a bushfire and this fine fuel is what quickly burns to produce a fire's energy and appetite for spreading. Flammable items with a diameter larger than 10mm may well burn also, but they take longer to ignite and will be consumed later so that delay is too slow for the energy produced to contribute much to the actual rate of spread for the bushfire.

The amount of fine fuel present can be measured and is quantified in tonnes per hectare T/Ha. Higher T/Ha figures means a greater fuel hazard and a higher risk should fire occur.

The final aspect of fuel needing consideration is the arrangement. Consider grass that is 1 metre high and has cured so it carries little moisture. Should this grass catch alight, it will burn readily due to the surrounding air and the small gaps between each blade that will allow fire to jump easily along its path driven by the wind. Now consider the same grass has been mown and is lying as mulched piles on the ground. Should the cut grass catch alight, the fire's progress would be much slower due to the inability for the same amount of air to get close to assist combustion. So while the fuel load (grass) is identical in both cases, it is the arrangement of the fuel that plays a significant part in how the fire will behave and spread.

For a bushfire to continue spreading there needs to be vegetation that is connected or in close enough proximity to facilitate that spread. The contiguous nature of vegetation gives a bushfire the potential to grow and spread. Firebreaks serve to divide vegetation into portions and limit the available fuel. The effectiveness of a firebreak relies on its width and how well the firebreak is maintained. While firebreaks are extremely useful, during an intense bushfire that is spreading freely, normal firebreaks may not be adequate to halt fire spread.

The available fuel at Mt Ninderry is quite varied and is divided in places by roads, well maintained mown yards, and portions of rainforest. Bushfire risk mapping will show locations of higher risk. Structures that are elevated and exposed to vegetation that slopes down to the SW – W - NW will be at greater risk than structures that are on low down on level ground and have good clearance between vegetation and the structure.

As the separation distance between a structure and vegetation increases, so too does the chances of that structure surviving from the threat of a bushfire. The State Planning Policy outlines recommended distances of setback to be 1.5 times the height of nearby vegetation.

2.5.2 The difference between hazard and risk

A HAZARD is a source of potential harm or a situation with a potential to cause loss, whereas RISK is the chance of something happening that will have an impact on objectives (ISO 13000:2009).

“It is measured in terms of consequences and likelihood. Risk is based upon the consideration of the consequences of the full range of natural hazard events on communities and their social settings, and the natural and built environment.” State Planning Policy – natural hazards flood and bushfire 2013 (draft pg 5).

“Risk reduction measures pose dilemmas for many residents on urban margins. Such people place a high value on living close to bushland, for a host of reasons (e.g. visual, recreational and cultural amenity). Conflicts may arise between risk reduction policies and activities in and around bushland margins and the amenity that people derive from living in these places. For example, the clearance of or permanent structural alteration of vegetation may diminish visual amenity for local residents. Risk management at the urban interface may involve inherent trade-offs between tangible (e.g. houses) and less tangible (e.g. human amenity, biodiversity) values. Such trade-offs may be difficult to evaluate objectively, though some promising initiatives exist (e.g. Morehouse et al.2010).” Bradstock, R et.al 2014 *Social Construct Of Fuels In The Interface*, Bushfire CRC, Melb.

Risk category	Definition
Acceptable risk	A risk that, following an understanding of the likelihood and consequences, is sufficiently low to require no new treatments or actions to reduce risk further.
Tolerable risk	A risk that, following an understanding of the likelihood and consequences, is low enough to allow the exposure to continue, and at the same time high enough to require new treatments or actions to reduce risk.
Intolerable risk	A risk that, following an understanding of the likelihood and consequences, is so high that it requires actions to avoid or reduce the risk ¹ . (State Planning Policy – natural hazards flood and bushfire 2013 draft pg 6)

2.5.3 The impact of climate change on risk

While no one fire event can be linked to climate change, the changes in our climate are having effects on the fire danger weather that has consequences to the duration, intensity and extent of fires across the South east corner of Queensland.

It is projected that there will be increases in large rainfall events which can lead to increases in fuel loading and the potential for the shortening of periods of time for prescribed burning (potential increase in wetter winters, hotter and drier autumns and hotter springs).

If we assume a temperature change of the maximum of 1.5° (mean air temperature) by 2030, Climate Projections Analogues Explorer (app) shows towns resembling Mt Ninderry (using Nambour as a nearest town) should expect climate similar to that of the towns of Gympie, Sarina and Mackay.

2.5.4 Encourage adequate insurance

The Insurance Council of Australia advises people to understand what coverage they have, as well as any exclusions that may be part of their insurance. Ensure that the sum insured is the same as that of the value of the assets insured.

<http://www.insurancecouncil.com.au/for-consumers/consumer-tips/bushfire-preparation>

2.6 Preparation to minimise fire risk

2.6.1 What is the Bushfire Survival Plan?

Each property owner needs to consider the potential for a bushfire emergency to occur that may impact on their property or day to day activities. Likewise, each property owner should consider what they can do and what preparations they will make prior to a bushfire occurring. Such preparations can be formalised in a Bushfire Survival Plan (BSF).

The Queensland Fire and Emergency Service (QFES) strongly advocate the need for residents and property owners that may be at risk from a bushfire to have their own Bushfire Survival Plan. A template for printing and filling out your own Plan can be found at:

https://ruralfire.qld.gov.au/Fire_Safety_and_You/Prepare.Act.Survive/

Properties that become overgrown increase the overall bushfire hazard for the community. It is the responsibility of individual property owners to recognise when a bushfire hazard exists on their property and plan for ways to mitigate that hazard.

Advice can be sort on how to prepare individual properties. Where a hazard spreads across multiple properties, a coordinated and cooperative approach between property owners will be needed. Mt Ninderry has four (4) Rural Fire Brigades close by with Urban Fire Stations at Nambour and Coolumb as well that will be able to provide such advice.

A property that is well prepared prior to a bushfire arriving will often have a good chance of surviving even if a neighbouring property is not so well prepared.

2.6.2 Sunshine Coast Council management of fire risk

Fire Management Plans have been developed for Mt Ninderry Environmental Reserve and Karnu Drive Bushland Conservation Reserve. These plans identify infrastructure such as fire access trails and also provide guidelines for how and where prescribed fire will be used on Council managed reserves in the Ninderry area.

These plans are currently under an internal review. Once completed they will be added to Council's Bushfire Management website.

Keys for gates to Council reserves have been provided to the local Rural Fire Brigade vehicles.

2.7 Communications strategy

The effectiveness of all fire management planning for preparation and response in times of emergency comes down to a matter of good communication based on trust and respect.

2.7.1 Preparatory communications

Healthy relationships

In preparing for a fire emergency, the development and fostering of healthy relationships within neighbourhoods and between neighbourhoods and authorities are paramount. These are not static and require on-going attention.

It is essential that all residents understand that neighbours may not share their value system and hence may manage their properties and assess risks in a different way.

It is also essential that residents understand the role, function, costing and voluntary nature of the Rural Fire Brigades in order to have realistic expectations. It is important that residents understand the nature of their landscape and the potential speed of fire in different landscape attributes.

Street meetings

To communicate this shared plan to the residents and to build neighbourhood relations and help manage expectations, a three-year program of street meetings based on prioritised streets using fire risk mapping will be developed.

These meetings will be run by the Rural Fire Services in association with Queensland Parks and Wildlife Service and be about an hour in duration on a weekend. Residents will be personally invited by individual letters with the Queensland Fire and Emergency Services logo on it and addresses supplied by Council, with Council to mail the letters. The meeting will be held in proximity to a house with good examples of recommended fixtures eg camlock valve on tanks and security screen.

The priority streets are Elouera, Karnu and Honeydew. The short term target is to hold meetings in each of these four streets before the next fire season, organised by Volunteer Community Educator Anne Schofield.

2.7.2 In times of emergency

Dial 000. Mt Ninderry residents need to be aware that a first action in a fire related emergency response if they see smoke or are aware of a potentially hazardous fire is to call 000.

The essence of the communication strategy in times of fire emergency relies on multiplicity: multiple channels to get the word out including media coverage, and SMS; and multiple points of call to answer questions as outlined in the Emergency Response Procedure including Helpline and Emergency Number.

Emergency AUS website – Residents can download the phone app to stay informed
<http://www.emergencyaus.info/discover/app>

Safer Zones – Two ‘safer’ areas to gather if needed are Leach Park and corner of Elouera Drive and Karnu Drive is also one, as well as Leach Park.

2.7.3 Rural Fire Brigade volunteer campaign

At every opportunity, the community needs to be involved in an on-going campaign to recruit volunteers to the Rural Fire Brigades. The skills and physical capabilities required are not confined to actual fire-fighting, but include a range of lighter responsibilities that may appeal to less able and older residents. To have a good network of volunteers throughout the community will strengthen the knowledge and awareness and keep community expectations of the RFB volunteers realistic, as well as bolstering the brigade numbers to address preparedness and emergency response

2.8 Community fire management activities

2.8.1 Vulnerable residents register

Education is critical, especially for those that cannot attend a fire management or street meeting eg elderly or infirm. A register needs to be established of Mt Ninderry residents who may fall into this category. Engaging authorities who are responsible for this is essential: Emergency Management (QFES) has a community liaison officer; COTA (Council of the Aging), the peak body for seniors, who was advocating for a state wide risk register (not sure if SCC has one). The document "Safeguarding Vulnerable Seniors during Natural Disasters" can be downloaded from COTA. (See: http://cotaqld.org.au/wp-content/uploads/2014/09/Safeguarding-Vulnerable-Seniors-from-Natural-Disasters-Forum-Report_2309-Final-Version.pdf)

A shelter evacuation centre may be a concern to be communicated to Sunshine Coast Council and may be a possibility for a community led activity.

2.8.2 Property water access signage for fire vehicles

Landholders are encouraged to display a blue 'W' sign at the front of their properties if they have available water and the right connections (50mm female camlock) and accessibility. These signs are available from Esma Armstrong and Anne Schofield VCE. The fittings can be purchased from most outlets and can be installed on the line below the tap without having to empty the tank. If there is standing water such as swimming pools and dams, can display an 'SW' sign to notify the RFB of this opportunity. The Rural Fire Brigade needs to be notified of all properties that are willing and qualify so they can check the appropriateness and develop a register.

2.8.3 Reducing fire risk on private property

Individual Property Management Planning is to be encouraged. SEQ Fire and Biodiversity Consortium will hold a workshop in 2016 to assist an identified cluster of properties in higher risk areas. (See: <http://www.fireandbiodiversity.org.au/index.html>).

2.8.4 Education package development

VCEs will target high-risk areas as determined by fire risk assessments (see 2.6.1), using the following strategies well in advance of the fire season:

- 1) Door-knock & leaflet high-risk areas with Voluntary Community Educator (VCE) contact details for property visits and resources;
- 2) Conduct property visits and 'street meets' as requested, providing information and resources;
- 3) Deliver 'Landholder Folders' to new residents via local Real Estate Agents;
- 4) Work with local Landcare group to encouraging plantings & land management practices that reduce fire risk; and
- 5) Facilitate a community meeting annually on preparing your property and family in advance of the fire season, which usually begins in August- September each year depending on conditions.

Utilities: Need to involve Energex, Telstra and Unity Water in education and communication program.

Funding opportunities: Contact advocacy groups to see if there are funding opportunities to assist older and vulnerable folk (COTA).

2.8.5 Delivery of Mt Ninderry Fire Management Education Package

This is to be primarily delivered by the VCEs. Planned training activities will help clarify community expectations and responsibilities with bushfire.

These activities will also assist in educating people about the roles and capacity of Rural Fire Brigades and Fire Wardens and to build better relationships with trust and respect. Key topics include:

1. Real vs perceived risk - Authorities understand the Ninderry landform does not lend itself to community members being trapped in unpredictable fire - e.g. low chance of blockage from trees falling on Ninderry Rd.
2. What happens in the event of an uncontrolled or dangerous wildfire: Prepare. Act Survive
 - Bushfire advice
 - Rural Fire Board risk notification
 - Community educators
 - Messages SMS and Facebook – QFES has a system in place to notify through social media and text
 - Stay or Go?
 - Enact your bushfire fire survival plan based on the Fire Danger Rating advised by authorities
 - Up to individuals to stay and defend or go early
 - Safety
 - Greater understanding and well considered plan will decrease panic and increase rationality
 - Designation of safer zones – Principal Safer Zone is Leach Park on Waterfall Rd where the helicopter can get in and water is available. Another Safer Zone if necessary is at the corner of Elouera and Karnu Drives. Also suggested is George Carpenter Park at 106 Ninderry Rd.
 - Neighbourhood Safer Places (NSPs) designated by local Council as 'places of last resort' are also listed on their website: www.sunshinecoast.qld.gov.au

2.8.6 Physical activities landholders can undertake

1. Understand species risk - melaleuca and stringybarks can cause embers. Rainforest plants when in closed assembly are 'less flammable plants', however when the fire does infiltrate, they do not bounce back like other ecological communities as they are not adapted to fire in the landscape.
2. Fuel manipulation by changing fuel arrangement – e.g. laying weeds down, mulching or encouraging the work of scrub turkeys! Hasn't reduced fuel *load* but has reduced fuel *hazard*.
3. Deal with long grass – can Council assist? Most effective if it comes through an action to address an overgrown, unsightly and vermin problem, rather than 'fire risk'. The wording of the complaint is important, and the community needs to know the most effective approach.
4. Animal fuel reduction – e.g. goats could be used as a tool to reduce fuel load.
5. Rolling working bees helping neighbours to control weeds.
6. Removal of potential fuel in Council green waste collection?

2.9 Conclusions

1	Fire Management is both an individual and community responsibility
2	Community response plan is imperative
3	Individual Property Fire Management Plans are valuable
4	Identify vulnerable neighbours
5	Engage with community
6	There is safety in numbers – needs to be a willingness to work together
7	Collaborative approach to understanding and reducing risk
8	Acceptance of individual's right to engage with bushfire risk assessment and management
9	Clusters of targeted Property Fire Management Plan for landscape scale outcomes in priority areas
10	Sunshine Coast Council continue to manage reserves in the Ninderry area as per Fire Management Plan guidelines.
11	Sunshine Coast Council continue to work in cooperation with reserve neighbours across reserve boundaries to manage bushfire risk and maintain environmental values

Any consideration of alternative exit routes should be dealt with in a separate process with the local councillor.

2.10 Follow Up

Plan for a five year plan review and ensure that everyone's needs are acknowledged.

1. Add benefit to Local Area Plan through proactive community planning and action
2. Assist other communities to use this planning process to help their areas
3. Add value in how council planning interacts with community planning
4. Ensure science informs process
5. Support community planning
6. Need to have QPWS at the table
7. Would like the plan to address all emergencies (all hazards approach)

2.11 Accessing the Mt Ninderry Co-ordinated Fire Management Plan

Planning products will be housed and available on SEQ Catchments website.

<http://www.seqcatchments.com.au/resources-general-reports.html>

3.0 Appendices

3.1 Tips for planting to reduce fire risk

*Anne Schofield,
Voluntary Community Educator (VCE) Area Coordinator
North Maroochy Group*

There is no such thing as a 'fire proof' plant.

All plants will burn in the right circumstances or if subjected to intense prolonged heat. However, there are types of plants that are more resistant to fire and there are garden layouts & planting arrangements that can reduce the spread of fire.

SO...you can reduce the damage of a bushfire by planting certain types of vegetation on your property AND using particular garden & planting layouts.

The survival of a house is influenced by many interacting factors. The four main ways houses are destroyed during a bushfire are:

- ember attack
- radiant heat
- direct flame contact
- wind

Ladder fuels
Don't
inadvertently
create
a fuse
to your
house



Plant flammability

Determining the flammability of plants is not straightforward & may vary in a bushfire - when conditions are often unpredictable. Plant flammability is described as a combination of:

- the time taken for a plant to ignite
- how readily it burns when the ignition source is removed
- how much material there is to burn
- how long it takes for all available fuel to be consumed.

Less fire-prone plant have the following characteristics:

- The leaves have a high water or salt content, making them less likely to ignite
- The leaves contain no or low volatile oils
- Foliage is coarse, not fine
- Plants are often short & low to the ground, reducing potential flame height
- Trees have smooth bark (all year!), with branches more than 2 metres above the ground
- Trees do not accumulate dead wood within the canopy
- They have an open rather than closed branch pattern with minimal 'density'

Moisture content depends on a number of factors:

- The time of day – eg. late afternoon
- The season: moisture content declines slowly during the dry season or in a drought
- Where the plant is located: amount of shade, wind, drainage & soil type
- The part of the plant: new growth has higher moisture content than old growth
- The age of the plant – old plants are usually woodier than young ones

Branch height

Plants with branches at least 2 metres above the ground are better than those with continuous foliage from the ground to the canopy - under-pruning increases separation. Separation between ground fuel and foliage on the rest of the plant prevents lower branches acting as 'ladder fuels'.



Plant density

Plants with closely packed leaves and branches have more fuel available within the plant and are usually more flammable



Branching patterns

Choose plants with open and loose branching as well as leaves that are thinly spread.

Foliage flammability

Plants with a coarse texture are less flammable than plants with a fine texture ('fine fuels').

To identify coarse textured plants it should be easy to distinguish each leaf from a distance of 3 metres.



Coarse-textured foliage



Medium-textured foliage



Fine-textured foliage

Selecting trees

There are a number of Australian native plants that manage fire well and may form part of your vegetation planting. Here are some examples:



Saltbush *Atriplex cinerea* - The salt-laden foliage of Saltbush allows it to withstand the intense heat of the desert...or a fire!



Native Passionfruit
Passiflora herbertiana

Queensland Silver or 'Pearl' Wattle
Acacia podalyriifolia - An evergreen shrub best known for its attractive silvery-gray foliage and an abundance of ball-like yellow flowers in late winter and spring. Reported to be quite drought tolerant.



Native Frangipani *Hymenosporum flavum*



Lillypilly *Syzygium smithii* – a rainforest plant

A simple test to gauge the fire vulnerability of the trees and shrubs in your garden:

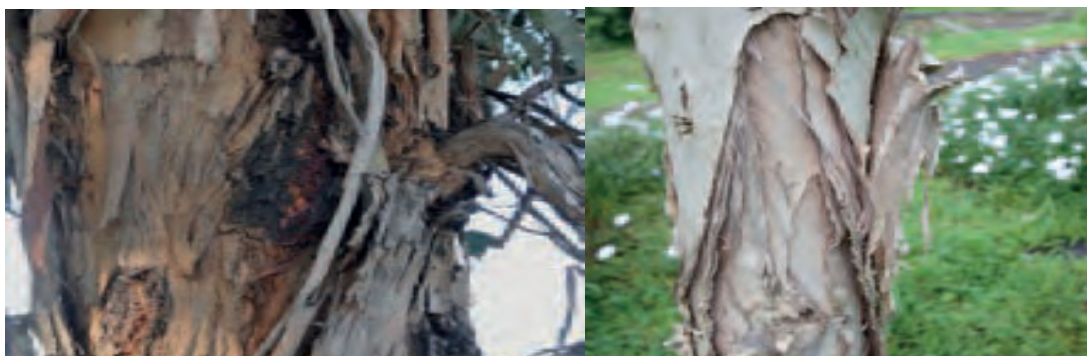
When fire restrictions permit burning off, throw a small sample of foliage from each tree and shrub onto a stack fire & see how much it flares up & crackles.

Consider pruning or even removing plants with foliage that flares fiercely and throws embers some distance.

Bushfires are often accompanied by strong winds, which may cause branches to break or whole trees to blow over. Trees can also catch fire, burn through and fall over ('roman candles'). Correctly selected and located trees can reduce:

- wind speed
- absorb radiant heat
- filter embers.

Some native trees such as stringy or paper barked trees help fire to 'climb' quickly.



Laying out gardens to reduce the impact of fire

- Garden layout factors are important in reducing the impact of fire. Aside from the types of plants there are layout factors to consider:
- Don't have tree branches hanging over the roof of your house
- Try and have at least 3 metres of clear access between any trees and your house
- Avoid creating 'ladders' that can assist the movement of fire by spacing trees and other plants apart
- Incorporate lawns, pebbles, pavers or water features to break up continuity of fuel
- Place non-flammable features such as tennis courts, swimming pools, dams, patios, driveways or paths on the northern and western sides of your house.
- Watch that flammable items, such as doormats and firewood stacks, are not located against or under the house.
- Locate farm machinery, sheds and poisons well away from the house (as they too may become fuel in a bushfire).

Creating defendable zones

A 'defendable zone' is an area of land around a building where vegetation is managed to reduce fire risks. The planting pattern breaks up continuity of fuel, reduces the amount of fuel available to a bushfire and can reduce wind speed and ember attack. The type of vegetation planted can also reduce fire risk.

The Inner Zone

The inner zone is the area immediately around the house. It provides separation from fuel sources, reduces radiant heat, eliminates direct flame contact and reduces ember attack. Vegetation in this zone needs to be planned and looked after well in advance of the fire season.

Inner zone features:

- Grass should be kept under 5cm in height
- Keep flammable objects away from windows, decks and eaves
- Don't plant larger shrubs near windows
- Don't plant shrubs under trees in this zone
- Tree canopy separation should be no less than 2 metres
- Don't have trees overhanging the roof or touching walls

The Outer Zone

The outer zone sits between the inner zone and unmanaged vegetation (beyond the defendable space). Vegetation is managed to a more moderate level to decrease the ground fuel and restrict available fuels

Outer zone features:

- Grass should be no more than 10 centimetres in height and leaf and other debris mowed, slashed or mulched.
- Shrubs and trees should not form a continuous canopy
- Tree branches below 2 metres from ground level should be removed
- Shrubs should not be planted too close to trees with loose, stringy or ribbon bark.
- Shrubs should be planted in separate clumps to break up 'fuel continuity'



If you are on a slope, don't have highly flammable trees on the downhill side of your house. Some species can carry a lot of dead wood, so clear it out before the fire season.

Ensure safe access and retreat for fire personnel to the inner zone.

Ensure water sources are accessible.

And DON'T throw garden litter over your fence if you back onto a park or reserve!

A note of caution

- All plants will burn in time if enough heat is applied for long enough to dry them out.
- If clearing native vegetation, you need to comply with Vegetation Protection legislation – contact your local Council.
- Regardless of your planting regime, be prepared to leave on a day of Severe or Catastrophic fire danger.
- The Fire Service cannot station an appliance at every property during a bushfire emergency.
- *Don't believe everything on the internet!*

Remember...

The arrangement of vegetation within a garden, rather than the flammability of individual plants, has a greater impact on how a bushfire will spread.

How you manage that vegetation is **entirely up to you!**

Help to keep our firefighters safe and happy – like our guys from Maroochy River...

