



Hill End Historic Site Reserve Fire Management Strategy 2009

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- ### PLAN OBJECTIVES
- Protection of life and property.**
 - Assist in providing protection of life and community assets through the implementation of Asset Protection (APZ) and Strategic Fire Advantage (SFAZ) Zones.
 - Maintain a network of fire management trails to assist with the strategic management of incidents.
 - Priority for works will be set by addressing those with the highest level of strategic value for fire suppression and the protection for assets.
 - Conserve biodiversity and cultural heritage.**
 - Under the approved fuel management activities protect sensitive cultural (non-Aboriginal and Aboriginal) heritage assets within the historic site.
 - Actively manage fire to promote the conservation and biodiversity values of the reserve by focusing on those areas currently subject to adverse fire regimes within the reserve i.e. areas long unburnt or having a high frequency of fire.
 - To prevent large scale high intensity wildfires from occurring, continue to use lower intensity fires to reduce fuel.
 - Utilise Ecologically Sustainable Development (ESD) principles in managing fire in the landscape.**
 - Implement a fire management approach based on stratosphere: the interval guidelines for broad vegetation types.
 - Avoid adverse fire regimes by ensuring variability in terms of years, extent and intensity of fire occurrence.
 - Conduct fuel management activities in a manner that develops a mosaic of vegetation types and structures with varying time since fire to provide habitat for plant and animal species.
 - Promote a whole of landscape approach to bushfire management.**
 - Continue to promote community awareness of fire management activities within the reserve, liaising with adjoining neighbours and stakeholders.
 - Encourage adjoining landowners to adopt principles of bushfire management activities.
 - Seek local knowledge to provide input into fire management activities.
 - Participate in the Chifley Bush Fire Management Committee.

FIRE MANAGEMENT ZONES

Zone	Purpose	Action
Asset Protection (APZ)	These areas are cooperatively managed with Rural Fire Service for the protection of assets. Apply Standards for asset protection zones & Planning for bush fire prevention 2006	Maintain the Overall Fuel Hazard (OFH) below or equal to a MODERATE Level Overall Fuel Hazard Guide, G. McCarthy, NPWS ed 2002. Mechanical works, spraying and burning are the permitted methods of fuel reduction.
Strategic Fire Advantage (SFAZ)	To manage fuels to assist in the strategic containment of bushfires for the protection of adjoining residential assets and assets within the Historic Site. It is recognised that strategic protection objectives may take precedence over land management outcomes	Maintain the Overall Fuel Hazard below or equal to a HIGH Level (It is estimated that it will take between 5 to 15 years for fuels to accumulate to this level) Burning, mechanical works, spraying are the permitted methods of fuel reduction.
Land Management (LMZ)	To promote the conservation and biodiversity values of the reserve and protect cultural (Aboriginal and non-Aboriginal) heritage assets. Reduce adverse fire regimes (i.e. high frequency and/or long unburnt) to ensure the continued ecological diversity of all vegetation communities.	Maintain the Overall Fuel Hazard below or equal to a HIGH Level for 50% of the LMZ The remaining area can have a greater OFH Level. Burning is the preferred method of fuel reduction.

- ### OPERATIONAL GUIDELINES
- Command and Control**
RFS NPWS SOP 67
NPWS/19/11
- Initial attack may be initiated by any fire agency. The importance of fast initial attack is crucial.
 - Senior officer of the first attack unit will assume role of control of the fire and ensure other agencies have been contacted as soon as possible.
 - On arrival of other units / agencies, the initial Incident Controller will consult in regard to ongoing command, control and incident management requirements as per BFMC Plan of Operations.
 - In all cases DECC will maintain close liaison with local brigades and landholders in the event of a fire.
- Heavy Plant**
RFS NPWS SOP 415
NPWS/19/14
- The use of heavy plant is integral to successful initial attack. Consider requesting immediately.
 - The initial Incident Controller may use heavy plant for first attack if they deem it appropriate and essential for containment.
 - Avoid locating containment lines across steep slopes or areas of heavy rock.
 - Do not construct containment lines parallel to drainage lines and within 20m of banks. Cross drainage features at right angles with as little soil disturbance as possible.
 - Where possible drain and stabilise containment lines as constructed. Stabilise control lines before standing plant down from fire operations. (Stockpile topsoil).
 - Heavy plant is to be guided and accompanied by an experienced officer. Guides and Operators should be briefed on the location of the proposed line, heritage items and machinery exclusion areas.
 - When engaged in direct or parallel attack they must be accompanied by a fire-fighting vehicle.
 - Caution when using plant as there are many shafts and underground structures in the area, they are not always visible.
- Aerial Water Bombing**
RFS NPWS SOP 1033
NPWS/19/14
- Aircraft dramatically increase the chance of successful initial attack. Consider requesting immediately.
 - The use of aerial water bombing should support containment by ground crews, focusing on hotspots and spottovers.
 - Coordination between ground crews and aircraft is essential during water-bombing operations. Air Attack Supervisors will develop and implement systems that allow direct communication between individual aircraft and relevant ground crews.
 - Where practical foam should be used to increase the effectiveness of water bombing.
 - Caution must be used when working to protect historic buildings as they may not be structurally sound and damage could result from water bombing.
- Fire Suppression Chemicals**
RFS NPWS SOP 412
NPWS/19/11
- The use of foaming agents (wetting agents) is encouraged in all fire operations - initial attack, suppression and mop-up.
 - Avoid use of foaming agents within 20m of drainage lines, swamps and dams. Take particular care to ensure foaming agents do not discharge into watercourses or dams. Take particular care to ensure foaming agents do not discharge into watercourses or dams.
 - Use of retardant is permitted in all fire operations but only when conditions are severe enough to warrant its use. The cost of retardant is high and set up time can be lengthy. Discuss options with the incident management team. A mobile batching plant is available from State Cops.
- Backburning**
RFS NPWS SOP 417
NPWS/19/14
- Backburning is only to take place in accordance with an agreed IMT strategy and only under approval from the Divisional Commander.
 - It is recognised that the specific circumstances will dictate how, where and when backburning operations take place. The following are provided as best practice guidelines.
 - Commence backburning late afternoon and early evening when humidity is rising and lower temperatures occur.
 - Use prevailing wind to maximise backburning opportunities. Intensity will not be too extreme, however, consider restricting downwind backburning operations when humidity is less than 20%.
 - Clear around dead and fibrous barked trees adjacent to containment lines prior to ignition. Alternately, wet down these trees (with foam) prior to ignition.
 - Avoid ignition of backburns at the bottom of slopes where a long and intense up slope burn is likely.
- Rehabilitation**
- Fire control lines constructed by earthmoving equipment should be stabilised and rehabilitated at the completion of fire operations.
 - The potential impacts of smoke and possible mitigation tactics must be considered when planning for wildfire suppression and prescribed burning operations.
 - Traffic management plans must be in accordance with RTA guidelines when conducting prescribed burns.
- Smoke Management**
- Hill End can have large number of visitors at any time, but particularly around school holidays and long weekends. These may include primary school groups.
- Fire Trail Standards**
RFS NPWS SOP 414
NPWS/19/12
- Fire Trails provide the main means of access for fire management activities (hazard reduction, backburning, fuel management). They alone are not containment lines.
 - Trails are classified using two categories:
 - The Strategic Classification either: Essential, Important or Dormant.
 - Vehicle Carrying Capacity either: Cat 1, Cat 7 or Cat 9.
 - Caution should be used in and around Hill End as there are underground mining features scattered through the landscape. These may not be apparent on the surface.
 - Trail widths Cat 1 trails a minimum of 4 metres formed running surface, clearance height of 4.5 metres.
 - Trail widths Cat 7 trails a minimum of 3 metres formed running surface, clearance height of 3.5 metres.
 - Caution when using bridges in the Hill End area as many are signed with 2 tonne limits.

- ### RECOMMENDED FIRE REGIMES FOR BROAD VEGETATION TYPES
- Provide a mosaic of areas with varying time since fire to provide habitat for plant and animal species. Within any proposed burn area aim to burn 50-70% of the fuels.
 - The reserve is dominated by highly modified vegetation, some historic orchards, eroded and grassed areas. There are significant areas of exotic trees and weeds. The native vegetation types of Dry Sclerophyll Shrub/Grass Forest (73%) and Sclerophyll Grassy Woodlands are highly disturbed. The dominant species is Red Stringybark *Eucalyptus macrorhynchos* with some remaining box species.
 - Where possible the aim is to maintain ecologically appropriate fire frequencies for each vegetation type.
 - Dry Sclerophyll Shrub/Grass Forest 7-30 years
 - Sclerophyll Grassy Woodlands 13-40 years (Bradstock, 2003, Fire Interval Guidelines).
 - White Box, Yellow Box, Blakey's Red Gum Woodland > 5 years between fire events.
 - Where possible our aim is to ensure a mosaic approach with variability in fire regimes, in terms of years, extent and intensity by:
 - Follow a short inter-fire period with a long inter-fire period.
 - Follow a low intensity with a high intensity fire or vice versa.
 - A large area fire with a smaller area fire.
 - A 50% analysis of vegetation type and time since fire has been undertaken, most areas are in the class >50% At Risk - Underburnt

- ### FIRE SEASON AND PRESCRIBED BURNING INFORMATION
- Autumn burning is preferred as weather conditions are expected to become cooler and wetter.
 - High Intensity Burns - March / April
 - Lower Intensity Burns - April / May
 - Spring burning may be carried out, but there is the additional risk of re-ignition. Ensure there is agreement and an understanding of the increased risks amongst all parties prior to ignition.
 - Burns should not be carried out past October.
 - Winter burning may be possible if the season is dry. In the correct conditions winter burns can be highly successful and should be considered.
 - Sustained decreases in the Southern Oscillation index are an indicator of the onset of drought. When this occurs all consideration should be made to increasing prescribed burning when possible.
 - Light winds are beneficial during prescribed burning operations to drive and lift fire through elevated fuels. Winds 5-10 km/h are ideal.
 - Results from Project VESTA show that there is a threshold of 12-15 km/h for wind speed and fire behaviour. At wind speeds below this threshold, fire rate of spread can appear deceptively slow, but as wind speeds pass this threshold there can be a large increase in fire behaviour. Be wary of this wind speed threshold!
 - The manner in which prescribed burns are ignited will effect the intensity and rate of spread. There are several ways ignition can take place - well spaced spot, close spaced spot, grid ignition and continuous line of fire.
 - All techniques have their advantages and disadvantages under different conditions. Continuous line of fire ignition is over-used by even well trained crews. Other techniques should be encouraged under appropriate conditions, caution is needed due to fire reaching potential rate of spread almost immediately.

COMMUNICATIONS

Fire, Police & Ambulance '000'

Agencies	Local Brigades
RFS Chifley Group - Bathurst RFS Chifley Group - Oberon RFS Cudgegong Team - Mudgee	Hill End Brigade UHF 4
NPWS Macquarie Area - Bathurst NPWS Macquarie Area - Hill End NPWS Fire Reporting Line NPWS Mudgee Area	Captain Robert Anderson P 6337 8319 or 6337 8275 Snr. Dept. Captain Robert Auld P 6337 8210 Dept. Captain Jim Shanahan P 6337 8285
NPWS Visitors Centre has keys to all NPWS houses	
Police '000'	Hill End 02 6337 8221
Country Energy - emergencies Department of Lands, Orange	NPWS VHF 24 Canobolas NPWS VHF 29 Sunny Corner RFS PMR 85 Canobolas RFS PMR 20 Monkey Hill
Forests NSW (Macquarie) Forests NSW Fire Duty Officer	SF VHF 03 Canobolas RFS PMR 58 Lewis Ponds RFS PMR 71 Eucareena
Community Health	02 6337 8283
Bathurst Regional Council	02 6333 6111 Aviation Communications - 125.45 or UHF Simplex Refer to IMT/Air Attack
SES Bathurst	02 6332 14 88 Portable Repeater Locations - sited within line of sight and where fire will not impact. Bald Hill is a good site for the main village.
Mobile NextG. Intermittent. No Digital/GSM coverage.	

- ### SUPPRESSION STRATEGIES
- Buildings**
- Follow RFS Structural Fire fighting SOP
 - Do not enter building unless trained and equipped to do so.
 - Use defensive strategies if fire is well developed.
 - Most buildings are wooden construction, very susceptible to ember attack.
 - Power to buildings always check with Country Energy staff 13 20 80.
 - Most buildings within Hill End are at extreme risk from ember attack.
- Direct Attack**
- Direct Attack should be the first strategy considered for any fire threatening the historic site
 - Fire fighter safety, fire behaviour and weather conditions will determine when a direct attack strategy is appropriate.
 - When not appropriate the following strategies will be employed.
- Moderate and Stable Weather Conditions Predicted (March to October)**
- When weather conditions are appropriate consider maximising the fire area outside the historic precinct in accordance with requirements for proposed prescribed burns.
 - Always seek clear and unanimous agreement from other fire fighting agencies, brigades and landholders before implementing this strategy.
 - This strategy is not appropriate during periods of high fire danger, when Cultural Assets of the historic site are or maybe threatened - or when it is likely conditions could quickly deteriorate
- Seasons with Moderate Weather Conditions Predicted**
- Minimise the fire area
 - Direct and parallel attack with plant and fire units, consider aircraft use.
 - Secure the flank on the next predicted downwind side as soon as possible.
- Seasons with Severe Unstable Weather Conditions Predicted**
- Minimise the fire area as quickly as possible.
 - Use all available resources and consider requesting additional resources immediately, consider aircraft use.
 - Only construct new containment lines where these can be successfully completed and backburning carried out before the arrival of the head fire. Add an extra margin during weather with low humidity and shifting winds.
 - Backburn fuels between the head fire and containment lines as soon as possible using ground ignition. Aerial ignition can be used to support and speed up this process.
 - 3-5 year burn areas are likely to contain head fires.
 - 3 year plus burn areas will reduce fire intensity, but may not hold head fires.
 - Secure and deepen control lines on the next predicted downwind side of the fire.
 - Investigate and have ready at least one, preferably two, backup containment lines.

- ### BIODIVERSITY STRATEGIES
- Standing or Fallen Dead Trees:** Loss of standing or fallen dead trees is classified as a Key Threatening Process in NSW. Protection of this habitat feature is critical in maintaining biodiversity at a site. Steps should be taken, if time permits and resources are available, to maintain dead trees at hazard reduction burns and wildfires. Options include blocking out burning dead trees as soon as it is safe to do so rather than letting them burn. Alternatively, raking a fuel free zone around dead trees prior to ignition will also help preserve them. Mostly this will only be possible on containment lines and serves the dual purpose of reducing the likelihood of spotting from burning dead trees. It is recognised that there will always be a need to push standing dead trees where they cannot be protected or they pose a safety hazard to fire fighters and/or will breach containment lines if they fall.
- The Mosaic Approach:** The basic principle of a mosaic structure is to maintain biodiversity by generating an environment with multiple vegetation types and structures with a variety of post fire ages. With any environment there is a diversity in the over-story, under-story and groundcover vegetation. Each operates as a separate habitat and will maintain a different set of species. To create a complementary mosaic structure across the landscape hazard reduction burning should avoid burning all of one habitat and instead seek to burn a portion only. At a micro level maintaining a mix of burn/unburnt within the burn area is also important as these provide refuges for species from where they can recolonise burnt areas when conditions become suitable again. It is recognised that strategic protection objectives take precedence and may override the mosaic approach to hazard reduction in some zones.
- Biodiversity Management:**
- FL1 - Historical record of *Zieria obovata* (recorded in 1922).
 - > 10 years between fires, conduct site inspections prior to planned burning.
 - FA1 - No Burning around Known roosting sites.
 - FA2 - No restrictions
 - FA3 - Avoid burning entire known population in one occurrence, even low intensity fires can be fatal. Survey for dead or injured animals after fires/burns, to gain understanding of population. Reconitization can take place quickly if there is a population to draw from. Dan Lunney pers com.
 - AH1 - No ground disturbance, minimise vegetation removal, keep control lines away from site.

