Fire Mitigation Plan
~ Forster ~

Great Lakes Council

July 2006

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Sections Amended:

- Section 8 pg 71. Table 8
- Section 9. pg8 Table 18
- Apendix XIII pg 127

Funding was made available through a three-way partnership between the Federal Government, State Government and Great Lakes Council.

EXECUTIVE SUMMARY

Great Lakes Council's, Fire Mitigation Plan – Forster has been prepared for the Forster urban and rural environs.

Funding through the Natural Disaster Risk Management Studies Programme assisted in the preparation of this report. The administration of the funding is with the NSW State Emergency Management Committee, through the Department of Transport and Regional Services (DOTARS).

Greater understanding of fire management planning by the community and planners provides a primary mechanism to protect life and property during fire events.

The areas mapped Bush Fire Prone Land guide fire management strategies in development assessment and strategic planning tools for hazard reduction works.

The bushfire mitigation program within this report identifies fire management zones such as asset protection zones, strategic fire advantage zones, land management zones, fire exclusion zones and highlights fire prevention and mitigation.

The management of hazardous fuels, or mitigation against imminent bushfires through cooperative education programs, reduces the risk to life and property throughout the area.

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SECTION 1

Introduction

Great Lakes Council has prepared this Fire Mitigation Plan to provide a comprehensive guide for fire management planning within the Forster urban area. Council has the responsibility to manage community land in a manner that assists fire fighting authorities during fire operations and the protection of assets and life.

The Fire Mitigation Plan - Forster (the Plan) covers the town of Forster and encompasses Council land including road reserves and Crown land (managed by Council). The plan considers management by other authorities, agencies, private property owners and existing management strategies.

The Plan provides fire management guidelines and incorporates statutory obligations to manage bushfire risks and to protect life and property.

Within the study area, the main township is Forster, situated on the eastern edge of Wallis Lake (Figure 1). Forster is accessed along the Lakes Way; north from Tuncurry and south from Bulahdelah. The coastal climate and the rural living setting within the Wallis Lake Region is also a well known tourist destination.

The Forster area has been developed with residential properties amongst reserves for conservation and recreational use. The study area is also bordered south and east by Booti Booti National Park (BBNP), Wallis Lake and the South Pacific Ocean.

Toward the west much of the Wallis Lake is surrounded by disturbed remnant vegetation (on private land, Council and Crown Land and in national park), although fragmented provided disjunct corridors for local flora and fauna.

Fire behaviour is greatly influenced by slope, aspect and fuel types. Understanding the effects of fire with forest types, fuel arrangements and knowing the influence of these on fire behaviour is important when assessing fire hazards and risks when planning fire management strategies.

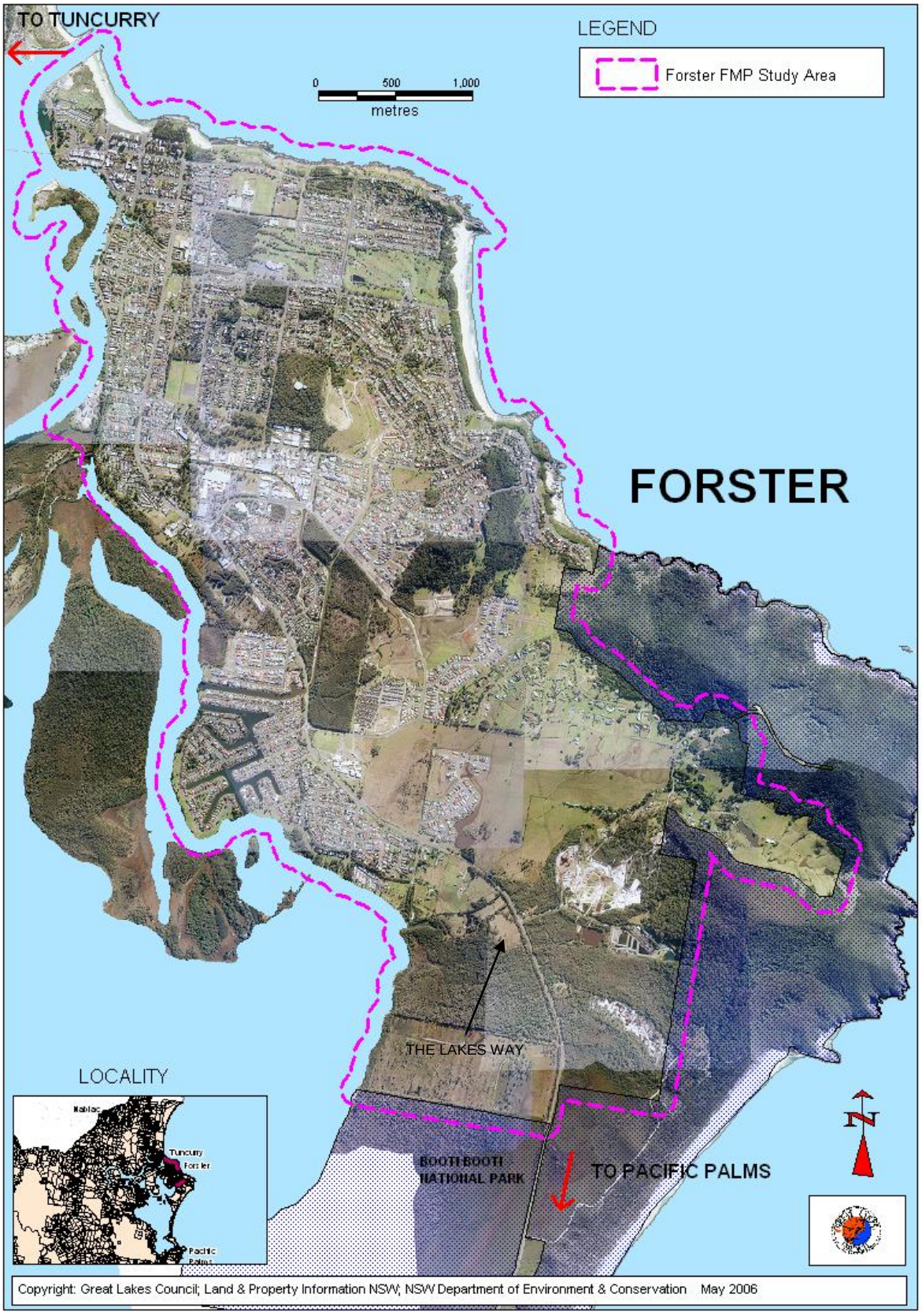


Figure 1: Location of Forster and the study area boundary.

Scope and Purpose

This report is a tool to guide fire management planning. Specifically, it assists Council land managers in applying processes, using appropriate assessment methods and to identify strategic management programs, for bushfire affected land and bushfire prone land.

The plan considers overall bushfire hazards and risks within Council owned and managed land (Council Land) within the Forster area. These fire management strategies are comprehensive within the plan identifying programs and activities necessary for Council to protect life and property, community assets and to meet fire and environmental management responsibilities and obligations.

These strategies have been guided by documents prepared by the NSW Rural Fire Service (RFS) including:

- Bush Fire Environmental Assessment Code for NSW, February 2006 (commonly known as 'The Code' and referred to as the BFEAC) and
- Planning for Bush Fire Protection, A guide for Councils, planners, fire fighting authorities, developers and home-owners, 2001 (PFBFP).

In addition an environmental assessment considers and reports on the environmental impacts of proposed hazard reduction works, under such legislation as the *Threatened Species Conservation Act 1995 (TSC Act)* and the EP&A Act.

The field assessments and analysis on Council Land incorporates threats to life and property from adjoining areas, overall bushfire risks, subsequent bushfire hazard ratings, existing land management practices, necessary approved fire management works, vegetation types and fire history. The proposed mechanical hazard reduction works and fire regimes involved scientific analysis of fire threat and frequencies and the anticipated bushfire impact on the community.

Active management and involvement in ongoing hazard reduction by the community is important. The reduction of ground fuels and implementation of home protection plans to prepare properties against the effects of fires, improves the success of overall fire mitigation works.

Consultation with the stakeholders, neighbours, RFS and the Parks and Wildlife Division of DEC enabled a coordinated approach between Council, fire specialists and affected neighbours.

The Plan has been prepared with reference to various legislative and planning controls. These include specific fire legislation such as the *Rural Fires Act 1997* (RF Act) and the *Rural Fires Regulation 2002*. In addition specific policies, strategies, plans and guidelines are considered during the preparation of the fire management plan are tabulated below.

Plans, Policies, Strategies and guidelines		
Local Government	**Building Environment**	**Fire related**
Council Policy for Bush Fire Protection for Rural dwellings and subdivisions 1993	Building Code of Australia - AS3959 Construction of Building in bushfire prone areas Standards Australia, 1999	Planning for Bushfire Protection (RFS 2001)
Great Lakes Council Current Policy Register	Planning for Bushfire Protection (RFS 2001)	Bush Fire Environmental Assessment Code for NSW (RFS 2006).
Councils Policy for Fire Management for Council Controlled Natural Areas 1996	Building in bushfire prone areas. (RFS 2004g).	Lower Hunter Zone BFMC, Bush Fire Risk Management Plan (BFMC 2004)
Great Lakes Local Environmental Plan 1996 (LEP)	Building in bushfire prone areas. Guidelines for single dwellings development applications (RFS 2004e).	Great Lakes Plan of Operations. (RFS 2004d).
Mapped Bushfire Prone Land	Building in bushfire prone areas. Guidelines for subdivisions applications. (RFS 2004f).	
Council Development Control Plans (DCP)	**Natural resource**	
Council Tree Preservation Order (TPO)	Integrated Catchment Management Plan for the Lower North Coast 2002 (DIPNR 2002)	
Draft Vegetation Strategy, Eastern Portion. Great Lakes Council. Volume 1 & 2. (GLC 2004a&b)	Supplementary State of the Environmental Report (GLC 2004)	

Understanding the document

The fire management plan has been prepared to give strategic and operational outcome to fire responsibilities of Council and be used as an educational tool for property owners. The plan has been divided into 2 parts, with 9 sections to assist in the interpretation of the process and prepared outcomes.

Part 1 – Background Information

Section 1 — Introduces the processes.
Section 2–6 — Provides background information for fire management

Part 2 – Fire Mitigation Plan

Section 7 — Identifies and discusses the local environment, features and local fire issues.
Section 8 — Identifies management strategies for fire management zones relating to assets in the area.
Section 9 — Identifies the works program.

Part 3 – Other related fire information

Appendices/References — Gives background details on various fire management planning policies, background information and other data to assist in the interpretation of the plan.

The flow chart in Figure 2 demonstrates the steps in the preparation of the plan. The dictionary in appendix I identifies references to fire planning and operations.

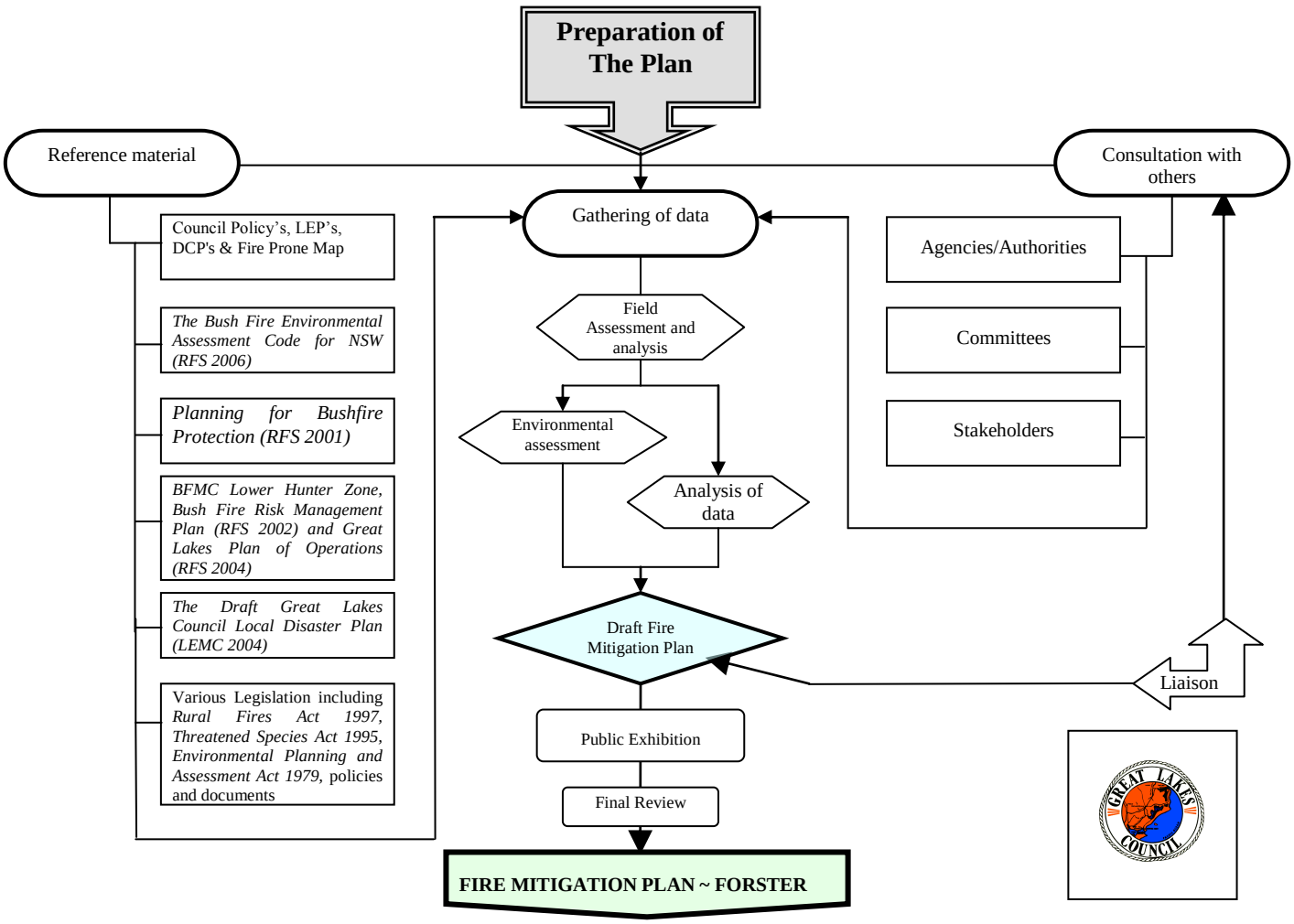


Figure 2: The planning process.

The planning process

The fire fighting functions apply to the various fire fighting authorities, during bushfires and emergency incidents. The plan provides additional information available for use during fire operations and concurrently meets the objectives of the RF Act.

Fire Management Objectives

Councils overall fire management objectives are defined within the *Great Lakes Council Management Plan* (Appendix II), and Councils policy for *Fire Management for Council Controlled Natural Areas.* Councils fire management objectives are consistent with statutory obligations and policies and are to:

- Protect life and property in or immediately adjacent to Council Land from bushfires.
- Minimise the spread of bushfire into or from Council Land.
- Minimise risk and reduce threat of bushfires on fire fighters and the community.
- Suppress or contain bushfire on Council Land.
- Reduce the risk of damage to assets and the environment.
- Maintain biodiversity and integrity of the natural environment.
- Promote participation of the community in implementing property fire management and Home Bush Fire Survival Planning.
- Inform the community of bushfire hazards and promote fire management planning in Bush Fire Prone Areas.
- Provide financial support and resourcing requirements to the NSW Rural Fire Service.
- Provide financial support and resourcing requirements to the State Emergency Service.
- Continue to annually evaluate and review the *Disaster Management Plan*.

Management Strategies

Council has identified their key fire strategies of the plan as:

- ❖ *To create fire management zones to assist in providing fuel reduced areas adjacent to assets.*
- ❖ *To implement fire mitigation programs to ensure ongoing fuel management continued for protection of community assets.*
- ❖ *To provide information for the community on bushfire works and to review in relation to Council's proposed activities.*
- ❖ *Acknowledge there are potential ignition risks of bushfires within parks and adjacent roadsides from natural and un-natural causes.*
- ❖ *Undertake environmental assessment for hazard reduction works to ensure steps towards sustainable actions area implemented.*

SECTION 2

Fire Management Responsibilities and Obligations

Under the RF Act public authorities and all land managers are responsible for preventing the occurrence of bushfires on and to mitigate against the spread of fires from entering or leaving their land.

Great Lakes Council

Council manages land within the local government area (LGA) including parks and reserves, formed and unformed road reserves and individual parcels of land.

Under the RF Act, the *State Emergency and Rescue Management Act 1989*, and the Rural Fires Regulation 2002 Council are:

- ✓ *A certifying authority to issue Bush Fire Hazard Reduction Certificates for Council managed land;*
- ✓ *Responsible for the identification of Bush Fire Prone Lands within the Council Area under section 146 of the EP&A Act which is certified by the Commissioner of the NSW RFS;*
- ✓ *Responsible for regulating property development & building construction through Local Environmental Plans (LEP) & Development Control Plans (DCP) to reduce hazards from bush, grass or rural fires. The Council refer developments under Section 100B to the Commissioner for certification of Bush Fire Safety Authorities;*
- ✓ *Responsible to ensure each DCP addresses bushfire hazard management and Council development controls in Bush Fire Prone Areas; and*
- ✓ *A consenting authority for development with consultation with the RFS in compliance with the RF Act under Section 79B and the EP&A Act and the Environmental Planning and Assessment Regulations 2000.*

Council contributes funds towards the operating costs of the RFS and the Emergency Services, to provide and maintain such items as fire fighting vehicles and facilities provide equipment and training of volunteers. Council also contributes towards employment of officers within the RFS to facilitate emergency services and mitigate hazards within LGA.

Bush Fire Management Committee

The Bush Fire Management Committee meets specific requirements under the RF Act. Great Lakes are within the Lower Hunter Zone Bush Fire Management Committee (BFMC), which

includes members from 2 other LGA's. A Council officer and an elected Councillor represent Great Lakes Council on the Committee.

The committee prepares the BFMC, Bush Fire Risk Management Plan (BFRMP), the BFMC, Plan of Operations, meets reporting requirements within the RF Act and is responsible for the promotion of public education programs relating to the bush and grass fire threat throughout the local area..

Great Lakes Council Local Disaster Plan

As constituted under the *State Emergency and Rescue Management Act, 1989* and within the State DISPLAN, Council has a committee member on the Great Lakes Local Emergency Management Committee (LEMC). The Local Disaster Plan guides determination of a local emergency and appointment of the Incident controller of the appropriate combat agency during fires in urban and rural areas.

The *Great Lakes Council Local Disaster Plan* (DISPLAN) assists in the arrangements at a local level to prevent, prepare for, respond to and recover from emergencies.

NSW Rural Fire Service

The NSW Rural Fire Service (RFS) work cooperatively with Council to ensure the effective allocation of funding, management, maintenance, support, of fire and emergency operations. The RFS also assists other emergency service organisations at incidents and at emergencies under the control of those organisations.

The RFS function is to provide bush fire fighting services and provide the resources including appliances and personnel resources to combat rural fires within the LGA, rural fire district. The network of Rural Fire Brigade Stations and equipment across the Great Lakes Area are managed by the RFS and maintained through Council depots.

Council has conferred to the Commissioner of the RFS a range of functions under the RF Act as they relate to issuing of s66-s70 notices, bush fire hazard complaints and the issuing of bush fire hazard reduction certificate in accordance with the Code. The issuing of bushfire hazard advice notices on private land is accompanied by the RFS authorised BFHRC for private landholders to undertake works. Other authorities certify their own bushfire hazard activities.

The RFS also provides community education, fire fighters and specialist to mitigate and suppress fires by assisting in emergencies and daily incidents such as wild fires, motor vehicle accidents, floods and storm damage events.

NSW Fire Brigade

The NSW Fire Brigade (NSWFB) responds to and manages emergency incidents, as well as educating the community through prevention programs and to build community resilience by preparing for emergencies.

> ✓ *'The NSWFB provides fire protection, urban search and rescue, hazardous material response, natural hazards response, emergency life support, terrorist consequence management and other emergency management capabilities. The NSWFB works cooperatively to develop and implement plans for emergency services throughout NSW, through the maintenance of strategic working alliances with other emergency and support services' (NSW Fire Brigade 2004).*

NSW Department of Environment and Conservation (Parks and Wildlife Division)

The Parks and Wildlife Division of the Department of Environment and Conservation (DEC) (commonly known as the National Parks and Wildlife Service (NPWS)) are a recognised fire authority and public land manager who implement fire and environmental management obligations under the *Threatened Species Act 1995* (TSC Act) and other related legislation. The organisation prepares fire management plans and identifies fire management strategies in accordance with DEC plans, policies and procedures such as those detailed in the "NPWS Fire Management Manual" (NPWS 2001).

DEC undertakes operational fire fighting cooperatively with other agencies and landholders. DEC fire management planning and approach to fire suppression, mitigation and prevention is to meet fire legislation, planning objectives that sustain ecological processes and principles, and which maintains the protection of life, property and environmental assets.

Department of Planning and Infrastructure (Forests)

Department of Planning and Infrastructure (DPI), (Forests) formerly State Forests (SF) provide resources and support for emergency fire management, to protect life, property, community assets and forest values.

Their Fuel Management Plans identify fire management zones, appropriate fire regimes, and hazard reduction works including the use of prescribed burns as a management tool for reducing forests fuels and to identify practices that are economically and ecological sustainable.

NSW Department of Lands

NSW Department of Lands (DL) has a responsibility for bushfire management on Crown Land, Crown Roads and Crown Reserves. This land is often fragmented, by settlements or are linear (foreshores, roadways, waterway areas), with varying conservation values. The Crown Reserve System promotes "...the cooperative care, control, and management of Crown reserves by the community with assistance from the Department of Lands, other government agencies and reserve users." (DL 2005). By Crown Land managers delegating to the local

government authority (managers of crown land), enable Council to cooperatively plan and implement fire management objectives.

Hazard reduction, environmental assessment and the preparation of a fire plans (by Reserve Trusts) during the management of reserves assist in protecting assets, neighbouring assets and communities as required by the DL (DL 2005b).

Country Energy/TransGrid

Country Energy recognises that vegetation management is important to prevent the spread of bushfires and prevent the ignition from electricity lines. Country Energy environmental policy and commitment to meeting legislative requirements ensures the environment is protected and enhanced for future generations, during service operations and fire prevention management.

The authority, TransGrid is responsible for the high voltage transmission lines and associated assets, which traverse the state and are generally, located in rural and semi-rural areas. TransGrid risk approach to asset management assumes that every transmission line has the potential to be impacted by fire, or to initiate fire, including bushfire.

TransGrid has also prepared a Bush Fire Risk Management Plan that identifies strategies, policies and procedures that are based on the principles of risk management and specifically on bushfire risk management (TransGrid 2003).

MidCoast Water

MidCoast Water is responsible for the supply of reticulated water and sewage system within some areas in Great Lakes LGA and the management of waste water through the facilities in Forster, Tuncurry, Hawks Nest, Bulahdelah and Stroud.

During fire fighting operations, authorised personnel access fire hydrants throughout some localities to supply fire appliances with fire fighting water. The readily available supply in some urban and rural areas assists in the suppression of wild fires or use during hazard reduction activities.

MidCoast Water ensures the protection of facilities by undertaking fire mitigation works around their own assets to required levels in the various fire management zones (FMZ's).

Private Landholders

The broader community actively undertakes hazard reduction works in and around their properties. As landholders become aware of changes to fire regulations further hazard reduction works are implemented. . These works complement works by other landholders or land managers in and around villages, townships and rural areas.

The emphasis on the responsibility for owner/occupiers to minimise the occurrence and the spread of fire, and to meet legislative requirements when bushfire hazard reduction is required, is highlighted through community education programs. Hazard reduction works can provide reduced fuels, safer environs and protection of community assets including biodiversity within forested areas.

Appendix III can assist landholders with being prepared for bushfires by providing steps and options to take and assist in fire prevention and hazard reduction. Additional information can be sourced on the RFS website or the local fire control centres and Rural Fire Brigades.

SECTION 3

Bush Fire Risk Description

Bush Fire Risk

Bush fire risk analysis is a mechanism to undertake risk assessments (in the field) on assets including life and property, natural and cultural heritage. By preparing for the imminent advancement of a bushfire incident, hazard reduction activities can serve to quell the intensity and subsequent detrimental affects on the community or the asset.

The BFRMP is an indicator for Council in prioritising bush fire mitigation works. Within this document the resultant bushfire risk ranking (extreme, major, moderate, minor or insignificant) identifies ranking of an area (or special area) depending on the ability for assets (built/natural) withstand or recover from a fire event).

Bush fire risk is defined as: The chance of the bushfire igniting, spreading and causing damage to assets within the community or reducing biodiversity of areas within natural areas.

The Plan incorporates field assessment of assets, the potential localised bushfire risks, hazard reduction requirements with outcomes that also consider environmental legislation and guidelines. The fire management strategies included within section 8 identify fire mitigation works proposed in asset protection zone (APZ's), strategic fire management zones (SFAZ), land management zones (LMZ) and fire exclusion zones (FEZ) within the study area.

Overview of the BFRMP Bush Fire Risks within the Study Area

The insignificant, minor and extreme bushfire risk category within Forster is a consequence of the proximity of bush land areas to the township. The management of fire hazards, through reducing fuels within bushland areas, assists in the protection of the community. Vegetation management lessens the impact on residents, visitors and fire fighters during a fire incident that may occur.

The Australian landscape has adapted and evolved due to fires. Lightning strikes are a natural phenomenon and have been known historically to occur throughout the area. Seasonal thunderstorms along the coastline and further inland are a source of ignition as well as other ignition sources which range from arson, escaped hazard reduction, accidental ignition and motor vehicle accidents.

Existing Features

The urban area of Forster has dissected the coastal vegetation and greatly reduced the existence of large vegetation units within the local area. Urban settlement has been

developed amongst areas retained for conservation and public recreation between Wallis Lake and east to the coastline. Within these areas there are key habitats (including SEPP 14 and 26) via corridors and adjoining existing reserve systems.

These remnant areas if ignited are likely to sustain bushfires, and may affect adjoining properties. To the south of the study area forested private land adjoin BBNP where historically, coastal bushfires have a fire path leading north or south parallel to the coast (Figure 3).

Various fire advantage lines exist both naturally and man made including roads, transmission lines, waterways, lakes and wet gullies. These may be used as required during wild fires as control lines however spotting which can occur during extreme fire weather conditions, may be as far as 5 kilometres across such advantage lines.

Forster has reticulated water within the urban area and also abuts Wallis Lake which provides water sources for fire fighters and aerial water bombing craft. This moister environment can assist in providing environmental conditions to slow the movement and longevity of fires.

The pattern of urban development within the township often divided by reserves, is conducive to ignition of fires from ember attack such as those in Forster (Figure 4). Bushfire affected land within Forster has been detailed only within the Plan. As seen in the example, parts of the surrounding area of Forster are predominantly managed land or maintained open space. The remnant bushland areas within the township may provide bushfire hazards adjacent to properties; however FMZ's are maintained adjacent to assets in order to reduce the fire risk.

The terrain within the local area has a variety of slopes that range from 0–5º in the low—lying areas to 15º on the undulating elevated slopes and at times greater than 18º in steeper areas. The steeper slopes enable fires to run in places at a greater rate of spread than those with lesser slope. The type and arrangement of fuels affect fire spread and fire behaviour in an area.

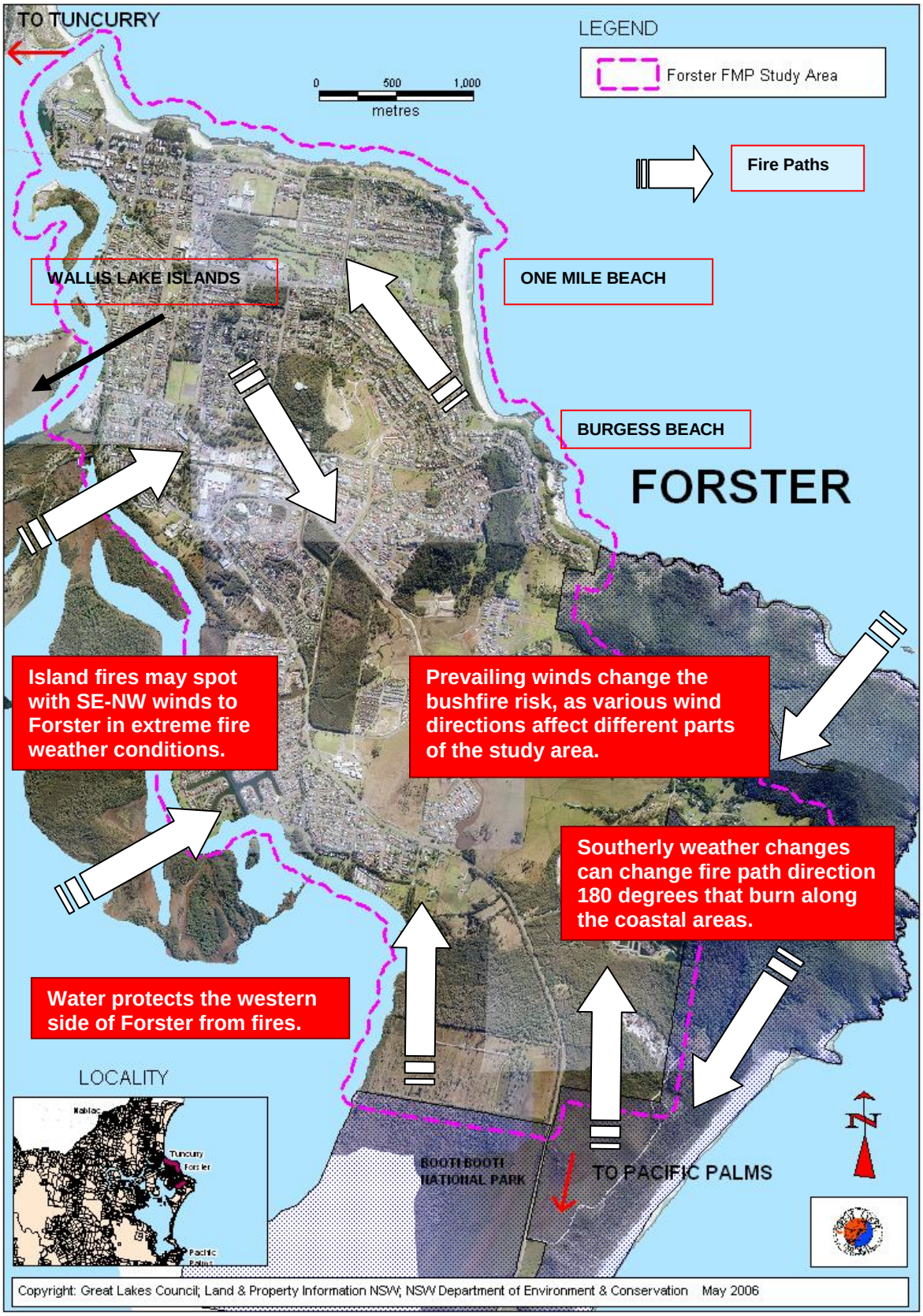


Figure 3: Bushfire risk to Forster.

Figure 4: Development within Forster.

Risk to Life and Property

The BFRMP identifies Forster urban area as being within an *insignificant, minor, moderate and major bushfire risks.* The higher the risk, the more chance fire has a greater impact on the asset or the community. The closer the bushfire threat the higher the risk. The BFRMP assessment identified and used set criteria in determining the bushfire risk. Council has summarised the assessment of both urban and rural developments (Appendix VI). This assists planners when implementing fire management under the various legislative documents and procedures.

Six localities have been identified where life and property[1] (LP) are directly threatened from the spread of fire or impacted by bushfire (bushfire affected lands), from adjacent bushland to the urban interface (Table 1) (Figure 5).

Table 1: Risk to life and property.

Code	Location	Description of risk	BFRMP Risk Rating
LP1	Forster (West) – Wallis Lake Foreshore	Western residential edge and bushland interface of Forster, linking with Forster Foreshore Reserve. Ember attach from bushfire on island reserves.	Insignificant
LP2	Forster (South & south-east) - BBNP	Eastern bushland/grassland interface (linking with BBNP) within rural and residential properties north of the reserve.	Insignificant / Minor / Moderate / Major
LP3	Forster (East) – Coastal Foreshore	Eastern bushland/grassland interface along the coastal foreshore (linking south into BBNP) within residential and rural properties east of Forster.	Insignificant
LP4	Forster (North) – The Sanctuary	Adjacent residential edge and open space interface linking with the reserves.	Insignificant / Major
LP5	Forster (Central) – Boundary Street	Adjacent residential edge and open space interface linking with the reserves. The bushland corridor links with private land.	Insignificant / Major
LP6	Forster (South) – Urban	Southern bushland/grassland interface (linking with forested land) within rural residential properties (south of Forster).	Moderate / Major

Potential ember attack during a bushfire incident from adjacent burning bushland re-enforces the importance and requirement for householders to mitigate against the fire threat and for residents to undertake their own fire preparedness activities.

[1] Life and Property is identified on figures as LP with corresponding number identified in Table 6

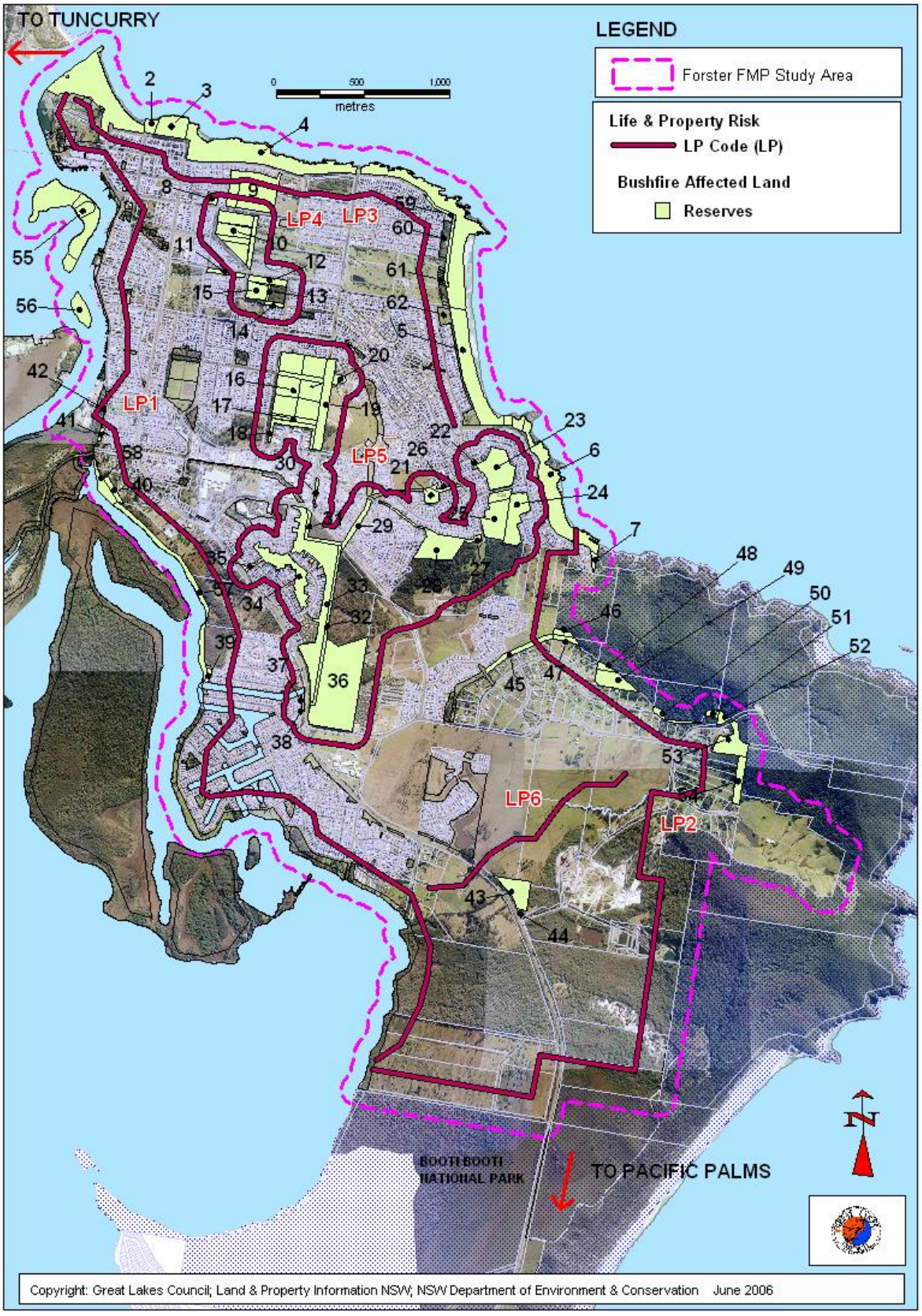


Figure 5: Location of life and property risk.

Risk to Natural Heritage

The BFRMP identifies and classifies Council reserves within Forster as having *insignificant, minor and major bushfire environmental and ecological risks*[2]. Those Council managed areas affected by bushfire have been included within Table 2. The risk rating indicates the effects of fire on the land identified or the actual level of impact of fire on the environment

Table 2: Risk to natural heritage on bush fire affected lands.

ID	Council Managed Land	Lot / DP	Vegetation Community	Vegetation Formation	Environmental & Ecological Risk Rating
1	Forster Beach RES 34 (R79681)	Lot 7088 DP 1066047	• Tuckeroo • Banksia • Cleared / Sand Ridge	• Dry sclerophyll shrub/grass forest • Rainforest	Insignificant
2	Forster Ocean Baths RES 21	Lot 7086 DP 1055392	• Blackbutt – Bloodwood/ Apple • Cleared / Sand Ridge	• Dry sclerophyll shrub/grass forest	Insignificant
3	Second Head Reserve RES 16	Lot 7122 DP 1024267	• Banksia • Blackbutt – Bloodwood/ Apple • Cleared	• Heathlands	Insignificant
4	Pebbly Beach / The Tanks/ Pt Bennetts Head RES 60	Lot 406 DP 753168	• Banksia • Cleared / Sand Ridge • Disturbed Heath • Fig Giant Stinger/Myrtle	• Heathlands	Insignificant
5	Bennetts Head/Burgess Beach (Pt One Mile) RES 51 (R83666 Part)	Lot 7033 DP 1026118	• Banksia • Scrub • Palm/ Myrtle • Fig Giant Stinger/Myrtle • Sand Ridge • Myrtle • Cleared	• Heathlands • Rainforest • Swamp sclerophyll forests	Insignificant/ Minor
6	Burgess Beach (Pt One Mile Beach) RES 51 (R83666 Part)	Lot 7033 DP 1026118	• Myrtle • Scrub • Tuckeroo • Fig Giant Stinger/Myrtle • Cleared	• Swamp sclerophyll forests • Heathlands • Rainforest	Insignificant / Major
7	Burgess Beach Reserve RES 5110	Lot 142 DP 31849	• Fig Giant Stinger/Myrtle	• Rainforest	Insignificant / Major
8	GLACICA	Lot 81 DP 48717	• Cleared	• Cleared	Insignificant
9	Forster Aquatic & Leisure Centre RES 5191	Pt Lot 427 Sec 31 DP 758422 & PART RES 89603	• Cleared	• Cleared	Insignificant
10	The Sanctuary & Road Reserve RES 86	RES 87776 & Lot 701, 702 DP 1000953, Lot 7076 DP 1000971, Lot 7077, 7078 DP 1075116	• Swamp Mahogany/Paperbark • Blackbutt – Bloodwood/ Apple • Cleared	• Swamp sclerophyll forests	Minor
11	Townsend Recreational Reserve RES 111 (R91588)	Lot 7081 DP 1000952	• Swamp (freshwater)	• Swamp sclerophyll forests • Rainforest	Insignificant / Minor / Major
12	Cemetery Forster RES 3 (R19843)	Lot 7079 DP 1075117	• Tallowwood • Palm • Cleared	• Semi mesic grassy forest	Insignificant
13	Cemetery Forster (Road Reserve)	Road Reserve	• Tallowwood	• Semi mesic grassy forest	Insignificant

[2] Environmental & ecological risk rating is the affect on the biodiversity and natural values of the area

ID	Council Managed Land	Lot / DP	Vegetation Community	Vegetation Formation	Environmental & Ecological Risk Rating
14	Likely Street Reserve RES 109 (R91525)	Lot 7080 DP 1075117	• Tallowwood	• Semi mesic grassy forest	Insignificant
15	Cemetery Forster (R19843)	Lot 7123 DP 1056466	• Tallowwood	• Semi mesic grassy forest	Insignificant
16	Water Reservoir Reserve RES 116 (R 94748)	Lot 132, 133, 134, 135, 136, 137 DP 753168 & Lot 7076 DP 1000961	• Cleared • Spotted gum-Ironbark/Grey gum • Tallowwood/Grey Gum	• Dry sclerophyll shrub/grass forest	Minor
17	Mark Street	Mark Street	• Cleared • Tallowwood/Grey Gum	• Dry sclerophyll shrub/grass forest	Insignificant
18	Public Reserve RES 5012	Lot 13 DP 263011	• Cleared • Tallowwood/Grey Gum	• Dry sclerophyll shrub/grass forest	Insignificant
19	Boundary Street	Boundary Street	• Cleared • Tallowwood/Grey Gum • Myrtle	• Dry sclerophyll shrub/grass forest	Minor
20	Public Reserve	Lot 867 DP 1063462	• Cleared • Tallowwood/Grey Gum • Myrtle	• Dry sclerophyll shrub/grass forest	Insignificant
21	Cocos Crescent Public Reserve RES 5241& RES 5253	Lot 248 DP 801790 & Lot 404 DP 810999	• Cleared • Palm • Spotted gum-Ironbark/Grey gum	• Swamp sclerophyll forests	Insignificant / Major
22	Public Reserve RES 5238	Lot 47 DP 793497	• Cleared	• Cleared	Insignificant
23	Public Reserve RES 5034	Lot 38 DP 260437	• Cleared • Tallowwood/Grey Gum • Swamp Mahogany/Swamp Oak	• Dry sclerophyll shrub/grass forest	Major
24	Public Reserve RES 5068	Lot 80 DP 262684 & Lot 140 DP 224909	• Tallowwood • Swamp Mahogany/Swamp Oak • Cleared • Palm	• Dry sclerophyll shrub/grass forest • Swamp sclerophyll forests • Rainforest	Major
25	Public Reserve RES 5252	Lot 347 DP 810426	• Tallowwood • Swamp Mahogany/Swamp Oak	• Dry sclerophyll shrub/grass forest	Major
26	Public Reserve RES 5239	Lot 48 DP 793497	• Cleared • Palm	• Cleared	Insignificant
27	Public Reserve RES 5285	Lot 500 DP 815328	• Spotted Gum • Tallowwood/Grey Gum • Cleared	• Dry sclerophyll shrub/grass forest	Insignificant / Minor
28	Public Reserve RES 5283	Lot 646 DP 836664	• Palm • Spotted gum	• Dry sclerophyll shrub/grass forest	Major
29	Drainage Reserve RES 5207	Lot 52 DP 738442	• Cleared	• Cleared	Insignificant
30	Public Reserve	Lot 100 DP 1035437	• Managed Garden	• Managed Garden	Insignificant
31	Part Boundary Street (Sth)	Boundary Street	• Swamp Mahogany/Paperbark • Smooth-barked Apple	• Swamp sclerophyll forests	Insignificant
32	Part Boundary Street (Sth)	Boundary Street	• Swamp Mahogany/Paperbark • Smooth-barked Apple • Paperbark/ Swamp Oak • Blackbutt-Bloodwood/Apple • Paperbark	• Swamp sclerophyll forests	Minor

ID	Council Managed Land	Lot / DP	Vegetation Community	Vegetation Formation	Environmental & Ecological Risk Rating
33	Drainage / Public Reserve	Lot 133 DP 264330	• Cleared • Swamp Mahogany/Paperbark • Paperbark	• Swamp sclerophyll forests	Insignificant
34	Public Reserve RES 5020	Lot 127 DP 264330	• Smooth-barked Apple • Cleared	• Dry sclerophyll shrub/grass forest	Insignificant
35	Public Reserve	Lot 129 DP 264330	• Cleared	• Dry sclerophyll shrub/grass forest	Insignificant
36	Public Reserve	Lot 23 DP 843479	• Paperbark • Cleared • Swamp Mahogany/Paperbark	• Swamp sclerophyll forests	Insignificant
37	Public Reserve RES 5195	Lot 17 DP 718960	• Cleared • Swamp Mahogany/Paperbark	• Swamp sclerophyll forests	Insignificant
38	RES 5005	Lot 5 DP 261963	• Cleared • Swamp Mahogany/Paperbark	• Swamp sclerophyll forests	Insignificant
39	Lampo Reserve RES 525 & Public Reserve	Lot 96 DP 771229 & Lot 49 DP 810924 & Lot 24 DP 847246	• Cleared	• Cleared	Insignificant
40	Public Reserve	Lot 11 DP 246251	• Paperbark	• Swamp sclerophyll forests	Insignificant
41	Public Reserve R85529	Lot 21 DP 243812	• Paperbark	• Swamp sclerophyll forests	Insignificant
42	Public Reserve	Lot 23 DP 1011195	• Paperbark • Cleared	• Swamp sclerophyll forests	Insignificant
43	Lot 1 DP 798402	Lot 1 DP 798402	• Swamp Mahogany/Paperbark	• Swamp sclerophyll forests	Minor
44	Public Reserve RES 5053	Lot 4 DP 571977	• Swamp Mahogany/Paperbark • Cleared	• Swamp sclerophyll forests	Minor
45	Public Reserve RES 5018	Lot 29 DP 263815	• Managed Garden	• Managed Garden	Insignificant
46	Standard RES 5265	Lot 2 DP 599950	• Cleared • Myrtle	• Rainforest	Major
47	Public Reserve RES 5198	Lot 34 DP 732573	• Cleared • Myrtle	• Rainforest	Major
48	Public Reserve RES 5264	Lot 6 DP 599949	• Cleared • Myrtle	• Rainforest	Major
49	Public Reserve	Lot 21 DP 732573	• Cleared • Myrtle	• Rainforest	Major
50	Public Reserve RES 5011	Lot 17 DP 2629	• Cleared • Myrtle	• Rainforest	Major
51	Public Reserve RES 5010	Lot 16 DP 262992	• Myrtle	• Rainforest	Major
52	Standard	Lot 6 DP 1014646	• Myrtle	• Rainforest	Major
53	Public Reserve	Lot 6 DP 1014646	• Cleared • Myrtle	• Rainforest	Major
54	Public Reserve RES 5186	Lot 16 DP 713933	• Cleared • Myrtle	• Rainforest	Major
55	Miles Island R82545 (Lot 7093 DP 1024268) & Lot 346 DP 753168	Lot 346 DP 753168 & Lot 7093, 7094, 7095 DP 1024268	• Swamp Oak • Mangrove • Sand Ridge	• Swamp sclerophyll forests • Estuarine & saline wetlands	Major
56	Leon Island R97462	Lot 7007 DP 1055393	• Swamp Oak	• Swamp sclerophyll forests	Major
57	Crown Land	Lot 7026 DP 1051706	• Paperbark	• Swamp sclerophyll forests	Insignificant

ID	Council Managed Land	Lot / DP	Vegetation Community	Vegetation Formation	Environmental & Ecological Risk Rating
58	Forster Recreation Reserve (R 700014)	Lot 5 DP 822655	• Paperbark • Cleared	• Swamp sclerophyll forests	Insignificant
59	Marine Drive	Marine Drive	• Sand ridge • Fig Giant Stinger/Myrtle • Banksia • Cleared	• Rainforest • Heathlands	Major
60	Public Reserve RES 5100	Lot 189 DP 229919	• Scrub • Sand ridge	• Rainforest	Major
61	RES 5175	Lot 1-9 DP 23572	• Scrub • Sand ridge • Palm/Myrtle • Paperbark/Swamp Oak • Cleared	• Rainforest • Swamp sclerophyll forests	Major
62	Collendina Park RES 5074	Lot 6 DP 242807	• Paperbark/Swamp Oak • Cleared	• Rainforest	Major

The adjoining BBNP is classified as having a major bushfire environmental and ecological risk.

Assessment of the fire risk within reserves adjacent to assets and identifying fire threats is part of the analysis within the plan. Fire regimes for hazard reduction burning are also described within code for SFAZ and LMZ's which consider biodiversity with burning practices.

There are higher risks to the conservation values to many of these areas as they are within Key Habitat and Regional Corridors and have high conservation values linking with BBNP and Wallis Lakes Estuary. When assessing the regional status of ecosystems within the LGA, (mapped of by the North East Comprehensive Regional Assessment (CRA)), the priority identified Swamp oak as a vulnerable, severely depleted community and requires further protection. In decreasing priority for local vulnerable status (paperbark) and rare status (mangrove, swamp and rainforest) the conservation of these communities during fire management is important.

SEPP 14 (Coastal Wetland) and SEPP 26 (Littoral Rainforest) both occur within the study area which requires special management practices to ensure their enhancement within the environment.

The compilation of the table within appendix VII assists planners to determine, by desktop, an overview of the vegetation types that are reviewed on site through each assessment determination. The vegetation category (type 1, 2 or 3 from the PBFP), guides the identification of fire management zones for new developments and subdivisions can assist during development assessment.

Risk to Cultural heritage

The conservation and protection of significant cultural heritage (Aboriginal and non-Aboriginal heritage) is important when undertaking any activity. The BFRMP does not specifically identify any archaeological or aboriginal heritage sites in or around the study area.

In addition the DEC (Parks and Wildlife Division) maintained Aboriginal Heritage Information Management System (AHIMS) search for Aboriginal Objects and Aboriginal Sites were consulted as part of the process.

Clause 21 of Great Lakes Local Environmental Plan, 1996 makes provision for significant 'Heritage items' and guides their enhancement and protection. Within Great Lakes, Schedule 2 does list 3 heritage items as local and regional (but not of state significance) within the study area.

Field Assessment Methodology

Field assessments are undertaken to provide data for analysis for managers. The assessment process follows guidelines provided by the RFS, and is an acceptable process for fire managers to determine the hazard and risk analysis of bushfire within and adjacent to bushfire affected Council managed land.

The contributing factors to the assessment include; the distance of the bushfire hazard to the asset (Threat) and, where the potential severity is influenced by the bushfire or by bushfire hazards (Risk). The overall fuel hazards are given as low, moderate, high, very high and extreme ratings.

The assessment includes using factors such as;

- ✓ vegetation type and separation distance of canopies;
- ✓ overall fuel loads, (bark, surface, elevated);
- ✓ slope;
- ✓ fuel quantity; and
- ✓ size of combined risk areas.

The hazard assessment also considers fire resistance construction standard of a building (or asset) (no standard, level 1, 2 or 3), Bush Fire Prone Land, BFRMP ratings including the hazard and risk rating and the risk management zone.

The assessment outcomes are based on potential extreme weather conditions, and the ability of an asset to recover from or withstand a bushfire.

Hazard reduction activities and seasonal influences affect vegetation growth rates and the resultant rating of the existing hazard. Variations in growth rates affect overall fuel loads, the ability to ignite and the rate the fire could spread. The preferred fire intensity within fire management zones adjacent to assets is ideally low—moderate. Fires may spread from adjoining areas or ignite as spot fires within the FMZ's.

The Commissioner of the NSW Rural Fire Service has certified Bush Fire Prone Land within Great Lakes Council under *section 146* of the RF Act. Bush Fire Prone Land was identified using bushfire vegetation mapping categories[3]. This provides a basis for planners and land manager's to identify areas where specific conditions apply to new developments and where hazard reduction activities are required to reduce the impact of bushfire on life and property.

Detailed site inspections capture hazard assessments and local environmental effects. Outcomes incorporate legislative requirements for fuel reduction and apply techniques with limited impact to local ecological values, yet simultaneously consider protection of life and property.

Recommendations for bushfire risk mitigation works are described within section 8.

[3] Refer to Appendix V for Criteria for mapping bushfire prone land

SECTION 4

Hazard Reduction

Guidelines for hazard reduction

Hazard reduction works are carried out to protect dwellings, buildings or other assets susceptible to fire. This provides a safer environment for fire fighters to work around whilst protecting people and assets during a fire.

Hazard reduction reduces fuel levels to minimise potential damage to life, property and the environment if a bushfire does occur.

Management of fuels

Graduated fuel management of hazards adjacent to development is important to ensure provisions are in place to assist in reducing the risk and the threat of fire whilst still maintaining at least a degree of the visual and environmental amenity of the area. These zones are commonly referred to as fire management zones including asset protection zones, strategic fire management zones, land management zones and fire exclusion zones.

Asset Protection Zone (APZ) *is an area surrounding an asset where ground fuel (often including the shrub layer) has been reduced to minimise the ignition and spread of fire and provide a refuge area for fire fighters and landowners to fight a bushfire.*

Strategic Fire Management Zone (SFAZ) *is the area adjacent to the APZ or are strategically located within fire paths (where APZ's are not in place) to reduce the severity of fires and the impact on the community. These areas complement works within APZ or other SFAZ and provide protection for fire fighters, watering points, significant sites or essential services.*

Land Management Zone (LMZ) *is the area of conservation and heritage value.*

Fire Exclusion Zone (FEZ) *is the area where fire is excluded from the area as fire regime thresholds have been met.*

Each zone has specific management strategies that can be implemented to meet management objectives (Table 3). Council has adopted the fire management zones and strategies as defined within the BFRMP.

Table 3: Fire management zones.

Fire Management Zones[4]	Objectives	Type of works	Notes
Asset Protection Zone (APZ)	❑ Protect life and property ❑ Mitigate against ignition of fires ❑ Prevent the spread of fires ❑ Reduce intensity of fires ❑ Minimise impact to conservation values within the area	✓ Reduce fuel levels by mechanical means ✓ Reduce fuels by hazard reduction burning ✓ Reduce fuels by grazing ✓ Works authorised within approved development applications (da's) ✓ Works certified by environmental impact assessment/the code	▪ Maintain average overall fuel levels (ofl) at moderate whereby levels are 8t/ha or below in an outer protection area (opa) ▪ Maintain fuels 5t and below per hectare in the inner protection area (ipa) ▪ Burn to reduce fine fuels by approximately 70-100%
Strategic Fire Advantage Zone (SFAZ)	❑ Protect life and property ❑ Mitigate against ignition of fires ❑ Prevent the spread of fires ❑ Reduce intensity of fires ❑ Minimise impact to conservation values within the area ❑ Enhance adjacent APZ works	✓ Reduce fuel levels by mechanical means ✓ Reduce fuels by hazard reduction burning ✓ Reduce fuels by grazing ✓ Maintain or construct fire advantages/fire trails ✓ Works authorised within approved da's ✓ Works certified by environmental impact assessment/the code	▪ Maintain average overall fuel levels at high and below. Burn to reduce fine fuels by approximately 50-80%
Land Management Zone (LMZ)	❑ Minimise impact to conservation values within the area	✓ Reduce fuels by hazard reduction burning ✓ Environmental assessment to be undertaken ✓ Maintain existing fire advantages/fire trails ✓ Construct fire advantages/fire trails ✓ Works certified by environmental impact assessment/the code for ecological burning	▪ Minimise works except for rehabilitation when required ▪ Burn to provide a mosaic pattern of burnt areas
Fire Exclusion Zone (FEZ)	❑ Minimise impact to conservation values within the area	✓ Maintain existing fire advantages/fire trails ✓ Construct fire advantages/fire trails ✓ Works certified by environmental impact assessment/the code	▪ Minimise works except for rehabilitation when required ▪ Hazard reduction & biodiversity burning excluded

[4] These zones are equivalent to the those defined within the Lower Hunter Zone, BFMC Bush Fire Risk Management Plan, 2002

Identification and implementation of hazard reduction activities for existing buildings are guided by conditions within the RFS publication of the *Bush Fire Environmental Assessment Code for NSW in 2006 (BFEAC)*. The widths of APZ fuel reduced areas are calculated using predetermined widths appropriate for various slopes (Appendix IV). Vegetation types and the floristic structure affect the implementation of mechanical on ground works. Retaining hospices (clumps/groups of trees/shrubs) of existing plants is to minimise impact on conservation values and improve community protection from the fires.

*The Planning for Bush fire Protection, 2001 (PBFP) identifies s*pecifications for asset protection zones, perimeter roads and fire trails, access and their construction standards for new developments. Reference to this manual is important for planners, developers and the community to understand bushfire protection and preparedness in bushfire prone land (Appendix IV).

The *BFEAC and the PBFP* guide hazard reduction work requirements for existing buildings as well as future developments and subdivisions. The BFEAC or other environmental assessment may be required to undertake mechanical fuel reduction activities or to initiate low—moderate intensity hazard reduction burns.

Hazard reduction options include:
Hand removal of shrubs;
Tree removal;
Clearing away fuels such as leaves, pruning's and clippings;
Clearing out gutters;
mechanical mowing, slashing, ploughing, trittering[5]; bulldozing;
Reducing fuels by grading or; and
Hazard reduction burning including pile burning (1.5m high piles) or prescribed burning of vegetation.

Encouraging a discontinuous vegetation layer ensures the environment is protected, when incorporating conservation of the remnant vegetation and reduction of elevated and ground fuels. Retaining a stand of vegetation is important as this can often act as a shield against strong winds, flying embers, and radiant heat on assets and provides protection on leeward side of these hospices.

[5] Trittering – mechanical mulching of the vegetation into smaller pieces

SECTION 5

Fire Preparedness and Community Education

Preparedness

The community is responsible for providing protection for themselves and their respective assets on their land from fire threat. By actively preparing property and homes against fires, possible fire ignitions and threats is a proactive approach to fire management.

Having a a background to bushfire regulations, how to prepare for grass and bushfires, what to do when fire approaches, what actions to take and consider and equipment required to assist during a fire event is part of being prepared.

There are several actions that can be undertaken including:

- ✓ Reduce possible ignition sources within properties.
- ✓ Reduce risk of ignition of the building and objects.
- ✓ Ensure designated access is clear for fire fighters.
- ✓ Reduced ground/fine fuels within the area.

Statistic shows, that by properly preparing a home and implementing appropriate strategies before the fire event, extensive damage can be reduced or even prevented.

SECTION 6

Ecological Considerations

Introduction

The plan promotes the integration of the protection and enhancement of the environment to ensure continued provision of environmental services and biodiversity whilst concurrently protecting life, property and community assets. Legislative guidelines initiate and explicitly require specific responses to meet these principles.

Further to these basic conservation requirements, is the completion of an environmental assessment to identify potential impacts of any proposed works which may effect the environment.

The *National Strategy for the conservation of Australia's biodiversity, 1996* promotes an integrated approach to conserve biological diversity and to meet community objectives. Ecologically sustainable development (ESD) meets the needs of Australians today, while conserving our ecosystems for the benefit of future generations (Department of Environment and Heritage 1992).

Fire and biodiversity in the Australian landscape is known to play an important role in determining the health and integrity of vegetation communities and fauna. This relates to both inter fire intervals (over and under frequent fire) and fire severity. Consideration to fire regimes and the management of fire on the environment is important when implementing fire management practices within natural areas.

Biodiversity Thresholds

Fire is a natural phenomenon however some landscapes are more adapted to fire whilst others are generally intolerant of fires, such as rainforests. Those that burn less frequently are moist forests but fires are more common in coastal heath, drier forests and woodland areas (Native Vegetation Advisory Council 1999).

Fire frequency affects the survival of plants and animals and longevity of populations. Minimal fire frequency enables enhancement of the environment whereas, inappropriate fire frequency disrupts the existing processes and thus biodiversity. *"Clearing of vegetation; and high frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition"* are recognised as key threatening processes (TSC Act 1995).

Species loss is expected when frequency of fires goes beyond known biodiversity thresholds. Recurrent disturbance interrupts plant life cycle processes such as maturation, seed

production and development of fire resistant organs (Bradstock *et al* 1995). Also, too infrequent fire intervals promote species loss and reduced diversity to both plant and animal communities.

The fire history (intensity and regularity) of an area directly influences the future requirement for a particular fire regime. A mosaic of burns (age classes) within a localised area varies existing fuel loads and resultant fire intensity within each vegetation community. Interruptions to natural systems from unplanned fires in bushland areas adjacent to urban fringes, recreational areas and road easements affect planning decisions. Consideration of these effects when planning hazard reduction burning reduces the impact on biodiversity.

The management of ground fuels is directly related to the years since individual fire events. Field analysis to assess fuel loadings enables managers to identify predicted fire behaviour from field assessments (NPWS 2003b) and therefore appropriately manages against risks.

Appendix VII, is an example of the quantitatively analysis of fine fuel accumulation that has been projected for the Sydney Region (NPWS unpub.). The managers accept the use of these tables to guide fuel accumulation using the age since last fire parameter. These fine fuel load graphs (including litter, herbs & shrub layer) can be applied to forested areas within the Great Lakes LGA. The graph demonstrates that immediately after fire open forests have a marked increase in fuels to year 5, whereby after this period accumulation slows and exponentially increases to a point where decomposition and successive changes eventually has minimal variation from its standard range (15 years +). Within rainforest formations fuel accumulates rapidly in the first 2 years then remains static as decomposition maintains a balanced environment (Refer to Appendix VII). Fire behaviour and intensity is affected by such factors as fuel accumulation and fuel loads.

Fire management objectives must ensure that there is, within an area, a mosaic pattern of burns with a range of age classes (time since fire) within each different vegetation community type (Bradstock *et al 1995*). This ensures seedlings mature and deposit viable seeds in the seed bank before the next fire.

Bradstock *et al 1995* defined fire regimes desirable to met conservation objectives and enhance species diversity. The related plant responses to fire frequency are seen below. A decline in population of plant species can be generally be expected in fire-tolerant communities (except rainforests, etc) when:

- ✓ *There are more than 2 consecutive fires less than 6-8 years apart (fire sensitive shrubs decline).*
- ✓ *Intervals between fires exceed 30 years (herbs and shrubs with short lived individuals and seed bank decline).*
- ✓ *3 or more consecutive fires occur at intervals of 15 – 30 years (sub-dominant herbs and shrubs decline).*

✓	*Occurrence of more than 2 consecutive fires which consume less than 8-10 tonnes/hectare of surface fuel (species with heat-simulated seed banks in the soil decline) (Bradstock et al 1995).*

Appendix VIII identifies the currently accepted biodiversity thresholds for all 65 vegetation communities within Great Lakes LGA, (as identified within the *Draft Great Lakes Vegetation Survey 2003) as* adopted from the DEC (Parks and Wildlife Division) (DEC 2005a; Bradstock *et al 1995*).This has been correlated with vegetation formation from Appendix IX and from of the Planning for Bushfire Protection, 2001 (Appendix 2 – Category 1, 2, or 3). Within this table specific minimum fire regime for SFAZ from within the Code has been collated.

The threatened species hazard reduction list within the Code (NSW RFS 2004g) are also referred to during the decision making process to identify the type of hazard reduction work that can be applied including hand removal, tree removal, slashing, trittering and burning.

Conservation Values

The Great Lakes area has demonstrated locally important and recognised significant ecological values, as described in documented reports and studies. On a local level the management of habitats and enhancement of conservation corridors, promotes diversity within the environment through appropriate fire management. The Great Lakes Council area has existing fauna corridors and predicted key habitat areas, which have been defined by the DEC (DEC 2005b).

The mechanism for national and state environment protection and biodiversity conservation is the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the TSC Act.

The TSC Act lists endangered populations (within Schedule 1, Part 2 of the TSC Act) and endangered ecological communities (within Schedule 1, Part 3 of the Act) in NSW. Two (2) endangered populations and eight (8) listed ecological communities potentially occur locally. This includes:

- Endangered Koala, Hawks Nest and Tea Gardens population.
- Endangered Emu population in the NSW North Coast Bioregion.
- Lowland Rainforest on floodplain in the NSW North Coast Bioregion.
- Littoral Rainforest in the NSW North Coast Bioregion.
- Coastal Saltmarsh in the NSW North Coast Bioregion.
- Swamp Oak Flood Plains in the NSW North Coast Bioregion.
- Freshwater Wetland on Coastal Floodplains in the NSW North Coast Bioregion.
- River-flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast Bioregion.
- Sub-tropical Coastal Floodplain Forest of the NSW North Coast Bioregion.
- Swamp Oak Floodplains of the NSW North Coast Bioregion and

- Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast Bioregion (TSC Act 1995).

The NSW Scientific Committee determines those species considered to be endangered (Schedule 1, Part 1), presumed extinct (Part 4), vulnerable (Schedule 2) and also activities deemed to be key threatening processes (Schedule 3). Such determinations are listed within the TSC Act. Table 4 shows the conservation significance within Great Lakes.

Fire managers need to have regard to conservation guidelines and consider management of various species and the impact through hazard reduction work, wildfire and disturbances, as well as key management guidelines from threat abatement plans.

Table 4: Conservation significance within Great Lakes.

Conservation significance within Great Lakes LGA	Status – EPBC. Listed as Endangered (E) & Vulnerable (V)	Status – TSC. Listed as Endangered (E) &Vulnerable (V)	Total Number
State & Nationally Threatened flora species	3 (E) & 8 (V)	5 (E) & 10 (V)	15
State & Nationally Threatened fauna species (26 mammals, 2 reptiles, 7 frogs & 47 birds)	4 (E) & 7 (V)	12 (E) & 70 (V)	82
International migratory wader species (JAMBA[6], CAMBA[7], Bonn Convention[8])	35	-	35
International migratory waterbird species (JAMBA, CAMBA, Bonn Convention)	21	-	21
International migratory near-shore seabird species (JAMBA, CAMBA, Bonn Convention)	7	-	7
Rare or threatened Australian plants (ROTAP)	-	-	7
Flora species recorded in Great Lakes LGA	-	-	1,428
Fauna species recorded in Great Lakes LGA	-	-	499

The Draft Great Lakes Council Vegetation Strategy, Volume 1 and 2, 2003, details vegetation community descriptions and regional and local status as well as the significance and conservation values of vegetation communities. It also details the association with vegetation communities of threatened fauna and flora, International migratory species, and rare or threatened plants (ROTAP). Also from within this report the regional status of vegetation within Great Lakes has been determined (Refer to Appendix X).

[6] Japan-Australia Migratory Bird Agreement (JAMBA)
[7] China-Australia Migratory Bird Agreement (CAMBA)
[8] Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)

Environmental Considerations

During the preparation of the fire mitigation plan and the subsequent operational works, planners have gathered field data and reviewed available background information. By referring to the following checklist (which includes reports and various documents) planners can ensure the process considers the range of potential issues and that hazard reduction activities on Council land meet both legislative and policy objectives:

Checklist	Reference Material Source
Planning for Bush Fire Protection, 2003	RFS
Bushfire Environmental Assessment Code For NSW, February 2006 (the Code)	RFS
Threatened Species/Threatened species hazard reduction list for the Code within each LGA	DEC/ RFS
Geographic information system layers	GLC/ RFS
Documentation on threatened and vulnerable species that have specific management consideration to fire or mechanical impacts	RFS/DEC
Updated Atlas of the NSW Wildlife records/Local records	DEC/GLC
Updated fire history records	RFS/DEC
Species impact statements	GLC/DEC
Environmental impact assessments or reviews of environmental factors	GLC
Eight part tests that apply to the area	GLC
Management plans for the area	GLC/DEC
Strategic plans	GLC
Detailed Local Environmental Studies	GLC/DEC
Local Environmental Plans (LEP's)	GLC
Updated changes to planning zones	GLC
Development controls and conditions on private development	GLC
Consideration to State Environmental Planning	Commonwealth & State Gov
Changes relating to the Native Vegetation Act, 2003	DOP

PART 2

Draft Fire Mitigation Plan

~ Forster ~

SECTION 7

Forster and our Living Environment

Location

Within the study area, Forster Township is situated between Wallis Lake and east to the South Pacific Ocean. Access is along the Lakes Way from the Pacific Highway south at Bulahdelah and north from Nabiac and Rainbow Flat. Forster area has 1,636 hectares for urban and rural living with an estimated population in 2005 of 13,404 (GLC 2003; derived from historic annual population increases).

Council managed land within the study area includes residential and commercial properties, road reserves and parks for recreation and environmental protection and crown land which cover approximately 246 hectares. Of this Council managed lands, 185 hectares are bushfire affected either by being Bushfire Prone Land or are affected by bushfire (Table 5, Figure 6).

Within Forster the reserves consist of remnant vegetation, not cleared (or regenerating) (Figure 6) which provide habitat and conserve highly significant areas such as coastal swamps recorded by the State of Environmental Protection 14 (SEPP 14) (adjacent to the lake) and coastal littoral rainforest (SEPP 26) or are considered EEC.

Parts of Forster's forested land were in 1950's open grasslands (from former clearing practices) which some areas have since regenerated within both private and public lands. Forest regeneration has occurred due to changing management practices which in places link to bushland corridors of Council Reserves with some bordering BBNP. The Parks and Wildlife Division of DEC manage BBNP, which borders the western side of the study area.

Road Access

Within Forster the bituminised roadways (primary and secondary) enable fire appliances to have good access from Tuncurry, Pacific Palms, Green Point and Bungwahl. The Lakes Way Road allows good egress for fire fighting units, residents, and visitors for use during fires fighting or use as an escape route.

Table 5: Bushfire affected Council managed land within the study area.

ID	Property Name	Reserve Number	Lo t/ DP	Ha	Vegetation Community	Land Type	Managed by
1	Forster Beach	RES 34 (R79681)	Lot 7088 DP 1066047	11.45	▪ Tuckeroo ▪ Banksia ▪ Cleared / Sand Ridge	Standard	Council & Crown[9]
2	Forster Ocean Baths	RES 21	Lot 7086 DP 1055392	0.6905	▪ Blackbutt – Bloodwood/ Apple ▪ Cleared / Sand Ridge	Community Land	Council & Crown
3	Second Head Reserve	RES 16	Lot 7122 DP 1024267	2.623	▪ Banksia ▪ Blackbutt – Bloodwood/ Apple ▪ Cleared	Community Land	Council & Crown
4	Pebbly Beach/The Tanks/Pt Bennetts Head	RES 60	Lot 406 DP 753168	12.57	▪ Banksia ▪ Cleared / Sand Ridge ▪ Disturbed Heath ▪ Fig Giant Stinger/Myrtle	Standard	Council & Crown
5	Burgess Beach/Burgess Beach (Pt One Mile)	RES 51 (R83666) RES 51 (R83666 Part)	Lot 7033 DP 1026118 Lot 7033 DP 1026118	7.688 11.76	▪ Banksia ▪ Scrub ▪ Palm/ Myrtle ▪ Fig Giant Stinger/Myrtle ▪ Sand Ridge ▪ Myrtle ▪ Cleared	Community Land Community Land	Council & Crown Council & Crown
6	Burgess Beach	RES 51 (R83666 Part) “ “	Lot 7033 DP 1026118 Lot 7033 DP 1026118 Lot 7033 DP 1026118	0.346 0.576 8.636	▪ Myrtle ▪ Scrub ▪ Tuckeroo ▪ Fig Giant Stinger/Myrtle ▪ Cleared	Community Land Community Land Community Land	Council & Crown Council & Crown Council & Crown
7	Burgess Beach Reserve	RES 5110	Lot 142 DP 31849	0.334	▪ Fig Giant Stinger/Myrtle	Community Land	Council
8	GLACICA	Lot 81 DP 48717	Lot 81 DP 48717	0.49	▪ Cleared	Standard	Council
9	Forster Aquatic & Leisure Centre	RES 5191 RES 5191	Pt Lot 427 Sec 31 DP 758422 Part RES 89603	3.136 4.495	▪ Cleared	Standard Community Land	Council Council
10	The Sanctuary	RES 86 (R 87776) “ “ “	RES 87776 Lot 702 DP 1000953 Lot 7077 DP 1075116 Lot 701 DP 1000953	1.316 1.748 0.137 1.724	▪ Swamp Mahogany/Paperbark ▪ Blackbutt – Bloodwood/ Apple	Standard Standard Standard Standard	Council & Crown Council & Crown Council & Crown Council & Crown

[9] Managed by Council and Crown - This is when the property is owned by Crown Land and jointly managed with GLC Council under a Trusteeship or Section 344.

ID	Property Name	Reserve Number	Lo t/ DP	Ha	Vegetation Community	Land Type	Managed by
10	The Sanctuary	" RES 86 (Pt R87776)	Lot 7076 DP 1000971 Lot 7078 DP 1075116	1.038 0.6627	▪ Cleared	Road Reserve Standard	Council & Crown Council & Crown
11	Townsend Recreational Reserve	RES 111 (R91588)	Lot 7081 DP 1000952	0.6425	▪ Swamp (freshwater)	Standard	Council & Crown
12	Cemetery Forster	RES 3 (R19843)	Lot 7079 DP 1075117	1.054	▪ Tallowwood ▪ Palm ▪ Cleared	Community Land	Council & Crown
13	Cemetery Forster	Road Reserve	Road Reserve	0.261	▪ Tallowwood	Road Reserve	Council
14	Likely Street Reserve	RES 109 (R91525)	Lot 7080 DP 1075117	0.3140	▪ Tallowwood	Standard	Council & Crown
15	Cemetery Forster	(R19843)	Lot 7123 DP 1056466	1.419	▪ Tallowwood	Community Land	Council & Crown
16	Water Reservoir Reserve	RES 116 (R 94748) " " " " " "	Lot 136 DP 753168 Lot 134 DP 753168 Lot 7076 DP 1000961 Lot 132 DP 753168 Lot 137 DP 753168 Lot 133 DP 753168 Lot 135 DP 753168	1.882 1.895 0.8974 1.91 1.837 1.877 1.855	▪ Cleared ▪ Spotted gum-Ironbark/Grey gum ▪ Tallowwood/Grey Gum	Community Land Community Land Community Land Community Land Community Land Community Land Community Land	Council & Crown Council & Crown Council & Crown Council & Crown Council & Crown Council & Crown Council & Crown
17	Mark Street	Mark Street	Mark Street	0.9062	▪ Cleared ▪ Tallowwood/Grey Gum	Road Reserve	Council
18	Public Reserve	RES 5012	Lot 13 DP 263011	1.364	▪ Cleared ▪ Tallowwood/Grey Gum	Community Land	Council
19	Boundary Street	Boundary Street	Boundary Street	3.605	▪ Cleared ▪ Tallowwood/Grey Gum ▪ Myrtle	Road Reserve	Council
20	Public Reserve	Lot 867 DP 1063462	Lot 867 DP 1063462	0.439	▪ Cleared ▪ Tallowwood/Grey Gum ▪ Myrtle	Standard	Council
21	Cocos Crescent Public Reserve	RES 5241	Lot 248 DP 801790	0.8278	▪ Cleared	Community Land	Council
21	Cocos Crescent Public Reserve	RES 5253	Lot 404 DP 810999	0.0045	▪ Palm ▪ Spotted gum-Ironbark/Grey gum	Community Land	Council
22	Public Reserve	RES 5238	Lot 47 DP 793497	0.1132	▪ Cleared	Community Land	Council
23	Public Reserve	RES 5034	Lot 38 DP 260437	4.41	▪ Cleared ▪ Tallowwood/Grey Gum ▪ Swamp Mahogany/Swamp Oak	Community Land	Council

ID	Property Name	Reserve Number	Lo t/ DP	Ha	Vegetation Community	Land Type	Managed by
24	Public Reserve	RES 5068	Lot 80 DP 262684 Lot 140 DP 224909	0.8834 3.49	▪ Tallowwood ▪ Swamp Mahogany/Swamp Oak ▪ Cleared ▪ Palm	Community Land Community Land	Council Council
25	Public Reserve	RES 5252	Lot 347 DP 810426	3.574	▪ Tallowwood ▪ Swamp Mahogany/Swamp Oak	Community Land	Council
26	Public Reserve	RES 5239	Lot 48 DP 793497	0.4412	▪ Cleared ▪ Palm	Community Land	Council
27	Public Reserve	RES 5285	Lot 500 DP 815328	0.3017	▪ Spotted Gum ▪ Tallowwood/Grey Gum ▪ Cleared	Standard	Council
28	Public Reserve	RES 5283	Lot 646 DP 836664	4.546	▪ Palm ▪ Spotted gum	Standard	Council
29	Drainage Reserve	RES 5207	Lot 52 DP 738442	1.098	▪ Cleared	Community Land	Council
30	Public Reserve	Lot 100 DP 1035437	Lot 100 DP 1035437	0.2666	▪ Managed Garden	Community Land	Council
31	Part Boundary Street (Sth)	Boundary Street	Boundary Street	0.8789	▪ Swamp Mahogany/Paperbark ▪ Smooth-barked Apple	Road Reserve	Council
32	Part Boundary Street (Sth)	Boundary Street	Boundary Street	2.151	▪ Swamp Mahogany/Paperbark ▪ Smooth-barked Apple ▪ Paperbark/ Swamp Oak ▪ Blackbutt-Bloodwood/Apple ▪ Paperbark	Road Reserve	Council
33	Drainage/Public Reserve	RES 5023	Lot 133 DP 264330	9.987	▪ Cleared ▪ Swamp Mahogany/Paperbark ▪ Paperbark	Community Land	Council
34	Public Reserve	RES 5020	Lot 127 DP 264330	3.808	▪ Smooth-barked Apple ▪ Cleared	Community Land	Council
35	Public Reserve	Lot 129 DP 264330	Lot 129 DP 264330	0.1482	▪ Cleared	Community Land	Council
36	Public Reserve	Lot 23 DP 843479	Lot 23 DP 843479	15.46	▪ Paperbark ▪ Cleared ▪ Swamp Mahogany/Paperbark	Community Land	Council
37	Public Reserve	RES 5195	Lot 17 DP 718960	0.161	▪ Cleared ▪ Swamp Mahogany/Paperbark	Community Land	Council
38	RES 5005	RES 5005	Lot 5 DP 261963	0.0144	▪ Cleared ▪ Swamp Mahogany/Paperbark	Community Land	Council

ID	Property Name	Reserve Number	Lot/ DP	Ha	Vegetation Community	Land Type	Managed by
39	Lampo Reserve	RES 5254	Lot 96 DP 771229	0.1776	▪ Cleared	Community Land	Council
		Lot 49 DP 810924	Lot 49 DP 810924	0.3352		Community Land	Council
		Lot 24 DP 847246	Lot 24 DP 847246	0.3352		Community Land	Council
40	Public Reserve	Public Reserve (Lot 11 DP 246251)	Lot 11 DP 246251	0.5901	▪ Paperbark	Community Land	Council
41	Public Reserve	R85529	Lot 21 DP 243812	0.2105	▪ Paperbark	Community Land	Council & Crown
42	Public Reserve	Lot 23 DP 1011195	Lot 23 DP 1011195	0.2494	▪ Paperbark ▪ Cleared	Standard	Council
43	Lot 1 DP 798402	Lot 1 DP 798402	Lot 1 DP 798402	2.696	▪ Swamp Mahogany/Paperbark	Operational	Council
44	Public Reserve	RES 5053	Lot 4 DP 571977	0.0647	▪ Swamp Mahogany/Paperbark ▪ Cleared	Community Land	Council
45	Public Reserve	RES 5018	Lot 29 DP 263815	1.498	▪ Managed Garden	Community Land	Council
46	Standard	RES 5265	Lot 2 DP 599950	0.4512	▪ Cleared ▪ Myrtle	Standard	Council
47	Public Reserve	RES 5198	Lot 34 DP 732573	0.5137	▪ Cleared ▪ Myrtle	Community Land	Council
48	Public Reserve	RES 5264	Lot 6 DP 599949	0.4462	▪ Cleared ▪ Myrtle	Standard	Council
49	Public Reserve	Lot 21 DP 732573	Lot 21 DP 732573	2.131	▪ Cleared ▪ Myrtle	Community Land	Council
50	Public Reserve	RES 5011	Lot 17 DP 2629	0.6672	▪ Cleared ▪ Myrtle	Community Land	Council
51	Public Reserve	RES 5010	Lot 16 DP 262992	0.3408	▪ Myrtle	Community Land	Council
52	Standard	Lot 6 DP 1014646	Lot 6 DP 1014646	0.4777	▪ Myrtle	Standard	Council
53	Public Reserve	Lot 6 DP 1014646	Lot 6 DP 1014646	3.305	▪ Cleared ▪ Myrtle	Standard	Council
54	Public Reserve	RES 5186	Lot 16 DP 713933	1.593	▪ Cleared ▪ Myrtle	Community Land	Council
55	Miles Island	Lot 346 DP 753168	Lot 346 DP 753168	2.2	▪ Swamp Oak	Community Land	Council
		R82545	Lot 7093 DP 1024268	4.428	▪ Mangrove	Standard	Council
		Part R82545	Lot 7094 DP 1024268	0.7131	▪ Sand Ridge	Standard	Council
		RES 39 (Pt R82545)	Lot 7095 DP 1024268	3.41		Community Land	Council
56	Leon Island	R97462	Lot 7007 DP 1055393	1.671	▪ Swamp Oak	Community Land	Council & Crown
57	Crown Land	Lot 7026 DP 1051706	Lot 7026 DP 1051706	4.055	▪ Paperbark	Standard	Council & Crown

ID	Property Name	Reserve Number	Lot/ DP	Ha	Vegetation Community	Land Type	Managed by
58	Forster Recreation Reserve	R 700014	Lot 5 DP 822655	1.359	▪ Paperbark ▪ Cleared	Standard	Council & Crown
59	Marine Drive	Marine Drive	Marine Drive	1.411	▪ Sand ridge ▪ Fig Giant Stinger/Myrtle ▪ Banksia ▪ Cleared	Road Reserve	Council
60	Public Reserve	Public Reserve RES 5100	Lot 189 DP 229919	1.206	▪ Scrub ▪ Sand ridge	Community Land	Council
61	Lot 9 Strand Street	RES 5175	Lot 1-9 DP 23572	0.9934	▪ Scrub ▪ Sand ridge ▪ Palm/Myrtle ▪ Paperbark/Swamp Oak ▪ Cleared	Community Land	Council
62	Collendina Park	RES 5074	Lot 6 DP 242807	1.7230	▪ Paperbark/Swamp Oak ▪ Cleared	Community Land	Council
			TOTAL - FORSTER	**185.40**			

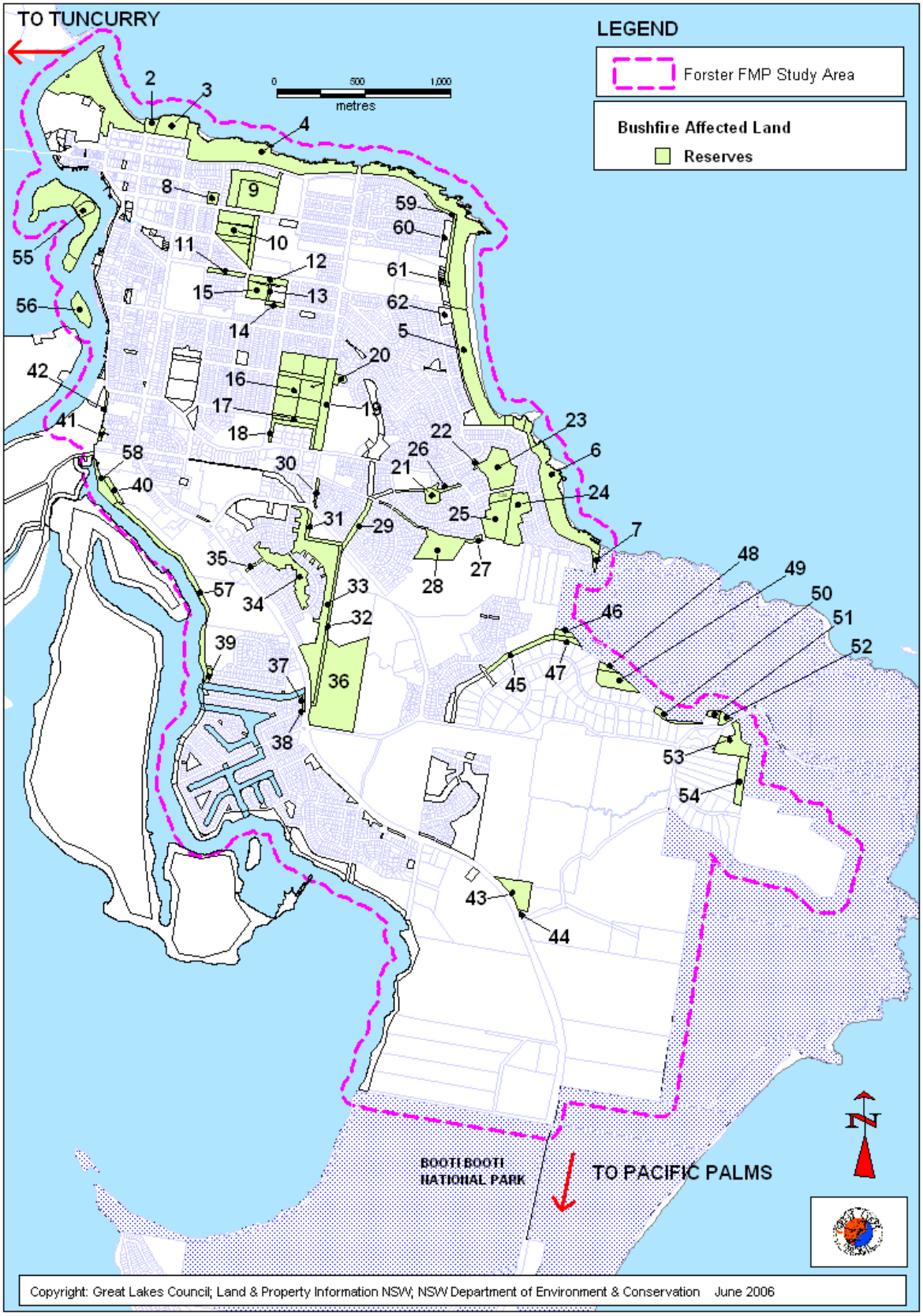


Figure 6: Location of Council managed land affected by bushfire in the study area.

Community Assets

The Forster urban area comprises of residential, commercial and special purpose properties that at times are adjacent to bushland areas. The study area (approximately 1,636 comprises of approximately 829 hectares of urban land, with some of the remaining area has been identified for future development within bushland areas.

Forster has a mixture of dwellings built to the Australian Building Standard AS 3959 since the approval of subdivisions. These have various fire regulations and development approvals in relation to fire management zones, building structure and protection in event of a fire.

Additionally Council approved buildings complied with the following Council bushfire protection policies and guides by the Department of Bush Fire Services before legislative changes took affect in 2003 to improve construction techniques and hazard reduction in bushfire prone lands:

- Policy for Bush Fire Protection for Rural dwellings/subdivisions (1993),
- Policy for fire management for council controlled natural areas (1996), and
- The Department of Bush Fire Services, "Planning for Bush Fire Protection, A guide for land use planners, fire authorities, developers and home owners"(1991).

Since the enforcement of the document "Planning for Bushfire Protection 2003", development within the area is required to meet legislative building standards and hazard reduction requirements. This also affects adjoining property owner's fuel reduction works Additionally the Code provides guidelines for fire protection of existing buildings.

Development within Council has impacted on the environment and fragmented bushland areas as seen in the example within Figure 7.

Public Utilities

Electricity infrastructure in the study area is maintained by Country Energy. Reticulated water and sewage is available within Forster and maintained by MidCoast water.

Telstra provides and maintains the communication network services through underground and overhead lines.

Service localities, maintenance points or junction boxes and underground electricity and telephone access points are identified by posts or marked on the ground within the vicinity of site, on roadways or easements.

Figure 7: An example of developments within Forster.

Natural and Cultural Heritage

The 1,636 hectares of the township of Forster, which includes approximately 182 hectares of Council managed land is surrounded by residential properties that have been cleared for developed; few areas remain with vegetation communities that originally existed in the area. Some properties have regeneration of bushland areas which are significant for conservation values within the local area. Fire management in these areas must consider the existing environmental values.

Council parks, road reserves and residential properties link with corridors through Forster. Within the study area the remnant vegetation structure is predominantly swamp sclerophyll forest, dry sclerophyll forest with a grass or shrubby understorey. Heathlands and rainforests are decreasing in number. Some areas lack sub dominant and ground cover layers as a consequence of human interaction (i.e. slashing). Limited smaller areas support swamps (with some being estuarine and saline wetlands) on the foreshore, with wet sclerophyll forest integrating with the surrounding drier forests.

Former vegetation survey and mapping projects involved a review of aerial photograph interpretation and targeted traverse (ground-truthing). Vegetation communities were delineated on the basis of the height/ density and major logistics' of the canopy as well as other structural descriptors and land use influences.

From these surveys and the vegetation community types described within the Draft Great Lakes Vegetation Strategy 2003, within the study area 27 natural vegetation communities were identified, in the study area which covers approximately 885 hectares. The forest types are those described in the Research Note No 17 (Forest Commission of NSW 1989) and a map of the location of the vegetation communities is provided in Figure 8.

The provided vegetation data is expected to have local variation as detailed ground—truthing would provide further floristic details, in addition to the existing mapped vegetation. This information is evolving and amended as ground truthing and survey work leads to maps being updated and enhanced.

Cleared land covers 44% of the mapped area within the study area. The wider vegetation formations within and adjacent to residential properties of Forster include in decreasing order; swamp sclerophyll forest (24% cover); with the remaining areas (each with less than 10% cover of the mapped area) includes; dry sclerophyll scrub/grass forest; heathlands; rainforests and semi mesic forests are. Further, there are wetland areas which require the appropriate hazard reduction management practice to be implemented with respect of environmental sensitivities.

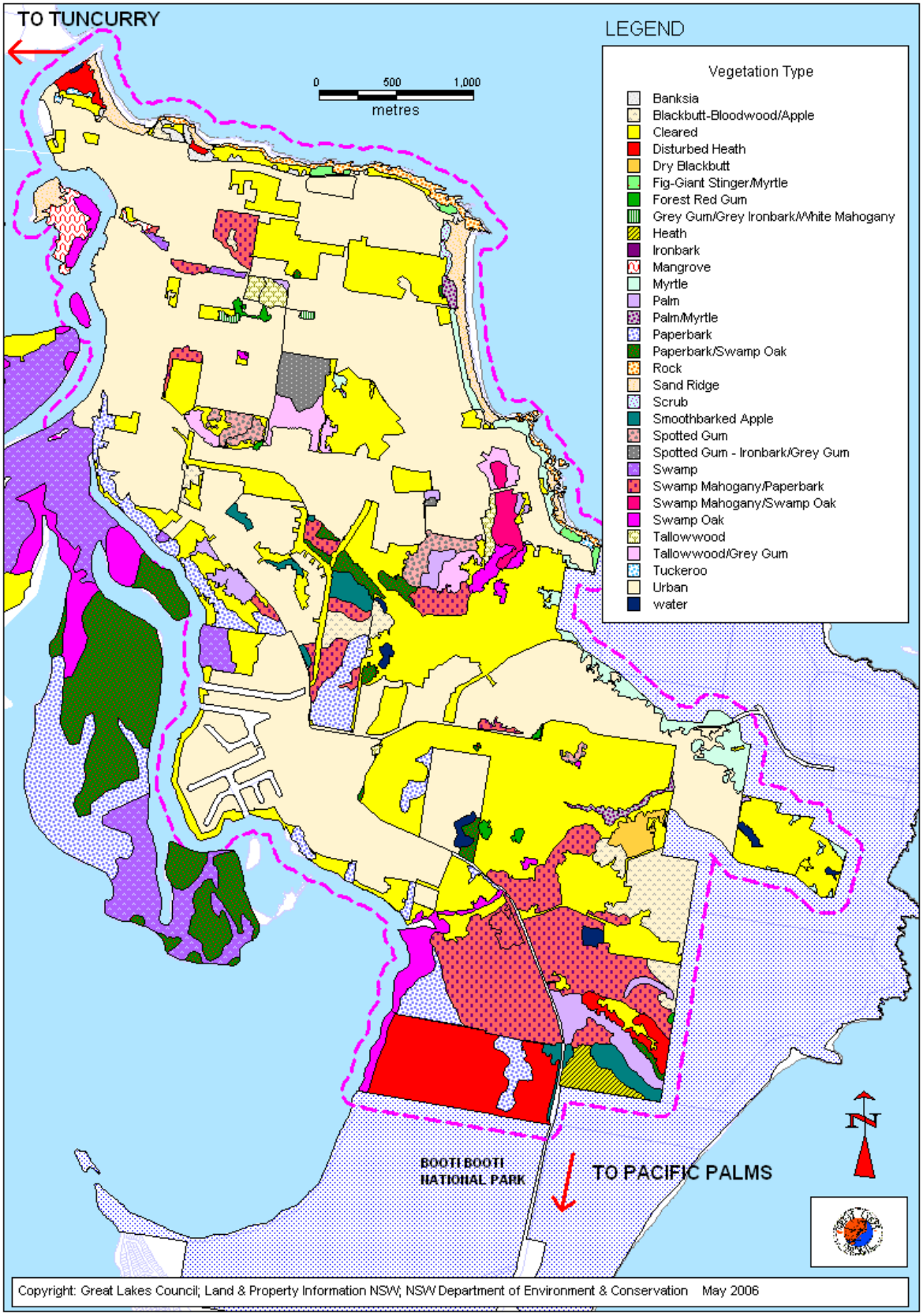


Figure 8: Vegetation within the study area.

From this analysis, it is evident that there area several vegetation communities inexistence that are likely to be classified as Endangered Ecological Communities. These include Coastal Saltmarsh, Littoral Rainforest and Swamp Oak or Swamp Sclerophyll Forest on Coastal Floodplain t. These areas are of high conservation value and would legally require management practices to protect these areas. Other vegetation communities mapped in Forster environs are also considered regionally rare, regionally vulnerable, severely depleted, a private land priority for conservation, and/or have a 100% conservation target within the Lower North Coast of NSW (refer to Appendix X).

The conservation values of Council natural areas within the study area provide an important buffer and contribute to habitat and environmental services in the local landscape. As such, proper recognition of the inherent values of such vegetation is considered essential in any fire management regime for Forster. For example Forster Recreation Reserve 129 is within the area defined as Key Habitat and Regional Corridor which extends into the adjacent conservation area of BBNP.

By recognising local vegetation types and understanding the complexity of fire, the enhancement and conservation of the environment can be achieved. These forest types have been grouped as vegetation formations (Figure 9) and are used to identify for the frequency and intensity of prescribed burning. These have led to the identification of fire regimes to meet biodiversity thresholds[10] for fire management planners within various vegetation formations (Figure 10).

In addition Council liaised with the DEC (Parks and Wildlife Division) regarding information within the maintained Aboriginal Heritage Information Management System (AHIMS) search for Aboriginal Objects and Aboriginal Sites within the study area. The hazard reduction proposals identified within the plan meet guidelines by the DEC and have no impact on existing recorded sites in Council managed land.

Clause 21 of Great Lakes Local Environmental Plan, 1996 makes provision for significant 'Heritage items' and guides their enhancement and protection. Within Great Lakes, Schedule 2 does list 3 heritage items as local and regional (but not of state significance) within the study area.

[10] Refer to Table 17 or appendix XI

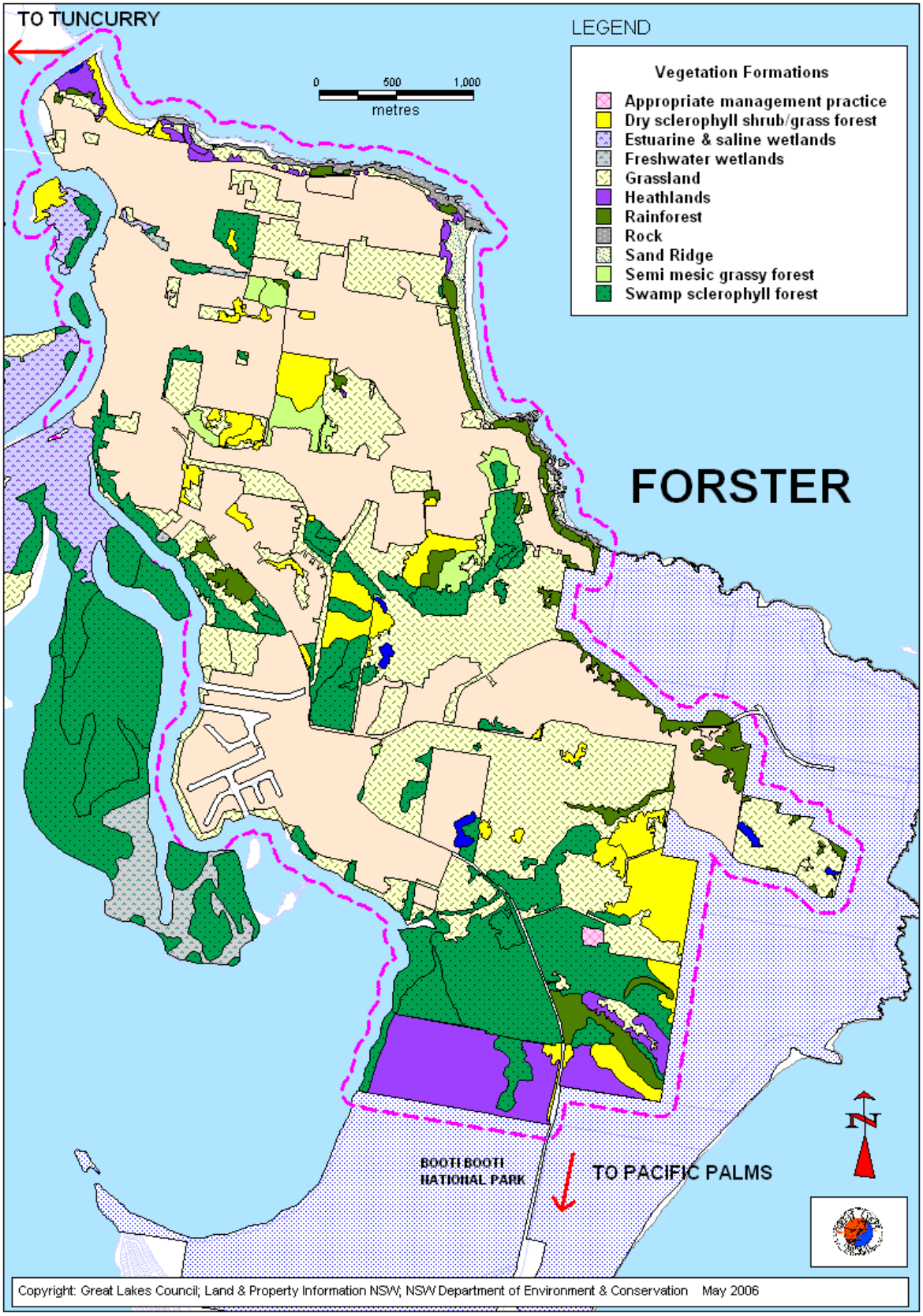


Figure 9: Vegetation formation for fire management

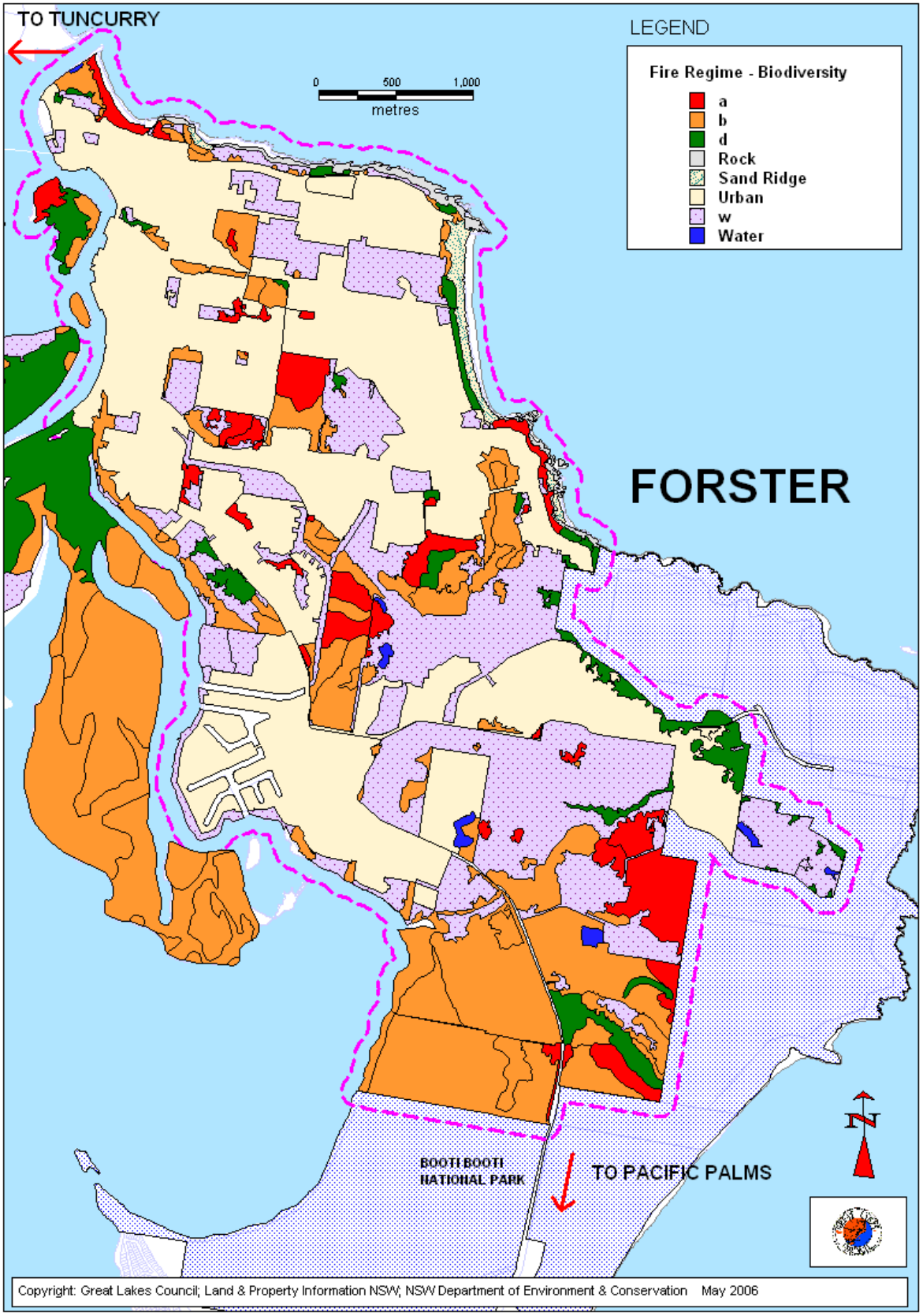


Figure 10: Biodiversity fire regimes applied to local vegetation

Water Supply/Fire Fighting Water Supply/Aerial Access

Forster has reticulated water that extends south to the Pacific Palms area. Fire hydrants provide water to fire fighters in the event of fire incidents. Wallis Lake also provides an unlimited water supply for protection and suppression during aerial operations.

There is a designated helicopter landing pad within Forster located within a public reserve adjacent to Cape Hawke Private Hospital. Other helicopter landing sites that may be used by approval during emergencies (south of Forster) are within DEC BBNP, The Ruins, Works Depot.

Fire history

Fires are known have regularly occurred within and neighbouring Forster study area and being within 8 kilometres of the coast fires are often influenced by variable coastal weather. Planned prescribed burns and wild fires have also burnt the forested and coastal heath areas within national parks. Locally fires have occurred mostly in spring, when the relative humidity are lower in late winter and early spring, often without known cause or from suspected arson.

Wildfire have occurred in the vicinity of Forster during various bushfire seasons including;, 1980–81, 1984–88, 1989––95, 1996–98, 2000–2003 and 2004–2005 (DEC 2005b and NSW RFS 2005b).

Private properties owners are known to undertake burning for land management purposes and hazard reduction through the non–bushfire season. These low or moderate intensity burns, do not threaten Forster and the rural areas during optimum manageable weather conditions.

Fire Trails/Fire Advantages/Control Lines

Fire trails are designed to provide access for fire fighting personnel and fire fighting units during incidents or planned fire operations. The fire trail register managed by the RFS records registered fire trails across the State. Council and private property have a variety of fire trails and fire advantages (including unformed roadways) within the study area that are identified as strategic fire advantages.

There are a small number of fire trails within Council managed land in this plan. The categories of fire trails that exist within Forster are recorded as being of primary access for fire appliances sizes (heavy, medium and light) and secondary access by light fire appliances (sometimes medium—heavy) within Reserve 116 and Boundary Street.

Various existing fire advantages along primary and secondary roadways within the study area, which include the Forster internal road system and The Lakes Way collectively assist in

fire operations. Wallis Lake prevents fires directly spreading to the town from the west, however in extreme fire events, spotting may occur from Islands.

Weather

The Australian Bureau of Meteorology (BOM) identifies climate zones by rainfall incidents and defines the Great Lakes LGA to be within a warm humid, mainly summer rainfall sub tropical zone. However, the area is at the boundary of the uniform rainfall and the mostly summer rainfall zones. Typically the local climate is warm—temperate, with generally warm to very warm summers and mild to cool winters.

Climatic data is available for four areas within or immediately adjacent to the LGA, at Forster, Coolongolook, Girvan State Forest and Nelson Bay (Bureau of Meteorology). Climatic details of these areas and historical relative humidly records (1961-1990) for Williamtown are documented in Appendix XI.

During the fire season the mean daily minimum temperature, on the coast is 13°C in October and rises to a mean daily maximum of 27.5°C in February. Monthly rainfall is highest in February and reducing from highest to lowest in January, December, March, November, April, and October respectively.

BOM records have shown that major fires in New South Wales such as the January 1994 experienced the worst conditions such as when a deep low-pressure systems occurring near Tasmania, brought strong, dry, westerly winds to the coast (BOM 2005b).

The BOM assist fire fighting authorities to predict fire weather and monitor bushfire weather during fire fighting operations. The local fire season is typically during the spring early summer, when the climate is hot with occasional strong winds from summertime cold fronts, which can lead to extreme fire danger periods. Lack of rain, low relative humilities and high winds contribute to increased fire danger (BOM 2005b). In most years, the summer rainfall in January brings the normal fire season to an end, although some drier years have extended beyond this period.

The drought indices (forest/grassland) are derived from the Keetch Byram Drought Indices (KBDI) and collectively with temperature, relative humility, wind speed, rainfall and duration identifies the fire danger rating.

The fire danger indices assist authorities to declare fire danger ratings (none, low, moderate, high, very high & extreme) and to work out fire behaviour in relation to predicted rates of spread that is affected by the soil dryness (KBDI). As the forest fire drought index (FFDI) increases so does the fire rating (RFS 2003c).

BOM provide fire weather warnings (bushfire alerts) during the bushfire danger period to the NSW RFS who broadcasts conditions and requirements, such as total fire bans and the issuing of fire permits for the lighting of fires.

The local coastal wind patterns distinctly change from the morning to the afternoon in which patterns are affected by coastal sea breezes.

Generally prevailing fire weather winds during winter and spring within Great Lakes LGA are predominantly from the south-west to north-west and shifting winds in summer from the west to north-west to the south-east to north- east in the afternoon's. Southerly changes up the coast also cause unpredictable fire weather conditions, which push strong hot winds preceding the cold front that often experiences moist cooler conditions.

Resources

Within the LGA there is a fleet of fire fighting appliances from 23 locations. The distances to Forster from other brigade stations, local to Forster are shown in Figure 11. Forster has well-maintained roadways including the main tourist drive being The Lakes Way. This allows efficient response time throughout the township when neighbouring brigades are required.

The Council in liaison with the RFS certify the existing number of resources and upgrades proposed by the RFS. Annual funding from the Council ensures the upkeep and improvement of vehicles and fleet vehicle.

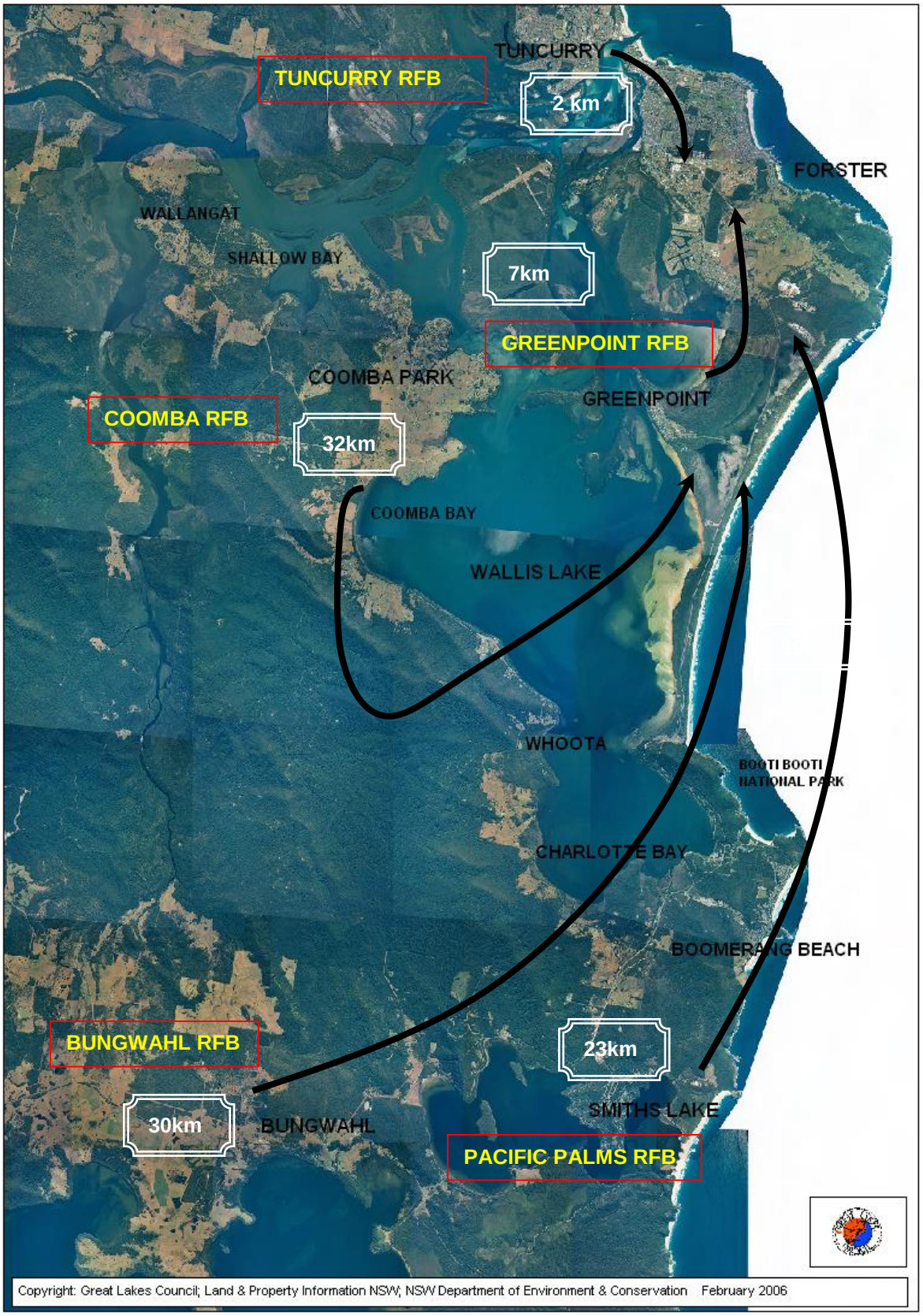


Figure 11: Distance to Forster from other Rural Fire Brigade Station locations.

Key Fire Issues for the Study Area

Throughout the preparation of the plan fire issues have been highlighted, being both of a positive and negative nature. From this summary of fire issues, land managers can easily identify, both at a planning level and during operational fire management, issues to be considered.

Key Fire Issues
❖ A large number of assets occur within Forster which potentially requires protection during fires.
❖ Bush fire mapping identifies areas of Forster as having a range of bush fire risks from insignificant to major.
❖ Remnant vegetation adjoins private properties in Forster which subsequently may increase fire threat to surrounding residences.
❖ Spotting may occur across ridgelines within the reserve areas adjacent to residential properties which require active fire management works to reduce potential.
❖ Reticulated water within Forster and the lake provides additional water supply for fire fighting.
❖ A proportion of private landholders have created various FMZ's and fire trails that need to be recognised and complimented in proposed community land management.
❖ Landholders adjacent to Council reserves need to prepare their assets against fire to increase self protection and awareness.
❖ Bushfire Prone Land requires building standards to be applied to developments reducing impact of fire on homes and properties.

SECTION 8

Management Strategies

Management strategies for each asset protection zone, strategic fire management zone or land management zone outlined, guide manager decisions. These have been mapped and identified within each reserve or managed land. To assist with understanding the codes on the figures, refer to identification (ID) seen within Table 6 which identifies the relationship with the figures.

Table 6: Terminology used on figures within the plan.

ID	Description
LP	Life and property
A1	Asset Protection Zone reference number (preceded by locality code)
S1	Strategic Fire Management Zone reference number (preceded by locality code)
C1	Land Management Zone for conservation reference number (preceded by locality code)
E1	Fire exclusion zone reference number (preceded by locality code)
Hs	Cultural heritage including Cultural Heritage and Aboriginal Heritage
Fl/ Fa	Threatened flora/ Threatened fauna
EEP/ ECC	Endangered populations/ Endangered ecological communities

The key element to hazard reduction activities are those strategies identified by Council within Table 7.

Table 7: Specific strategies applied to fire management zones.

1	Create and/or maintain APZ and SFAZ specifications on Council land for adjacent existing developments.
2	Create and/or maintain fire advantage lines to provide access for fire fighters.
3	Promote to the community, education on importance of hazard reduction and Council proposed works.

Table 10 contains relevant fire objectives and hazard reduction works applied to a particular zone, which may vary depending on the proposed management techniques.

Council has taken into consideration neighbouring fire management strategies adjacent to Council land. It is recognised that private landholders and other authorities have evolving management practices and fire strategies may alter from existing works in the future.

Therefore an annual review of fire management strategies both in the field and those referenced within other contemporary planning documents is important to ensure management is cohesive and evolutionary.

Asset protection zones

Using the criteria described within the Plan for determining APZ's a total of 50 APZ's have been identified within Council Land and reserves (Figure 12-16 and Table 8).

Consideration of existing APZ's on adjacent properties, enable Council fire management strategies meet fire protection requirements.

Strategic Fire Advantages

Three (3) SFAZ's are recorded in reserve area and road reserves within Council land which are fire trails (Figure 12-17 and Table 10 & 11).

Mechanical slashing within SFAZ's within bushland areas including public reserve areas, drainage reserves and road reserves, assist in protecting assets, strengthening adjacent APZ's or providing strategic areas to be used during fire operations.

Council road reserves adjacent to managed major and minor roads use mechanical hazard reduction methods. This roadside slashing along the road verge to a distance of 2.5 metres either side in both urban and rural areas widens the existing fire break (being the bitumen or gravel roadways) and assists in mitigating the spread of fire to adjacent properties.

Fire advantages are used during fire operations to limit the spread of bushfires or used as a control line. The line/area constitutes fuel reduced areas (limiting fire spread), whether natural like rainforests; rivers; lakes; rocks) or man made (fire trails; road; APZ's and SFAZ's.

Change is imminent and reference to these are intended as a guide only, as other management and planning decisions by managers may alter suitability in the future.

Land Management Zones

Forty (40) LMZ's (C) have been identified within Council Land ((Figure 12-14 and Table 13). Council has mapped these zones and identified the vegetation communities within each zone. The fire management objectives in each LMZ vary depending on existing use (e.g. recreation) and/or environmental sensitivity are identified within Table 12. Biodiversity thresholds are described within Table 17. The implementation of ecological based fire regimes of irregular mosaic burn patterns and minimal intervals between burns is important for managing bushland areas within larger zones.

Regeneration of disturbed areas within reserves consistent with management of public reserves and recreation areas objectives is important when managing for fire and the conservation of areas.

Where existing management within this zone does have cleared land, the land management type; whether lease area or commercial buildings, fire protection legislation applies to developments.

Ecological Considerations

Within the study area there are communities that appear to satisfy the criteria for listing as endangered ecological communities (EEC). The TSC Act guides the conservation and enhancement of these areas. Fire management planning incorporates legislation and objectives of biodiversity enhancement in areas nearby or within communities such as these. In addition the Code (2006) has provisions for the protection of biodiversity including guidelines for burning in SFAZ's and LMZ's by identifying fire regimes for each zone (Table 15).

The Wallis Lake Foreshore area is within the riparian zone and requires protection when the existing fire regime has either exceeded or do not support burning for biodiversity.

Areas classified as being SEPP 26 or SEPP 14 is significant and management of theses areas is important to ensure their continued enhancement to conservation values.

Fire Exclusion Zone

Twenty (20) FEZ's have been identified within Council Land. The fire regime has either been exceeded (within areas of high conservation values) or the vegetation type does not support burning for biodiversity (Table 18, Figure 12-16). This includes areas where any occurrence of fire inhibits the ability of vegetation to fully recover to former complexity within vegetation types including estuarine and saline wetlands and rainforest. Areas classified as being SEPP 26 or SEPP 14 is significant and management of theses areas is important to ensure their continued enhancement to conservation values.

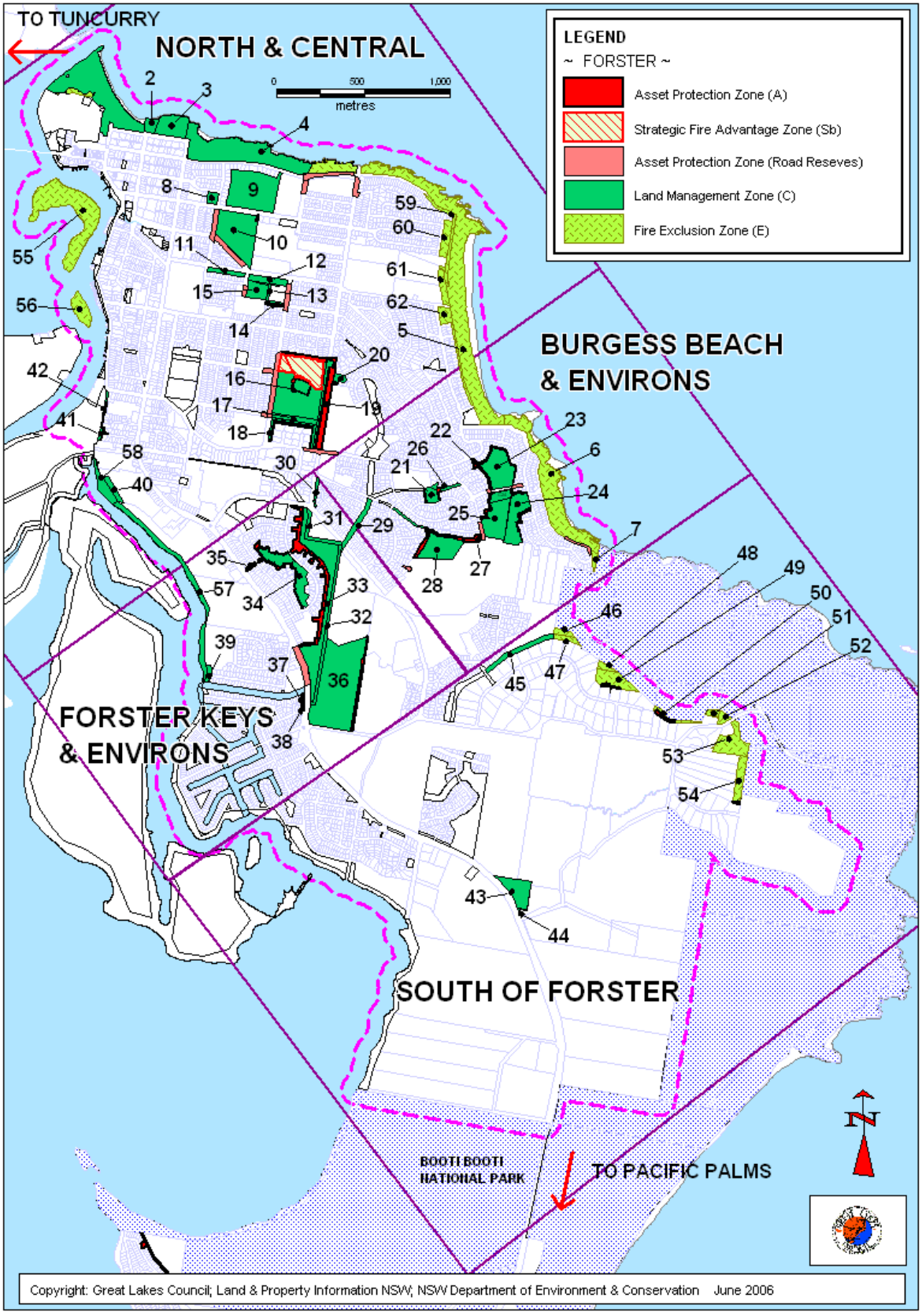


Figure 12: The overview of FMZ's within bushfire affected land in Forster.

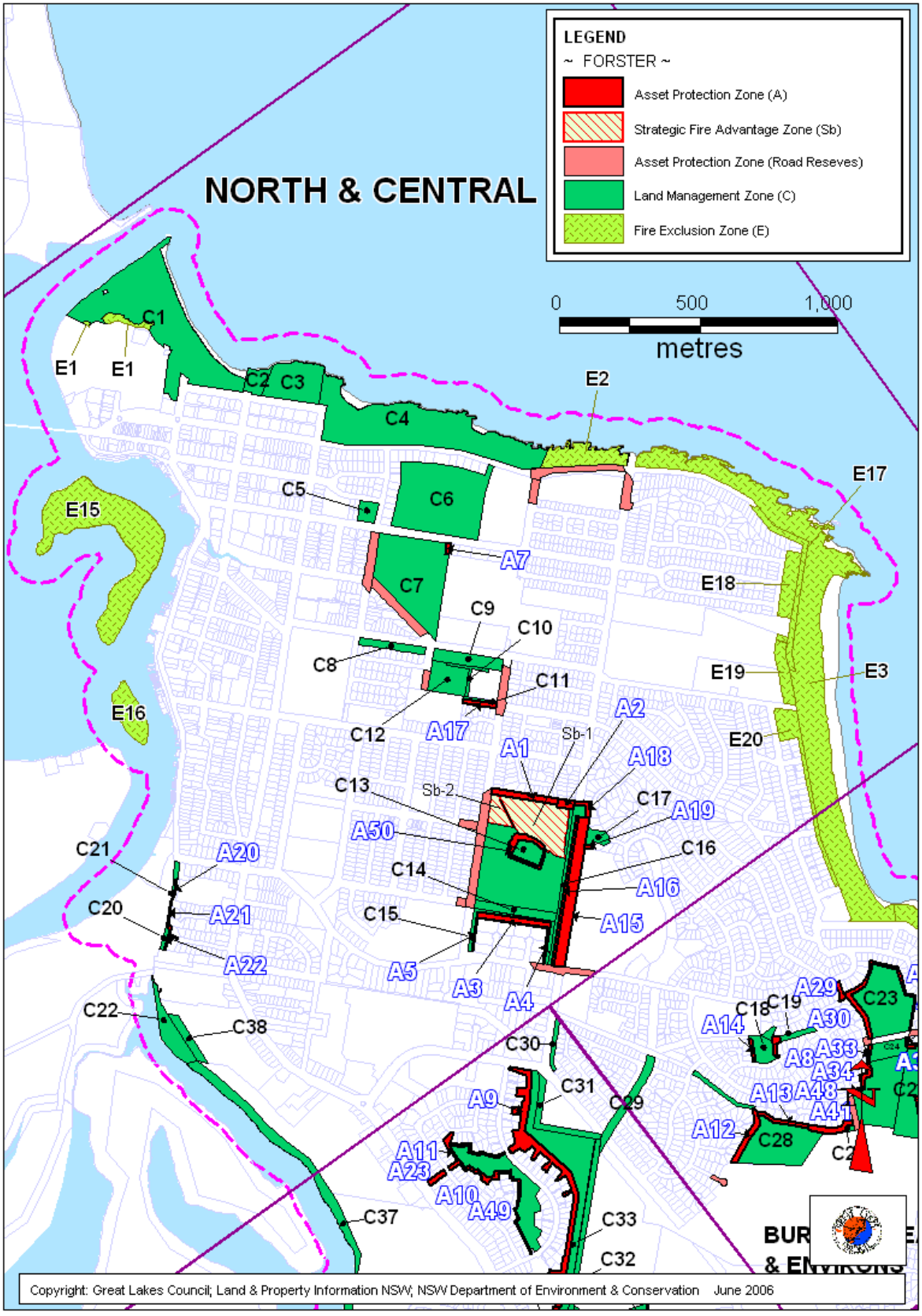


Figure 13: North and central fire management zones

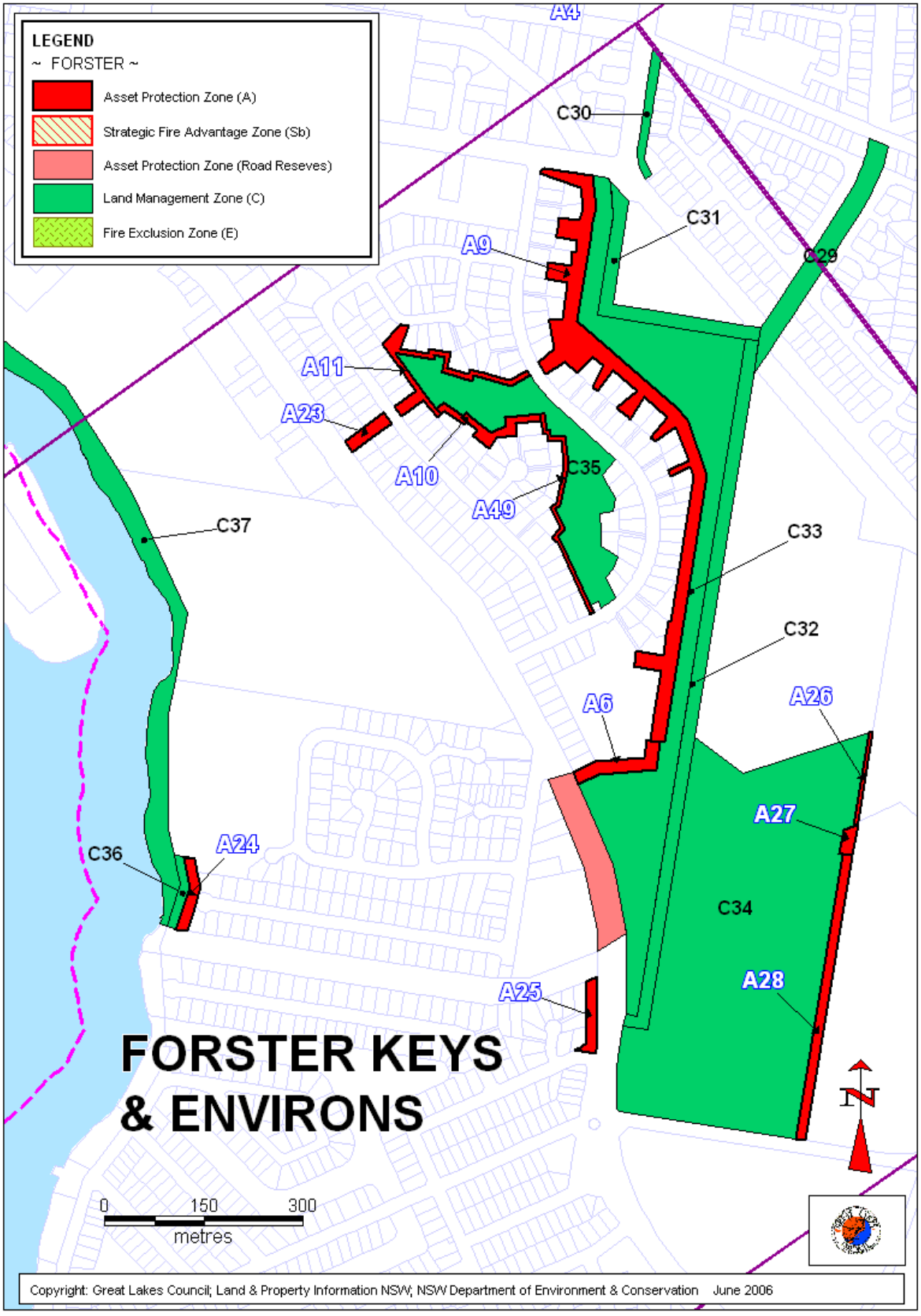


Figure 14: Forster Keys and environs fire management zones.

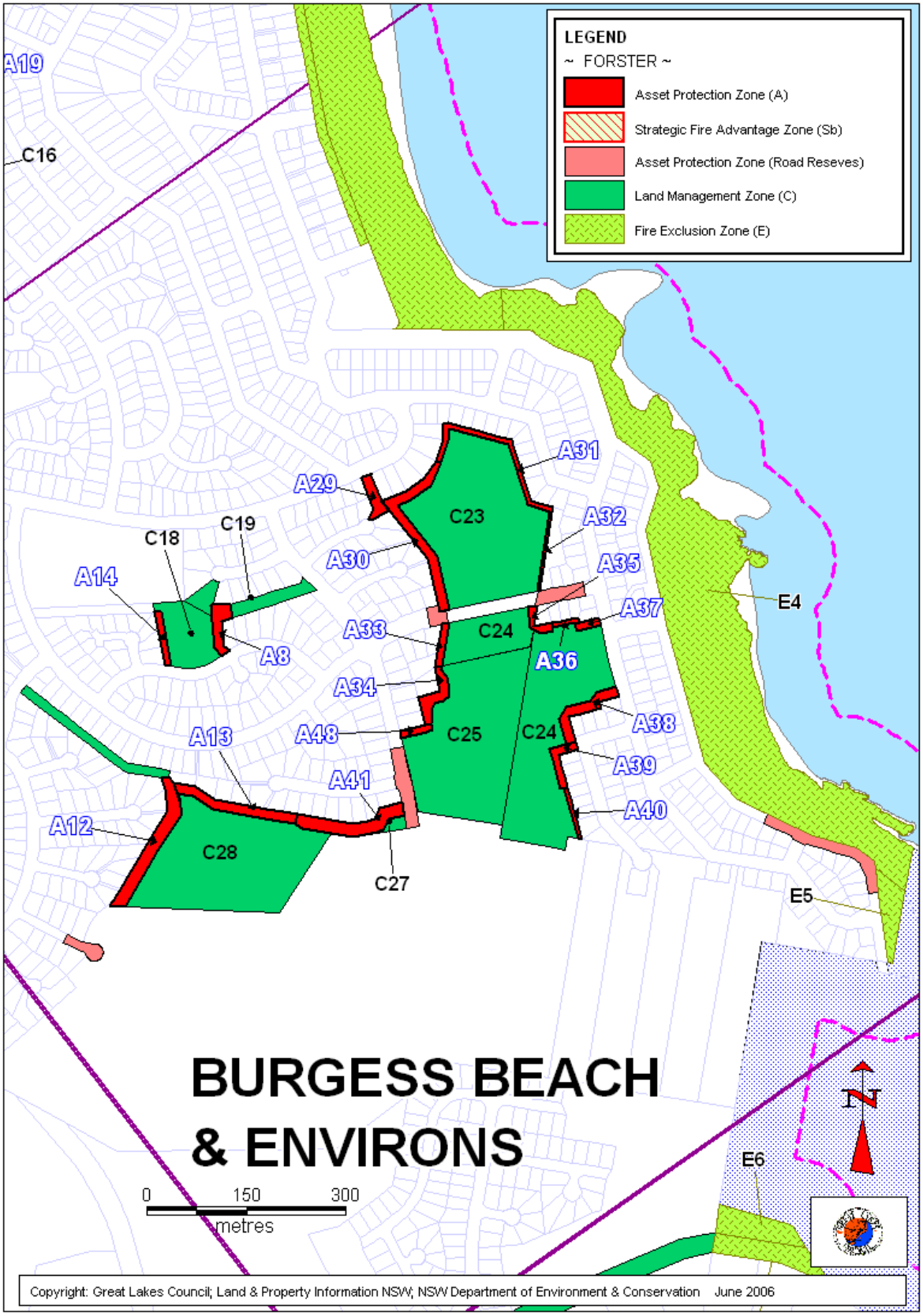


Figure 15: Burgess Beach and environs fire management zones.

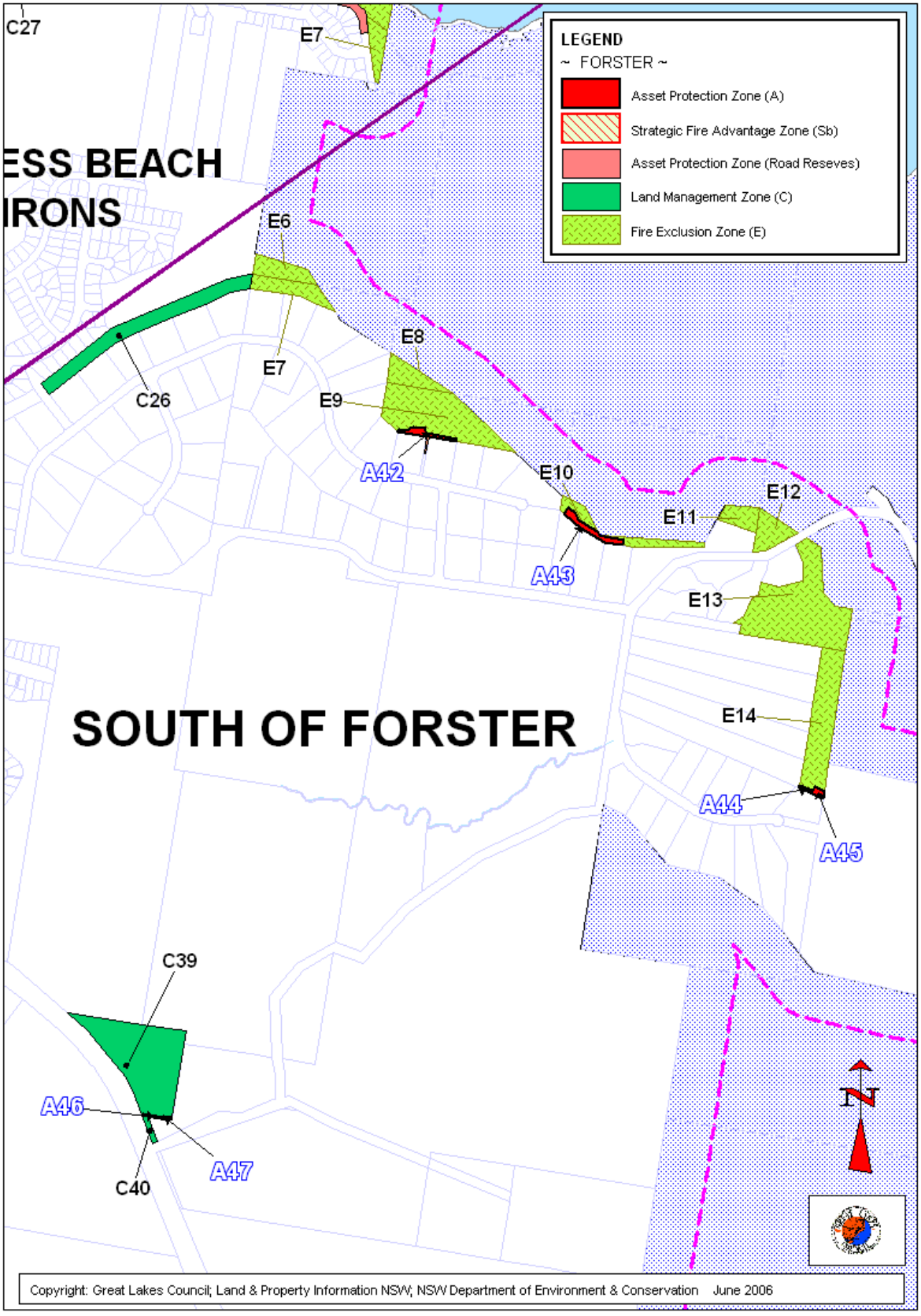


Figure 16: South of Forster fire management zones.

Figure 17: Fire trails within Forster.

Table 8: Specific fire objectives applied to asset protection zones.

Reserve ID	APZ Code (F)	Council Managed Land	Reserve	Zone Objective	Width (m)	Length (m)	Area (Ha)	Maintenance Type	Frequency of Maintenance[11]
Forster									
16	A1	Water Reservoir Reserve	RES 116	• To protect the bushland interface south of 9 properties linking with the reserve.	20	242	0.4791	Hand removal / Mowing / Slashing	Annual (Herb/shrub cover)
16	A2	Water Reservoir Reserve	RES 116	• To protect the bushland interface west of 2 properties linking with the reserve.	30	68	0.1848	Hand removal / Mowing / Slashing	Annual (Herb/shrub cover)
18	A3	Public Reserve	RES 5012	• To protect the bushland interface north of the Industrial Estate linking with the reserve.	20	294	0.5328	Hand removal / Mowing / Slashing	Annual (Herb/shrub cover)
18	A4	Public Reserve	RES 5012	• To protect the bushland interface east of the Industrial Estate linking with the reserve.	7	124	0.0919	Mowing/ Slashing	Annual (Herb/shrub cover)
18	A5	Public Reserve	RES 5012	• To protect the bushland interface west of the Industrial Estate linking with the reserve.	6	124	0.0749	Hand removal / Slashing	Annual (Herb/shrub cover)
33	A6	Drainage/Public Reserve	RES 5023	• To protect the bushland interface south of properties linking with the reserve.	20	161	0.3013	Mowing / Slashing	Annual (Herb/shrub cover)
10	A7	The Sanctuary	RES 86	• To protect the bushland interface west of the Girl Guide property linking with the reserve.	14	40	0.0569	Hand removal	Annual (Grassy ground cover)
21 & 26	A8	Cocos Crescent Public Reserve	RES 5241/5253/5239	• To protect the bushland interface south & west of 2 properties linking with the reserve.	14	112	0.144	Hand removal / Mowing / Slashing	Annual (Palm debris) (Grassy ground cover))
33	A9	Drainage/Public Reserve	RES 5023	• To protect the bushland interface east of multiple properties linking with the reserve.	20	1632	2.916	Mowing/ Slashing	Annual (Grassy ground cover)
34	A10	Public Reserve	RES 5020	• To protect the bushland interface north of 6 properties linking with the reserve	10-15	219	0.2462	Mowing / Slashing	Annual (Herb/shrub cover)
34	A11	Public Reserve	RES 5020	• To protect the bushland interface south of 18 properties linking with the reserve.	8	551	0.453	Mowing / Slashing	Annual (Grassy ground cover)

[11] Frequency of maintenance: Monitor fuel loads within APZ's and adapt frequency of mechanical fuel reduction to meet the maximum average fuel hazard level to be 8 tonnes/hectare.

Reserve ID	APZ Code (F)	Council Managed Land	Reserve	Zone Objective	Width (m)	Length (m)	Area (Ha)	Maintenance Type	Frequency of Maintenance[11]
28	A12	Public Reserve (Zamia)	RES 5283	• To protect the bushland interface east of 8 properties linking with the reserve.	20	224	0.4233	Mowing / Slashing	Annual (Herb/shrub cover)
27	A13	Public Reserve (Zamia)	RES 5283	• To protect the bushland interface south of 7 properties linking with the reserve.	15	186	0.2833	Hand removal / Mowing / Slashing	Annual (Grassy ground cover)
21	A14	Cocos Crescent Public Reserve	RES 5241	• To protect the bushland interface east of 3 properties linking with the reserve	10	83	0.0817	Hand removal / Mowing / Slashing	Annual (Grassy ground cover)
19	A15	Boundary St	Boundary St	• To protect the bushland interface west of Palm Grove Estate linking with the reserve (IPA).	40	543	2.119	Hand removal / Mowing / Slashing	Annual (Herb/shrub cover)
19	A16	Boundary St	Boundary St	• To protect the bushland interface west of Palm Grove Estate linking with the reserve (OPA).	10	543	0.5429	Hand removal / Mowing/ Slashing	Annual (Herb/shrub cover)
14	A17	Likely Street Reserve	RES 109 (R 91525)	• To protect the bushland interface north of 6 properties linking with the reserve.	16	120	0.1909	Hand removal / Mowing	Annual (Grassy ground cover)
19	A18	Boundary St	Boundary Street	• To protect the bushland interface west of 3 properties linking with the reserve	17	132	0.1618	Hand removal / Mowing/ Slashing	Annual (Grassy ground cover)
20	A19	Public Reserve	Lot 867 DP 1063462	• To protect the bushland interface north of 2 properties linking with the reserve.	15	31	0.0462	Hand removal	Annual (Herb/shrub cover)
42	A20	Public Reserve	Lot 23 DP 1011195	• To protect the bushland interface west of Cedar Grove linking with the reserve.	3	78	0.0239	Hand removal / Mowing	Annual (Grassy ground cover)
42	A21	Public Reserve	Lot 23 DP 1011195	• To protect the bushland interface west of 2 properties linking with the reserve.	4	94	0.0375	Hand removal / Mowing	Annual (Grassy ground cover)
41	A22	Public Reserve	R85529	• To protect the bushland interface west of 4 properties linking with the reserve.	5	106	0.0547	Hand removal / Mowing	Annual (Grassy ground cover)
35	A23	Public Reserve	Lot 129 DP 264330	• To protect the bushland interface north & south of 4 properties linking with the reserve.	10	146	0.1488	Mowing	Annual (Grassy ground cover)
39	A24	Lampo Reserve	RES 5254	• To protect the bushland interface west of 2 properties linking with the reserve.	17	113	0.1861	Hand removal / Mowing / Slashing	Annual (Grassy ground cover)
37 & 38	A25	Public Reserve	RES 5195 & 5005	• To protect the bushland interface east of 3 properties linking with the reserve.	15	116	0.1746	Mowing	Annual (Grassy ground cover)
36	A26	Public Reserve	Lot 23 DP 843479	• To protect the bushland interface west of 1 property linking with the reserve.	6	143	0.0846	Slashing	Annual (Herb/shrub cover)
36	A27	Public Reserve	Lot 23 DP 843479	• To protect the bushland interface west of Golden Ponds Retirement Village	20	57	0.0822	Mowing / Slashing	Annual (Grassy ground cover)

Reserve ID	APZ Code (F)	Council Managed Land	Reserve	Zone Objective	Width (m)	Length (m)	Area (Ha)	Maintenance Type	Frequency of Maintenance[11]
				linking with the reserve.					
36	A28	Public Reserve	Lot 23 DP 843479	• To protect the bushland interface west of Golden Ponds Retirement Village linking with the reserve.	15	437	0.6643	Mowing / Slashing	Annual (Grassy ground cover)
22	A29	Public Reserve	RES 5238	• To protect the bushland interface east & west of 3 properties linking with the reserve.	15	67	0.1132	Hand removal / Mowing	Annual (Grassy ground cover)
23	A30	Public Reserve	RES 5034	• To protect the bushland interface south & east of 10 properties linking with the reserve.	15	296	0.4062	Hand removal / Slashing	Annual (Herb/shrub cover)
23	A31	Public Reserve	RES 5034	• To protect the bushland interface south & west of 17 properties linking with the reserve.	8	295	0.2235	Hand removal	Annual (Herb/shrub cover)
23	A32	Public Reserve	RES 5034	• To protect the bushland interface west of 1 property linking with the reserve.	4	118	0.0485	Hand removal	Annual (Herb/shrub cover)
24	A33	Public Reserve	RES 5068	• To protect the bushland interface east of 2 properties linking with the reserve.	10	65	0.0646	Hand removal / Slashing	Annual (Herb/shrub cover)
25	A34	Public Reserve	RES 5252	• To protect the bushland interface east of 3 properties linking with the reserve.	16	115	0.1329	Hand Removal / Slashing	Annual (Herb/shrub cover)
24	A35	Public Reserve	RES 5068	• To protect the bushland interface south of 1 property linking with the reserve.	13	70	0.0666	Slashing	Annual (Herb/shrub cover)
24	A36	Public Reserve	RES 5068	• To protect the bushland interface south of 3 properties linking with the reserve.	7	36	0.029	Hand removal / Mowing	Annual (Grassy ground cover)
24	A37	Public Reserve	RES 5068	• To protect the bushland interface south of 1 property linking with the reserve.	11	37	0.0411	Hand removal / Mowing	Annual (Grassy ground cover)
24	A38	Public Reserve	RES 5068	• To protect the bushland interface north of 4 properties linking with the reserve.	15	144	0.1993	Mowing / Slashing	Annual (Grassy ground cover)
24	A39	Public Reserve	RES 5068	• To protect the bushland interface north & west of 3 properties linking with the reserve.	12	109	0.1068	Mowing / Slashing	Annual (Grassy ground cover)
24	A40	Public Reserve	RES 5068	• To protect the bushland interface west of 4 properties linking with the reserve.	6	81	0.0478	Hand removal / Mowing/ Slashing	Annual (Grassy ground cover)
28	A41	Public Reserve (Zamia)	RES 5285	• To protect the bushland interface south of 7 properties linking with the reserve.	20	180	0.3457	Hand removal / Mowing / Slashing	Annual (Grassy ground cover)
49	A42	Public Reserve	Lot 21 DP 732573	• To protect the bushland interface north of 2 properties linking with the reserve.	6-16	127	0.1175	Hand removal / Mowing	Annual (Grassy ground cover)

Reserve ID	APZ Code (F)	Council Managed Land	Reserve	Zone Objective	Width (m)	Length (m)	Area (Ha)	Maintenance Type	Frequency of Maintenance[11]
50	A43	Public Reserve	RES 5011	• To protect the bushland interface north of 3 properties linking with the reserve.	12-16	147	0.1844	Hand removal / Mowing	Annual (Grassy ground cover)
54	A44	Public Reserve	RES 5186	• To protect the bushland interface north of 1 property linking with the reserve.	5	29	0.0157	Hand removal / Mowing	Annual (Grassy ground cover)
54	A45	Public Reserve	RES 5186	• To protect the bushland interface north of 1 property linking with the reserve.	15	29	0.038	Hand removal / Mowing	Annual (Grassy ground cover)
43	A46	Operational Land	Lot 1 DP 798402	• To protect the bushland interface north of 1 property linking with the reserve.	3	42	0.0125	Hand removal / Mowing	Annual (Herb/shrub cover)
43	A47	Operational Land	Lot 1 DP 798402	• To protect the bushland interface north of 1 property linking with the reserve.	6	23	0.0123	Hand removal / Mowing	Annual (Herb/shrub cover)
25	A48	Public Reserve	RES 5252	• To protect the bushland interface south of 1 property linking with the reserve.	10	49	0.0500	Hand removal	Annual (Herb/shrub cover)
34	A49	Public Reserve	RES 5020	• To protect the bushland interface east of 13 properties linking with the reserve.	6	361	0.2143	Mowing / Slashing	Annual (Grassy ground cover)
16	A50	Water Reservoir Reserve	RES 116	• To protect the bushland interface that surrounds the Water Reservoir within the reserve.	10-25	428	0.4871	Mowing / Slashing	Annual (Herb/shrub cover)
28	A12a	Public Reserve (Zamia - Southern Parkway)	RES 5283	• To protect the bushland interface east of properties linking with the reserve	20	303	0.6055	Mowing / Slashing	Annual (Herb/shrub cover)
				Total		**9865m**	**14.34ha**		

Table 9: Specific fire objectives applied to APZ's within road reserves.

APZ Code (F)	Council Managed Land	Zone Objective	Total Area of Road Reserve (m)	Width of APZ	Maintenance Type	Existing Management
Forster						
Rd-A1	Anglers Avenue	• To protect adjacent residential properties. • To assist in mitigating the spread of bushfire from adjacent bushland interface.	0.0977	As per guideline within Plan.[12]	Mowing/ Slashing	Public-sealed road (edges mowed)
Rd-A2	Bennetts Head Street	• As above	0.7722	• As above	Mowing/ Slashing	Public-sealed road (edges mowed)
Rd-A3	Boundary Street	• As above	0.4103	• As above	Mowing/ Slashing	Public-sealed road (edges mowed)
Rd-A4	Burgess Road	• As above	0.3431	• As above	Mowing/ Slashing	Public-sealed road (edges mowed)
Rd-A5	Cross Street	• As above	0.6402	• As above	Mowing/ Slashing	Public-sealed road (edges mowed)
Rd-A6	Garden Street	• As above	0.1947	• As above	Mowing/ Slashing	Public-sealed road (edges mowed)
Rd-A7	Hadley Street	• As above	0.2277	• As above	Mowing/ Slashing	Public-sealed road (edges mowed)
Rd-A8	Karloo Street (1)	• As above	0.152	• As above	Mowing/ Slashing	Public-sealed road (edges mowed)
Rd-A9	Karloo Street (2)	• As above	0.0739	• As above	Mowing/ Slashing	Public-sealed road (edges mowed)
Rd-A10	Kentia drive	• As above	0.2542	• As above	Mowing/ Slashing	Public-sealed road (edges mowed)
Rd-A11	Kularoo Drive	• As above	0.5188	• As above	Mowing/ Slashing	Public-sealed road (edges mowed)
Rd-A12	Likely Street (1)	• As above	1.316	• As above	Mowing/ Slashing	Public-sealed road (edges mowed)
Rd-A13	Likely Street (2)	• As above	0.5233	• As above	Mowing/ Slashing	Public-sealed road (edges mowed)
Rd-A14	Oriana Close	• As above	0.1054	• As above	Mowing/ Slashing	Public-sealed road (edges mowed)
Rd-A15	Panorama Crescent	• As above	0.0162	• As above	Mowing/ Slashing	Public-sealed road (edges mowed)
Rd-A16	St Alban Place	• As above	0.1795	• As above	Mowing/ Slashing	Public-sealed road (edges mowed)
Rd-A17	Strand Street	• As above	0.8031	• As above	Mowing/ Slashing	Public-sealed road (edges mowed)
Rd-A18	The Lakes Way	• As above	1.108	• As above	Mowing/ Slashing	Public-sealed road (edges mowed)

[12] Width of APZ: Variable widths depending on setback of adjacent assets and adjacent relevant hazard reduction works.

Table 10: Specific fire objectives applied to SFAZ's.

Reserve ID	SFAZ Code (F)	Council Managed Land	Reserve	Zone Objective	Width (m)	Length (m)	Maintenance Type	Vegetation Community
Forster								
Fire Trails (1.5km in Total)								
19	S1	Boundary Street	Boundary St	• To provide fire trail access to the internal area of the road reserve.	6	606	Slashing / Unsealed & Sealed road maintenance	▪ Cleared ▪ Spotted gum-Ironbark/Grey gum ▪ Tallowwood/Grey Gum
16	S2	Water Reservoir Reserve	RES 116	• To provide fire trail access to the internal area of the reserve.	6	358	Slashing / Unsealed & Sealed road maintenance	▪ Cleared ▪ Spotted gum-Ironbark/Grey gum
27 & 28	S3	Zamia Reserve	RES 5283/5285	• To provide fire trail access to the internal area of the reserve.	6	536	Slashing / Unsealed & Sealed access maintenance	▪ Spotted Gum ▪ Tallowwood/Grey Gum ▪ Cleared
				Total		1500m		

Table 11: Specific fire objectives applied to SFAZ's applying biodiversity thresholds for burning.

Reserve ID	SFAZ Code (F)	Council Managed Land	Reserve	Zone Objective	Area (Ha)	Maintenance Type	Vegetation Community
Forster							
16	Sb1	Water Reservoir Reserve	RES 116	• To strengthen the adjacent APZ and mitigating the spread from the LMZ towards assets.	3.185	Prescribe burn (2006-2009)	▪ Spotted gum-Ironbark/Grey gum
16	Sb2	Water Reservoir Reserve	RES 116	• As above.	0.6259	Prescribe burn (2006-2009)	▪ Spotted gum-Ironbark/Grey gum
				Total	3.810		

Table 12: Fire management objectives applied to LMZ's

Zone Objective:	This will be achieved by :
❖ To protect the environmental values within the reserve and maintain biodiversity thresholds.	✓ Maintain adjacent FMZ's as per Tables 11 & 12 to minimize impact within LMZ's.
❖ To protect cultural heritage values within the reserve.	✓ Implement hazard reduction burns to maintain biodiversity.
❖ Conserve and protect the integrity of areas with high conservation values or areas with highest regional priority status for conservation targets.	✓ Implement hazard reduction activities to meet guidelines and conditions within the Code and the TSC Act, relating to mechanical and the use of fire within FMZ's to protect and enhancement of threatened species and their habitats.
❖ Protect riparian areas from inappropriate burning regimes.	✓ Implement Catchment management objectives adjacent to enhance Wallis Lakes.
❖ To manage reserves as per management plans or existing use.	✓ Regenerate disturbed areas and promote re-establishment within FMZ to minimise any negative impact.
	✓ Suppress bushfires to maintain fire regimes to enhance biodiversity.
	✓ Implementing current land management practices as per policies, procedures and management plans.

Table 13: LMZ's within the Forster study area.

Reserve ID	LMZ Code (F[13])	Property Name	Reserve Number	Lot/ DP	Ha	Vegetation Community
1	C1	Forster Beach	RES 34 (R79681)	Lot 7088 DP 1066047	11.01	▪ Tuckeroo ▪ Banksia ▪ Cleared / Sand Ridge
2	C2	Forster Ocean Baths	RES 21	Lot 7086 DP 1055392	0.6905	▪ Blackbutt – Bloodwood/ Apple ▪ Cleared / Sand Ridge
3	C3	Second Head Reserve	RES 16	Lot 7122 DP 1024267	2.623	▪ Banksia ▪ Blackbutt – Bloodwood/ Apple ▪ Cleared
4	C4	Pebbly Beach/The Tanks/Pt Bennetts Head	RES 60	Lot 406 DP 753168	10.57	▪ Banksia ▪ Cleared / Sand Ridge ▪ Disturbed Heath ▪ Fig Giant Stinger/Myrtle

[13] Locality abbreviation for Forster = F

Reserve ID	LMZ Code (F13)	Property Name	Reserve Number	Lot/ DP	Ha	Vegetation Community
8	C5	GLACICA	Lot 81 DP 48717	Lot 81 DP 48717	0.49	▪ Cleared
9	C6	Forster Aquatic & Leisure Centre	RES 5191	Pt Lot 427 Sec 31 DP 758422 & Part RES 89603	7.631	▪ Cleared
10	C7	The Sanctuary	RES 86 (R 87776 & Part R87776	RES 87776 & 701-702 DP 1000953, Lot 7076 DP 1000971 & Lot 7077-7078 DP 1075116	6.558	▪ Swamp Mahogany/Paperbark ▪ Blackbutt – Bloodwood/ Apple ▪ Cleared
11	C8	Townsend Recreational Reserve	RES 111 (R91588)	Lot 7081 DP 1000952	0.6425	▪ Swamp (freshwater)
12	C9	Cemetery Forster	RES 3 (R19843)	Lot 7079 DP 1075117	1.054	▪ Tallowwood ▪ Palm ▪ Cleared
13	C10	Cemetery Forster	Road Reserve	Road Reserve	0.261	▪ Tallowwood
14	C11	Likely Street Reserve	RES 109 (R91525)	Lot 7080 DP 1075117	0.1231	▪ Tallowwood
15	C12	Cemetery Forster	(R19843)	Lot 7123 DP 1056466	1.419	▪ Tallowwood
16	C13	Water Reservoir Reserve	RES 116 (R 94748)	Lot 132- 137 DP 753168 & Lot 7076 DP 1000961	7.191	▪ Cleared ▪ Spotted gum-Ironbark/Grey gum ▪ Tallowwood/Grey Gum
17	C14	Mark Street	Mark Street	Mark Street	0.9062	▪ Cleared ▪ Tallowwood/Grey Gum
18	C15	Public Reserve	RES 5012	Lot 13 DP 263011	0.6686	▪ Cleared ▪ Tallowwood/Grey Gum
19	C16	Boundary Street	Boundary Street	Boundary Street	0.7899	▪ Cleared ▪ Tallowwood/Grey Gum ▪ Myrtle
20	C17	Public Reserve	Public Reserve (Lot 867 DP 1063462)	Lot 867 DP 1063462	0.393	▪ Cleared ▪ Tallowwood/Grey Gum ▪ Myrtle
21	C18	Cocos Crescent Public Reserve	RES 5241 & RES 5253	Lot 248 DP 801790 & Lot 404 DP 810999	0.683	▪ Cleared ▪ Palm ▪ Spotted gum-Ironbark/Grey gum
26	C19	Public Reserve	RES 5239	Lot 48 DP 793497	0.3745	▪ Cleared ▪ Palm
41	C20	Public Reserve	R85529	Lot 21 DP 243812	1.441	▪ Paperbark

Reserve ID	LMZ Code (F13)	Property Name	Reserve Number	Lot/ DP	Ha	Vegetation Community
42	C21	Public Reserve	Lot 23 DP 1011195	Lot 23 DP 1011195	1.88	▪ Paperbark ▪ Cleared
58	C22	Forster Recreation Reserve	R 700014	Lot 5 DP 822655	1.359	▪ Paperbark ▪ Cleared
23	C23	Public Reserve	RES 5034	Lot 38 DP 260437	3.732	▪ Cleared ▪ Tallowwood/Grey Gum ▪ Swamp Mahogany/Swamp Oak
24	C24	Public Reserve	RES 5068	Lot 80 DP 262684 & Lot 140 DP 224909	3.822	▪ Tallowwood ▪ Swamp Mahogany/Swamp Oak ▪ Cleared ▪ Palm
25	C25	Public Reserve	RES 5252	Lot 347 DP 810426	3.363	▪ Tallowwood ▪ Swamp Mahogany/Swamp Oak
45	C26	Public Reserve	RES 5018	Lot 29 DP 263815	1.498	▪ Managed Garden
27	C27	Public Reserve	RES 5285	Lot 500 DP 815328	0.0651	▪ Spotted Gum ▪ Tallowwood/Grey Gum ▪ Cleared
28	C28	Public Reserve	RES 5283	Lot 646 DP 836664	3.73	▪ Palm ▪ Spotted Gum
29	C29	Drainage Reserve	RES 5207	Lot 52 DP 738442	1.098	▪ Cleared
30	C30	Public Reserve	Public Reserve (Lot 100 DP 1035437)	Lot 100 DP 1035437	0.2666	▪ Managed Garden
31	C31	Part Boundary Street (Sth)	Boundary Street	Boundary Street	0.8789	▪ Swamp Mahogany/Paperbark ▪ Smooth-barked Apple
32	C32	Part Boundary Street (Sth)	Boundary Street	Boundary Street	2.151	▪ Swamp Mahogany/Paperbark ▪ Smooth-barked Apple ▪ Paperbark/ Swamp Oak ▪ Blackbutt-Bloodwood/Apple ▪ Paperbark
33	C33	Drainage/Public Reserve	RES 5023	Lot 133 DP 264330	6.771	▪ Cleared ▪ Swamp Mahogany/Paperbark ▪ Paperbark
36	C34	Public Reserve	Public Reserve (Lot 23 DP 843479)	Lot 23 DP 843479	14.64	▪ Paperbark ▪ Cleared ▪ Swamp Mahogany/Paperbark

Reserve ID	LMZ Code (F[13])	Property Name	Reserve Number	Lot/ DP	Ha	Vegetation Community
34	C35	Public Reserve	RES 5020	Lot 127 DP 264330	2.897	▪ Smooth-barked Apple ▪ Cleared
39	C36	Lampo Reserve	RES 5254, Lot 49 DP 810924, Lot 24 DP 847246	Lot 96 DP 771229, Lot 49 DP 810924 & Lot 24 DP 847246	0.1546	▪ Cleared
57	C37	Crown Land	Lot 7026 DP 1051706	Lot 7026 DP 1051706	4.055	▪ Paperbark
40	C38	Public Reserve	Public Reserve (Lot 11 DP 246251)	Lot 11 DP 246251	0.5901	▪ Paperbark
43	C39	Lot 1 DP 798402	Lot 1 DP 798402	Lot 1 DP 798402	2.671	▪ Swamp Mahogany/Paperbark
44	C40	Public Reserve	RES 5053	Lot 4 DP 571977	0.0647	▪ Swamp Mahogany/Paperbark ▪ Cleared
				TOTAL - FORSTER	**111.21**	

Table 14: FEZ's within the Forster study area.

Reserve ID	LMZ Code (F[14])	Property Name	Reserve Number	Lot/ DP	Ha	Vegetation Community
1	E1	Forster Beach (2 parts)	RES 34 (R79681)	Lot 7088 DP 1066047	0.4597	▪ Tuckeroo ▪ Banksia ▪ Cleared / Sand Ridge
4	E2	Pebbly Beach/The Tanks/Pt Bennetts Head	RES 60	Lot 406 DP 753168	2.009	▪ Banksia ▪ Cleared / Sand Ridge ▪ Disturbed Heath ▪ Fig Giant Stinger/Myrtle
5	E3	Burgess Beach/Burgess Beach (Pt One Mile)	RES 51 (R83666 & R83666 Part)	Lot 7033 DP 1026118	19.47	▪ Banksia ▪ Scrub ▪ Palm/ Myrtle ▪ Fig Giant Stinger/Myrtle ▪ Sand Ridge ▪ Myrtle ▪ Cleared

[14] Locality abbreviation for Forster = F

Reserve ID	LMZ Code (F14)	Property Name	Reserve Number	Lot/ DP	Ha	Vegetation Community
6	E4	Burgess Beach	RES 51 (R83666 Part)	Lot 7033 DP 1026118	9.574	▪ Myrtle ▪ Scrub ▪ Tuckeroo ▪ Fig Giant Stinger/Myrtle ▪ Cleared
7	E5	Burgess Beach Reserve	RES 5110	Lot 142 DP 31849	0.3340	▪ Fig Giant Stinger/Myrtle
46	E6	Standard	RES 5265	Lot 2 DP 599950	0.4512	▪ Cleared ▪ Myrtle
47	E7	Public Reserve	RES 5198	Lot 34 DP 732573	0.5137	▪ Cleared ▪ Myrtle
48	E8	Public Reserve	RES 5264	Lot 6 DP 599949	0.4462	▪ Cleared ▪ Myrtle
49	E9	Public Reserve	Lot 21 DP 732573	Lot 21 DP 732573	2.013	▪ Cleared ▪ Myrtle
50	E10	Public Reserve	RES 5011	Lot 17 DP 2629	0.4829	▪ Cleared ▪ Myrtle
51	E11	Public Reserve	RES 5010	Lot 16 DP 262992	0.3408	▪ Myrtle
52	E12	Standard	Lot 6 DP 1014646	Lot 6 DP 1014646	0.4777	▪ Myrtle
53	E13	Public Reserve	Lot 6 DP 1014646	Lot 6 DP 1014646	3.305	▪ Cleared ▪ Myrtle
54	E14	Public Reserve	RES 5186	Lot 16 DP 713933	1.54	▪ Cleared ▪ Myrtle
55	E15	Miles Island	Lot 346 DP 753168, R82545 & RES 39 (Part R82545)	Lot 346 DP 753168	9.456	▪ Swamp Oak ▪ Mangrove ▪ Sand Ridge
56	E16	Leon Island	R97462 (Lot 7007 DP 1055393)	Lot 7007 DP 1055393	1.671	▪ Swamp Oak
59	E17	Marine Drive	Marine Drive (Road Reserve)	Marine Drive	1.411	▪ Sand ridge ▪ Fig Giant Stinger/Myrtle ▪ Banksia ▪ Cleared
60	E18	Public Reserve RES 5100	Public Reserve (Lot 189 DP 229919)	Lot 189 DP 229919	1.206	▪ Scrub ▪ Sand ridge

Reserve ID	LMZ Code (F14)	Property Name	Reserve Number	Lot/ DP	Ha	Vegetation Community
61	E19	RES 5175	Lot 1-9 DP 23572	Lot 1-9 DP 23572	0.9934	▪ Scrub ▪ Sand ridge ▪ Palm/Myrtle ▪ Paperbark/Swamp Oak ▪ Cleared
62	E20	Collendina Park - RES 5074	Cnr Lot 6 DP 242807	Lot 6 DP 242807	1.7230	▪ Paperbark/Swamp Oak ▪ Cleared
				TOTAL - FORSTER	**57.88**	

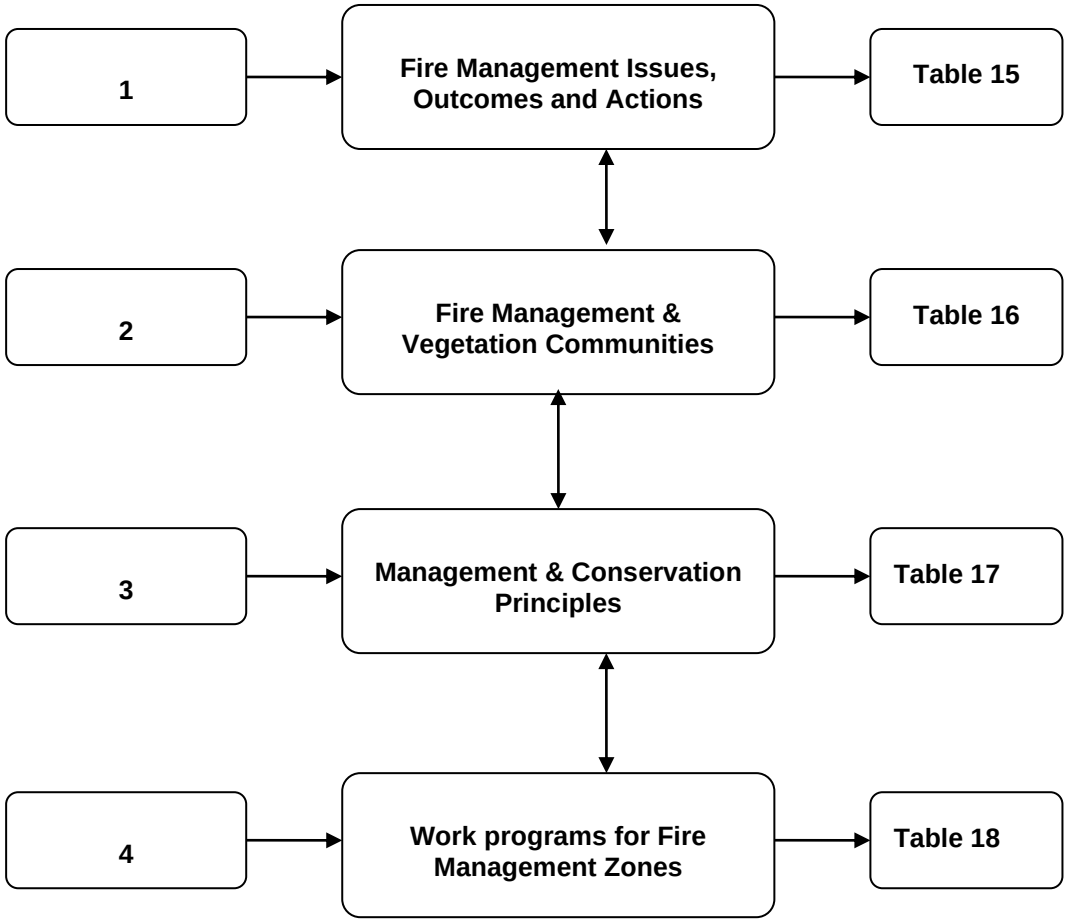
SECTION 9

Summary

Fire Mitigation

The plan has reviewed and provided strategic guidelines for planners and land mangers. The fire management outcomes reflect Council management requirements through the identification of specified on-ground works.

The key fire issues listed through the plan reiterate the direction of Councils fire management planning and the necessity to implement work program to mitigate against the bushfire risk. The chart below identifies the steps taken during the preparation of the plan and links the following tables presented in the concluding section of the plan.



These tables should be referred to for detailed management of each fire management zone. For example Table 18 summarises the on ground management of APZ's and SFAZ's can be implemented by a variety of methods including;
Council parks maintenance (primarily slashing)
Council open space maintenance (primarily mowing)
Council road maintenance
Council drainage reserve maintenance

The management of areas, described by width and length give an indicative size; at times the areas are variable for the total length hence the minor discrepancies. Reference to the map size and shape overcomes any issues.

As part annual works program, monitoring of fire hazards is important as this guides the slashing and mowing regimes within fire management zones. Assessment is in accordance with this Plan guidelines and using reference material such as the *Overall Fuel Hazard Guide Sydney Basin* (NPWS 2003) to assess fuel loads within Council Land. Slashing too frequent in bushland areas encourages introduced grasses and weeds to invade and in the long-term, changes vegetation structure (as grasses become more abundant with increased slashing frequencies.

Management Issues

Through the preparation of this plan key fire issues have been identified which have led to the subsequent outcomes to mitigate these issues (Table 15). The plan outcomes reflect management requirements by undertaking on ground works to specified requirements as discussed through various sections within the plan. The actions identified below guide Councils fire management strategies.

Table 15: Fire management issues and Council actions.

Key fire issues	Outcomes	Actions
❖ A large number of assets occur within Forster which potentially requires protection during fires.	✓ Promotion of fuel management to owners is important to promote mechanical works within Forster.	✓ Request assistance for RFS to undertake community education.
❖ Bush fire mapping identifies areas of Forster as having a range of bush fire risks from insignificant to major.	✓ In the event of a fire, adjoining properties to reserves will be fire affected.	✓ Provide fire management zones to reduce fuels.
❖ Spotting may occur across ridgelines within the reserve areas adjacent to residential properties which require active fire management works to reduce potential.	✓ Potential threat from spotting across the ridge encourages land managers to reduce risks.	✓ Ensure asset protection zones are maintained to reduce impact from radiant heat.

Key fire issues	Outcomes	Actions
❖ Reticulated water within Forster and the lake provides additional water supply for fire fighting.	✓ Promotion of fire hydrants for use by fire fighters.	✓ Awareness of fire hydrants system through appropriate authority.
❖ Remnant vegetation adjoins private properties in Forster which subsequently may increase fire threat to surrounding residences.	✓ Assets require protection from fire threat.	✓ Reduce ground fuels within reserves.
❖ A proportion of private landholders have created various FMZ's and fire trails that need to be recognised and complimented in proposed community land management.	✓ Maintenance of these areas is important to ensure continued fire mitigation works to reduce fire effects to the community.	✓ Monitor fire fuel loads through work programs.
❖ Landholders adjacent to Council reserves need to prepare their assets against fire to increase self protection and awareness.	✓ Landholders to implement hazard reduction programs and prepare properties in the event of a fire.	✓ Promote to the community the importance of preparation for fires.
❖ Bushfire Prone Land requires building standards to be applied to developments reducing impact of fire on homes and properties.	✓ Development consents for building specifications are affected by fire provisions in this area. ✓ Provide APZ & SFAZ adjacent to assets as per the guidelines within the Code. ✓ Implement fuel reduction works as guided by the BFRMP.	✓ Meet legislative requirements during development assessment. ✓ Meet requirements for protection of the community following guidelines for fire management.

Table 16: Biodiversity thresholds1 and fire regimes to be applied to vegetation.

Biodiversity thresholds and fire regime to be applied to vegetation communities in Forster.

Fire Regime	Biodiversity Thresholds Within Strategic Fire Advantage and Land Management Zones (NPWS 2001)	Vegetation Community Type (Council 2003) *[#1 and #2 indicate options for the same community]	Forest Type (Council, DVS, 2003)	Vegetation Group (Category 1,2,3) PBFP2	The Vegetation Formation Described By The RFS For Minimum Fire Frequency For SFAZ (BFEAC)	Minimum Year Fire Frequency (BFEAC)
Forster						
a	❖ Avoid 3 or more consecutive fires, with each of <5 years apart ❖ Avoid inter fire periods of >30 years ❖ Avoid 2 or more successive fires that totally scorch or consume the tree canopy ❖ Avoid 3 or more consecutive fires of low intensity	Blackbutt – Bloodwood/ Apple	41	1	Dry sclerophyll shrub/grass forest	5
		Spotted Gum	70	1	Dry sclerophyll shrub/grass forest	5
		Spotted Gum – Ironbark/ Grey Gum	74	1	Dry sclerophyll shrub/grass forest	5
		Smooth-barked Apple	105	1	Dry sclerophyll shrub/grass forest	5
b	❖ Avoid 3 or more consecutive fires, with each of <8 years apart ❖ Avoid 3 or more consecutive fires, with each of the fires >15 years apart ❖ Avoid inter fire periods of > 30 years ❖ Avoid 2 or more consecutive fires that consume < 10t/ha of surface fuels	Banksia	107	2	Heathlands	7
		Disturbed Heath	219/223	2	Heathlands	7
		Heath	223	2	Heathlands	7
		Paperbark	31	1	Swamp sclerophyll forests	7
		Scrub	224	2	Heathlands	7
		Swamp - #1	231	3	Freshwater wetlands	6
		Swamp Mahogany/ Paperbark	30/31	1	Swamp sclerophyll forests	7
		Swamp Mahogany/ Swamp Oak	30/32	1	Swamp sclerophyll forests	7
		Swamp Mahogany/ Palm		1	Swamp sclerophyll forests	7
		Swamp Oak	32	1	Swamp sclerophyll forests	7
		Tallowwood - #1	45	1	Semi mesic grassy forests	10
		Tallowwood/ Grey Gum	45/60	1	Semi mesic grassy forests	10
d	❖ Any fire occurrence (a limited recovery ability exists)	Fig/ Giant Stinger	6	3	Rainforest	na

[1] Biodiversity thresholds adapted from Bradstock et al 1995; NSW National Parks and Wildlife Service described within *the Draft Fire Management Strategies for Myall Lake National Park and Island Reserves, 2003a*.

[2] **Vegetation Group 1** - Forest (wet sclerophyll forest, dry sclerophyll forest)
Vegetation Group 2 - Woodlands, tall heath, and wetlands (scrub, open Shrub, closed heath)
Vegetation Group 3 - Rainforest (Closed Forest), open woodlands, grasslands (PBFP 2001)

Fire Regime	Biodiversity Thresholds Within Strategic Fire Advantage and Land Management Zones (NPWS 2001)	Vegetation Community Type (Council 2003) *[#1 and #2 indicate options for the same community]	Forest Type (Council, DVS, 2003)	Vegetation Group (Category 1,2,3) PBFP2	The Vegetation Formation Described By The RFS For Minimum Fire Frequency For SFAZ (BFEAC)	Minimum Year Fire Frequency (BFEAC)
		Fig/ Myrtle	6/23	3	Rainforest	na
		Fig-Giant Stinger/Myrtle		3	Rainforest	na
		Mangrove	33	3	Estuarine & saline wetlands	na
		Palm	7	3	Rainforest	na
		Palm/ Myrtle	7/23	3	Rainforest	na
		Tuckeroo	24	3	Rainforest	na
NA	Not Applicable	Natural Grassland	230	3	No prescribed fire on headlands[3]	na
		Rock/Sand	-	na	Other	na
w	**Use a, b, c, d** options for biodiversity thresholds	Introduced Scrub	221	1,2,3	W. Appropriate management practice[4]	na
		Mixed Forest Regrowth Mixed Pine Mixed Woodland Vine		1,2,3	W. Appropriate management practice	na

[3] Not described in BFEAC schedule
[4] W. Variable within each vegetation formation

Table 17: Conservation principles applied to hazard reduction works within each zone.

Type of Zone	Conservation Principle	Implementation	Monitoring
Asset Protection Zone - slashing - tree removal	Provide hospices within the area to maintain biodiversity; promote longevity of plants; buffer radiant effects from fire; reduce wind and provide habitat for fauna. Minimal thinning to meet canopy width specifications by the RFS. Tree removal of smaller, unhealthy, species with minimal impact on species using the habitat, in particular the Koala. Maintain habitat trees, seed trees and significant trees within zone.	Mechanical slashing of areas to protect assets. Tree removal by retaining stumps is preferred. Approval for stump removal of smaller trees assessed during site evaluation. Maximum overall fuel loads average is moderate.	Monitor fuels loads and changing vegetation community to guide slashing regimes to maintain appropriate fuel loads. Assess conservation values of the area and assess regrowth of slashed area and the impact on the local environment. Survey for threatened species.
Asset Protection Zone -burning	Burn area prescription to reduce fine fuels by 50-70% and elevated fuels by <50%. Ensure buffer zones within the burn area to protect impacts of erosion on steeper and riparian areas.	Fire regime is applied as frequently as needed to ensure the maximum overall fuel loads average is moderate.	Monitor fuels loads. Survey for threatened species.
Fire Advantages (Can be within Strategic Fire Advantages Zones or Asset Protection Zones) - slashing - tree removal	Natural or mechanical reduced fuels to provide corridors of lineal barriers or improved access to assist fire fighters to combat fire. Minimise soil erosion and ensure stumps are retained (below ground level) with approved tree removal.	Recognition of natural barriers or areas previously disturbed (not maintained). Within existing maintained areas (APZ/SFAZ), implement mechanical slashing of areas to reduce fuels to compliment management within APZ or SFAZ or adjacent zones.	Monitor accessibility and conservation values. Survey for threatened species.
Strategic Fire Advantage Zone -slashing -tree removal (Mechanical or hand removal)	Reduce fuels to provide corridors of lineal barriers or improved access to assist fire fighters to combat fire. Often related to drainage reserves, access & Services easements. Provide hospices within the area to compliment adjacent APZ or SFAZ. Minimise soil erosion and ensure stumps are retained (below ground level) with approved tree removal.	Mechanical slashing of areas to reduce fuels to compliment adjacent APZ. Maximum overall fuel loads average is high. Frequency less than within an APZ.	Monitor fuels loads. Survey for threatened species.
Strategic Fire Advantage Zone – burning	Burn area prescription to reduce fine fuels by 50-70% and elevated fuels by <50%. Mosaic burn 50-70% of the total area. Consider biodiversity thresholds for fire intensity and regularity.	Ecological based fire regimes of irregular mosaic burn areas integrated with protection of the community by providing fuel reduced areas, to compliment adjacent APZ or SFAZ. Maximum overall fuel loads average is high.	Monitor fuels loads. Survey for threatened species. Record fire frequency and intensity to meet prescriptions.
Land Management Zone - burning	Mosaic burn of up to 50% of the area to be burnt. Consider biodiversity thresholds for fire intensity and regularity.	Ecological based fire regimes of irregular mosaic burn areas. Protect riparian area conservation values.	Record fire frequency and intensity to meet prescriptions.
Fire Exclusion Zone	Hazard reduction and biodiversity burning excluded.	Conservation area.	Record fires.

Table 18: Specific works program applied to fire management zones.

(Refer to Table 8—11 for related strategies)

APZ Code (F)	Location	Reserve	Width (m)	Length (m)	Area (Ha)	Maintenance Type	
1. Council parks maintenance (primarily slashing) 2. Council open space maintenance (primarily mowing) 3. Council road maintenance 4. Council drainage reserve maintenance						**1 - 4 (and/or) maintenance type options**	
FORSTER							
ASSET PROTECTION ZONES							
A1	Water Reservoir Reserve	RES 116	20	242	0.4791	Hand removal / Mowing / Slashing	1
A2	Water Reservoir Reserve	RES 116	30	68	0.1848	Hand removal / Mowing / Slashing	1
A3	Public Reserve	RES 5012	20	294	0.5328	Hand removal / Mowing / Slashing	1
A4	Public Reserve	RES 5012	7	124	0.0919	Mowing/ Slashing	1
A5	Public Reserve	RES 5012	6	124	0.0749	Hand removal / Slashing	1
A6	Drainage/Public Reserve	RES 5023	20	161	0.3013	Mowing / Slashing	1
A7	The Sanctuary	RES 86	14	40	0.0569	Hand removal	-
A8	Cocos Crescent Public Reserve	RES 5241/5239/5253	14	112	0.144	Hand removal / Mowing / Slashing	2
A9	Drainage/Public Reserve	RES 5023	20	1632	2.916	Mowing/ Slashing	4
A10	Public Reserve	RES 5020	10-15	219	0.2462	Mowing / Slashing	1
A11	Public Reserve	RES 5020	8	551	0.453	Mowing / Slashing	2
A12	Public Reserve	RES 5283	20	224	0.4233	Mowing / Slashing	1
A12a	Public Reserve (Zamia - Southern Parkway)	RES 528	20	303	0.655	Mowing Slashing	1
A13	Public Reserve	RES 5283	15	186	0.2833	Hand removal / Mowing / Slashing	1
A14	Cocos Crescent Public Reserve	RES 5241	10	83	0.0817	Hand removal / Mowing / Slashing	1
A15	Boundary St	Boundary St	40	543	2.119	Hand removal / Mowing / Slashing	1
A16	Boundary St	Boundary St	10	543	0.5429	Hand removal / Mowing/ Slashing	1
A17	Likely Street Reserve	RES 109 (R 91525)	16	120	0.1909	Hand removal / Mowing	2
A18	Boundary St	Boundary Street	17	132	0.1618	Hand removal / Mowing/ Slashing	1
A19	Public Reserve	Lot 867 DP 1063462	15	31	0.0462	Hand removal	-
A20	Public Reserve	Lot 23 DP 1011195	3	78	0.0239	Hand removal / Mowing	2
A21	Public Reserve	Lot 23 DP 1011195	4	94	0.0375	Hand removal / Mowing	2
A22	Public Reserve	R85529	5	106	0.0547	Hand removal / Mowing	2
A23	Public Reserve	Lot 129 DP 264330	10	146	0.1488	Mowing	2
A24	Lampo Reserve	RES 5254	17	113	0.1861	Hand removal / Mowing / Slashing	2
A25	Public Reserve	RES 5195 & 5005	15	116	0.1746	Mowing	2
A26	Public Reserve	Lot 23 DP 843479	6	143	0.0846	Slashing	2
A27	Public Reserve	Lot 23 DP 843479	20	57	0.0822	Mowing / Slashing	1
A28	Public Reserve	Lot 23 DP 843479	15	437	0.6643	Mowing / Slashing	1
A29	Public Reserve	RES 5238	15	67	0.1132	Hand removal / Mowing	2
A30	Public Reserve	RES 5034	15	296	0.4062	Hand removal / Slashing	1

APZ Code (F)	Location	Reserve	Width (m)	Length (m)	Area (Ha)	Maintenance Type	
1. Council parks maintenance (primarily slashing) 2. Council open space maintenance (primarily mowing) 3. Council road maintenance 4. Council drainage reserve maintenance						**1 - 4 (and/or) maintenance type options**	
FORSTER							
ASSET PROTECTION ZONES							
A31	Public Reserve	RES 5034	8	295	0.2235	Hand removal	-
A32	Public Reserve	RES 5034	4	118	0.0485	Hand removal	-
A33	Public Reserve	RES 5068	10	65	0.0646	Hand removal / Slashing	1
A34	Public Reserve	RES 5252	16	115	0.1329	Hand Removal / Slashing	1
A35	Public Reserve	RES 5068	13	70	0.0666	Slashing	1
A36	Public Reserve	RES 5068	7	36	0.029	Hand removal / Mowing	2
A37	Public Reserve	RES 5068	11	37	0.0411	Hand removal / Mowing	2
A38	Public Reserve	RES 5068	15	144	0.1993	Mowing / Slashing	1
A39	Public Reserve	RES 5068	12	109	0.1068	Mowing / Slashing	1
A40	Public Reserve	RES 5068	6	81	0.0478	Hand removal / Mowing/ Slashing	1
A41	Public Reserve	RES 5285	20	180	0.3457	Hand removal / Mowing / Slashing	1
A42	Public Reserve	Lot 21 DP 732573	6-16	127	0.1175	Hand removal / Mowing	-
A43	Public Reserve	RES 5011	12-16	147	0.1844	Hand removal / Mowing	-
A44	Public Reserve	RES 5186	5	29	0.0157	Hand removal / Mowing	-
A45	Public Reserve	RES 5186	15	29	0.038	Hand removal / Mowing	-
A46	Operational Land	Lot 1 DP 798402	3	42	0.0125	Hand removal / Mowing	1
A47	Operational Land	Lot 1 DP 798402	6	23	0.0123	Hand removal / Mowing	1
A48	Public Reserve	RES 5252	10	49	0.0500	Hand removal	-
A49	Public Reserve	RES 5020	6	361	0.2143	Mowing / Slashing	2
A50	Water Reservoir Reserve	RES 116	10-25	428	0.4871	Mowing / Slashing	1
A51	Public Reserve (Zamia - South Parkway)	RES 5283	15	290		Hand removal / Mowing / Slashing	1
A52	Public Reserve (Zamia - South Parkway)	RES 5283	21	95		Hand removal / Mowing / Slashing	1
A53	Public Reserve (Zamia - South Parkway)	RES 5283	15	200		Hand removal / Mowing / Slashing	1
		Total		9865m	14.34ha		
STRATEGIC FIRE ADVANTAGE ZONES							
S1	Boundary Street	Boundary St	6	606	0.36	Slashing / Unsealed & Sealed road maintenance	1
S2	Water Reservoir Reserve	RES 116	6	358	0.22	Slashing / Unsealed & Sealed road maintenance	1
S3	Zamia Reserve	RES 5283/5285	6	536	0.32	Slashing / Unsealed & Sealed access maintenance	1
		Total		1500m	0.90ha		
STRATEGIC FIRE ADVANTAGE ZONES - Prescribed Burning							
Sb1	Water Reservoir Reserve	RES 116	Approx 260	Approx 200	3.185	Prescribe burn (2006-2009)	1
Sb2	Water Reservoir Reserve	RES 116	Approx 96	Approx 108	0.6259	Prescribe burn (2006-2009)	1
		Total			3.810ha		

APPENDICES

APPENDIX I – Dictionary

back burning: the application of fire to combustible matter so as to provide a fire break to control or suppress a fire or protect persons, property or the environment from an existing or imminent danger arising out of a fire, incident or other emergency.

Bush fire: includes a grass fire.

Bush fire danger period: a period fixed by or under section 81 or 82 of the *Rural Fires Act 1997.*as a bushfire danger period.

Bush fire hazard reduction certificate (BFHRC): a certificate referred to in section 100D of the *Rural Fires Act 1997.*

Bush fire hazard reduction notice: a notice under section 66 of the *Rural Fires Act 1997.* .

Bush fire hazard reduction work:

(a) the establishment or maintenance of fire breaks on land, and
(b) the controlled application of appropriate fire regimes or other means for the reduction or modification of available fuels within a predetermined area to mitigate against the spread of a bushfire, but does not include construction of a track, trail or road.

Bush fire prone land has the same meaning as it has in the *Environmental Planning and Assessment Act 1979*.

bushfire risk management plan (BFRMP): a plan prepared under Division 4 of Part 3 for the purpose referred to in section 54 of the **Rural Fires Act 1997**.

fire fighting appliance includes all vehicles, equipment and other things used for or in connection with the prevention or suppression of fire or the protection of life or property in case of fire.

fire fighting authority means the following:

(a) the Service,
(b) New South Wales Fire Brigades,
(c) the National Parks and Wildlife Service,
(d) the Forestry Commission,
(e) any other body prescribed by the regulations for the purposes of this definition.

fire permit: a permit issued under section 89 of the *Rural Fires Act 1997.*

local authority means:

(a) in relation to land that is situated within an area within the meaning of the *Local Government Act 1993*—the council of the area.

managed bushfire hazard reduction work means bushfire hazard reduction work that is carried out in accordance with a bushfire risk management plan.

Bush Fire Management Committee **(BFMC)***:* a Committee constituted under Part 3 of the *Rural Fires Act 1997.*

plan of operations: a plan prepared under Division 4 of Part 3 for the purposes referred to in section 53 of the *Rural Fires Act 1997.*

public authority means:

(a) any public or local authority constituted by or under an Act other than this Act, or
(b) any Government Department, or
(c) a statutory body representing the Crown, or
(d) a State owned corporation, or
(e) any person prescribed by the regulations as a public authority.

(***Rural Fires Act 1997 No 65)***

Definitions within the *State Emergency and Rescue Management Act 1989*

combat agency *means the agency identified in Displan as the agency primarily responsible for responding to a particular emergency.*

Displan *means the State Disaster Plan*

emergency *means an emergency due to an actual or imminent occurrence (such as fire, flood, storm, earthquake, explosion, accident, epidemic or warlike action) which:*

(a) endangers, or threatens to endanger, the safety or health of persons in the State, or
(b) destroys or damages, or threatens to destroy or damage, property in the State,

being an emergency which requires a significant and co-ordinated response.

emergency services organisation *means the Police Service, Fire Brigades, Rural Fire Brigades, Ambulance Service, State Emergency Service, Volunteer Rescue Association or any other agency which manages or controls an accredited rescue* unit

APPENDIX II – Council fire management objectives

Council fire management objectives are defined within the *Great Lakes Council Management Plan*[19], as seen below.

Purpose:

- ✓ *'To protect life and assets through the provision of services which prevent and mitigate the occurrence of fires and other emergencies. (Assets include but not restricted to economic, social, environmental and heritage values found on both public and private lands).*

Objectives:

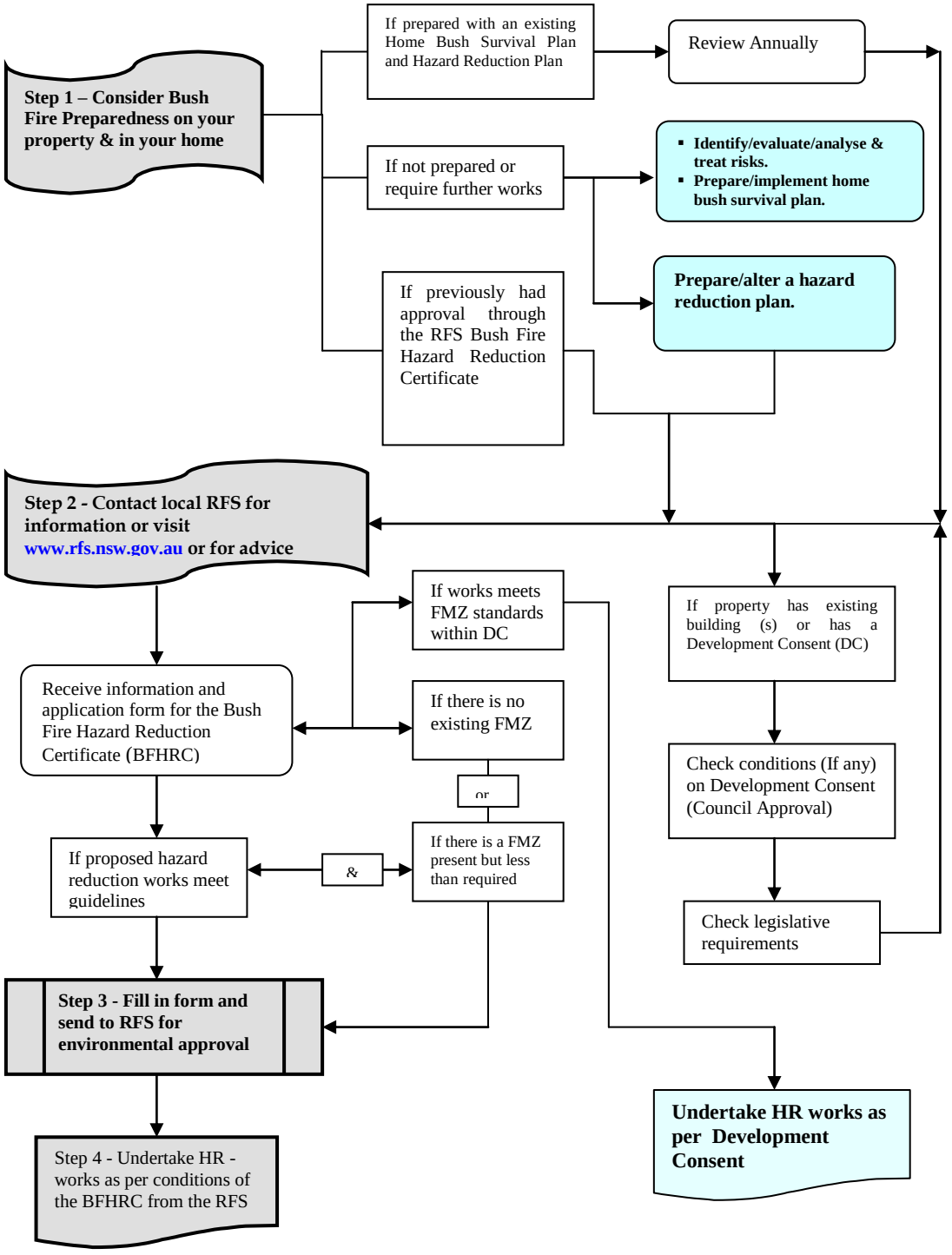
- ✓ *'Council shall provide financial support and resourcing requirements, as necessary, to enable the Rural Fire Service to effectively perform their responsibilities in accordance with the negotiated service level agreement.*

- ✓ *'Council shall provide financial support and resourcing requirements, as necessary, to enable the State Emergency Service to effectively perform their responsibilities in our local government area.*

- ✓ *'Council shall continue to evaluate and review the Disaster Management Plan for our local government area, in collaboration with the local Rural Fire Service, State Emergency Service and other relevant agencies, annually and where necessary due to legislative changes occurring from time to time.'*

[19] The current GLC Management Plan needs to be referred to for amendments to the purpose and objectives which may be changed from time to time.

APPENDIX III– What you can do to assist with fire mitigation and hazard reduction.



HR – Hazard Reduction
BFHRC – Bush Fire Hazard Reduction Certificate

FMZ – Fire Management Zone
DC - Development Consent through Council

Bush Fire Preparedness - Readiness of householders/property owners in the event of an imminent bushfire

APPENDIX IV - Fire Mitigation

The Local Environmental Plan (LEP) permits strategic bushfire hazard reduction within applicable zones across the Great Lakes LGA.

The LEP provides the mechanism to achieve bushfire objectives and protection measures and identifies criteria specified in bushfire prone areas appropriate to the potential level of the hazard.
DCP's support the objectives of the LEP and can detail bushfire protection measures necessary for the protection of life and property in the event of a bushfire event.

Two core documents including the NSW Rural Fire Service *Planning for Bushfire Protection (2001b) and the Bushfire Environmental Assessment Code (2003a)* assist with guiding specific fuel management practices and fire prevention works on both new and existing developments.

Referral to these along with other reference material from the NSW Rural Fire Service assist in planning for bushfire mitigation works.

The Building Code of Australia (BCA) provides guidelines to building in bushfire prone areas within the AS3959 Construction of buildings in bushfire prone areas.

These guides collectively assist the community and managers to:

- assess bushfire protection of properties
- recognise vegetation type and fire effects
- identify building setbacks
- consider the local environment
- reduce the impact of imminent bushfire attack
- provide adequate fire management zones
- implement fuel management practices and
- promote fire prevention programs to the community.

The bushfire risk assessment of hazards is undertaken which assist in the development of fire management zones known as *Asset Protection Zones* (APZ) and the *Strategic Fire Advantage Zones* (SFAZ).

Asset Protection Zones for existing structures

An APZ represents the area surrounding a development, which is managed to reduce the bushfire hazard to an acceptable level. Its main purpose is to provide a buffer between any habitable structure and the bushfire hazard, and progressively reduce fuel loads.

For bushfire planning purposes APZ's are generally included within the property being developed, however it may incorporate areas of land off the development site where such land has a compatible use (e.g. road, sporting field, or developed lot). Each APZ varies in form and width, according to vegetation type, slopes and **form of construction**. When slopes are greater, depths are increased to reduce impact from higher intensity fires.

Where existing assets require fire mitigation works the guidelines within the BFEAC assists in preparing fire management strategies for an area. Guidelines for maximum distances for APZ can be seen below:

Maximum Distance of an Asset Protection Zone from the Asset (or Adjacent Asset)		
	Residential & Special Purpose Buildings	*Major Buildings*
Upslope		
<18	20 metres	20 metres
Downslope		
< 10°	20 metres	20 metres
>10 – 15°	30 metres	20 metres
>15 °	40 metres	20 metres

(RFS 2006)

Asset Protection Zones for new developments

When considering "new development" including new, alterations or additions to residential or industrial buildings refer to *Planning for Bushfire Protection (20001)* to define fire management zones.

❖

The table below extracted from this document shows the APZ minimum requirements that apply to both residential and special protection developments, for each vegetation groups and slope variations.

The APZ will comprise of two components, being the Outer Protection Area (OPA) and the Inner Protection Area (IPA).

Outer Protection Area

The OPA is located between the hazard and the IPA often linking with the area originally forming part of the bushfire hazard and is located on the bushland side of the perimeter road. In this area, vegetation is managed so cover is not continuous and fuel loads generally do not exceed 8 tonnes per hectare or in grasslands height should be maintained below 10 centimetres.

Within Bush Fire Prone Areas		APZ -Vegetation Group 1* (Forest [wet sclerophyll forest, dry sclerophyll forest])		APZ -Vegetation Group 2* (Woodlands, tall heath, and wetlands [scrub, open Shrub, closed heath])		Vegetation Group 3* (Rainforest [Closed Forest], open woodlands, grasslands †[20])
	Slope	Residential	Special Protection	Residential	Special Protection	Both
Upslope	>5°	20 m	60 m	20 m	30 m	20 m
	5°–0	30 m	75 m	30 m	40 m	20 m
Downslope	>0 – 5°	40 m	80 m	35 m	50 m	20 m
	>5 – 10°	50 m	90 m	40 m	60 m	20 m
	>10 – 15°	60 m	100 m	50 m	80 m	20 m
	>15 – 18°	70 m	100 m	60 m	100 m	20 m

(RFS 2001b)

Outer Protection Area – cont

The fine fuel loadings are maintained so that the intensity of a fire is reduced along with a corresponding reduction in the level of direct flames, radiant heat and ember attack on the IPA. The depth of the OPA varies from 0–10 metres deep for residential development or up to 15 metres in depth for special protection developments.

Inner Protection Area

The IPA extends from the edge of the development to the edge of the OPA. Within this area, fuel loads are strictly managed so that there is minimal fine fuels **available** that can become involved in fire at close to the development and therefore minimises direct flame contact and radiant heat. Any vegetation within this area **must not provide a path for the transfer of fire** to the development — i.e. **fuels are discontinuous**.

While trees and shrubs or other vegetation may occur, the **canopy must not touch or over hang the building** and be far enough away from the dwelling not to ignite the house by direct flame or radiant heat emission. In addition, species that produce excessive amounts of ground fuel in a short period or fire danger period.

There is preference to retain smooth bark species over rough barked species. The more fibrous bark increases the fire hazard rating as they assist with the spread and spotting capabilities of a fire. Retain discontinuous vegetation to provide a barrier to reduce the effects from radiant heat and ember attack.

Perimeter Road, Fire Trail and Access Roads

The perimeter road or fire trail lies between the OPA and the boundary of the allotment or the reserve.
The fire trail can form part of the IPA that provides fire fighters access to structures and APZ's to conduct back burning or hazard reduction, property protection or provide refuge for fire fighters.

* The APZ requirements are based on **Level 3 construction** in accordance with AS3959–1999. Where opportunities exist to increase APZ depth, then the site assessment methodology for bushfire attack, required setbacks and construction levels set out in Appendix 3.3 (of the *Guidelines*) must be applied.

† scrubland, , mallee also are within Group 3 vegetation but occurs western NSW areas.

[20] Small remnants forests (less than 1ha) may be considered to be equivalent to the specifications for group 3 vegetation.

The PBFP guidelines identify specifications and design including construction standards, turn around areas, signage and environmental controls for perimeter road, fire trail and access roads.

APPENDIX V - Mapping Bushfire Prone Land

In August 2002 amendments came into effect to the *Environmental Planning and Assessment Act 1979* and the *Rural Fires Act 1997to improve protection of people property and the environment from bushfires.*

*C*ouncils are required to map bushfire prone lands within their local government areas with consultation with the Commissioner of the NSW Rural Fire Service.

Councils are required to place specification of bushfire prone land on section 149 Planning Certificate. The Commission issues fire safety authority (section 100B of the *Rural Fires Act*) for special purpose developments of bushfire prone land.

The criteria for bushfire prone land mapping requires vegetation to be divided into 3 groups as per Appendix 2 in the *Planning for Bush Fire Protection (2001)* document:

a) **Vegetation Group 1** – Forest
b) **Vegetation Group 2** – Woodlands, tall heath and wetlands
c) **Vegetation Group 3** –Rainforests, open woodlands, grasslands, shrublands and mallee.

Once vegetation classes have been determined and mapped across a council area, application of **bushfire vegetation categories** to the vegetation groups must be completed. The *Guideline – Bush Fire Prone Land Mapping, NSW Rural Fire Service, 2004* defines the criteria for **Bush Fire Vegetation Categories**[21] **using the above mapped** Vegetation Groups and is as follows: -

(i) Vegetation Group 1 and 2, greater than 1 hectare – **Bush fire Vegetation Category 1**
(ii) A 100 metre external buffer to Bush fire Vegetation Category 1 vegetation polygon—**Buffer zone Category 1**
(iii) Vegetation Group 3, greater than 1 hectare – **Bush fire Vegetation Category 2**

A 30 metre external buffer to Bushfire Vegetation Category 2 vegetation polygon —Buffer zone Category 2

(iv) Areas less than 1 hectare within, or partially within
(v) 100m lateral separations from a bushfire vegetation category 1, are **—Bush fire Vegetation Category 2.** or
(vi) 30m lateral separations from a bushfire vegetation category 2 are **—Bush fire Vegetation Category 2.**

Vegetation **excluded** from the above mentioned vegetation groups include:

i. Areas of "Vegetation groups" 1, 2 and 3, less than 1 hectare and not less than 100m lateral separation from a Bushfire Vegetation Category 1, or not less than 30m lateral separation from a Bushfire Vegetation Category 2, are excluded; or
ii. Areas of "Managed grassland" including grassland on, but not limited to, public lands, grazing land, recreational areas, commercial/industrial land, airports/airstrips and the like are excluded; or
iii. Areas of managed gardens and lawns within curtilage of buildings;
iv. Managed botanical gardens;
v. "Agricultural lands" used for annual and/or perennial cropping, orchard, market gardens, nurseries and the likes are excluded; or
vi. Mangroves.

(RFS *2004b; 2004e)*

[21] The NSW Rural Fire Service owns bushfire prone mapping and is held in custody by Council

APPENDIX VI – Bush Fire Risk Description

A summary of the criteria for the identification of bushfire risk of an area, from the Lower Hunter Zone, Bush Fire Risk Management Plan can be seen within the table below:

Bush Fire Risk Description

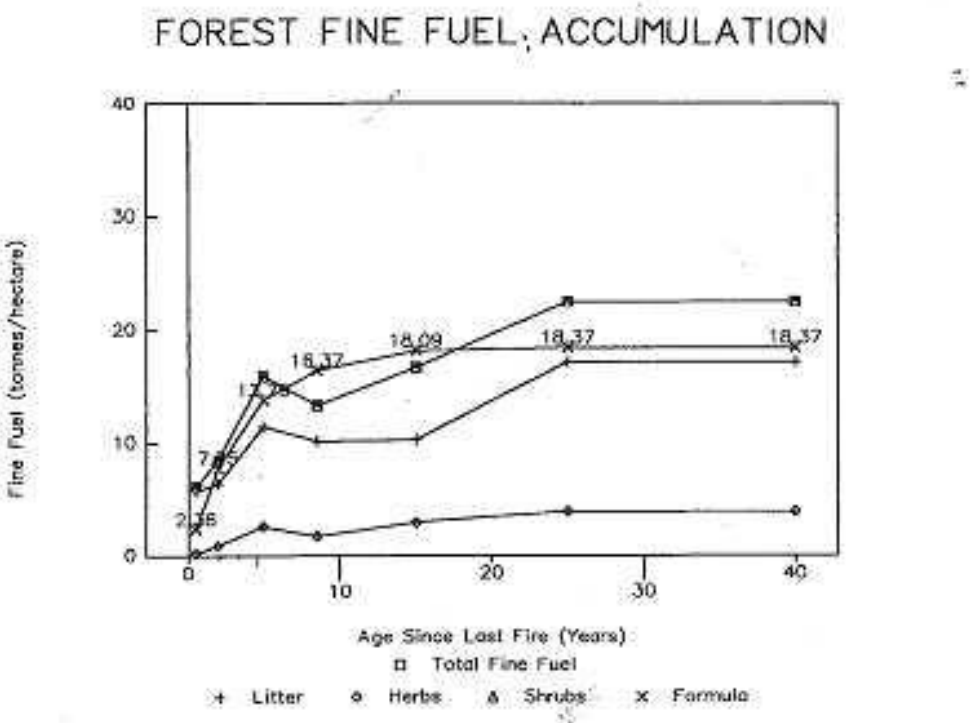
Development Type *X — absent, 4— present)*	*Bushfire Threat*[22]	*Bushfire Risk*[23]	*Consideration to Asset Protection/ Building Design*[24]
Urban/bushland interface/ Multiple Occupancies	Within 100m	Extreme	7
Urban/bushland interface/ Multiple Occupancies	Within 100m	Major	4
Urban/bushland interface	100m – 2.5km	Major	7 and 4
Environmental/Ecological Assets	Any	Major	4
Remote Rural Residential Development	Any	Major	7 and 4
Agricultural areas	Any	Moderate	7

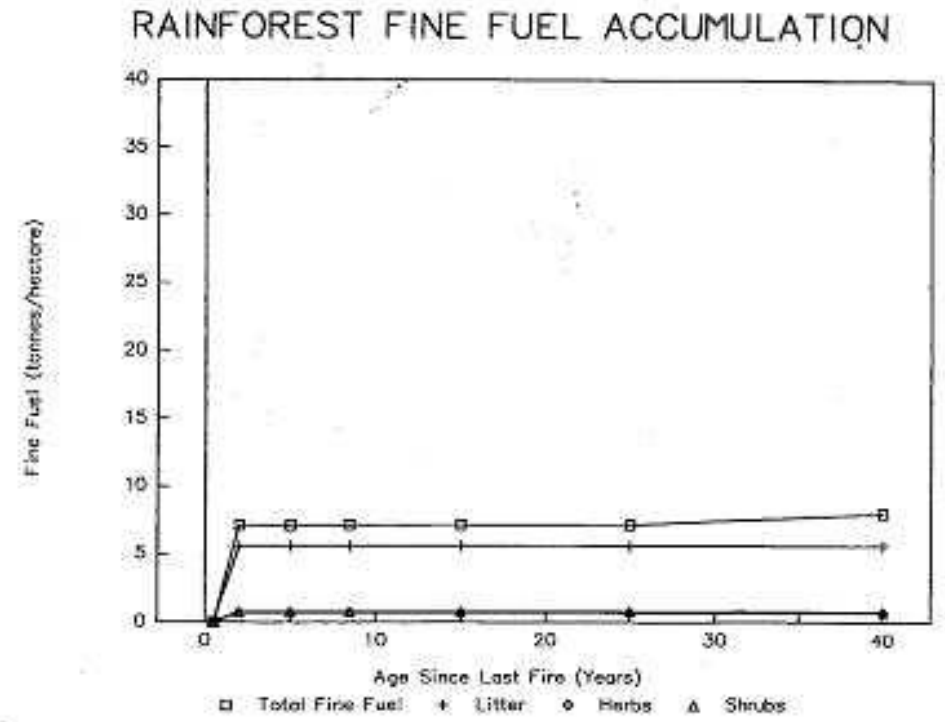
[22] How close assets are located to the hazard

[23] Level of risk as defined within the *Bushfire Risk Management Plan 2001*

[24] Consideration to fuel reduced areas (property protection), housing design and perimeter roads

APPENDIX VII- Fine Fuel Accumulation





(NPWS unpub.)

APPENDIX VIII – Biodiversity Thresholds for Vegetation Communities

Biodiversity thresholds[25] and fire regime to be applied to vegetation communities in Great lakes LGA.

Fire Regime	Biodiversity Thresholds Within Strategic Fire Advantage and Land Management Zones (NPWS 2001)	Vegetation Community Type (Council 2003) *[#1 and #2 indicate options for the same community]	Forest Type (Council, DVS, 2003)	Vegetation Group (Category 1,2,3) PBFP[26]	The Vegetation Formation Described By The RFS For Minimum Fire Frequency For SFAZ (BFEAC)	Minimum Year Fire Frequency (BFEAC)
a	❖ Avoid 3 or more consecutive fires, with each of <5 years apart ❖ Avoid inter fire periods of >30 years ❖ Avoid 2 or more successive fires that totally scorch or consume the tree canopy ❖ Avoid 3 or more consecutive fires of low intensity	Blackbutt – Bloodwood/ Apple	41	1	Dry sclerophyll shrub/grass forest	5
		Blackbutt/ Scribbly Gum	40	1	Dry sclerophyll shrub/grass forest	5
		Blackbutt/ Sydney Peppermint/ Smooth-barked Apple	42	1	Sclerophyll grassy woodlands	5
		Dry Blackbutt	37	1	Dry sclerophyll shrub/grass forest	5
		Forest Red Gum - #1	92	1	Sclerophyll grassy woodlands	5
		Grey Gum/ Grey Ironbark/ White Mahogany	62	1	Dry sclerophyll shrub/grass forest	5
		Ironbark	84	1	Dry sclerophyll shrub/grass forest	5
		Ironbark/ Smooth-barked Apple/ Stringybark	84/106	1	Dry sclerophyll shrub/grass forest	5
		Mahogany/ Ironbark/ Grey Gum/ Blackbutt	60/37	1	Dry sclerophyll shrub/grass forest	5
		Red Bloodwood	126	2	Sclerophyll grassy woodlands	5
		Scribbly Gum	117	1	Dry sclerophyll shrub/grass forest	5
		Smooth-barked Apple	105	1	Dry sclerophyll shrub/grass forest	5
		Spotted Gum	70	1	Dry sclerophyll shrub/grass forest	5
		Spotted Gum – Ironbark/ Grey Gum	74	1	Dry sclerophyll shrub/grass forest	5
		Sydney Peppermint	128	1	Dry sclerophyll shrub/grass forest	5
		Sydney Peppermint/ Stringybark	115	1	Dry sclerophyll shrub/grass forest	5
		White Mahogany/ Red Mahogany/ Grey Ironbark/ Grey Gum	60	1	Dry sclerophyll shrub/grass forest	5

[25] Biodiversity thresholds adapted from Bradstock et al 1995; NSW National Parks and Wildlife Service described within the *Draft Fire Management Strategies for Myall Lake National Park and Island Reserves, 2003a*.

[26] **Vegetation Group 1** - Forest (wet sclerophyll forest, dry sclerophyll forest)
Vegetation Group 2 - Woodlands, tall heath, and wetlands (scrub, open Shrub, closed heath)
Vegetation Group 3 - Rainforest (Closed Forest), open woodlands, grasslands (PBFP 2001)

Fire Regime	Biodiversity Thresholds Within Strategic Fire Advantage and Land Management Zones (NPWS 2001)	Vegetation Community Type (Council 2003) *[#1 and #2 indicate options for the same community]	Forest Type (Council, DVS, 2003)	Vegetation Group (Category 1,2,3) PBFP26	The Vegetation Formation Described By The RFS For Minimum Fire Frequency For SFAZ (BFEAC)	Minimum Year Fire Frequency (BFEAC)
b	❖ Avoid 3 or more consecutive fires, with each of <8 years apart ❖ Avoid 3 or more consecutive fires, with each of the fires >15 years apart ❖ Avoid inter fire periods of > 30 years ❖ Avoid 2 or more consecutive fires that consume < 10t/ha of surface fuels	Banksia	107	2	Heathlands	7
		Disturbed Heath	219/223	2	Heathlands	7
		Forest Red Gum - #2	92	1	Semi mesic grassy forests	10
		Heath	223	2	Heathlands	7
		Heath Paperbark	31/223	2	Heathlands	7
		Paperbark	31	1	Swamp sclerophyll forests	7
		Paperbark/ Blackbutt	31/37	1	Swamp sclerophyll forests	7
		Paperbark/ Smooth-barked Apple/ Sydney Peppermint	31/106	1	Swamp sclerophyll forests	7
		Paperbark/ Swamp Oak	31/32	1	Swamp sclerophyll forests	7
		Red Mahogany	68	1	Dry sclerophyll shrub/grass forest	7
		Red Mahogany/ Smooth-barked Apple	68/105	1	Dry sclerophyll shrub/grass forest	7
		Rough-barked Apple	129	1	Swamp sclerophyll forests	7
		Scrub	224	2	Heathlands	7
		Swamp - #1	231	3	Freshwater wetlands	6
		Swamp Mahogany	30	1	Swamp sclerophyll forests	7
		Swamp Mahogany/ Forest Red Gum	30/92	1	Swamp sclerophyll forests	7
		Swamp Mahogany/ Grey Gum	30/60	1	Swamp sclerophyll forests	7
		Swamp Mahogany/ Paperbark	30/31	1	Swamp sclerophyll forests	7
		Swamp Mahogany/ Swamp Oak	30/32	1	Swamp sclerophyll forests	7
		Swamp Mahogany/ Palm		1	Swamp sclerophyll forests	7
		Swamp Oak	32	1	Swamp sclerophyll forests	7
		Tallowwood - #1	45	1	Semi mesic grassy forests	10
		Tallowwood/ Grey Gum	45/60	1	Semi mesic grassy forests	10

Fire Regime	Biodiversity Thresholds Within Strategic Fire Advantage and Land Management Zones (NPWS 2001)	Vegetation Community Type (Council 2003) *[#1 and #2 indicate options for the same community]	Forest Type (Council, DVS, 2003)	Vegetation Group (Category 1,2,3) PBFP26	The Vegetation Formation Described By The RFS For Minimum Fire Frequency For SFAZ (BFEAC)	Minimum Year Fire Frequency (BFEAC)
c	❖ Avoid more than 1 fire every 30 years ❖ Avoid inter-fire periods > 200 years	Flooded Gum	48	1	Wet sclerophyll forests	25
		Flooded Gum/ Paperbark	48/31	1	Wet sclerophyll forests	25
		Inland Brush Box	53	1	Wet sclerophyll forests	25
		Ironbark/ Grey Gum/ Flooded Gum	60/48	1	Wet sclerophyll forests	25
		Moist Blackbutt	36	1	Wet sclerophyll forests	25
		Sydney Blue Gum	46	1	Wet sclerophyll forests	25
		Sydney Blue Gum/ Paperbark	46/31	1	Wet sclerophyll forests	25
		Tallowwood - #2	45	1	Wet sclerophyll forests	25
		Tallowwood/ Sydney Blue Gum	47	1	Wet sclerophyll forests	25
		Tallowwood/ Sydney Blue Gum/ Brushbox	47/53	1	Wet sclerophyll forests	25
d	Any fire occurrence (a limited recovery ability exists)	Fig/ Giant Stinger	6	3	Rainforest	na
		Fig/ Myrtle	6/23	3	Rainforest	na
		Fig-Giant Stinger/Myrtle		3	Rainforest	na
		Headland Brushbox	25	3	Rainforest	na
		Mangrove	33	3	Estuarine & saline wetlands	na
		Myrtle	23	3	Rainforest	na
		Palm	7	3	Rainforest	na
		Palm/ Myrtle	7/23	3	Rainforest	na
		Swamp - #2	231	3	Estuarine & saline wetlands	na
		Tuckeroo	24	3	Rainforest	na
		Yellow Tulipwood	22	3	Rainforest	na
N A	Not Applicable	Natural Grassland	230	3	No prescribed fire on headlands[27]	na
		Pine	-	1 or 2	Other	na
	(Primary/foredune landscape)	Sand Ridge	233	na	Heathlands/Beach	n/a
		Rock/Sand	-	na	Other	na
w	**Use a, b, c, d** options for biodiversity thresholds	Introduced Scrub	221	1,2,3	Appropriate management practice[28]	na
		Mixed Forest Regrowth Mixed Pine Mixed Woodland Vine Sandridge/Beach Cleared/Grasslands	220	1,2,3	Appropriate management practice	na

[27] Not described in BFEAC schedule
[28] W. Variable within each vegetation formation

APPENDIX IX – Vegetation formations for NSW

Vegetation formations for NSW to be applied to the Bush Fire and Environmental assessment Code for asset protection zones and strategic fire advantage zones.

A. Rainforests	Forests dominated by trees with soft broad leaves (non eucalypts), with vines, ferns and palms in the understorey. Coast and tablelands in mesic sites on fertile soils.
B1. Wet sclerophyll forests	Tall forests of dominated by straight-trunked eucalypts with dense understories of shrubs with broad soft leaves, ferns and herbs. Relatively fertile soils in high rainfall parts of coast and tablelands.
B2. Semi-mesic grassy forests	Tall forests dominated by straight-trunked eucalypts, with mixed grassy understories and sparse occurrences of shrubs with broad soft leaves. Coast and tablelands in high rainfall regions and along major inland watercourses on relatively fertile soils.
C. Swamp sclerophyll forests	Forests of hard-leaved trees (eucalypts, paperbarks, casuarinas) with scattered shrubs and continuous groundcover of water-loving sedges and herbs. Floodprone flats and plains and riparian zones principally along the coast and inland rivers.
D. Sclerophyll grassy woodlands	Woodlands of eucalypt trees, with dry understories of grasses, herbs and sometimes scattered shrubs. Rolling terrain with fertile soils and moderate rainfall on the coast, tablelands and western slopes.
E1. Dry sclerophyll shrub/grass forests	Eucalypt forests with mixed understories of hard-leaved shrubs and grasses. Moderately fertile soils in moderate rainfall areas of the coast, tablelands and western slopes.
E2. Dry sclerophyll shrub forests	Low forests and woodlands dominated by eucalypts, with understories of hard-leaved shrubs and sparse groundcover (few grasses or sedges). Regions receiving high to moderate rainfall on the coast, tablelands and western slopes, often in steep areas.
F. Semi-arid woodlands	Open woodlands dominated by eucalypts, acacias and casuarinas, with open understories of hard-leaved shrubs, grasses and forbs, including many ephemeral species. Low-moderate rainfall regions of the near western plains, including infrequently flood-prone sites.
G. Heathlands	Dense to open shrublands dominated by shrubs with small, hard leaves and sedges. High rainfall regions of the coast and tablelands on infertile soils, often in exposed topographic positions.
H. Alpine complex	Mosaics of low herbfields, grasslands and shrublands. High, snow-prone parts of the southern ranges.
I. Grasslands	Closed tussock grasslands with a variable compliment of herbs and few if any woody shrubs or trees. Fertile soils of the tablelands and western floodplains.
J. Freshwater wetlands	Swamp forests, wet shrublands or sedgelands, usually with a dense groundcover of sedges. Throughout NSW on peaty or gleyed soils with impeded drainage.
K. Estuarine and saline wetlands	Low forests, shrublands and herbfields of mangroves, succulent shrubs (saltmarsh) or marine herbs (sea grasses). Coastal estuaries and saline sites of the western plains.
M. Arid and semi-arid shrublands	Open shrublands of hard-leaved shrubs, hummock or tussock grasses and ephemeral herbs. Low rainfall regions of the far western plains.

(RFS 2005)

APPENDIX X - CRA Vegetation Unit Distribution and Conservation Value

The Lower North East Comprehensive Regional Assessment (CRA) and DEC (Parks and Wildlife Division) used broad scale mapping to assess the status of the ecosystem. The local vegetation community were ranked from highest regional priority to the lowest, including those ecosystems that are known to be vulnerable, rare, severely depleted and those that have private land priority.

Forest Type	CRA Name	Current area Lower North East CRA (Ha)	% of Original Extent Remaining	Status	RFA Cons. Target Met
92	Escarpment Red Gum	20,498	27.4%	▪ Vulnerable ▪ Severely Depleted ▪ Highly Inadequately Reserved ▪ Private land priority	No
129	Rough-barked Apple	2,636	18.8%	▪ Vulnerable ▪ Severely Depleted ▪ Private land priority	No
32	Swamp Oak	4,868	22.7%	▪ Vulnerable ▪ Severely Depleted ▪ Private land priority	No
107	Banksia	4,196	47.8%	▪ Vulnerable ▪ Private land priority	No
31	Paperbark	12,866	NA	▪ Vulnerable	No
224	Scrub	3,073	NA	▪ Vulnerable	Yes
68	Red Mahogany	65	100	▪ Rare ▪ Highly inadequately Reserved ▪ Private land priority	No (*)
45	Tallowwood	746	85.3%	▪ Rare ▪ Private land priority	No (*)
33	Mangrove	1,001	NA	▪ Rare ▪ Private land priority	No (*)
223	Heath	14,286	NA	▪ Rare ▪ Private land priority	No (*)
126	Red Bloodwood	5	100%	▪ Rare	Yes (*)
230	Natural Grassland	138	NA	▪ Rare	No (*)
231	Swamp	9,130	NA	▪ Rare	No (*)
6, 7, 22, 23, 24, 25	Rainforest	256,326	NA	▪ Rare	No (*)
36	Dry Grassy Blackbutt-Tallowwood	59,390	44.0%	▪ Severely Depleted ▪ Highly Inadequately Reserved ▪ Private land priority	No
60, 62	South Coast Shrubby Grey Gum	151,030	42.2%	▪ Severely Depleted ▪ Highly Inadequately Reserved ▪ Private land priority	No
42	Blackbutt-Sydney Peppermint-Smooth-barked Apple	1,382	38.8%	▪ Severely Depleted Private land priority	No
106	Stringybark-Apple	81,300	38.9%	▪ Severely Depleted ▪ Private land priority	No
84	Ironbark	89,985	43.0%	▪ Severely Depleted	Yes
30	Swamp Mahogany	2,177	46.9%	▪ Private land priority	No
48, 48/31	Wet Flooded Gum-Tallowwood	6,161	65.6%	▪ Private land priority	No
48	Coastal Flooded Gum	8,753	57.7%	▪ Private land priority	No
70, 74	Dry Foothills Spotted Gum	17,688	53.8%	▪ Private land priority	No
47	South Coast Tallowwood-Blue Gum	71,217	67.1%	▪ Private land priority	No
106, 128	Smooth-barked Apple-Sydney Peppermint-Stringybark	9,517	57.6%	-	No

Forest Type	CRA Name	Current area Lower North East CRA (Ha)	% of Original Extent Remaining	Status	RFA Cons. Target Met
41?	Dry Heathy Blackbutt-Bloodwood	2,889	58.5%	-	Yes
53	Open Coastal Brushbox	64,878	62.8%	-	Yes
37	Coastal Sands Blackbutt	17,312	64.0%	-	Yes
60	Dry Grassy Tallowwood-Grey Gum	178,516	67.6%	-	No
62	Grey Gum-Stringybark	16,056	69.5%	-	Yes
46	Southern Wet Sydney Blue Gum	41,695	72.8%	-	Yes
105	Smooth-barked Apple	18,751	73.7%	-	No
40, 117	Heathy Scribbly Gum	23,471	74.8%	-	Yes
117	Lowlands Scribbly Gum	9,724	84.3%	-	Yes
36	Mid Elevation Wet Blackbutt	6,981	88.6%	-	Yes
62	Moist Open Escarpment White Mahogany	38,495	90.2%	-	Yes
36	Wet Foothills Blackbutt-Turpentine	50,264	92.6%	-	Yes
115	Sydney Peppermint-Stringybark	13,778	99.4%	-	Yes
234	Rock	6,576	NA	-	Yes

(Great Lakes Council 2004a)

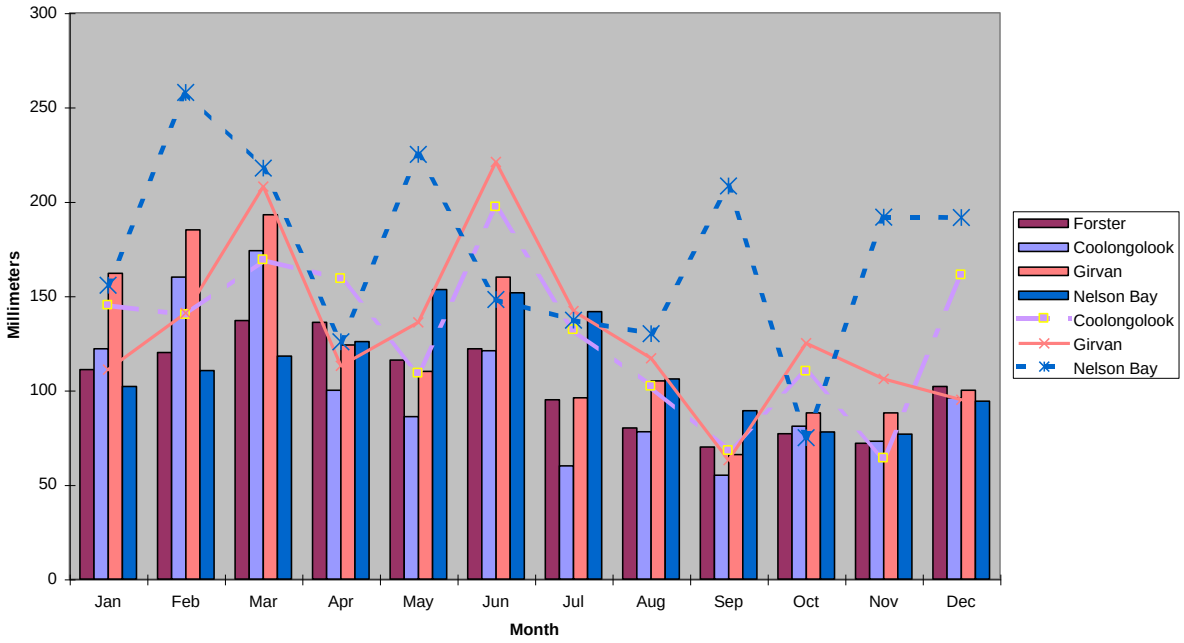
APPENDIX XI – Climate

Climatic details of the Upper Hunter and Lower Hunter weather districts.

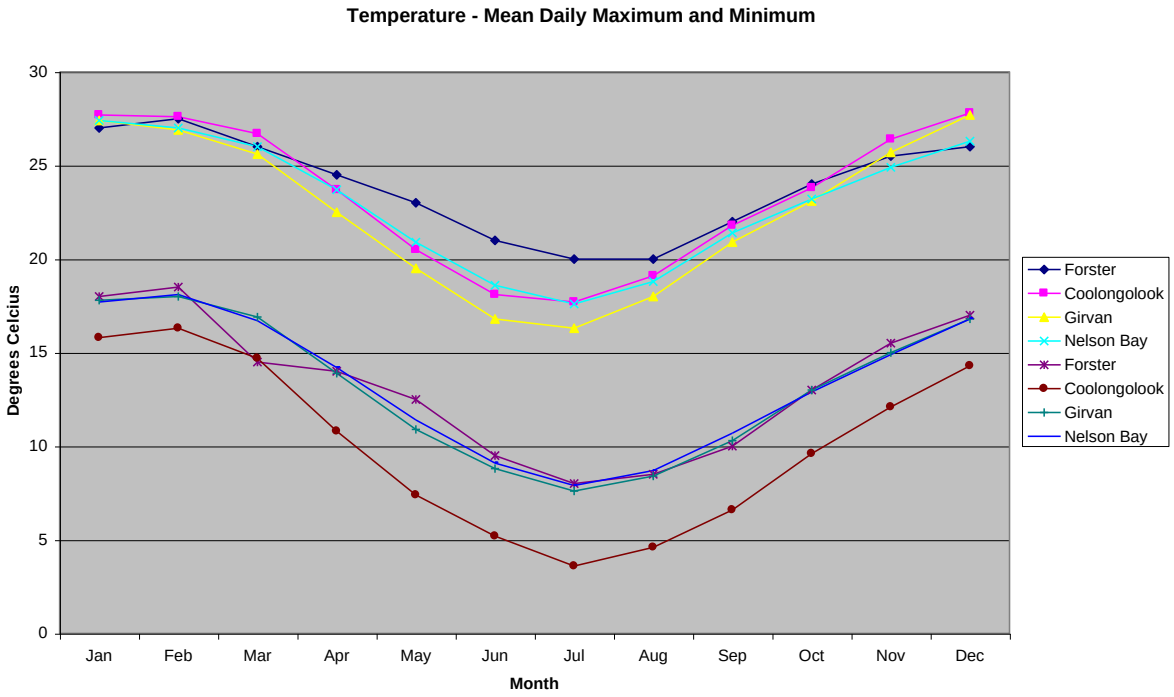
Climate Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ANN
Mean Daily Max. Temp (°C)													
Forster	27.0	27.5	26.0	24.5	23.0	21.0	20.0	20.0	22.0	24.0	25.5	26.0	23.9
Coolongolook	27.7	27.6	26.7	23.7	20.5	18.1	17.7	19.1	21.8	23.8	26.4	27.8	23.5
Girvan	27.4	26.9	25.6	22.5	19.5	16.8	16.3	18.0	20.9	23.1	25.7	27.7	22.6
Nelson Bay	27.4	27	26	23.7	20.9	18.6	17.6	18.8	21.4	23.2	24.9	26.3	23
Mean Daily Min. Temp (°C)													
Forster	18.0	18.5	14.5	14.0	12.5	9.5	8.0	8.5	10.0	13.0	15.5	17.0	13.3
Coolongolook	15.8	16.3	14.7	10.8	7.4	5.2	3.6	4.6	6.6	9.6	12.1	14.3	10.3
Girvan	17.8	18.0	16.9	13.9	10.9	8.8	7.6	8.4	10.3	13.0	15.0	16.8	13.1
Nelson Bay	17.7	18.1	16.7	14.2	11.4	9.1	7.9	8.7	10.7	12.9	14.9	16.8	13.3
Mean. Rainfall (mm)													
Forster	111	120	137	136	116	122	95	80	70	77	72	102	1238
Coolongolook	122	160	174	100	86	121	60	78	55	81	73	96	1205
Girvan	162	185	193	124	110	160	96	105	66	88	88	100	1477
Nelson Bay	102	110.4	118.1	125.8	153.4	151.7	141.7	106	89.2	77.9	76.8	94.3	1347.4
Highest Daily Rain													
Forster	-	-	-	-	-	-	-	-	-	-	-	-	-
Coolongolook	145	140	169	159	109	197	132	102	68	110	64	161	197
Girvan	111	141	208	113	136	221	142	117	63	125	106	95	221
Nelson Bay	155.7	257.8	217.7	125.7	225	148.1	137.2	130	208.3	74.9	191.8	191.5	257.8

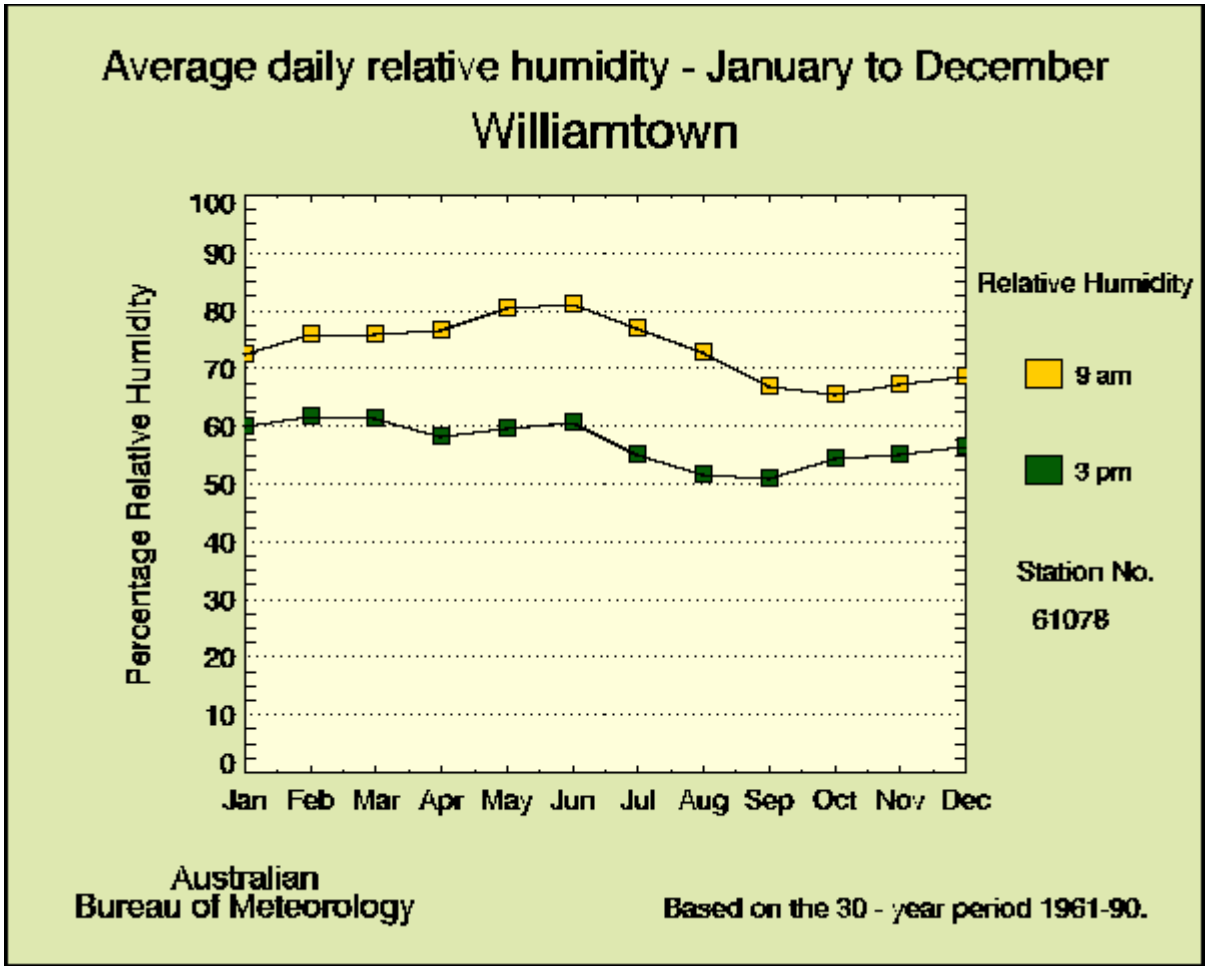
(Commonwealth of Australia, Bureau of Meteorology 2005a; Great Lakes Council 2004a)

Rainfall - Mean maximum (bar) and highest daily rain (line)



(Commonwealth of Australia, Bureau of Meteorology 2005a; Great Lakes Council 2004a)





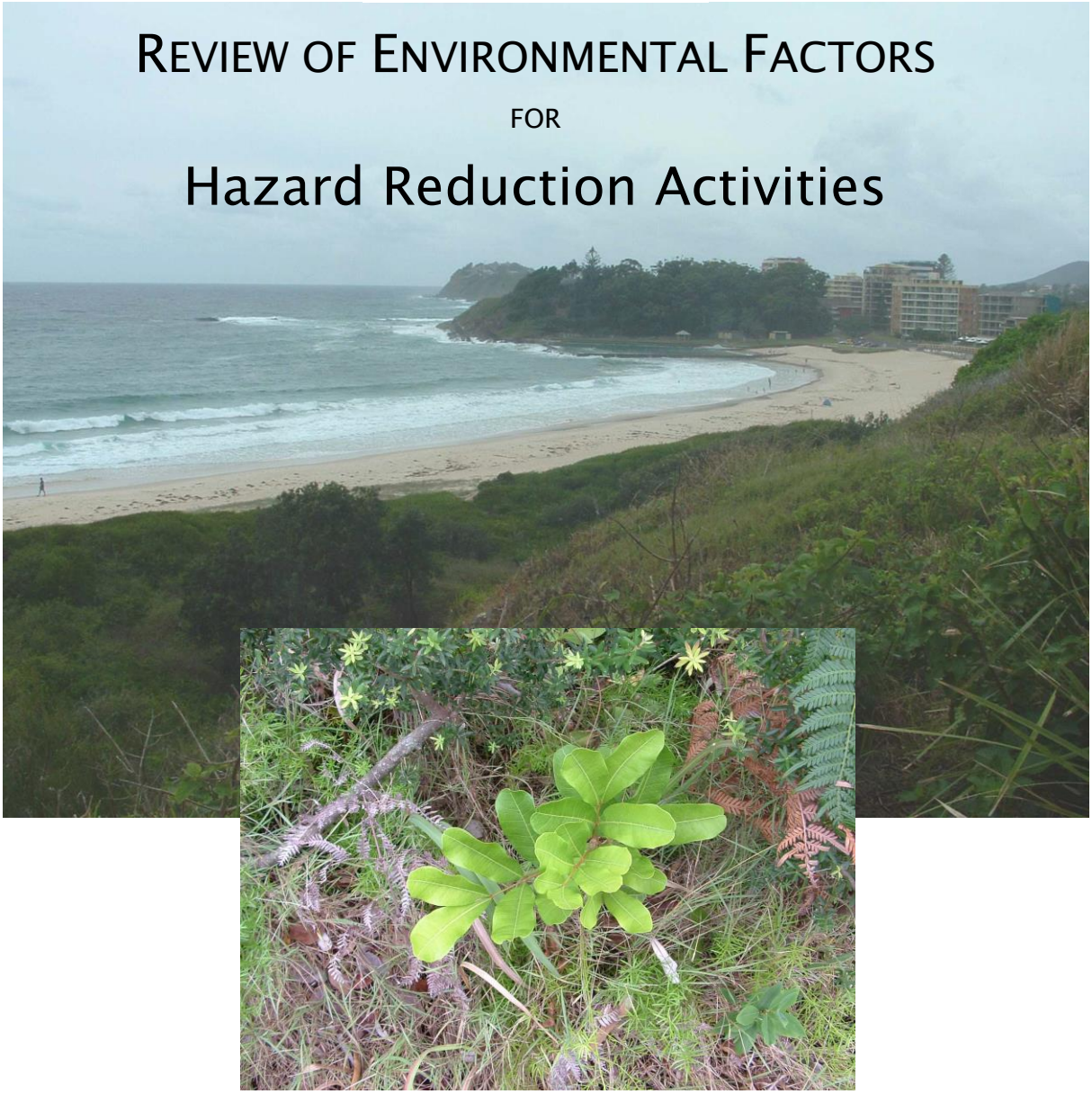
(Commonwealth of Australia, Bureau of Meteorology 2005a; Great Lakes Council 2004a)

APPENDIX XII – Review of Environmental Factors

REVIEW OF ENVIRONMENTAL FACTORS

FOR

Hazard Reduction Activities



Within the Fire Mitigation Plan – Forster

REVIEW OF ENVIRONMENTAL FACTORS

GREAT LAKES COUNCIL

Activity Name:	Hazard reduction works within fire management zones including asset protection zone (APZ) and strategic fire advantage zone (SFAZ).
Plan Name:	Fire Mitigation Plan - Forster
Location of Activity:	Forster – 1km east of Tuncurry
Activities:	The creation and ongoing maintenance within the APZ and SFAZ.
Reserves and managed land:	Refer to section 7 within the Plan. There is a total of 182 hectares of 58 reserves affected by bushfire.

Planning – Relevant Legislation

No	Act/Regulation	Comments
1.1	***Local Government Act 1993***	The proposed activities are compatible with the *Local Government Act 1993* and Great Lakes Council management practices.
1.2	***Environmental Planning and Assessment Act 1979***	Part 5 of the *Environmental Planning and Assessment Act 1979* requires an 'Environmental Assessment' to be conducted for all 'activities'. This REF is an 'Environmental Assessment' for the purpose of Part 5 of the Act. An 8-Part test of significance for potential threatened species is required under the *Environmental Planning and Assessment Act 1979*.This REF is the assessment of the activities. Section 5A of the *Environmental Planning and Assessment Act 1979* requires the application of an 8 part test to assess the impact of 'activities' on threatened species, populations or ecological communities, or their habitats as declared under the *Threatened Species Conservation Act 1995*.
1.3	***Threatened Species Conservation (TSC) Act 1995***	All assessments within attachment 1 and 2, to determine the requirement for an 8-part test were conducted as part of this REF. This concluded that the proposed activities will have minimal impact on threatened species, populations or ecological communities, or their habitats as declared under the *Threatened Species Conservation Act 1995* and hence the proposed activities is permitted under the Act.
1.4	***Local Environmental Plans, DCP's***	Proposed activities comply with Local Environmental Plan and Development Control Plans.
1.5	***Rural Fires Act 1997***	The proposed activities will assist Council to meet its statutory obligations under the *Rural Fires Act 1997*, and Regulations that specifically requires land owners/occupiers to prevent and minimise the spread of bush fires.
1.6	***NSW Heritage Act 1977***	There are no items listed under the *NSW Heritage Act 1977* within Council managed land, affected by the activities.
1.7	***Plan of Management***	There are plans of management for reserves within Forster. The proposed activities are in accordance with providing ongoing protection of life and property of the community and within Council reserves management objectives.

No	Act/Regulation	Comments
1.8	***Council Policies***	The proposed activities are in accordance with "Fire Management For Council Controlled Natural Areas, 1996" and the Fire Mitigation Plan – Forster (The Plan). The Plan provides fire management guidelines and incorporates statutory obligations to manage bush fire risks, to protect life and property, prevent and control bush fires. Concurrently, it considers and provides for public recreation, biodiversity and the conservation of the natural and cultural heritage of the area.
1.9	***Regional/District Strategies of Plans***	Booti Booti National Park boarders the study area of Forster and is managed by the DEC.
1.10	***Other Planning Controls or Agency approvals***	• *SEPP 14 (Coastal Wetlands)* - Under Section 4 of State Environmental Planning Policy No.14 (Coastal Wetlands). There are recorded sites that occur within the study area. • *SEPP 26 (Littoral Rainforest)* - Under Section 4 of State Environmental Planning Policy No.16 (Littoral Rainforests). There are littoral rainforest areas that occur within the study area. • *SEPP 44 (Koala Habitat)* - Under Section 5 of State Environmental Planning Policy No.44 (Koala Habitat Protection). Koalas have been recorded locally.
1.11	***Commonwealth Matters (eg Ramsar, World Heritage, National Estate)***	• *RAMSAR* - Proposed activities are not within a site listed under the RAMSAR convention. • *World Heritage* - Proposed activities is not within a World Heritage Area. • *National Estate* - Proposed activities is not in an area listed on the National Estate Register.
1.12	***Protection Of The Environment Operations Act 1997 (the POEO Act)***	s133 Prohibition by EPA of burning in open air or incinerators – (1) EPA is of the opinion that weather conditions are such that the burning of fires in the open while those conditions persist will contribute or is likely to contribute to air pollution to such an extent that the making of an order under this section is warranted. (2) The EPA may, by order published in accordance with this section, prohibit, unconditionally or conditionally, the burning of fires in the open or in all or any specified classes of incinerators. s134 Directions by authorised officers concerning fires 1 (b) air pollution from the fire is injurious to the health of any person or is causing or is likely to cause serious discomfort or inconvenience to any person. s139 Operation of plant The occupier of any premises who operates any plant (other than control equipment) at those premises in such a manner as to cause the emission of noise from those premises is guilty of an offence if the noise so caused, or any part of it, is caused by the occupier's failure: (a) to maintain the plant in an efficient condition, or (b) to operate the plant in a proper and efficient manner. s145 Littering generally - (1) Offence of littering. A person who deposits litter in or on a public place or an open private place is guilty of an offence. Schedule 2 Regulation-making powers - 6 Open fires or incinerators. The regulation or prohibition of the burning of fires in the open or in incinerators. 6B Emission of air impurities air impurity includes smoke, dust (including fly ash), cinders, solid particles of any kind, gases, fumes, mists, odours and radioactive substances.

No	Act/Regulation	Comments
1.13	***Native Vegetation Conservation Act 1997/ Tree Preservation Order (TPO/, The* Bush fire Environmental Assessment Code for NSW (RFS 2006)**	The Bush fire environmental assessment Code for NSW, 2006 (the Code) is an environmental assessment where certified authorities are consenting bodies including Local Governments. Conditions for hazard reduction works under these guidelines enable works to be undertaken without the requirement for a review of environmental factor (REF). If the proposed works are beyond the Codes guidelines then reference to the Native Vegetation Act or the Councils TPO is required. Existing works are within the guidelines of the Code. Council has undertaken the preparation of a REF, to clarify works in more detail. Any additional fire mitigation works in Forster would either require a HRC or a more detailed REF.

The Activities

Assessment

Council managed land within the study area has been assessed for fuel loads, bush fire risk, fire threat and ecological considerations. The field environmental and habitat assessment enables details within each reserve to be collated to ensure hazard reduction works comply with legislative constraints and biodiversity thresholds. Further, section 4 details guidelines hazard reduction and section 5 for ecological consideration.

The assessment outcomes are based on likely extreme weather conditions, and the ability of an asset to recover from or withstand the expected bush fire as a consequence on its fire resistance standard. This period is when the most damage is expected as fire intensity is at its greatest.

To determine local habitat attributes a field assessment was undertaken to determine:

- Structural vegetation;
- Presence and frequency of habitat trees;
- Size class of trees;
- Density of shrub and ground covers;
- Presence of fallen timber;
- Presence of rock outcrops;
- Presence of wet area and water bodies;
- Extent of movement corridors;
- Extent of faunal refugia; and
- Implied conservation significance.

From this site assessments, and desk top analysis it is possible to identify if any potential significant habitat features exist. A list of potential threatened species assists in determining the effects on species and the local biodiversity.

Fire assessment

Bushfire management and mitigation measures are also guided by other documents such as the Lower Hunter Zone, Bush Fire Management Committee, Bush Fire Risk Management Plan (BFRMP).

Within section 3 of the plan it states: *'Field assessments are undertaken to provide data for analysis for managers. The assessment process follows a guideline provided by the RFS, and is an acceptable process for fire managers to determine the bush fire hazard and risk analysis of bush fire within and adjacent to Council managed land.*

The contributing factors to the assessment include the distance of the bush fire hazard to the asset (Threat) and, where the potential severity is influenced by the bush fire or by bush fire hazards (Risk). The overall fuel hazards are given as low, moderate, high, very high and extreme ratings. The assessment includes using factors such as;

vegetation type and separation distance of canopies;
overall fuel loads, (bark, surface, elevated);
slope;
fuel quantity; and
size of combined risk areas.

The assessment is assisted by using the guide NSW National Parks and Wildlife Service, (2003b) Overall Fuel Hazard Guide Sydney Basin NSW Edition May 2003 (Ed. G. McCarthy). NSW National Parks and Wildlife Service, Hurstville.

The hazard assessment also considers fire resistance construction standard of a building (or asset) (no standard, level 1, 2 or 3), Bush Fire Prone Land, BFRMP ratings including the hazard and risk rating and the risk management zone.

Assessment	Forster
Bush Fire Prone Land	**Parts are recorded as bushfire prone land**
Life and property hazard rating	**Insignificant, Minor, Moderate and Major**
Environmental and ecological risks	**Insignificant, Minor and Major**
Construction standard of neighbouring assets	**No standard, Level,1-3**

Future Management

The public reserves, reserves and drainage reserves will be continued to be managed for the protection of life and property and to mitigate the spread of fire within the reserves.

Impact on neighbouring properties

Graduated fuel management of hazards adjacent to development is important to ensure provisions are in place to assist in reducing the risk and the threat of fire whilst still maintaining at least a degree of the visual and environmental amenity of the area. These zones are commonly referred to as fire management zones including asset protection zones, strategic fire management zones, land management zones and fire exclusion zones.

The management of these zones is a tool to assist in the monitoring and management of fuels that impact on a development, either nearby or at a distance from the asset. Each zone has specific management strategies that can be implemented to meet management objectives (Refer to section 4 of the Plan for further details).

Signs

Community education plays an important part to Councils management and implementation of fire mitigation works. Notification of neighbouring properties of intended work ensures mitigation works are promoted and encouraged with adjoining property owners.

Public education through signage of asset protection zones promotes fire management objectives to the wider community and assists in the long term maintenance of the fire management zones (FMZ's).

Reversibility of Proposed Activities

According to the Fire Mitigation Plan - Forster the dominant vegetation community type surrounding the Forster is swamp sclerophyll forest and dry sclerophyll shrub/grass forest with fewer occurrences of heathlands and rainforests.

The Code certifies the mechanical mowing/ slashing and hand removal within APZ's and slashing within APZ's and SFAZ's. There are no conditions as part of the Code relating to any known threatened species within the areas of proposed works.

Mechanical hazard reduction by machinery may be reversed as regeneration of forested areas is possible if slashing is removed from the area. Minimal impact by mowing/ slashing and hand removal on the vegetation ensures the biodiversity of the whole area is retained.

By reducing fuels adjacent to assets and within other fire management zones, this assists in reducing the fire intensity which ultimately reduces the fire effect on the fauna and flora at the time of the fire.

Mechanical slashing of control lines associated with hazard reduction burning (approximately 500m) is required to be regenerated.

Hazard reduction by burning within the described SFAZ's reduces fuels adjacent to residential and urban areas. By undertaking this burn it also assists in the protection of the town water supply and communication tower within the reserve.

Alternatives

Hazard Reduction by Burning verses mechanical slashing:

While this alternative would achieve fire management objective hazard reduction by burning would have a greater environmental impact than frequently slashing within an APZ.

The size of the SFAZ's does not either environmental or financial be conducive to be mechanical slashed within such an large area. The natural bushland area will respond to fire and regenerate without greatly impacting on the environment and where biodiversity is not exceeded.

The area that has been identified to be hazard reduced provides adequate protection for residences of Forster.

Do nothing:

Council have an obligation to protect life and property around Forster. Council are required to meet its statutory obligation under Section 63 of the Rural Fires Act (1997) to minimise the spread of fire.

Fire fighting authorities would also have less ability to contain fires that within the rural/urban interface or access fire advantages around the village if no fuel reduction works were undertaken.

The Existing Environment

4.1 The location

Area (ha)	Approximately 14 hectares within APZ's and 3.8 hectares within SFAZ's, within reserves
General Location	The proposed activities are located within Forster.
Neighbouring properties	Private property with variable setbacks.
Implied conservation values	Low to high conservation values within the various reserves.
Key Habitat	Adjacent to the study area and within Booti Booti NP Key Habitat is recorded.
Key Corridor	Occurs throughout the eastern side of Forster which links with Booti Booti NP.
Soils	The Forster has a variety of soil landscapes including; transferral landscape, swamp landscape (south Forster); estuarine landscape in low lying areas on the lake fringe; erosional landscape on the undulating hillslopes; Colluvial landscape occurs on higher ridgeline (southeast Forster); residual landscape (small area south of Forster); aeolian landscape (may be windblown sand dunes); beach landscape and disturbed landscapes from human activity. Acid sulphate soils occurs in low lying areas of Forster and the majority is LWa4, LEs1(p), Nap4(p) and LWa2, with much smaller occurrences of Lap2(p), HWa1, HEa1, NEm, Lap4 and NWd4(p).

4.2 Field assessment

Slope (°)	Low lying areas, undulating landscape with slopes general 3-10 degrees though may be up to 15 degrees on steeper hillslopes.
Drainage/ Watershed	The APZ's and SFAZ's mechanical works including mowing, slashing and hand removal are within most areas of 0-5 degrees, 5-10 degrees slopes.
Riparian areas	Several of the reserves have riparian zones. Conditions on hazard reduction works apply within these areas.
Vegetation	The detailed vegetation survey by Council identified 28 forest types as described within the GLC vegetation strategy, 2004 in summary (in decreasing size) includes; Cleared; Swamp Mahogany/Paperbark; Disturbed Heath; Paperbark; Blackbutt-Bloodwood/Apple; Myrtle; Palm; Swamp Oak; Tallowwood/Grey Gum; Sand Ridge; Smoothbarked Apple; Spotted Gum; Paperbark/Swamp Oak; Rock; Spotted Gum - Ironbark/Grey Gum; Heath; Swamp Mahogany/Swamp Oak; Swamp; Tallowwood; Water; Dry Blackbutt; Palm/Myrtle; Banksia; Forest Red Gum; Fig-Giant Stinger/Myrtle; Scrub; Grey Gum/Grey Ironbark/White Mahogany; Tuckeroo; Mangrove; and Ironbark.
Habitat trees (Hollows/dead)	Hollow bearing trees are present but not impacted by fire mitigation works. Habitat values for hollow-dependant fauna are minimal.
Size class of trees	Tree heights are generally between 8-15 metres for swamp sclerophyll forest; 12-20 metres dry sclerophyll grass forest (to 22m on drier ridgelines); 18-22 metres wet sclerophyll forests with generally a 40-60% cover in drier communities (occasionally 30%) and 60% cover in wetter communities.
Shrub and ground cover	Small trees and shrubs present, with ground covers present in most communities. Within dry sclerophyll shrub/grass forests shrubs are dry in nature and are sparse to a height of 3-metres, occasionally 4-metres within Spotted gum and Spotted Gum-Ironbark/Grey Gum. Ground cover is sparse to moderate to 0.5-metres. Within the swamp sclerophyll forests the small

	trees grow to 6-metres and shrubs form a moderately dense layer from 1- 2-metres. The ground cover layer can also be dense to 1-metre. Within each vegetation community the species present is variable.
Fallen timber	There is evidence of some larger timber retained on the ground as well as smaller timber found amongst the litter layer.
Rocky outcrops	Some present in higher ridgelines.
Wet areas	Riparian zones are adjacent to the lake and within Paperbark, Swamp forests and wet sclerophyll forest. Gahnia predominantly is found in wetter areas within various forests in Forster. Conditions apply to these and within drainage lines within Forster.
Corridors	The reserve areas although disjunct provide a habitat corridor which links with the adjoining national park and provide corridors through and around the urban area.
Faunal refugia	Within the various public reserves and drainage easement remnant vegetation provides habitat for birds and smaller arboreal animals. Reserve 34, 16, 60, 51, 86, 3, 116, 5034, 5252, 5068, 5283, 5023, 5020, Boundary Street, Lot 23 DP 843479, Lot 1 DP 798402, Lot 21 DP 732573, Lot 6 DP 1014646, Miles Island, and Lot 7026 DP 1051706 support a larger areas, and is very important to local species for habitat and refuge. It provides movement, dispersal through the reserves and into the very large high value habitats.
Evidence of Threatened species	None recorded in the field during this assessment.
Threatened species resource	N/A
Noxious weeds	Noxious weeds have been recorded within Forster area including Bitou bush, Crofton weed, Blackberry, .Pampas Grass, Mist flower and Mother of Millions. There are also environmental weeds within some of the reserves.
Cave, mines or tunnels	None recorded.
Past Disturbance	Clearing and mowing has occurred in areas maintained as open space park land area. In additional in some cases unauthorised clearing by neighbours have encroached within reserve, often leading to escaped garden plants or dumping of rubbish. There is minimal invasion of weeds and no noxious weeds were identified within fire management zones.
Fire disturbances	Both wildfires and prescribed burning has occurred within some of the reserves.
Fire Assessment	There was a variation in fuel loads within the reserves in Forster. Ongoing maintenance in managed open space areas resulted in low fuel loads. Reserves conserved for environmental protection and not managed for open - space had higher fuel loads present. Bark fuels – Low. Moderate and high (0 to 2t/ha) Surface fuels – Low. Moderate and high (<4 to 12 t/ha) Elevated fuels – Low. Moderate and very high (0 to 6t/ha) **Overall Fuel Loads = Low to very high where bark hazard is high.** **Overall Fuel Loads = Moderate to extreme where bark hazard is very high.**
Fire advantages	The APZ's and SFAZ's provide advantage lines for fire fighters behind residential properties. Access on managed reserves across mown open space areas enable fire fighters good egress in the event of a fire.
Water points	Fire hydrants, boat ramps or lake edge.
Additional comments regarding fire assessment	Adjoining properties are required to undertake hazard reduction works which is certified by the NSW Rural Fire Service.

4.3 Significant features

Conservation Significance (National/state/local natural or cultural heritage values)	There is some mapped vegetation communities within reserves that have state significance as they possibly may be an endangered ecological community (EEC). This includes 'Swamp Sclerophyll Forest on Coastal Floodplains of the North Coast Bioregions'. In a regional context those forest community considered vulnerable are: ▪ 31 Paperbark is within a modified forests being highly significant forest community (APZ works). ▪ 30/ 31 Swamp Mahogany/ Paperbark (APZ works) ▪ 31/32 Paperbark/ Swamp Oak (APZ) Forests communities considered regionally rare with a 100% conservation target in the Lower North East of NSW are: ▪ 37 Dry blackbutt and 45 Tallowwood. ▪ 45 Tallowwood ▪ 32 Swamp Oak ▪ 30/32 Swamp Mahogany/ Swamp Oak ▪ 33 Mangrove Existing reserves protect these areas from further degradation by unauthorised works. Fire mitigation works occurs within 3 of these vegetation communities however impact is minimal and is often within the transitional zone which often has formerly been disturbed. The activities will not affect any wetland areas and will have a minimal, short-term effect on the environment. The size of the works is minimal compared to the remaining area within the reserves.
Plants (ROTAPs or threatened species, communities, critical habitats and regionally significant species)	Four (4) plants listed under Schedule 2 of the *Threatened Species Conservation Act, 1995 which* occur in the vicinity of Forster. One of these occur within Council managed land.
Animal (regionally rare or threatened species, communities, critical habitats)	Nineteen (19) threatened species are known to occur within the study area or 5km radius of activities in Forster, based on site records and data contained in the wildlife Atlas NSW. A procedure for determining which of these species require assessment under Section 5A of the EP&A Act has been undertaken.
Water Catchment values including identified high conservation value subcatchment	Forster study area is adjacent to the BBNP and within the Wallis Lake Catchment area. Conservation of the transitional zones on the lake edge is important to many vegetation communities found within zone.
Known or potential for Indigenous heritage values	The Lower Hunter Zone BFMC Bushfire Risk Management Plan does not identify any archaeological or aboriginal heritage sites in or around Forster. In addition the DEC (Parks and Wildlife Division) maintained Aboriginal Heritage Information Management System (AHIMS) search for Aboriginal Objects and Aboriginal Sites did not identify any aboriginal sites within Council land.
Historic heritage values (eg. historic	The proposed activities do not impact on any areas of historic values recorded in Forster.

places, movable heritage or relics)	
Recreation	There will be minimal impact to recreational pursuits as the activities within the reserves are mechanical works which can occur at the same time public are visiting the reserve due to the small area of the reserve is being maintained.
Scenic and visually significant	The proposed activities within the various sites are surrounded by dry sclerophyll shrub/ grass forests and swamp sclerophyll forests. The mechanical works will ensure the over storey shrubs and trees remains intact. The ground covers will be most affected with some impact on the shrub layer. The area will be slashed which ensure a ground cover remains within the fire management zones (although reduced in height). There is minimal impact on the soil by slashing/ mowing or hand removal. The regrowth of the area ensures that plants can continue to mature and set seed. The frequency of works in the forest area ensures the fuel loads are maintained below 8 tonnes per hectare. Grassed areas are periodically mown more frequently to ensure grass height remains to meet the required guidelines.
Education	Community education is encouraged by Council which meet Council policies and guidelines within the FMP.
Interests of external stakeholders (eg. apiarists, leaseholders)	The proposed activities are within 55 different reserves in Forster with adjacent residents being of most interest to the works. The public exhibition of the Fire mitigation Plan- Forster enables the community to make comments on the activities proposed. In addition neighbouring properties will be advised by letterbox drop of the proposed activity of notified through other media such as radio or press release.

Environmental Impacts

	Yes or No[29]	likely impact: negligible, low, medium or high adverse; positive, n/a	Justification for significance of impact including safeguards and receiving environment?
5.1 Physical issues			
1. Does the proposal disturb ground features including filling or excavation?	No	N/A	
2. Does the proposal affect a waterbody, watercourse or wetland?	Yes	Minimal	Minimal compaction by heavy machinery (tractor) when slashing. Removal of debris repeatedly on an area may result in minimal soil disturbance. Erosion will be monitored throughout the implementation and completion of the works. Appropriate erosion control measures (sediment traps) will be put into place to prevent soil erosion as necessary.
3. Does the proposal change flood or tidal regimes, or is it affected by flooding?	No	N/A	
4. Does the proposal use or transport hazardous substances?	Yes	Minimal	A small amount of fuel will be used in mowers and wiper snipers which are carried in certified fuel containers in accordance with the Dangerous Goods Act.
5. Does the proposal generate or dispose of gaseous, liquid or solid wastes?	No	N/A	
6. Will activity emit dust, odours, noise, blasts or radiation in the proximity of residential areas?	Yes	Minimal	Increased noise generated from machinery mowing or slashing the areas.
7. Does the proposal affect coastline or dunes, alpine areas, karsts features, unique landforms or groundwater recharge areas?	No	N/A	
8. Does the proposal affect erosion prone areas or areas with slopes greater than 18°?	No	N/A	No steep slopes >18° are present.
9. Does proposal affect subsidence or slip areas?	No	N/A	
10. Does proposal affect areas with acid sulphate, sodic or highly permeable soils?	No	Minimal	Acid sulphate soils are recorded in some areas in Forster and are affected by works below SL or 1-2m below SL. However the mechanical works within reserves will not be below SL and have minimal surface soil disturbance from machinery driving over the area while mowing or slashing. The acid sulphate soil risk only occurs within when works are below ground level.

[29] If yes is selected, both other columns need to be completed. If no, just select n/a in the likely impact column.

	Yes or No[29]	likely impact: negligible, low, medium or high adverse; positive, n/a	Justification for significance of impact including safeguards and receiving environment?
11. Does the proposal affect areas with salinity or potential salinity problems, or groundwater recharge areas?	No	N/A	
12. Is the proposal within a SEPP 14 - Coastal Wetland or SEPP 26 -Littoral Rainforest or equivalent?	Yes		Developments have occurred within SEPP 14 adjacent to R85529, Lot 21 DP 243812. As a result of this residential development approximately 2m of sand fill has been placed within the reserve on top of the SEPP14. Human intervention has changed the area to a disturbed soil landscape. The mapping of the SEPP 14 requires an amendment to cater for this change which is now part of an APZ.
5.2 Biological Issues			
5.2.1 Flora			
1. Have you accessed flora databases?	Yes		Refer to Attachment 2.
2. Has the site been surveyed for flora, including ROTAPs and threatened species?	Yes		No ROTAP or threatened species were found within the site.
3. Were any habitats or species of significance or potential significance noted (eg. wildlife corridors, remnant vegetation, inadequately reserved plant communities)?	No	N/A	There is no threatened plant species within Council managed however four (4) were found within the study area or within a 5km radius of activities. No 8-part test of significance is required.
4. Does the site have cultural landscape values?	No	N/A	
5. Is the vegetation to be cleared or modified including any ROTAPs, threatened species or communities?	Yes	Low	The vegetation is be modified, within the ground and shrub layers with no impact on ROTAP species. Hospices are to be retained to provide habitat and discontinuous vegetation structure.
5.2.2 Fauna			
1. Have you accessed all available NPWS fauna databases (eg. Wildlife Atlas)?	Yes		DEC threatened fauna and flora records have been viewed and details in particular of threatened species are within Attachment 1.
2. Has the site been surveyed for fauna, including for threatened species?	Yes		No threatened species were found within the reserve or FMZ's.
3. Were any habitats or species of significance (including threatened species) or potential significance noted?	Yes		Nineteen (19) threatened species are known to occur within the study area or 5km radius of activities in Forster, based on site records and data contained in the wildlife Atlas NSW.

	Yes or No[29]	likely impact: negligible, low, medium or high adverse; positive, n/a	Justification for significance of impact including safeguards and receiving environment?
			No 8-part tests of significance are required to assess the likely impact of the activity (Attachment 1 &2).
4. Does the activity displace or disturb fauna or create a barrier to movement?	Yes		The mechanical slashing will disturb some fauna temporarily. The reduced habitat is very small in size and the hospices and adjacent conservation zone provides habitat for smaller reptiles, birds and insects.
5.3 Community Issues			
1. Does the proposal affect the existing use of community services or infrastructure including access or increased visitation?	Yes	Minimal	Some APZ's will allow access to the rear of houses. Impact can be reduced by leaving hospices to reduce visual access into these areas and thus pedestrian access. Some areas require barriers such as bollards or gates to restrict access.
2. Does the proposal affect or change the transport requirements of an area?	Yes	Minimal	Machinery/ lawn mowers will be unloaded from vehicles on the road side but disturbances only temporary.
3. Does the proposal affect sites of importance to local or broader community for their recreational or other values?	No	N/A	
4. Has consultation with the potentially affected community been undertaken?	Yes		The community has been notified of the Fire Mitigation Plan – Forster which details the proposed activities.
5. Does the proposal affect the use of, or the community's ability to use, natural resources, especially water?	No	N/A	The open space areas that are also FMZ's are used by the public. The short grass is preferred by the community in these areas.
6. Does the proposal affect the visual or scenic landscape?	Yes	Minimal	The proposed activities will cause short-term visual changes to the landscape as the area will be able to be accessed and viewed from the adjoining properties.
5.4 Ecological Communities and General Impact			
1. Is the activity likely to cause a threat to the biological diversity or ecological integrity of a community?	No	N/A	
2. Is the activity likely to introduce noxious weeds, vermin, feral species or genetically modified organisms into an area?	Yes	Minimal	The disturbance of the ground layer species may enable weed species to invade. Ongoing weed management will control the spread of weeds in these areas.

	Yes or No[29]	likely impact: negligible, low, medium or high adverse; positive, n/a	Justification for significance of impact including safeguards and receiving environment?
3. Is the activity likely cause a bushfire risk? or changes the fire regime	Yes	Medium	The FMZ's are primarily to provide protection to the community in the event of a fire. The reduced ground fuels reduce the chance of fire.
4. Is the activity likely to have any other potential impact on flora, fauna or ecological communities?	No	N/A	
5. Bushfire prone areas	Yes		Parts of the area are mapped as being bushfire prone in Forster.
5.5 Cultural Heritage Issues			
5.5.1 Aboriginal heritage			
1. Have you accessed the NPWS Aboriginal sites register?	Yes		A DEC Aboriginal Heritage Management System (AHIMS) search revealed no sites within the areas proposed for hazard reduction activities.
2. Has an assessment been carried out in order to determine the likelihood of occurrence of Aboriginal relics or places of significance?	Yes		No further aboriginal sites were located during field inspections.
3. Does the proposal affect Aboriginal relics or places of significance or importance to the Aboriginal community?	No	N/A	As some areas have not previously subject to slashing, trittering or removal of many trees (or significant trees) the DEC (Cultural Heritage Division) was contacted. No trees greater than 100cm were identified for removal.
4. Does the proposal affect areas nominated or declared as Aboriginal Places?	No	N/A	
5. Does the proposal affect areas subject to land claims or Native Title claims?	No	N/A	
5.5.2 Historic heritage			
1. Has the area been surveyed or assessed for heritage items or historical archaeological sites?	Yes		While there were known historic sites within Forster, no known historic areas were identified as being within areas where hazard reduction works have been proposed.
2. Does the proposal affect known heritage items or historic archaeological relics?	No	N/A	
3. Has a conservation plan or other conservation assessment been prepared for the place? If so, is the proposed activity in accordance with the conservation plan or assessment?	No	N/A	

	Yes or No[29]	likely impact: negligible, low, medium or high adverse; positive, n/a	Justification for significance of impact including safeguards and receiving environment?
6 Biological issues during construction			
6.1 Natural Resource Use Issues During Construction and Operation			
1. Is the activity likely to result in the degradation of the reserve or any other area reserved for conservation purposes?	Yes	Minimal	The removal of some ground covers and shrubs within a small proportion of the reserves will have minimal effect on conservation values of the area.
2. Is the activity likely to involve the use, wastage, destruction or depletion of natural resources including water, fuels, timber or extractive materials?	Yes	Minimal	Removal of shrubs and ground covers from the area to a local refuge area ensures green waste does not remain in the FMZ's.
3. Is the activity likely to have any other impact on natural resources?	No	N/A	

Summary of environmental impacts

The overall impacts of the proposed activities are considered to be low. The activities are considered to have a positive impact on neighbouring properties. The main impacts will be the mechanical hazard reduction of the FMZ which is localised, with short-term displacement of some fauna. These impacts, however, are not considered to be significant for the following reasons:

- The area that is involved is small compared to the total adjacent reserve area.
- Erosion controls will be implemented as required.
- No recorded threatened plant species is known to occur within the proposed activities area.
- The proposed activities will have little impact on the threatened fauna of the area (Refer to Attachment 1 & 2).

Any burn will provide valuable protection to life, property and in a way that is environmentally acceptable and economically viable. Within the SFAZ a low intensity burn will be lit under prescribed weather and fuel moisture conditions that will ideally meet the following:

- Flame height < 1.5m
- Intensity < 1000 kW/m
- Only surface and near surface fuels consumed
- Between 50 and 80% of surface fuels consumed
- Minimum smoke production and
- Maximum smoke transportation

A lighting pattern that minimises intensity and the chance of the burn escaping will be used and all boundaries of the burn will be patrolled for escapes.

The proposed burn will have little impact on the threatened fauna (recorded arboreal animals) of the area because of the proposed fire intensity and implementing the burn within prescribed fire regimes. The burn will modify surface fuels with minimal scorching to canopy where arboreal species nest/roost. The smoke and heat produced from the activity may impact temporarily on species, though is unlikely to result in deaths.

Environmental Safeguards

The proposed activities within the fire management zones are to ensure activities meet legislative and policy guidelines. In addition to ensure environmental safeguards (Fire Mitigation Program) are implemented options for conditions guided by the Code, planning documents and legislation.

Environmental Safeguards

No.	Action
1	Prior to any hazard reduction works, the required APZ width within this plan is measured from the boundary of the reserve. N.B. In order to determine the required width of the APZ, the setback from the adjacent asset (house etc) combined with existing slope determines the maximum width as per the Code. The APZ may be staggered depending on the setback (of assets) within adjacent properties.
2	Under scrubbing shall be conducted sensitively, with selected understorey clumps marked to be retained. The area to be retained is approximately 30% of the total area.
3.	All trees and shrubs in excess of 3m to be retained, except where canopy separation or access trail is required. Determination for removal must be by an authorised Council Officer.
4.	Large fallen logs (where applicable) shall be retained, with care taken where epiphytes exist.
5.	Trees greater than 3m to be marked/approved for removal in consultation with the Parks and Recreation Section. In this case, trees shall be selected based on bark hazard (flammability), health, desirability (feed trees etc) and shall be clearly marked or area described for action.
6.	All Cabbage Tree Palms greater than 500mm shall be retained as this is a protected plant.
7.	Rainforest shrubs and fire retardant plant species shall be selectively retained within the APZ.
8.	Protect & retain all bush rock.
9.	The works shall target noxious weeds and environmental weeds.
10.	Remove fuel reduction work debris from site to an authorised area for disposal. Approval to store removed fuel before disposal must be sought from an authorised officer.
11.	The DEC (Cultural Heritage Division) must be contacted to assess impact of proposed works when: Areas that have not previously been subject to slashing, trittering or removal of many trees (or significant trees) or trees are greater than 100cm diameter (at breast height) are identified for removal. Conditions will be given that apply to proposed works.
12.	Skirting (removal of lower branches) to separate tree canopy from the ground or understorey vegetation should be used in preference to tree removal where appropriate in consultation with the Parks and Recreation Section.
13.	Undertake field survey for target threatened species when specified within the REF, to ensure safeguards can be implemented to protect species which occur or have moved into the area (Refer to the REF for further details).

Conditions as guided by the Code.

The following mechanical hazard reduction conditions are suggested options for works formally identified in the Plan.

Hazard Reduction Conditions: Mechanical

✓	Preference shall be given to the retention of smooth barked trees and large trees with hollows.
✓	Trees and shrubs up to 3 metres in height may be removed as part of the hazard reduction activity approved as described within this report or specified on site by an authorised Council Officer.
✓	Dangerous trees may be removed with the approval of Great Lakes Council.

✓	Slashing and trittering shall not be carried out on slopes exceeding 18 degrees.
✓	The works shall be carried out in a manner to ensure the retention of topsoil on the ground surface.
✓	Council shall comply with any relevant management actions identified in the NPWS Threatened Species Hazard Reduction schedule.
✓	Council shall comply with any relevant management actions identified through referral to NPWS Cultural Heritage Division with regard to Aboriginal heritage sites>.
✓	Soil moved by ploughing or blading shall be redistributed evenly over the effected area. Natural or assisted re-vegetation of the effected area is to be encouraged in order to prevent soil erosion.
✓	Where a fire break is to have a slope length greater than 60 metres, slashing/trittering is the preferred hazard reduction method. Mowing may be used when existing maintenance type compliments management objectives.
✓	This REF does not permit the use of graders and dozers to clear native vegetation.
✓	This REF does not permit the re-shaping of the soil surface or the redirection of overland flows.
✓	Hazard reduction works are not permitted within 10 metres for APZ/ or 20 metres for SFAZ of a stream, wetland, lake or swamp.
✓	This certificate does not permit the removal of trees on slopes greater than 18 degrees.
✓	Herbicides shall not be permitted within 10 metres of any riparian area.
✓	Herbicides shall only be used in accordance with the *Pesticides Act 1999I, the Protection of the Environment Operations Act 1997* and the directions on the herbicide container label.

Hazard Reduction Conditions: Prescribed Burning

✓	Low intensity burn may be conducted in accordance with the NSW Rural Fire Service *Standards for Low intensity Bush Fire Hazard Reduction Burning.*
✓	Moderate intensity burn may be conducted with a fire fighting agency in attendance and in accordance with an agency approved plan.
✓	Prescribed burn may be contained within planned control lines.
✓	Fire interval threshold must be longer than or equal to the minimal fire interval for SFAZ as defined within the Code and found within the Fire Mitigation Plan - Forster
✓	Fire interval threshold for LMZ are as defined within Part 5 of the Code.
✓	Construction of additional control lines must be limited to a minimum extent necessary to carry out the burn and must not exceed 4 metres and allowed to regenerate following the burn.
✓	Conditions for the control line construction must meet specification in 5.3 and Table 5.1 of the Code to minimise soil erosion.

Conclusion & Recommendation

In considering the degree of impact of fire management works overall, high ranking is triggered if a number of individual categories are considered to be high, or if one particular category is particularly significant. Tick statement that applies.

☐	**The proposal is not likely to have a significant impact on the environment. No further assessment is required. The proposal is recommended for unconditional approval**
☒	The proposal is not likely to have a significant impact on the environment. No further assessment is required. The proposal is recommended for conditional approval.
☐	**The proposal is likely to have a significant (medium or high) impact on the environment. It is recommended that an EIS / an EIS and SIS be prepared.**
☐	**the proposal will have a significant impact on the environment and or community/cultural values and it is recommended that the proposal not proceed**

Attachment 1

Wildlife Atlas

A search of the NSW Department of Environment and Conservation (DEC) Wildlife atlas of threatened fauna and flora species present within a 10km radius from Boundary Street within Forster.

Data from the database was extracted in May 2006 and contains data from sources including government agencies, non-government organisations and private individuals. These data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. (DEC 2006). 'Copyright NSW Department of Environment and Conservation'

Flora

Family	Species	Within the Study Area	Outside study area	Threatened Species	ROTAP Code
Asclepiadaceae	*Cynanchum elegans*	✓	Within BBNP	E1	3ECi
Fabaceae (Caesalpinioideae)	*Senna acclinis*	×	Within BBNP	E1	3RC
Rubiaceae	*Asperula asthenes*	✓	×	V	3VC
Scrophulariaceae	*Lindernia alsinoides*	✓	×	E1	

Fauna

Family	Scientific Name	Common Name	Within the Study Area	Outside study area (5km of activity)	Legal Status
Class -Aves					
Ardeidae	Botaurus poiciloptilus	Australasian Bittern	×	✓	V
Ciconiidae	*Ephippiorhynchus asiaticus*	Black-necked Stork	✓	×	E1
Diomedeidae	Thalassarche melanophris	Black-browed Albatross	×	✓	V
Laridae	*Sterna albifrons*	Little Tern	✓	✓	E1
Accipitridae	*Pandion haliaetus*	Osprey	✓	✓	V
Scolopacidae	*Limosa limosa*	Black-tailed Godwit	✓		V
Scolopacidae	*Xenus cinereus*	Terek Sandpiper	✓	✓	V
Tytonidae	Tyto novaehollandiae	Masked Owl	×	✓	V
Haematopodidae	*Haematopus fuliginosus*	Sooty Oystercatcher	✓	✓	V
Haematopodidae	*Haematopus longirostris*	Pied Oystercatcher	✓	×	V
Charadriidae	*Charadrius mongolus*	Lesser Sand Plover	✓	×	V
Class - Mammalia					
Phascolarctidae	*Phascolarctos cinereus*	Koala	✓	✓	V
Petauridae	*Petaurus norfolcensis*	Squirrel Glider	✓	✓	V
Pteropodidae	Pteropus poliocephalus	Grey-headed Flying-fox	×	✓	V
Molossidae	*Mormopterus norfolkensis*	Eastern Freetail-bat	✓	×	V
Vespertilionidae	*Miniopterus australis*	Little Bentwing-bat	✓	✓	V
Vespertilionidae	*Miniopterus schreibersii oceanensis*	Eastern Bent-wing Bat	✓	×	V
Vespertilionidae	*Myotis adversus*	Large-footed Myotis	✓	×	V
Class - Amphibia					
Myobatrachidae	Crinia tinnula	Wallum Froglet	×	✓	V

Attachment 2

Section 5A EP&A Act 1979 – 8-Part Test of Significance

Threatened Species Considerations:

- *Is the activities likely to significantly affect threatened species, populations or ecological communities, or their habitat (include the eight-part test (s.5A EP&A Act 1979)?* (Note: A species impact statement is required if an activities is on land that is, or is part of critical habitat or there is likely to be a significant effect as determined under s.5A of the EP&A Act 1979).

There are a number of threatened species (Flora and Fauna) that has been identified to occur within the study area (and 5km radius from activities). Those that pertain to estuarine and water way areas which do not inhabit forest areas have been excluded form the assessment as works are not within these areas.

Those remaining are those defined as potential subject threatened species *"considered likely to occur within habitats of the study area that are impacted by hazard reduction works".* A preliminary assessment of the impact on species in the following table details a summary of habitat attributes and species requirements with regard to the impact of works on the species.

Common Name / Status	**Comments - Section 5A Assessment requirement**	**Assessment Not required ☒ (No significant impact) Required ☑**
Koala (Secure to vulnerable)	Being an arboreal marsupial inhabits forest and woodland communities. Koalas rely on over storey trees and shrubs for food and shelter, with preference to local species such as Tallowwood and Swamp Mahogany. However there was no evidence of koala population locally. The activities are modifying the shrub and groundcover layers found within the FMZ's and does not affect Koalas preferred tree species for resting or feeding. Although under SEPP 44, there are listed Schedule 2 Koala feed trees which do occur in some reserves, no core habitat is identified within Forster.	☒
Little Bentwing Bat (Vulnerable)	Critically relying on caves for roosting sites, but forages through the understorey of woodlands and forest areas... No caves were located in the FMZ's for which these species may inhabit. No other structures locally are known to support this species in Forster. The small modification of the area would not adversely affect the lifecycles of this species.	☒
Masked Owl (Vulnerable)	Relying on presence of high densities of tree hollows for nesting and homes in old growth forests and hollows greater than 120 years old to provide habitat for their main prey species. The regenerating forest found locally limits there presence as few old growth trees are presence. Known to frequent modified forest areas and bushland fringes foraging for prey with a home range up to 1,100 hectares. There diet consists of mammals, birds and insects. The limited area modified for fire mitigation works has minimal impact on these species.	☒
Yellow Bellied Glider	Prefers tall mature forest in regions of high rainfall. There are a minimal number of habitat trees locally or known hollows for this species to frequent. Winter flowering eucalypts and sap-site trees determine local distribution. Although likely to inhabit the area there are no significant impacts on this species.	☒

As a consequence it is concluded that there would be insignificant impact on the lifecycles, habitat disruptions or conservation status of the potential species due to factors such as:

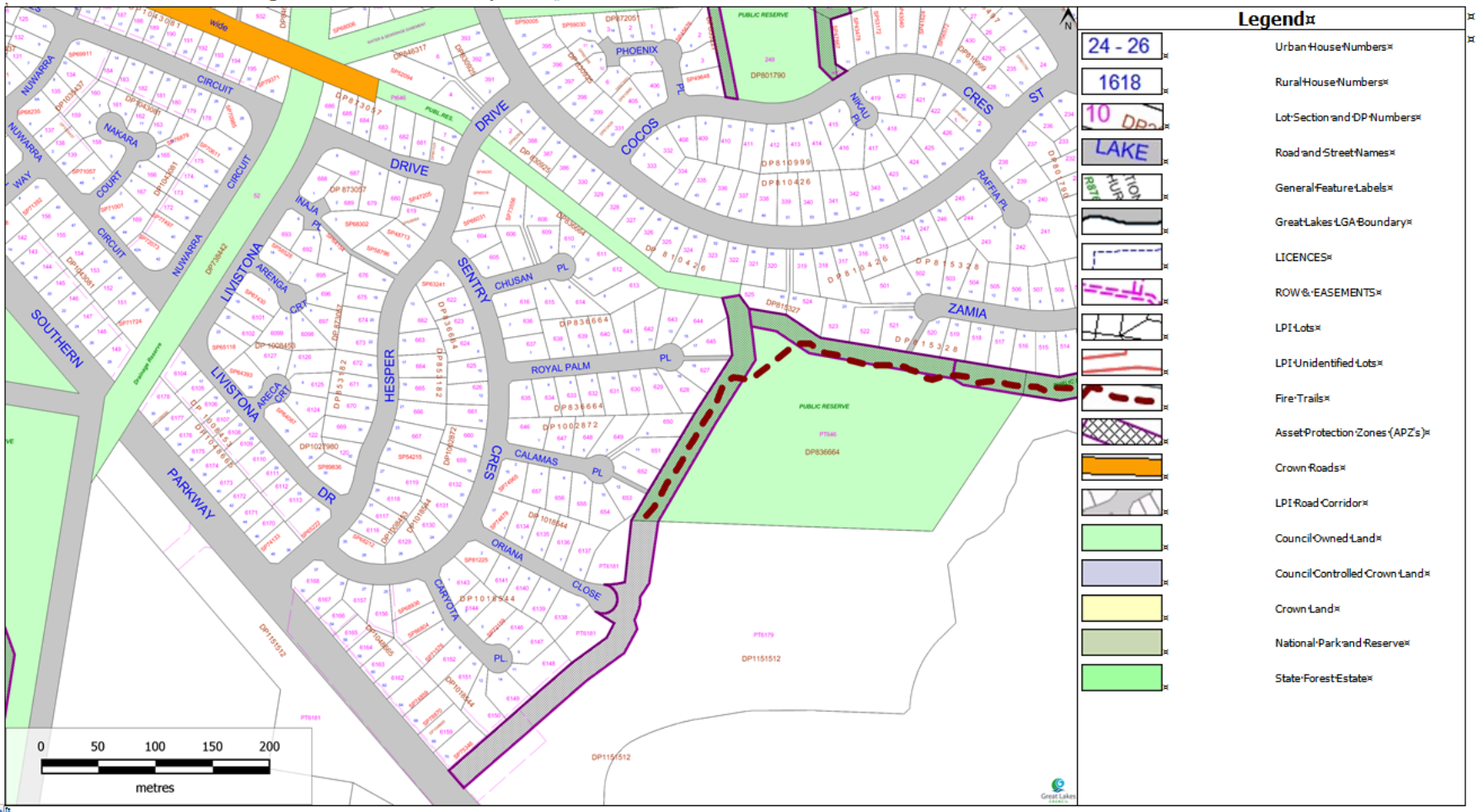
- The small area of works in relation to the adjacent larger are of the reserve retained for conservation;
- The minimal impact on species as they do not inhabit the understorey which has minimal modification.
- The retention of key habitat features including the protection of tree hollows and important vegetation;
- The retention of hospices and over storey and canopy species;
- The environmental safeguards and conditions enclosed within the Plan; and
- The low impact nature of proposed activity and the ability of the bushland area to sustain fire within biodiversity thresholds.

The discussion in the above table and the resultant conclusion; that there is not significant impact on species, additional Species Impact Statement (SIS) is not deemed required for any of the species.

APPENDIX XIII - Map APZ-A12 Public Reserve (Zamia - Southern Parkway)

APZ - covering Lot 6179 DP1151512 & Lot 646 DP836664

Amendment to Draft Fire Mitigation Plan - Forster - July 2006



Great Lakes Council
PO Box 450
Forster NSW 2428
Telephone (02) 6591 7222
Facsimile (02) 6591 7200

Map Zoom: 935.7 m
Map Scale: 1:4,456

Created on: Wednesday, 4 November 2015
By: GLC-DOM|andrews

APZ - covering Lot 6179 DP1151512 & Lot 646 DP836664

Amendment to Draft Fire Mitigation Plan - Forster - July 2006

Great Lakes Council
PO Box 450
Forster NSW 2428
Telephone (02) 6591 7222
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Map Zoom: 935.7 m
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Created on: Wednesday, 4 November 2015
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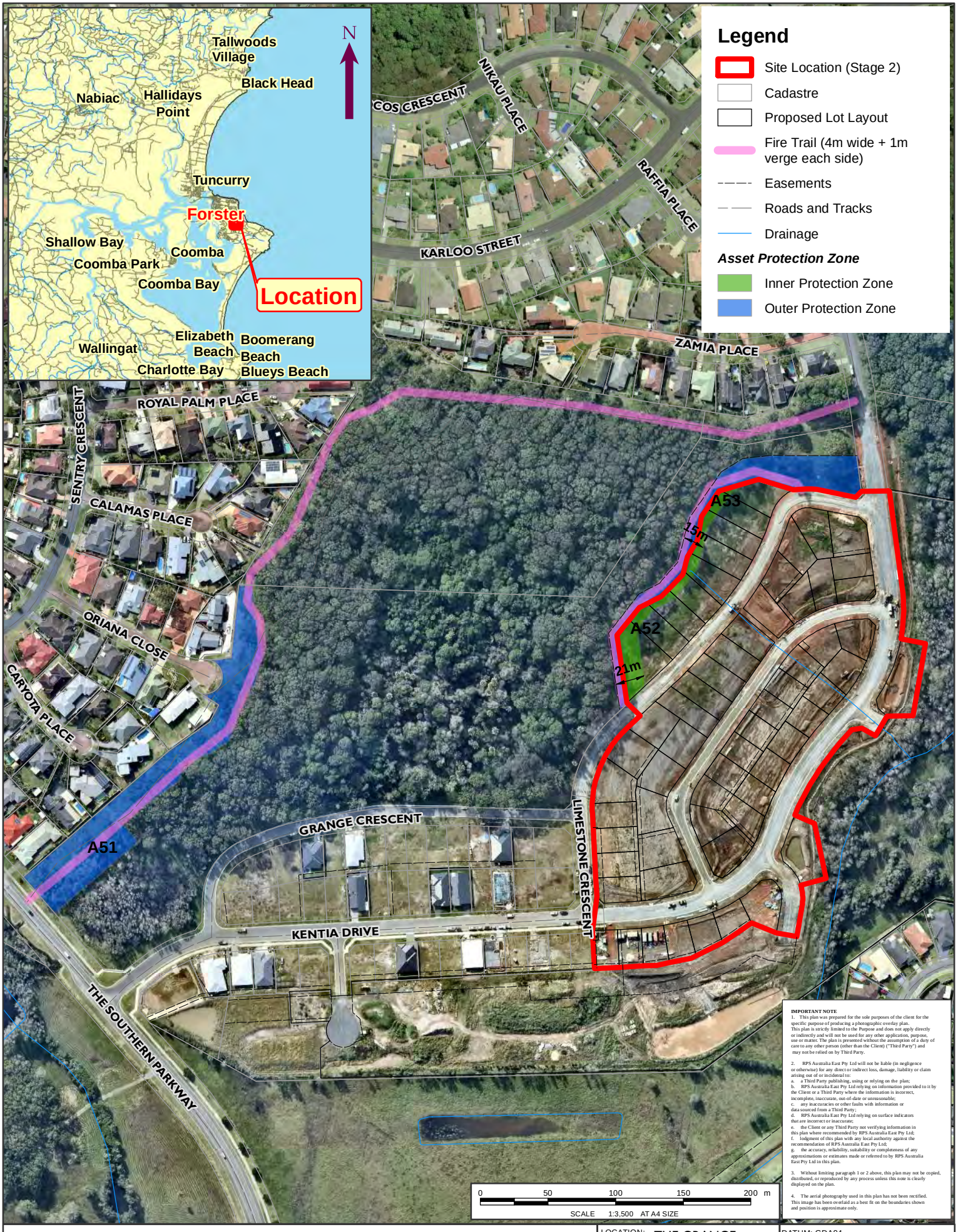

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4. The aerial photography used in this plan has not been rectified. This image has been overlaid as a best fit on the boundaries shown and position is approximate only.

APPENDIX IV: AMENDMENT TO FIRE MITIGATION PLAN FOSTER

LOCATION: THE GRANGE FORSTER	DATUM: GDA94 PROJECTION: MGA Zone 56
JOB NO.: **PR 147853** PURPOSE: BUSHFIRE Technician: Natalie.Wood Date: 14/09/2020	Data Sources: RPS, Client Nearmap 29/04/2020

CLIENT: MID COAST COULCIL

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
Unit 2A, 45 Fitzroy Street, Carrington, NSW, Australia, 2294 PO Box 120, Carrington, NSW, 2294
T: 02 4940 4200 F: 02 4940 4299 www.rpsgroup.com.au

Path: J:\JOBS\147k\147853 Foster\10 - Drafting\Arcgis Map Documents\Bushfire\147853 Figure 1 Location A A4 20200819.mxd

NEW_A4_Portrait 2018 Rev:B Produced:NW Reviewed: NW Date: 10/05/2018

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