APPENDIX 10 – ABORIGINAL ARCHAEOLOGICAL REPORT

Lower Thredbo Valley Shared Path: Bullocks Flat to Curiosity Rocks, Snowy Mountains, NSW. Aboriginal cultural heritage assessment.

By
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August 2015

Final report to NPWS and Snowy River Shire Council

Frontispiece: Lower Thredbo valley Photo: S. Feary.

Feary S. and Niemoeller G. 2015. Lower Thredbo Valley shared path: Bullocks Flat to Curiosity Rocks, Snowy Mountains, NSW. Aboriginal cultural heritage assessment. FINAL REPORT to NPWS and SRSC.

Definitions & Acronyms used in report

ACHAR	Aboriginal Cultural Heritage Assessment Report
AHIP	Aboriginal Heritage Impact Permit
asl	above sea level
BP	Before Present
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
KNP	Kosciuszko National Park
KNPPoM	Kosciuszko National Park Plan of Management
LGA	Local Government Area
LTVT	Lower Thredbo Valley Track
NP	National Park
NP&W Act	NSW *National Parks and Wildlife Act 1974*
NPWS	National Parks and Wildlife Service
OEH	NSW Office of Environment & Heritage
PoM	Plan of Management
RAP	Registered Aboriginal Party
REF	Review of Environmental Factors
SRSC	Snowy River Shire Council
Study area	the area identified by the AHIMS search
Subject area	the area to be directly affected by the proposal. That is, the footprint of the proposal.

Executive Summary

Southern Ranges Region of National Parks and Wildlife Service (NPWS) wishes to extend an existing shared path (pedestrian and bicycle), which currently ends at Bullocks Flat in the lower Thredbo valley in Kosciuszko National Park. The extension would continue down the valley for an additional 20 kms on the steep northern slope to meet up with the existing Pallaibo walking track and thence to the Thredbo picnic area next to Kosciuszko Road. An upgrade of the existing walking track would be required.

Snowy River Shire is also planning to extend an existing shared path on the western shore of Lake Jindabyne, from Curiosity Rocks to Hatchery Bay, a distance of around 5 kms, on land owned by Snowy Hydro and managed by Council. The path requires a bridge crossing over Wollondibby Creek and it is also intended to rationalise a series of informal vehicle tracks and close those causing damage to the lake's foreshores.

There are plans to link the two shared paths to create a continuous shared path from Thredbo Village to Hatchery Bay. This would require a short diversion from the Pallaibo track to meet with a new bridge across the Thredbo River, and a new section of path from the bridge through the Gaden Hatchery to Gaden Road. The route would utilise the existing Gaden and Hatchery Roads across to Hatchery Bay to link with the path around the lake. This report contains an assessment of all shared path options as provided to the consultants at the time of field survey.

The Thredbo valley has been the subject of intensive archaeological research since the 1980s and many sites have been recorded, from extensive artefact scatters at Crackenback resort and the Ski tube, to small scatters and isolated finds along the valley's lower slopes from Bullocks Flat to Thredbo Village. Most artefacts have been made from high quality quartz which has probably been locally quarried. Sites tend to occur on flat elevated land above the flood zone on both sides of the river.

The Jindabyne valley has also been the subject of intensive archaeological investigation, from surveys in 1976 when dam levels were historically low to recent surveys for residential subdivisions at East Jindabyne. Most recorded sites are artefact scatters, characterised by many artefacts including ground implements, made from river pebbles. The large numbers of sites reflect the availability of rich resources at the confluence of the Snowy and Thredbo in pre-contact times. The base of the mountains has been interpreted as a major meeting place for intertribal gatherings associated with movement to the mountain peaks for bogong moth feasts during summer months.

Several recorded sites occur on or close to the proposed route options, the most significant being a granite rock feature called Curiosity Rocks, now surrounded by the waters of Lake Jindabyne, and an adjacent peninsula with a large stone artefact scatter. The rock formation has high cultural significance for Ngarigo people, especially women, and the area was recently nominated for gazettal as an Aboriginal Place under the National Parks and Wildlife Act 1974.

Aboriginal consultation for the assessment was conducted in accordance with OEH requirements for Aboriginal consultation. A total of seventeen individuals and groups responded to the initial invitations for consultation, the majority identifying with the Murring clan from the south coast. Members of the Southern Aboriginal Working Group (SAWG) established under the Kosciuszko National Park Plan of Management were also invited to register an interest in being consulted and five responded. On site meetings and inspections were held with Ramsey Freeman representing the Snowy Mountain Indigenous Elders Group and Ngarigo knowledge holder Iris White. Representatives from Bega LALC and SAWG participated in fieldwork, carried out by consultants Sue Feary and Gerard Niemoeller in May 2015, together with NPWS project manager Chris Darlington and Alannah Dickeson from SRSC.

Systematic field survey was conducted for all route options, with the section between Bullocks Flat and Paliabo track presenting major logistical challenges in terms of access and also in regard to very thick understory vegetation making it very difficult to see the ground. Pallaibo track provided reasonable visibility over more gentle terrain as did the route around Lake Jindabyne.

Field survey resulted in the recording of 26 locales, all stone artefacts, with the majority being quartz. Little was found in the lower Thredbo valley due to the low archaeological potential of the predominantly steep terrain. However, 10 isolated finds /small artefact scatters were recorded on gentle spurs or flat areas above the river, where bare ground was exposed. Numerous artefacts were recorded along the Pallaibo track and one artefact was recorded in the vicinity of the proposed bridge in the Gaden Hatchery grounds. Four new sites were recorded on the western shores of Lake Jindabyne, including one site of at least 30 artefacts. Distribution patterns of new and existing sites around Lake Jindabyne almost certainly reflect the location of major waterways prior to flooding for the dam.

All sites in the lower Thredbo valley section were interpreted as isolated finds or small scatters with low potential to extend below the ground or beyond what was visible during the survey. Artefacts on the Pallaibo track represent a diffuse dispersed scatter accumulated over generations of seasonal use. As a complex the sites in the lower Thredbo valley have some archaeological significance as they are new recordings in previously unsurveyed areas and offer a comparison to assemblages recorded further upstream. However, the numbers of artefacts are too small and their context too disturbed to make any meaningful contribution to the current body of knowledge, hence their overall archaeological significance is assessed as being low.

Likewise the individual sites around Lake Jindabyne have mostly low archaeological significance, but as a complex they are consistent with existing paradigms of Aboriginal occupation and use of the Jindabyne valley. A small section of the proposed path goes through the proposed Curiosity Rocks Aboriginal Place (AP) which has high cultural and social significance to Ngarigo and coastal people.

The likely extent of each site in the lower Thredbo valley section has been mapped to show its relationship with the proposed alignment of the shared path. During fieldwork, it was possible to realign the route to avoid the likely extent of all recorded sites. Since areas of high archaeological potential *viz*

elevated river terraces and flat spurs are being avoided by the path, the potential for other sites to be present is low. The bridge over the river at Gaden Hatchery can also be relocated to avoid the known site.

The report recommends that an Aboriginal Heritage Impact Permit (AHIP) is not required for the proposed track between Bullocks Flat and the Pallaibo track where it turns north at Sawpit Creek. It further recommends that upgrading Pallaibo track will require an AHIP to harm recorded objects. An area-based AHIP application is recommended for the section of Pallaibo to be upgraded, to encompass any additional objects not visible at the time of survey, with artefacts to be either moved out of harm's way or collected and repatriated on country.

Two of the recorded sites at Lake Jindabyne will not be impacted as they are not on the route. One site WOLLONDIBBY1 will require an AHIP for partial impact as it is on the path alignment, on an existing informal vehicle track. The remainder of this site may also be impacted by a proposed Aboriginal sites conservation works programme for the western shores of Lake Jindabyne to be conducted by OEH and Snowy River Shire Council. An AHIP will also be required for site Hatchery Bay 2 which will be bisected by the track if any works are intended for Gaden Road. If the expanded Curiosity Rocks Aboriginal Place is gazetted in the near future, an AHIP will be required to construct sections of path within the AP.

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1. Introduction

This report describes the Aboriginal cultural heritage assessment undertaken in respect of proposals to extend existing shared paths (pedestrian and bicycle) in the lower Thredbo River valley in Kosciuszko National Park (KNP) (hereafter called the LTVT), and on the western shores of Lake Jindabyne. The two proposals may be linked to form a continuous path by way of a new bridge over the Thredbo River and an additional section of path at the Gaden Trout Hatchery, and inclusion of Hatchery Road. The LTVT is approximately 20 kms long and the Snowy River Shire section is approximately 5 kms.

The proponents of the development are Southern Ranges Region of National Parks and Wildlife Service of the NSW Office of Environment and Heritage for the section within Kosciuszko National park (LTVT) and the Snowy River Shire Council for the remainder of the path.

A Review of Environmental Factors (REF) has been prepared for all options of the proposed path within Kosciuszko NP to meet the requirements of Part 5 of the *Environmental Protection and Assessment Act 1979 and* Section 228 of the EPA Regulation 2000 (EnviroKey, 2015). As the proposed activity is occurring in Kosciuszko National Park, REF preparation was also guided by the requirements of the Kosciuszko National Park Plan of Management (DEC NSW, 2006).

Snowy River Shire Council has prepared a Statement of Environmental Effects (SEE) for the proposed shared path between Hatchery Bay and Curiosity Rocks, a distance of 5.2 kms (Snowy River Shire Council, 2015). The shared path extension is consistent with the Lake Jindabyne Foreshore Management Plan but will also require OEH approval for construction within the Curiosity Rocks Aboriginal Place once gazetted.

The Aboriginal heritage assessment and report preparation have been conducted in accordance with relevant OEH guidelines and codes (DECCW, 2010; DECCW, 2010;OEH, 2011) and relevant sections of the Kosciuszko National Park Plan of Management (DEC NSW, 2006, p. 99)

1.1. Description of proposal

The LTVT commences at Bullocks Hut in the lower Thredbo Valley, where it crosses to the northern side of the Thredbo River to run roughly adjacent to the Thredbo River for approximately 20 kilometres, to end at the Thredbo River Picnic Area at Kosciuszko Road. The Snowy River Shire Council (SRSC) is currently working with community stakeholders and government to seek approval and fund a bridge crossing and shared path that will link the LTVT to Jindabyne at Gaden Trout Hatchery (EnviroKey, 2015). The SRSC are intending to extend their existing shared path around Lake Jindabyne from the Curiosity Rocks car park in the south to Hatchery Bay picnic area in the north and thence along Gaden Road to link with the LTVT at the Gaden Trout Hatchery. The section of Hatchery Road between Kosciuszko Road and the Hatchery Bay Picnic area is unsealed and the lower section of the road below the public toilet may be closed to prevent

vehicle access to the lake edge. No works are proposed for the sealed section of Gaden Road between Kosciuszko Road and the hatchery.

Due to the uncertainty as to whether the SRSC will proceed, this heritage assessment investigated two contingencies at the lower end of the proposed track:

- Option 1 – Construction of a bridge over the Thredbo River at the Gaden Trout Hatchery, linking to a new section of track extending from the Pallaibo Track and another new section from the river to Hatchery Road. An external party, likely Snowy River Shire Council, would own the bridge.
- Option 2 – Track to continue past the Gaden Trout Hatchery, join the Pallaibo Track at the lowest point where it crosses Sawpit Creek and continue along the Pallaibo Track to the Thredbo River Picnic Area. This option will require that section of the Pallaibo Track to be re-zoned from a walking track to a multi-use track. Some track modifications and upgrades would be required.

The final development may encompass both options 1 and 2 above.

The proposal involves construction of a shared path to international mountain bike standards along the mid and lower slopes of the northern side of the Thredbo River in Kosciuszko National Park and on slopes and ridges on the western side of Lake Jindabyne. It will involve vegetation clearing to a maximum width of 2 metres, benching where required, and some excavation. A new footbridge will be built over the Wollondibby River, and also the Thredbo River if Option 1 goes ahead.

1.2. Objectives of assessment

The objective of the archaeological assessment is to establish whether or not construction of the proposed shared paths and associated infrastructure will result in impacts to Aboriginal heritage and to determine the need, or otherwise, for an Aboriginal Heritage Impact Permit (AHIP) and any associated conditions where appropriate. This will involve: field investigation; description, analysis and significance assessment of all objects found; synthesis and analysis of relevant archaeological data and historical and anthropological information, and preparing a report that meets relevant OEH standard and guidelines, to support an AHIP application should one be necessary.

1.3. Personnel

The assessment and report preparation have been conducted by consultant archaeologists Sue Feary and Gerard Niemoeller with assistance from Chris Darlington from NPWS, Alannah Dickeson from Snowy River Shire Council and Jackie Taylor from OEH. Chris Darlington provided essential logistical support for fieldwork and Ronnie Thomas from Bega Local Aboriginal Land Council and Derek Davison representing the Southern Aboriginal Working Group (SAWG)/Ngarigo, participated in field survey over five days.

OEH staff Miles Boak, Sarah Robertson and Christine Gant-Thompson from the OEH Queanbeyan office and Ramsey Freeman from Snowy Elders Aboriginal Corporation, attended on Tuesday 20th May. Jackie Taylor and Roy Barker from OEH , Alannah Dickeson and Rochelle Crowe from Snowy River Shire Council and Iris White, Ngarigo elder SAWG member attended on Friday 23rd May, for sections of the shared path to be constructed by Snowy River Shire Council.

1.4. Aboriginal consultation

The assessment includes an Aboriginal consultation process conducted in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW, 2010a). The study area is within the Bega and Eden LALC boundaries. Fourteen Aboriginal parties registered an interest in being consulted and were sent the draft methodology for the field survey and offered the opportunity to share cultural information and to provide recommendations for management of any Aboriginal objects to be impacted by the proposed development. A detailed written response was provided by the Bega LALC. The draft report has been circulated to registered parties for comment.

2. Aboriginal consultation

The consultation process for this project has been in accordance with Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW, 2010a). The consultation process was conducted by Chris Darlington, NPWS and Alannah Dickeson, Snowy River Shire Council, with assistance from Sue Feary. Steps taken in the consultation process were as follows:-

2.1. Notification

A list of Aboriginal parties to be consulted in regard to proposed activities was compiled from the following sources:-

- Responses to an advertisement seeking expressions of interest for being consulted in regard to the proposed extension of the shared path from Bullocks Flat to Curiosity Rocks which was placed in the Summit Sun, Cooma-Monaro Express and Bega Post on 14 and 16 April respectively (see Appendix 1 for newspaper advertisement).

- The membership list for the Southern Aboriginal Working Group (SAWG). This group was established under the KNP Plan of Management and comprises knowledge-holders with cultural connections to KNP country (see Table 1 for list). On 2nd April 2015, a letter was sent to all SAWG members by post or email asking if they wanted to be consulted in regard to the development proposal (see Appendix 1).

- A list of registered Aboriginal groups with a potential interest in being consulted regarding the proposed works was sought from the NSW Office of Environment and Heritage's Queanbeyan office on 27 March 2015. Table 2 is the list provided by OEH (contact details removed). The area falls within the boundaries of the Bega and Eden LALCs, who are both registered with OEH for Snowy River Shire. Nineteen parties were on the list, of which 10 live on the south coast and are affiliated with the Murrin clan whose boundaries were described as extending *'from the Hawkesbury River to the Snowy River'.*

- On 2nd April 2015, a letter was sent to all these registered groups by post or email asking if they wanted to be consulted in regard to the development proposal (see Appendix 1).

Table 1: Southern Aboriginal Working group members

Title	FirstName	LastName	Organisation
Ms	Sharon	Anderson	
Mr	Evan	Anderson	
Aunty	Deanne	Davison	Ngarigo Elder
Mr	Stanley	Dixon	
Ms	Colleen	Dixon	
Mr	David	Dixon	
Miss	Robben	Dixon	
Miss	Michelle	Dixon	
Mrs	Sally	Lavallee	
Miss	Erica	Luff	
Mr	Rod	Mason	
Mr	Paul	McLeod	
Aunty	Rachel	Mullett	Ngarigo Elder
Ms	Ellen	Mundy	
Mrs	Doris	Paton	
Mr	Tim	Paton	
Aunty	Rae	Solomon-Stewart	Ngarigo Elder
Mr	Matthew	Stewart-Fitzpatrick	
Miss	Tamika	Townsend	
Mrs	Iris	White	

Table 2: List of registered Aboriginal parties held by OEH for Snowy River Shire

Organisation/Individual Name
Bega Local Aboriginal Land Council
Eden Local Aboriginal land Council
Mr Arnold Williams CEO Ngunnawal Elders Corporation
Bega Traditional Aboriginal Elders Council Inc (BTAEC). John Dixon
Ramsay Freeman Snowy Mountains Indigenous Elders Group
Matilda House (on behalf of Williams, Freeman and Simpson-Wedge families)
Colleen Dixon
Yukkumbruk. Contact: Serena Williams
Alice Williams
Nundagurri Aboriginal Corporation. Contact: Aaron Broad - Chief Cultural Heritage Officer (Murrin Clan: This group's states that their boundaries extend from the Hawkesbury River to the Snowy River)
Walbunja Aboriginal Corporation: Senior Technical Services Officer - Hika Te Kowhai
Goobah Development Pty Ltd. Contact: Basil Smith Chief Cultural Heritage Officer (Murrin Clan: This group's states that their boundaries extend from the Hawkesbury River to the Snowy River)
Gunyuu Contact: Darlene Hoskins-McKenzie CEO (Murrin Clan: This group's states that their boundaries extend from the Hawkesbury River to the Snowy River)
Wullung: Contact Person Lee-Roy Boota - Chairperson (Murrin Clan: This group's states that their boundaries extend from the Hawkesbury River to the Snowy River)
Badu: Contact person Karia Lea Bond - Chairperson (Murrin Clan: This group's states that their boundaries extend from the Hawkesbury River to the Snowy River)
Yerramurra: Contact Person - Nicholas Wade Glover - Chairperson (Murrin Clan: This group's states that their boundaries extend from the Hawkesbury River to the Snowy River)

Jerringong: Contact Person - Jodie Stewart - Chairperson (Murrin Clan: This group's states that their boundaries extend from the Hawkesbury River to the Snowy River)
Murrumbul: CEO - Levi McKenzie (Murrin Clan: This group's states that their boundaries extend from the Hawkesbury River to the Snowy River)
Wingikara: Contact Person - David Bell (Murrin Clan: This group's states that their boundaries extend from the Hawkesbury River to the Snowy River)
MUNYUNGA: Contact Person - Peter Foster (Murrin Clan: This group's states that their boundaries extend from the Hawkesbury River to the Snowy River)

3. All the organisations listed on page 10, Section 4.1.2, of the OEH consultation requirements (DECCW 2010a) were contacted by email or post on 14 April 2015 with the exception of Snowy River Shire Council, as they are one of the proponents, and National Native Title Tribunal (NNTT)(see Appendix 1 for letter). The NNTT website was accessed to determine whether any native claims were registered over the subject area or had been determined in favour of native title claimants.

2.2. Outcome of notification process

- Table 3 lists groups/individuals who registered an interest in being consulted. Registration was by telephone calls, emails and written correspondence, in response to the newspaper advertisement and/or the letter to OEH registered Aboriginal groups and agencies and members of the SAWG.
- NTSCorp advised they were unable to pass on confidential information regarding Aboriginal people registered with them, but offered to pass the request on to relevant groups. No responses were received (Appendix 2).
- The Aboriginal Land Rights Registrar and LLS responses are at Appendix 2.
- A search of the NNTT website revealed no registered native title claims over the subject area.

Table 3: Responses from SAWG memebers and RAPs registered weith OEH

Stakeholder	Date of request to be consulted	Mode of communication
1. Bega Local Aboriginal Land Council	2/4/15	Email
2. Eden Local Aboriginal Land Council	10/4/15	Email
3. Ramsay Freeman – Snowy Mountains Indigenous Elders Group	8/4/15	Telephone
4. Nundagurri Aboriginal Corporation	2/4/15	Email
5. Walbunja Aboriginal Corporation	2/4/15	Email
6. Goobah Development Pty Ltd	16/4/15	Email
7. Gunyuu – Murrin Clan	10/4/15	Email
8. Wullung – Murrin Clan	2/4/15	Email
9. Badu – Murrin Clan	2/4/15	Email
10. Murrumbul – Murrin Clan	10/4/15	Email

11. Wingikara – Murrin Clan	11/4/15	Email
12. Munyunga – Murrin Clan	11/4/15	Email
13. Paul McLeod – Southern Aboriginal Working Group (SAWG)	2/4/15	Email
14. Iris White - SAWG	8/4/15	Telephone
15. Tamika Townsend - SAWG	8/4/15	Email
16. Doris Paton - SAWG	14/4/15	Telephone message
17. Rod Mason - SAWG	13/4/15	Email

2.3. Stages 2 and 3: Presentation of information about project and gathering information about cultural significance

- Due to the large number of individuals seeking to be consulted, many who live on the coast, more than 4 hours drive from the subject area, and the relatively small-scale of the proposed development, it was not feasible to hold a project meeting. Detailed information was distributed to all registered parties on 20th April 2015 by post or email as per Sections 4.2 and 4.3 of OEH's Aboriginal consultation requirements ;

    - presenting more information on the proposed track extension and its potential impacts on Aboriginal heritage
    - presenting a draft methodology for conducting the Aboriginal heritage assessment, including field survey
    - seeking comment on potential management recommendations
    - a list of queries regarding the cultural significance of the area , to assist NPWS and Snowy River Shire in planning and design of the proposed track See Appendix 3 for information sent to Registered parties.

- A detailed response was received from the CEO, Bega LALC (see Appendix 4).
- Iris White and Ramsay Freeman had telephone conversations with Alannah, Sue and Chris regarding consultation.
- No responses were received from remaining registered parties.
- NPWS contacted Eden LALC, as the western end of the shared path is within their boundaries. The CEO of Eden LALC advised that Bega LALC heritage officer Ronnie Thomas was authorised to represent the interests of the Eden LALC in regard to the shared path proposal.
- NPWS and SRSC also engaged a number of registered party members to participate in part or all of the five days of fieldwork , including Ronnie Thomas (Bega LALC), Derek Davison (Ngarigo); Iris White (Ngarigo/SAWG) and Ramsey Freeman (Snowy Mountain Indigenous Elders Group).
- Iris White briefed the field team in regard to the cultural significance of the Curiosity Rocks area.

2.4. Stage 4: Review of draft ACHAR

A copy of the draft ACHAR has been sent to registered parties for comment and feedback within a 28 day period. A written response was received from Bega LALC (Appendix 8). Bega LALC endorsed the report and its recommendations and advised that their preference was for artefacts to be moved out of harm's way rather than be collected.

Chris Darlington contacted Iris White by telephone, who advised that she had not had a chance to read the report, but 'trusted' NPWS and SRSC to appropriately managed Aboriginal heritage within their respective jurisdictions.

No other responses had been received as at 6 August 2015.

3. Description of the area

3.1. Location

The subject area is in the South East Highlands region of southern NSW, on the southern and eastern fall of the Snowy Mountains from the Main Range at 2228 metres asl to 900 metres asl in the steep gorge of the lower Thredbo valley and the broad open Jindabyne valley, the latter now inundated. The nearest town is Jindabyne a few kms to the east, with Cooma approximately 70 kms to the northeast (Figure 1).

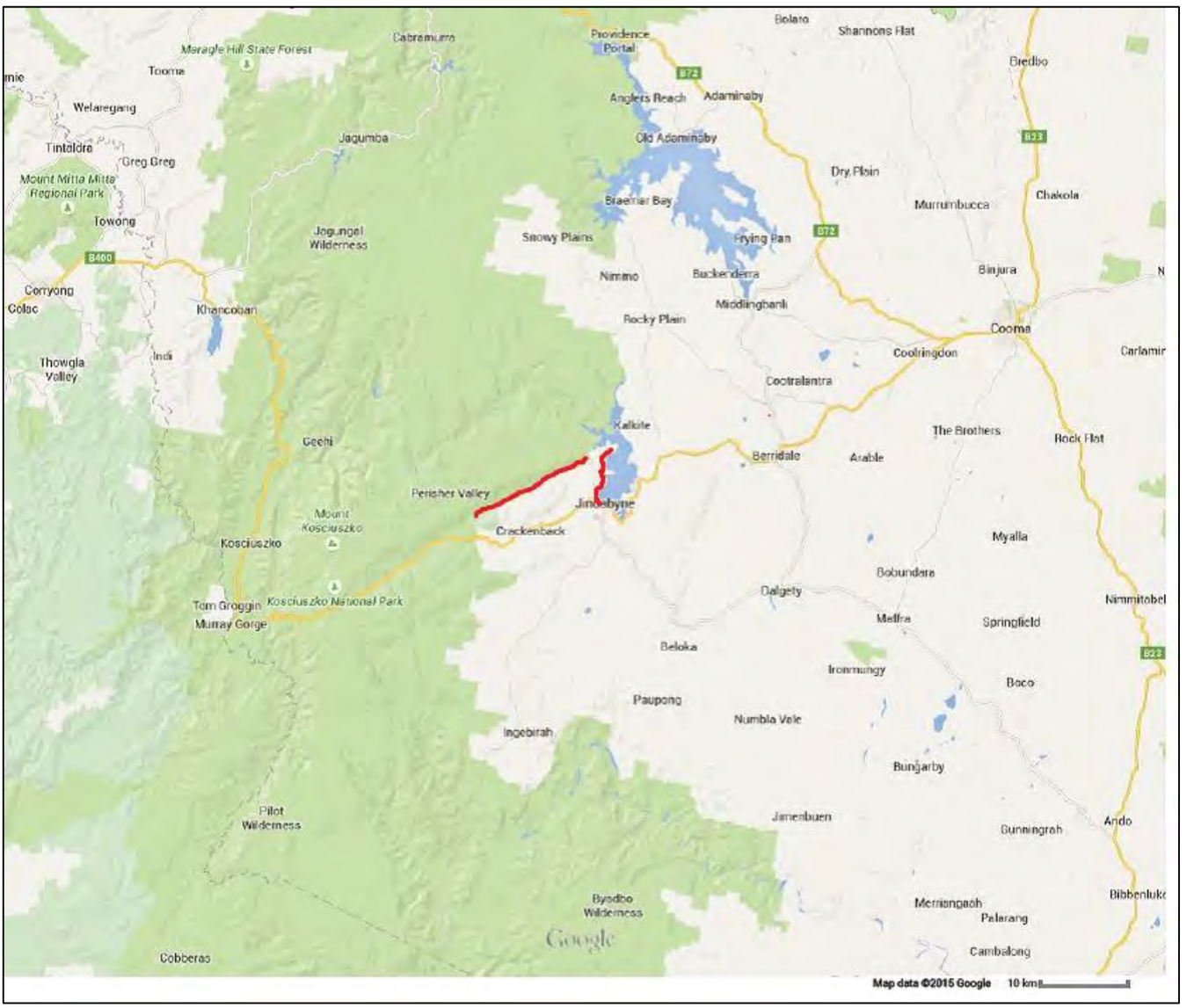

Figure 1: Locality map. Subject areas shown in red

The subject area for the shared path in KNP is a 20 kilometre long corridor of 50 metre width on the northern slopes of the lower reaches of the Thredbo valley between Bullocks Flat [55 -629210/5966732] and the Thredbo River Picnic area in KNP [55-6292105966637] (Figure 2) .

The subject area for the shared path at lake Jindabyne is a 5 km long corridor of 50 metre width between Hatchery Bay [55-644176/5971897] and Curiosity Rocks [55-643530/5969914], with a bridge crossing over Wollondibby Creek (Figure 3.)

If Option 1 proceeds, the corridor will deviate from the Paliabo track near Sawpit Creek, cross the Thredbo River over a new bridge at the Trout Hatchery and follow Gaden Road and Hatchery Bay Road to the western side of Lake Jindabyne at Hatchery Bay where it turns south to follow the lake shore to Curiosity Rocks (Figure 3).

The proposed shared path is within County Wallace, Parishes Mitchell, Guthega and Crackenback, in the Snowy River Shire. It is located on the Perisher Valley, Jindabyne and Kalkite Mountain 1:25K topographic maps.

Figure 2: Aerial photo showing location of two proposed shared path extensions

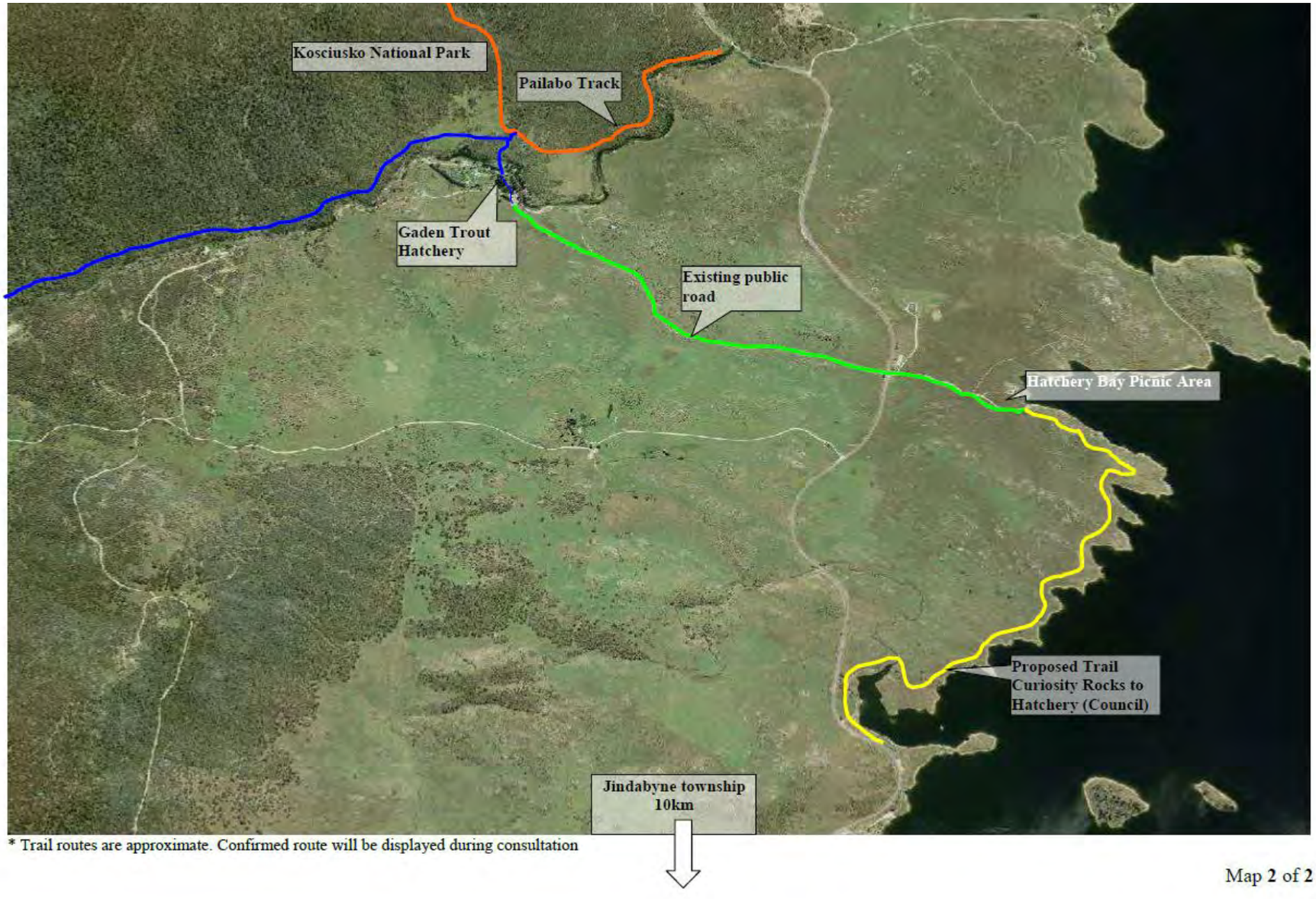

Figure 3: Aerial photo showing Option 1 with associated linkages

Feary S. and Niemoeller G. 2015. Lower Thredbo Valley shared path: Bullocks Flat to Curiosity Rocks, Snowy Mountains, NSW. Aboriginal cultural heritage assessment. FINAL REPORT to NPWS and SRSC.

3.2. Biophysical setting

Thredbo Valley (within KNP)

The landform of the study area is highly variable due to the length of the proposed track. In some sections the track follows the relatively flat river plain adjacent to Thredbo River while in other sections the landscape is very steep where the track deviates greater distances from the edge of Thredbo River. Some of these sections would have slopes greater than 25 degrees. The track crosses many small tributaries to Thredbo River most of which are very minor and most likely ephemeral or intermittent. At the higher elevations of the track, typically above about 1050 metres ASL, there was a distinct lack of surface rock and significant rock outcrops. Below this elevation there was a higher occurrence of rock outcropping and loose surface stone. Generally the surrounding landscape is steep to very steep (Figure 4). Adjacent to the proposal, slopes are consistently greater than 25 degrees. The study area is part of the east-west river valley of the Thredbo River, in between two significant east-west ridge lines with elevations of greater than 1500 metres asl to the north and 1400 metres asl to the south (EnviroKey, 2015). Thredbo River is impacted by seasonal changes in climate resulting in high flows during the spring snow melt and subject to snow and ice during the winter seasons.

Figure 4: proposed path alignment, mid slope in lower Thredbo River valley

Jindabyne

Landforms between the Thredbo valley and Lake Jindabyne comprise the undulating foot slopes of the Snowy Mountains, on the western side of Lake Jindabyne. Land within the Gaden trout hatchery has been

modified through landscaping and construction of trout pools and a picnic area. The land around the lake is gently to steeply undulating, characterised by prominent headlands with distinctive granite outcrops (Figure 5). The proposed path is designed to be above the highest dam level; hence it is sometimes cut into quite steep slopes.

Figure 5: Lake Jindabyne with a rocky granite headland

Geology and geomorphology

The following information is taken from the REF. According to the 1:500,000 Monaro Geology Map the geology of the area is largely foliated granite, leucogranite, adamellite, granodiorite and tonalite consisting of largely massive intrusions. The geological formation that covers the entire length of the proposal is the Kosciuszko Batholith, with the Thredbo River following a large fault line that runs in a north-east direction. To gain a more detailed understanding of the landscapes within the study area, information was taken from the NSW Mitchell Landscapes (Mitchell 2002). These provide a geological description of the landscapes of each bioregion within NSW. The study area is within the Jindabyne Plains (Jbv) landscape in the South East Highlands (SEH) - Monaro Region. This landscape consists of wide open valleys and plains at a general elevation of 800 to 900 metres with surrounding low ranges and rounded peaks to 1100 metres on massive Silurian-Devonian granite and granodiorite. In one section the study area is close to the edge of the Main Range Montane (Mam) in the Australian Alps (AA) - Montane Region which is described as well-drained steep slopes on Silurian-Devonian gneissic granite, granite and granodiorites and Ordovician Slate, chert, quartzite and phyllite with a general elevation of 100 to 1500 metres (EnviroKey, 2015).

Prior to inundation, the Eucumbene River entered through a northern gorge into the Jindabyne valley to join the Snowy and Thredbo rivers in the broad alluvial valley. The Snowy River was a stream of around 50 metres width, flanked by flat land, low banks and marshes (Chapman, 1977). Curiosity Rocks was a prominent rock feature adjacent to Wollondibby creek and the peninsula to the south was once a ridge line remnant parallel to Wollondibby Creek (Avery, 1997; Boot, nd). Figure 6 is an aerial photo of the Jindabyne valley prior to dam construction showing the location of Curiosity Rocks at the confluence of the Wollondibby and Thredbo Rivers.

Figure 6: Jindabyne valley prior to flooding. Circle shows location of Curiosity Rocks.

Soil types and properties

The study area is within the Jindabyne Plains (Jbv) landscape in the South East Highlands (SEH) - Monaro Region (Mitchell 2002). The Jindabyne Plains landscape consists of wide open valleys and plains at a general elevation of 800 to 900 metres with surrounding low ranges and rounded peaks to 1100 metres. Soils consist of shallow gravelly loams, extensive red and yellow texture-contrast soils on slopes, two or

three terraces marginal to the main streams with dark coloured gritty uniform loams and clays in alluvium (Mitchell 2002). In one section the track is close to the edge of the Main Range Montane (Mam) landscape in the Australian Alps (AA) - Montane Region. The Main Range Montane landscape has soils which are intermediate in character between low elevation texture-contrast profiles and higher elevation organic uniform profiles. Their properties vary with bedrock; gritty clay loams on granites and pedal red to yellow clay subsoils on meta-sediments (Mitchell 2002).

The now submerged Jindabyne valley floor contains alluvial deposits with some Tertiary gravels, sands, sandstone and clay (Dibden, 2012).

Vegetation

The following information has been taken from the REF (EnviroKey, 2015). A detailed flora survey was conducted for the LTVT section of the proposed path, which mapped three main vegetation communities - Snow Gum - Mountain Gum shrubby open forest; Snow Gum - Candle Bark woodland, and Alpine Ash - Mountain Gum moist shrubby tall open forest. The first is the most common along the track alignment and occurs on the steep to very steep sections along Thredbo River over a length of about 14.46 kilometres. The canopy cover was up to about 60 percent cover with a dense shrub layer. Snowgum-Candlebark woodland occurs on the river flats of Thredbo River at both the western and eastern ends of the track alignment over a length of 3.92 kilometres. The canopy was more open and typical of woodland, up to about 40 percent cover. Alpine ash-Mountain Gum forest was observed over a small area (1.67 kilometres in length) within the middle of the eastern section of the track alignment extending from the bank of Thredbo River as far upslope as was surveyed for the proposal. The topography was steep to very steep and the vegetation was typical of a forest habitat with an average canopy cover of 60 percent.

All three types have mixed mid and understory with several species known to have been utilised by Aboriginal people eg Tasman Flax-lily (*Dianella tasmanica*) and Alpine Pepperbush (*Tasmannia xerophila*).

The vegetation groups are characterised by an 'open' or 'sparse' shrub layer but in many situations the vegetation observed did not fit the vegetation descriptions. This was most evident in the large patches of very dense shrub growth, some virtually monospecific, underneath the canopy, which excluded many of the usual groundcover species. The fire that occurred in 2003 is the most likely explanation for this unusual growth with the dense shrub layer growing in response to the fire event (EnviroKey, 2015).

The Lake Jindabyne section occurs within disturbed open grassland of mostly introduced grasses and shrubs with a long history of grazing. A few copses of snow gums occur on rocky headlands (Figure 7).

Figure 7: vegetation around Lake Jindabyne

3.3. History of [Aboriginal] peoples living on the land

Numerous archaeological sites in the Thredbo River valley and around the shores of Lake Jindabyne attest to a considerable Aboriginal presence in pre-contact times. Archaeological excavations at what is now Lake Crackenback resort produced radiocarbon dates demonstrating Aboriginal occupation from 4,000 years BP (Kamminga, 1992). Around 60 kms to the north but still in Ngarigo country, a double burial with rare grave goods, including a kangaroo tooth necklace, gave a date of 7,000 years BP (Feary, 1996).

The montane and alpine areas of the Australian Alps form the highest part of the Great Dividing Range including its highest peak, Mt Kosciuszko at 2228 metres (Costin 1954). Between the mountain peaks, major rivers such as the Snowy and Mowamba and Thredbo/Crackenback Rivers, have incised deep parallel valleys, arising in the alpine herb fields and descending through montane woodlands to the tablelands. Such valleys would not only have offered shelter to Aboriginal people during cold winter months; they would also have provided travelling routes between the tablelands and high mountain peaks, as well a range of seasonally available resources (Kamminga, 1992; Grinbergs, 2008).

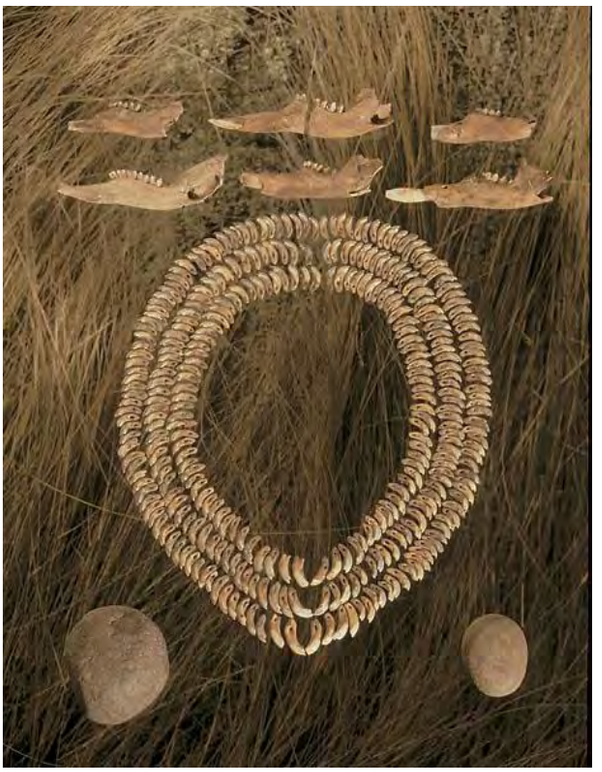

Figure 8: 7,000 year old grave goods from an Aboriginal burial site near Cooma

According to ethnographic and ethnohistoric records and Aboriginal oral tradition, the Thredbo valley falls within the country of the large group of Ngarigo speaking people, who spoke variants of a language also spoken at Tumut, Yass, Queanbeyan and Braidwood (Wesson, 2000). The Ngarigo occupied the Monaro tablelands and were often referred to as the Monaro tribe, but their territory also included the high mountain peaks of the Snowy Mountains to the west. The records and maps of A. W. Howitt, Norman Tindale and R.H.Matthews all place the Thredbo River within the territory of Ngarigo speaking peoples (see Young 2005 and Figure 9). Howitt describes the territory of the Ngarigo thus:

> *The Ngarigo had the Wolgal on the north, the Ya-itmathang on the northwest, the Kurnai on the west and south-west, and the Yuin or Coast Murring to the southeast. The Ngarigo in fact occupied the Monaro tableland. The name of this tribe was that of its language, and the tribespeople called themselves "Murring", that is "men, indicating that it belong to another nation who used that term in common* (Howitt, 1996, pp. 78-79).

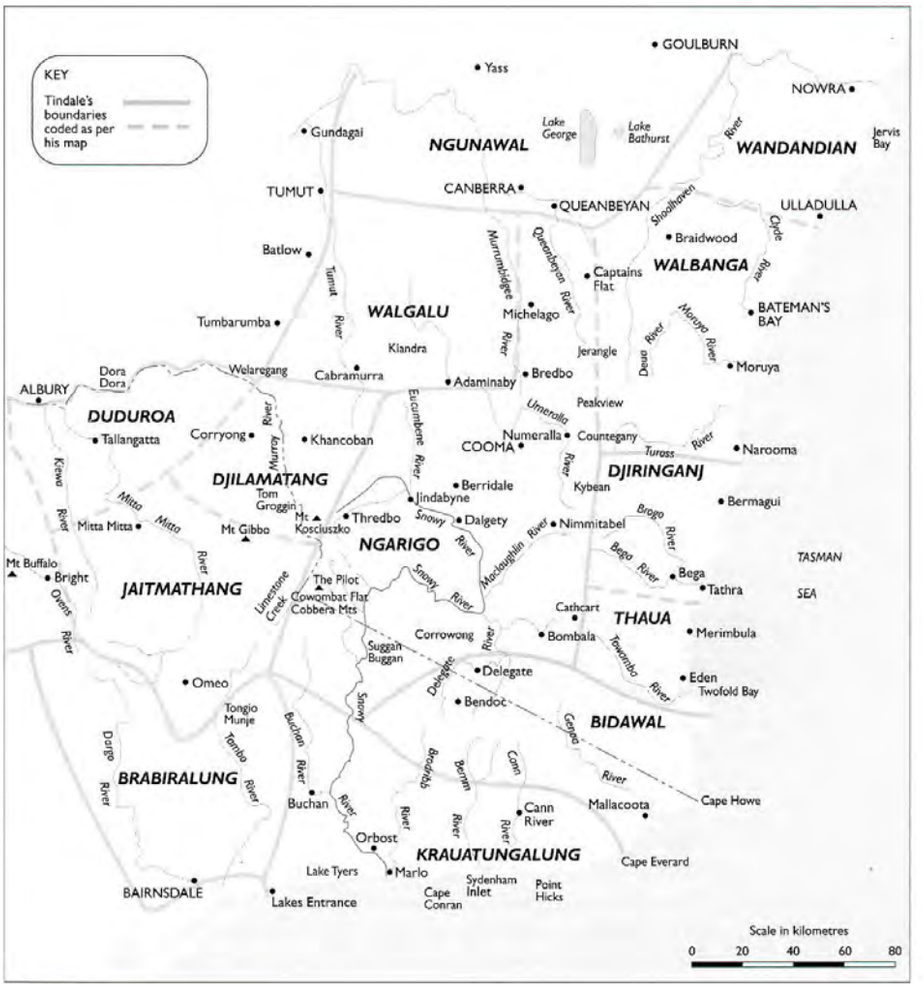

Figure 9: Tindale's map of tribal boundaries. Source: Young (2005).

There were also divisions based on location and activity. Howitt called those who lived in the high mountains Bemeringal, from *Bemering* , meaning mountain, which included the people living on the Monaro tablelands. This distinguished them from people living on the coast, the Katungal and the coastal hinterland, the Paiendra (Flood, 1982).

Historical records contain numerous descriptions of the annual bogong moth feast, almost to the exclusion of descriptions of other aspects of traditional Aboriginal life. Payten (1949) provides a description of the gatherings drawn from the accounts of settlers on the Monaro;

> *From Eden, Bega, Braidwood, Tumut, the Upper Murray and Gippsland the tribes wended their way to the tablelands and thence to the foot of the main range. Here a halt was made to observe certain formalities before commencing the feast of several months' duration, usually November, December and January. For these three months the aborigines feasted on the moth, to them a great delicacy and a food which was both plentiful and easily acquired. The excursions of these tribes and groups were contrary to the usual fixed tribal boundaries and knowing the ways of the Aboriginal we would expect that such a migration would be carried out under proper rules and procedures* (in Grinbergs 2008:10) .

Both Young (2005) and Kamminga (1993) give excellent summaries of ethnographic descriptions of large gatherings of Aboriginal people at various locations in the vicinity of the Thredbo valley, conducting ceremonial activities prior to heading to the mountain peaks for the bogong moth feasts.

In 1973, archaeologist Josephine Flood set out to establish an overall picture of pre-contact Aboriginal life in the mountains, making extensive use of the ethnographic record pertaining to bogong moth feasts (Flood 1980). She concluded that Aboriginal occupation of the Australian Alps was largely determined by the weather and the seasonal availability of the bogong moth. Human activity at the highest elevations in the Alps would have been restricted to the warmer months of the year and during winter months when the peaks are covered with snow, Aboriginal people would have migrated to the more sheltered valleys. Flood (1980) argued that larger occupation sites, possibly the result of repeated and/or extended visitation at various times of the year, will be found at altitudes up to 1200m. Between 1200m and 1500m, smaller lithic scatters would be the dominant site type, reflecting short term summer camps possibly associated with specialised activities. By and large, subsequent research has supported this model of archaeological site distribution (Grinbergs 2008).

However, subsequent research has also suggested an overemphasis by Flood and the populist literature, on the influence of bogong moths in interpreting traditional Aboriginal occupation and resource use in the region (Chapman 1978, Grinbergs 1992; Kamminga 1993). Furthermore Sandra BoWollondibbyler suggested that the tubers of the daisy yam, *Microseris scapigera* would have been a more reliable staple food, with bogong moth harvesting restricted to special and infrequent ceremonial occasions (Bowdler, 1981).

While sites found in the Thredbo valley may reflect use of the valley as a travelling route to the high country, the presence of large numbers of sites at what was once the confluence of the Snowy and Thredbo Rivers is more difficult to understand. They may be associated with seasonal activities such as ceremonial gatherings prior to movement to the mountains, or they may have nothing at all to do with moth feasts, being more a reflection of a riverine based economy, relying on the resources of the river rather than on the resource poor treeless plains. An interesting feature of the local archaeology is a reliance on large river pebbles in stone tool making in the Jindabyne valley, which may reflect a shortage of other stone material or a particular technology. Many sites in the Thredbo valley are dominated by quartz artefacts. Avery (1997) notes that quartz is locally available from reefs, veins, nodules and pebbles. Silcrete is also present in the Dalgety –Berridale area, the Eucumbene valley and the Adaminaby Plateau and is locally available at Kara creek on the Berridale Plateau and at Mt Gilead, south of Jindabyne (Chapman, 1977) .

Although the Thredbo and Jindabyne valleys are in Ngarigo territory, it is highly likely that both areas frequently visited by non-Ngarigo speaking people from the coast and elsewhere, for the purposes of meeting with other groups for ceremonial activities. Non-Ngarigo speakers would have following cultural protocols for accessing other people's country. The archaeological sites therefore probably represent use and occupation by many different Aboriginal groups, including those from other tribal areas.

Ngarigo people's first encounter with another culture was in 1823, when explorer Captain Mark John Currie who '*passed through a chain of clear downs to some extensive ones, where we met a tribe of natives'* (Hancock, 1972, p. 3). White settlement commenced in the 1830s, disrupting traditional Aboriginal life, although the numerous ethnographic accounts from the 19th and early 20th of traditional ceremonial activity suggest that cultural integrity remained relatively intact until the advent of the Aborigines Protection Board. Hancock (1972) suggests that the problem pastoralists had with native animals such as kangaroos and possums and dingoes was entirely due to cessation of Aboriginal hunting which kept numbers in control. There is mention of many Aboriginal people in the Jindabyne region dying of starvation during a severe drought between 1824 and 1829 and of a sharp decline in numbers between the 1820s and 1840s.

Aboriginal people worked as stockmen and in domestic employment and there appears to have been considerable movement between the coast and tablelands in relation to whaling, bean and pea picking on the coast in the early 20th Century. Once the reserves were set up, Aboriginal people became more dispossessed of their lands and more reliant on government handouts and numbers dwindled from disease, hunger and the gun (Young, 2005). Many Ngarigo people ended up in the reserve at Delegate, set up in 1892 and revoked in 1957.

Historical records suggest that Aboriginal people had no involvement in construction of the Snowy Hydro Scheme, which changed the face of the Jindabyne area and everybody who lived there (Seldon, 2011). Further research in this area could be fruitful.

Although there is a large population of Ngarigo people in southern NSW today, very few live in the Cooma – Jindabyne area, being either at Tumut/Tumbarumba or on the south coast. They continue to have strong connections to country, through participation in management of Kosciuszko National Park by membership of various advisory groups and by employment.

3.4 Material evidence

3.4.1. Aboriginal Heritage Information Management System (AHIMS)

A search of the AHIMS register was undertaken on 24th April 2015 for a 20 EW x 10 NS kilometre area (200km^2) including and surrounding the subject area [study area]. Initial searches of a larger area were unable to be processed by AHIMS due to the large number of recorded sites. The search area was gradually reduced until AHIMS could accommodate the search parameters. Table 4 below shows the grid coordinates for the AHIMS register search.

A total of 116 Aboriginal sites have been previously recorded within the search area (see Appendix 5 for list of sites). Of these, twenty-one (62-1-0315 to 62-1-0333) are individual recordings of stone artefacts around the Curiosity Rocks peninsula. These are almost certainly a re-recording of stone artefacts

associated with the large artefact scatter at site 62-1-0150. Unfortunately it was not possible to verify this, as site cards for 62-1-0315 to 62-1-0333 have not been submitted to AHIMS.

Table 4: parameters of AHIMS search

	Minimum	Maximum
Easting	**55 625000**	**55 645500**
Northing	**5965000**	**5975000**

The site features and site types provided by the AHIMS search were analysed to understand what the most commonly recorded site types are in the region and indicate what site types may be expected to occur along the shared path alignment. Where a single artefact was recorded and specified, these have been expressed as an isolated stone artefact. Where the numbers of artefacts was not recorded, these sites have been expressed as stone artefact locale and included with sites where more than one stone artefact was recorded.

A review of the AHIMS Site data shows all but one (99.1%) of the 116 recorded sites are open sites. A rock shelter with deposit has been recorded at Porcupine/Lubra Rocks, which is also an important female site (61-3-0014). Frequency of site feature attributes for previously recorded AHIMS Sites (n=115) is shown in Table 5. Note that a single site may contain multiple features or attributes.

Table 5: Frequency of site features extrapolated from AHIMS register search

Site Features	*n = 115*	*%*
Stone artefact locale	80	69.6%
Isolated stone artefact	22	19.1%
Potential Archaeological Deposit (PAD)	7	6.1%
Culturally modified tree	2	1.7%
Bora / Ceremonial / Grinding groove	1	0.9%
Burial / Stone artefact locale	1	0.9%
Grinding Groove	1	0.9%
Shelter / Potential Archaeological Deposit (PAD)	1	0.9%
Totals	**115**	**100.0%**

Table 5 shows that stone artefacts (stone artefact locales and isolated stone artefacts) represents the most common site feature recorded within the AHIMS Search area (88.2%). The distribution of previously recorded sites is shown in Figure 10, which is as much a reflection of where surveys have been conducted as it is of pre-contact Aboriginal occupation.

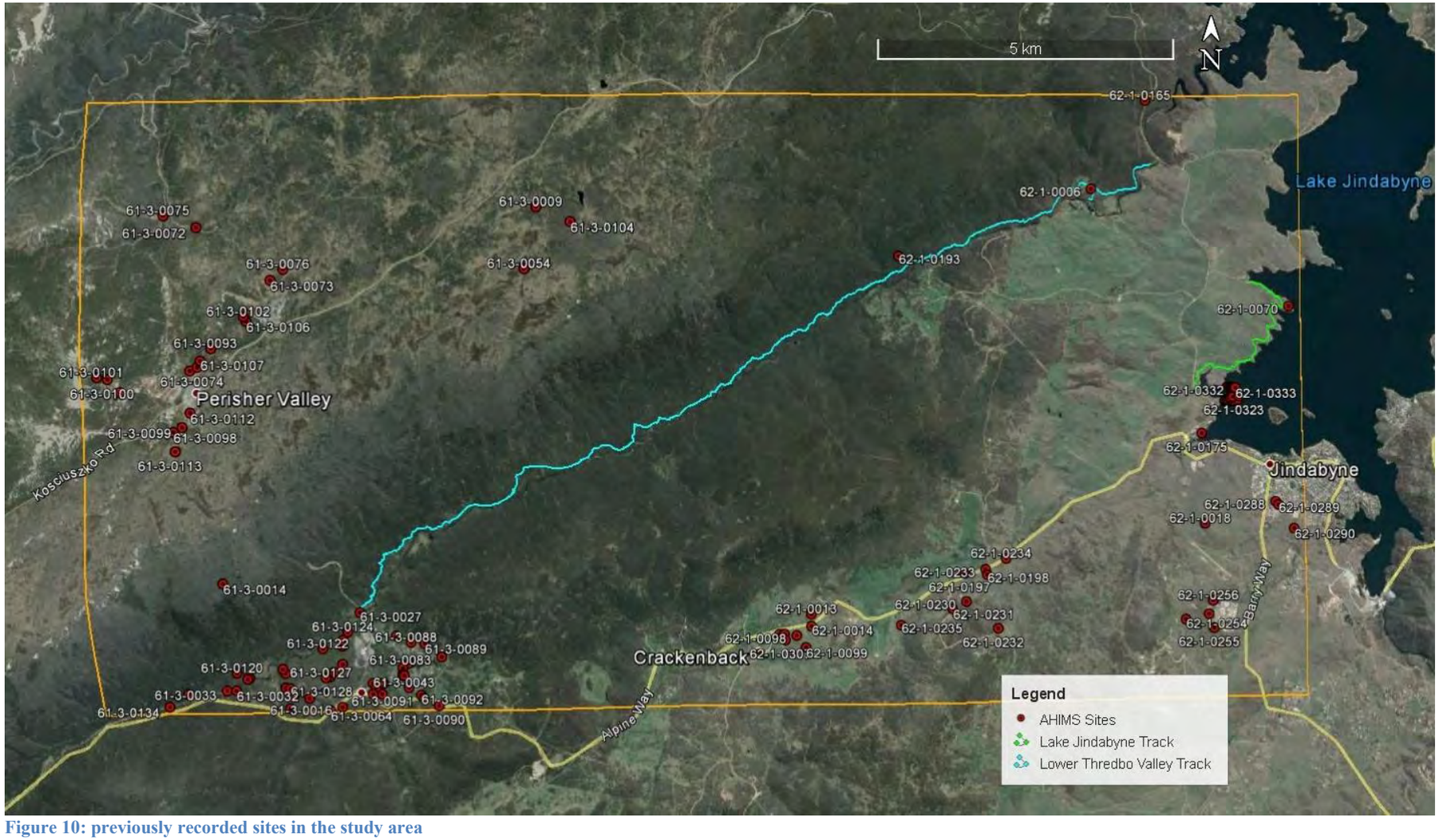

Figure 10: previously recorded sites in the study area

Site 62-1-0150 has restricted access on AHIMS but is known to encompass an extensive artefact scatter on the peninsula adjacent to Curiosity Rocks, and the rock feature itself, which is culturally and spiritually significant to Ngarigo people, particularly women (Avery, 1997). A report nominating the area for gazettal as an Aboriginal Place was prepared in 2013 (OEH, 2013) and it appears that the AP was gazetted on 6 July 2014 (see Appendix 6 for gazettal notice). However the gazettal covered an area much smaller than that nominated, being confined to the rock feature itself. Various OEH staff have verbally advised the authors that the gazettal was withdrawn and the larger area is to be re-gazetted. It has not been possible to obtain any documentation to support or refute this advice.

3.4.2. Regional archaeological context

The regional archaeological context can be understood by examining reports of previous archaeological investigations arising from academic research and heritage assessment associated with developments.

Since the subject area is located in the lower Thredbo valley, and the Jindabyne valley, close to the confluence of the Thredbo and Snowy Rivers (now submerged under Jindabyne dam) the archaeological signature of both the Thredbo valley and the Jindabyne area are relevant.

Jindabyne archaeology[1]

In 1976 Val Chapman conducted pioneering work around Lake Jindabyne when lake levels were historically low. She recorded 34 artefact scatters, with three being >100 artefacts, with a diverse array of artefact types including many made from river pebbles. The largest sites were closely associated with major rivers, now submerged by the dam (Chapman, 1977). Chapman refers to an old Australian Museum record of a bora ground and axe grooves located at the junction of Wollondibby Creek and the Snowy River, now submerged (AHIMS # 62-1-17).

Chapman also conducted the first targeted study in east Jindabyne which recorded six artefact scatters, at the break of slope or at the base of steep slopes, generally close the water courses. These also contained worked river pebbles as well as silcrete artefacts (Chapman, 1982).This pattern was to be found in subsequent studies for proposed subdivisions in East Jindabyne.

Another early survey of Lake Jindabyne was done by NPWS Ranger John Gallard when he located 26 sites (Gallard, 1975). Some of which were re-recorded by Chapman and again decades later by consultant archaeologists. He identified a number of possible hearths, which were later interpreted as termite mounds (Navin, 1998).

[1] Most of the information in this section has been taken from Dibden (2012) and Navin Officer (2003), which contain excellent summaries of previous archaeological investigations.

Djekic (1982) located six culturally modified trees (none definite) and six small artefact scatters associated with the Snowy River, during a transmission line survey between Cooma and Jindabyne. Geering subsequently salvaged one of Djekic's sites, found to contain over 700 artefacts, the majority made from quartz, with other raw materials, including river pebbles (Geering, 1982).

Walkington (1988) found no sites during a survey for the proposed Mill Creek subdivision south of Lake Jindabyne. Koettig (1989) surveyed a proposed pipeline route between Berridale and Lake Jindabyne and found 12 artefact scatters and isolated finds located on a range of landforms. One site was subsequently test excavated (Silcox, 1990).

Packard (1990) surveyed archaeologically sensitive areas area for the east Jindabyne sewerage scheme and found two artefact scatters.

In 1990 Kerry Navin surveyed the site for the proposed Tyrolean Village estate in East Jindabyne and recorded 18 artefact scatters, seven being isolated finds, found mainly along ridges (Navin, 1998). Permits were subsequently issued to allow destruction of most of the recorded sites. In 2003, Navin Officer conducted an audit of sites within the Tyrolean Village footprint. As well as finding all previously recorded sites, they recorded an additional 10 artefact scatters, all less than 10 artefacts. They concluded that most sites were small, disturbed surface scatters of stone artefacts. They noted that the east Jindabyne area was rich in archaeological sites which were suffering from the effects of cumulative impacts (Navin Officer Heritage Consultants PL , 2003). They also stated that in 2003, OEH would be unlikely to issue permits to harm objects without subsurface investigation (Navin Officer Heritage Consultants PL , 2003). In 2012, Dibden surveyed a section of the larger Tyrolean Village estate which contained four previously recorded sites of which one was re-located and no new sites were found. In contrast to Navin officer, Dibden concluded that the archaeological landscape was still relatively intact and that sub-surface testing was not warranted (Dibden, 2012).

In 1991 Kerry Navin surveyed the Rush's report development area at east Jindabyne, which recorded 20 artefact scatters, with the largest being close to permanent water sources and generally consistent with existing patterns of site distribution (Navin, 1991). Consents were also issued for several of these sites.

A survey of steep land at 'Alpine sands' in East Jindabyne identified six artefact scatters (Saunders 1997).

Williams Barber Archaeological Services (1993) surveyed an area south of Jindabyne on the Barry Way and found four small artefact scatters made mostly from quartz. Oakley (1999) subsequently inspected three sites recorded during this survey and a surrounding area but found no sites. Although the land was located between two major creeklines, it was considered to have low potential.

Many other archaeological csurveys have been condeucted around lake Jindabyne and Dibden (2012) contains an excellent summary of archaeological investigations undertaken in the Jindabyne area. As a result of her analysis, Dibden (2012:19) concluded;

In summary, artefact scatters are typically recorded during field survey in the Jindabyne area. Artefact scatters will generally be found within the majority of survey contexts, indicating that stone artefacts are widely distributed across the landscape. However, site density varies significantly according to topography, gradient, elevation and proximity to various water sources. Artefact scatters which cover large areas and contain high artefact numbers are typically found on reasonably elevated contexts close to major streams (3rd or 4th order) such as the Wollondibby, Thredbo and Snowy Rivers. These sites are probably representative of long term, intensive and repeated Aboriginal occupation (Flood 1980: 190 – 192; Kamminga 1992: 107). Smaller scatters can be found elsewhere across a number of landform elements and terrain contexts. These sites are likely to be representative of smaller scale foraging and hunting activities.

Perhaps the most important and well-studied site in the area is that associated with Curiosity Rocks, a natural rock feature now inundated with water. Avery (1997) conducted a sampling exercise across what would have been a low peninsula prior to dam building and identified an extensive and diverse artefact assemblage, with knapping floors and sub-surface deposits. Most artefacts were primary flakes made from quartz which is different to many other recorded sites around the lake, which are dominated by pebble tools. Avery suggests that these may have been collected over the years by fossickers. The value of the site lies not only in its very large numbers of artefacts, but also its proximity to Curiosity Rocks and bora grounds and axe grooves (61-1-0013) now inundated, and the intertribal meeting places for Aboriginal people at Wollondibby and Crackenback and elsewhere.

Thredbo valley

Jo Flood found no archaeological sites in the Thredbo Valley during her doctoral research (Kamminga 1993) but sites have been reported from there since 1973 when NPWS Ranger John Gallard recorded a site along the Rutledge's – Bullocks track as containing 'axes, hammerstones, scrapers and flakes.' Large numbers of Aboriginal sites have since been recorded from the Thredbo valley. Most are artefact scatters recorded during archaeological investigations for developments but there are also anecdotal references to burials and stone arrangements (61-3-0013), although these have never been re-located. In 1949 R.F. Payten, described 'three blackfellows graves, of which two are on the Thredbo River , a few miles above the confluence of the Little Thredbo and Thredbo Rivers , comprising mounds of earth covered in stones, about 3 feet high' (Young 2005 :79), which may refer to the same site. Another example of an historical record is that of a 19th Century Aboriginal grave near Jindabyne, recorded by Richard Helms in his article 'Anthropological Notes', in the *Journal of Proceedings of Linnaean Society*, 1895 (Figure 11).

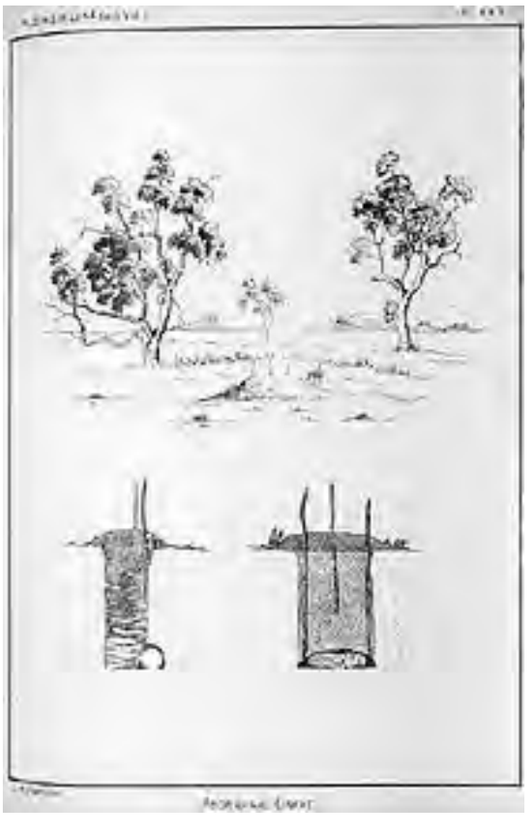

Figure 11: Aboriginal grave near Jindabyne. Source: http://www.powerhousemuseum.com/hsc/snowy/impact.htm

In 1983, David Hogg PL was commissioned to prepare an EIS for a proposed ski tube between Bullocks Flat and Perisher Valley and associated infrastructure. Archaeologist Katrina Geering prepared the archaeological report, noting that Gallard had collected all the artefacts he had seen and deposited them in the NPWS office at Sawpit Creek. It is probable that he collected the more obvious artefacts, such as axes and hammerstones, leaving behind more 'mundane' items such as unretouched quartz flakes. A significant bias was introduced into the remaining archaeological evidence as a result of this selective collection.

Geering recorded numerous sites within the area to be impacted by the ski tube car park at Bullocks Flat, including 64 artefacts where Gallard had previously recorded. Geering interpreted the sites as a possible summer base camp and recommended salvage prior to development. As part of the salvage operations, the site was re-mapped and test excavations were conducted by ANU Tech, resulting in the site being interpreted as an almost continuous and relatively dense artefact scatter between Rutledge's and Little Thredbo huts. Part of the site was issued with a 'consent to destroy' to allow construction of the ski tube car park, while the remainder of the site was afforded some protection through remediation works by NPWS (see Feary 2008).

During the 1980s and 1990s, an accelerated rate of development of facilities and services within the ski resorts prompted a number of environmental impact assessments, many of which included archaeological investigations. The Thredbo Valley is the only thoroughfare from Jindabyne to Thredbo Village, and has been the subject of numerous archaeological surveys associated with installation of infrastructure to service the Thredbo ski fields. These include upgrading and maintenance of the Alpine Way (Paton 1985; Navin Officer

1992); upgrading an electricity line (Walkington 1987); laying an optical fibre cable (Paton 1988) and installation of a Telstra cable line (Barber 2003).

Archaeological sites, comprising surface scatters of mostly quartz flakes were recorded along all the routes, including some re-recordings of previously recorded sites. Consents to destroy have been issued for a number of these sites, to allow developments to proceed.

In 1987 extensive archaeological investigations, including test excavations, were undertaken for the proposed Lake Crackenback Tourist Resort, located just outside the national park at the junction of Little Thredbo and Thredbo Rivers. A total of 661 artefacts were recovered from the excavation, being mainly quartz (96%), with flakes representing nearly 95% of the assemblage and exhibiting little temporal or spatial variation. Radio-carbon dating of charcoal samples obtained from stratified deposits gave dates of 940 +/- 150 BP (ANU-6866), 4390 +/- 80 BP (ANU-6867) and 2460 +/- 120BP (ANU-6868) respectively (Kamminga et al 1989: 35). This provided the first dated cultural sequence within the NSW section of the Australian Alps.

The Lake Crackenback Tourist resort was archaeologically re-visited in 2003 during a survey by Barber (2003), who identified seven artefact locales. Other surveys in the vicinity also found small artefact scatters on spur crests and gentle slopes (Parkes & Barber, 2003). Subsequent subsurface testing revealed very few artefacts despite the high archaeological potential of the landform where excavations were conducted (Barber, 2003).

In April 2008, archaeologist Alistair Grinbergs conducted a preliminary investigation of the route of the proposed shared use track between Bullocks Flat and the Thredbo Rangers station in the Thredbo valley. He identified 21 sites, comprising small artefact scatters, isolated finds and a possible axe grinding groove. Some of his recordings were re-interpretations of a previous recording of single, large artefact scatter, as a series of smaller sites strung along the valley, mainly on the eastern side, close to but above the river's flood zone (Grinbergs 2008). Grinbergs identified two areas of potential archaeological deposit (PAD) during his preliminary investigations, both within the riparian zone. He noted that ground visibility was very poor due to a thick cover of alpine grasses and that surface and subsurface artefacts may be present but could not be seen during the survey.

In 2008, further analysis and salvage of site 61-3- 0019, was conducted for Stage 1 of the shared use track, between Bullocks Flat and Thredbo Diggings. Sixty five stone artefacts on the pathway were systematically recorded and collected and subsequently buried together at a location close to the new pathway (see Feary 2009 for a full description of the salvage).

In 2010, as part of Stage 2 of the shared path, subsurface testing was conducted at three bridge crossings over the Thredbo River, within Kosciuszko National Park (Niemoeller, 2011). Three 50x50cm test pits and 5 hand auger holes were excavated at each bridge site, on both sides of the river where practicable. Despite the large numbers of surface artefact scatters recorded in this section of the Thredbo Valley, no evidence for Aboriginal occupation was found during the subsurface investigations. None of the test excavations were done at the PAD sites identified previously by Grinbergs, however, the test pit locations were considered to be of equally high archaeological potential. The absence of any subsurface evidence at these locations may be related to a lack of archaeological evidence on the surface. An alternative explanation is that, with the exception of Bridge

Site 1 (south), the test pits were positioned much closer to the river than most of the previously recorded sites, indicating that periodic flooding may have washed sites away, and/or the locations were never actually used by Aboriginal people because they were flood prone. Although bridge site 1 south was more elevated, it also had quite a slope, making it less suitable for camping.

Kamminga has postulated that the valley was a major thoroughfare for Aboriginal people moving into the higher mountain peaks from ceremonial grounds at Kalkite and the Wollondibby valley and the base of Mount Crackenback and those sites can be expected to occur all the way up the valley (Kamminga 1993). He interprets the archaeology of the Thredbo valley as a continuous archaeological site, comprising many activity areas and postulates that flaking of quartz pebbles at locations along the valley floor and lower slopes over millennia has produced a high background count of flaking debitage. Kamminga considers that every test excavation conducted at regular intervals along the Thredbo valley will reveal stone artefacts (Kamminga 1993).

The sample size of subsurface deposits is too small to make sound judgements on whether Kamminga's model of continuous subsurface deposits along the entire valley can be challenged. However, these findings may contribute to a refining of the model, by suggesting that rather than an even distribution of archaeological material along the valley, traditional use was concentrated at the lower end of the valley around Bullocks Flat and the Little Thredbo River, where people gathered and/or lived. Transitory movement up and down the valley has left much less evidence, perhaps only a background scatter, some of which has been subject to the impacts of flooding over thousands of years.

In 2014, an Aboriginal heritage assessment was conducted at two locations on the Thredbo River where bank stabilisation activities were proposed. A collapsed gabion wall required urgent attention adjacent to the Fish Trap within Gaden Trout Hatchery grounds and only a few metres upstream of the proposed new bridge across the river. The other location was the southern banks of the river at Paddys Corner, a distinct and very large bend in the river, popular with fishers and a crossing place for cattle going to the high country in historic times. No sites were found at either location (Feary, 2014).

3.4.3. Local archaeological context

The AHIMS search indicates that five recorded sites are on or close to the proposed alignment (see Table 6 and Figure 9). A section of the existing path is within the proposed Aboriginal Place boundaries at Curiosity Rocks and the proposed extension will also be within the boundaries until it reaches Wollondibby Creek (see Figure 12).

Table 6: recorded archaeological sites in or close to subject area

SITE ID	SITE NAME	DESCRIPTION	STATUS
61-3-0027	Site C/ Crackenback River 2/Tallangatta	Four quartz flakes on northern side of river recorded in 1983. Unable to be found during a survey of the same area in 1984 (Paton, 1984))	May have been destroyed by Skitube bridge development. Not on alignment of shared path
62-1-0193	Brooks Mill Creek 1	Possible culturally modified tree, northern side of	Not on track alignment.

		Thredbo River. Very steep country	Will not be impacted
62-1-0006	Sawpit Creek; Thredbo River; Site 28	3 axe heads on northern banks of Thredbo River at Paddys Corner. Artefacts collected in 1976 during PhD research by Jo Flood	Description does not match grid reference. Exact location unknown
62-1-0170	Colorado Point; Lake Jindabyne; J/WS 24,25,26	Large artefact scatter on western side of lake, recorded and collected when lake levels low in 1977 (Chapman, 1977).	Close to alignment
62-1-0150	Curiosity Rocks – rock feature [now in lake] and peninsula	Large artefact scatter on peninsula adjacent to Curiosity Rocks, initially recorded by Chapman (1977). Major site protection works conducted in 1999. Includes culturally significant places. Within the proposed Curiosity Rocks Aboriginal Place boundaries	Site badly damaged and needs further site protection works. Will not be impacted as path has already been built at this location.
Curiosity Rocks Aboriginal Place	62-1-0150	Nomination included rocks and portion of lake shore, identified as being spiritually significant (see Figure 11 below).	AP gazetted on 6/7/2014, but excluded western shores of lake. Has been de-gazetted (OEH staff pers. comm.)

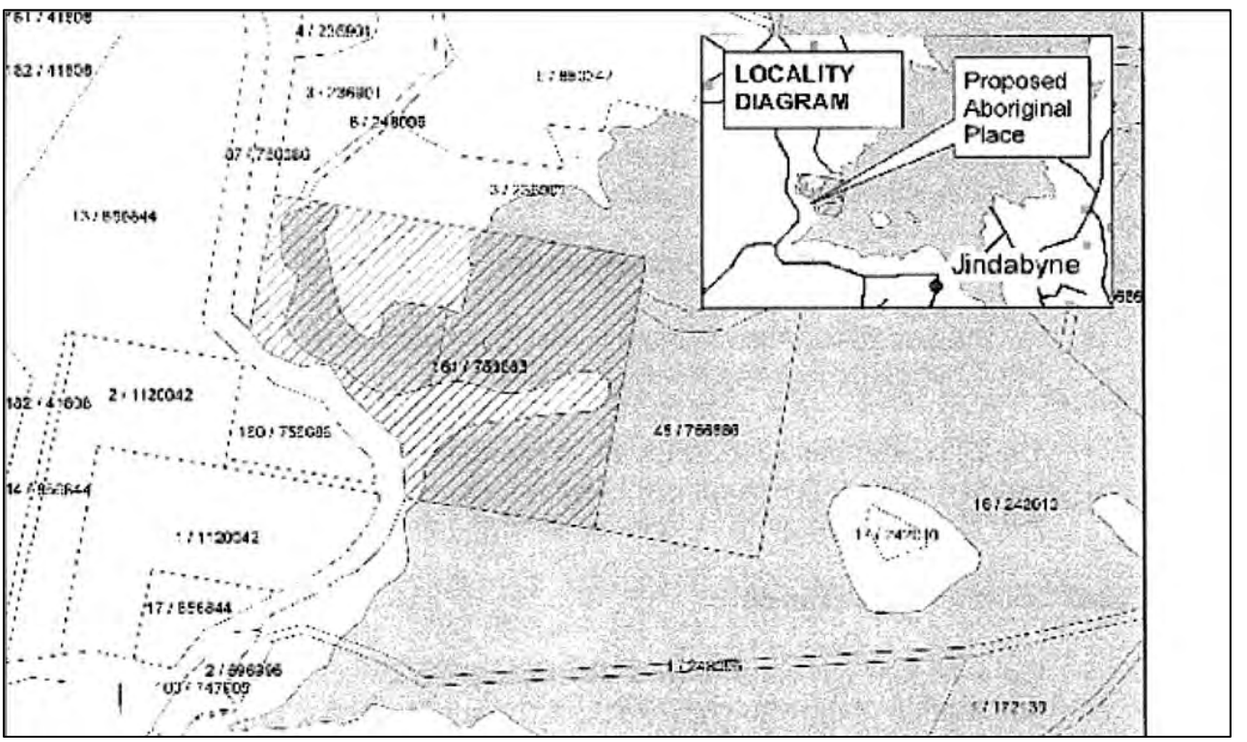

Figure 12: Proposed Aboriginal Place, Curiosity Rocks (hatched area)

4. Proposed activity

4.1. Land use history

Archaeological evidence suggests that pre-contact Aboriginal history involved use of the Thredbo valley potentially for living (around Bullocks Flat) and for movement into the high country for at least 4,000 years. The confluence of Snowy and Thredbo rivers may have been a major camping area for Aboriginal people. During this time, the area would have been dominated by riverine systems on gentle terrain supporting open forest, and treeless plains of the Monaro tablelands. Aboriginal people probably burnt the area as part of land management but the extent to which this has modified the structure and floristics of the vegetation is scientifically unknown. There is scientific evidence to indicate that forest at higher elevations was rarely burnt prior to white settlement (Zylstra, 2006).

Clearing of vegetation for grazing and agriculture probably began in the 1820s, when the fertile land on the banks of the Snowy River attracted James and John Prendergast. Prendergast and his brothers were instrumental in setting up the Monaro to Gippsland cattle route which aided in the economic growth of the area (Seldon, 2011). Another early white inhabitant James Spencer, a squatter at Waste Point was believed to have been the first person to graze sheep in the high country during summer, beginning decades of damage to the high country until the Kosciuszko State Park was declared.

The region was dominated by grazing with occasional visits from fishermen or bushwalkers, something of backwater;

> *Jindabyne was then only a very slow backward place of about 300 people – one of those country towns that grew, a shop here and a shop there – it wasn't a collective town* (McHugh, 1989, p. 56).

Jindabyne and the Snowy Mountains region experienced profound social and environmental change with the commencement of the Snowy Hydro Scheme in 1949 and an influx of thousands of European workers to the area. Inundation of the Jindabyne valley began in 1967 and the township's people were moved to where Jindabyne currently stands, leaving behind a whole town that emerges when dam levels are very low. Flooding the valley submerged many Aboriginal sites. Figure 13 shows the proposed route on the western edge of the lake overlain on a pre-dam aerial photograph. Curiosity Rocks is shown by numerous small dots and numbers and the AP nomination is shown in red. The association between Curiosity Rocks and confluence of two major water courses is plain to see.

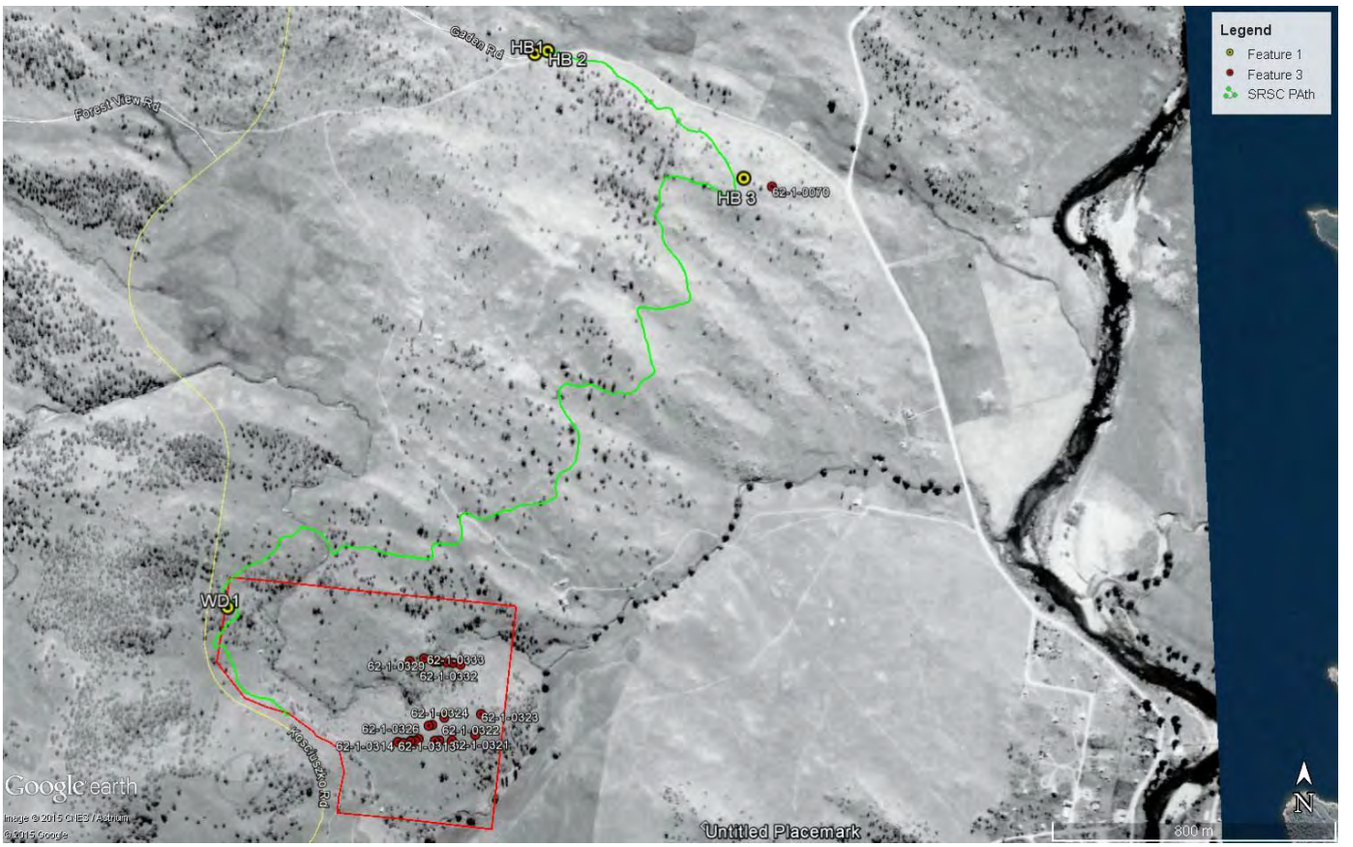

Figure 13: 1960s aerial photo with AP (red) and proposed shared path route shown (green). Photo courtesy Snowy Mountains Hydro.

With increasing recreational use of the mountains for skiing since the 1960s, much infrastructure has been built along the Thredbo Valley which has led to major impacts on Aboriginal sites (see Section 3.4.2).

In response to Australians' love of freshwater recreational fishing in, the Gaden Trout Hatchery began in 1948 on land owned by Bill Napthali, on the western arm of the Paddys Corner bend on the south bank of the Thredbo River. Acclimatisation societies played a major role in management of the hatchery and provision of trout eggs, but it was financially onerous and in 1959, management was passed to NSW Fisheries. The Fish Trap was constructed across the river in 1974.

Historical clearing in the National Park, indicates a long history of disturbance from pastoral activities (Figure 14). Open grassy areas on gentle terrain may be natural due to frost hollow effects, the result of Aboriginal burning or due to clearing for pasture or all three.

Figure 14: stone chimney in open grasslands near Paddys Corner, KNP.

Prior to gazettal of the Kosciuszko National Park, cattle used to cross the river at Paddys Corner, enroute to summer pasture in the high country. Hard hooves would have damaged any Aboriginal sites and eroded the river banks and has compacted the soil. Frequent flooding has removed and re-deposited sediments many millions of times, and any associated Aboriginal objects.

4.2. Description of development

The following information is taken from the REF for the activity within Kosciuszko NP and from the Statement of Environmental Effects (SEE) for the Snowy River Shire section.

4.2.1 LTVT section from Bullocks Flat to Pallaibo (including Pallaibo track and proposed bridge over Thredbo River at Gaden Hatchery with associated bridge approaches.

The LTVT begins at Bullocks Hut in the Thredbo River valley where it immediately crosses to the northern side of the Thredbo River utilising the pedestrian access on the Skitube Bridge (pending formalisation of an agreement between Perisher Blue and OEH).

It will run roughly adjacent to the Thredbo River for approximately 20 kilometres and end at the Thredbo River Picnic Area at Kosciuszko Road (Figure 15). With the Thredbo River being the national park boundary in this area, the track will remain entirely on the north (national park) side of the river until it exits at either Gaden Trout Hatchery or Thredbo River Picnic Area. The Snowy River Shire Council (SRSC) is currently working with community stakeholders and government to seek approval and fund a bridge-crossing and trail that will link the LTVT to Jindabyne at Gaden Trout Hatchery (see below).

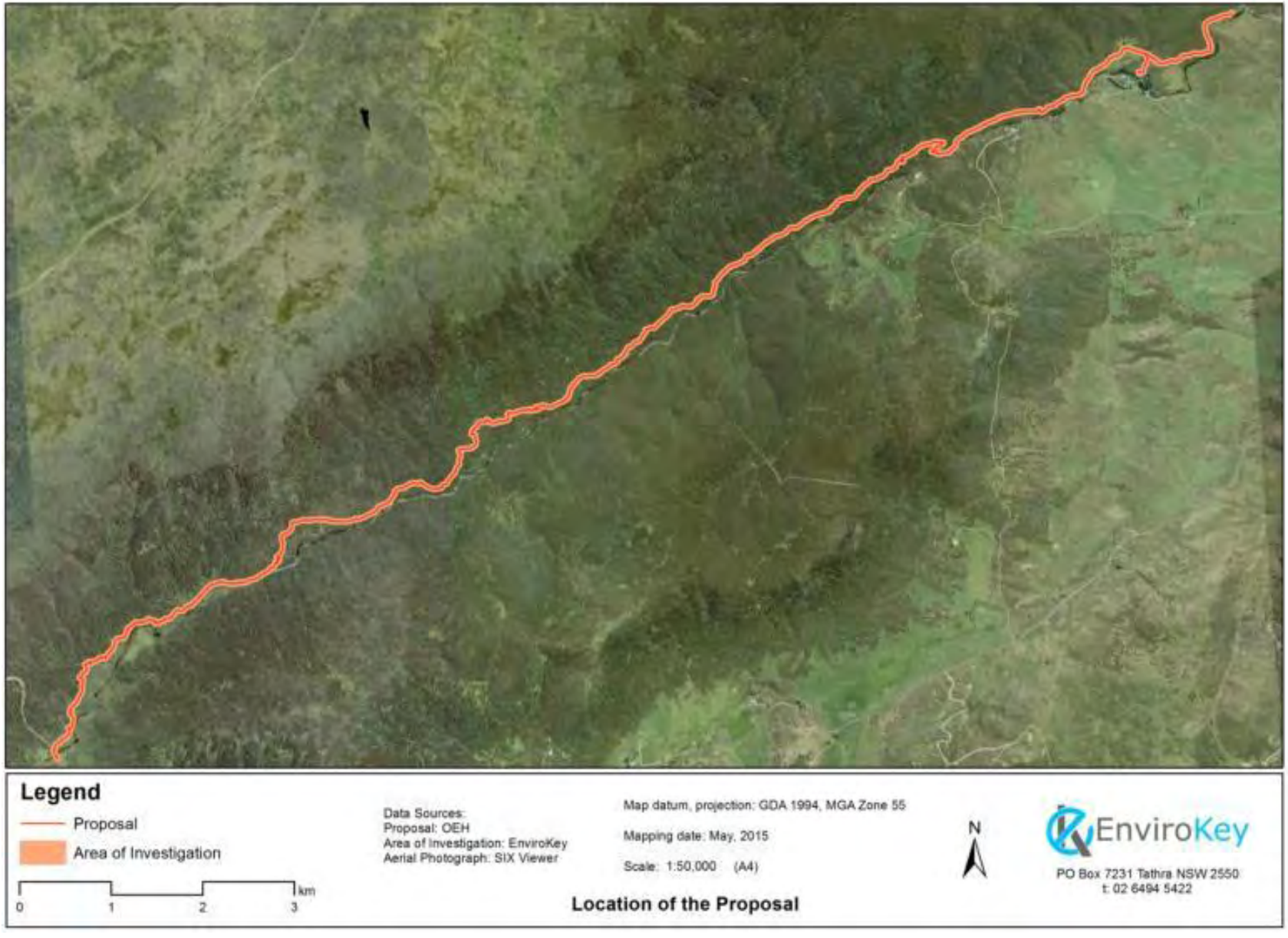

Figure 15: Thredbo Picnic area - proposed shared path between Bullocks Flat and Thredbo Picnic area

Due to the uncertainty as to whether SRSC will secure the funds required this ACHAR is assessing two options, *viz.*

- Option 1 – Construction of a bridge at the Gaden Trout Hatchery. An external party, likely Snowy River Shire Council, would own the bridge.
- Option 2 – Track to continue past the Gaden Trout Hatchery, join the Pallaibo Track at the lowest point where it crosses Sawpit Creek and continue along the Pallaibo Track to the Thredbo River Picnic Area. This option will require that section of the Pallaibo Track to be re-zoned from a walking track to a multi-use track. Some track modifications and upgrades would be required.

The final path may encompass both options 1 and 2 above. For the purposes of the assessment it has been assumed that both options will be utilised and both have been assessed.

The REF's preferred option has the proposed track with a hand-benched track to a width of up to 1300 mm. This would achieve an IMBA grade of blue square or an 'intermediate' rating. This track would be suitable for skilled mountain bikers, suitable for mountain bikes. The IMBA Trail Difficulty Rating System (IMBA Australia 2012) indicates that the track width must be handlebar width or greater (specifically 600mm plus or minus 300mm for tread or bridges), with possible sections of rocky or loose tread and the trail will have obstacles such as logs, roots and rocks.

The shared-use track would be constructed to International Mountain Bike Association (IMBA) guidelines for sustainable trails. The track criteria will conform to the IMBA 'More Difficult – Blue Square' trail difficulty rating, but will generally be slightly narrower and at a more challenging end of the grade of track that would be classified 'Blue Square'. Track features are described in Table 7.

Table 7: features of proposed track

Track Feature	Description
Tread width	Up to 1300 mm benched track.
Tread surface	Primarily a firm, stable bare earth surface. Some armouring may be required through unsuitable ground conditions.
Bridges and platforms	Creeks, tributaries, springs and other crossings containing notable moisture will be protected by low-level raised platforms, constructed by steel with fibreglass reinforced plastic (FRP) mesh deck.
Tread landscaping	Many sections of the track, particularly those sections where drainage is limited, the tread will be 'lifted' and 'tilted' to create improved drainage.
Track Corridor (Vegetation Clearance)	1.5m – 1.8m wide, 2.4m high
Average Trail Grade	10% or less
Maximum Trail Grade	15% or greater
Natural Obstacles and Technical Trail Features	Unavoidable obstacles less than 200mm high and bridges minimum 600mm wide

Track Construction

- Rolling contour track to IMBA specifications
- 1.5 metres to 1.8 metres wide vegetation clearance constructed with brush-cutters, chainsaws and other equipment
- 2.4 metre high track corridor constructed with brush-cutters, chainsaws and other equipment
- Track alignment chosen to ensure food line of sight and enable use in both directions
- Up to 1300 millimetre wide benched track constructed with powered and non-powered hand tools by experienced track builder
- Potential use of a small excavator for certain sections if access allows
- Onsite materials could be utilised (where available and appropriate and in the accordance with the project Environmental Management Plan (EMP)) for track armouring, creek crossings and bridge approaches
- Many sections of the track, particularly those sections where drainage is limited, the tread would be 'lifted' and 'tilted' to create improved drainage.

Creek and Tributary Crossings

- Steel bridge structures with fibreglass reinforced plastic mesh deck
- A 'more difficult' rating will allow bridges to be shorter, narrower and lower as entries that are more technical and exits to the crossing are permissible. Where possible, bridges will be less than 900mm high and most will not require handrails
- Due to experience of target user, deck level will only allow for one in five year flood. Construction will be built to a standard to withstand the force of such flood waters
- 600 - 900mm wide bridge deck is considered adequate. However wider decking at 1300mm will be constructed if budgets allow
- Smaller bridges allow for simpler modular design that requires less technical expertise and minimises onsite construction
- Smaller bridges result in less material and therefore fewer helicopter lifts to deliver to site
- Approaches to bridges will require rock armouring, approximately 500mm either side. This rock will need to be dropped in.

Damp Area Crossings

- Damp areas and springs will mostly be crossed with elevated FRP decking
- Some shorter crossings will be armoured with stone pitching and decomposed granite. This would require materials to be brought in.

For much of the track there is either a damp area of a creek/tributary crossing every 200 to 300 metres.

The proposed track will be built above the Thredbo River's flood line for the entire route.

Construction/Maintenance

- Loadings and width of platforms may not allow ATV access
- Two wheel motorbike at low speed would be ideal, with the possibility of small trailer for equipment and light materials
- Helicopter for heavy materials such as armouring and platforms
- Pedestrian and mountain bike access will be a major form of access for both construction and maintenance
- Limited vehicle access to points near the trail through fire roads from opposite side of the river
- Tethered boat/rafts and pulley systems can be used to bring light materials and fuel across the river
- People can wade across the river in low flows and at designated safe points.

4.2.2 Jindabyne section

Snowy River Shire Council proposes to undertake an extension of the Lake Jindabyne Shared Trail from Curiosity Rocks to Hatchery Bay (see Figure 3). The total length of the Shared Trail will be 5.2km. The shared trail would be constructed in accordance with the International Mountain Bike Association (IMBA) principles of sustainable trails as has previous trail development from Cobbon Crescent to Tyrolean Village.

The proposed route traverses through disturbed open grassland with a full bench cut construction to a maximum width of 1.8metres. The track will be constructed by either manual labour, or small excavator/bobcat. To minimise disturbance, track construction will work from existing tracks, some sections will only require poisoning of grass and no excavation or soil removal.

The area for the proposed trail is relatively flat with gradual slopes. The Wollondibby Creek forms an inlet into Lake Jindabyne just after the Curiosity Rocks area. A bridge will be built over Wollondibby Creek.

The project scope of works is as follows;

Section 1

- Trail Construction - distance 600m
- Vegetation clearing / brush cutting of trail corridor to 1.8m wide where required.
- Machine excavation of rolling contour bench cut trail 1.2m wide to IMBA standards.
- Installation of 1-2m long bridge lead ins to either end of bridge 1.
- Revegetation of excess spoil / disturbed ground within trail corridor.
- Trail Construction – distance 200m
- Supply and install large rock / DGADEN BRIDGE20mm material to trail sections through rocky outcrops, and compact trail tread on completion.

- Other works -Livestock control
- Install 2 x cattle grid ramps / squeeze gates as per specification.
- Bridge 1 – distance 15m
- Construction of steel framed bridge with Weldlock mesh fibreglass deck as per drawing specifications.

Section 2

- Trail construction - distance 600m
- Vegetation clearing of trail corridor to 1.8m wide.
- Brush cutting / mowing of trail tread to 700mm wide to remove vegetation to ground
- level.
- Spraying of non-selective herbicide on trail tread where required.
- Hand shaping to install trail tread / backslope where required on steeper side slopes.
- Revegetation of excess spoil / disturbed ground within trail corridor.
- Other works – point B
- Revegetation of old Wollondibby trails in area.
- Install rest area at Curiosity Rocks including seating.

Section 3

- Trail Construction – distance 3.2km
- Vegetation clearing of trail corridor to 1.8m wide.
- Brush cutting / mowing of trail tread to 700mm wide to remove vegetation to ground level.
- Spraying of non-selective herbicide on trail tread where required.
- Hand shaping to install trail tread / backslope where required on steeper side slopes.
- Revegetation of excess spoil / disturbed ground within trail corridor.
- Other works -Livestock control – points C-F
- Install 5 x cattle grid ramps / squeeze gates as per specification.

Section 4

- Trail Construction – distance 800m
- Vegetation clearing of trail corridor to 1.8m wide.
- Brush cutting / mowing of trail tread to 700mm wide to remove vegetation to ground level.
- Spraying of non-selective herbicide on trail tread where required.
- Hand shaping to install trail tread / backslope where required on steeper side slopes.
- Revegetation of excess spoil / disturbed ground within trail corridor.

4.2.3 Linking sections

If Option 1 goes ahead, the two sections of shared path will be linked by Gaden Road between the trout hatchery and Kosciuszko Road, and Hatchery Bay Road between Kosciuszko Road and Hatchery Bay picnic area. The former is a sealed road for which no activity is planned and it was therefore not inspected. The latter is an unsealed vehicle track the lower section of which may be closed off to vehicles and restricted to use by bicycles and walkers. This section was inspected as part of the Lake Jindabyne section of the field survey.

4.3. Potential harm to Aboriginal objects

The REF describes the following potential impacts of the shared path within Kosciuszko National Park.

> ..potential impacts are considered to be likely due to the track alignment across steep slopes with a requirement to cut into or excavation into the soil to create flat surfaces. Also the removal of all mid-storey vegetation would require removal of shrubs and seedlings by the roots to minimise regrowth and this would also create soil disturbance exposed to erosion. Though this is considered an indirect impact, it is likely that erosion will represent a significant challenge during the construction and maintenance of the track due to the steepness of the landscape. Even light precipitation events are likely to create runoff in this landscape which increases the potential for erosion. Design features (such as the retention of groundcover vegetation where possible and the retention of vegetation outside the impact area) and a series of mitigation measures are likely to avoid or limit the potential impacts of soil erosion (EnviroKey, 2015).

Any Aboriginal objects present on or close to the final alignment of the proposed shared path will be directly impacted by path construction, due to disturbance of the sediments on or in which artefacts occur, as described above. Culturally modified trees in the lower Thredbo valley will be impacted by vegetation clearing along the path's corridor. Other site types such as stone arrangements that may be present around Lake Jindabyne will be affected if they are on or close to the final route.

Harm is likely to continue as a result of increased use of the area once the shared paths are constructed. The REF proposes a series of safeguards/measures to minimise the likelihood of indirect impacts affecting any biota within the study area and these will also apply to any associated Aboriginal objects, such as stone artefacts.

5. Archaeological investigations

5.1. Predictions

Factors to consider when developing a predictive model are: - landforms, disturbance history, distribution patterns of known sites, and existing predictive models derived from previous investigations in the region. Based on these factors, the Aboriginal objects most likely to be present in the lower Thredbo valley are **stone artefacts** with a lesser likelihood of **culturally modified trees**. Artefacts are most likely to occur as isolated finds or low density scatters of flaked stone artefacts made from good quality quartz and occasionally silcrete or porphyry rock types.

Most of the path is along slopes of up to 25 degrees, with a very low potential for artefacts associated with camping or travelling. These are most likely to occur on the flat elevated river terraces above the highest flood levels or on flat spurs and ridges. Mature eucalypts occur on the slopes in the Thredbo valley, and have the potential to contain scars resulting from removal of bark by Aboriginal people.

There is a high potential for artefacts to be present along the Pallaibo track section due to its proximity to the river and gentle terrain, and along the short deviation from Pallaibo to the proposed bridge site.

Aboriginal objects most likely to occur around Lake Jindabyne are flaked and ground stone implements, including those made from river pebbles, and possibly **stone arrangements**.

A possible axe groove was recorded further up the Thredbo valley in 2008, but being granite, it is more likely to be a natural feature (Grinbergs 2008). **Axe grooves** are very unlikely to occur in outcropping rock on mid-slopes, being usually found close to a water supply and in sandstone rather than granite.

Stone quarries using quartz outcrops on valley slopes and quartz veins in granite surrounding Lake Jindabyne are predicted to occur, although none have been recorded in the region thus far.
The Gaden Hatchery section is predicted to have no objects due to the highly modified and landscaped appearance of the grounds.

5.2. Field survey

Field survey methodology was guided by the following factors:

- The nature of the proposal – a linear transect along the slopes of the lower Thredbo Valley and above the northern bank of the Thredbo River and around the shore of Lake Jindabyne.

- A high level of logistical difficulty for the lower Thredbo valley, as access was only possible at either end or by crossing the river at two locations only on the south side– Pender Lea and Robertson's crossing, with permission from landowners.

- Very limited ground visibility, mostly steep terrain and thick vegetation post fire in the Thredbo valley, and a thick cover of introduced grasses on the slopes around Lake Jindabyne. Hence field survey concentrated on finding areas of bare ground and looking carefully for stone artefacts. All large trees were carefully inspected for scars in LTVT. Quartz outcrops were checked for evidence of quarrying.

- The footprint for the shared path is only 2 metres but the development corridor is 50 metres wide, to allow for small last minute deviations. However it was not always possible to systematically survey this width in LTVT due to the steep terrain, many creek crossings and very thick understorey.

The field methodology sent to Registered Aboriginal Parties for comment is described below:

- Field survey will involve surface investigation only and is expected to take up to six (6) days of walking. The track route will be clearly marked with tape and it is the intention to walk the route

in its entirety, and 25 metres each side of the midline. This will allow flexibility in path alignment, to avoid Aboriginal sites or significant environmental features if present. The route will be walked by both archaeologists, accompanied by agency representatives where appropriate, and one or two appropriately qualified and experienced Aboriginal heritage officers, representing registered Aboriginal parties. Careful attention will be paid to bare patches of ground for the presence of stone artefacts and any mature trees that may contain cultural scars.

- Logistical issues for fieldwork in the national park include the rugged nature of the terrain, presence of thick vegetation, and the need to wade across the river at some locations. There are also limited opportunities to access the track by vehicle, which means that on some days long distances will need to be covered.
- Where vegetation is thick and ground visibility very limited or non-existent, the archaeological sensitivity of the landform – including the potential for buried or obscured archaeological material, will be assessed, based on landforms, topography and geomorphological processes. The need for any future subsurface investigations will be identified.
- Recording, significance assessment and recommendations regarding further work, will be in accordance with relevant OEH codes.

Fieldwork occurred over five days between 19 and 23 May 2015, conducted by consultant archaeologists Sue Feary and Gerard Niemoeller, accompanied by Aboriginal heritage officers Ronnie Thomas and Derek Davison, and supported by Project Manager Chris Darlington (for Lower Thredbo Valley) and Alannah Dickeson (for lake Jindabyne). The entire route was walked by all field crew, to 25 metres each side of the flagged centreline where feasible. A different section of the track was surveyed on each of the five days. The section within the Kosciusko National Park and Thredbo Valley was completed over four days, with the section around Lake Jindabyne conducted over one day.

All large eucalypts were checked for scars and all patches of bare ground were checked for stone artefacts. Outcrops of quartz and other rock types were checked for quarrying. Areas of relatively higher archaeological potential were identified and mapped.

The level of visibility and exposure for this survey was generally very low (<3%) and this was especially true of the Lower Thredbo Valley section within Kosciuszko National Park (Figure 16). The highest visibility was afforded either along existing tracks such as the Pallaibo Track (Figure 17), vehicle tracks nearer Jindabyne or around the eroded margins of Lake Jindabyne. Observations for the different sections and transects of the proposed track and survey are described in Table 8.

Figure 16: typical understory, near Bullocks Flat

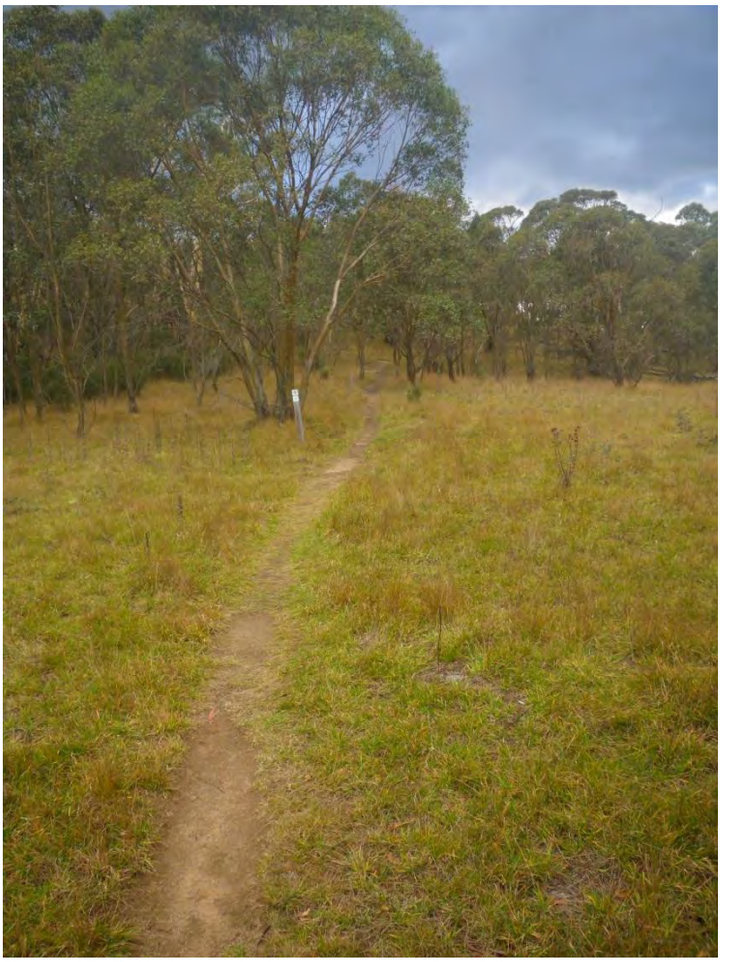

Figure 17: Pallaibo track showing improved visibility

Feary S. and Niemoeller G. 2015. Lower Thredbo Valley shared path: Bullocks Flat to Curiosity Rocks, Snowy Mountains, NSW. Aboriginal cultural heritage assessment. FINAL REPORT to NPWS and SRSC.

Table 8: Observations recorded along the proposed track

Track	*Section / Transect*	*Landscape Traversed*	*Land units Traversed*
Lower Thredbo Valley Track, KNP	Bullock Flats to Pender Lea	Side slopes of Lower to mid foot slopes of Thredbo Valley	Numerous minor spur slopes and incised gullies, with some low gradient shelves on lower slope above Thredbo River Gradients (2 to 25 degrees)
Lower Thredbo Valley Track, KNP	Pender Lea to Robertsons Crossing	Lower to mid foot slopes of Thredbo Valley	Numerous minor spur slopes and incised gullies, with some low gradient shelves on lower slope above Thredbo River (2 to 25 degrees)
Lower Thredbo Valley Track, KNP	Robertsons Crossing to Gaden Trout Hatchery	Lower to mid foot slopes of Thredbo Valley	Numerous minor spur slopes and incised gullies, with some low gradient shelves on lower slope above Thredbo River and near Brooks Mill Creek (2 to 25 degrees)
Lower Thredbo Valley Track, KNP	Gaden Trout Hatchery – Pallaibo Track to Thredbo River Picnic area, Kosciuszko Road	Lower to mid foot slopes of Thredbo Valley	Numerous minor spur slopes and incised gullies, with some low gradient shelves on lower slope above Thredbo River and near Sawpit Creek. (0 to 10 degrees)
Lake Jindabyne	Curiosity Rocks to Hatchery Bay	Shores of Lake Jindabyne	Side slopes of gently undulating low rises and gullies. (2 to 10 degrees)

5.3. Results and analysis

The proposed track traverses the side slopes of the lower to mid-foot slopes of Thredbo Valley and crosses many micro variations (of spurs and gullies) not shown on the topographic maps.

The length of the survey, allocated time and amount of micro variations made the recording and calculating of specific details as per Requirements 10 and 11 of the Archaeological Code of Practice unfeasible. Instead the general of level of visibility and exposure was recorded for each transect section. Observations about visibility and exposure for each section are included within Table 9.

Table 9: visibility and exposure recorded along the proposed track

Track	*Section / Transect*	*Landscape Traversed*	*kms*	*Visibility*	*Exposure*
Lower Thredbo Valley Track, KNP	Bullock Flats to Pender Lea	Side slopes of Lower to mid foot slopes of Thredbo Valley	6.7	1%	1%
Lower Thredbo Valley Track, KNP	Pender Lea to Robertsons Crossing	Lower to mid foot slopes of Thredbo Valley	4.5	1%	1%
Lower Thredbo Valley Track, KNP	Robertsons Crossing to Gaden Trout Hatchery	Lower to mid foot slopes of Thredbo Valley	4.7	1%	1%
Lower Thredbo Valley Track,	Gaden Trout Hatchery – Pallaibo Track to	Lower to mid foot slopes of Thredbo Valley	1.4	2%	2%

KNP	Thredbo River Picnic area, Kosciuszko Road				
Lake Jindabyne	Curiosity Rocks to Hatchery Bay	Shores of Lake Jindabyne	4.2	2%	3%

A total of 26 Aboriginal sites were recorded during the survey, all of which comprised stone artefacts. The number and types of sites recorded for each section are shown in Table 10.

Table 10: Number of sites and site types recorded by section along the proposed track.

Track	*Section / Transect*	*No of sites*	*Site types*
Lower Thredbo Valley Track, KNP	Bullock Flats to Pender Lea	4	3 isolated stone artefacts, 1 possible quarry
Lower Thredbo Valley Track, KNP	Pender Lea to Robertsons Crossing	1	1 isolated stone artefact
Lower Thredbo Valley Track, KNP	Robertsons Crossing to Gaden Trout Hatchery	6	2 artefact scatters, 4 isolated stone artefacts
Lower Thredbo Valley Track, KNP	Gaden Trout Hatchery – Pallaibo Track to Thredbo River Picnic area, Kosciuszko Road	11	1 artefact scatter, 10 isolated stone artefacts
Lake Jindabyne	Curiosity Rocks to Hatchery Bay	4	3 artefact scatters, 1 isolated stone artefact

Most of the recorded sites contained flaked stone artefacts whilst two also contained manuport / anvils which were likely utilised within the stone artefact manufacture process of bipolar flaking (LTVT 2 and Hatchery Bay (HB) 3). Site WOLLONDIBBY (WD) 1 exhibited the highest number of artefacts (30+) (Figures 18 and 19), followed by LTVT 2 (20) and Hatchery Bay (HB) 2 (10+). A low density possible quarry site of porphyritic material was also recorded (BULLOCKS FLAT (BF) 3). Although no cores were recorded at this site, the flakes were manufactured from the associated porphyritic material outcropping at this location. Table 11 provides details of site types recorded.

Figure 18: informal road on ridge with site WOLLONDIBBY1

Figure 19: artefacts from WOLLONDIBBY1

Table 11: Frequency of site types recorded during this survey.

Site Type	*No of site types recorded*	*%*
Isolated stone artefact (1 artefact)	16	61.5%
Isolated stone artefacts (2 artefacts)	2	7.7%
Stone artefact scatter (3 + artefacts)	7	26.9%
Quarry	1	3.8%
Total	**26**	**100.0%**

Stone Artefact Types and Raw Materials

The majority of flaked stone artefacts were manufactured from quartz and quartz is the dominant stone raw material and is represented at 22 (84.6%) of the 26 recorded sites. In contrast silcrete was represented at 4 sites (15.4%), porphyritic at 3(11.5%) (Figure 20), and chert was represented at 1 (3.8%) of the recorded sites. Table 12 below shows a simple measure of assemblage complexity and compares the number of raw materials and artefacts recorded at each site. Most of the recorded sites (21 or 80.8%) contained a single artefact type (predominantly flakes) manufactured from one stone raw material, predominantly quartz.

Figure 20: non-quartz artefacts from BULLOCKS FLAT3

Table 12: Comparison of numbers of stone artefact types and raw materials recorded at sites.

	No of Raw Materials represented			
No of Stone Artefact types represented	**1**	**2**	**3**	**Totals**
1	21			21
2	1	1	2	4
4		1		1
Totals	**22**	**2**	**2**	**26**

Density of Sites

The density of sites per kilometre for each section was calculated to provide an indication and discuss the intensity of land use and occupation by Aboriginal people (Table 13). Whilst these calculations do not consider visibility and exposure, and this is acknowledged as a limitation, there are numerous other factors that may influence the actual measure. These factors might include raw material availability and factors determined by the actual track route across slopes.

Table 13: Frequency of site types recorded during this survey

Track	*Section / Transect*	*Landscape Traversed*	*kms*	*No of sites recorded*	*No of sites recorded per kilometre*
Lower Thredbo Valley Track, KNP	Bullock Flats to Pender Lea	Side slopes of Lower to mid foot slopes of Thredbo Valley	6.7	4	0.6
Lower Thredbo Valley Track, KNP	Pender Lea to Robertsons Crossing	Lower to mid foot slopes of Thredbo Valley	4.5	1	0.2
Lower Thredbo Valley Track, KNP	Robertsons Crossing to Gaden Trout Hatchery	Lower to mid foot slopes of Thredbo Valley	4.7	6	0.8
Lower Thredbo Valley Track, KNP	Gaden Trout Hatchery – Pallaibo Track to Thredbo River Picnic area, KosciuszkoRoad	Lower to mid foot slopes of Thredbo Valley	1.4	11	7.8
Lake Jindabyne	Curiosity Rocks to Hatchery Bay	Shores of Lake Jindabyne	4.2	4	0.9

Table 14 provides a summary of site information, including location, artefact descriptions and the potential for site to contain archaeological depth. The latter has been assessed as low for most sites and low to moderate for some, especially on the Pallaibo track where slopes have a lower gradient. The recorded artefacts probably reflect a background scatter resulting from occupation and movement along gentle lower slopes. Artefacts have been heavily disturbed as a result of previous track construction. It should be noted that no sites were found during test excavations for the Thredbo to Bullocks Flat section of the shared path (Niemoeller, 2011).

Although much of LTVT was steep with a low archaeological potential, isolated finds and small artefact scatters were still found (Figure 21). Their locations were not on the steeper slopes but on relatively flat spurs above the river and often between gullies which carry water on a temporary basis. This pattern is similar to that on the Thredbo valley further upstream and also in the Snowy River valley, where extensive scatters occur where major tributaries join the Snowy River. The reduced numbers of sites compared to further up the Thredbo valley can be explained by lack of visibility (although similar problems were encountered further up the valley) and the alignment of the track being generally along a steep mid-slope.

LTVT3 is located a few hundred metres west of 61-1-0006 (although the plotted location of the latter does not correlate with the description on the site card which places it on the northern side of Paddys Corner). LTVT3 is on a small knoll, which differs from the described context for 61-1-0006, hence it is concluded there is no relationship between the two sites.

Figure 21: selection of quartz artefacts from site LTVT2

Few objects were found around Lake Jindabyne, when compared to other previous studies conducted around the lake, probably because the alignment is away from prior rivers. The two largest sites WOLLONDIBBY1 and Hatchery Bay 2 are in highly disturbed contexts, due to vehicle damage and changing dam levels respectively (Figure 22).

Figure 22: Lakeshore at location of Hatchery Bay2

Figure 23 shows the location of newly recorded sites along the alignment and the index for following figures (Figures 24 to 27), which provide more detail for each section of the alignment.

Table 14: Site descriptions

Site name	*Location*	*Grid Coordinates (Zone 55, GDA 94) Easting*	*Northing*	*Site Type*	*Landscape*	*No of artefacts*	*No of artefact types per site*	*No of stone raw materials per site*	*Raw materials and Artefacts types represented*	*Description*	*Likelihood of Potential Archaeological Deposit (PAD)*
BULLOCKS FLAT(BF)1	Northern bank Thredbo River	629388	5966833	Isolated stone artefact	Lower foot slopes	1	1	1	Quartz / flake	1 quartz flake (0-10mm) in small exposure on gentle slope (<5 degrees)	Low
BULLOCKS FLAT(BF)2	Northern bank Thredbo River	629615	5967498	Isolated stone artefact	Mid foot slopes	1	1	1	Quartz / flake	1 isolated quartz flake (0-10mm) associated with large wombat hole. Natural quartz noted nearby	Low
BULLOCKS FLAT(BF3)3	Northern bank Thredbo River	632972	5969129	Quarry	Lower foot slopes	2	1	1	Porphyritic / flakes	2 flakes and angular fragments near outcrop exposure of dark grey porphyritic type material.	Low
BULLOCKS FLAT(BF)4	Northern bank Thredbo River	634016	5969740	Isolated stone artefact	Mid foot slopes	1	1	1	Quartz / flake	1 quartz flake, (20-30mm) with some cortex, located in small grassy exposure above deep humic soils.	Low to moderate
Robertsons (RC) 1	Northern bank Thredbo River	636020	5970857	Isolated stone artefact	Lower to Mid foot slopes	1	1	1	Quartz / flake	1 quartz flake (10-20 mm). Approx 10m north of the proposed shared track, will not be impacted.	Low
LTVT1	Northern bank Thredbo River	638084	5972065	Isolated stone artefacts	Lower to Mid foot slopes	2	1	1	Quartz / flake	2 quartz artefacts 5 metres apart on level area (<3° slope); 1 quartz core poor quality material 2 negative flake scars; 1 quartz flake.	Low
LTVT2	Northern bank Thredbo River	639220	5972554	Stone artefact scatter	Lower foot slopes	20	4	2	Quartz / flakes, retouched flakes, cores and manuport/anvil	3 stone artefact locales located along crest of small spur / bench. 20 artefacts - 17 at locales 2 and 3. 15 quartz flakes, 3 quartz cores (2 multiplatform and 1 single platform), 1 quartz retouched flake. Some of these artefacts manufactured from very high quality quartz). Single	Moderate

Site name	Location	Grid Coordinates (Zone 55, GDA 94) Easting	Northing	Site Type	Landscape	No of artefacts	No of artefact types per site	No of stone raw materials per site	Raw materials and Artefacts types represented	Description	Likelihood of Potential Archaeological Deposit (PAD)
										large rounded river cobble manuport with small amount of possible pitting possibly resulting from anvil use and bipolar flaking.	
LTVT3	Northern bank Thredbo River	641361	5973489	Stone artefact scatter	Lower foot slopes	3	2	1	Quartz / flakes and core	2 quartz flakes and single platform quartz core on small, distinct knoll in large open plain between river and proposed track, possibly near site AHIMS Site 62-1-006. Numerous exposures from wombat diggings.	Moderate
Gaden Hatchery (GH)1	South bank Thredbo River – Gaden Trout Hatchery	641475	5973265	Isolated stone artefact	River bank	1	1	1	Porphyritic / retouched flake	1 large porphyritic retouched flake (40-50mm), immediately adjacent to the Thredbo River within Gaden Hatchery picnic area and poplar trees in disturbed context subject to frequent flooding and exhibiting redeposited sand. Flake displays lateral and distal retouch and minor cortex on platform.	Low
GADEN BRIDGE (GB)1	Flat bench	641528	5973345	Isolated stone artefacts	Lower foot slopes	2	1	1	Quartz / flakes	2 quartz flakes approximately 1 metre apart, flat grassy area with black sallee regrowth above granite gravels and minor clay soils.	Low
GADEN BRIDGE (GB)2	Flat bench	641529	5973327	Isolated stone artefact	Lower foot slopes	1	1	1	Quartz / flake	1 quartz flake approximately 15 metres south of GADEN BRIDGE1, and located in a small exposure with black sallee regrowth above granite gravels and minor	Low

Site name	Location	Grid Coordinates (Zone 55, GDA 94) Easting	Northing	Site Type	Landscape	No of artefacts	No of artefact types per site	No of stone raw materials per site	Raw materials and Artefacts types represented	Description	Likelihood of Potential Archaeological Deposit (PAD)
										clay soils.	
PALLAIBO (P)1	Pallaibo track	641667	5973412	Isolated stone artefact	Lower to Mid foot slopes	1	1	1	Quartz / flake	1 quartz flake on track, (10-20mm), slight slope and southwest aspect towards river	Low
PALLAIBO (P)2	Pallaibo track	641758	5973379	Isolated stone artefact	Lower to Mid foot slopes	1	1	1	Quartz / flake	1 quartz flake on track, (10-20mm)	Low
PALLAIBO (P)3	Pallaibo track	641926	5973409	Stone artefact scatter	Lower foot slopes	2	2	2	Quartz, silcrete / flake, retouched flake	2 quartz flakes, (0-10 and 10-20 mm) and 1 silcrete retouched flake (beige colour thumbnail scraper).	Low to moderate
PALLAIBO (P)4	Pallaibo track	641935	5973412	Isolated stone artefact	Lower foot slopes	1	1	1	Quartz / flake	1 quartz retouched flake / bipolar core (10-20 mm) located on flat section of track at top of rise.	Low to moderate
PALLAIBO (P)5	Pallaibo track	641944	5973419	Isolated stone artefact	Lower foot slopes	1	1	1	Quartz / flake	1 quartz flake (0-10mm) on flat section of track	Low to moderate
PALLAIBO (P)6	Pallaibo track	642031	5973445	Isolated stone artefact	Lower foot slopes	1	1	1	Quartz / flake	1 quartz flake (10-20mm) on gently rising section of track	Low to moderate
PALLAIBO (P)7	Pallaibo track	642045	5973448	Isolated stone artefact	Lower foot slopes	1	1	1	Silcrete / flake	1 silcrete flake (10-20mm)	Low to moderate
PALLAIBO (P)8	Pallaibo track	642197	5973464	Stone artefact scatter	Lower foot slopes	3	1	1	Quartz / flake	2 quartz flakes (0-10 mm); 1 quartz flake (10-20 mm) located on flat section of track.	Low to moderate
PALLAIBO(P)9	Pallaibo track	642260	5973571	Isolated stone artefact	Lower foot slopes	1	1	1	Quartz / flake	1 quartz flake (0-10 mm) located on flat section of track.	Low to moderate
PALLAIBO (P)10	Pallaibo track	642256	5973601	Isolated stone artefact	Lower foot slopes	1	1	1	Quartz / flake	1 quartz flake (10-20mm) located on gentle slope.	Low to moderate
PALLAIBO (P)11	Pallaibo track	642399	5973843	Isolated stone	Lower foot slopes	1	1	1	Quartz / flake	1 quartz flake (10-20mm) located close to Thredbo	Low to moderate

Site name	Location	Grid Coordinates (Zone 55, GDA 94) Easting	Northing	Site Type	Landscape	No of artefacts	No of artefact types per site	No of stone raw materials per site	Raw materials and Artefacts types represented	Description	Likelihood of Potential Archaeological Deposit (PAD)
				artefact						River.	
WOLLONDIBBY (WD)1	Lake Jindabyne	643235	5970312	Stone artefact scatter	Spur crest / slope	30+	2	3	Quartz, silcrete, tuff / flakes, retouched flakes	Site located over crest and northerly sloping knoll spur. Scatter of stone artefacts distributed along existing track and washed into rills.	Moderate Artefacts likely to occur in subsurface context and extend to either side of track where visibility is very low.
Hatchery Bay(HB) 3	Lake Jindabyne,	644734	5971512	Isolated stone artefact	spur crest / granite boulders	1	1	1	Igneous / anvil	Single rounded river cobble used as anvil, hammer stone. Some grinding on edge. Located in association with outcrop of large granite boulders. Near plotted location of previously recorded AHIMS site 62-1-0070	Low to moderate. Some potential for subsurface artefacts.
Hatchery Bay (HB)2	Lake Jindabyne,	644163	5971887	Stone artefact scatter	Slope	10+	2	3	Quartz, silcrete, chert / flakes and retouched flakes	A diffuse scatter of stone artefacts eroding out and extending along sandy lake foreshore margin. Quartz flakes also occur on side slope above margin and exposed on existing vehicle track that crosses proposed track alignment.	Moderate Given artefacts are eroding out of margin some PAD considered likely.
Hatchery Bay (HB)1	Hatchery Bay road /	644136	5971881	Stone artefact scatter	Gentle slope	4	1	1	Quartz / flakes	Sparse scatter of 4 quartz flakes along existing vehicle track. 1 artefact manufactured from high quality translucent quartz.	Low to moderate

Kamminga (1992) postulated that the Thredbo valley was a major thoroughfare for Aboriginal people moving into the higher mountain peaks from ceremonial grounds at Kalkite and the Wollondibby valley and the base of Mount Crackenback and those sites can be expected to occur all the way up the valley (Kamminga 1992). He interpreted the archaeology of the Thredbo valley as a continuous archaeological site, comprising many activity areas and postulates that flaking of quartz pebbles at locations along the valley floor and lower slopes over millennia has produced a high background count of flaking debitage.

Within the Lower Thredbo Valley (between Bullocks Flat and Gaden Hatchery the archaeological evidence is almost entirely comprised of low density quartz scatters or isolated artefacts. Ten of the eleven sites located along this section contain flaked stone artefacts entirely manufactured from quartz. Only one site (LTVT 2), along this 15.9 kilometre section contained more than 3 stone artefacts. All flaked artefacts at LTVT 2 were similarly manufactured from quartz.

In contrast 3 of the 4 sites located around Lake Jindabyne contained more than 3 stone artefacts. Raw material diversity along this section was also higher with 50% of the sites containing raw materials other than quartz.

The section along the Pallaibo track is also interesting. Although the majority of these sites (91%) are isolated artefacts and almost entirely comprised of quartz flaked artefacts, the density of sites per kilometre (7.8) calculated through this section is almost 10 times higher than further up the Thredbo Valley where, on average only 0.7 sites were found per kilometre. A number of additional factors may also influence these calculations including the proposed route of the track and the levels of visibility and exposure. The visibility and exposure were considerable lower further up the Thredbo Valley than along the Pallaibo Track.

The dominance of low density artefact occurrences comprised of quartz stone artefacts is well noted in previous surveys. The archaeological evidence revealed during this study continues to the support those results and the postulations of Kamminga (1992).

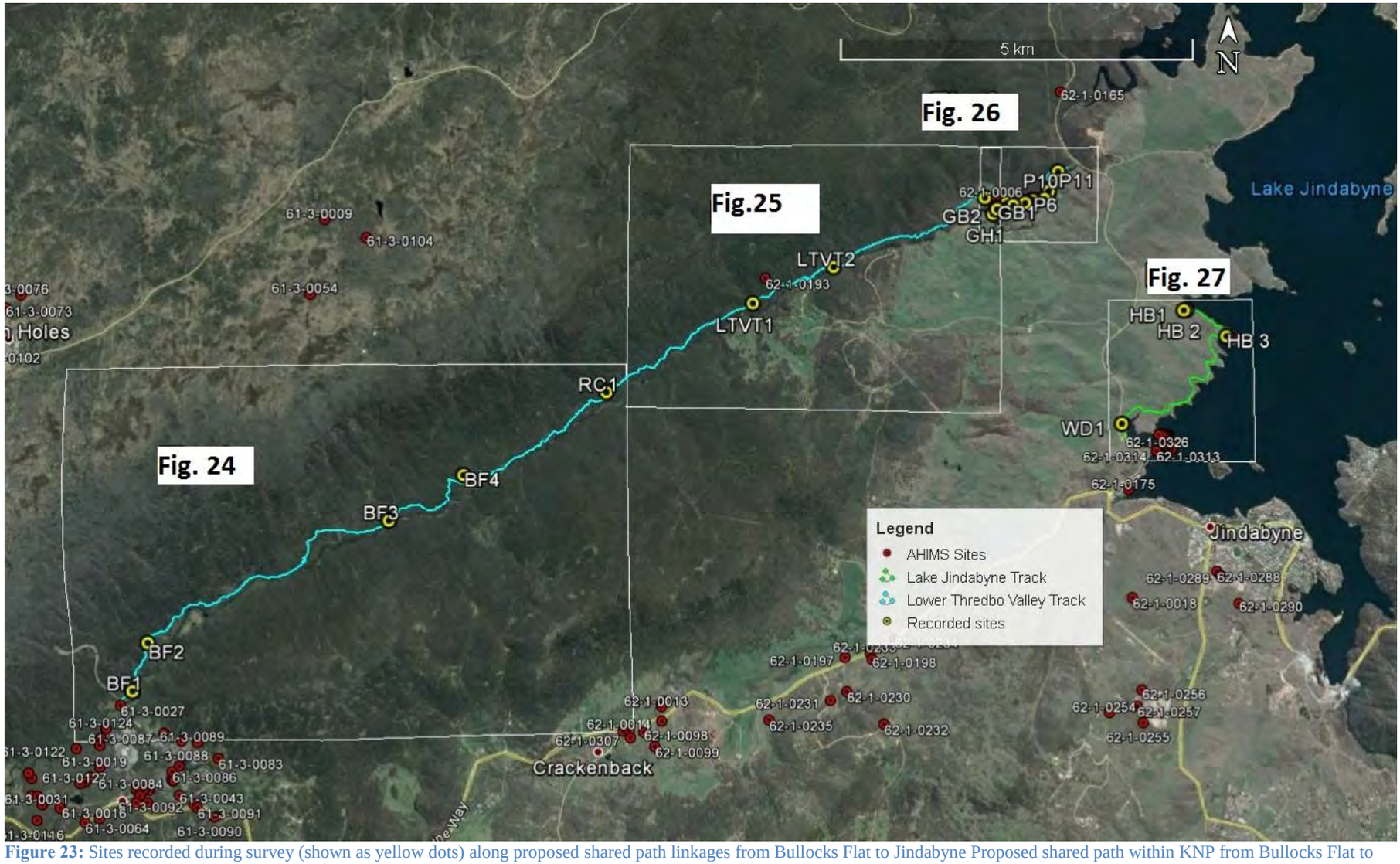

Figure 23: Sites recorded during survey (shown as yellow dots) along proposed shared path linkages from Bullocks Flat to Jindabyne Proposed shared path within KNP from Bullocks Flat to Gaden Hatchery and Pallaibo Track shown in blue. Proposed shared path around Lake Jindabyne between Hatchery Bay and Curiosity Rocks shown in green. Previously recorded AHIMS Sites (shown as red dots).

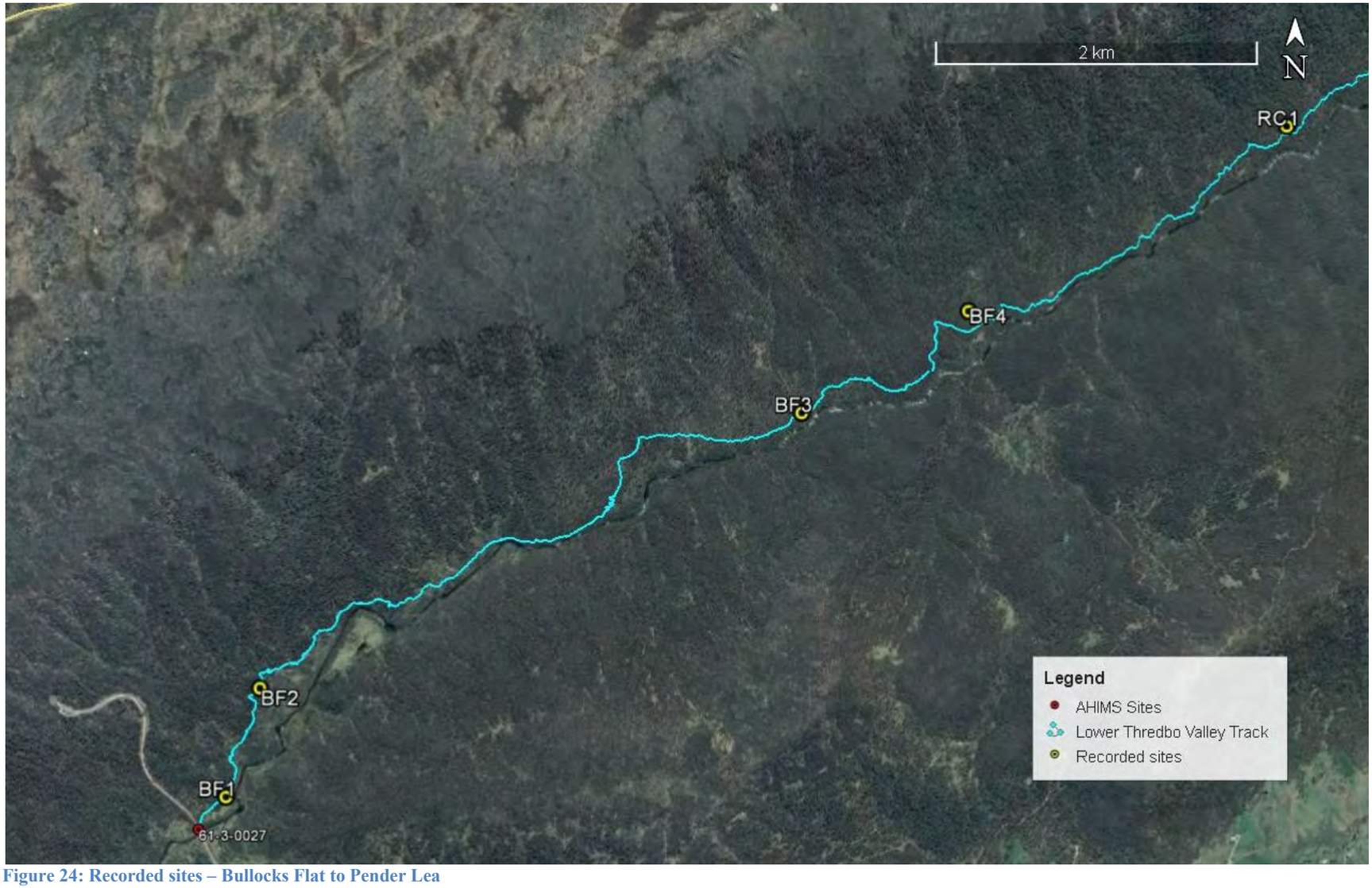

Figure 24: Recorded sites – Bullocks Flat to Pender Lea

Figure 25: Recorded sites Pender lea to Robertsons Crossing

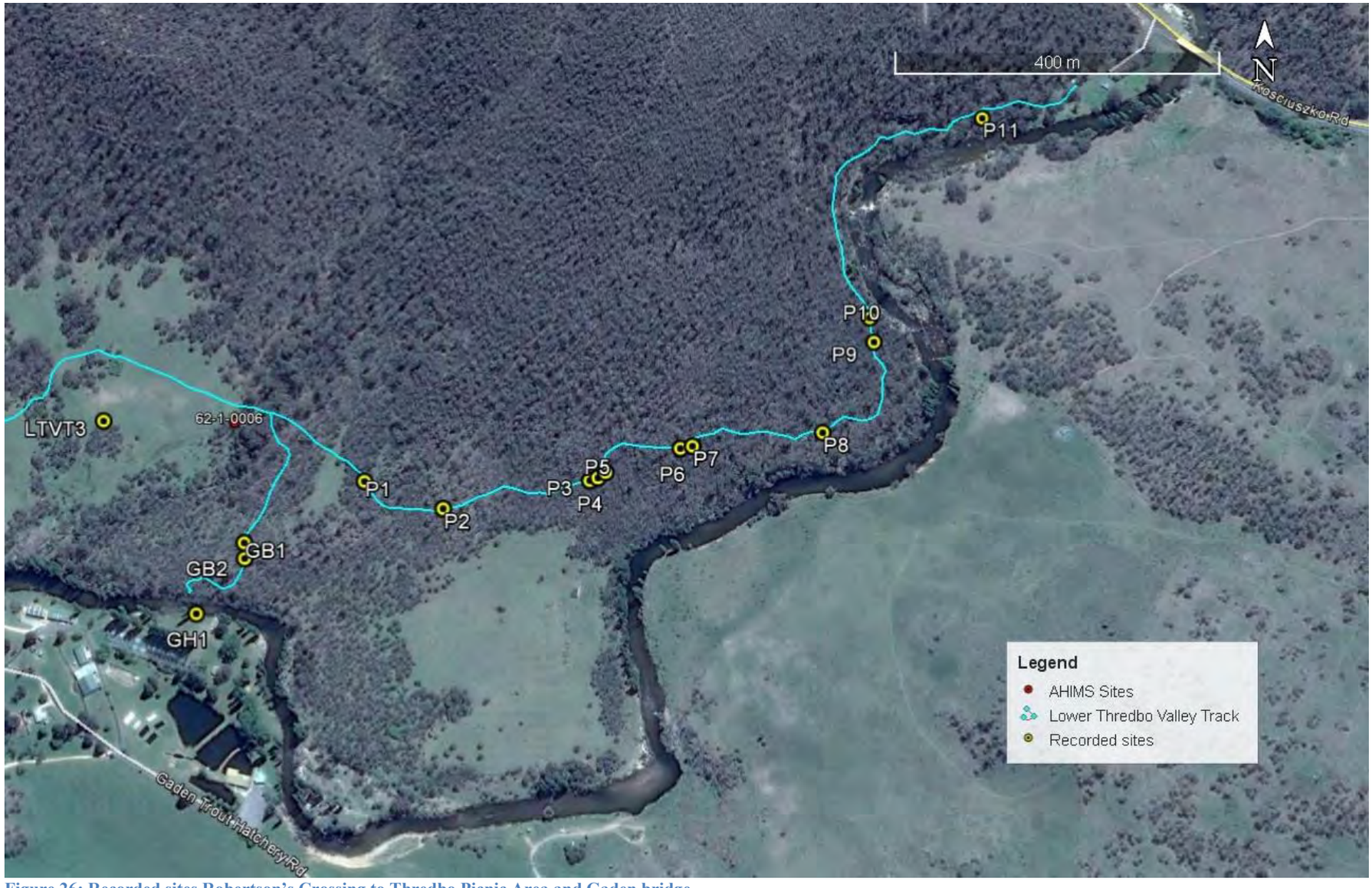

Figure 26: Recorded sites Robertson's Crossing to Thredbo Picnic Area and Gaden bridge

Feary S. and Niemoeller G. 2015. Lower Thredbo Valley shared path: Bullocks Flat to Curiosity Rocks, Snowy Mountains, NSW. Aboriginal cultural heritage assessment. FINAL REPORT to NPWS and SRSC.

Figure 27: recorded sites Curiosity Rocks to Hatchery Bay Road

Feary S. and Niemoeller G. 2015. Lower Thredbo Valley shared path: Bullocks Flat to Curiosity Rocks, Snowy Mountains, NSW. Aboriginal cultural heritage assessment. FINAL REPORT to NPWS and SRSC.

The locations of several previously recorded sites were searched for if they were recorded as being on or close to the path alignment. Assessment of these previously recorded sites is shown in Table 15.

Table 15: Assessment of previously recorded sites on or near route

SITE ID	SITE NAME	DESCRIPTION	STATUS
61-3-0027	Site C/ Crackenback River 2/Tallangatta	Four quartz flakes on northern side of river recorded in 1983. Grid reference does not correlate with location description. Unable to be found during a survey of the same area in 1984 (Paton, 1984). May have been destroyed by Skitube bridge development.	Not found, but unlikely to be on alignment of shared path which is on a steep side slope.
62-1-0193	Brooks Mill Creek 1	Possible culturally modified tree, northern side of Thredbo River. Very steep country. Not on track alignment. Will not be impacted	Not investigated as well upslope from path alignment.
62-1-0006	Sawpit Creek; Thredbo River; Site 28	3 axe heads on northern banks of Thredbo River at Paddys Corner. Grid references do not correlate. Artefacts collected in 1976 during PhD research by Jo Flood.	One site found in the vicinity (LTVT3), but unlikely to be related to it.
62-1-0070	Colorado Point; Lake Jindabyne; J/WS 24,25,26	Large artefact scatter on western side of lake, recorded when lake levels low in 1977 (Chapman, 1977). Collected in 1977	Not on alignment. Re-located, 1 utilised river cobble (Hatchery Bay 3)
62-1-0150	Curiosity Rocks – rock feature [now in lake] and artefact scatter on peninsula	Large artefact scatter on peninsula adjacent to Curiosity Rocks. Major site protection works conducted in 1999. Site badly damaged and needs further site protection works.	Will not be impacted as path has already been built at this location. Site may extend further north around lake (along river).
Curiosity Rocks Aboriginal Place	62-1-0150	Nomination included rocks and portion of lake shore, identified as being spiritually significant (see Figure xx below). AP gazetted on 6/7/2014, but excluded western shores of lake.	Section of path will be within proposed AP. Date for gazettal unknown.

6. Significance assessment

6.1. Criteria

The ICOMOS Burra Charter provides the framework for cultural significance assessment using the key criteria of **social, aesthetic, scientific** and **historic** values (ICOMOS 2000). The OEH assessment guidelines also provide some direction on how to apply these criteria in the context of an ACHAR report (OEH, 2011).

Significance assessment relates to physical objects, places, and features of the natural/cultural environment associated with intangible values.

Social value: Generally, all evidence of pre-contact Aboriginal presence is significant to Aboriginal people; even it is not visible at the time of a particular field inspection. The previously recorded edge ground axes collected from Paddys Corner and artefacts collected from Colorado Point have high social significance, although their current whereabouts is unknown.

All of the recorded sites located during this assessment are stone artefacts and therefore likely to have fairly uniform level of significance to Aboriginal people. A particular exception may be that of site Hatchery Bay 3 containing an anvil / hammer stone. Artefacts that are particularly tactile or that have a higher level of rarity will often be of particular significance to Aboriginal people.

Curiosity Rocks including the rock feature and the adjacent peninsula with its artefact scatter have high social and spiritual significance (see Section 2.4). Ethno-historical information indicates that the Thredbo valley was a traditional route of movement for attending bogong moth feasts in the Snowy Mountains. Areas such as Wollondibby and Crackenback were important tribal meeting places, hence these areas are likely to have social value to Ngarigo people.

Scientific (archaeological) value*:* this refers to the capacity of the evidence to contribute to current understanding of Aboriginal pre-contact history of the region, - '*the timely and specific research questions'* of the time, generally expressed in terms of rarity, representativeness or educational value (Sullivan & Bowdler, 1984).

Individual sites are small and on the surface, comprising primary flakes and occasional retouched pieces. They accord with previously recorded sites in the Thredbo valley and around Lake Jindabyne; hence they are neither rare nor particularly good representations of their type. The measurements and analysis conducted for this assessment have realised the scientific value of the individual sites.

As a complex, the recorded sites along LTVT and Pallaibo demonstrate the close association between relatively minor topographical variation and site distribution patterns, and offer a comparative analysis for previous findings in the Thredbo valley and also in the Snowy River valley. The complex has moderate archaeological significance as the sites are the first to be recorded in this section of the valley.

Sites recorded at Lake Jindabyne were small and disturbed. None are rare or good representative examples of their type hence they have low archaeological significance. The object found at Colorado Point may be part of previously recorded site 62 - 1-70 which is of high archaeological significance, but was collected in the 1970s.

The isolated find recorded at Gaden hatchery is not *in situ* and has low archaeological significance.

Collectively, the newly recorded sites do not contribute substantively to the current body of knowledge concerning Aboriginal occupation of the region and are therefore of low archaeological significance.

The assessment of archaeological significance is primarily based on the discussion of previously recorded site types within the region and the number of artefact and raw materials types recorded at each site. The potential for PAD also contributes to the archaeological research potential.

Identified sites were attributed with a separate value between 1 and 5 [low to high]) to assess their archaeological significance (representative / rarity values and archaeological research potential) (see Appendix 7 for attributions). These scores were then totalled (5 values x 3 significance indicators = cumulative values) to provide a numeric value reflecting the level of archaeological significance for each place (Table 16).

These values were ranked against the index of cumulative values to determine the overall archaeological significance of each site. The archaeological significance for each site is summarised in Table 17. The full significance matrix assessment is included at Appendix 7.

Table 16: Significance indicators and cumulative values index

Value	*Significance*	*Cumulative values*	*Attributed Archaeological significance*
1	Low	3 -5	Low
2	Low to moderate	6 – 8	Low to moderate
3	Moderate	9 -11	Moderate
4	Moderate to high	12- 13	Moderate to high
5	High	14 –15	High

Table 17: Significance values assigned for identified sites

Archaeological Significance	*No of sites*	*Assessment of archaeological significance for recorded sites*
Low	21	BULLOCKS FLAT 1, BULLOCKS FLAT 2, BULLOCKS FLAT 4, Robertsons 1, LTVT 1, LTVT 3, GADEN HATCHERY 1, GADEN BRIDGE 1, GADEN BRIDGE 2, PALLAIBO1 – 11, Hatchery Bay 1
Low to moderate	3	BULLOCKS FLAT 3, Hatchery Bay 2, Hatchery Bay 3

Moderate	2	LTVT2, WOLLONDIBBY 1
Moderate to high	0	-
High	0	-

A*esthetic value:* Curiosity Rocks is a visually arresting rock formation and has aesthetic value for this reason and also because it evokes emotional responses from knowledge holders (Figure 28).

Figure 28: Curiosity Rocks - peninsula in foreground with rock formation in lake

Historic: apart from the continuation of traditional practices associated with bogong moth feasts there are no known Aboriginal historic associations with Jindabyne or the lower Thredbo valley although large numbers of Aboriginal people lived around Jindabyne in the early 1800s.

6.2. Statement of cultural significance

Aboriginal objects recorded during this assessment associated with the Lower Thredbo valley and Jindabyne valley have medium social significance and low - moderate archaeological significance. The Curiosity Rocks area has very high social significance overall and the artefact scatter on the peninsula has high archaeological significance. The presence of the objects supports existing models of Aboriginal occupation of the region but does not contribute substantively to the existing knowledge.

7. Assessing harm

7.1. Avoiding harm

The narrowness of the path, the low-key nature of the development, and consideration of heritage issues in the early stage of planning have enabled some flexibility in the path alignment in order to avoid Aboriginal sites.

When a site or object was discovered during this survey of lower Thredbo Valley, avoidance strategies were discussed on site and where feasible the track was realigned. This meant realigning and reflagging the track, flagging the site in a different colour and recording the site location for later entry and capture into the relevant spatial management system (GIS). In each case, a buffer of at least 5 metres radius was left around the objects, or, if the extent of the site was able to be assumed from landform elements, e.g. toe of a spur, the track was realigned to avoid the assumed extent. For example Figure 29 shows the relationship between the estimated extent of site LTVT2 and the proposed path (blue line), which will be realigned to totally avoid the site.

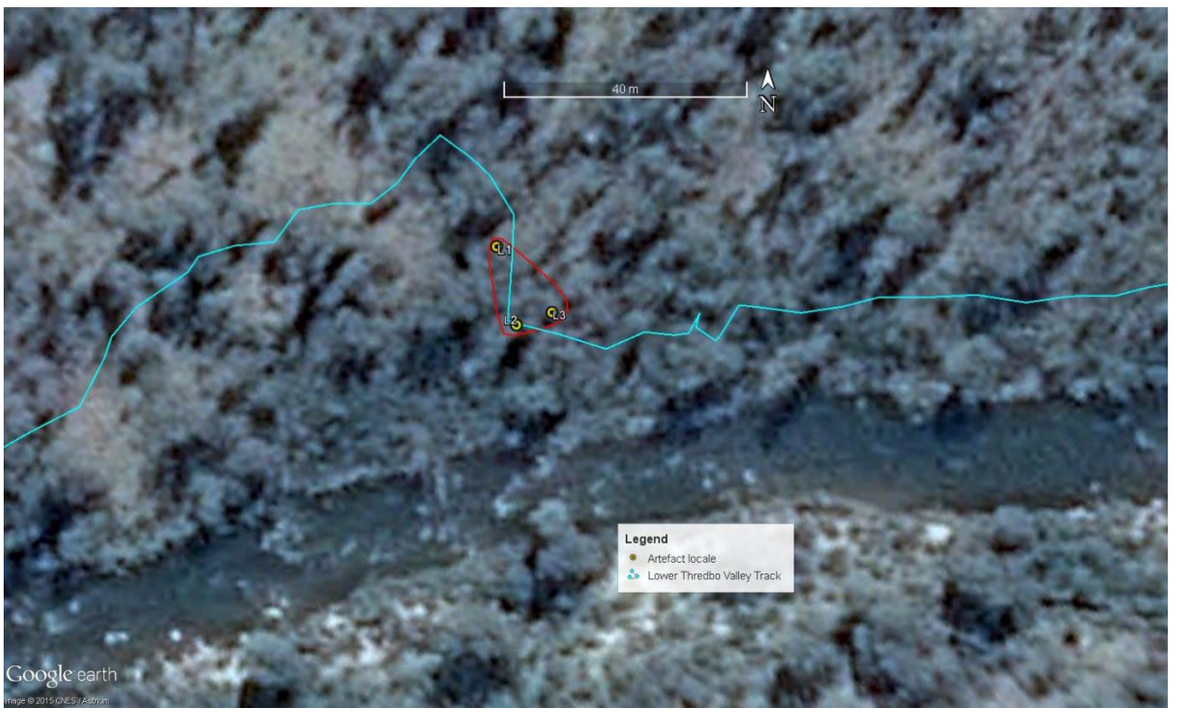

Figure 29: extent of site LTVT 2vrelative to the proposed path alignment

The new realigned section of track was then resurveyed to ensure that no other Aboriginal sites or objects may be disturbed. Constraints allowing and wherever possible, the track was realigned to the downward side of the artefact so as to minimise any future potential harm resulting from water movement or erosion that may result from the construction or use of the track. The position of the objects in relation to the track also influenced the realignment strategy. Realignments aimed to establish a 10 metre minimum buffer for avoiding sites. Table 18 identifies sites able to be avoided by track

realignment. Figures 30 to 40 show the relationship between the proposed track, inferred extent of recorded sites and proposed realignments of the track to avoid harm.

This impact assessment was conducted following the implementation of avoidance management strategies meaning that the level of proposed impact is now generally very low. Where avoidance is not possible an alternative strategy to mitigate harm is proposed (see section below).

7.2. Mitigating harm

Artefacts recorded along the Pallaibo track (PALLAIB0 1-PALLAIBO 11) will be harmed if Option 2 proceeds and the track is upgraded. Prior to development, movement of artefacts to the side of the track, or community collection and repatriation at a location agreed to by NPWS and Registered Aboriginal Parties are two effective strategies for mitigating harm (see Table 18). One RAP (Bega LALC) has indicated a preference for artefacts to be moved out of harm's way and the new location to be recorded on AHIMS.

Table 18: Harm management strategies

Site name	Site Type	Archaeological Significance	Management response	Type of Harm Direct/Indirect/ None	Degree of Harm Total/Partial / None	Consequence of Harm Total/ Partial/ No Loss of Value
BULLOCKS FLAT1	Isolated stone artefact	Low	Avoid - Realign path (see Fig 30)	None	None	No loss of value
BULLOCKS FLAT2	Isolated stone artefact	Low	Avoid - Realign path (see Fig 31)	None	None	No loss of value
BULLOCKS FLAT3	Quarry	Low to moderate	Will not be impacted (see Fig 32)	None	None	No loss of value
BULLOCKS FLAT4	Isolated stone artefact	Low	Will not be impacted (see Fig 33)	None	None	No loss of value
Robertsons 1	Isolated stone artefact	Low	Will not be impacted (see Fig 34)	None	None	No loss of value
LTVT1	Isolated stone artefacts	Low	Avoid - Realign path (see Fig 35)	None	None	No loss of value
LTVT2	Stone artefact scatter	Moderate	Avoid - Realign path (see Fig 36)	None	None	No loss of value
LTVT3	Stone artefact scatter	Low	Will not be impacted (see Fig 37)	None	None	No loss of value
Gaden Hatchery 1	Isolated stone artefact	Low	Avoid - Position bridge footings to avoid site [Option 1]	None	None	No loss of value
GADEN BRIDGE1	Isolated stone artefacts	Low	Avoid - Realign path (see Fig 38)	None	None	No loss of value
GADEN BRIDGE2	Isolated stone artefact	Low	Avoid - Realign path (see Fig 38)	None	None	No loss of value
PALLAIBO 1	Isolated stone artefact	Low	Movement or repatriation [Option 2]	Direct	Partial	No loss of value
PALLAIBO 2	Isolated stone artefact	Low	Movement	Direct	Partial	No loss of value
PALLAIBO 3	Stone artefact	Low	movement	Direct	Partial	No loss of value

Site name	Site Type	Archaeological Significance	Management response	Type of Harm Direct/Indirect/ None	Degree of Harm Total/Partial / None	Consequence of Harm Total/ Partial/ No Loss of Value
	scatter					
PALLAIBO 4	Isolated stone artefact	Low	movement	Direct	Partial	No loss of value
PALLAIBO 5	Isolated stone artefact	Low	movement	Direct	Partial	No loss of value
PALLAIBO 6	Isolated stone artefact	Low	movement	Direct	Partial	No loss of value
PALLAIBO 7	Isolated stone artefact	Low	movement	Direct	Partial	No loss of value
PALLAIBO 8	Stone artefact scatter	Low	movement	Direct	Partial	No loss of value
PALLAIBO 9	Isolated stone artefact	Low	movement	Direct	Partial	No loss of value
PALLAIBO 10	Isolated stone artefact	Low	movement	Direct	Partial	No loss of value
PALLAIBO 11	Isolated stone artefact	Low	movement	Direct	Partial	No loss of value
Wollondibby1	Stone artefact scatter	Moderate	Impact by shared path, and by proposed conservation works (see Fig 39)	Direct	Partial	Partial loss of value
Hatchery Bay 3	Isolated stone artefact	Low to moderate	Will not be impacted – no further action required.	None	None	No loss of value
Hatchery Bay 2	Stone artefact scatter	Low to moderate	Impact by shared path (see Fig 40)	Direct	Partial	Partial loss of value
Hatchery Bay 1	Stone artefact scatter	Low	Impact if roadworks or if closure rehabilitation (see Fig 40)	Direct	Partial	Partial loss of value

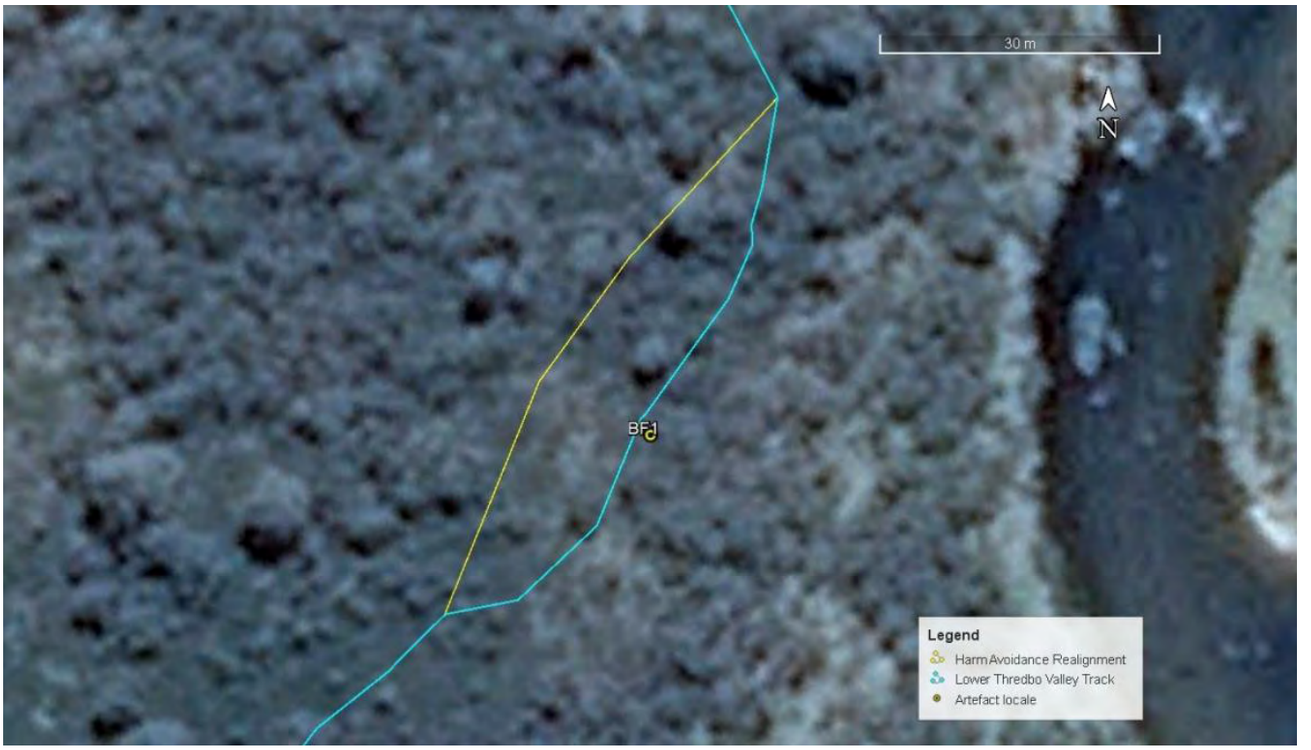

Figure 30: Proposed realignment (shown in yellow) to avoid harm to site Bullocks Flat 1.

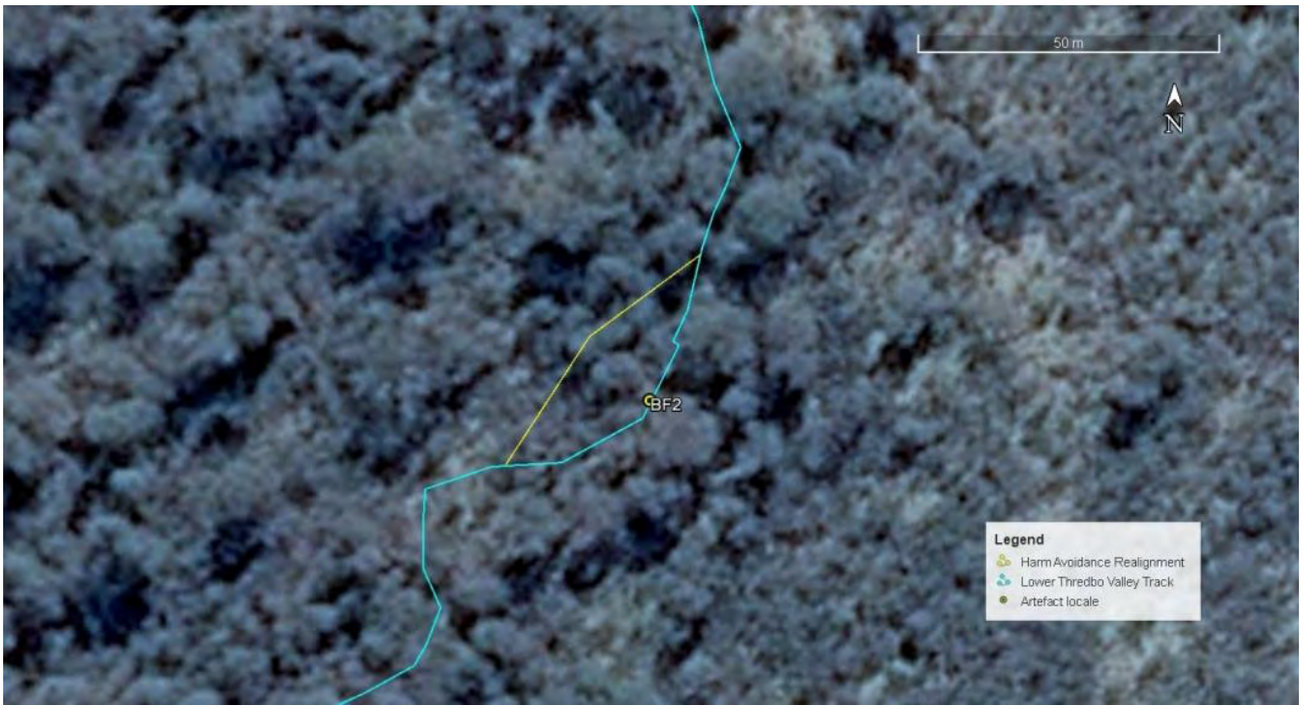

Figure 311: Proposed realignment (shown in yellow) to avoid harm to site Bullocks Flat 2.

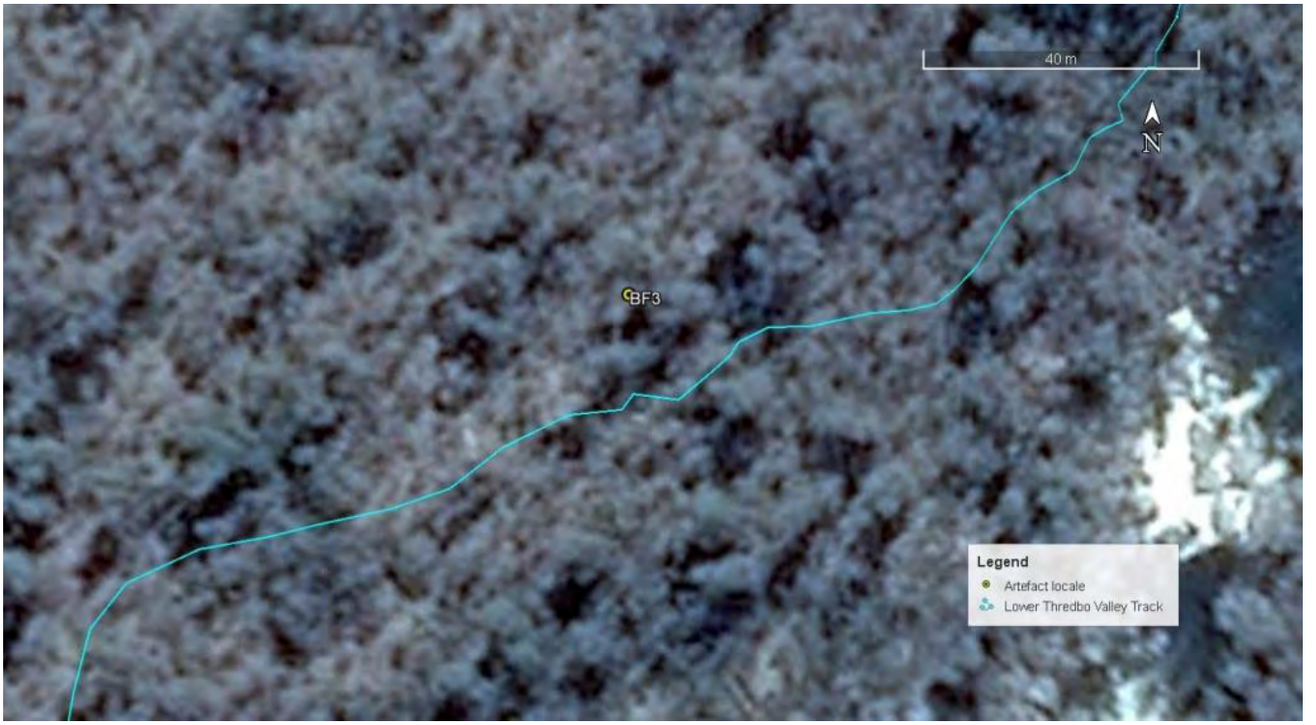

Figure 32: Location of site Bullocks Flat 3 in relation to proposed aligment (shown in blue).

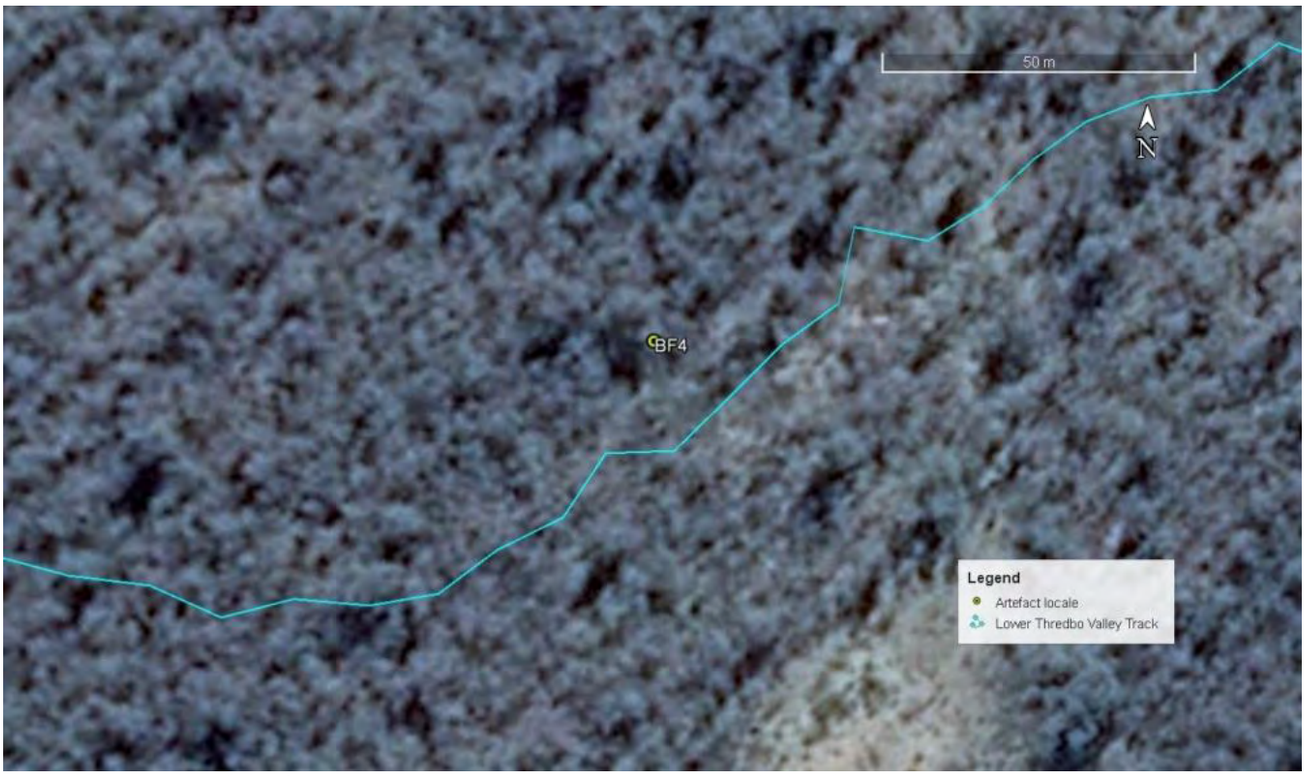

Figure 333: Location of site Bullocks Flat 4 in relation to proposed aligment (shown in blue).

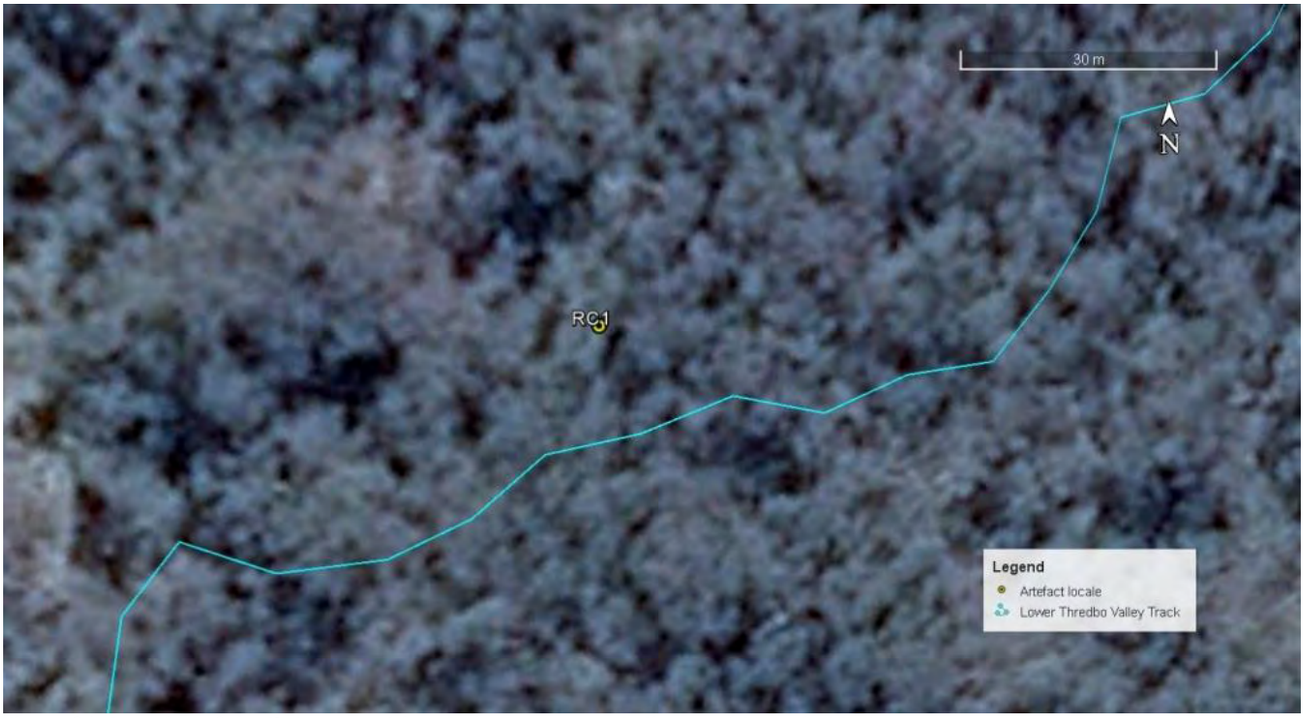

Figure 34: Location of site Robertsons 1 in relation to proposed aligment (shown in blue).

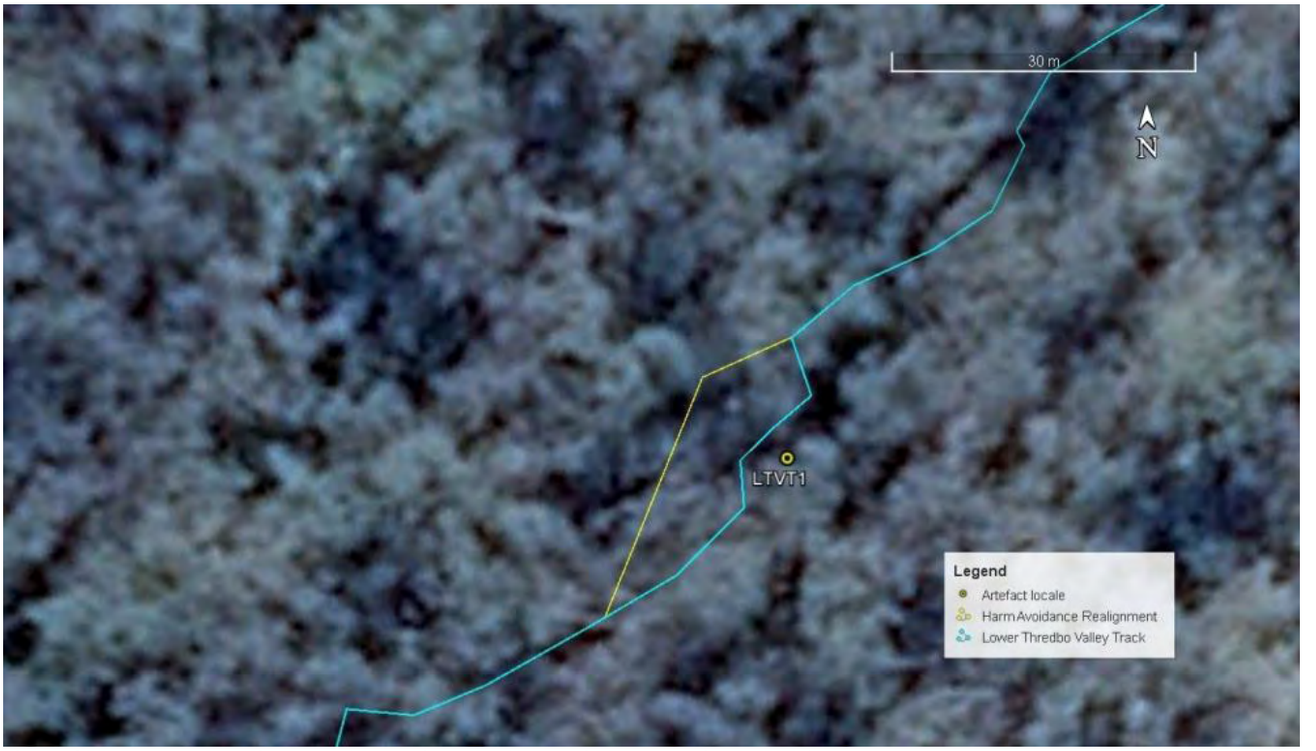

Figure 355: Proposed realignment (shown in yellow) to avoid harm to site LTVT 1.

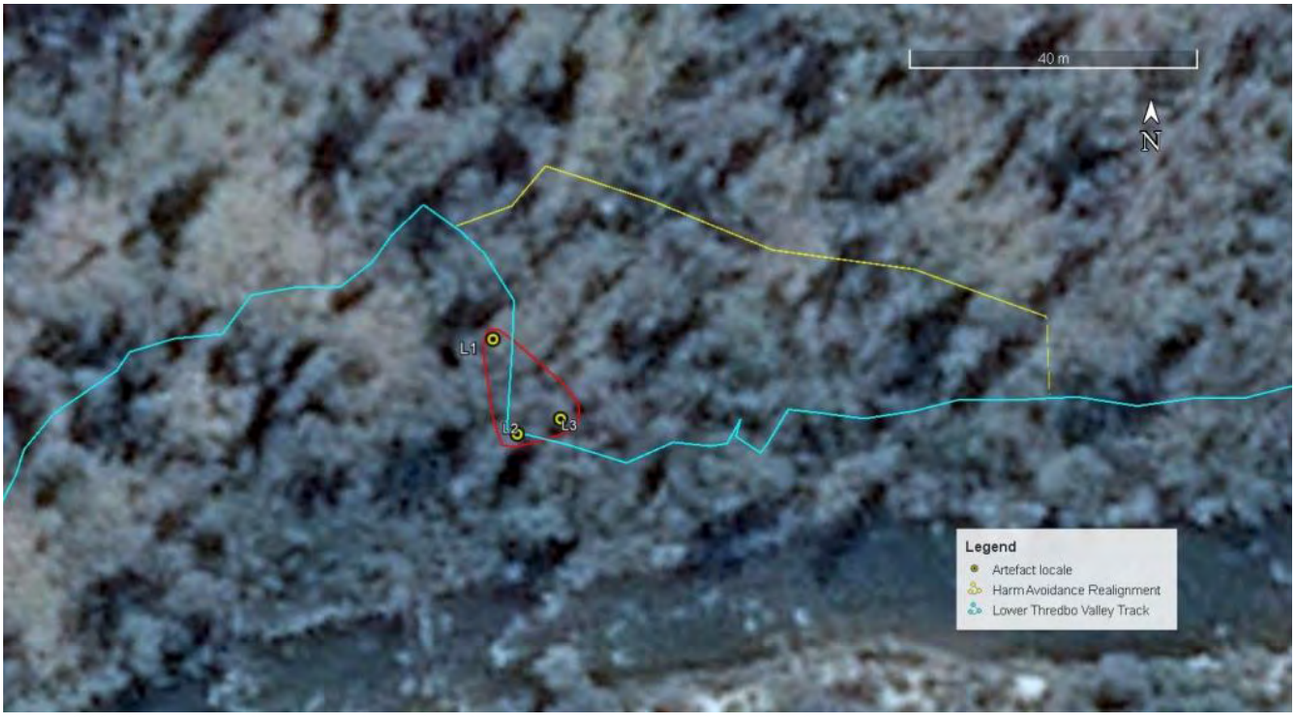

Figure 366: Proposed realignment (shown in yellow) to avoid harm to site LTVT 2.

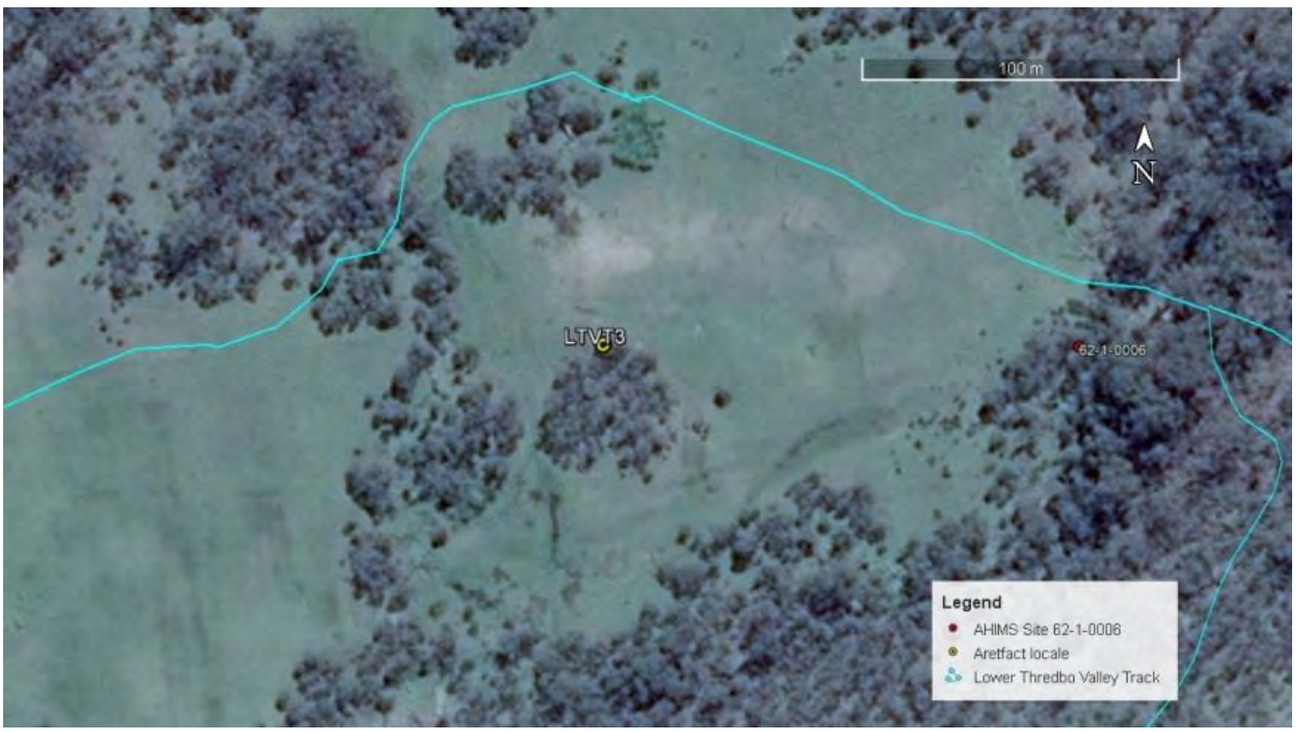

Figure 377: Location of site LTVT 3 in relation to proposed aligment (shown in blue).

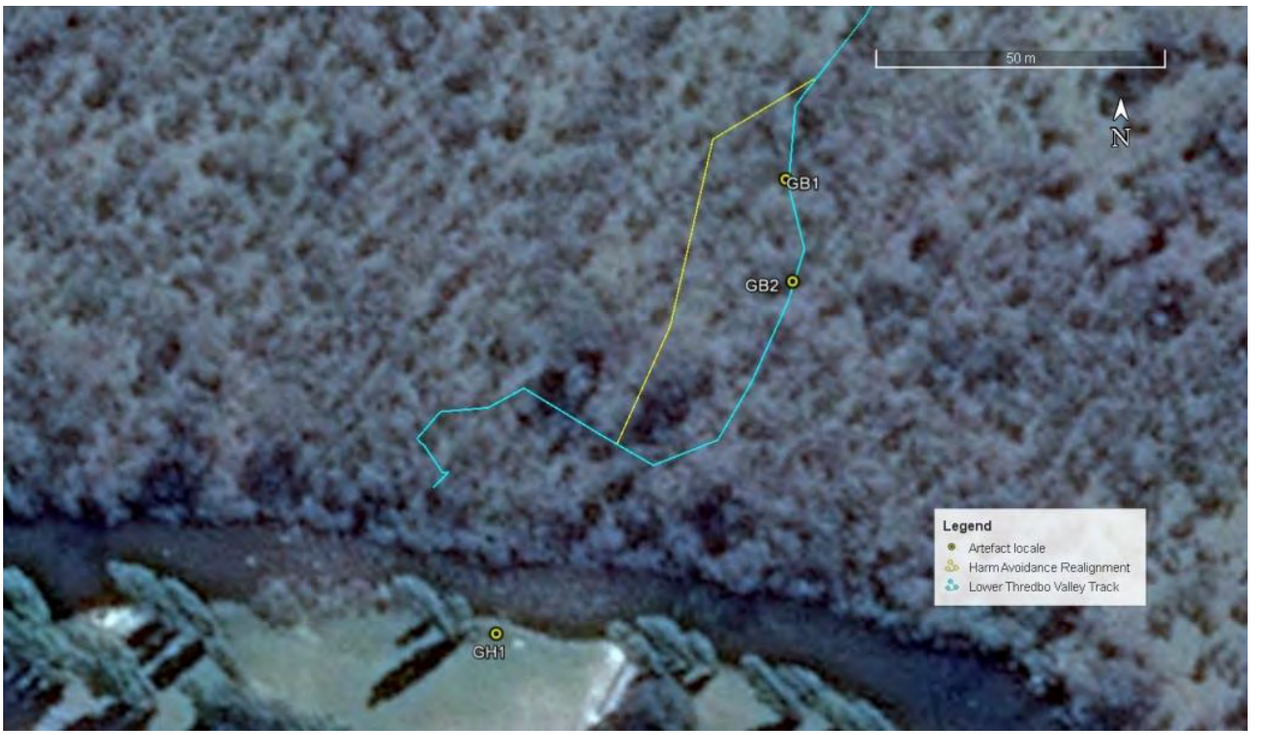

Figure 388: Location of site Gaden Hatchery 1 and proposed realignment (shown in yellow) to avoid harm to sites Gaden Bridge 1 and 2.

7.3. Harm cannot be avoided

Site WOLLONDIBBY1 was observed on an existing informal vehicle track adjacent to Lake Jindabyne and is likely to extend beyond the visible area each side of the road, along the ridgeline (Figure 39). The proposed path (green in Figure 39) goes to the east of the visible extent of WOLLONDIBBY1 and may impact on it. The extent of the site has been estimated as associated with crest and northerly sloping knoll spur.

Site HATCHERY BAY2 extends along the Lake Jindabyne shoreline and up the slope and it likely to be larger than what was observed. Because the extent of this site cannot be reliably determined, it is possible that the proposed path will cause impact on the southern edge of the site as shown in Figure 40.

The estimated extent of site **HATCHERY BAY1,** a dispersed artefact scatter on and beside the existing informal vehicle road is also shown in Figure 40. This road may be closed to vehicles and rehabilitated, which will result in impact to HATCHERY BAY1.

Figure 399: Visible extent of WOLLONDIBBY1 (in red) and estimated extent (orange) following the crest of the spur (approximate).

Figure 40: Possible extent of HATCHERY BAY2 and HATCHERY BAY1

Feary S. and Niemoeller G. 2015. Lower Thredbo Valley shared path: Bullocks Flat to Curiosity Rocks, Snowy Mountains, NSW. Aboriginal cultural heritage assessment. FINAL REPORT to NPWS and SRSC.

8. Potential conservation outcomes

Realignment of the LTVT section of the proposed path to avoid known sites can be considered a conservation outcome. The LTVT section of the shared path has been realigned to avoid all the newly recorded sites with at least a 5m metre suitable buffer where site boundaries are diffuse or uncertain. Although the sites are assessed as having low-moderate archaeological significance, they are the first to be recorded and it is pleasing that they will be conserved. Avoidance of the recorded sites along the Pallaibo deviation is also a conservation outcome. Site Gaden Hatchery 1, at the location of the bridge footings in the Gaden Hatchery picnic area can be avoided by moving the bridge footings.

Aboriginal artefacts recorded along the Pallaibo section of the shared path will be either moved to the side of the track or collected and repatriated if Option 2 is chosen. Although the context of the sites will be impacted, the artefacts themselves will be conserved through movement or collection and repatriation. In its response to the draft ACHAR, the Bega LALC supported movement of artefacts out of harm's way

Large artefact scatter WOLLONDIBBY1 on the western side of Lake Jindabyne will be directly partially impacted by construction of the shared path. However, although the path will impact a portion of this site, the remainder of the site beyond the proposed path will be protected as a result of a programme of road closure and environmental protection to be conducted by OEH and Snowy River Shire.

9. Principles of ecologically sustainable development

Ecologically sustainable development (ESD) involves the effective integration of social, economic and environmental considerations in decision-making processes. In 1992, the Commonwealth and all state and territory governments endorsed the *National Strategy for Ecologically Sustainable Development*. In NSW, the concept has been incorporated in legislation such as the EP&A Act and Regulation.

For the purposes of the EP&A Act and other NSW legislation, the Intergovernmental Agreement on the Environment (1992) and the *Protection of the Environment Administration Act* 1991 outline the following principles which can be used to achieve ESD.

(a) The precautionary principle: that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

In the application of the precautionary principle, public and private decisions can be guided by:

(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and

(ii) an assessment of the risk-weighted consequences of various options,

(b) Inter-generational equity: that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,

(c) Conservation of archaeological diversity and integrity: that conservation of archaeological diversity and integrity should be a fundamental consideration,

These principles have been considered and followed in respect of this assessment.

10. Recommendations

1. It is recommended that no further archaeological investigation is required as the archaeological footprint has been adequately understood from field investigations and research conducted in respect of the assessment for the current proposed alignment. Further investigation may be required if there are to be significant deviations from the existing proposed alignment.

2. Artefact scatters recorded along the LTVT section of the path and the deviation to the new bridge at Gaden should be flagged and fenced off during track construction to ensure they are not inadvertently damaged (BULLOCKS FLAT1, BULLOCKS FLAT2, BULLOCKS FLAT3, BULLOCKS FLAT4, LTVT1, LTVT2, GADEN BRIDGE1 and GADEN BRIDGE2). The location of all sites, including their known or assumed extent should be clearly marked on all maps and plans being used during track construction.

3. It is recommended that works can proceed on the lower Thredbo Valley section of track, but must cease if Aboriginal objects are encountered and the OEH Queanbeyan office notified. It is recommended that NPWS organise for contractors undertaking track work to receive basic training in the recognition of Aboriginal artefacts.

4. NPWS may consider archaeological re-survey of less steep [more archaeologically sensitive] sections of the track once the vegetation has been slashed, which will hopefully improve ground visibility. If additional artefacts are found, it is not too late to realign the track to avoid them, with a 5 metre radius buffer.

5. If the Pallaibo track is to be upgraded, an AHIP will be required to harm objects Pallaibo 1 to Pallaibo 11 inclusive. Harm may result from the activity itself, or from movement or community collection prior to the activity commencing. These artefacts reflect a dispersed background scatter and more objects may be present but not visible at the time of field inspection. It is recommended that an area based AHIP is sought for the track between the Thredbo Picnic area and where the track turns north over Sawpit Creek. The AHIP should include a condition for movement, in accordance with responses on the draft ACHAR from one of the Registered Aboriginal Parties [Bega LALC].

6. It is recommended that an AHIP is sought for partial harm to sites WOLLONDIBBY1, HATCHERY BAY2 and HATCHERY BAY1. Harm may result from the activity itself, or from movement or community collection prior to the activity commencing. The AHIP should include a condition for movement, in accordance with responses on the draft ACHAR from one of the Registered Aboriginal Parties [Bega LALC].

7. If an Aboriginal Place is declared for Curiosity Rocks using the boundaries identified in the original nomination, an AHIP will be required to construct the section of path within the AP.

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