Contents

1 Executive Summary ......................................................................................................................... 3
2 Endorsement and Approval ............................................................................................................ 5
3 Background ..................................................................................................................................... 6
4 Land Use and Fire Management Objectives .................................................................................. 7
5 Risk Register .................................................................................................................................... 9
6 Appendices .................................................................................................................................... 21
   6.1 Appendix A: Environmental factors ....................................................................................... 21
   6.2 Appendix B: Land Use and Fire Management Objectives ..................................................... 27
   6.3 Appendix C: Summaries of existing controls in Vernon Arafura Fire Management Zone .... 30
   6.4 Appendix D. Tools and Resources ....................................................................................... 36
7 Contacts ......................................................................................................................................... 38
1 Executive Summary

The purpose of this plan is to support community wide fire management within the Vernon Arafura Fire Management Zone in line with the *Bushfires Management Act 2016*.

This plan was prepared by Bushfires NT (BFNT) in consultation with the Vernon Arafura Regional Bushfires Committee and with input from a range of stakeholders. The plan has been endorsed by the Vernon Arafura Regional Bushfires Committee.

Arrangements for the mitigation, management and suppression of bushfires in the region are to be based on risk management principles that will guide the direction and evaluation of these activities.

A risk register is the central tool for assessing and reviewing effectiveness of actions. There was one risk identified as extreme and five as high:

- Increased fuel loading due to spread of gamba grass (Extreme Risk 12);
- Volunteer program not being sustainable (High Risk 1);
- Poor public understanding of fire management including roles and responsibilities of BFNT, Volunteer Bushfire Brigades (VBBs) and land holders (High Risk 3);
- Environmental impact from inappropriate bushfire management (High Risk 4);
- Insufficient cooperation between land managers with different fire management objectives (High Risk 5); and
- Turnover of fire managers/landholders (High Risk 6).

Regional Bushfires Committee Recommendations

Of the five Fire Management Zones in the Northern Territory, Vernon Arafura has unique risks due to its relatively large and growing peri urban population, extensive infrastructure and widespread gamba grass. In addition to existing controls summarised in Appendix C further strategies were identified to address the higher risks.

*Engagement, awareness and education:*

Currently, the public has a poor understanding of how fire management works in the Territory, its risks; and the roles of all the players (Risk 3). This could be improved by developing and resourcing a Community Engagement Plan. Guided by the *Bushfires Management Act*, the Plan would increase awareness of the roles and responsibilities of the Northern Territory Government (NTG), BFNT, VBBs and landowners. The implementation of a “fires near me” website with clear fire messaging relevant to the NT would allow landholders to be more aware of fires in their location and allow them to make better decisions. Like elsewhere in the Territory the turnover of fire stakeholders is high (Risk 6) so any Engagement Plan needs to be continually reviewed to stay relevant.

*Information:*

Clear, accessible information will improve public understanding of fire management (Risk 3) and help them make better decisions in the risk mitigation process (prevention, preparedness, response and recovery). Fire messaging regarding fire danger period, fire bans and information on fire breaks and how to develop property fire action plans are essential. One risk, environmental impact from inappropriate bushfire management (Risk 4) will be better managed if actual data on these impacts is available. North Australian Fire Information (NAFI) website must be supported to continue its service and further developed to respond to user needs.

The new Bushfire Emergency Management System (BEMS) will provide integrated monitoring and recording of fire management data and link with operational systems across a number of organisations. It will enable the coordinated management of bushfire mitigation and bushfire response throughout the
Northern Territory. This improved availability of situational awareness will help address risks 1, 3 and 6. It is expected that BEMS will become operational in July 2018, the effectiveness of the system will improve in future years.

**Collaboration, interoperability and building partnerships:**

The risk of high fuel load due to poorly managed gamba grass is extreme and requires urgent attention (Risk 12). A whole of Government approach with increased collaboration between key agencies is essential. Recent, successful efforts of the Department of Environment and Natural Resources (DENR) including compliance with the *Weed Management Act* and engagement with private and Government landholders needs to be scaled up. Increased communication between government agencies and land owners is required to coordinate efforts. VBBs can play a greater role in gamba management including community awareness and on-ground management.

The 16 Volunteer Bushfire Brigades are the cornerstone of bushfire management in Vernon Arafura but increasing demands have highlighted that unless further support is provided this model is unsustainable (Risk 1). A Strategy to diversify recruitment; strengthen leadership; and provide incentives for retention is required. BFNT should offer dedicated support to help build resilience of VBBs and develop greater interoperability including targeted training in incident management.

The large number of landholders in Vernon Arafura have multiple and often conflicting fire management objectives (Risk 5). BFNT and VBBs need to better support property and community planning processes.

**Consultation:**

Consultation with the wider community about what might attract different volunteers is required (Risk 3). Consult other divisions in DENR, Government agencies, local councils, real-estate agents and industry peak bodies on how we can increase community capacity in bushfire management including reducing gamba grass (Risk 12).

**Review, evaluate and adapt:**

A culture of review, evaluation and incorporating lessons learnt is the key to improve fire management in the region. BFNT and VBBs will undertake post season review of both operational and strategic programs and provide feedback to the community. A cost benefit analysis of BFNT operational programs should be conducted with a focus on determining the value of planned burning and impacts to the environment (Risk 4).

**Operational programs:**

The Vernon Arafura Region has a number of historical operational programs that aim to mitigate against high fuel loads and prepare BFNT staff, VBBs and landholders to manage wildfires. Roles and responsibilities of BFNT and VBBs have changed with the new *Bushfires Management Act* (Risk 3). To address this a skills and capacity audit of Vernon Arafura staff and VBBs should identify shortfalls including: compliance training, using spatial data, land management, incident management training and leadership skills.
2 Endorsement and Approval

Prepared by BFNT  
DATE: 26/3/2018

Submission to Regional Bushfire Committee for endorsement  
DATE: 26/3/2018

Notice of endorsement to Executive Director BFNT  
DATE: 26/4/2018

Public notice of Regional Bushfire Management Plan  
DATE: 14/5/2018

Version valid until  
DATE: 26/4/2019

Signed:

Chair Vernon Arafura Regional Bushfire Committee (Shaun Ansell)  
DATE: 26/4/2018

Acting Executive Director Bushfires NT (Andrew Turner)  
DATE: 26/4/2018
3 Background

The Northern Territory is large (1,355,235 km²) and sparsely populated (244,000 in 2016) with the majority of people living around Darwin and in a few larger rural centres. The Vernon Arafura Fire Management Zone covers an area of approximately 59,086 km² and spans from north of Katherine to the Van Diemen Gulf south to north and from the Kakadu National Park boundary and the Joseph Bonaparte Gulf east to west (Figure 1).

Across this spectrum, landowners are an essential part of the fire management process. Communication, co-operation and shared responsibility within the community, matched by a capacity to undertake self-protective measures, form the basis of successful fire management throughout the Northern Territory. Equally, this plan acknowledges the autonomy of land managers in harnessing fire as a tool to achieve their land management objectives, supported by their responsibilities under the *Bushfires Management Act* and principles of good land stewardship.

![Figure 1: Location of Vernon Arafura Fire Management Zone in the Northern Territory.](image)

The annual accrual of fuels and dynamic development history of the area suggests the Vernon Arafura Regional Bushfire Management Plan should be reviewed every 12 months. This fire management plan applies to the land and people within the Vernon Arafura Fire Management Zone as of 1 April 2018. It will be reviewed by the Vernon Arafura Regional Committee at the beginning of each fire season (March/April).

Appendix A outlines environmental factors important to the Vernon Arafura Fire Management Zone including: climate; vegetation; and fire history.

Regional plans are designed to identify and categorise risk at a regional level, to enable the optimal allocation of resources and specific control/treatments in the risk management process. Figure 2 below displays where the regional plans align (in terms of scale, process and risk) relative to other types of fire management planning in the NT. This document relates to tactical level planning (in blue).
4 Land Use and Fire Management Objectives

The Vernon Arafura Fire Management Zone has a diversity of land tenures and land uses (Table 1).

Table 1: Summary of land tenures and land uses in the Vernon Arafura Fire Management Zone

<table>
<thead>
<tr>
<th>Land tenures</th>
<th>Land uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>5687 x Freehold Blocks (&lt;1200 ha)</td>
<td>Rural sub-divisions</td>
</tr>
<tr>
<td>64 x Large Freehold Blocks (&gt;1200 ha)</td>
<td>Horticulture</td>
</tr>
<tr>
<td>26 x Pastoral Leases</td>
<td>Conservation</td>
</tr>
<tr>
<td>26 x National Parks and Reserves</td>
<td>Pastoral</td>
</tr>
<tr>
<td>1 x Land Council</td>
<td>Indigenous</td>
</tr>
<tr>
<td>10 x Aboriginal Land Trust</td>
<td>Agriculture and Hay</td>
</tr>
<tr>
<td>9 x Aboriginal Ranger Groups</td>
<td>Forestry</td>
</tr>
<tr>
<td>16 x Volunteer Bushfire Brigades</td>
<td>Defence</td>
</tr>
<tr>
<td>3 x Fire and Rescue Service Emergency Response Areas</td>
<td>Carbon Farming</td>
</tr>
<tr>
<td>6 x Local Government Areas</td>
<td>Tourism</td>
</tr>
<tr>
<td>2 x Northern Territory Government Electorates</td>
<td>Government Land</td>
</tr>
<tr>
<td>3 x Defence Areas</td>
<td>Corridors</td>
</tr>
<tr>
<td></td>
<td>Public Infrastructure</td>
</tr>
<tr>
<td></td>
<td>Water storage</td>
</tr>
<tr>
<td></td>
<td>Remote Communities</td>
</tr>
<tr>
<td></td>
<td>Mines and Extraction, Exploration Prospectors</td>
</tr>
<tr>
<td></td>
<td>Aquaculture</td>
</tr>
<tr>
<td></td>
<td>Recreational Hunters</td>
</tr>
</tbody>
</table>

In 2018 there is a complex array of land uses, often with multiple uses on the same parcel of land within Vernon Arafura Fire Management Zone (Figure 3). The fire management objectives to support these land uses are even more diverse and have been summarised in Appendix B (Table B1). This list is finite but aims at recognising all values as equally important.
Figure 3: Major land use in the Vernon Arafura Fire Management Zone (2017). Underlying land tenure is complex.
5 Risk Register

The central component of the Vernon Arafura Regional Bushfire Management Plan is transparent evaluation of regional scale risk events, an evaluation of existing controls and possible treatment actions to reduce the highest level risks.

A risk register records details of appropriate scale risks events at the beginning and during the life of the project, their grading in terms of consequence and likelihood of occurring, a threshold which determines acceptability of that risk, existing and potential controls/treatments to mitigate each high level risk and subsequent results (residual risk).

The Vernon Arafura Regional Bushfire Management Plan uses the existing Department of Environment and Natural Resources Risk Management Process and Risk Register and is consistent with Australian Standard ISO 31000.

The risk identification was completed with information compiled during a series of stakeholder workshops. These include:

- 3 March 2017 BFNT staff workshop: identify regional risks;
- March/April 2017 Volunteer Bushfire Brigade Planning Workshops: identify local risks;
- 26 April 2017 Regional Committee Meeting: land use, fire management objectives and regional risks identified;
- 28 August 2017 Regional Planning Workshop: land use, fire management objectives and regional risks identified;
- 30 October 2017 Regional Committee meeting: Possible Risk Treatment Actions were suggested for grouped risks; and
- On 12 February 2018 a sub-committee of Regional Committee and BFNT staff assessed the level of identified risks and suggested additional Possible Risk Treatment Actions.

Appendix C outlines some of the existing controls of the risks. Electronic tools and resources useful for fire management in the Vernon Arafura region are presented in Appendix D.
<table>
<thead>
<tr>
<th>Risk</th>
<th>Risk Details (Causes and Impacts)</th>
<th>Risk Owner</th>
<th>Existing Controls</th>
<th>Possible Risk Treatment Actions</th>
<th>(Consequence x Likelihood) = Risk Level</th>
</tr>
</thead>
</table>
| 1. Volunteer program not sustainable | Causes: Inadequate resources to support volunteers; difficulty in encouraging local volunteer recruitment; lack of training opportunities for volunteers; lack of leadership training, or leadership opportunities; increased number of residents who work outside the region; increased number of FIFO workers; no common retention and/or succession plans across Volunteer Bushfire Brigades (VBB). Impacts: The capability to respond to wildfires or undertake fuel reduction burns is reduced. Increased number of fires and fire severity exhausting the capacity of volunteers; poor community perception of the role of VBBs creating a reluctance of people willing to volunteer. | BFNT, VBBs | Bushfires Management Act. FF1 training to develop basic firefighting skills. Informal training and leadership provided within VBB. Volunteer Consultative Committee. Authorised Bushfires Volunteer processes. Community Engagement Officer position provides support to brigades and volunteers. Fire Control Officers provide advice and support to brigades and volunteers. BFNT provides opportunities to support volunteers through BFNT Facebook, appreciation events, rotating volunteers during the fire season from other regions etc. | Engagement, awareness and education:  - Targeted recruitment. Follow up with new residents when they contact Brigades.  
Information:  - Provide awareness program to rural public for recruitment and retention to VBBs  
Collaboration, interoperability and building partnerships:  - Build capacity within current volunteer cohort through increasing training and structured mentoring opportunities.  - Diversify roles in brigades to include community engagement.  - Reintroduce nationally accredited Fire Fighter 1 training.  - Leadership training of senior volunteers.  - Provision of accredited training for fire wardens.  - Incident management and AIIMS training for Brigade leaders.  
Consultation:  - Develop feedback processes to gain an understanding of the reasons volunteers leave to improve volunteer recruitment and retention. This could be achieved by conducting exercises such as an exit interview in order to identify reasons for leaving and what can be improved.  - Consultation with wider community about what might attract different volunteers.  
Review, evaluate and adapt:  - Review of current VBB governance model and consider alternative models which better reflect demographics, expectations, and funding.  - Undertake post season review of both operational and strategic programs and report findings to Bushfires Council.  - Recommend that the new Bushfires Emergency Management System includes a capability to track the number of hours volunteers have assisted at planned burns or wildfires.  
Operational programs:  - Review brigade funding to support increased expectations and rising costs.  - Incentives scheme such as NTFRS auxiliary model or army reserve.  - Consider dividing the Captain’s role in brigades to define or recognise the different skill set required for governance of a committee versus the leadership and skill of a Captain at an operational level. | (Major x Likely) = High |
| 2. Poor government awareness about the value of BFNT and VBBs. | Causes: Limited opportunity to engage with Government audiences to communicate Bushfires NT business. If fire management going well, Government may take the organisations for granted. | NTG, BFNT, VBBs | Executive Director reporting upwards to Minister. Invite the Minister and Chief Minister to attend volunteer Appreciation events | Engagement, awareness and education:  - Provide guest speakers at interagency events and engage with relevant agencies.  
Increase public awareness of contributions of BFNT and VBBs.  
Invite the Minister for a tour during mitigation and response periods. | (Moderate x Possible) = Medium |
<table>
<thead>
<tr>
<th>Risk</th>
<th>Risk Details (Causes and Impacts)</th>
<th>Risk Owner</th>
<th>Existing Controls</th>
<th>Possible Risk Treatment Actions</th>
<th>(Consequence x Likelihood) = Risk Level</th>
</tr>
</thead>
</table>
| 3. Poor public understanding of fire management including roles and responsibilities of BFNT, VBBs and land holders. | Causes: Inadequate engagement and awareness regarding complexities of fire management and roles and responsibilities of all stakeholders. Impacts: Unrealistic expectations set by public not being met leading to conflict; increased risk to public safety; lack of willingness for people to undertake a volunteer role. | NTG, BFNT, VBBs | Bushfires Management Act. Community engagement in the form of media releases, interviews, signs, Bushfire Information Messages (BIM), and Bushfire Watch and Act Messages (BWA). Variable Message Sign (VMS) boards strategically placed on roads to communicate key messages including Fire Ban Days and Smoke Over Road. Social media messaging: compliance planning preparation, Facebook, Twitter, DENR website, Secure NT, show circuit. Catalogue of current publications. VBBs direct engagement with community. | Information:  
- Provide public information on the location and status of fires onto the Internet using a system similar to the Fires Near Me  
- Increase information and education programs on NT bushfire management  
**Collaboration, interoperability and building partnerships:**  
- Chief Executive of DENR to be represented on the Territory Emergency Management Council to highlight fire danger and responses.  
- Strengthen partnerships with recovery agencies such as Red Cross and Department of Chief Minister.  
- Strengthen working relationships with Police Fire and Emergency Services. **Consultation:**  
- Develop and undertake joint NTFRS and Bushfires NT exercises and utilise these as possible media opportunities. **Review, evaluate and adapt:**  
- Economic cost-benefit analysis to value contributions of BFNT/ VBBs.  
- BFNT reporting back to community post event or fire season.  
- BFNT undertake post season review of both operational and strategic programs and report findings to Minister.  
- Investigate if the new Bushfires Emergency Management System (BEMS) includes a capability to track the number of hours volunteers have assisted at planned burns or wildfires. This information may be able to be publically displayed as ‘counter’ similar to other jurisdictions. **Operational programs:**  
- Review the funding model to better reflect the risks based on both the demographics and fuel loads. | (Moderate x Almost Certain) = High |
<table>
<thead>
<tr>
<th>Risk</th>
<th>Risk Details (Causes and Impacts)</th>
<th>Risk Owner</th>
<th>Existing Controls</th>
<th>Possible Risk Treatment Actions</th>
<th>(Consequence x Likelihood) = Risk Level</th>
</tr>
</thead>
</table>
| 4. Environmental impact from inappropriate bushfire management. | Causes: Lack of policy and procedures to minimise environmental impacts  
Impacts: Real and perceived impact on environment including biodiversity, soil and water. Loss of social licence.                                                                 | Landholders, BFNT, VBBs | Collaboration with other divisions in Department of Environment and Natural Resources.  
Certificate IV in Land Management and Conservation or equivalent for all BFNT fire control officers.  
Imbed the underlying principle of fire mitigation in the planning process to minimise the environmental impact.  
Ensure the environment is discussed at each planned burn risk assessment.  
Collaborate with other agencies to manage gamba grass.  
There are several biodiversity assessments already undertaken in the region (e.g. Litchfield National Parks, Twin Hills). | Engagement, awareness and education:  
- Target education at people with little knowledge of fire and land management.  
- Increase the awareness of the benefits of less frequent, cool, patchy burning. Communicate the science behind this practice.  
- Adjust burn frequency based on vegetation requirements.  
Information:  
- Develop a range of information products to assist landowners reduce the impact of fire on their land.  
Collaboration, interoperability and building partnerships:  
- Develop plain English summaries of key research papers and incorporate in planning cycle.  
- Review and incorporate relevant lessons learnt from the Kimberly, Top End, Arnhem Land and Cape York.  
- Increase the engagement of Weeds staff when targeting fuel reduction planning.  
- Continue to work with the Darwin Centre for Bushfire Research at the Charles Darwin University and other researchers.  
Consultation:  
- Address issue at Northern Australian Fire Management forum.  
Review, evaluate and adapt:  
- Develop rigorous monitoring and evaluation process for all landholders to assess prescribed burning operations.  
Operational programs:  
- Develop guidelines on burn timing, severity and frequency for all landholders to minimise environmental impact. | (Moderate x Likely) = High |
| 5. Insufficient cooperation between land managers with different fire management objectives. | Causes: Land managers have a diverse range of views and objectives regarding fire management.  
Impacts: Conflict has potential to cause relationship, financial and environmental damage. | Landholders | Bushfires Management Act.  
Fire Management Plans (private, pastoral, government agencies).  
BFNT operational support to land managers (mitigation and suppression). | Engagement, awareness and education:  
- Increase face-to-face contact between BFNT and land managers.  
- Educating land managers to use fire as a management tool and the requirement to communicate with neighbours when developing their fire management plans.  
Information: | (Moderate x Almost Certain) = High |
<table>
<thead>
<tr>
<th>Risk</th>
<th>Risk Details (Causes and Impacts)</th>
<th>Risk Owner</th>
<th>Existing Controls</th>
<th>Possible Risk Treatment Actions</th>
<th>(Consequence x Likelihood) = Risk Level</th>
</tr>
</thead>
</table>
|      | BFNT regional engagement processes (property visits). Planned Burn Risk Assessment. Annual planning of mitigation activities by VBBs. |           | BFNT, VBBs, Landholders | • Local governments, real-estate agencies and other key industry peak bodies educating landowners and new residents.  
• BFNT and volunteer brigades to increase visitation and provide information to landowners.  
• BFNT to facilitate planning meetings between neighbouring land managers.  
Collaboration, interoperability and building partnerships:  
• Support collaboration between managers to identify fire objectives and coordinate efforts.  
• BFNT request land managers set clear objectives about their priority on what they want to protect first in the event of a wildfire (e.g. infrastructure, pasture).  
• Collaborate with agencies such as Pastoral Land Board and local government to incorporate fire management when diversifying land uses.  
Consultation:  
• BFNT and volunteer brigades visit new land managers to discuss fire management.  
Review, evaluate and adapt:  
• Review multi tenure operations with stakeholders annually.  
Operational programs:  
• Compliance and enforcement training rolled out across BFNT.  
• Conflict resolution training for staff, Fire Wardens and Captains.  
• Work with Government agencies to develop processes for fire managements when land uses overlapping (e.g. Department of Primary Industry and Resources and mineral exploration licences on pastoral lease).  
Engagement, awareness and education:  
• Increase contact between BFNT and larger tenures.  
• Better contingency planning including inductions, fire management awareness and networking with more experienced neighbours.  
• Follow up with new residents if BFNT or VBB is aware they have moved to the area.  
• Support local government to increase awareness (roles and responsibilities and fire management) of new residents.  
Information:  
• Develop scale appropriate property fire plan templates.  
Collaboration, interoperability and building partnerships:  
• Include a fire management plan in land manager handover that detail responsibilities and who to contact for training and support.  
• BFNT and volunteer brigades to increase visitation and provide information to landowners.  
Consultation:  
• NT Cattlemen’s Association.  
• Northern Land Council | (Moderate x Likely) = High |
<p>| 6. Turnover of fire managers/landholders. | Causes: Staff, volunteers or land holder leave and take knowledge with them. Impacts: A turnover in management can lead to reduced capacity, knowledge, networks and continuity. |           | Bushfires Management Act 2016. FF1 training provides new staff or land holder opportunity to network with neighbours and BFNT. Land owner or occupier engages with BFNT or VBB when seeking a Permit To Burn. BFNT provides up to date information and procedures to be dispersed by VBBs. Pastoral and larger tenure planning visits by BFNT staff. | | |</p>
<table>
<thead>
<tr>
<th>Risk</th>
<th>Risk Details (Causes and Impacts)</th>
<th>Risk Owner</th>
<th>Existing Controls</th>
<th>Possible Risk Treatment Actions</th>
<th>(Consequence x Likelihood) = Risk Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Loss of stakeholder network.</td>
<td>Causes: Maintenance of extensive network developed by BFNT staff and VBBs loses priority. Impacts: If the existing stakeholder network diminishes, BFNT capacity and authority will be severely reduced.</td>
<td>BFNT, VBBs, Landholders</td>
<td>Bushfires Management Act 2016. FF1 training Business Continuity Plan VBB governance and funding. Procurement support. Mitigation programs including Aerial Prescribed Burns, Vacant Crown Land, Power and Water, Road Corridor and Land Corporation. BFNT community stalls. Pre-and post-season gatherings. BFNT regional engagement processes (property visits). Joint wildfire response (Parks and Wildlife, NTPRS, private landholders, station staff, VBB).</td>
<td>• With local governments, real-estate agencies and other key industry peak bodies on educating landowners and new residents. <strong>Review, evaluate and adapt:</strong> • Review multi tenure operations with stakeholders annually. • Undertake post season review of both operational and strategic programs and provide feedback to the community or affected land managers. Operational programs: • BFNT to develop an extension program that may incorporate volunteer brigades or BFNT staff visits to new land managers.</td>
<td>(Moderate x Possible) = Medium</td>
</tr>
<tr>
<td>8. Unmanaged land.</td>
<td>Causes: Fire management lacking or inadequate for a number of reasons (e.g. vacant owner). Impacts: Unmanaged fuel increases wildfire risk</td>
<td>Landholders including Government Agencies</td>
<td>Bushfires Management Act 2016 Fire Break compliance</td>
<td><strong>Engagement, awareness and education:</strong> • BFNT and volunteer brigades increase local community engagement programs. • Utilise local events as a conduit for engagement and raise awareness. <strong>Information:</strong> • Ensure educational and awareness materials are widely distributed. • Commence media campaigns around key issues, such as onset of fire break enforcement or fire danger periods. <strong>Collaboration, interoperability and building partnerships:</strong> • Maintain existing relationships and keep in touch with stakeholders who infrequently interact with BFNT. • Continue to facilitate collaboration and provide support to stakeholders in developing their Fire Action Plans. • Conduct regional office face-to-face visits. <strong>Consultation:</strong> • BFNT and volunteer brigades meet regularly to maintain relationships and identify emerging issues. • BFNT to work with other agencies such as NT Fire and Rescue Service, NT Police to maintain networks. <strong>Review, evaluate and adapt:</strong> • Review multi tenure operations with stakeholders annually. • Undertake post season review of both operational and strategic programs and provide feedback to the community or affected land managers. Operational programs: • BFNT operational team to develop an extension program that may incorporate volunteer brigades or BFNT staff to visit new land managers.</td>
<td>(Minor x Likely) = Medium</td>
</tr>
<tr>
<td>Risk</td>
<td>Risk Details (Causes and Impacts)</td>
<td>Risk Owner</td>
<td>Existing Controls</td>
<td>Possible Risk Treatment Actions</td>
<td>(Consequence x Likelihood) = Risk Level</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------</td>
<td>------------</td>
<td>------------------</td>
<td>--------------------------------</td>
<td>----------------------------------------</td>
</tr>
</tbody>
</table>
| 9. Public and volunteers may expect aerial firefighting will be available at any time or location. | Causes: Access to fixed wing aircraft support for wildfire suppression in the outer Vernon Arafura is not currently feasible. Expectations of some stakeholders being unrealistic or unfounded.  
Impacts: Reduced response capability and public expectations not being met. | BFNT | Bushfires Management Act 2016.  
Primary and secondary response zones based around cost benefit of fixed wing vs. rotary wing.  
Batchelor and Hughes airstrips are the nominated operating air bases for aerial fixed wing fire-fighting. | • Enforce Bushfire Management Act  
• BFNT Fire Control Officers undertake training in Certificate IV in Government Investigations. | (Moderate x Possible) = Medium |
| | potentially impacting on multiple neighbours. | | | • Brigades to report problem land to BFNT so they can liaise with the land owner to develop solutions.  
• Coordinate burning and mitigation.  
• Fires break management compliance.  
• Enforce compliance of unmanaged land.  
• Work with Weed Management Branch on blocks with highest gamba grass risk. | | |

Consultation:  
• Potential to develop land management arrangements with VBB and landowner.

Operational programs:  
• Enforce Bushfire Management Act  
• BFNT Fire Control Officers undertake training in Certificate IV in Government Investigations.

Engagement, awareness and education:  
• Increase public awareness of cost/ benefits/limitations of aerial response.

Information:  
• BFNT develop public information on fire management arrangements.

Collaboration, interoperability and building partnerships:  
• VBB and BFNT to work with land managers on fire management practices.

Consultation:  
• Public information be provided to volunteer brigades and to enable them to be used during consultation within more relevant communities.

Review, evaluate and adapt:  
• BFNT and VBB provide preseason and end of year review and feedback to local communities on fire conditions and response.  
• Explore effectiveness of fixed wing response in relation to distance from fire ground/incident.

Operational programs:  
• A procedure to assist in the triage of where and when to send aircraft that considers the requirement for ground support and crews that work with the aircraft, refuelling etc. and the availability of large of amounts of water required.  
• Identify contingencies for more distant subdivisions.  
• Train staff and key volunteers in aerial support roles.  
• Build a case for funding facilities in the growing region.  
• Establish arrangements that ensure access to appropriate landing facilities and water points in these regions.  
• Maintain water points to create access for aerial drafting by rotary wings.  
• Work with land managers to reduce fire fuel loads.
<table>
<thead>
<tr>
<th>Risk</th>
<th>Risk Details (Causes and Impacts)</th>
<th>Risk Owner</th>
<th>Existing Controls</th>
<th>Possible Risk Treatment Actions</th>
<th>(Consequence x Likelihood) = Risk Level</th>
</tr>
</thead>
</table>
| 10. Reduction of mitigation programs. | Causes: Mitigation program may become lower priority with reduced support.  
Impacts: Increased threat of late season wildfires and reduced public confidence. | BFNT including Government Agencies | Annual VBB planning  
Current mitigation programs include Fuel reduction activities on:  
- Increase public awareness of mitigation programs and highlight the work brigades undertake to reduce the fire threat in their local community.  
Information:  
- Provide public information on the location of mitigation burns on the Internet.  
Collaboration, interoperability and building partnerships:  
- Strengthen pre-season planning, monitoring and storing data.  
Consultation:  
- Department of Infrastructure, Planning and Logistics.  
- Parks and Wildlife.  
- Litchfield, Coomalie and Wagait and Belyuen councils.  
- Kenbi Land Trust.  
- Northern Land Council.  
- Dundee and Marrakai Progress Associations.  
Review, evaluate and adapt:  
- Continue to review programs and report on outcomes.  
- Development of BEMS for more accurate reporting.  
Operational programs  
- aerial prescribed burns  
- Vacant Crown Land  
- Power and Water  
- Council Programs  
- Permits to Burn  
- Fire Break Enforcement Program  
- Repeater Maintenance  
- Railway Corridor  
- Roadside Verges  
- Landcare Program  
- Volunteer Brigade Seasonal Planning | (Major x Unlikely) = Medium |
Impacts: Success and failures may be overlooked reducing potential for improvement. Loss of public confidence because decisions not evidence based. Leads to complacency. | BFNT, Regional Committees, Landholders, NTG, Australian Government | Bushfires Management Act 2016.  
Hot debriefs performed after prescribed burns.  
After Action Reviews  
End of season regional BFNT and VBB meetings.  
NTG strategic programs (APB, Strategic Breaks, Compliance and Enforcement) evaluation and reporting.  
Robust monitoring for carbon farming projects | Engagement, awareness and education:  
- BFNT continue to undertake joint mitigation planning with VBB.  
- VBB continue to provide feedback to BFNT on the outcome of mitigation actions  
Information:  
- Make results of monitoring publicly available similar of Park and Wildlife report cards.  
Collaboration, interoperability and building partnerships:  
- Develop culture and measures for simple monitoring and evaluation.  
Consultation:  
- As part of the normal review or debrief process ensure stakeholders are included in the consultation process.  
- At preseason and end of season volunteer Captains briefings. | (Minor x Likely) = Medium |
<table>
<thead>
<tr>
<th>Risk</th>
<th>Risk Details (Causes and Impacts)</th>
<th>Risk Owner</th>
<th>Existing Controls</th>
<th>Possible Risk Treatment Actions</th>
<th>(Consequence x Likelihood) = Risk Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.</td>
<td>Increased fuel loading due to spread of grassy weeds (gamba).</td>
<td>Causes: Gamba grass remains the single greatest driver of change in the region and is jointly responsible (alongside rural development) for the escalating cost of fire management. <strong>Impacts:</strong> Increased fire frequency and intensity threatens life, assets and environment. Increased incidents strain resource capacity.</td>
<td>Landholders, DENR, NTG</td>
<td>Bushfires Management Act 2016. &lt;br&gt;Interagency coordination of management efforts to maximise efficiency across government programs. &lt;br&gt;VCL weeds spray program. &lt;br&gt;Gamba Action Program &lt;br&gt;Statutory Gamba Grass Weed Management Plan. &lt;br&gt;Compliance of Weed Management Act. &lt;br&gt;Fire Break enforcement program.</td>
<td>Engagement, awareness and education: &lt;br&gt;• Support Weed Management Branch (DENR) extension program &lt;br&gt;• Educate stakeholders in methods of control using examples of good practice. Information: &lt;br&gt;• Support Weed Management Branch (DENR) to manage gamba including slowing spread. Collaboration, interoperability and building partnerships: &lt;br&gt;• Collaborate with Government agencies and landholders to develop practical whole of government policy. &lt;br&gt;• Support Weed Management Branch’s Gamba Action Plan and the statutory Gamba Grass Weed Management Plan. &lt;br&gt;• Recent, successful efforts of the Department of Environment and Natural Resources (DENR) need to be scaled up rapidly. &lt;br&gt;• Increase communication between government agencies and land owners to coordinate management efforts. &lt;br&gt;• Brigades to play greater role in gamba management including community awareness, spraying and use of stock as a tool. Consultation: &lt;br&gt;• Support Weed Management Branch (DENR). Review, evaluate and adapt: &lt;br&gt;• Monitor and evaluate strategic programs, increasing mitigation where required. &lt;br&gt;• Develop fine scale fire scar mapping to help identify high risk long unburnt areas Operational programs: &lt;br&gt;• Develop consistent management guidelines and test in different circumstances. &lt;br&gt;• Have more experienced staff (T3 and above) controlling incidents when there is dense gamba.</td>
</tr>
<tr>
<td>Risk</td>
<td>Risk Details (Causes and Impacts)</td>
<td>Risk Owner</td>
<td>Existing Controls</td>
<td>Possible Risk Treatment Actions</td>
<td>(Consequence x Likelihood) = Risk Level</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------</td>
<td>------------</td>
<td>------------------</td>
<td>---------------------------------</td>
<td>----------------------------------------</td>
</tr>
</tbody>
</table>
| 13. Non-compliance with the *Bushfires Management Act 2016.* | Causes: Land owners or occupiers not meeting their responsibilities under the new legislation.  
Impacts: Non-compliance will increase the risk of wildfire on neighbouring parcels. Flow on effects of non-compliance with the *Weeds Management Act 2001.* | Landholders, BFNT | *Bushfires Management Act 2016.*  
Fire break enforcement program.  
Train Fire Control Officers to effectively enforce the Act  
Public information via interviews, advertising, DENR website and newspapers.  
Signage repairs and maintenance providing general information as well as targeted messaging including Fire Weather Indicator signs and VMS boards.  
Creation of Compliance and Enforcement Unit. | **Engagement, awareness and education:**  
• Focus on familiarising stakeholders with the Act during existing training and engagement events.  
• Continue to refine and communicate clear, accessible messages to the public in regards to their responsibilities as land owners or occupiers.  

**Information:**  
• Ensure educational and awareness materials are widely distributed.  
• Commence media campaigns around key issues, such as onset of fire break enforcement or fire danger periods.  

**Collaboration, interoperability and building partnerships:**  
• Potential to develop land management arrangements with VBB and landholder.  

**Consultation:**  
• Increased consultation between, BFNT, Fire Wardens and land owners on expectations and responsibilities  

**Review, evaluate and adapt:**  
• Brigades to report problem land holders to BFNT so that staff can follow up directly with landowner.  

**Operational programs:**  
• All Fire Control Officers undertake the Certificate IV in Government Investigations or Skill Set training. | (Moderate x Possible) = Medium |
| 14. BFNT leadership not sustainable. | Causes: Limited staff development and succession planning.  
Impacts: Gaps in chain of command when key staff not available. | BFNT, DENR | Introduction of another tier of leadership (T4 in Batchelor).  
Acting opportunities for development of staff.  
Increase training of operational staff (e.g. BOM training, Government compliance, AIIMS, Air Attack Sector management, Incident Control, frontline leadership).  
Revision of the Chief Fire Control Officers Standard Operating Procedures.  
Staff rostering including rotations from southern NT and seasonal staff.  
Annual BFNT staff forum. | **Engagement, awareness and education:**  
• Development of a capability plan, for both BFNT and volunteers.  
• Publicise a training calendar.  
• Provide professional developmental opportunities to volunteers such attendance at AFAC conferences.  

**Information:**  
• Provide regular update on the progress of staff and volunteer development activities through facebook or Hot Topics.  

**Collaboration, interoperability and building partnerships:**  
• Well trained multi-skilled staff, increase leadership opportunities for staff.  
• Develop leadership program for BFNT staff and volunteers.  
• Work with NT Fire and Rescue service to develop and implement joint exercises and training.  
• BFNT to link in with other agencies involved in the NT emergency management arrangements.  
• BFNT to collaborate with similar agencies from other jurisdictions in order to utilise relevant training and leadership programs.  

**Consultation:**  
• NT Fire and Rescue  
• NT Police  
• Captains and Fire Wardens  
• AFAC partner agencies  
• Department of the Chief Minister  
• Volunteer Consultative Committee  
• Vernon Arafura Bushfires Committee | (Major x Unlikely) = Medium |
<table>
<thead>
<tr>
<th>Risk</th>
<th>Risk Details (Causes and Impacts)</th>
<th>Risk Owner</th>
<th>Existing Controls</th>
<th>Possible Risk Treatment Actions</th>
</tr>
</thead>
</table>
| 15. Incomplete operational policy for implementation of the Act. | **Causes:** Policies and derived procedures are not complete.  
**Impacts:** Not having clearly defined roles and responsibilities in BFNT can weaken the legitimacy of actions when enforcing the Act. | BFNT, DENR | Bushfires Management Act 2016.  
BFNT staff are in the process of developing procedures for operational activities.  
BFNT staff are learning about the Act as a group as guided by the Compliance and Enforcement Unit to clarify roles and responsibilities as defined by the Act.  
Bushfires NT Strategic Plan 2017-2020  
Department of Environment and Natural Resources Strategic Plan 2017 – 2020.  
Bushfires NT 2018 Business Plan.  
Revision of the Chief Fire Control Officer’s Standing Order and Standard Operating Procedures. | Engagement, awareness and education:  
- Staff need to be aware of both new and existing guidelines in order to implement them.  
- Continue to develop key policies and procedures in order to guide structured and cohesive actions.  
**Information:**  
- Regional operational teams to regularly update their procedures to ensure new staff are able to follow standard practices.  
- New staff are provided with good orientation and induction process.  
**Collaboration, interoperability and building partnerships:**  
- BFNT work with other stakeholders, such as Weeds Branch or Parks and Wildlife to ensure consistency in government policies.  
**Consultation:**  
- Annual Staff forum to ensure consistency and understanding across the BFNT.  
**Review, evaluate and adapt:**  
- Develop triage policy for when land holders inform BFNT that they have lost control of fire.  
**Operational programs:**  
- Staff utilise and refer to BFNT procedures, policies and manuals to ensure consistency in delivery of programs. |
| 16. Unclear leadership on cross boundary fires. | **Causes:** Different organisations (NTFRS and Bushfires NT) and legislation (Fire and Emergency Act and Bushfire Management Act) at city/rural interface (e.g. Wanderrie Rd)  
**Impact:** Potential confusion around command and control on large fire spanning NTFRS Emergency Response Area and Bushfires NT Fire Protection Zone. | BFNT, NTFRS | Bushfires NT Standard Operating Procedures for Chief Fire Control Officer.  
Shared high level decision making e.g. Fire Ban days.  
Same doctrine (AIIMS).  
Training Bushfires NT staff in AIIMS Officer to officer working arrangements between NTFRS and Bushfires NT. | Engagement, awareness and education:  
- Roll out the implementation of BEMS.  
- Ensure volunteer Captains and BFNT staff are trained in AIIMS.  
**Information:**  
- Shared messaging between NTFRS and BFNT including public warnings.  
**Collaboration, interoperability and building partnerships:**  
- Formalised MOU between NTFRS and BFNT.  
- Joint training exercises between NTFRS and BFNT and respective volunteer brigades.  
- CEO of DENR to be represented on the Territory Emergency Management Council to highlight fire danger and responses.  
**Consultation:**  
- NT Fire and Rescue  
- Volunteer Consultative Committee | (Minor x Likely) = Medium |
<table>
<thead>
<tr>
<th>Risk</th>
<th>Risk Details (Causes and Impacts)</th>
<th>Risk Owner</th>
<th>Existing Controls</th>
<th>Possible Risk Treatment Actions</th>
<th>(Consequence x Likelihood) = Risk Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>NT Police</td>
<td></td>
<td>Review, evaluate and adopt:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Review multi tenure operations with stakeholders annually.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Undertake post season review of both operational and strategic programs and provide feedback to management and Territory Emergency Management Council.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Operational programs:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Integrate Bushfire NT fires into the Joint Emergency Services Communications Centre (JESC or 000).</td>
<td></td>
</tr>
</tbody>
</table>
6 Appendices

6.1 Appendix A: Environmental factors

Climate

The Vernon Arafura region broadly has two seasons, the wet (October to April) and the dry (May to September). There is a rainfall gradient from an average of 1782 mm (Dum In Mirrie near Dundee Beach) in the north to 1235 mm (Douglas River) in the south with monsoonal activity greatest closest to the coast (Figure A1).

Average maximum temperatures range from 30 °C to 32 °C throughout the year, reaching 37 °C in October away from the coast. Average minimum temperatures range from 24 °C in the wet to 17 °C in the dry with average afternoon relative humidity being 80 and 65% respectively.

Wind during the fire prone dry season is a constant south easterly correlated with high pressure systems moving through the Great Australian Bight with a significant coastal influence coming from a northerly direction in the afternoon up to 100km inland.

The build-up period to the wet (late September to late November) has high humidity, high temperatures and regular electrical storms which can start fires in random locations.

Figure A1: Climate averages at four locations within the Vernon Arafura Fire Management Zone.
Vegetation

The Vernon Arafura Region typically includes woodlands, grasslands and coastal wetlands. Australia’s landscapes are divided into 89 large geographically distinct bioregions based on common climate, geology, landform, vegetation communities and species information called the Interim Biogeographic Regionalisation for Australia (IBRA). In the Vernon Arafura region there are three IBRAs (Figure A2). These include the:

- Darwin Coastal
- Daly Basin
- Pine Creek
- Victoria Bonaparte

![Interim Biogeographic Regionalisation for Australia bioregions in the Vernon Arafura Fire Management Zone](image)

Generally as rainfall gets lower or substrate rockier, tree height and grassy fuel load decrease. There are three broad types of grasses: annuals, tussock and spinifex; each affecting fire behavior and frequency differently. There is a large variation in grass curing times across the region particularly in wet areas.

Fire history

Fire has been associated with Aboriginal people and their management of the savanna landscapes for millennia. Burning demonstrated ownership and responsibility for country; managed resources; and aided access and mobility.
In 1862 John Stuart first passed overland from South Australia to Darwin. The Overland Telegraph Line was completed 10 years later opening up the area to pastoralism. Traditional fire regimes were seen as a danger by Europeans in most instances; a risk to livestock, pasture, and infrastructure.

Today, the biggest bushfire risk is the rapidly growing rural fringe around Darwin and Palmerston cities combined with the rapid spread of high fuel load gamba grass. Between 1986 and 2015 the Litchfield Shire, characterised by closely space rural lifestyle blocks, grew from 7,400 to 23,600 people (Figure A3). The area’s fire history is influenced by its demographics, in particular the proximity of over 150,000 people traversing, residing, working, and recreationally using the region. In addition, hundreds of thousands of tourists visit many locations in the region adding to potential unplanned ignitions and raising the public safety risk. Sixteen Volunteer Bushfire Brigades have been established in the Vernon Arafura region as a direct response to this increased risk and community expectation of these brigades is high.

In recent years gamba grass has spread in the Vernon Arafura region particularly in subdivided areas around Greater Darwin (Figure A4). Gamba grass is a 4 m high perennial tussock grass and was introduced to the Northern Territory in the 1940s for pasture trials. In 1978 a cultivar was released to the pastoral industry which quickly spread as it tolerated high stock numbers and a range of soils. It was planted widely through the western Top End. Gamba grass has since spread and moved into undisturbed country, where if unmanaged it poses a significant risk to life, property, horticulture and the environment. Its huge fuel loads (up to 16 tonnes per ha compared with 4 tonnes for native grass) can result in fires that are five times as intense. Furthermore, gamba grass cures late (August) when fire weather is at its worst. The late curing means early season fuel reduction is often partial resulting in areas burning again later in the season. The intense heat of gamba fires and the inability to drive through the tall, closely spaced tussocks poses significant risk to firefighters. It can be spread by machinery, animals, wind (including fire updrafts) and flood waters.
Pastoralism and mining have been important land uses in much of the Vernon Arafura region with significant development of the region over the past 50 years. The other major land uses in the Vernon Arafura region include: horticulture, silviculture, hay, Aboriginal use, conservation, tourism and defence. Whilst they all have different land management objectives they share the overall fire management objective to minimise fires during the late dry season between August to November.

The Vernon Arafura region experiences an annual fires season related to wet season growth of vegetation and its gradual curing over the dry season. Patterns of fire have remained relatively constant over time. Between 2004 and 2010 an average of 52.7% of Vernon Arafura was burnt with 35.4% burnt early (before August 1) and 17.3% burnt late. More recently (2011 to 2017), 54% of the area was burnt with 38.7% burnt early and 15.3 burnt late (Figures A5 and A6).
Figure A5: Comparison of frequency of early fires between a) 2004 and 2010 & b) 2011 and 2017 in Vernon Arafura Fire Management Zone.
Figure A6: Comparison of frequency of late fires (after July 30) between a) 2004 and 2010 & b) 2011 and 2017 in Vernon Arafura Fire Management Zone
### 6.2 Appendix B: Land Use and Fire Management Objectives

Table B1: Land uses within the Vernon Arafura Fire Management Zone and corresponding fire management objectives

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Fire management objective (examples)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sub-divisions</strong></td>
<td></td>
</tr>
<tr>
<td>Rural/Residential</td>
<td>Protect assets</td>
</tr>
<tr>
<td></td>
<td>Safety for blockies and firefighters</td>
</tr>
<tr>
<td></td>
<td>Promote biodiversity</td>
</tr>
<tr>
<td></td>
<td>Multi choice (opportunity for people to burn different ways)</td>
</tr>
<tr>
<td></td>
<td>Exclude Fire</td>
</tr>
<tr>
<td></td>
<td>Do nothing- vacant landholder</td>
</tr>
<tr>
<td></td>
<td>Awareness and education</td>
</tr>
<tr>
<td>Horticulture</td>
<td>Exclude fire (e.g. orchards)</td>
</tr>
<tr>
<td></td>
<td>Use fire to clean up (e.g. veg. farms)</td>
</tr>
<tr>
<td><strong>Conservation – Parks and</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Indigenous Protected Areas</strong></td>
<td>Visitor safety</td>
</tr>
<tr>
<td></td>
<td>Protect assets</td>
</tr>
<tr>
<td></td>
<td>Correct fire regime to maintain specific communities (e.g. sandstone)</td>
</tr>
<tr>
<td></td>
<td>Exclude from fire sensitive areas</td>
</tr>
<tr>
<td></td>
<td>Reduce fuel loads</td>
</tr>
<tr>
<td></td>
<td>Protect areas of cultural significance</td>
</tr>
<tr>
<td>Pastoral</td>
<td>Exclude trespassers (hunter management)</td>
</tr>
<tr>
<td></td>
<td>Be sustainable and safe</td>
</tr>
<tr>
<td></td>
<td>Stop woody thickening using fire.</td>
</tr>
<tr>
<td></td>
<td>Burning at the right time</td>
</tr>
<tr>
<td></td>
<td>Need to be a good neighbour</td>
</tr>
<tr>
<td></td>
<td>Improve pasture</td>
</tr>
<tr>
<td></td>
<td>Animal Health - break up tick cycle</td>
</tr>
<tr>
<td></td>
<td>Green pick from early burns</td>
</tr>
<tr>
<td></td>
<td>Promote Flora and Fauna protection</td>
</tr>
<tr>
<td></td>
<td>Erosion control of fragile soils</td>
</tr>
<tr>
<td></td>
<td>Bush country as buffer</td>
</tr>
<tr>
<td></td>
<td>Regular weed management</td>
</tr>
<tr>
<td>Indigenous</td>
<td>Use fire as tool to resources</td>
</tr>
<tr>
<td></td>
<td>Customary use</td>
</tr>
<tr>
<td></td>
<td>Financial gain</td>
</tr>
<tr>
<td>Agriculture Hay</td>
<td>Exclude fire from some areas</td>
</tr>
<tr>
<td></td>
<td>Use fire to reduce fuel loads</td>
</tr>
<tr>
<td></td>
<td>Exclude fire from hay production</td>
</tr>
<tr>
<td></td>
<td>Early burning to hold country together</td>
</tr>
<tr>
<td></td>
<td>Fire to manage gamba infestations</td>
</tr>
<tr>
<td>Land Use</td>
<td>Fire management objective (examples)</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
|                              | Grazing to reduce fuel loads  
|                              | Asset protection - cattle, feed, infrastructure  
| Forestry                     | use fire as tool  
|                              | exclude unwanted fire  
|                              | Exclusion  
|                              | Initial development  
|                              | Use cattle to reduce fuel loads  
|                              | Sandalwood  
|                              | African mahogany  
|                              | Working with neighbours in fire management  
|                              | Prescribed burning on unused tracts of land  
|                              | Breaks fire access trails  
| Defence                      | Reduce fuel loads  
|                              | Protect Infrastructure  
|                              | Safety  
|                              | Reduce against Liability  
| Carbon Farming               | Financial gain  
|                              | Getting back onto country  
|                              | Exclude late season fires  
| Tourism                      | keep landscape attractive for visitors  
|                              | remain safe  
|                              | Aesthetics  
|                              | Safety  
|                              | Education on North Australian fire management  
|                              | Traffic Management  
|                              | Political intervention  
| Government Land              | Reduce fuel load  
|                              | Reduce threat of litigation  
| Corridors (roads, rail, pow gas, water) | Reduce fuel loads on land  
|                              | Reduce potential for litigation from bushfires  
|                              | Safety/ infrastructure  
|                              | Protect against liability  
|                              | Reduce potential as source of fire  
|                              | Burning for exploration  
|                              | Protect equipment  
| Public Infrastructure e.g. schools, Territory Wildlife Park | Exclude fire  
|                              | Protect assets  
| Water storage (dam)          | Reduce fuel load early in season  
<p>|                              | Exclude hot late season fires |</p>
<table>
<thead>
<tr>
<th>Land Use</th>
<th>Fire management objective (examples)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Remote Communities</strong></td>
<td>Protect infrastructure</td>
</tr>
<tr>
<td></td>
<td>Safety</td>
</tr>
<tr>
<td></td>
<td>Hunting</td>
</tr>
<tr>
<td></td>
<td>Visibility and regeneration of flora and fauna</td>
</tr>
<tr>
<td><strong>Mines and Extraction, Exploration Prospectors</strong></td>
<td>reduce fuel loads on land</td>
</tr>
<tr>
<td></td>
<td>keep site safe</td>
</tr>
<tr>
<td></td>
<td>Safety</td>
</tr>
<tr>
<td></td>
<td>Protect infrastructure</td>
</tr>
<tr>
<td></td>
<td>Open development</td>
</tr>
<tr>
<td></td>
<td>Reduce fuel loads</td>
</tr>
<tr>
<td><strong>Aquaculture</strong></td>
<td>Reduce fuel loads</td>
</tr>
<tr>
<td></td>
<td>Exclude late season fires</td>
</tr>
<tr>
<td><strong>Recreational Hunters</strong></td>
<td>Flush game out</td>
</tr>
<tr>
<td></td>
<td>Clear grass for visibility for quads and dogs</td>
</tr>
<tr>
<td></td>
<td>Have fun</td>
</tr>
<tr>
<td></td>
<td>Promote new growth</td>
</tr>
</tbody>
</table>
6.3 Appendix C. Summaries of existing controls in Vernon Arafura Fire Management Zone

Engagement, Awareness and Education

Information

Public Information
BFNT issue Bushfire Information Messages (BIM) to the public when fire activities are likely to impact the public, such as controlled burns on major arterial roads. The message informs the public of:

- what is occurring
- where it is happening and
- likely time of commencement and completion.

A Bushfire Watch and Act message (BWA) is only issued when a large bushfire is impacting infrastructure and instructions and information need to be given to the public.

Major Risk - Public are not kept informed of fire management activities, leaving them uninformed and unprepared.

Signage Repairs and Maintenance
BFNT maintain signage throughout the region, ranging from general information for the public to more detailed information on forecasted fire weather for the day. Volunteers and BFNT adjust the fire weather indicators, including signage on Fire Bans, as forecasts change.

Major Risk - Fire weather indicator signage not updated, inaccurate information to the public.

Collaboration, interoperability and building partnerships

Volunteer Bushfire Brigades
There are currently 16 Volunteer Bushfires Brigades in the region. Each VBB is an incorporated body. VBB undertake mitigation and wildfire response throughout the region.

Major Risk - Brigades not having the capacity to operate fire equipment.

Volunteer Vehicle Replacement Program
BFNT supports the Volunteer Bushfires Brigades by allocating fire equipment to the Brigades. The program aims to maintain an operational ready fleet, through replacement and refurbishment of vehicles and grants to Volunteer Bushfires Brigades to maintain vehicles they are using.

Major Risk - Overall age of the Volunteer fleet

Training
BFNT provide fire management training to volunteers and stakeholders within the region to ensure firefighting capabilities and capacity are maintained. BFNT assist the training brigade when required to deliver fire specific training.

Major Risk - Training of a high standard is not maintained and current.
**Gamba Grass Risk Reduction**

Although there is no formal program a number of controls currently exist including: supporting Weed Management Branch’s (DENR) Gamba Action Plan, gamba grass statutory weed management plan, compliance and enforcement program and free herbicide program; working with VBBs to identify and treat high fuel private blocks; work with Department of Infrastructure, Planning and Logistics, Litchfield Shire Council and VBBs to reduce fuel loads on public land; develop fine scale fire scar mapping (10m resolution) of subdivided areas to identify long unburnt high risk areas; increase community and firefighter awareness of changed risk; BFNT fire break enforcement program to reduce risk to infrastructure and have adequate fire access trails around property.

**Major Risk – Increased fuel loads and fire intensity potentially threatening landholder and firefighter safety, property and the environment.**

**Property Plans**

BFNT work with larger properties owners and managers to identify fire prone areas, fire history and hazard mitigation measures, including aerial prescribed burning. BFNT facilitate stakeholder meetings between managers of larger tenures and Volunteer Bushfire Brigades to form fire action plans for the annual fire season.

**Major Risk - Owner or management change leading to reduced relationship and lack of continuity in hazard abatement.**

**Indigenous estate**

BFNT assist several indigenous entities with planning of fuel hazard reduction burning, generally undertaken by local indigenous ranger groups. BFNT assist the ranger groups from time to time with aerial prescribed burning, including areas under joint management. BFNT and Volunteer Bushfire Brigades undertake planning within communities, advising on fire breaks placement and mitigation activities.

The main indigenous estates within the Vernon Arafura Region are the:

- Larrakia Community (NLC Land Trust) (3,226ha)
- Waruk Community (Limilngan-Wulna landholding corporation)(1,059ha)
- Kenbi Land (Delissavale/ Wagait/ Larrakia Aboriginal Land Trust)
- Acacia Larrakia Rangers (130,000ha)
- Western Top End Region (NLC Land Trust)
- Bulgul Rangers (36,000ha land and sea)
- Malak Malak Rangers( 30,000ha)
- Wagaman Rangers (130,000ha)
- Wudikupildiyerr Rangers
- Thamarrurr Rangers (500,000ha)

**Major Risk – Large tracts of unmanaged land within the Region and bushfires coming from this land impacting infrastructure.**
Parks and Wildlife Commission NT Estate
BFNT and Parks and Wildlife work cooperatively across the Vernon Arafura region. Parks and Wildlife utilise BFNT as bombardiers for their aerial burning program. BFNT have input into fire management within the parks, including joint management areas (see Indigenous estate). Parks and Wildlife estates includes the following:

Litchfield Park (145,600ha)  Berry Springs Nature Park and Territory Wildlife Park (804ha)
Swim Creek  Blackmore River Conservation Reserve (518ha)
Shady Camp  Mary River - Mary River Conservation Reserve
Wildman River  Mistake Billabong
Point Stuart Coastal Reserve  Jimmy Creek Monsoon Forest
Alligator Lagoon  Mary River - Mary River Conservation Reserve
Boggy Springs  Opium Creek
McKinlay Sector(112,000ha)  Annaburoo Delta Block
Territory Wildlife Park & Windows on the Wetland (19ha)  Adelaide River Conservation Reserves - Black Jungle, Lambells Lagoon Reserve, Fogg Dam, Harrison Dam, Melacca Swamp (11,500ha),
Manton Dam (11,650ha)  Howard Springs Hunting Reserve (1,600ha)
Djukbinj National Park (55,500ha)

Major Risk – Mitigation works not completed where park boarders residential areas. Spread of weeds through Parks estate.

Weeds Management Branch herbicide distribution
BFNT issue herbicide to stakeholders on behalf of the Weed Management Branch (WMB) for the control/eradication of invasive weeds such as Gamba Grass. The program has been running for several years and has proved very successful in reducing large tracts of gamba grass; reducing the spread of bushfires.

Major Risk - Program is stopped and landholders stop weed management.

Subdivision and clearance applications
BFNT comment of subdivision plans and clearance applications to ensure all new developments have fire breaks installed during construction. BFNT visit sites, inspecting for compliance prior to issuing clearance for land title issue, ensuring consistent fire break coverage throughout the region.

Major Risk - Developers are no longer required to install fire breaks giving inconsistent fire break coverage.

Mining and Exploration
BFNT advise mining companies on fire management and from time to time assist with APB and fire management plans.

Major Risk - Lack of engagement with mining operations.
Consultation

Volunteer Consultative Committee

A reference group representing Volunteer Bushfire Brigades across the NT. Consultation regarding standards, equipment and issues. Capacity to report to the Minister.

**Major Risk – Representation of broad range of members and poor linkages with similar groups in other jurisdictions.**

Review, Evaluate and Adapt

Vernon Arafura Regional Bushfire Committee

The first regional committee was called the Northern Regional Fire Committee and gazetted in 1966. The regional committees are appointed by the Minister, representing fire stakeholders in the region. The two major responsibilities of the committee as stated in the *Bushfires Management Act 2016* are to:

- make recommendations to the Bushfires Council NT on measures to be taken to mitigate, manage and suppress bushfires in its fire management zone; and
- endorse a regional bushfire management plan prepared by Bushfires NT (BFNT) for its fire management zone.

**Major Risk - No ability to convey regional concerns to the Minister via the Bushfires Council NT.**

Operational Programs

Aerial Prescribed Burning

BFNT in consultation with property managers undertake aerial prescribed burning (APB) to reduce fuel hazards. The APB method commenced in the region in 1973. Many properties undertake additional aerial works at their own cost. Other identified tracts of public land receive aerial burn treatment as part of this program (see Vacant Crown Land and Power Water Corporation).

**Major Risk - Large scale fires developing over several tenures, requiring large resource input to control and extinguish.**

Vacant Crown Land

BFNT have informally assisted the Department of Infrastructure, Planning and Logistics staff in fuel assessment and hazard reduction on Vacant Crown Land (VCL), since 1989. In 2008 a formal Memorandum of Understanding was signed, with BFNT undertaking responsibility for all facets of fire management on VCL (see VCL Fire Management Plan) within the region, covering a total area of 13,831km².

Management includes supervising contractors maintaining fire access trails, establishment of new fire access trails, advising and co-ordinating Volunteer Bushfire Brigades undertaking prescribed burns and aerial prescribed burning.
Major Risk - Land tenures with no fire breaks are non-compliant with legal requirements. Fire travelling from VCL tenures to private tenures exposing government to litigation.

**Major Road Corridor Fuel Hazard Reduction**
Mitigation of fuel hazards along major road corridors commenced in 1991 when the ‘Firebreak Compliance and Enforcement program’ commenced. Prior to this there was only ad hoc slashing occurring with notable evidence of fire ignitions occurring on major arterial roads.

BFNT co-ordinates a fuel hazard reduction program within the road side reserves, with Volunteer Bushfire Brigades undertaking burning activities and being renumerated for this work.

**Major Risk – Fire ignition along major, high traffic, road corridors entering private properties exposing government to litigation.**

**Power Water Corporation Dam Catchment**
Darwin River Dam opened in 1972 covering an area of approximately 291km² with a perimeter of 112km. Strategic fuel reduction is undertaken on an annual basis by both aerial ignition and ground burning, to prevent late season bushfires impacting the dam and adjacent rural subdivisions and promoting biodiversity and the long term viability of the different vegetation communities found within the dam catchment.

**Major Risk – Large bushfires in the Dam catchment affecting the water quality and escaping into surrounding rural developments exposing Power Water Corporation to litigation.**

**Northern Territory Land Corporation**
The mitigation of fuel hazards and the establishment and maintenance of firebreaks on Northern Territory Land Corporation (NT Land Corp) tenures has been occurring since 1991. Liaison between Bushfires NT and representatives from NT Land Corp to ensure fire breaks are installed and maintained. From time to time Volunteer Bushfire Brigades undertake fuel hazard reduction burns to mitigate identified risks within the Region.

**Major Risk - Land tenures with no fire breaks are non-compliant with legal requirements. Fire travelling from NT Land Corp controlled tenures to private tenures exposing government to litigation.**

**Litchfield Municipal Council**
Litchfield Municipal Council has 20 tenures within the region as well as responsibility for road networks (710km). The Council have a 5 year fire management plan, developed by a consultant with input from Bushfires NT that commenced in 2014. Volunteer Bushfire Brigades undertake fuel hazard reduction burns on council tenures as identified in the Litchfield Council fire management plan.

The fuel hazard reduction activity is co-ordinated by BFNT. The Council undertake an extensive fire break and road side slashing program annually.

**Major Risk - Land tenures with no fire breaks are non-compliant with legal requirements. Fire travelling from NT Land Corp controlled tenures to private tenures exposing government to litigation.**
Rail Corridor
BFNT has been working with Genesee Wyoming Australia, since 2004 in regards to fuel hazard reduction within the rail corridor. Genesee Wyoming has their own management programs to combat weeds and erosion within this corridor. By reducing the weed density through herbicide application they are effectively reducing the fuel loads within the corridor. When required, Volunteer Bushfire Brigades undertake the ground burning and BFNT undertakes APB to reduce fuel hazards.

Major Risk – Ignition of fires by trains and associated equipment within the rail corridor, with the potential for multi tenured bushfires, exposing company to litigation.

Firebreak Compliance and Enforcement
A firebreak enforcement program is undertaken annually to ensure all tenures meet the requirement of the Bushfires Management Act to establish breaks. This program is undertaken by BFNT and assists in fire management giving fire fighters lines of defence to work from.

Major Risk – Political will to undertake the program reduced, requirements of the Act not enforced. Absentee land owners.

VHF Radio Network
The VHF radio network of repeaters provides reliable communication coverage across the region and is used for control and management of operations. Each repeater has coverage of approximately 120km however repeaters are able to be linked to give wider coverage of the region. During the fire season, the fire weather for the day is broadcast to volunteers and they give an indication of who is available if a fire occurs. There is a closed network for BFNT and aircraft for aerial firefighting purposes. This is an authorised radio system used by BFNT, volunteers and approved landholders involved in large scale fire management.

Major Risk - Radio network is not maintained and effective and efficient communications are reduced.

Aerial Fire Fighting Support
The use of aircraft in the region started with aerial ignition work. As the region became more settled and developed the use of rotary wing aircraft in firefighting became apparent. Rotary aircraft are used for water bombing and air attack supervision in larger fires. Fixed wing aircraft are utilised for fire bombing in the more intensive land use areas within the region, including the rural urban interface.

Major Risk - Loss of funding for use of aerial firefighting applications.
Appendix D. Tools and Resources

- **Gamba Action Program (Weed Management Branch)**
  Provides information on how to manage gamba grass

- **North Australia Fire Information**
  Provides information on up to date fire location, fire scar from this year and previous years and summaries of fire histories

- **NRM InfoNet uses the NAFI base map to generate reports threatened species, weed and pest species lists, fire frequency since 2000 and profiles of climate, vegetation and soils.**

- **Bureau of Meteorology**
  Provides weather data: 4 and 7 day forecasts, fire weather warning, current observations, past weather and outlooks. The dynamic user friendly Meteye provides in depth data in a map format.
  Registered User Site specific to fire management

- **Long Paddock**
  Queensland Primary industries site that monitors pasture biomass, pasture growth over various periods of time, curing index and relative rainfall.

- **LandSat and MODIS, Sentinel 2**
  Websites providing satellite images that are taken on a regular occurrence
  MODIS provides a 250m pixel image daily; LandSat provides 25m pixels image every 14 days; Sentinel 2 provides 15m pixels image every 7 days
  This imagery allows us to analyse fire scar in greater detail than NAFI for evaluation purposes.
  Sites where images can be found are numerous and include:
  LINK: https://worldview.earthdata.nasa.gov/
  LINK: https://lv.eosda.com/

- **IBRA Assessment**
  A regular assessment during fire season to judge fuel loads, mitigation efforts, response capability and previous history to assess whether geographical regions are above average, average or below average fire potential.
  Feeds into Bushfires and Natural Hazards CRC working Group North Australian Fire Managers Forum.
NT Pastoral Feed Outlook
Provides a quarterly update of seasonal outlook for pasture (fuel) regarding curing, fuel load and palatability from across 11 pastoral areas.

NR Maps
NRMaps is a NT Department of Natural Resources and Environment data visualiser for: Bushfires NT, Flora and Fauna, Significant Biodiversity Areas, Parks and Reserves, Vegetation Resources, Land Resources, Water Inundation, Water Resources, Surface Water Drainage, Land Administration, Topographic Map Index, Mining Titles Register, Geology and Geophysics
LINK: http://nrmaps.nt.gov.au

Secure NT
SecureNT brings together social media alerts and warnings from the Northern Territory Government emergency services and agencies. Members of the public can access information to prepare, respond and recover from all types of emergencies.
LINK: https://securent.nt.gov.au/

Fire and Rescue Service NT Incident Map
The Northern Territory Fire Incident Map provides realtime information to the public regarding fire incidents. Currently, the data being displayed on the NT Incident Map only shows incidents being responded to by the NT Fire and Rescue Service not Bushfires NT. Work is underway to remedy this issue.

NT Legislation Database
Is a database for all Northern Territory Legislative Assembly Legislation and Regulations.

Google Earth
Google Earth is a 3D data visualiser which is either web or desktop based. The desktop version has basic mapping functions and can import other data such as hot spots or fire scars from NAFI.
LINK: https://www.google.com/earth/download/ge/agree.html?gl=AU&hl=en

Department of Environment and Natural Resources
Provides information on Department Divisions including Bushfires NT, Rangelands, Flora and Fauna and Water Resources
7 Contacts

For further information about this Plan contact the Department of Environment and Natural Resources, Bushfire NT, Batchelor on (08) 89760098.