Perspectives Heritage Solutions Pty Ltd

Joanna Freslov
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AAV Project No. 2833

Post Wildfire Indigenous Heritage Survey

Volume 2: Management of Impacts from Wildfire and Suppression Activities

A Report to Parks Victoria, the Department of Sustainability and Environment and Aboriginal Affairs Victoria

PO Box 713 • Hurstbridge VIC 3099
Phone (03) 9718 1554 • Fax (03) 9718 1829

Cover plate: High intensity burn in the Mitta Mitta River valley, near Anglers Rest (view east)

Executive Summary

During the 2003 a large bushfire burnt over 1.2 million hectares of private and public land in the high country of northeast Victoria and Gippsland. The fire and suppression activities affected a range of values in the highlands including Aboriginal heritage values. The Public Land Ecological and Cultural Bushfire Recovery Program determined that the best way to address and enhance effective cultural heritage management was an increased understanding of the nature and extent of the impact of bushfires on Indigenous heritage values.[1]

The Public Land Ecological and Cultural Bushfire Recovery Program aimed to collect this information through a project which would investigate and assess the impact of the bushfire and fire suppression activities on Indigenous cultural heritage values on public land. This project also included an assessment of the impact of the bushfire on non-material heritage values including spiritual places and historic attachments. The project was to be managed jointly by Parks Victoria (PV) and the Department of Sustainability and Environment (DSE).

Parks Victoria and the Department of Sustainability and Environment therefore commissioned Perspectives Heritage Solutions Pty Ltd to conduct a an archaeological survey for Aboriginal cultural heritage values within 12 study areas (later expanded to 14 areas) in the highlands and alpine regions of northeast Victoria and Gippsland (Figure 1). The project required close consultation with, and the participation of, the relevant local Indigenous communities and the mentoring and training of Indigenous staff employed by DSE and PV in field techniques including artefact identification, use of field equipment, site recording and in developing management options.

The main results of the project are reported in Volume 1, while results of community consultation are discussed in Volume 3. In order to assist the fire suppression managers across all agencies, the major results with respect to fire impacts and fire suppression activities have been presented in a separate volume (Volume 2). This volume presents the observations of the survey and management principles for the protection of Aboriginal cultural heritage during the fire management cycle that has been derived from consultation with a broad range of stakeholders. These are summarised in the table below.[2]

[1] Indigenous Wildfire Survey Brief

[2] Archaeological reports may be independently reviewed by Aboriginal Affairs Victoria and the relevant Aboriginal community. Although the findings of a consultant's report will be taken into consideration, recommendations in relation to managing heritage places should not be taken to imply automatic approval of those actions by Aboriginal Affairs Victoria or the Aboriginal community.

Summary Table of Management Principles

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STRATEGY	PRINCIPLE	OBJECTIVES	ACTIVITY/ACTIONS
Wildfire Prevention and Preparedness	Fire prevention planning and preparedness planning should take place in collaboration, and cooperation with Indigenous stakeholders to facilitate the protection of Indigenous cultural values.	Re-affirm the principles of the state-wide Code of Practice for fire management on public land.	Consult with the relevant Indigenous stakeholders when reviewing the Code of Practice. Update the Code of practice to provide the highest possible standard for heritage protection.
		Develop, maintain and improve consultation and communication with Indigenous stakeholders in the fire district.	Identify all appropriate Indigenous stakeholders. In consultation with Indigenous stakeholders develop a consultation and communications strategy for the fire district. Implement the strategy and ensure on-going consultation with appropriate Indigenous stakeholders. Develop a program of which promotes the understanding of the fire management process/system amongst the Indigenous community and relevant stakeholders.
		Promote increased awareness of Indigenous cultural heritage values among fire managers and fire suppression personnel.	Support and maintain current departmental programs in Indigenous cultural awareness.
		Plan to provide the highest possible heritage protection during fire suppression activities.	In consultation with Indigenous stakeholders, heritage planners and fire managers identify risks, areas at risk, degree of risk and fire suppression methods used in the fire district. In consultation with Indigenous stakeholders develop suitable fire suppression protocols which minimise or avoid impact to both known and unknown Aboriginal cultural values. In consultation with Indigenous stakeholders identify key heritage value areas and develop fire suppression heritage

STRATEGY	PRINCIPLE	OBJECTIVES	ACTIVITY/ACTIONS
			action plans for these areas. Develop a cultural heritage risk/fire suppression prescription matrix for each fire district and incorporate the matrix into the fire management plan. Ensure fire managers and fire fighting teams are trained in heritage site recognition, protection measures, appropriate management and reporting protocols. Develop protocols for the provision and protection of essential heritage information to Incident management teams (IMTs) for all fire districts. Carry out a program of training to IMTs accessing and using the heritage information. Identify, train and maintain a rapid response Indigenous heritage team/contact person for each fire district for each fire season. Develop a program of orientation and training in incident management for the Indigenous community.
		Prescribed burns are planned to minimise impacts to Aboriginal heritage values	Consultation is undertaken with Indigenous stakeholders during planning for prescribed burns to ensure impact to Aboriginal cultural heritage values is minimised or avoided. Consultation is undertaken with Indigenous stakeholders to assist management of cultural heritage sites and places through prescribed burns in sensitive locations. Consultation is undertaken with the Indigenous rapid response team/person in a timely way and agreed protocols regarding information sharing are supported.
Wildfire Suppression	During any fire event, Aboriginal cultural heritage values should be protected and managed in a cooperative, strategic and sensitive way.	Relevant information which supports best practice heritage protection during wildfire suppression activities is provided in a timely way.	The Indigenous rapid response team/person and IMT will ensure ongoing communication and consultation where necessary throughout the incident. The IMT will ensure that all necessary information is communicated to the fire fighting teams in a timely way.

STRATEGY	PRINCIPLE	OBJECTIVES	ACTIVITY/ACTIONS
		Any identified threats to the integrity of Indigenous heritage values will be managed and addressed in a culturally appropriately way and in partnership with the Indigenous community.	Fire fighting teams will endeavor to identify cultural heritage sites, locations where they might occur and threats to cultural values where practical. The teams will ensure the appropriate fire suppression method is used which best protects cultural heritage in the given circumstance. The fire fighting teams will report any disturbance or exposure of cultural heritage values in a timely way to the appropriate person. Ensure communication strategies are reaffirmed for the reporting of threats to cultural sites or the discovery of cultural sites.
Wildfire Recovery	Following fire events, threats to Indigenous cultural sites should be identified, necessary management should be undertaken and the further survey undertaken where opportunities allow.	Management of impacts to any cultural sites is carried out in consultation and collaboration with the relevant Indigenous stakeholders.	Following a wildfire reported impacts and impacts to potential Aboriginal heritage values are identified. Impact management plans are developed with Indigenous stakeholders Management works are carried out with Indigenous stakeholders consistent with heritage management guidelines.
		Fire rehabilitation and recovery plans are developed in collaboration with Indigenous stakeholders to minimise impacts to known and unknown Aboriginal heritage values.	Urgent fire rehabilitation work carried out behind the wildfire front is planned and carried out without impacting on known and unknown Aboriginal cultural values. Fire rehabilitation works are planned in consultation with the Indigenous stakeholders to minimise or avoid impact to Aboriginal values consistent with appropriate rehabilitation methods.
		Good management of Aboriginal cultural values in Crown land reserves is enhanced by further investigations in fire affected areas.	A targeted program of Indigenous heritage assessment is carried out where possible in fire affected areas to assist in management planning, increasing knowledge and awareness and in planning management works.

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Acknowledgments

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Abbreviations

AAV	Aboriginal Affairs Victoria.
DNRE	Department of Natural Resources and Environment (formerly DCNR, now DSE).
DSE	Department of Natural Resources and Environment (formerly DNRE).
ECC	Environment Conservation Council (formerly LCC).
ICOMOS	International Council on Monuments and Sites.
ICS	Incident Control Systems.
IMT	Incident management team.
PV	Parks Victoria.

1 Introduction

1.1 Requirements of the Brief

In early 2003 a large bushfire burnt over 1.2 million hectares of private and public land in the high country of northeast Victoria and Gippsland. A large number of ground-disturbing activities were required to contain and suppress the fire including the construction of 3000 access tracks, fire control lines and widening of 1600 existing tracks.[3] The fire affected a range of environments including low altitude riparian environments, eucalypt forests, alpine heathlands, grasslands and bogs.

The Public Land Ecological and Cultural Bushfire Recovery Program, a program set up by several agencies to assist the recovery of communities, the environment and infrastructure, recognised that Indigenous cultural heritage values within the bushfires affected areas were significantly affected by both the fire and the bushfire suppression activities. The program believed that effective ongoing management and better planning for cultural heritage values in the highland and alpine regions would be enhanced through an increased understanding of the nature and extent of the impact of bushfires on Indigenous heritage values.[4]

The Public Land Ecological and Cultural Bushfire Recovery Program aimed to collect this information through a project which would investigate and assess the impact of the bushfire and fire suppression activities on Indigenous cultural heritage values on public land. The project would include an assessment of the impact of the bushfire on non-material heritage values including spiritual places and historic attachments. The project was managed jointly by Parks Victoria (PV) and the Department of Sustainability and Environment (DSE).[5]

Parks Victoria (PV) and the Department of Sustainability and Environment (DSE) therefore required an archaeological survey for Aboriginal cultural heritage values be conducted within 14 study areas in the highlands and alpine regions of northeast Victoria and Gippsland. The project required close consultation and the participation of relevant Indigenous communities and the mentoring and training of Indigenous staff employed by DSE and PV in field techniques including artefact identification, use of field equipment, site recording and in developing management options.

This volume describes the specific impact to Aboriginal cultural sites arising from the wildfire and fire suppression activities and outlines principles for the management of cultural heritage values arising from the results of the field survey and the background review.

The relevant requirements stipulated by the brief required the survey team to:

- To assess and document the nature and extent of damage caused by wildfire and the associated fire suppression activities to Indigenous cultural heritage values across the project area, and to provide recommendations for protection and future management.

- To work with the Aboriginal community in documenting matters such as cultural significance and traditional interpretation of recorded sites, and in developing appropriate management options;

[3] PV/DSE Wildfire Indigenous Survey Brief.

[4] PV/DSE Wildfire Indigenous Survey Brief.

[5] PV/DSE Wildfire Indigenous Survey Brief.

1.2 This Report

This report contains the following sections:

- A background review of fire history in Victoria.
- Background review of known impacts of fire on cultural heritage sites.
- Methodology used to collect data for the development of the management principles.
- Context of the management principles and significance assessment.
- Discussion of results.
- Management principles.

Figure 1: Location of the study areas

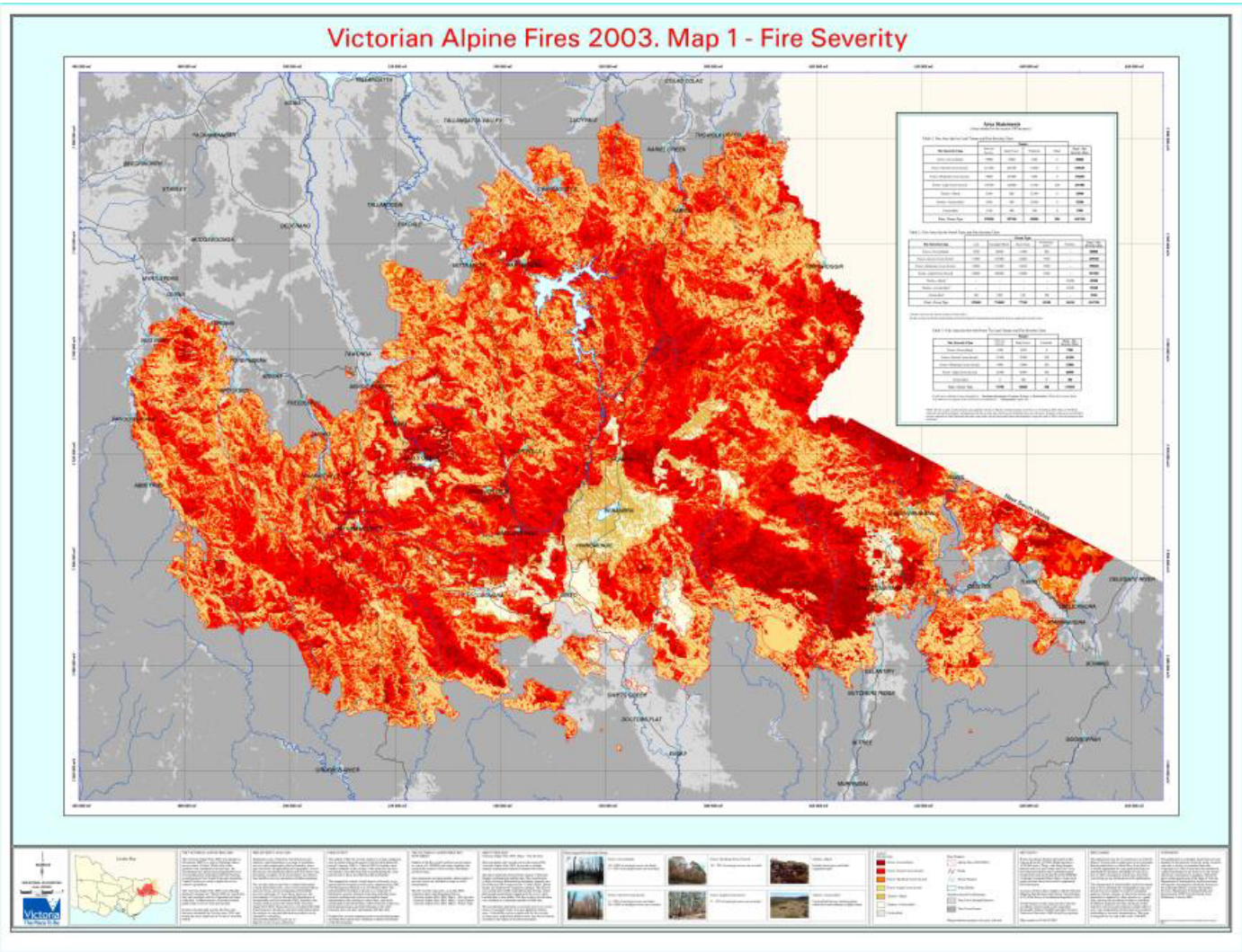


Figure 2: Impact of the wildfires in the alpine region[6]

[6] Source DSE, www.dse.vic.gov.au/maps&facts

2 Background Review

2.1 Introduction

Parks Victoria and the Department of Sustainability and Environment are the primary Crown land managers in the State of Victoria managing a large area of the state between them. Both land managers have clear policy guidelines and responsibilities under a number of pieces of legislation including State and Federal heritage legislation and the *National Parks Act* 1975 which outline the responsibilities for the protection of cultural heritage within their land management boundaries (see Appendix 1). While small wildfires are common in Crown lands, very large fires are less common and the effects of such fires on the cultural heritage resource on Crown land has not so far been studied. This section reviews information about the impact of wildfires on cultural heritage resources.

2.2 The Wildfires in the Victorian Alps

2.2.1 Introduction

Southeastern Australia is one of the most fire-prone environments in the world. Victoria has a land area of approximately 22 million ha, one third of which is made up of State Forest, National Park and other reserves (Wareing and Flinn 2003: 1). Serious fires are not uncommon in Victoria, with large fires occurring in 1851; 1898; 1905; 1906; 1914; 1926; 1932; 1939 (Black Friday); 1942; 1944; 1952; 1962; 1965; 1968; 1977; 1980/81; 1983 (Ash Wednesday); 1985, 1998 (Caledonia River) and 2003 (8 January). Between 1926 and 1978, 260 lives were lost due to Victorian wildfires (Wareing and Flinn 2003: 1).

The 1939 and 1983 fires are considered the most significant of the 20th century. The 1939 fires burnt between 1.5 and 2 million ha of land, including portions of the eastern Highlands, the Otway Ranges, south-western Victoria and South Gippsland (Wareing and Flinn 2003: 1). The fires are said to have shaped the current forests in these areas. Extensive areas of Alpine Ash and Mountain Ash were destroyed (Wareing and Flinn 2003: 1). The 1983 fires burnt 210 000 ha of public and private land across western and central Victoria including grasslands, coastal heath, ash forests and alpine vegetation communities (Wareing and Flinn 2003: 2).

In 2002/2003 fires 80 outbreaks across eastern Victoria were ignited by lightning aided by a long period of drought that preceded the fires (Wareing and Flinn 2003: 5). It took 60 days to contain them, with over 1 million hectares of National Park, State forest and grazing land burnt (Wareing and Flinn 2003: 1). The long-term effects of the fires on water quality and stream biota as a result of overland flow and erosion was of particular concern (Wareing and Flinn 2003: 1). These effects were seen after storms on March 29 2003 when massive stream sedimentation followed sheet, rill and gully erosion in forested lands near Cobungra. Another incident on February 26 in the Buckland catchment caused downstream water supply problems for Porepunkah and Wangaratta (Wareing and Flinn 2003: 1). Smoke from the fires also tainted grapes and affected apple crops in areas of northeast Victoria (Wareing and Flinn 2003: 12).

2.3 Preliminary Assessment of the 2003 Fires on Cultural Heritage

It has been difficult so far to estimate the effect of large scale fires on cultural heritage. Anecdotal evidence suggests that forest fires have some impact but quantifying it has been difficult without some data. Following the Caledonia fire in 1998 Parks Victoria commissioned an archaeological survey in the affected areas and two small scoping studies were initiated immediately after the 2002/2003 fires which have provided some information (see discussion of David *et al.* 1998 below).

2.3.1 Southern Alpine Region

2.3.1.1 Caledonia Area (David et al. 1998)

David *et al.* (1998) conducted an assessment of the Aboriginal heritage values of the Caledonia fire area following a wildfire in December 1997–January 1998. The study region comprised an area bordered by Mount Wellington and the Moroka River in the south, Bennison Plains in the southwest, Mount Reynard in the northwest and the Watchtower in the northeast that had been affected by the 1997 wildfire. The area was sample surveyed with areas selected on the basis of known attributes commonly associated with Aboriginal occupation. These included association with water (river and creek valleys), topography (saddles, ridges, spurs), rock outcrops (Bogong moth habitat), vegetation types, and disturbance (David *et al.* 1998: 33). The results of the survey are discussed in Volume 1. But the results of the survey as they relate to fire impacts are quoted below

> Just over one third (36%) of all artifacts recorded were burnt (table 13). Clearly the intensity of the burn, the type of fuel and the location of the artefact are significant variables affecting the frequency of artefact damage from fire. Evidence for exfoliation of sedimentary rocks as a result of thermal damage was observed at various locations including Mt Reynard and Snowy Bluff. The visibility of local stone in this way contributes to visibility obstruction. (David *et al.* 1998: 51).

David *et al.* (1998: 60) also note that while the fire significantly improved the discovery of sites increasing the overall sample size compared to other surveys in forests, the increased sample size did not necessarily change the overall patterning. The increased leaf fall and charred ground surface may have decreased ground surface visibility in some areas, but seems not have affected the overall increased instance of site location (David *et al.* 1998: 62).

2.3.1.2 AAV Preliminary Survey in the Southern Alps Region Post the 2002–2003 Wildfires

A preliminary study of the impact of the 2002–2003 alpine wildfires was conducted by Aboriginal Affairs Victoria (AAV) staff and Indigenous communities, supported by DSE and PV regional staff in mid-April 2003 (AAV 2003). The Indigenous community representation included the Gippsland Regional Heritage Program, Gippsland and East Gippsland Aboriginal Co-operative Ltd and Moogji Aboriginal Council (AAV 2003: 2). The project focused on impacts within the Gippsland region and the southern part of the Alps (AAV 2003: 2). Small teams were used to assess impacts in a number of areas including Dinner Plain, Mount Hotham, Omeo, Orbost, Gelantipy, Suggan Buggan and Limestone Creek. The survey mainly focused on the effects of fire suppression activities particularly fire control lines (see below for description). These teams recorded about 50 previously recorded and new Aboriginal sites. Artefacts found on these sites were assessed, recorded and generally replaced in the sites, though several sites in Far East Gippsland were collected/salvaged at the instigation of Aboriginal representatives as they regarded some of the disturbed sites to have been totally destroyed (AAV 2003: 5). The results of this impact assessment suggested that fire control lines were highly damaging and were likely to be placed in archaeologically sensitive locations and would therefore most probably intersect with Aboriginal cultural surface sites as well as *in situ* sites (AAV 2003: 5).

The survey also assessed the impact of post-fire rehabilitation works such as dog fence replacement (AAV 2003: 6). The teams reviewed a number of proposed new fence lines (AAV 2003: 7). Some opportunistic survey of fire affected areas was also undertaken and a number of sites were located including artefacts scatters and some scarred trees (AAV 2003: 10).

The report (AAV 2003) summarised the achievements of the project as:

- Improved relationship between Government agencies and local Aboriginal groups.
- Improving the understanding of Cultural Heritage Management throughout the various government departments that are involved in land management.
- Understanding the probable impact of future Dog Fencing and Containment line works on cultural heritage values of the region.

- Locating sites of Aboriginal significance die to the excellent ground visibility as a result of the fire.
- Understanding the *extent* of Aboriginal sites that previously (prior to the fire) were not fully realized (AAV 2003: 11).

The results and recommendations from this study contributed toward the initiation of the present study.

2.3.1.3 Post Fire Indigenous Scoping Project Dargo District

A small survey was carried out by two PV Indigenous officers for PV in May 2003 in the Dargo Fire area. Three artefact scatters were located: two sites on the Crooked River, and one on the Wongungarra River on fire control lines. The survey team recommended that the sites be fully recorded and registered.

2.3.2 Northern Alpine Region

2.3.2.1 Northeast Fire Recovery Assessment: Aboriginal Cultural Heritage Impact Assessment (Kelly 2003)

A similar project to the AAV (2003) project was commissioned in the northeast alpine region by PV and the DSE (Kelly 2003: 5). Indigenous representation included Mungabareena Aboriginal Corporation, Taunaurong Clans traditional owners, Bangerang Cultural Centre and the Northeast Cultural Heritage Program. The survey areas to some extent overlapped with the southern survey area and included Mitta Mitta, Mount Beauty, Mount Bogong, South Buffalo, Buckland, Corryong, Stanley and Eldorado (Kelly 2003: 5–6). The survey approach was different to the Gippsland survey and was directed toward surveying a range of landforms within fire affected areas including lower river valleys and peripheral slopes, middle altitude watercourses and valleys, upper ridges, spurs and slopes, higher mountainous and sub mountainous valleys, ridges, spurs and mounts (Kelly 2003: 6). Environmental zones sampled include lower altitude riparian and sclerophyll forest zones, mid altitude riparian and Eucalypt forest zones, high altitude (mountainous and sub mountainous) heaths and snow gum forests, and steep slopes and spurs within the mountain/mountainous ash environmental zone (Kelly 2003: 6).

Mr Kelly's team also undertook some experimentation with heat effects on quartz that is of interest to this study. Results from this study showed that following a high intensity burn, despite showing little surface evidence of change (e.g. colour change), both natural and humanly modified quartz became more brittle and were thus more susceptible to secondary impacts and increased incidence of fracture (Kelly 2003: 7). The secondary fracture was distinguishable from humanly modified quartz by its blocky and angular fracture planes (Kelly 2003: 7). Low temperature burns (see below) had little impact with no colour change noted on artefacts, but an oily black surface residue was deposited on the quartz which tended to obscure fresh fracture planes. Kelly (2003: 7) thought it was likely that this residue would wash away in time.

The survey found evidence (sites and artefacts) of past human occupation in all environmental and landform zones with 12 Aboriginal archaeological sites found and recorded (Kelly 2003: 7). Kelly (2003: 7) also observed that while the impact from the fires had affected Aboriginal sites, it had enhanced ground surface visibility and provided increased opportunities for site discovery. However the impact of the fire suppression activities had been severe. In his recommendations he noted that low intensity fuel reduction burns have a much lesser impact on Aboriginal archaeological cultural resources than does the high intensity burn and extensive fire suppression activities associated with a wildfire (Kelly 2003: 9).

2.4 Impact of Fire on Cultural Resources

While the two preliminary impact studies (AAV 2003, Kelly 2003) have provided a limited assessment of the impact of the 2002–2003 alpine wildfires, a more detailed and extensive impact assessment of the fire affected areas on *all* Aboriginal cultural resources was required by the brief for this current study. Therefore, while a large proportion of the study focused on Aboriginal

archaeological sites, it was not confined to archaeological sites. The scope of the study encompassed a broader definition of Aboriginal cultural heritage resources.

2.4.1 Definition of Cultural Heritage Resources

The definition of cultural resources in this project includes both material and non-material resources. Pearson and Sullivan (1995: 4) define cultural heritage resources as

> Cultural resources are the result of humanity's interaction with or intervention in the natural world or its natural resources. . . . Cultural resources include all manifestations of humanity: buildings, landscapes, artefacts, literature, language, art, music, folkways and cultural institutions.

It is this broader concept of cultural heritage that has defined the scope of the study. Such places are also protected under the Commonwealth *Aboriginal and Torres Strait Islander Heritage Protection Act* 1984.

> The Commonwealth Act deals with Aboriginal cultural property in a wider sense and provides blanket protection to any places, objects and folklore that "are of particular significance to Aboriginals in accordance with Aboriginal tradition". Places may include archaeological sites or historical/spiritual places of contemporary significance to Aboriginal people.[7]

The cultural resources identified and assessed in this study therefore include 'Aboriginal Archaeological Sites', or those heritage places that have a material manifestation of past human activity. Such places can be detected through recognisable remains. These sites can include[8],

- Isolated artefacts.
- Artefact scatters.
- Scarred trees.
- Aboriginal quarries.
- Grinding grooves.
- Rock shelters.
- Stone arrangements.
- Rock art sites.
- Post contact sites.

The cultural resources also assessed include Aboriginal 'places'. Aboriginal places may have physical remains (for example, a mission site or a massacre site) or no remains (for example, a mythological association with place, such as the location of a spirit being). Aboriginal places may have been described in historic documents or be part of the oral history of the local Aboriginal people. The location of such places is generally established through interviews with Aboriginal knowledge-holders or through archival research, rather than archaeological survey; though once the location is known, archaeological survey may be used to investigate the location to see whether any cultural remains have survived. These places are highly significant to Aboriginal people and are protected by legislation. Such heritage places can be

- Associations with pastoralism/rural industry.
- Associations with settlements/towns.
- Associations with forests.
- Places where people independently congregated/frequented/travelled.
- Government administration of resources for Aboriginal people.
- Associations with the Church.
- Land reserved for Aboriginal people.
- Places of conflict.
- Places where people have died or been buried since contact.
- Places linked to significant people.

These places are more fully discussed in Volume 2.

[7] Source www.dvc.vic.gov.au/AAV

[8] See Glossary for terms

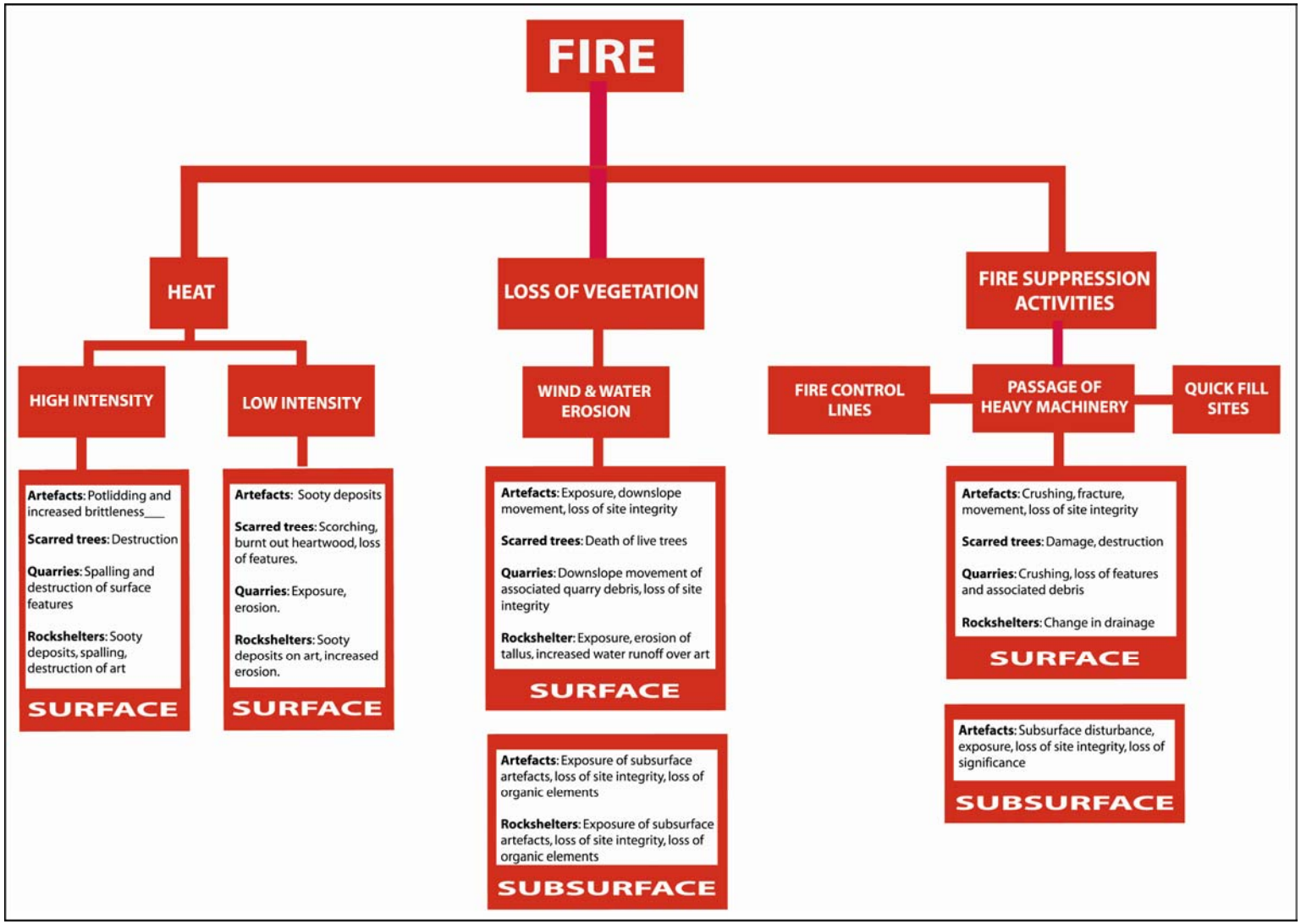


Figure 3: Potential impacts on archaeological cultural heritage resources by wildfire and suppression activities

The impact of wildfire on such places may be less tangible than on archaeological sites. Nevertheless the impact on such places can be no less significant. These issues are also assessed in this document.

2.4.2 Potential Impacts from Wildfires

Prior to the survey a review of literature and the preliminary studies highlighted a number of likely impacts. Impacts are divided into short-term and long-term (Wettstaed and LaPoint 1990: 2). The short-term effects are those associated with the fire and fire suppression activities, while long-term activities are those associated with erosion and rehabilitation works. The short-term impacts can be broadly divided into several categories including the effects of heat, defoliation and fire suppression activities. The impacts can be related to the intensity of the fire, type of archaeological site and to whether the material is located on the surface or subsurface. These impacts are shown in Figure 3. Impacts can vary in severity depending on the intensity of the burn. Einiger (1990) defines the intensity of burns as follows:

- Low intensity burn: 100–250° C. Soil temperatures do not exceed 100° C at a depth of 10–20 mm.
- Moderate intensity burn: 300–400° C. Soil temperatures may reach 200—300° C at a depth of 10 mm.
- High intensity burns: 500–750° C. Soil temperatures can reach 350—450 ° C at a depth of 10—20 mm and 100 C at 50 mm.

The heat impact does penetrate far into the soil until temperatures are high as the soils act as an insulating agent. The heat of the burn is determined by the fuel load (CDF 1998: Chapter 7). Experiments have shown that stone artefacts develop spalls (potlidding) above 350 ° C (Purdy and Brooks 1971). The impact of fires is therefore mainly on the surface sites, though subsurface materials may be affected by high temperatures when surface heat is transmitted by burning materials such as fallen logs (CDF 1998: Chapter 7).

2.4.2.1 Low Intensity Burns

Experiments have shown that low intensity burns have little or no impact on surface stone artefacts. Low intensity burns can be natural where fuel load is low or from prescribed burns. Generally impact is confined to blackening by the deposition of sooty deposits without alteration of original shape in any way (CDF 1998: Chapter 7). Scarred trees however are at great risk during even low intensity burns, suffering scorching, burning of the exposed heartwood and defoliation of live trees with some death and fall.

2.4.2.2 Moderate Intensity Burns

At moderate heat, stone artefacts can be damaged resulting in spalling. Organic remains such as pollen can be seriously affected (CDF 1998: Chapter 7).

2.4.2.3 High Intensity Burns

High intensity burns can result in severe damage to sites. Soot and smoke may leave deposits of soot on rock faces affecting art sites, while the intense heat on rock faces (e.g. granite) can cause severe exfoliation which may result in loss of art features. The high temperatures can result in fracture of silicious stone artefacts (CDF 1998: Chapter 7).

2.5 Mechanical Fire Suppression Activities

While wildfire may have a considerable effect on archaeological sites, mechanical suppression activities generally have the most devastating impacts on sites (Hanes 2001: 4). Fire suppression activities include hand clearance (rake hoe) and mechanical clearance of control lines, chain saw felling of trees and branches, passage of heavy machinery, access of water from rivers and water sources (quick fill sites), other access works (e.g. helicopter landing sites) and rehabilitation works.

2.5.1 Fire Control Lines

Fire control lines are cleared for several reasons: to provide a fire break, to provide a location from which a backburn be initiated, to provide better access for larger fire fighting vehicles and to protect property. The control line may be an extension laterally of an existing track or a wide swathe cut through vegetation in a key location. Surface vegetation is removed back to mineral earth either by a mechanical excavator (bulldozer) or by hand (rake hoe). Surface disturbance can be minor or extensive.

During the construction of fire control lines artefacts may be moved, crushed and mixed. Subsurface materials may be exposed and disturbed. Delicate features such as *in situ* hearths may be completely dispersed. Sites may suffer a complete loss of integrity with resulting loss of potential information. It is important to recognise that when this occurs the loss is permanent and irreplaceable. Where Aboriginal sites are extensive and the fire containment lines are narrow, a substantial portion of a site may remain undisturbed. Smaller sites may be totally disturbed or destroyed.

2.5.2 Passage of Heavy Machinery

In heavily forested areas in the alpine regions, thick vegetation obscures the ground surface so that there are few areas where the ground can be adequately inspected for archaeological sites. As a result tracks have provided many archaeological surveys with the primary window for locating surface archaeological materials and many sites are known to exist on tracks. Generally these tracks have limited traffic which for the most part comprises small four-wheel drive vehicles, though they are maintained by grading involving movement of material from the track sides and then reshaping/cutting of a new surface and new rollover drainage bars every three to four years. In those areas where timber harvesting takes place, heavy logging trucks impact heavily on dirt tracks. During fire fighting activities, some tracks may suffer heavier and more frequent traffic than normal. Sites on these tracks may be more affected by this traffic than the passage of smaller vehicles. Impacts include, crushing and displacement of artefacts, erosion and movement during run-off, exposure of subsurface artefacts and loss of site integrity.

2.5.3 Water Access Locations

When water is needed for filling tankers for fire suppression activities, tankers may fill up repeatedly in one location. Vehicles may back and turn on river terraces, banks, and lake and pond sides with consequent churning of damp sediments. These locations are commonly of high sensitivity for Aboriginal sites. Stratified *in situ* sites with high scientific potential are sometimes found in such locations so that these activities have the potential to impact on scientifically significant sites.

2.5.4 Other Access Works

Other clearance works may also be carried out including track widening and the clearance of vegetation for helicopter sites to provide access into remote areas. These activities may have the same impacts as the construction of fire control lines discussed above. Chain saws may be used to fell trees for clearance, potentially impacting upon scarred trees which if not recognised may be felled or damaged.

2.5.5 Rehabilitation Works

Following fire suppression activities every effort is made to restore the environment to its original condition as far as is practical. Rehabilitation works may include closure of tracks, repositioning of felled timber across fire control lines, and replanting and sediment traps. As above these activities have the potential to substantially disturb both surface and subsurface cultural materials. Scarred trees may be felled or damaged.

2.6 Impact of Wildfire and Suppression Activities on Aboriginal Places

It is important to note that while widespread damage to cultural sites may result from wildfire suppression activities and the fire itself, the cultural landscape comprises a wide diversity of cultural values including cultural, spiritual and historical places which may or may not have known material

remains. However, it should never be assumed that because a place or landscape feature is a known Aboriginal spiritual or named place that it is not associated with material remains which could be damaged. Similarly, if a place has no remains, damage to the 'sense of place' may occur anyway when disturbed by fire or suppression activities. Only Aboriginal people, particularly those with knowledge about a particular place can assess whether damage has occurred, albeit physical or less tangible.

2.7 Conclusion

There is relatively little information about the impact of wildfire and fire suppression activities on Aboriginal cultural sites, though a brief review of available literature both here and overseas suggests that there are consistencies between the effects of fires in widely differing environments in Australia and the United States. This information is compared to results collected from the survey in the 2003–2004 alpine bushfire impact areas in the following sections. A risk analysis and management options are developed based on the results of the survey.

3 Methodological Procedures and Results

3.1 Introduction

One of the aims of the survey was to observe and collect data on the effects of the 2003–2004 wildfires on Aboriginal cultural resources in the fire affected areas. Other aims and results are discussed in Volume 1 and 3. This section briefly describes the methodology used for data collection, analysis of results specifically relevant to the development of the management options, heritage action plans and the risk analysis.

3.2 Collection of data

The survey sampling strategy was largely dictated by the distribution of fire effects (see survey methodology Volume 1). The survey strategy did not purport to be random but focused on survey in fire affected areas. Virtually all survey undertaken for this project was undertaken in either fire affected areas or in locations affected by fire suppression activities. A small percentage of survey transects (c. 15%) were located in areas which were opportunistically inspected or deliberately targeted in fire affected areas but were neither fire affected or affected by fire suppression activities.

It was not possible to get an even spread of transects across fire intensity zones as the major effort made by survey parties was to achieve a reasonable sample of survey transects over different land forms, different environmental zones and in locations necessary to test predictive modelling. Nevertheless information was collected over a wide range of fire affected areas. This data forms the basis for the statements made below which underpin the management principles.

Collection of data was both systematic and incidental. Information about fire impact was collected for each site location and survey transect, but also while travelling between survey sample areas. It was quite difficult to judge the intensity of the burn. While the difference between high intensity and low intensity was clear, the demarcation between low and moderate and moderate and high is more difficult. Criteria used to judge intensity were:

Low intensity—light scorching and burning of trees and undergrowth, strong regrowth.

Moderate—moderate scorching, undergrowth more or less destroyed. Regrowth present.

High—Crowns destroyed, some dead and fallen trees, undergrowth destroyed, light to no regrowth.

3.3 Results

While there was a range of fire intensity effects across all study areas, some study areas were more fire affected than others. Study Area 2 and 8 (Bundarra/Glen Valley and Mitta Mitta/Dartmouth) were severely affected across large areas and the greater proportion of areas surveyed within these units had been subject to high intensity burns. Study Units 3, 11 and 14 (Gibbo River, Mount Sarah/Winchester/Dargo High Plains, Dargo 2) had more evidence of moderate or low intensity burns. Survey Units 10 and 6 (Buffalo National Park and Yalmy Road/Moonkan Track) had many survey units which were hardly fire affected. In both these two units access into fire affected areas was particularly difficult and the majority of transects were surveyed in unaffected areas.

Based on the results of the surveys a number of conclusions/statements can be made about the impact of wildfire and wildfire suppression actives in the alpine region during the 2003–2004 wildfires.

Table 1: Site density per hectare

Unit No.	Survey Unit	Average visibility (%)	Effective coverage (ha)	No sites located	Site Density (sites per ha)
9	Stanley State Forest	20	4	1	0.3
5	Mt Taylor/Tubbut	39.6	31.2	19	0.6
4	Tambo	29.1	13.5	10	0.7
12	Mount Mittamatite	58.6	14.1	11	0.8
7	Nariel/Pinnibar	16.5	13	16	1.2
6	Yalmy Road/Moonkan	71.4	5.1	10	2.0
8	Mitta Mitta Dartmouth	42.2	13.5	28	2.1
14	Tom Groggin	54.2	5.7	13	2.3
3	Gibbo	66.4	12	31	2.6
11	Mount Selwyn	23.9	7.7	23	3.0
10	Buffalo N.P.	42	7.4	27	3.6
1	Mt Sarah/Winchester/Dargo	55.9	15.4	60	3.9
2	Bundarra/Glen Wills	63.8	6.4	25	3.9
13	Dargo 2	53.4	7.9	51	6.5
	Totals		**156.9**	**325**	

3.3.1 Fire Intensity

3.3.1.1 Site Discovery in relation to Site Frequency

Sites were more frequently discovered in transects in areas which had suffered intense burns, but this statement is qualified by a further statement that this was only true 'if sites were there' (Table 1). The relationship between exposure, site discovery and site patterning is very complex and not easily quantified.

Plate 1: View upslope below the Omeo Road, Bundarra

Plate 2: Typical vegetation regrowth and visibility on the Bundarra River near the Bundarra Big River Confluence, Study Area 2

For instance, in many transects in the Gibbo River and Mitta Mitta/Dartmouth units, intensely burnt areas were in locations considered sensitive for Aboriginal sites, but no archaeological material

was found. Although alluvial mining had grossly affected many creek and river corridors, sites were equally rare on major ridgelines. While not all sites are surface sites and it is possible that sites were subsurface in these locations, sufficient erosion had taken place to make this unlikely. It is likely in these areas that the good visibility and lack of sites is providing crucial information about the actual distribution of sites across the landscape. Generally it is difficult to argue for areas of low occupational intensity without sufficient data from areas of good visibility, so that these areas provide important insights into the probable occupation patterning in the alpine and sub-alpine landscape.

The high discovery rate in the Dargo 2 Unit (see Table 1) is not directly related to the intensity of burning in this study area. Many sites were found in unburnt areas in the major river valleys. This survey took place toward the end of the project by which time the predictive modelling was being tested with good discovery rates.

Site location in river corridors and creek lines was facilitated by the impacts of the wildfires, even a year after the fires. Regrowth following intense fires was generally stronger in river and creek corridors which lowered the overall site count in this landform. However while this was true for low or moderate intensity burns, in areas where high intensity burns had occurred, regrowth was still poor a year later which provided near perfect conditions for the location of sites. Many large sites were found along the Big River where under normal conditions dense undergrowth would have covered the sites and they would not have been found (Plate 2).

A critical factor for the location of sites was the presence of erosion. Environments where surveys were commonly conducted would normally be considered to be aggrading environments. In such areas artefacts would commonly be buried, although past timber getting practices are likely to have disturbed artefacts and brought them to the surface. Following high intensity fires severe defoliation has led to severe sheet erosion in many sloping areas, with small pockets of erosion and exposure on flatter areas. This has led to local and intermittent exposure of small sites in flatter areas and exposure on a wide scale. This was particularly prevalent in areas underlain by granite or granite-gneiss geology (for example the Bundarra, Buffalo, Mitta Mitta/Dartmouth and Gibbo River units).

Mountain Ash forests seem to burn with a high intensity, often on steep slopes and associated with sheet erosion. However, very few sites were found in these forests (N=17; 5.2%). Ash forests are relatively darker and wetter than other forests and may have been frequented less or have fewer resources. It is interesting that this lowered site incidence correlates somewhat with Aboriginal stories which tell of *Dulagars* (mythical and scary forest spirits) that live in the wetter forests (Eadie Terrick Interview 2002). These stories are widespread among people who have access to the ash forests of southeastern Australia (Annette Xiberras Interview 2004).

Alpine and sub-alpine grasslands seem less affected by fire, either subject to lower intensity burns or strong regrowth. There was almost no visibility in such locations. Small pockets of visibility in these areas were provided by burnt heathy plants and snow gums (Plate 3). Despite the poor visibility, sites were frequently found in these small circles of visibility surrounded by dense grass. It is difficult in such circumstances to determine whether sites are located on the edge of the grassy plains in the snow gum as the current distribution suggests or whether artefacts are distributed more widely across the plain. However, the small windows of visibility suggest sites are common in these areas and while fires will have a low impact on surface scatters, fire control lines and other suppression activities in such areas may have a severe impact.

Plate 3: Burnt heath in snow gums below Mount Loch 10 (AAV 8324-0121)

Several rockshelters were located in survey units 1, 3, 10, and 11. Defoliation had significantly contributed to the location of some of these shelters. Two shelter sites at Mount Cope (Mount Cope 3 and 6 (AAV 8324-0154, 0155) were found because dense vegetation surrounding the entrance to these shelters had been burnt revealing the opening. This area had been previously surveyed by Hughes and Clark (2002) and the shelters had not been located (Plate 4).

Plate 4: Burnt vegetation in front of Mount Cope 6 (AAV 8324-0155) (view east)

3.3.1.2 Site Impacts

Scarred Trees

Very few scarred trees were found during the survey. Scarred trees are above ground features and are unaffected by the site visibility problems affecting surface sites. Scarred trees must have once been common in the alpine and sub-alpine regions. They would have been associated with possum hunting (footholds), shield and bowl making and particularly with the provision of bark shelters. The low incidence is unlikely to be related to the 2003–2004 wildfires, but a combination of many factors including timber harvesting associated with mining in the 19th century, timber harvesting in the 20th century, and death due to age and previous wildfires. No scarred trees were found on the ground with the exception of scarred trees at Mount Sarah which the survey team concluded were natural scars (see Volume 1).

Artefacts Scatters

Artefact scatters were the dominant site type located (N=236, 72.6%). The wildfire had minimally affected the artefacts themselves. While most quartz artefacts and coarse-grained artefacts had sooty deposits, other raw materials seemed unaffected (Plate 5). Only one fine grained quartzite artefact showed evidence of more severe heat impact. The artefact showed evidence of spalling, with one pot lid spall evident. The artefact was found in site Precipice Plain 1 (AAV 8323-0073) in a burnt area of snow gums. It is likely the more intense heat was caused by fallen burning snow gum branches. There was no evidence that larger artefacts including grindstones and axes were affected by the fire intensity, nor were artefacts found to be more brittle as suggested by the Kelly (2003) experiment.

Plate 5: Sooty deposits on quartz

Grinding Grooves

In situ grinding grooves found in several locations were unaffected by fire intensity and there was no evidence of spalling or other heat effects.

Plate 6: Sooty deposits on other materials

Rockshelters

Rockshelters located in survey units 1, 3, 10, and 11 were unaffected by the fires. In most there was little evidence of sooty deposits or exfoliation. It is likely that the burn intensity in these areas was quite low. In a rock shelter on the summit of The Brothers, in study unit 3, there was severe exfoliation, but the fuel load around the site was minimal

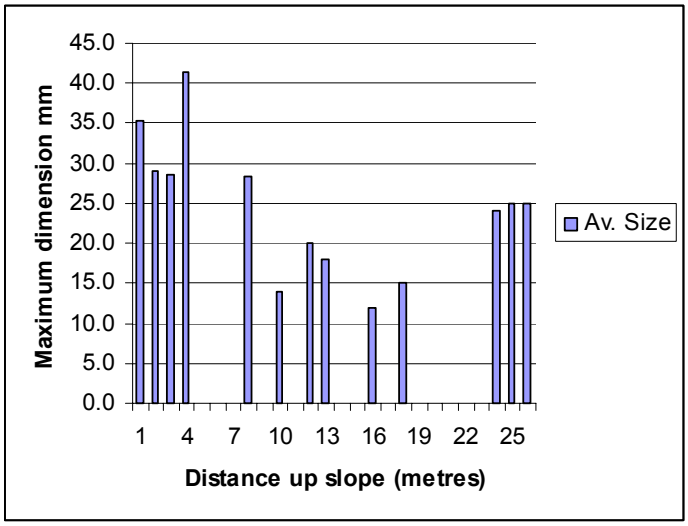
and the burn intensity looked low. It is likely that exfoliation in this shelter is due to other factors including frost, or older burns.

Quarry Sites
No fire impacts were observed in quarry sites other than sooty deposits on outcrops and associated debris.

3.3.2 Erosion

3.3.2.1 Artefact Scatters

Figure 4: Maximum artefact dimension plotted by location on slope



Erosion caused significant impacts to sites throughout all units but the damage is hard to quantify without carrying out detailed and lengthy observations. There was some evidence from sites on the Omeo Road (Omeo Road 1 and 2 (AAV 8423-0029, 8324-0110) that artefacts were being washed downslope as much as 30 metres. Artefacts from Omeo 1 (AAV 8423-0029) were found in a gully at the base of the slope below the site (Plate 7). The most parsimonious explanation for their presence in this location is downslope movement.

There are two ways of inferring movement downslope from sites: intermittent monitoring of tagged items in a site and assessment of size sorting. Smaller artefacts will move further than larger items so that documentation of size sorting can infer movement. The maximum dimension of artefacts against location was measured on a sloping transect on site Omeo 1 (Figure 4).

Plate 7: Site Omeo Road 1 (AAV 8423-0029), showing slope down to the Omeo Road

While numbers are quite small (N=24). There is no significant clustering of smaller artefacts at the foot of the slope (1 metre). However, slope was gentle in this location and major effects would most likely be seen on steeper slopes. Observation over a number of such sites suggests that movement is occurring with consequent loss of site integrity. The figure shows that bigger items are located at the foot of the slope.

3.3.2.2 Other Site Types

There were no significant impacts caused by erosion observed on other site types.

3.3.3 Fire Suppression Activities

A good sample of survey transects involved locations where fires suppression activities had taken place including fire controls lines, quick fill sites, helicopter pads, and rehabilitations works.

3.3.3.1 Fire Control Lines

A large amount of survey was conducted on fire control lines. Control lines ranged from narrow additions to existing tracks (Plate 9) to broad swathes cut through the forest (Plate 8). Disturbance ranged from moderate to extremely disturbed. There were no examples of very minor disturbance.

Plate 8: Wide control line, Yalmy Road (Snowy River N.P.)

The survey found that fire control lines had disturbed large sites on a small percentage of control lines. Generally disturbance was to small sites. Two control lines were constructed where clusters of sites were known and registered with AAV (Moonkan Track, Varneys Track) and damage to the sites could conceivably have been avoided through in both instances.

Plate 9: Narrow extension of track at Mount Sarah (possibly old control line)

However, the known sites were quite small scatters and the eventual size of the scatters as revealed by the fire control lines could not have been anticipated given the known information (Plate 10). At Dinner Plain an enormous scatter was disturbed by a long fire control line. No sites were previously known in this location, but an extremely large site had been located north of the Hotham Road on Dinner Plain which suggested the area might be quite sensitive and some impact could have been predicted.

The Yalmy Road fire control line on the edge of the Snowy River National Park was thoroughly surveyed and despite its size and length and the level of disturbance, only four small lithic scatters were found (AAV 8623-0076-079) (Plate 8). The area is steep and rugged, forests are relatively damp and distant from major waterways, and good stone resources are also relatively distant in the Snowy River corridor. By contrast the Moonkan Track and Varneys Track control lines in the Snowy River N.P. were in an area close to the Snowy River, located on a ridgeline which parallels the river for some distance, intersects with other ridgelines, is close to a shallow river crossing, is in drier forests and located close to major resource zones and on relatively gentle relief (at the intersection) (Plate 10). The major point to be drawn from the differences in impact on these fire control lines is that the impact to sites could have easily been predicted in both cases from the known archaeology and current predictive modelling.

Plate 10: Varneys Road (view west)

Survey around control lines often showed that the greater portion of sites existed outside the control lines in more undisturbed areas. Even with very large sites, where disturbance from the control lines was substantial, the greater portion of the site remained intact on either side (e.g. the Dinner Plain F.C.L.). This has implications for the placement of critical control lines in archaeologically sensitive areas to minimise impacts (see Volume 3 and management principles in this volume).

By contrast, many fire control lines were constructed beside tracks on very narrow ridgelines (e.g. Blue Rag Range Track and Mount Sarah Track). There is generally a low density background scatter of artefacts along narrow ridgelines in the higher parts of the Dividing Range, with some small denser patches between this background scatter. Consequently where tracks and control lines occupy narrow ridgelines, the control lines may completely destroy a large number of sites.

Plate 11: Dinner Plain Track near Hotham (view south)

3.3.3.2 Quick Fill Sites

A number of areas that had potentially been used as quick fill locations were found on the Snowy Creek, Gibbo and Buffalo rivers. Despite obvious disturbance at these locations, no sites had been disturbed in these sensitive locations.

3.3.3.3 Helicopter Pads

Several helicopter pads were inspected during the survey including the Hollow Way Pad (Mitta Mitta Dartmouth Survey Unit), and the Mount Sarah Pad (Mount Sarah/Winchester/Dargo High Plains). Helicopter pads provided good survey quadrats as they were usually well cleared and located on high points. No sites were found on any of the helipads.

3.3.4 Rehabilitation Works

During the survey it was noticed that major rehabilitation works had already commenced along fire control lines in many locations. A number of sites were found in rehabilitated locations (Plates 11 and 12). It is likely that where sites have been found on fire control lines the construction of the original fire control line initiated the disturbance to the site, but this has been compounded by the rehabilitation works. In the rehabilitated lines, felled trees, originally pushed into windrows, have been dragged back across the line to prevent access, provide sediment traps, prevent erosion and encourage regrowth of vegetation. The action of dragging the trees from the windrows has disturbed the ground surface and sites further, though the stabilisation of erosion will contribute to the stability of any undisturbed portion of the site.

Plate 12: Rehabilitated fire control line Tea Tree Spur, south of Mount Sarah (Study Area 1).

3.4 Impact to Non Material Cultural Heritage Values

See Volume 3 for a discussion of these issues, though the general view from a discussion with traditional owners and Aboriginal communities was that fire was natural and its affect on places and was part of 'nature' and had been going on for thousands of years (Dinner Plain Workshop, Volume 3). This view did not extend to fire suppression activities where the general view was that there had been a general impact on what was considered to be a cultural landscape extending over the entire alpine region. However, there was also acceptance that fire suppression activities had to take place to protect life and property and the natural values of the alpine region.

3.5 Summary of Impact on Aboriginal Cultural Sites

The following statements can made about the effects of the fire and associated fire suppression works:

- The survey located 319 Aboriginal sites (six historic sites).
- Few sites were discovered in areas which had not been burnt 39 (12%). (See Volume 1 for a comparison between site discovery rates in burnt areas versus the rates in unburnt areas).
- Fire control lines had disturbed or exposed 43 (13%) sites. Damage to these sites included loss of vertical and spatial integrity and breakage of artefacts. No specific damage to scarred trees was noted, but this has been found in other surveys.
- A larger proportion of sites had been exposed or disturbed by access tracks (N=57, 17%). Damage included loss of spatial and vertical integrity and breakage of artefacts.
- Most sites discovered were found off tracks and control lines and had been had been exposed by the destruction of the vegetation and subsequent erosion. Damage to these sites involved mainly loss of spatial integrity.

3.6 Risk Management Assessment

Based on the results of the survey (see Volume 1) and the results of the fire impact analysis, a risk analysis has been summarised in the table below (Table 2).

Table 2: Impact Assessment for Fire and Fire Suppression Activities

Impact Agent	Site Type	Impact rating	Effects/Impacts
Fire Intensity			
High intensity burn	Scarred tree	**Severe**	High intensity burn may destroy tree, kill tree or burn out heartwood. Even a low intensity burn may destroy tree if there is sufficient fuel around tree.
	Rock art site	**Very high**	High intensity burn of vegetation or other material close to shelter may cause severe exfoliation and loss of art, sooty deposits and blackening of art, increased erosion and weathering.
	Rock shelter	**High**	High intensity burn of vegetation or other material close to shelter may cause severe exfoliation, increased erosion and weathering, erosion of any talus deposit.
	Quarry	**High**	High intensity burn may cause cracking and spalling and loss of surface features and post bushfire erosion and displacement of associated debris.
	Grinding groove	**High**	High intensity burns likely to cause cracking and spalling.
	Artefact scatters	**High**	High intensity burns will initiate erosion and loss of structural integrity and spalling in silica-rich materials.
Moderate intensity burn	Scarred tree	**Moderate**	Moderate intensity burn may severely scorch tree and compromise it. Fire control lines may damage trees and occasionally destroy trees.
	Grinding groove	**Moderate**	Moderate intensity of burn may cause cracking and spalling at higher temperatures.
	Artefact scatters	**Moderate**	Even a moderate intensity burn may initiate erosion in susceptible sediments (e.g. granite or granite-gneiss).
Cool burn	Scarred tree	**Low to Moderate**	Depending on fuel load in surrounding areas, scarred trees may be at risk of destruction from cool burns when fuel load is high and close.
	Artefact scatter	**Low**	Low to moderate intensity burn will cause little damage; high intensity burn will

Impact Agent	Site Type	Impact rating	Effects/Impacts
			cause some spalling in silica rich materials.
	Grinding groove	**Low**	Low intensity burn unlikely to damage site, though there may be some deposit of soot.
	Quarry	**Low**	Low to moderate intensity burn unlikely cause much damage.
Prescribed Burn			
Cool burn	Scarred tree	**Moderate**	There is a moderate risk to scarred trees unless the tree is identified and potential fuel load is not cleared from around tree.
	Artefact scatter	**Low**	Minimal to no impact.
	Grinding groove	**Low**	Minimal to no impact provided slow burning fuel is cleared from around grooves.
	Quarry	**Low**	Minimal to no impact provided slow burning fuel is cleared from outcrops.
	Rock shelter	**Low**	Minimal to no impact provided a buffer zone is cleared from around the shelter site.
	Rock art site	**Low**	Minimal to no impact provided a buffer zone is cleared from around the shelter site.
Fire Suppression Activities			
Control lines	Artefact scatter	**Severe**	Where control lines are placed on flat areas where flat land is at a premium, on flatter ridgelines, river flats, terraces, gentle spurs above rivers.
	Scarred tree	**Severe**	Tree may be pushed over or destroyed during fire containment line construction.
	Quarry	**High**	Sites are uncommon, so risk of impact is low. Risk may be reduced to negligible if quarry is marked/identified.

Impact Agent	Site Type	Impact rating	Effects/Impacts
	Rock shelter	**High**	Impact may be high if fire containment line is put close to rock shelter and damages deposit extending out into the talus.
	Rock art site	**High**	Impact may be high if fire containment line or other activities change drainage in the area and water runs into the shelter.
	Scarred tree	**Low**	Scarred trees are uncommon in the study areas. Risk to tree may be reduced to negligible if tree is marked or identified and fuel load in surrounding area is reduced.
	Artefact scatter	**Low**	Where control lines are placed on steep slopes.
	Grinding groove	**Low**	Sites are uncommon, so risk of impact is low. Risk may be reduced to negligible if grooves are marked/identified.
	Rock shelter	**Very low**	Minimal impact to the rock art site if activities clear surrounding area but do not impact on talus.
	Rock art site	**Very low**	Minimal impact on the rock art or shelter if activities clear fuel from the area but do not impact on drainage.

4 Context of the Management of Cultural Heritage Values

4.1 Statutory Legislation

Cultural heritage remains, both Aboriginal and non-Aboriginal are a record of the past occupation of the landscape by Aboriginal people and by later immigrants. They have the potential to provide a different record of the past than that provided by written records and to record much longer periods of time. Their value lies in their relevance to current communities. As the urban development of the environment continues, pressure increases on this diminishing resource. When archaeological remains are disturbed or destroyed, the information lost is irretrievable. These remains are an important heritage for all Australians and their protection is recognised as important and worthy of legislation. All heritage remains are protected by legislation (see Appendix 1).

The legislation governing the protection of heritage remains forms an important component of their management. The relevant components of the legislation are discussed in this section, followed by the recommended management actions in the event that Aboriginal remains are unexpectedly located.

4.2 Statutory Protection of Aboriginal Sites (Source AAV)

With the exception of human remains interred after 1834, the Victorian *Archaeological and Aboriginal Relics Preservation Act 1972* provides protection for all material relating to the past Aboriginal occupation of Australia. This includes individual artefacts, scatters of stone artefacts, rock art sites, ancient camp sites, human burials, scarred trees, ruins and archaeological deposits associated with Aboriginal missions or reserves. The Act also establishes administrative procedures for archaeological investigations and the mandatory reporting of the discovery of Aboriginal sites. Aboriginal Affairs Victoria administers the *Archaeological and Aboriginal Relics Preservation Act* 1972.

The Commonwealth *Aboriginal and Torres Strait Islander Heritage Protection Act* 1984 provides protection for Aboriginal cultural property in Victoria. The Commonwealth has delegated specific powers and responsibilities to the Victorian Minister responsible for Aboriginal affairs. This delegation is held by the Hon. Gavin Jennings MP. The legislation is administered by Aboriginal Affairs Victoria.

Whereas the State Act provides legal protection for all the physical evidence of past Aboriginal occupation, the Commonwealth Act deals with Aboriginal cultural property in a broader sense. This cultural property includes any places, objects and folklore that 'are of particular significance to Aboriginals in accordance with Aboriginal tradition'. There is no cut-off date and the Act may apply to contemporary Aboriginal cultural property as well as older sites.

The Commonwealth Act takes precedence over State cultural heritage legislation if there is conflict. In most cases, Aboriginal archaeological sites registered under the State Act will also be Aboriginal places subject to the Commonwealth Act.

4.3 Significance of Aboriginal Sites

As a general principle all Aboriginal sites are considered to be of high cultural significance to Aboriginal people as they are a tangible link to their past. The archaeological record is the primary record of the pre-contact period of the Aboriginal occupation of Australia, so that all manifestations of this record are significant to Aboriginal people.

Similarly all Aboriginal sites are of some scientific significance as they are a non-renewable resource. The Australian ICOMOS Charter for the Conservation of Places of Cultural Significance (The Burra Charter) examines the significance of archaeological sites and heritage places and proposes a methodological procedure for establishing significance, which has generally been adopted by heritage professionals and which has been used for the assessment of sites and places in this report (Australia/ICOMOS 1988).

Significance is defined in the Burra Charter by a limited range of criteria and values: 'aesthetic, historic, scientific or social values for past, present or future generations' (Marquis-Kyle and Walker 1992: 21). Aesthetic, social and historic values are not generally assessed for Aboriginal pre-contact sites (for more information about these values see Appendix 2). Scientific significance is the most commonly assessed value for pre-contact sites, though other values may be assessed for post-contact or cultural sites and places. Significance of Aboriginal sites is discussed in Volume 1 and an assessment provided of all sites recorded in the survey.

The management principles discussed in the following section are based on the Aboriginal assessment of cultural significance rather than potential scientific significance of sites, so that all Aboriginal cultural sites should be regarded as highly significant and protected accordingly.

4.4 Areas where Potential Archaeological Deposits May Occur (Sensitivity)

Heritage legislation protects both known and unknown archaeological remains (see Appendix 1 for a discussion of this matter). Good management of archaeological heritage values entails a process, which manages both the known and unknown values. The unknown values are best managed by analysing survey data and known heritage values to predict those locations where there is rated probability that archaeological deposits may occur. Generally these areas are called archaeologically sensitive zones. The location of sensitive areas is discussed more fully in Volume 1.

5 Management Principles

5.1 Introduction

While the survey has made a number of observations regarding the impact of both the fires and fire suppression activities on Aboriginal cultural heritage, the management of risk of impact to Aboriginal cultural values is complex and will need to be integrated into PV and DSE protocols, policies and OHS practices to provide the best and most practical process. Detailed operational recommendations are therefore beyond the scope of this study and will be addressed in a subsequent study. This volume therefore provides the context to develop best practice management procedures through a set of principles. These are listed in the table below.

The principles reflect the results of the survey, the fire risk management process, consultation with Aboriginal community representatives and consultation with agency fire management officers. Further issues and concerns voiced by Aboriginal community representatives and traditional owners are discussed in detail in Volume 3.

Table 3: Management principles

STRATEGY	PRINCIPLE	OBJECTIVES	ACTIVITY/ACTIONS
Wildfire Prevention and Preparedness	Fire prevention planning and preparedness planning should take place in collaboration, and cooperation with Indigenous stakeholders to facilitate the protection of Indigenous cultural values	Re-affirm the principles of the state-wide Code of Practice for fire management on public land.	Consult with the relevant Indigenous stakeholders when reviewing the Code of Practice. Update the Code of practice to provide the highest possible standard for heritage protection.
		Develop, maintain and improve consultation and communication with Indigenous stakeholders in the fire district.	Identify all appropriate Indigenous stakeholders. In consultation with Indigenous stakeholders develop a consultation and communications strategy for the fire district. Implement the strategy and ensure on-going consultation with appropriate Indigenous stakeholders. Develop a program of which promotes the understanding of the fire management process/system amongst the Indigenous community and relevant stakeholders.
		Promote increased awareness of Indigenous cultural heritage values among fire managers and fire suppression personnel.	Support and maintain current departmental programs in Indigenous cultural awareness.
		Plan to provide the highest possible heritage protection during fire suppression activities.	In consultation with Indigenous stakeholders, heritage planners and fire managers identify risks, areas at risk, degree of risk and fire suppression methods used in the fire district. In consultation with Indigenous stakeholders develop suitable fire suppression protocols which minimise or avoid impact to both known and unknown Aboriginal cultural values. In consultation with Indigenous stakeholders identify key heritage value areas and develop fire suppression

STRATEGY	PRINCIPLE	OBJECTIVES	ACTIVITY/ACTIONS
			heritage action plans for these areas. Develop a cultural heritage risk/fire suppression prescription matrix for each fire district and incorporate the matrix into the fire management plan. Ensure fire managers and fire fighting teams are trained in heritage site recognition, protection measures, appropriate management and reporting protocols. Develop protocols for the provision and protection of essential heritage information to Incident management teams (IMTs) for all fire districts. Carry out a program of training to IMTs accessing and using the heritage information. Identify, train and maintain a rapid response Indigenous heritage team/contact person for each fire district for each fire season. Develop a program of orientation and training in incident management for the Indigenous community.
		Prescribed burns are planned to minimise impacts to Aboriginal heritage values.	Consultation is undertaken with Indigenous stakeholders during planning for prescribed burns to ensure impact to Aboriginal cultural heritage values is minimised or avoided. Consultation is undertaken with Indigenous stakeholders to assist management of cultural heritage sites and places through prescribed burns in sensitive locations. Consultation is undertaken with the Indigenous rapid response team/person in a timely way and agreed protocols regarding information sharing are supported.
Wildfire Suppression	During any fire event, Aboriginal cultural heritage values should be protected and managed in a cooperative, strategic and	Relevant information which supports best practice heritage protection during wildfire suppression activities is provided	The Indigenous rapid response team/person and IMT will ensure ongoing communication and consultation where necessary throughout the incident.

STRATEGY	PRINCIPLE	OBJECTIVES	ACTIVITY/ACTIONS
	sensitive way	in a timely way.	
			The IMT will ensure that all necessary information is communicated to the fire fighting teams in a timely way.
		Any identified threats to the integrity of Indigenous heritage values will be managed and addressed in a culturally appropriately way and in partnership with the Indigenous community.	Fire fighting teams will endeavor to identify cultural heritage sites, locations where they might occur and threats to cultural values where practical.
			The teams will ensure the appropriate fire suppression method is used which best protects cultural heritage in the given circumstance.
			The fire fighting teams will report any disturbance or exposure of cultural heritage values in a timely way to the appropriate person.
			Ensure communication strategies are reaffirmed for the reporting of threats to cultural sites or the discovery of cultural sites.
Wildfire Recovery	Following fire events, threats to Indigenous cultural sites are identified, necessary management is undertaken, and advantage is taken of further survey opportunities	Management of impacts to any cultural sites is carried out in consultation and collaboration with the relevant Indigenous stakeholders.	Following a wildfire reported impacts and impacts to potential Aboriginal heritage values are identified.
			Impact management plans are developed with Indigenous stakeholders. Management works are carried out with Indigenous stakeholders consistent with heritage management guidelines.
		Fire rehabilitation and recovery plans are developed in collaboration with Indigenous stakeholders to minimise impacts to known and unknown Aboriginal heritage values.	Urgent fire rehabilitation work carried out behind the wildfire front is planned and carried out without impacting on known and unknown Aboriginal cultural values.
			Fire rehabilitation works are planned in consultation with the Indigenous stakeholders to minimise or avoid impact to Aboriginal values consistent with appropriate rehabilitation methods.

STRATEGY	PRINCIPLE	OBJECTIVES	ACTIVITY/ACTIONS
		Good management of Aboriginal cultural values in Crown land reserves is enhanced by further investigations in fire affected areas.	A targeted program of Indigenous heritage assessment is carried out where possible in fire affected areas to assist in management planning, increasing knowledge and awareness and in planning management works.

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APPENDICES

Appendix 1: Legislative Requirements

Aboriginal Sites (Source AAV)

VICTORIAN STATE LEGISLATION

With the exception of human remains interred after the year 1834, the State *Archaeological and Aboriginal Relics Preservation Act 1972* provides protection for all material relating to the past Aboriginal occupation of Australia, both before and after European occupation. This includes individual artefacts, scatters of stone artefacts, rock art sites, ancient campsites, human burials, scarred trees, and ruins and archaeological deposits associated with Aboriginal missions or reserves. The Act also establishes administrative procedures for archaeological investigations and the mandatory reporting of the discovery of Aboriginal sites. Aboriginal Affairs Victoria administers the *Archaeological and Aboriginal Relics Preservation Act 1972*.

The *Archaeological and Aboriginal Relics Preservation Act 1972* requires that a Schedule 2 'Notification of an Intent to Conduct an Archaeological Survey be lodged with the Heritage Services Branch of Aboriginal Affairs Victoria prior to conducting an archaeological survey that does not involve disturbance to Aboriginal archaeological sites.

Consent from the Heritage Services Branch of Aboriginal Affairs Victoria be obtained before archaeological fieldwork involving disturbance to an Aboriginal site is carried out. Aboriginal Affairs Victoria will not usually issue consents for archaeological fieldwork involving disturbance to an Aboriginal site without prior permission from the relevant Aboriginal community.

COMMONWEALTH CULTURAL HERITAGE LEGISLATION

In 1987, Part IIA of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* was introduced by the Commonwealth Government to provide protection for Aboriginal cultural property in Victoria. Immediately after enactment, the Commonwealth delegated the powers and responsibilities set out in Part IIA to the Victorian Minister Responsible for Aboriginal Affairs. This delegation is held by the Hon. Gavin Jennings MP. The legislation is administered on a day-to-day basis by Aboriginal Affairs Victoria.

Whereas the State act provides legal protection for all the physical evidence of past Aboriginal occupation, the Commonwealth act deals with Aboriginal cultural property in a wider sense. Such cultural property includes any places, objects and folklore that 'are of particular significance to Aboriginals in accordance with Aboriginal tradition'. There is no cut-off date and the Act may apply to contemporary Aboriginal cultural property as well as ancient sites. The Commonwealth act takes precedence over State cultural heritage legislation where there is conflict. In most cases, Aboriginal archaeological sites registered under the State act will also be Aboriginal places subject to the provisions of the Commonwealth act.

Section 21U(3-4) of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*, requires written consent from the relevant Victorian Aboriginal community (see below) to disturb, destroy, interfere with or endanger an Aboriginal place, object or archaeological site. If a reply to any such permit application is not received from an Aboriginal community within 30 days, an application for a permit may be made to the State minister responsible for Aboriginal affairs. This is provided for under Section 21U (5-6) of the 1987 addition to the Act.

The schedule to the Commonwealth act lists local Victorian Aboriginal communities. Each community's area is defined in the Regulations. The relevant Aboriginal communities for the study areas are:

- Area 1: Gippsland East Gippsland Aboriginal Co-operative.
- Area 2: Gippsland East Gippsland Aboriginal Co-operative, Moogji Aboriginal Council.
- Area 3: Moogji Aboriginal Council.
- Area 4: Moogji Aboriginal Council.

- Area 5: Moogji Aboriginal Council.
- Area 6: Moogji Aboriginal Council.
- Area 7: Bangerang Cultural Centre.
- Area 8: Bangerang Cultural Centre.
- Area 9: Camp Jungai, Bangerang Cultural Centre.
- Area 10: Camp Jungai Co-operative, Bangerang Cultural Centre.
- Area 11: Bangerang Cultural Centre, Camp Jungai.
- Area 12: Bangerang Cultural Centre.
- Area 13: Gippsland East Gippsland Aboriginal Co-operative
- Area 14: Moogji Aboriginal Council.

Consultation or enquiries regarding Aboriginal sites and Consent to Disturb permits in these community areas may be referred to the chairpersons of the organisations. Current contact details for the representative bodies are listed on the AAV web site.

Applications to excavate or disturb an Aboriginal archaeological site for purposes of archaeological fieldwork should be made in writing to:

The Director
Aboriginal Affairs Victoria
GPO Box 2392V
MELBOURNE VIC 3001

General inquires relating to Aboriginal archaeological sites should be forwarded to:

The Site Registrar
Heritage Services Branch
Aboriginal Affairs Victoria
GPO Box 2392V
MELBOURNE VIC 3001

Ph: (03) 9208 3273
Fax: (03) 9208 3292

Native Title Act

Native title refers to 'the rights and interests of Aboriginal and Torres Strait Islander people in land and waters, according to their traditional laws and customs' (NNTT 2000: 1). It is not a new grant of land rights but recognition that those land rights are already in existence.

Indigenous people who follow their traditional laws and customs and have maintained their traditional laws and customs and a link with their country hold native title rights (NNTT 2000: 1). These rights may mean rights of possession, use or access to country, but commonly it may mean the right to be involved in any decisions regarding the use of their lands and waters by other people (NNTT 2000: 1).

Native title can exist in the following areas where title has not been extinguished by an act of government:

- Vacant Crown land, other public land or Crown lands.
- Forests, beaches, national parks, public reserves.
- Some types of pastoral leases.

- Land held by Government agencies, or held in trust for Aboriginal communities.

Native title may also exist over inland waters and offshore waters including oceans, seas, reefs, lakes, rivers, creeks, swamps and other waters not in private ownership (NNTT 2000: 3).

Native title may coexist with other rights in any area including leases, licences, public access, but it does not invalidate others' rights (NNTT 2000: 4). Rights such as home ownership, holding a pastoral lease or mining licences are not invalidated by native title rights. Native title rights are not recognised over land where freehold possession is held (e.g. most farms, cities, houses). Commercial leases also may confer exclusive possession (NNTT 2000: 4).

Native title may be extinguished in some circumstances including privately owned land, residential, commercial and some other leases and in areas where public roads and works have been constructed (NNTT 2000: 4).

Indigenous people in Australia may apply to have their native title rights recognised through the Federal Court. Since the 'Wik' amendments, claims are referred to the Native Title Registrar to pass a 'registration test' to gain some rights (NNTT 2000: 8). These rights include the 'right to negotiate over proposed developments' (e.g. mining or public works known as 'future acts'), 'statutory access rights to non-exclusive pastoral and agricultural leases, subject to certain conditions' and the 'right to oppose non-claimant applications (NNTT 2000: 8). Where the applicant fails the registration test the case can be referred to the National Native Title Tribunal (NNTT) to be mediated. The NNTT is an independent body set up under the *Native Title Act* 1993 'to provide administrative processes to deal with native title applications and to provide information to indigenous people and the broader community about the native title process'. Enquiries about native title can be made through the National Native Title Tribunal.

National Native Title Tribunal
GPO Box 9973
Melbourne VIC 3000

PH. 1800 640 501

An extensive process was undertaken with all native title claimants for this project including the Dhudoroa people, Monaro people, the Gunai Kurnai, the Taunurong Clans, the Bidawal People, and to a limited extent the Way Wurru People (see Volume 1).

Appendix 2: Significance Assessment

Significance Assessment

In order to make informed decisions regarding the management of heritage sites and places, the assessment of significance is an integral part of the assessment of heritage values. The significance assessment process assists in deciding which sites and places are worthy of preservation, the degree to which they are managed and the way in which they are managed.

Significance assessment in Victoria and Australia in general is based on a common process that has been broadly accepted by heritage professionals. The process for determining significance is derived from an international formula developed by ICOMOS (International Council on Monuments and Sites) and is described in the Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (The Burra Charter) (Australia ICOMOS 1988; Marquis-Kyle and Walker 1992).

The Burra Charter (revised 1992) defines cultural heritage significance as the 'aesthetic, historic, scientific, social or spiritual value for past, present or future generations'.

The Burra Charter describes four criteria for assessing significance:

- Aesthetic value—associated with the stimulation of the senses, including form, scale, colour, texture and fabric material.
- Historic value—associated with an historic figure, event, phase, or activity.
- Scientific value—associated with importance to research, rarity, quality and representativeness.
- Social value—associated with its special meaning, or significance to groups, the general public, in a national or political sense.

ABORIGINAL CULTURAL HERITAGE SIGNIFICANCE ASSESSMENT

The brief provided required an assessment of the significance of any newly located archaeological sites. This process requires assessment of both the cultural and scientific values.

The assessment of cultural values is made by the relevant Aboriginal people. It is preferable to provide a written statement and include this in the report, although this is not always possible.

Scientific Significance

Scientific significance assessment is assessed on two criteria: research potential and representativeness.

Research Potential

Research potential is assessed on the basis of the site contents and site condition.

The site contents refers to all material and organic remains present that are the result of past human behaviour, or are associated with past human behaviour, or that can shed light on past human behaviour. Site contents also refer to the structure of the site, including its size, the distribution or patterning of material remains within the site, the presence of any stratified deposits and the rarity of the material remains.

The site condition affects its site significance and sites are assessed on the basis of the degree to which they have been disturbed.

An assessment methodology is outlined below (see Bowdler 1981; Sullivan and Bowdler 1984).

Site Contents Ratings

0 No cultural materials remaining.

1 Site contains a small number (e.g. 0–10 artefacts) or limited range of cultural materials with no evident stratification.

2 Site contains:

(a) a larger number, but limited range of cultural materials: and/or

(b) some intact stratified deposit remains.

3 Site contains:

(a) a large number and diverse range of cultural materials; and/or

(b) largely intact stratified deposit; and/or

(c) surface spatial patterning of cultural materials that still reflect the way in which the cultural materials were laid down.

Site Condition Ratings

0 Site destroyed.

1 Site in a deteriorated condition with a high degree of disturbance but with some cultural materials remaining.

2 Site in a fair to good condition, but with some disturbance.

3 Site in an excellent condition with little or no disturbance. For surface artefact scatters this may mean that the spatial patterning of cultural materials still reflects the way in which the cultural materials were laid down.

Representativeness

Representativeness refers to the regional distribution of a particular site type. It is assessed on whether the site is common, occasional or rare in a given region. Assessments of representativeness are subjective, biased by current knowledge of the distribution and numbers of archaeological sites in a region. This varies from place to place depending on the extent of previous archaeological research. Consequently, a site, which is assigned low significance values for contents and condition, but a high significance value for representativeness, can only be regarded as significant in terms of current knowledge of the regional archaeology. Any such site should be subject to further re-assessment as additional archaeological research is carried out.

Assessment of representativeness also takes into account the contents and condition of a particular site. For example, in any region, there may only be a limited number of sites of any type that have suffered minimal disturbance. Such sites would therefore be given a high significance rating for representativeness, although they may occur commonly within the region.

Representativeness Ratings

1. Common occurrence.

2. Occasional occurrence.

3. Rare occurrence.

Scientific Significance Ratings

Overall scientific significance ratings for sites, based on a cumulative score for site contents, site integrity and representativeness are given as follows:

1-4 Low scientific significance.

5-7 Moderate scientific significance.

8-9 High scientific significance.

Appendix 3: Discovery of Human Remains

Discovery of Human Remains (Source AAV)

If suspected human remains are discovered during any excavation or development work, the steps outlined below should be followed.

Legal requirements

The *Coroner's Act 1985* requires anyone who discovers the remains of a 'person whose identity is unknown' to report the discovery directly to the State Coroner's Office or to the Victoria Police. A person who fails to report the discovery of such remains is liable to a $10,000 fine. The Coroner's Act does not differentiate between treatment of Aboriginal and non-Aboriginal remains. The majority of burials found during development work are, therefore, likely to be subject to this reporting requirement.

In addition, Part IIA of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* requires anyone who discovers suspected Aboriginal remains in Victoria to report the discovery to the responsible Minister. The Director, Aboriginal Affairs Victoria, holds delegated authority to receive and investigate such reports.

It should be noted that the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* is subordinate to the *Coroner's Act* 1985 regarding the discovery of human remains. Therefore, the location at which the remains are found should be first treated as a possible crime scene, and the developer and/or contractor should not make any assumptions about the age or ethnicity of the burial.

Victoria Police Standing Orders require that an archaeologist from the Heritage Services

Branch, Aboriginal Affairs Victoria, should be in attendance when suspected Aboriginal remains have been reported (Police Headquarters and the State Coroner's Office hold after-hours contact numbers for Heritage Services Branch staff). Where it is believed the remains are Aboriginal, the Police will usually invite representatives of the local Aboriginal community to be present when the remains are assessed. This is because Aboriginal people usually have particular concerns about the treatment of Aboriginal burials and associated materials.

Aboriginal Affairs Victoria - suggested procedure to be followed if suspected human remains are discovered

1. If suspected human remains are discovered during development, work in the area must cease and the Police or State Coroner's Office must be informed of the discovery without delay. The State Coroner's Office can be contacted at any time on

Ph: (03) 9684 4444

2. If there are reasonable grounds to suspect the remains are Aboriginal, the discovery should also be reported to Aboriginal Affairs Victoria on

Ph: 1300 888 544

Aboriginal Affairs Victoria will ensure that the local Aboriginal community is informed about the circumstances of the discovery.

3. Do not touch or otherwise interfere with the remains, other than to safeguard them from further disturbance.

4. Do not contact the media.

Glossary of Terms Used in the Text

Glossary of Terms Used in the Text

Aboriginal Archaeological Site	The location of the physical remains resulting from past Aboriginal behaviour before and after settlement
Aboriginal Artefact Scatter	A scatter of material remains resulting from past Aboriginal activity on the surface of the ground. Can be stone tools, animal bones, plant remains. AAV defines a scatter as more than 5 items in 100 m^2
Aboriginal Historic Site	Site with material remains resulting from Aboriginal people's activity from any period since settlement
Aboriginal Historic Place	A location that is important because of its associations with, and cultural significance to, Aboriginal people. Such places may or may not have material remains.
Archaeological Site	The location of the physical remains of past human behaviour
Archaeology	The study of past human behaviour
Artefact Scatter	Artefact scatters are scatters of stone artefacts, generally five or more within 100 square metres
Backed Points	Points that are asymmetrical in shape, triangular or flat, trapezoid in section, with a thick trimmed (retouched or blunted) back (McCarthy 1976: 44)
Blade	A long, thin stone flake that is at least twice as long as it is wide and which has parallel lateral margins
Bondi Point	Blades trimmed partially or completely along one or both edges of the thick margin combined with a plain, facetted or trimmed butt. The length ranges from 10 to 50 mm, width 18 mm to 30 mm, thickness 2 mm to 5 mm cm (McCarthy 1976: 44)
Chert	Cryptocrystalline silica occurring as bands or nodules in sedimentary rock (Whitten and Brooks 1972: 76). A stone with good flaking qualities highly prized for stone tool manufacture.
Cleavage	Natural weathered outer surface of the stone not smoothed by water
Conglomerate	Rounded or sub-rounded gravels in a silicious matrix (Wesson and Beck 1981: 30)
Contact site	A site showing the material evidence of contact with an alien culture from the settlement period. For example an Aboriginal contact site may have worked glass tools or traditional use of

	non-Aboriginal materials, or non-Aboriginal materials in an unusual context (glass, tin or pottery in a campsite.
Core	Original nucleus from which stone fragments (flakes and blades) are removed by striking with a hammerstone
Cortex	Outer unworked surface of stone. May be rough or smooth discoloured or patinated.
Flake	Fragment of stone removed from a core by striking. Features include a platform where the stone was struck and detached, a bulb or bulge showing where the force of the blow transmitted through the stone, sharp edges where the stone detached
Geometric Microliths	Triangular or crescent shaped with backing or abrupt trimming along the thick margin (McCarthy 1976: 44)
Historic Site (Non-Aboriginal)	Site with material remains resulting from human activity from any period from settlement to 50 years ago
Heritage Place	A place with aesthetic, historic, scientific or social values for past, present or future generations – '...this definition encompasses all cultural places with any potential present or future value as defined above' (Pearson and Sullivan 1995: 7)
Historic Scatter (Non-Aboriginal)	A scatter of material remains resulting from past non-Aboriginal activity on the surface of the ground. Can be bricks, glass, tin, iron, ceramics etc.
Historic Structure	Building or substantial above ground structure older than 50 years
Isolated Artefact	AAV term to describe the location of a small number (<5) of artefacts or items of cultural material in $100m^2$
Knapping Event	Location where stone tool manufacture has taken place, showing evidence of related activities or sequence of manufacture
Microliths	Small retouched artefacts commonly hafted
Pre-contact	Before first settlement by non-Aboriginal people. Time period may vary as parts of Australia and Victoria were settled at different times. Contact peoples may vary e.g. Europeans in Victoria, but other groups earlier in northern Australia.
Post-contact	After settlement
Quarry	Exposed rock outcrops where stone or other materials (e.g. ochre) was removed for various purposes
Quartz	Clear or opaque highly silicious rock, pink, grey, white or clear. Very commonly used in the manufacture of stone artefacts
Retouch	Smaller regularly spaced elliptical flake removals from a tool for the purpose of shaping or sharpening

Scarred Tree	Scars on trees resulting from the removal of bark by Aboriginal people for various purposes. The scars may be various sizes and expose the sapwood on a branch or trunk of the tree.
Scrapers	Artefacts with retouched edges which are concave, convex or combinations of both (McCarthy 1976: 34)
Silcrete	Very brittle, intensely indurated rock composed mainly of quartz clasts cemented by a matrix which may be well-crystallised quartz, cryptocrystalline quartz, or amorphous (opaline) silica (Langford-Smith (1978b: 3).
Small Tool Tradition	A wide range of small artefacts including Pirri Points, Kimberly Points, Tula (and non-Tula or Burren) adzes and slugs, backed blades, and blades without backed retouch (such as butted blades) present in late assemblages and most probably hafted (Gould 1980: 177).
Visibility	The extent to which the ground surface may be viewed when surveying for archaeological remains