Warburton Mountain Bike Trails: Historic Survey Report

DRAFT REPORT

Prepared for: Yarra Ranges Shire

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- Tarryn Elverd, Jayson Kelly & Matt Harrington (Yarra Ranges Council)

Summary

The Shire of Yarra Ranges intends to develop Mountain Bike Trails and associated car parking at Warburton, Victoria. North of the Warburton Highway, the study area is located on the slopes of Mt Donna Buang within the Yarra Ranges National Park, the Woiwurrung State Forest, and Warburton Golf Club and encompasses the O'Shannassay Aqueduct. South of Warburton the study area crosses over Mount Little Joe to the summit of Mount Tugwell. The study area is within the municipality of the Yarra Ranges Shire Council and consists of approximately 180 kilometres of trail.

Construction of the trails involves utilisation of existing tracks including fire trails, four wheel drive tracks and informal mountain bike trails, with new construction to link these up and access new terrain. Construction methods will involve manual clearance of undergrowth and trimming of vegetation, and some mechanical excavation to bench tracks and create various trail features.

The study area is within forested areas around the Warburton, which historically have been subject to gold mining, timber harvesting and processing and some farming. There have been substantial settlements in the bushland for short periods, especially during the gold rush. Elements of these historical land uses can still be found and are intended to be protected during the development and operation of the Mountain Bike Trails.

This assessment has considered the background history to the area, conducted targeted surveys to determine the likely survival of historic features and historical archaeological sites, and provides management recommendations for conserving cultural heritage values in the study area. As a result of consideration of areas of heritage value and archaeological sensitivity, parts of the trail alignment have been modified, in particular, to avoid the Old Warburton Cemetery, the Yankee Jim Creek mining area, and the site of Anderson's Mill.

Impact Assessment

Based on an evaluation of the potential impacts from the proposed mountain bike trail construction and use, the following assessment of impacts has been made.

The proposed mountain bike trails are mostly to be constructed with minimal impact to ground conditions comprising only clearing of vegetation and earthworks to a depth of less than 200 mm. Where such works are undertaken through historic features such as mining remains, water races and tramway formations, minimisation of impacts can be achieved by avoiding excavation of soil altogether. Recommendations have been provided for managing potential impacts, The following methods are proposed for specific locations:

Heritage listed places:

Mountain Bike Trail alignments have been designed to avoid heritage listed places where possible.

Modifications were made to avoid trails in the Yankee Jim Creek mine area (HO342 Yarra Yarra Hydraulic Gold Sluicing Company) and Maroondah Water Supply Catchment (H2381) therefore no specific management related to these places is required.

The alignments pass through Mount Donna Buang-Bridle Tracks & Road (HO140) and the Warburton rail line (HO214). However, no fabric or definable features will be impacted in the areas through which the trails pass therefore no specific management is required.

Unlisted heritage places:

Design of track alignments has been determined to avoid unlisted heritage places where possible. Following detailed field assessment, the alignments were modified in some instances to ensure any impacts would be minimal. The general location of these unlisted historic places has been identified in order to define areas for

specific management actions. The primary actions are to design and construct trails in these areas to minimise impacts to the ground surface, and to undertake monitoring of works in these areas shown in Figure 3, with a protocol to manage any unexpected finds.

Where potential impacts to features may occur – the following management actions are recommended:

Water races and tram lines

- Approach angles should be gentle, avoiding dropping down steep hills and especially turning sharply on the formation to minimise erosion and damage to the feature. Preferably the approach angle to any linear historic features including water races and tramway formation will be less than 10 degrees.
- Construction works should be confined to removing vegetation and adding new earth to the existing ground surface rather than excavating into the feature. Where excavation is needed near water races and tramlines, this should be subject to archaeological monitoring.

Mining features

- Substantial features such as adits, shafts, mullock heaps and tailings will be avoided by aligning tracks at least 5 metres from any identifiable or suspected historic land form..
- Tracks in the vicinity of mines should avoid steep descents that might create erosion or gullying and require larger earthworks.

Recommendations

The following recommendations are provided to guide construction of mountain bike trails in such a manner that they will not have detrimental impacts on historic cultural heritage values in the study area.

Recommendation 1 Avoiding historic places

Identified historic archaeological and heritage places, and areas of historical and archaeological sensitivity marked on Figure 2 and Figure 3 should be avoided during construction.

If construction is proposed near areas of historical and archaeological sensitivity works should be designed to minimise impacts and assist in managing the place. For example, tracks may lead to areas of hydraulic sluicing and gold workings, in order to provide interpretation opportunities, but the tracks should not cut across the sluiced faces and banks. Similarly, if level areas from former timber tramways are to be used, approaches should avoid causing erosion or other damage to the features.

Recommendation 2 Induction and protocol for unexpected finds

A protocol should be implemented to inform contractors of the need to avoid historical and archaeological features, how to recognise them, and who to contact should unexpected historical and archaeological features or objects should be discovered during works. In order that contractors are able to fulfil this recommendation an induction should be presented by a suitably qualified heritage professional on site, which covers information needed.

Recommendation 3 Inspection and monitoring

During construction, a program of inspection and archaeological monitoring should be carried out in areas of historical and archaeological sensitivity or adjacent to these areas as shown in Figure 3 and as listed places of archaeological potential, as follows:

- Anderson Sawmill site - Warburton Golf course (the alignment avoids this site)
- MWC Hut site Donna Buang summit

- SCV Hut site Donna Buang summit
- Old Donna Buang Road
- Henry (1907) and Slocumb & Walker (1907-12) mill and tramway site, Dee Rd
- Henry (1906-07) and Walker (1912-13) mill and tramway site, Mckenzie King Dr
- MMBW works site Dee Rd and O'Shannasy Aqueduct
- Yankee Jim Mine, Old Warburton (the alignment avoids this site)
- Old Warburton Cemetery (the alignment avoids this site)
- Former water race Big Pats Creek to Yankee Jim mine
- Laudehr (1900-10) tramway Old Warburton
- Lady Hopetoun mine site

A suitably qualified Historical archaeologist with an understanding of the type of historic and archaeological sites found within the study area should undertake the inspection. This inspection should occur when works are underway, once access has been arranged. If during the inspection potentially significant historical archaeological features are identified, options should be examined for realigning the trail to avoid impacts. If impacts cannot be avoided, and the site is deemed to be an archaeological site under the *Heritage Act 2017*, then recording and consent provisions should be enacted according to Recommendations 4 and 5.

Recommendation 4 Recording heritage places

If any historic archaeological sites are identified during trail construction works and inspection, an assessment should be made as to whether they fulfil the criteria for inclusion on the Victorian Heritage Inventory as historical archaeological sites. Such places are generally more than 75 years old and have a component that includes archaeological deposits. Consultation with Heritage Victoria should be undertaken to confirm whether criteria and thresholds for the VHI are met, and if so, a VHI site record card should be completed by a qualified archaeologist and submitted to Heritage Victoria.

Any place recorded in the VHI, will then be subject to Recommendation 5 if it is likely to be impacted by works.

Recommendation 5 Statutory approvals

Victorian Heritage Register

Where works are to be conducted within the boundaries of places listed on the Victorian Heritage Register, a Permit should first be obtained from Heritage Victoria.

- The Victorian Heritage Register H2381 MAROONDAH WATER SUPPLY SYSTEM (UPPER AND CENTRAL SECTIONS)

It is understood that the trail alignments avoid the VHR place and therefore a permit will not be required.

Victorian Heritage Inventory

If works are to be conducted within a place listed on the Victorian Heritage Inventory, Consent to Damage should first be obtained from Heritage Victoria.

- Victorian Heritage Inventory H8022-0111 O'SHANNASSY AQUEDUCT SAWMILL SITE - Anderson, Richards and Robinson- established their plants in the area. Jas Henty & CO. log tramway was extended to convey logs from Mt Donna Buang (McCarthy).

Yarra Ranges Heritage Overlay

If works are to be carried out within any area included on the Yarra Ranges Heritage Overlay, a planning permit or exemption should be sought from the Shire of Yarra Ranges.

- HO214 – Lilydale – Warburton Railway
- HO140 - Mount Donna Buang-Bridle Tracks & Road

Recommendation 6 Management protocols

The following are proposed should be enacted to ensure that works minimise any impacts to potential archaeological and heritage places, and if any historic or archaeological features are encountered during works, these can be appropriately managed.

- Design works to minimise impacts
- Avoid cutting across tramway formations, water races or sluice banks
- Induction for contractors in how to recognise and manage historic features, when to stop works, who to contact
- Heritage advisor inspection during works in sensitive area
- Realign to avoid features if possible
- If not possible to avoid, record and obtain heritage approval
- Implement a regular process of inspection in case use of the trails reveals historical or archaeological remains which should then be managed appropriately.

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1 Introduction

The *Heritage Act 2017* and *Planning and Environment Act 1987* provide protection to historical sites in Victoria. These sites are an important part of our heritage as they represent evidence of the more recent period of settlement in Victoria and can provide us with important information about past lifestyles and cultural change.

Biosis Pty Ltd was commissioned by Shire of Yarra Ranges to complete a historical archaeological survey for the proposed Mountain Bike Trails at Warburton Victoria.

1.1 Objectives

The objective of the study is to assess the historic cultural heritage potential of the study area, record any historical sites that are present and to develop recommendations to ensure best cultural heritage practise is maintained.

The project brief stems from previous work to prepare a CHMP as the consultants considered there was potential for historic places and archaeological features to be present.

1.2 Authorship

The current study was completed by the Biosis staff listed in Table 1.

Table 1 Biosis staff undertaking the study

Staff	Role
Gary Vines	Archaeological survey and reporting
Elise Nuridin	Background research
Erica Walther	QA
Kym Oataway	Project Management and QA

1.3 Location and description of study area

The study area comprises two separate and extensive areas to the north and south of Warburton within the municipality of the Yarra Ranges Shire Council and consists of approximately 180 kilometres of proposed trail. North of the Warburton Highway, the study area is located on the slopes of Mt Donna Buang within the Yarra Ranges National Park, the Woiwurrung State Forest, and Warburton Golf Club and encompasses the O'Shannassay Aqueduct. South of Warburton the study area is within the Yarra State forest and crosses over Mount Little Joe to the summit of Mount Tugwell.

The location of the study area is shown on Figure 1. Cadastral information for the study area is listed in Table 2. Overall, the study area consists of road, Crown Land and some Private land.

Table 2 Cadastral information for the study area

Address	(1) 17 Dammans Road, Warburton 3799 (2) 490 Maroondah Highway, Warburton 3799 (3) 300 Rosella Road, Wesburn 3799 (4) 15 Marlino Ave (5) 18A Brett Road, Warburton 3799 (6) 3 Clinch Street, Warburton 3799 (7) Brisbane Hill Road Warburton (8) Blackwood Ave, Warburton 3799 (9) Doon Road, launching Place 3139 (10) 325 Old Warburton Road, Warburton 3799 (11) 2950 Warburton Highway, Wesburn 3799 (12) Old Warburton Road, Warburton 3799 (13) 930 Woods Point Road, East Warburton 3799
Local Government Authority	Yarra Ranges
Lot/Plan	(1) 2\PS402610 (2) Allotment 2032 SPI 2032\PP4003; Allotment 2030 SPI 2030\PP4003; Allotment 2027 SPI 2027\PP4003; Allotment 2003 SPI 2003\PP4003; Allotment 2004 SPI 2004\PP4003 and Allotment 2002 SPI 2002\PP4003 (3) Allotment 2017 SPI 2017\PP4003 and Allotment 2018 SPI 2018\PP4003 (4) 30A\PS623932 (5) 1\TP185973 and 2\TP185973 (6) 2\TP148012 (7) 1\TP162603; 1\TP162637; 1\TP164527 (8) Res1\ps443697 (9) Allotment 2007 SPI 2007\PP5831 (10) Allotment 2003 SPI 2003\PP5831; Allotment 114 SPI 114\PP5831; Allotment 115 SPI115\ PP5831; Allotment 112 SPI 112\PP5831; Allotment 109 SPI 109\PP3738; Allotment 108 SPI 108\PP3738; Allotment 111 SPI 111\PP3738; Allotment 110 SPI 110\PP3738; Allotment 143 SPI 143\PP3738; Allotment 103 SPI 103\PP3738 (11) Allotment 100A SPI 100A\PP3738; Allotment 100 SPI 100\PP3738; Allotment 99 SPI 199\PP3738; Allotment 93 SPI 93\PP3738; Allotment 90A SPI 90A\PP3738; Allotment 90 SPI 90\PP3738; Allotment 91 SPI 91\PP3738; Allotment 96 SPI 96\PP3738; Allotment 95 SPI 95\PP3738; Allotment 97A SPI 97A\PP3738; Allotment 97B SPI 97B\PP3738 (12) 1\TP366304; 1\TP340760; 1\TP398849; 1\TP369897 (13) Allotment 2040 SPI 2040\PP3738
Planning Zone	Green Wedge Zone – Schedule 4 Public Use Zone – Service and utility Rural Conservation Zone – Schedule 3 Public Conservation and Resource Zone

	Low Density Residential Zone Public Park and Recreation Zone Road Zone – Category 1
Coordinates*	(1) 383676 5820849 (55) (2) 383278 5821934 (3) 381338 5822827 (4) 384434 5821124 (5) 384499 5821221 (6) 384736 5821478 (7) 384917 5821578 (8) 385556 5821622 (9) 383424 5820423 (10) 383198 5820327 (11) 383251 5819970 (12) 383128 5819444 (13) 383271 5818078
Melways/VicRoads	(1) 289 J4 (ed. 39) (2) 289 J1 and 80 B5 (ed. 8) (3) 80 C5 (ed. 8) (4) 290 A3 (ed. 39) (5) 290 B3 (ed. 39) (6) 290 B2 (ed. 39) (7) 290 C2 (ed. 39) (8) 290 d2 (ED. 39) (9) 289 j5 (ED. 39) (10) 289 H5 (ed. 39) (11) 289 H6 (ed. 39) (12) 289 H7 (ed. 39) (13) 289 H10 (ed. 39)

* All geographic coordinates in this CHMP are referenced to the Victorian Government Standard GDA94 MGA

1.4 Owners/occupiers

Most of the study area is crown land reserve with most of the land, The area south of Warburton mostly comprises the Yarra State Forest, while the forest to the north of Warburton, leading up to Mt Donna Buang and beyond, is within the Yarra Ranges National Park. Administration of these areas is vested in the following organisations:

Table 3 Land Ownership

Property	Administrative body	Contact details
Yarra Ranges National Park	Parks Victoria	Level 10, 535 Bourke Street Melbourne 3000
Yarra State Forest **Woiwurrung State Forest**	DELWP	8 Nicholson St, Melbourne 3000

Property	Administrative body	Contact details
Yarra river Frontage		
Warburton Golf Course	Privately Run	Warburton Golf Club 17 Dammans Road, Warburton, 3799 5966 2306

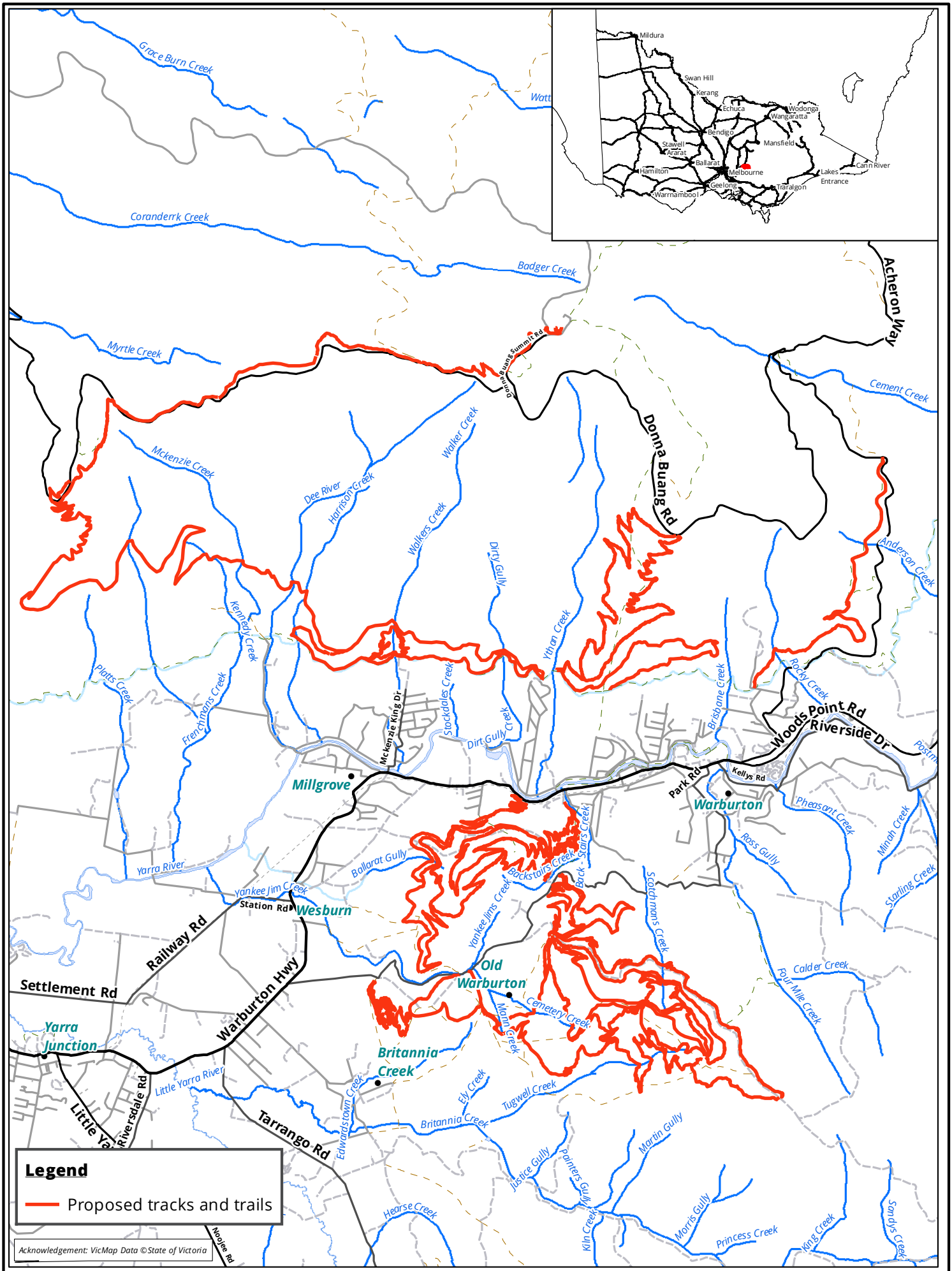


Figure 1 Location of the study area - Warburton, Victoria

0 500 1,000 1,500 2,000 Metres

N

Scale 1:55,000 @ A4, GDA 1994 MGA Zone 55

Biosis Pty Ltd
Albury, Ballarat, Melbourne
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 27956,
Date: 07 October 2019,
Checked by: GV, Drawn by: JSP, Last edited by: lmilne
Location:P:\27900s\27956\Mapping\27956_F1_Locality

2 Background

When new development is proposed, it must be established whether there are any historical sites within the study area and how they might be impacted. Therefore, background research in to regional history and previously recorded historical sites can inform the likelihood of sites being in the study area.

2.1 Environment

The study area is located within a landscape of dissected uplands consisting of steep sided valleys on either side of an alluvial valley floor (Economic Development, Jobs, Transport and Resources, 2018). Soils on the slopes are mostly young due to the continuous movement of material downslope while soils within the alluvial flats are thin gradational and often stony again due to the continuous downwards movement (Cochrane, Quick, & Spencer-Jones, 1995).

The summit of Mount Donna Buang is 1,250 metres above sea level. Adjacent to this to the west is Ben Cairns with a summit of 900 metres above sea level. These hills slope towards the Yarra River and Warburton. Mount Little Joe is 440 metres above sea level and Mount Tugwell, 780 metres above sea level. Many creeks and tributaries flow downslope for the upper slopes of the surrounding hills of Mount Donna Buang, Mount Little Joe and Mount Tugwell.

Mount Donna Buang is capped with Devonian acid volcanics while the underlying geology of Mount Tugwell is of the Warburton Granodiorite, a granite intrusion while Mount Little Joe is formed by the Humevale Siltstone (Dxh) of Lower Silurian to Lower Devonian Age (Cochrane, Quick, & Spencer-Jones, 1995).

Within the foot slopes of Warburton and along the Yarra River valley floors and tributaries are deposits to accumulated colluvial and alluvial deposits of Quaternary age. The local colluvium consists of gravel, sand, clay and rubble, and includes deposits channel deposits. The local alluvium consists of gravel, sand and silt and includes deposits of low terraces and alluvial floodplain deposits (Cochrane, Quick, & Spencer-Jones, 1995).

2.1.1 Vegetation

The study area is dominated by a tall eucalypt tree layer to 30 metres tall over a medium to tall dense shrub layer of broadleaved species typical of wet forest mixed with elements from dry forest types. The ground layer includes herbs and grasses as well as a variety of moisture-dependent ferns including occasional tree ferns. The dominant trees are Mountain Ash and Manna Gum.

2.2 Land Use History

2.2.1 Exploration and European settlement

European surveyors and explorers were drawn to the Yarra River, as the most substantial waterway in the Port Phillip District, commencing with Charles Grimes in 1803 who followed it only as far as a rock ledge forming falls near Queen Street. Knowledge of the mountain forests in the Upper Yarra came only after settlers travelled up the River to the Warrandyte area by 1837, McMahon Creek in 1839 and the headlands in 1844 and 1845. A survey of the area undertaken by McComb in 1838 noted that no Aboriginal people were seen during the Yarra River survey; however scarred trees were observed indicating that they had been present.

The Ryrie brothers arrived in the Upper Yarra Valley in the 1830s, driving their cattle from the Monaro plateau in New South Wales. In 1837, William Ryrie established the 43,000 acre Yering Station that extended from Acheron, north of the Divide, to Lilydale. His brother, Donald ran a 16,000 acre out-station from Healesville along the Yarra Valley to Launching Place and Warburton, including the surrounding ranges (O.C.R, 1953).

In 1845 Robert Hoddle conducted a survey of the Loddon that included a search for the source of the Yarra River and mapped the region. Hoddle's Creek is named after him. The first freehold land was not taken up in the Warburton area until 1871, as the major rush moved towards Woods Point and beyond, and the workings along Yankee Jims Creek became more permanent.

2.2.2 Gold

Gold mining commenced in the Upper Yarra in 1859 following an earlier discovery in Emerald. The gold rush began at Britannia Creek at the junction with the Little Yarra River that soon established the township of Britannia near the present village of Wesburn, (formerly known as West Warburton). A small township provided miners with relief from carrying provisions on their back. Several stores and a warden's office existed at the junction of Britannia Creek and the Little Yarra River.

Yankee Jim's Creek goldfield opened in 1859, with the area renamed Warburton in 1863 after the Gold Warden for the district, Charles Warburton Carr. In 1860, the mining population consisted of around 500 miners who rushed to Big Pat's Creek upon the discovery of gold. Yankee Jims Gold field, was established in around the same time. It was named after a colourful American James McAvoy (1831-1884) who made a fortune from mining in the area.

The mining was mainly for alluvial gold in the deep deposits along the Yarra and its tributaries and creeks (as opposed to reef). The deposits were reported to be "of the most substantial character", with the wash being two feet (600 mm) thick at a depth of 70 feet (21 m) resting on a granite bottom with nuggets of up to 7 ounces (200 gms) in weight (Parkinson, 2017). The first quartz prospecting claim was registered in 1863 at Yankee Jim's Creek (The Warburton District Progress Association, 2017). In order to supply water to the gold fields for sluicing, an open channel was cut from Starling's Creek to the diggings at Old Warburton with extra water being diverted from Four Mile Creek. In 1864 a major diversion scheme was established that exposed the creek bed of the Yarra River by tunnel through what is known as the Great Peninsula (Department of Natural Resources & Environment, 1999).

In 1870 a waterwheel was built at Warburton to drive a battery to crush gold bearing rock. This was located at the Shining Star mine near Mount Little Joe, one of the few reef mines (Parkinson, 2017). Walter Fisher a master carpenter from Walhalla, was commissioned to build a large over-shot wheel to drive a crushing battery. A water race was constructed around the hillside to deliver water from the upper section of Big Pat's creek to supplement the water from Yankee Jim's creek. On completion of the project the wheel was "christened" with a bottle of whisky and set in operation (Geof, 2019); (The Water Wheel Gold Crusher Mill at Old Warburton, 1904).

Plate 1 Watermill and house at Old Warburton, 1904

Plate 2 Shining Star mine water wheel

Miners then turned to hydraulic sluicing to extract remaining alluvial gold in deep deposits and surface soils, creating huge man-made gorges, some of which are 30 metres deep adjacent to Yankee Jim's Creek (L.G, 1937) (Plate 4). In 1873 a hydraulic sluicing operation was commenced by the Warburton Hydraulic gold Mining company whose race carried water for approximately seven miles to elevations of around 320 feet above the claim. In 1876 this company erected a 1,000 feet, 50 foot high flume across Warburton saddle.

The Yarra Yarra Hydraulic Gold Sluicing Company re-worked areas of Yankee Jim's Creek in the 1870s and 1880s. They constructed five miles (8km) of water races extended from Big Pat's Creek and delivered 2,300 litres of water per minute. The company was sluicing through 30 feet of old alluvial workings, timbered shafts and drives to access the creek bed. A water wheel was also constructed on along Yankee Jim's Creek to drive the company's battery. Gideon Scott Lang, was holder of the mining lease in 1873. He was a pastoralist and author and "an adventurous and enterprising pioneer", who was involved in the mining venture at Old Warburton. The company was suspended in 1884, three years after its founder's death (Context Pty Ltd, 2000).

Hydraulic sluicing was also taking place at Starvation and Hoddles Creeks at this time. By the early 1880s most of the sluicing companies had exhausted their land. The last two surviving companies were Britannia Hydraulic Sluicing and Warburton Hydraulic Sluicing. In order to access deposits, these companies cut deep drainage culverts, known as tail-races, through solid granite boulders. Operations at both of these companies ceased in 1884. Plate 3 shows the landholdings around Old Warburton, including the line of the water race.

Only minor hydraulic works were mentioned within the historic record from 1884 to the early 20th century, when brief hydraulic operations were carried out at McMahon's and Hoddles Creeks in 1906-1907 (Department of Natural Resources & Environment, 1999).

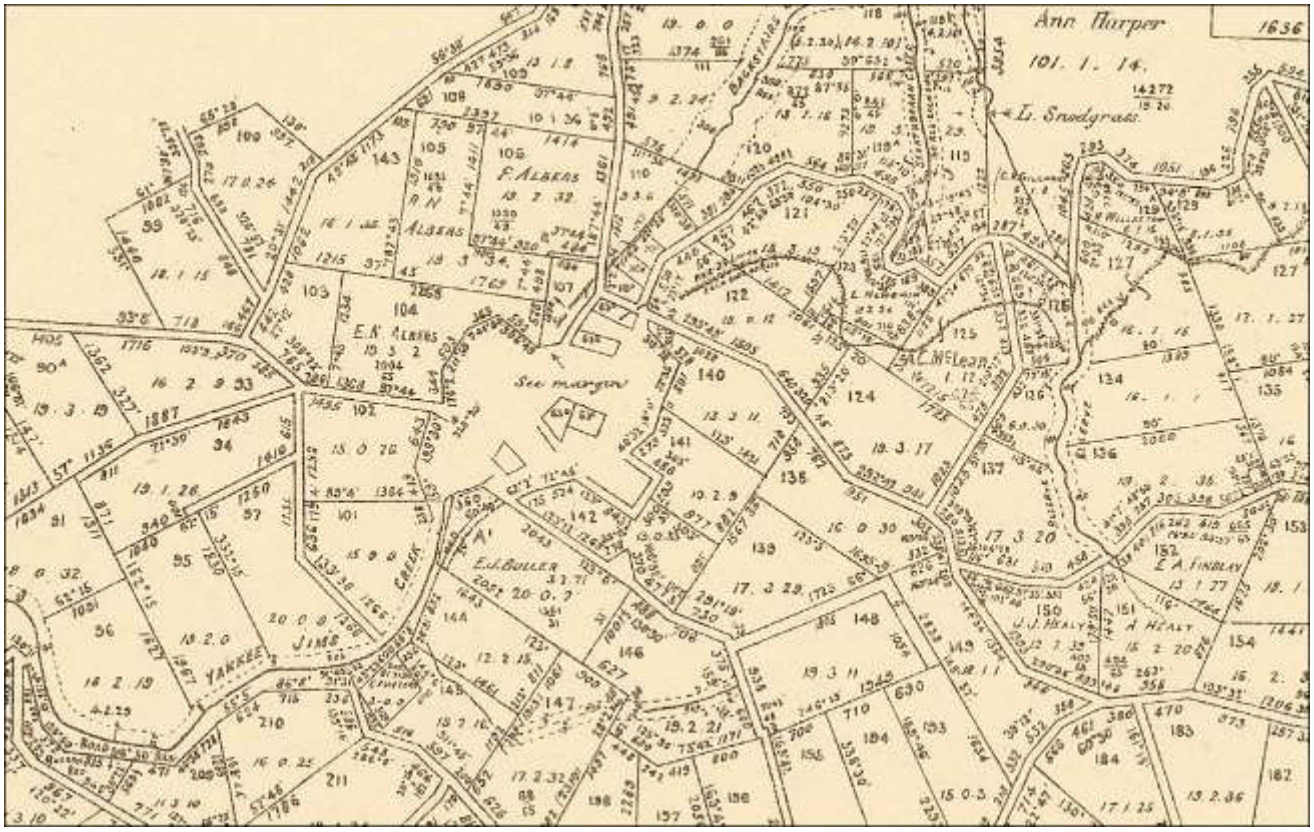


Plate 3 Warburton County of Evelyn, (State Library Victoria)

Plate 4 Hydraulic sluicing for alluvial gold at Warburton (Calvert)

Quartz reefing began around Britannia Creek in 1860. During this time, miners opened up reefs across the Upper Yarra Goldfields. Quartz mining within the area was always a small-scaled operation. The largest of these was the Golden Bower and Star Quartz at Donovan's Creek. In 1874 a small rush at the junction of McMahon's Creek and the Yarra led to the establishment of Reefton. New reefs were discovered at Hoddles Creek in 1878, where the Pigtail Company established a battery, pump and winding gear. Also at this time, the Muddy Creek Company cut a six mile water race to supply its battery at McMahon's Creek. By the early 20th century, small scale mining operations consisted of the Lady Hopetoun in Warburton, Hoddles Creek at Hoddles Creek and Mountain Queen at McMahon's Creek. Most of these operations were no longer in existence by 1910 (Department of Natural Resources & Environment, 1999).

During the 1870s and 1880s deep lead mining was carried out at Yankee Jim's and Hoddles Creeks. The Melbourne Quartz and Alluvial GMC, the London Company and the City of Melbourne Company worked Hoddles Creek. The Melbourne Quartz and Alluvial GMC drained their working using horse and whim. None of these operations were successful. With the gold in Old Warburton exhausted, miners moved on to Woods Point where larger reefs were being worked. By the 1890s most of the 'easy' gold had been found and many of the miners left the area (Parkinson, 2017).

2.2.3 Roads and Townships

Routes to the goldfields were created along the steep ridges into the dark gullies throughout the district. Bullock drays and pack horses would transport materials into the diggings. One such route became known as *Back Stairs Creek* (possibly located within the present study area) from the staircase looking effect that the horses had worn into the steep sides of the creek. Another track was opened up between Reefton along the Great Dividing Range from Marysville to other gold mining towns in Matlock and Wood's Point. These tracks and routes helped in opening up the Upper Yarra for settlement (The Warburton District Progress Association, 2017).

Plate 5 Old Warburton - selections on Upper Yarra (State Library Victoria)

The settlement at Yankee Jims may have first been known as Warburton, but it became Old Warburton when the main town shifted to the new road alignment to an area previously known as Scotchman's Creek. A cemetery was reserved at Old Warburton, located on the south side of Old Warburton Road. It is understood that a number of burials were interred here before the settlement diminished and the cemetery was no longer visited or maintained. The reserve subsequently regrew with thick native forest indistinguishable from the forest reserves in the vicinity.

A liquor licence was issued to Edward Buller in 1864 and his hotel helped to serve the needs of the mining community. There is purported to have been a Police Barracks Site, School, a Post Office Site, Guest House, several private homes and a number of mines including the Yarra Yarra Gold Sluicing Company Works and Water Race, the Shining Star Mine Site, the Lady Hopetoun Mine Site. (Old Warburton Township Site, 2019). However, by 1869, few miners remained at Yankee Jim's with only a small settlement of about 12 buildings and a few huts left until 1926 when most of the remaining buildings were destroyed by bushfires.

The Lady Hopetoun Mine was established in about 1889, when W Wye found gold at the head of Scotchman's Creek and formed a small company called the Lady Hopetoun gold Mining Company which was managed by Mr W Murphy. They initially drove a tunnel into the hill side and flowed this with another 75 feet lower down, and erected a 10 head battery, which was run by water from the 'old water race' which they cleaned out.[1] The mine had to cut through granite boulders to reach the dyke 5 feet wide, while the cost of the race was put at £10,000, .However, in October 1890 the shareholders met to consider winding the company up.[2]

[1] "GOLD-MINING AT WARBURTON." The Lilydale Express (Vic. : 1886 - 1897 ; 1914 - 1920) 11 April 1891: 3. Web. 4 Nov 2019 <http://nla.gov.au/nla.news-article252179426>.
[2] "Advertising" The Argus (Melbourne, Vic. : 1848 - 1957) 3 October 1890: 3. Web. 4 Nov 2019 <http://nla.gov.au/nla.news-article8439425>.

Plate 6 Lady Hopetoun Mine (Station Mural from photograph)

A Mr Wildman guided the Upper Yarra tourist club to the site in 1891[3] and the area remained a local scenic spot for some time, as indicated by postcards of the nearby Lady Hopetoun Fern Gully (Plate 7).

J. Houston was managing in July 1891. In 1892 a third tunnel was being driven and the tramway was being repaired due to having been damaged by floods. In 1892, the company appears to have foundered with the Sherriff's Office taking court action,[4] and by 1905 the mine appears to have been idle. The mine was described as 'long abandoned' when it was still being visited in the late 1930s.[5]

[3] WARBURTON. (1891, February 14). The Lilydale Express (Vic. : 1886 - 1897 ; 1914 - 1920), p. 2. Retrieved November 4, 2019, from http://nla.gov.au/nla.news-article252178635
[4] Advertising (1892, July 7). The Age (Melbourne, Vic. : 1854 - 1954), p. 2. Retrieved November 4, 2019, from http://nla.gov.au/nla.news-article19933965
[5] OLD WARBURTON (1937, January 2). The Age (Melbourne, Vic. : 1854 - 1954), p. 17. Retrieved November 4, 2019, from http://nla.gov.au/nla.news-article206187023

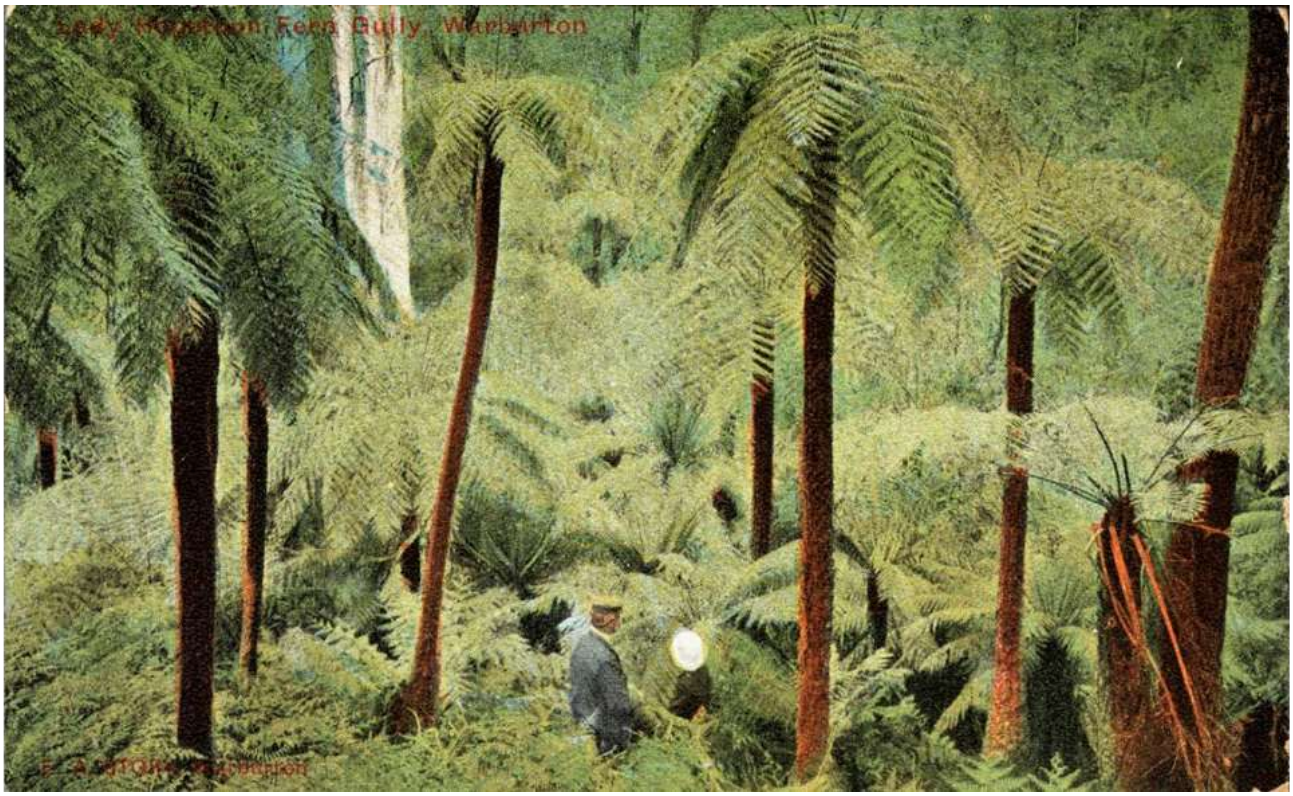


Plate 7 Lady Hopetoun Fern Gully c.1907 (State Library Victoria H96.200/2004)

Warburton went through a period where guest houses, close to the railway line, provided accommodation for city holiday makers until the railway line closed in 1965. Today the area is served with hotels, motels, conference centres and bed and breakfast accommodation. Warburton, nestled between mountains, has become a new centre of tourism.

Roads were constructed into the mountains, initially to access gold mining areas, then for timber extraction and finally for tourism. The Country Roads Board built a hut on the Ben Cairn road, while the Melbourne Walking Club, and Ski Club of Victoria (formed 1924) also built huts near Mt Donna Buang. A number of steep tracks were constructed up the mountain side, evidently replacing the previous timber incline tramways, the roads are huts shown on Plate 9.

Plate 8 Warburton Parish Plan showing Old Warburton Cemetery and landholdings.

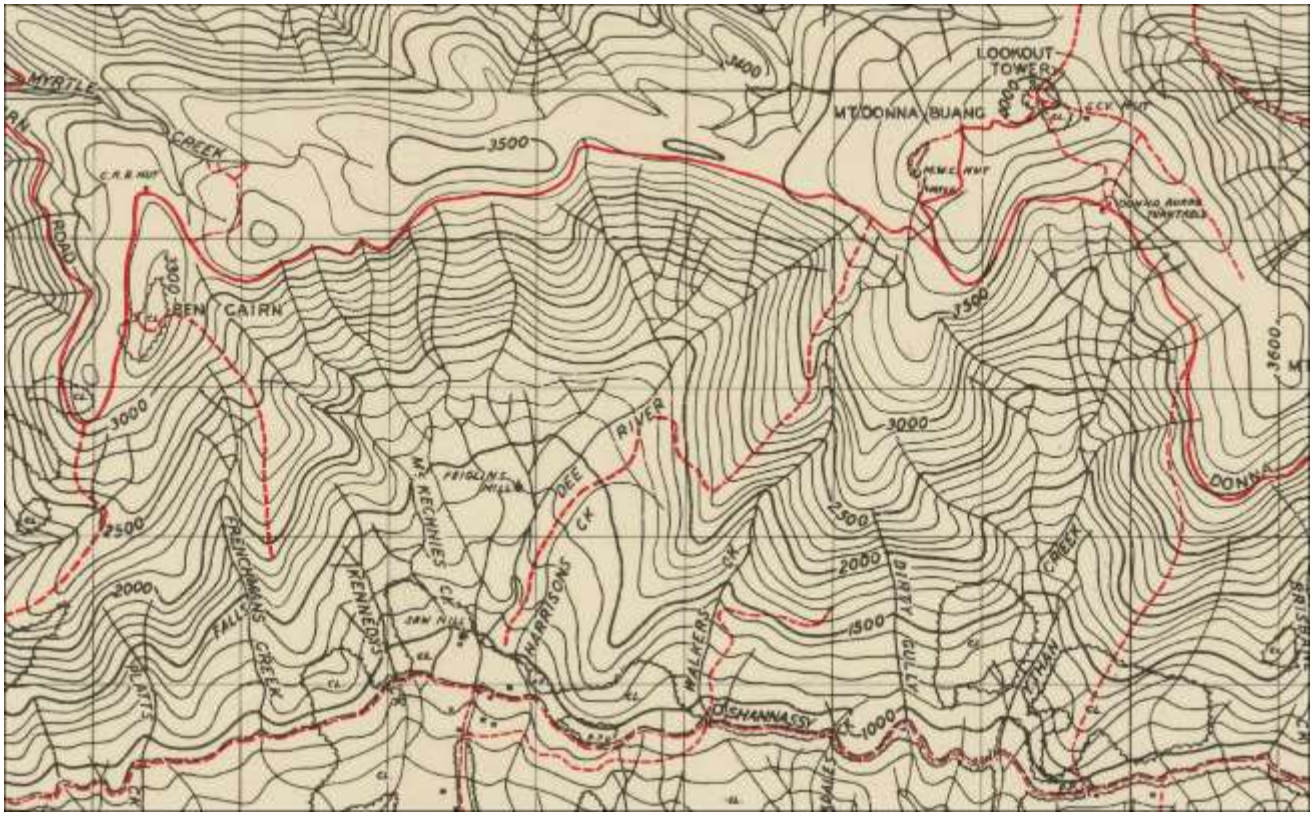


Plate 9 Mt Donna Buang Area, Parishes of Yuonga and Glenwatts (Department of Lands 1957)

2.2.4 Timber

The gold mining boom in the region, increased the need for timber that was the impetus for the logging industries in the Yarra Ranges. The goldfields in Bendigo and Ballarat stripped the landscape of the local timber supplies that led to opening up large tracts of land in the Yarra Ranges and the establishment of the West Gippsland sawmills as well as the railway line from Melbourne to Warburton. Wagon loads of timber were taken over bush tracks to Lilydale where the railway line started.

In 1901 the railway line was extended to Warburton that helped strengthen the growing timber industry. Sawmills and timber tramways were constructed throughout the area that fed to the train line that supplied timber to Melbourne. These narrow gauge lines (Plate 10) were called tramways due to an Act of Parliament preventing anyone other than the government from operating train lines (Parkinson, 2017). The main tramways were located from Mount Bride, in Yankee Jim's Creek Gully, and along Britannia Creek that carried timber to Wesburn. The rail line to Warburton ceased operations in 1965 and is now the Warburton Rail Trail.

Plate 10 Timber tramway along Yankee Jim Creek (Padula B. , 2018)

Several timber mills were located in the Wesburn Area, to the west of Warburton as well as on the slopes of Mount Little Joe, Bride, Myrtalia and Tugwell as well as within Britannia Creek and Yankee Jim's Creek Gully within Old Warburton. The primary timber mills were the Cameron and Co Warburton Sawmill that operated from 1889-1900 on Old Warburton Road near Yankee Jim's Creek. This was later owned by Laudher, Gillis and Ewart from 1924-1929. The main tramways were from Mt Bride, in Yankee Jim's Creek Gully, and along the Britannia Creek Rd, carrying timber to the railhead at Wesburn. Laudher's Pioneer Sawmills was in operation

between 1900 and 1910 and was located on Cemetery Creek that flows through the present study area. Herman Mill and R. Platt and Co were located on the summit of Mount Bride and on Mount Bride Road respectively (Padula B. , 1889 to 1919- Mills in the Wesburn and Old Warburton Area, 2018).

The timber industry started in Warburton as gold ran out. Axemen cut wagon loads of palings which were taken over rough bush tracks to Lilydale, which was the railhead at the time.

Steam and diesel engines were used to power the sawmills and haul the logs. In some cases the logs were lifted by cable and pulley high above the ground to transport them to the tramways, where narrow gauge engines hauled them to mills and railheads. In more remote areas, horses were used to pull empty bogies up graded tines. When loaded, the logs would run downhill under the control of braking systems. The mills provided work for all who wanted it and towns (such as Powelltown) sprang up around the mills. Some of the timber tramways still remain open to walkers but chainsaws, bulldozers and timber jinkers replace the old method of getting timber.

Some of the main mills included Cameron and Co. "Warburton Sawmills", which was situated on Yankee Jim's Creek, on Old Warburton Rd (1889-1900) and later owned by Laudher and Gillis and Ewart (1924-1929). Laudehr's Pioneer Sawmills, were constructed near Old Warburton in 1900, and then moved south to the slopes of Mt Tugwell in 1910. Parbury built a mill on the site now in the Golf Course, in 1905, possibly reusing Anderson's 1901 mill. Slocum and Walker operated a number of mills, including one at the head of the Dee River 1907-12, and another near the aqueduct at the end of McKenzie King Driver, which had been commenced by Henry in 1906. Feiglins Mill was located near the Dee River on the slopes of Ben Cairn (McCarthy, 2001).

Plate 11 Cable hauled incline tramway Warburton 1907 (Padula B. , 2018)

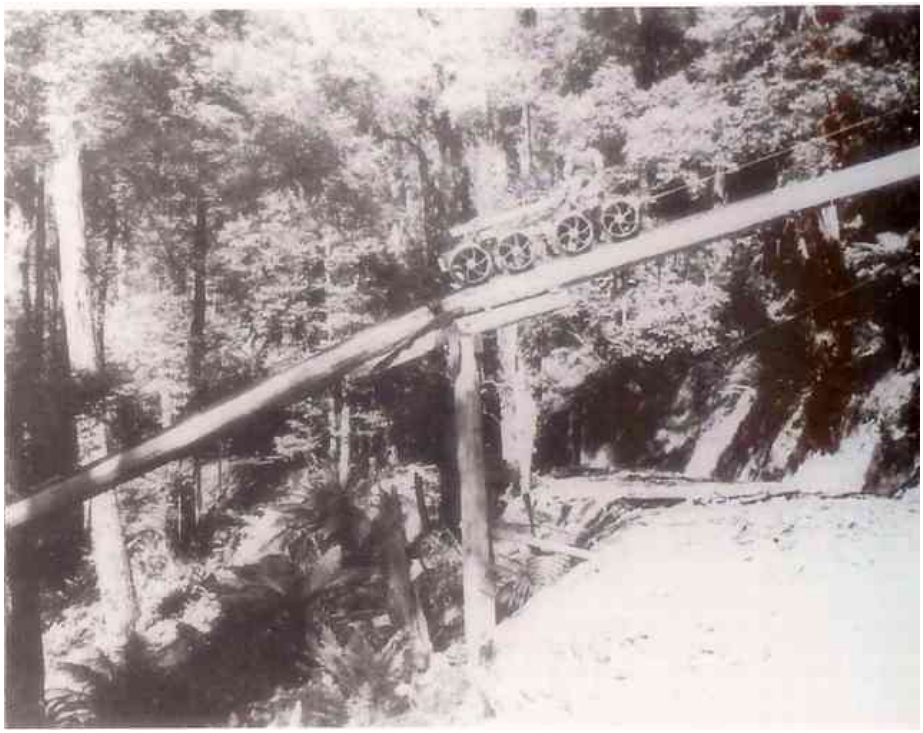


Plate 12 Ben Cairn incline crossing Mt Baw Baw road.

Located within the present day Warburton was the Anderson Sawmill, which was in operation from 1901 to 1905 and then taken over by a Mr Parbury in 1905, and became the Brookfield Sawmill. Timber from the mill were transported by tramway over the Yarra in order to meet the railway. The mill was built on the north side of the Yarra River, situated near the bottom of the present day Warburton Golf Course and nearby the part of the study area. Logs were delivered to the mill from the near the summit of Mount Donna Buang, crossing a concrete bridge spanning the O'Shannassy Aqueduct (discussed below). The tramway was dismantled in 1929, following the closure of the mill in 1928, but may have been reconstructed for Horner's Mill at the top of the line in the 1930s. (Padula B. , 2018).

Plate 13 Timbert tramway crossing over O'Shannassy Aqueduct (Padula B. , 2018)

Plate 14 Anderson's Mill bush tram, 1906 (Padula B. , 2018)

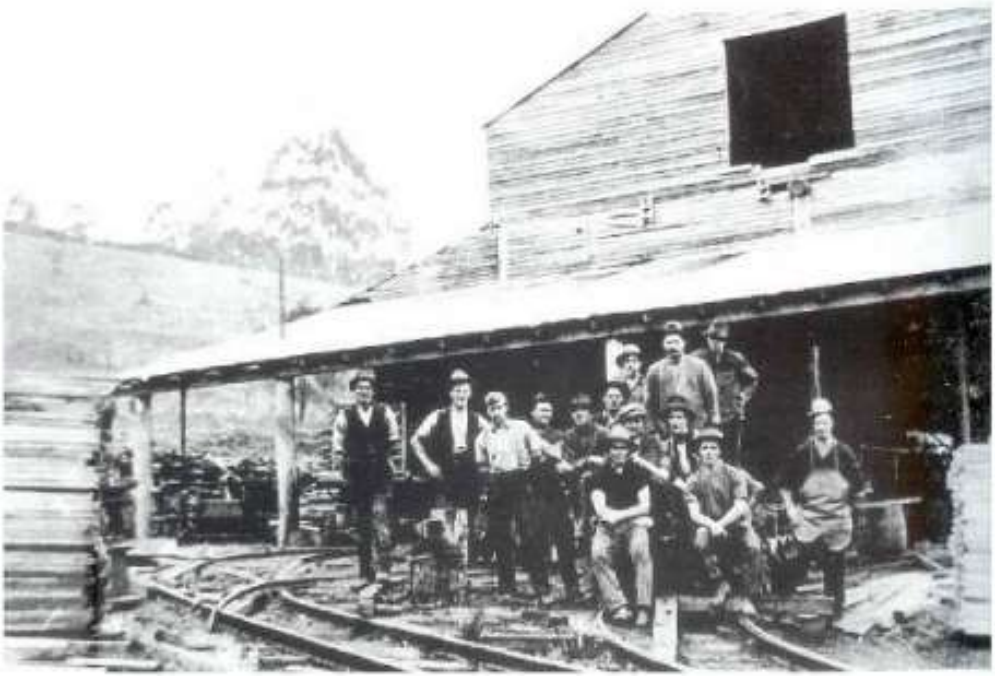


Plate 15 Parbury's Brookfield Mill, 1922 (Padula B. , 2018)

Slocumb and Walker ran several sawmills which cross the study area. The first was in operation from 1907 to 1912, north of the Yarra River. A smaller mill was located on Scotchman's Creek, only in operation from 1919 to 1920 (Padula B. , 1919 to 1920 - Slocum and Walker's Mill, 2018).

The Enterprise Mill was one of the largest sawmills constructed in the Warburton area, situated on the slopes of Mount Victoria, above the Warburton township. It commenced business as the Enterprise Sawmilling Company in 1922. Ownership changed to Cuning, Smith and Company in 1925, and continued business until 1932. Logs were transported to the mill along a tramway down from Cement Creek. Once sawn the timber

continued along the tramway, which crosses twice through the current study area, until reaching the La La siding (Padula B. , 1922 to 1932 - Enterprise Mill (La La), 2018).

2.2.5 Water supply

By the early 20th century there was an increased demand for water to be supplied to the growing City of Melbourne. The O'Shannassy Aqueduct was designed in 1911 and constructed by 1914. The first step for the construction of the aqueduct was the clearing of forest trees. The channel for the aqueduct was largely dug by hand, with the aid of horse drawn scoops. The open channel was 2.81 metres wide at the top and 1.026 metres deep and was founded on the underlying solid clay base. An access track running parallel to the open channel was constructed using the excavated material that was then fitted with rails that enabled the workers access to the site as well as the delivery of construction materials by horse drawn carriages (Unknown, 2017).

The aqueduct was to carry water from the O'Shannassy Reservoir in the Yarra Ranges to the Silvan Dam holding Reservoir in Silvan (Plate 16). The aqueduct consisted of 37 kilometres of open or covered concrete channels with three tunnels and 40 kilometres of steel pipes and delivered 20 million gallons of water daily (Rithie, 1934) (Plate 17). Many of the logging trails and tramways intersected the aqueduct where concrete bridges with rails were constructed for access to the logging trains and farming properties. The aqueduct was decommissioned in 1997 and is now a walking/cycling trail (Padula B. , 1911 to 1915- The O'Shannassay Aqueduct and Weir, 2017).

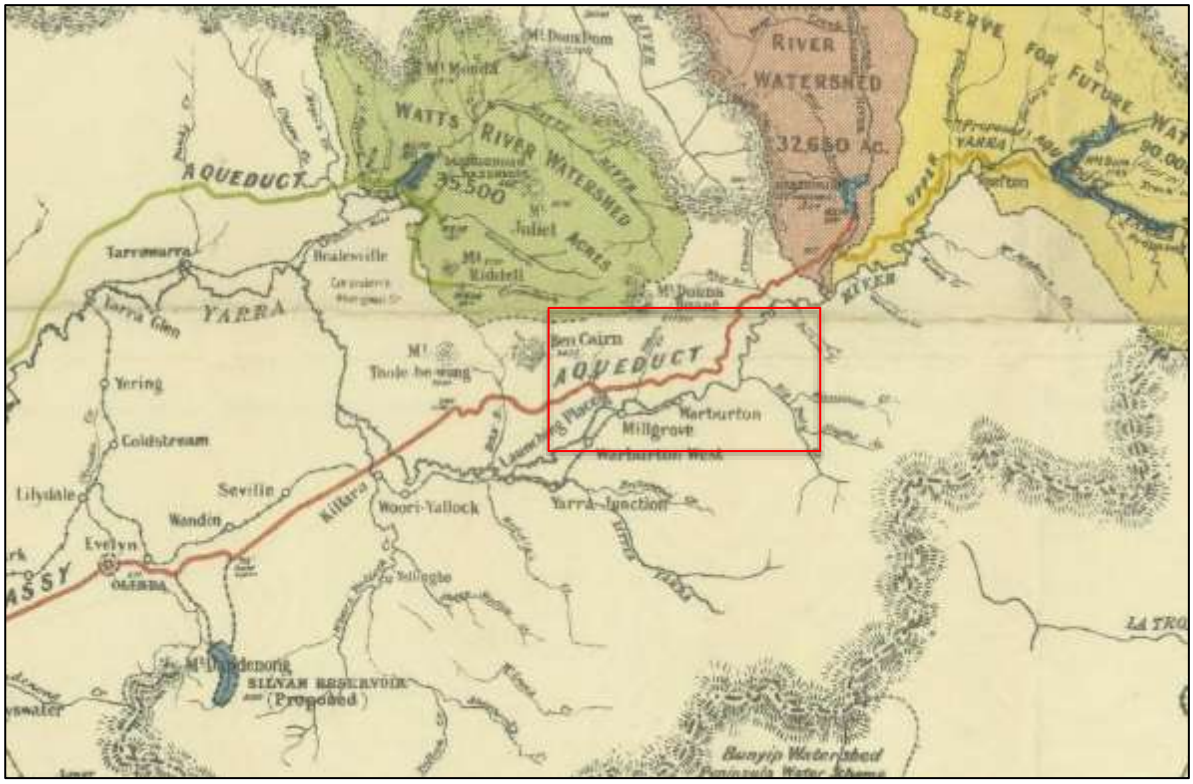


Plate 16 1922 mapping showing an excerpt fo the O'Shannassy Aqueduct route (Melbourne and Metropolitan Board of Works, Water Supply Division, 2017). Approximate location of study area in red.

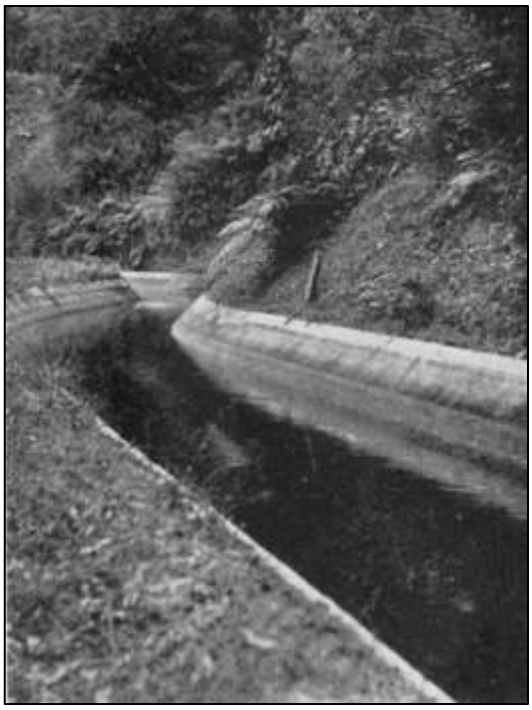


Plate 17 The O'Shannassy Aqueduct in Warburton (accession no. H96. 136/17) (Valentine Publishing Co, 1940)

2.2.6 Bushfires

Documented bushfires have occurred in Warburton throughout the 20th century. In late January of 1926 fires began on Mount Donna Buang that burnt slowly in the hills. In February the small individual fires had come together as well as winds of up to 97 kilometres per hour spread the fires through the Dandenong Ranges and much of Gippsland to Mallacoota. The fires devastated an area of 390,000 hectares with Warburton and Powellton being two of the worst affected places (NFSA, 2017). In 1939, what became known as the Black Friday bushfires, is one of the worst on record. Strong winds and drought conditions swept the fires across large parts of Victoria. An area of almost 2 million hectares was burned across the state and townships destroyed, including parts of Warburton. A total of 71 lives, 69 sawmills and over 1,000 homes were lost as well as 575,000 hectares of reserved forest and 780,000 hectares of forested Crown land (Forest Fire Management Victoria, 2017). In 1983, the Ash Wednesday bushfires also devastated Warburton. Over 100 fires started on this day that destroyed over 40,000 hectares in Warburton alone (Forest Fire Management Victoria, 2017). These fires have had a devastating effect on the preservation of built heritage across the study area.

2.2.7 Recreation

During the late 1920s and 1930s, Mount Donna Buang was a popular ski resort that contained a ski lodge, cafes, a ski hire, and 6 runs that cut through the forest. Skiing first took place on Mount Donna Buang in 1924 by the president of the Warburton Progress Association who invited some skiers to inspect the mountain. The ski party thought that the mountain had potential and it was agreed that a ski run would be cleared. In 1925 a ski party went up the mountain to determine the best route up the mountain as well as the best areas to ski and how to carry the equipment on a pack horse. It was reported that the walking track was too steep and the newly built ski slope was too narrow to be considered safe. By 1927, conditions for skiing had improved however, the road to get there was either a 12 mile long well graded road or a four mile long very steep bridle track (Sisson, 2015).

The first ski run was constructed in the summer of 1924-1925. The run was a 130 metre long and 2.5 metres wide that was widened to 40 metres in 1929. This initial run was renamed the Main Run as more runs were cut through the forest. In 1932-1933 another ski run, 20 metres wide and 41 metres long was created to the south of the Main Run. By 1934 there were two properly built runs on the mountain, one that was 130 metres long with a 21 degree slope and the other shorter but steeper. An increasing number of tourists to the area was the impetus needed to construct further runs and to widen and extend the existing runs. The ski runs were created by clearing any vegetation in the area. Explosives were often used in order to clear the runs of rocks and tree stumps (ibid).

In 1937 there were six ski runs down the mountain. Unfortunately, these names and locations have been lost. However, Sisson (2015) used 1944 aerial photographs and pedestrian survey undertaken in 2011-2014 to determine the likely locations of each ski runs as follows:

- The Main Run was located behind the present day toilet block with a staircase placed down the middle
- A slope to the north of the Main Run
- A slope to the south of the Main Run
- A slope heading north from the summit tower that later became a firebreak. The walking track to Boobyalla Saddle follows this course
- The present day walking track that descends from the summit towards 10 Mile
- The fire break to the southwest that ran roughly parallel to the top 800 metres of the summit road.

The 1939 bushfires and the start of the Second World War brought skiing on Mount Donna Buang to a decline (ibid).

2.3 Previous assessments

2.3.1 Archaeological and heritage studies

Few archaeological or heritage assessments have been undertaken within the forested areas around Warburton. An archaeological survey was undertaken in 1988 by Hillary du Cros (1988). This was focussed on Aboriginal heritage, but also discussed historical heritage in the area.

While there have been a number of published histories of Warburton and surrounds, there has been little investigation of potential archaeological values in the forested areas. An exception is the work of the Light Railways Research Society, which has published extensively on timber tramways and sawmills in the region. Among their studies of relevance to the present investigations are listed in the following table:

Author	Title	Light Railways edition
K. McCarthy	Federal Timber Company – Warburton, Victoria	63, January 1979
K. Train	Federal Timber Company – Warburton Victoria	64, April 1979
Chas Bevan	W. Richards & Sons' Tramway, Warburton	85, July 1984
WRR Johnson & John Buckland	From Warburton to Powelltown. A Tramp Along Timber Tramways	137, July 1997
Mike McCarthy	Warburton Logging Tramways	146, April 1999
Colin Harvey	Starvation Creek Tramway, East Warburton (LR 85)	230, April 2013

Author	Title	Light Railways edition
AP Winzenreid	Brittania Creek: Wood Distilling in the Warburton District	95, January 1987
Mike McCarthy	Mountains of Ash. A History of the Sawmills and Tramways of Warburton & District	163, February 2002
Wayne Chynoweth	Frame found at Warburton	26, Summer 1969

The stage 1 of the Yarra Ranges Heritage study was conducted in 1999 to identify places of potential heritage value and develop a background thematic history for the municipality. However this study does not appear to have involved extensive field survey to the level likely to identify and document heritage places in the study area (Context Pty Ltd, 2000).

There are five previously recorded heritage places and Yarra Ranges Heritage Overlay (HO) places located within the study area. The location and description of each place are listed below.

Maroondah Water Supply System (Upper and Central Sections) (H2381) comprises the Watts River catchment and water collection infrastructure near Healesville and an aqueduct running from Healesville to Greensborough. The system became operational from 1891 and is Melbourne's second largest scale water supply system. The upper section remains operational, whilst the central section was decommissioned in the mid-2000s but remains intact.

O'Shannassy Aqueduct Sawmill Site (H8022-0111) is located on Sussex Street in Warburton. The site was established in September 1901 by three sawmillers; Anderson, Richards and Robinson, who set up their plants in the area. Over the years, the site was used by several sawmilling businesses and a log tramway was extended for logs from Mount Donna Buang.

Mount Donna Buang-Bridle Tracks and Road (HO140) comprises of bridle tracks, walking tracks and road access to Mount Donna Buang near Warburton. Bridle tracks cut to help locals and visitors access Mount Donna Buang date from as early as 1912, and were developed into the present access road. They later became of national significance as an important Upper Yarra Valley beauty spot and recreational area.

Lilydale – Warburton Railway (HO214) is a linear feature, originally with rail track running from Lilydale to Warburton. The rail track has been removed however sections of the railway reserve between Launching Place and Warburton East have been developed as the 'Centenary Trail', consisting of 12 kilometres of pathway. The area illustrates the impact of the railway on the development of the upper section of the Yarra Valley, particularly for timber utilisation and its community use and association.

Yarra Yarra Hydraulic Gold Sluicing Company (HO342) is located at 390 Old Warburton Road in Warburton. It was an important gold mining site associated with Old Warburton's years as a major gold township, and has high local significance. The place covers an extensive area that is now regenerated bush land, and includes some shafts and evidence of the mining operations. The Yarra Yarra Hydraulic Gold Sluicing Company covers an extensive area that has now regenerated as bush. The company's works involved extensive sluicing operations, creating a large, steep-sided "canyon" up to 10-12 metres deep. There are also some shafts and adits in this area, demonstrating a different form of gold-mining, and a water race. Some areas appear to have been used as camp sites associated with the works.

Places listed on the cultural heritage registers are shown on Figure 2 and listed in Table 4, Table 5 and Table 6.

Table 4 Victorian Heritage Register

VHR No.	Name	Location
H2381	Maroondah Water Supply System (Upper and Central Sections)	Fernshaw, Toolangi, Healesville, Warburton, Chum Creek, Dixons Creek, Yarra Glen, Christmas Hills, Kangaroo Ground, Research, Eltham, Diamond Creek, Greensborough, Bundoora, Bend of Islands, Reservoir, Yarra Ranges

Table 5 Victorian Heritage Inventory

VHI No.	Name	Location
H8022-0111	O'Shannassy Aqueduct Sawmill Site	Sussex Street, Warburton, Yarra Ranges Shire

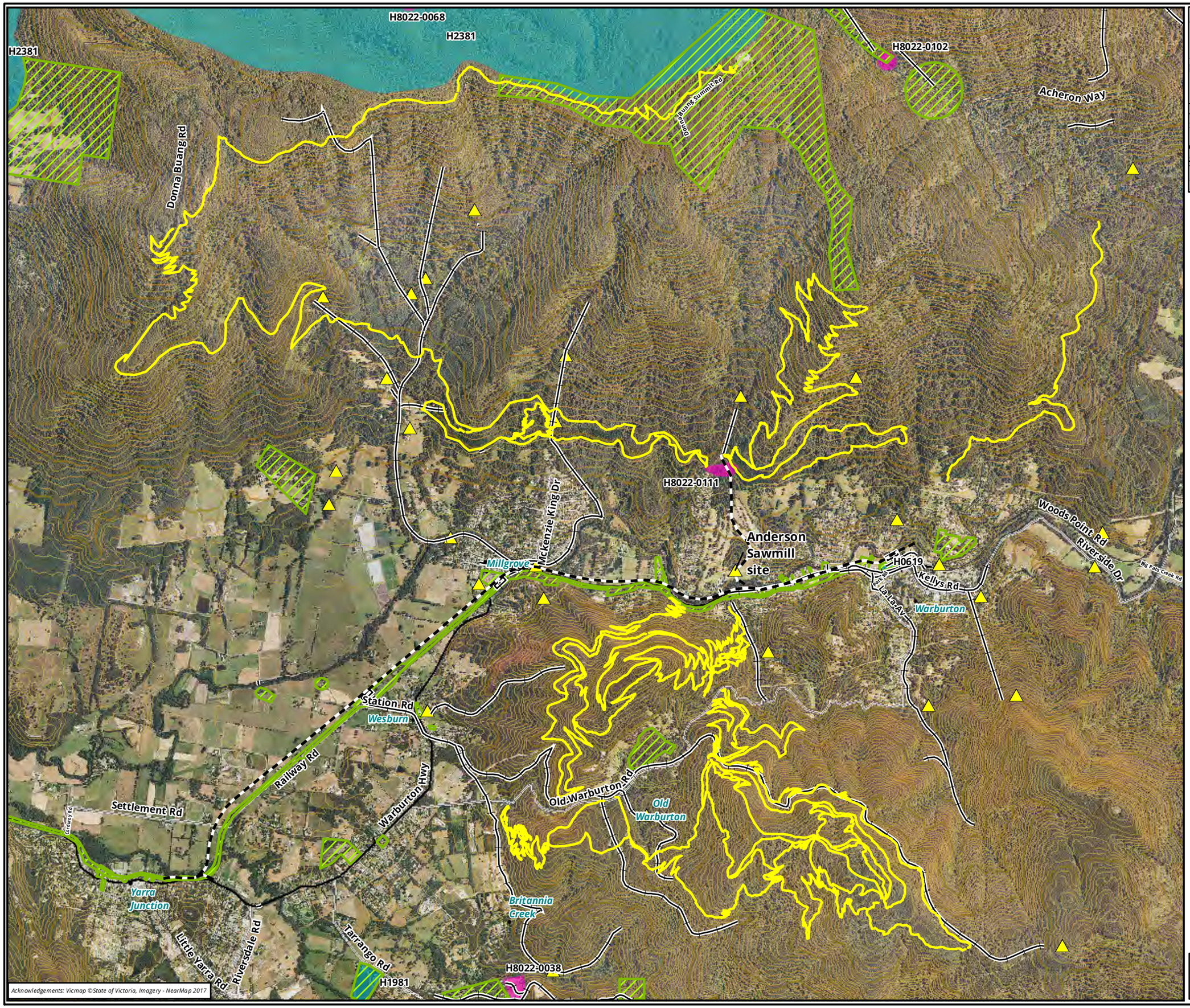
Table 6 Yarra Ranges Council Heritage Overlay

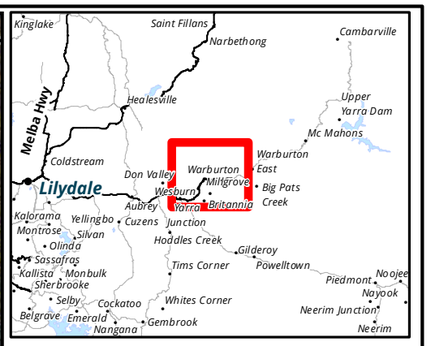
HO No.	Name	Location
HO140	Mount Donna Buang-Bridle Tracks and Road	Donna Buang Road, Warburton
HO214	Lilydale – Warburton Railway	Lilydale/Warburton
HO342	Yarra Yarra Hydraulic Gold Sluicing Company	390 Old Warburton Road, Warburton (Old Warburton)

2.4 Site prediction

Based on the assessment of historical and heritage studies and an understanding of past land uses in the study area, it is considered there is a high potential for historic archaeological sites and other heritage places to be present in the study area.

The dense vegetation and steepness of the terrain precluded a systematic survey of the entire study area, but the availability of mapping data for historic sawmill, tramway mining and other historic sites allows an approximate location to be determined for many of these places. These have been included in the survey assessment and plotted in Figure 2.





Legend

- Proposed tracks and trails
- Railway
- Tramway
- Sawmill
- Victoria Heritage Inventory
- Victoria Heritage Register
- Heritage overlay

Figure 2 Location of recorded heritage places

0 500 1,000 1,500 2,000

Meters

Scale: 1:35,000 @ A3

Coordinate System: GDA 1994 VICGRID94

N

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Matter: 27956,
Date: 07 October 2019,
Checked by: KO, Drawn by: DK, Last edited by: lmilne
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3 Fieldwork

3.1 Aims and method

The aim of the survey was to identify any historical sites within the study area and record them in accordance with standards detailed in Heritage Victoria's (2008; 2014) technical guides.

As the survey area was densely vegetated and very steep in places, it was recognised that pedestrian survey of the entire extent of the mountain bike trails was not going to be practical, and so the aims were modified to provide a viable survey coverage and useful results. Therefore the aims were as follows:

- Inspect areas of different terrain and vegetation types to determine the character of the area,
- Inspect all locations where proposed trails intersect with known historical or archaeological features, including tramways, sawmills and mining areas
- Survey identified historic features and locations to determine if any surviving fabric of features exist.

Locations of potential historic features were identified in historical research and plans as potential areas of archaeological sensitivity. These were plotted on base plans for use in the field, and the co-ordinates loaded onto a DGPS units. These locations were then inspected on foot from the nearest accessible road or four wheel drive track.

Waypoints and Tracks were plotted with hand held GPS, and digital images taken of the general location and any visible evidence of archaeological features or potential artificial landforms, such as tramway alignments or sluice banks.

DGPS and photo locations were plotted on base plans with overlaid historical data, to assess whether likely historical features had been identified.

3.2 Survey coverage

A number of factors hinder the identification of cultural heritage material. Ground surface visibility can be defined as how much of the ground surface is visible and what other factors (such as vegetation, gravels or leaf litter) may limit the detection of cultural heritage material (Burke & Smith, 2004). The higher the level of ground surface visibility, the more easily cultural heritage material can be identified (Ellender & Weaver, 1994).

Overall, ground surface visibility was only about 5%. Much of the area of investigations, not only had zero visibility, but regrowth eucalypt forest, tree ferns, bracken and dense weed cover such as blackberry obscured the landform as well.

Additional assessment was made by matching proposed routes with the existing informal trail alignment as shown in Strava on-line trail mapping and confirmed on ground. This provided potential hot spots where existing trails provided surface visibility and potential impacts could be assessed. Existing cycle routes tend to use four wheel drive track and roads. The O'Shannasy Aqueduct is used by walkers and cyclists, while steep tracks running down the mountain are generally used by walkers only.

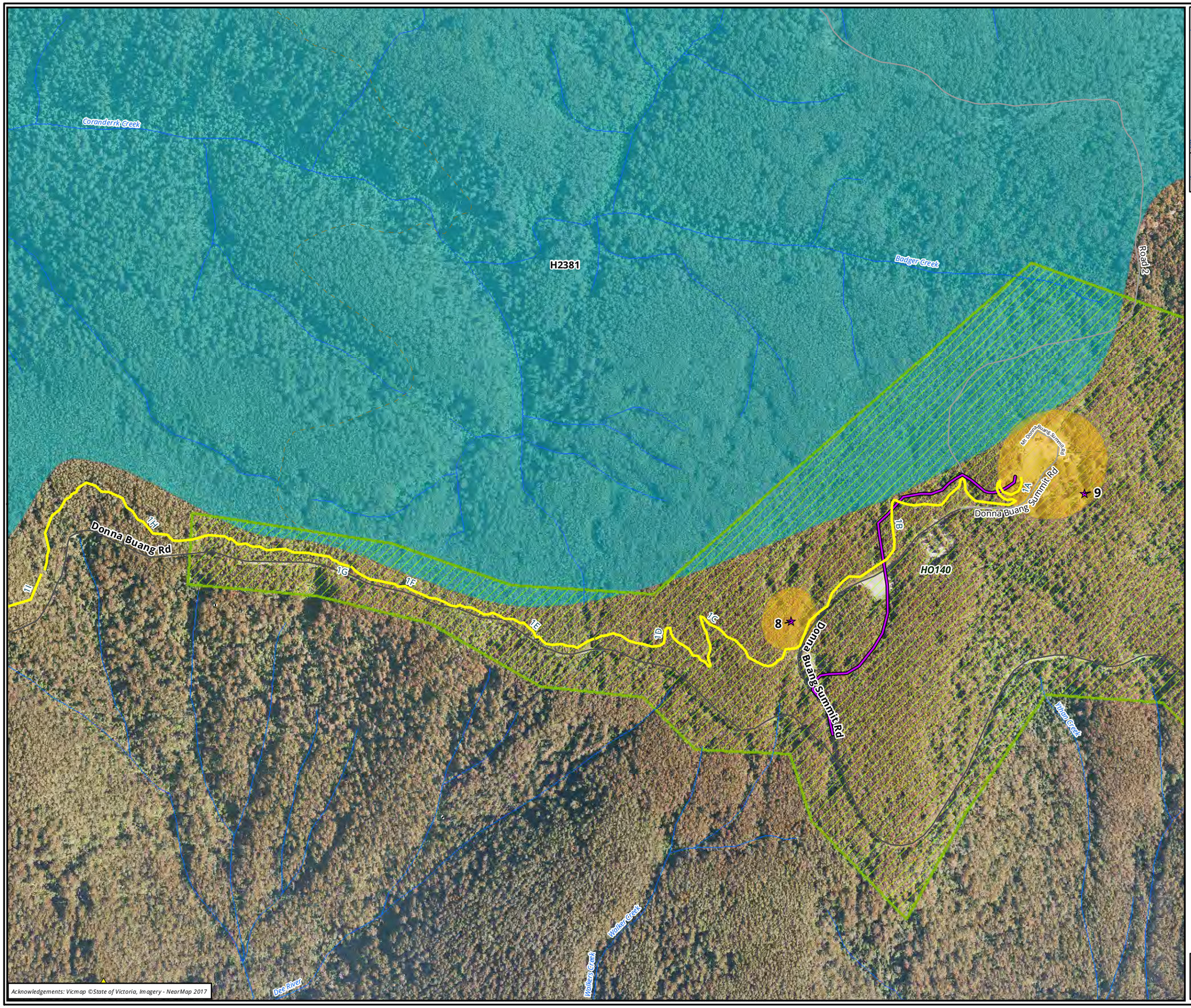
The informal cycle tracks currently in use, tend to be in the southern part of the study area around Mt Little Joe and Mt Torbreck. The former timber tramways do not appear to be utilised for the current informal trails, and are not intended to be used for the new construction. There are some areas where existing and

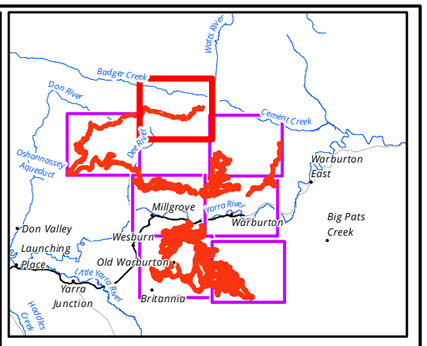
proposed trails cross the tramway routes, and these are discussed in the results and management recommendations sections below (Sections 3.3 and 5.3).

3.3 Results

The survey was completed by Gary Vines (Heritage Advisor, Biosis Pty Ltd) with assistance from Zac Carter (Biosis Pty Ltd) on the 15 and 16 January 2019.

While much of the study area was heavily vegetated and so survey results must be qualified, several specific historic features, some of which correspond to known historic places and activities, were identified. These are mapped in Figure 3 discussed below.





Legend

- Proposed tracks and trails
- Tramway
- Sawmill

Place name

- 8 MWC Hut site
- 9 SCV Hut site
- 10. Former water race
- Area of archeological sensitivity
- Heritage overlay
- Victoria Heritage Register

Figure 3.1 Areas of archaeological and heritage sensitivity

0 100 200 300 400 500

Meters
Scale: 1:10,000 @ A3
Coordinate System: GDA 1994 VICGRID94

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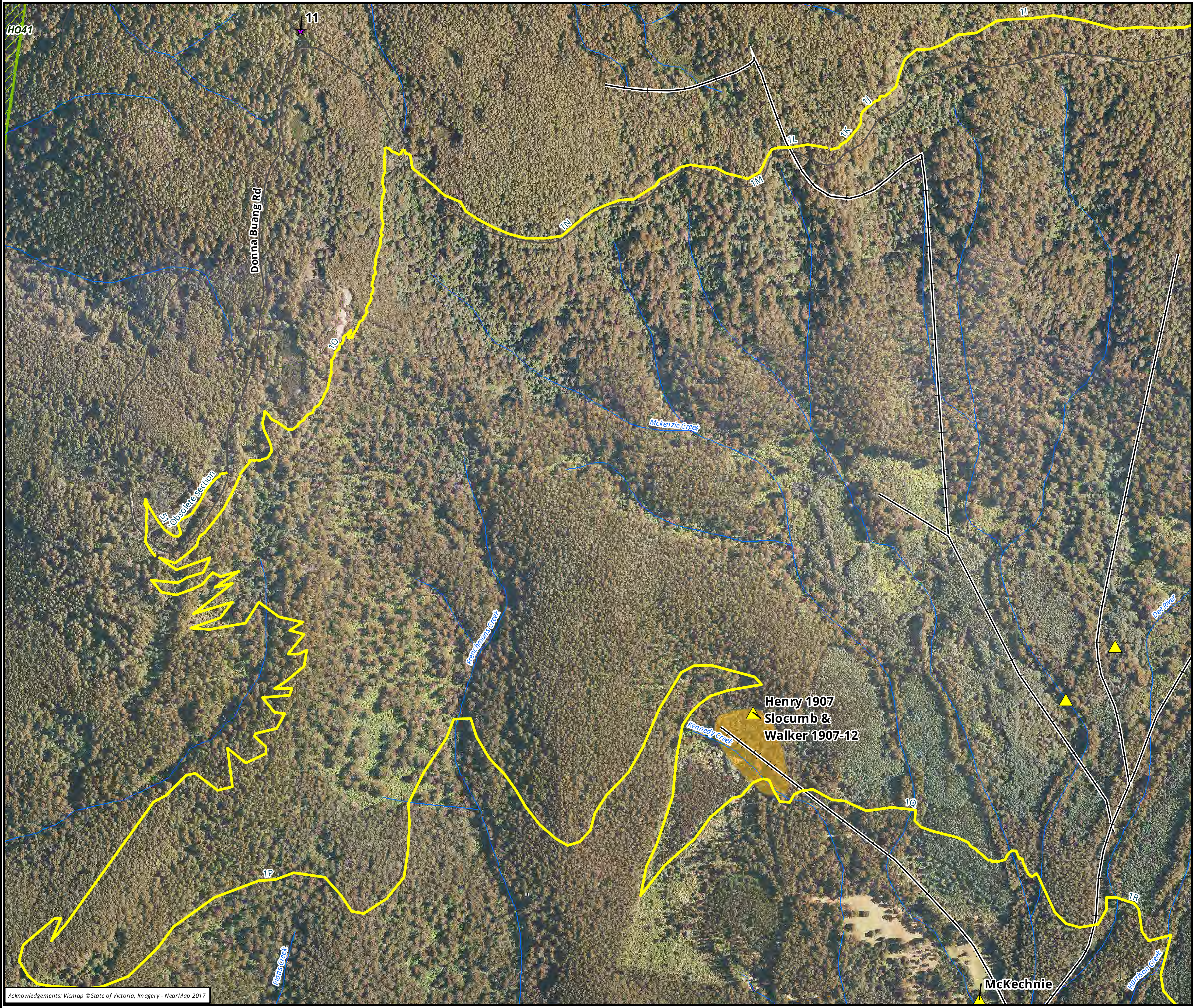

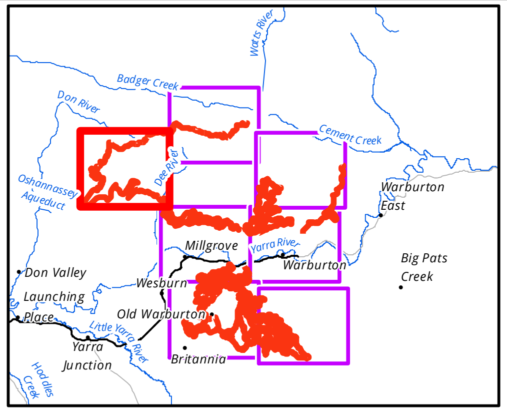

Legend

Proposed tracks and trails

Tramway

Sawmill

Place name

11 CRB Hut site

Area of archeological sensitivity

Heritage overlay

Figure 3.2 Areas of archaeological and heritage sensitivity

0 100 200 300 400 500

Meters

Scale: 1:10,000 @ A3

Coordinate System: GDA 1994 VICGRID94

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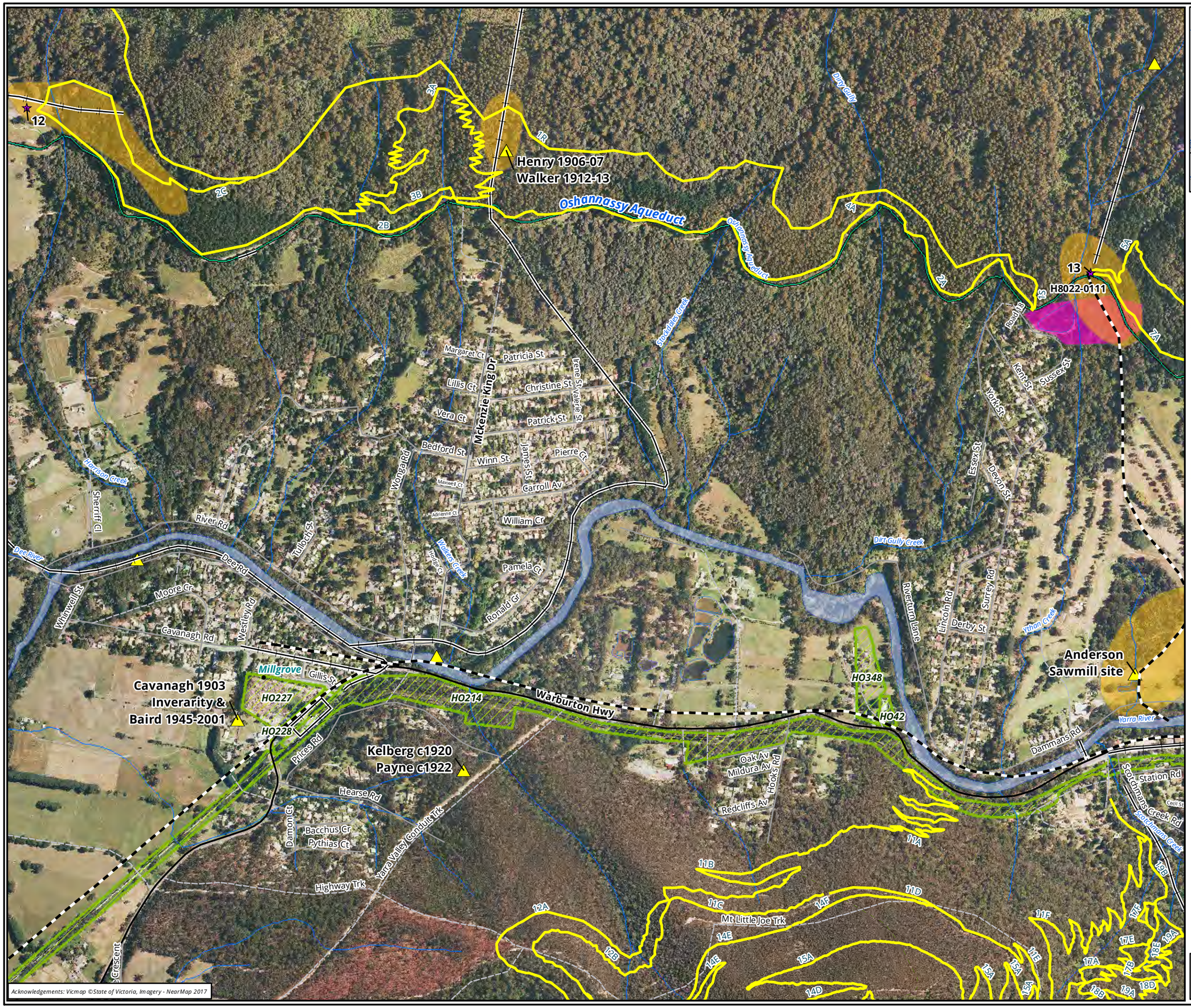

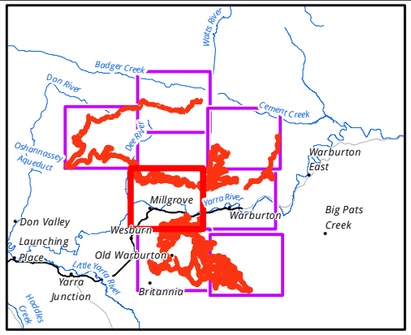

Legend

- Proposed tracks and trails
- Railway
- Tramway
- Sawmill
- O'Shannassy Aqueduct

Place name

- 12 MMBW works site
- 13 H8022-0111 O'Shannessy aqueduct sawmill and tramway site
- Area of archeological sensitivity
- Heritage overlay
- Victoria Heritage Inventory

Figure 3.3 Areas of archaeological and heritage sensitivity

0 100 200 300 400 500

Meters
Scale: 1:10,000 @ A3
Coordinate System: GDA 1994 VICGRID94

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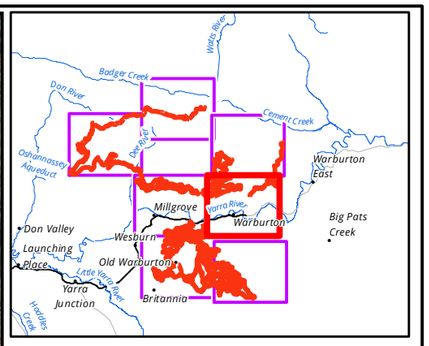

Legend

- Proposed tracks and trails
- Railway
- Tramway
- Sawmill
- O'Shannassy Aqueduct
- Area of archeological sensitivity
- Heritage overlay
- Victoria Heritage Register

Figure 3.4 Areas of archaeological and heritage sensitivity

0 100 200 300 400 500

Meters
Scale: 1:10,000 @ A3
Coordinate System: GDA 1994 VICGRID94

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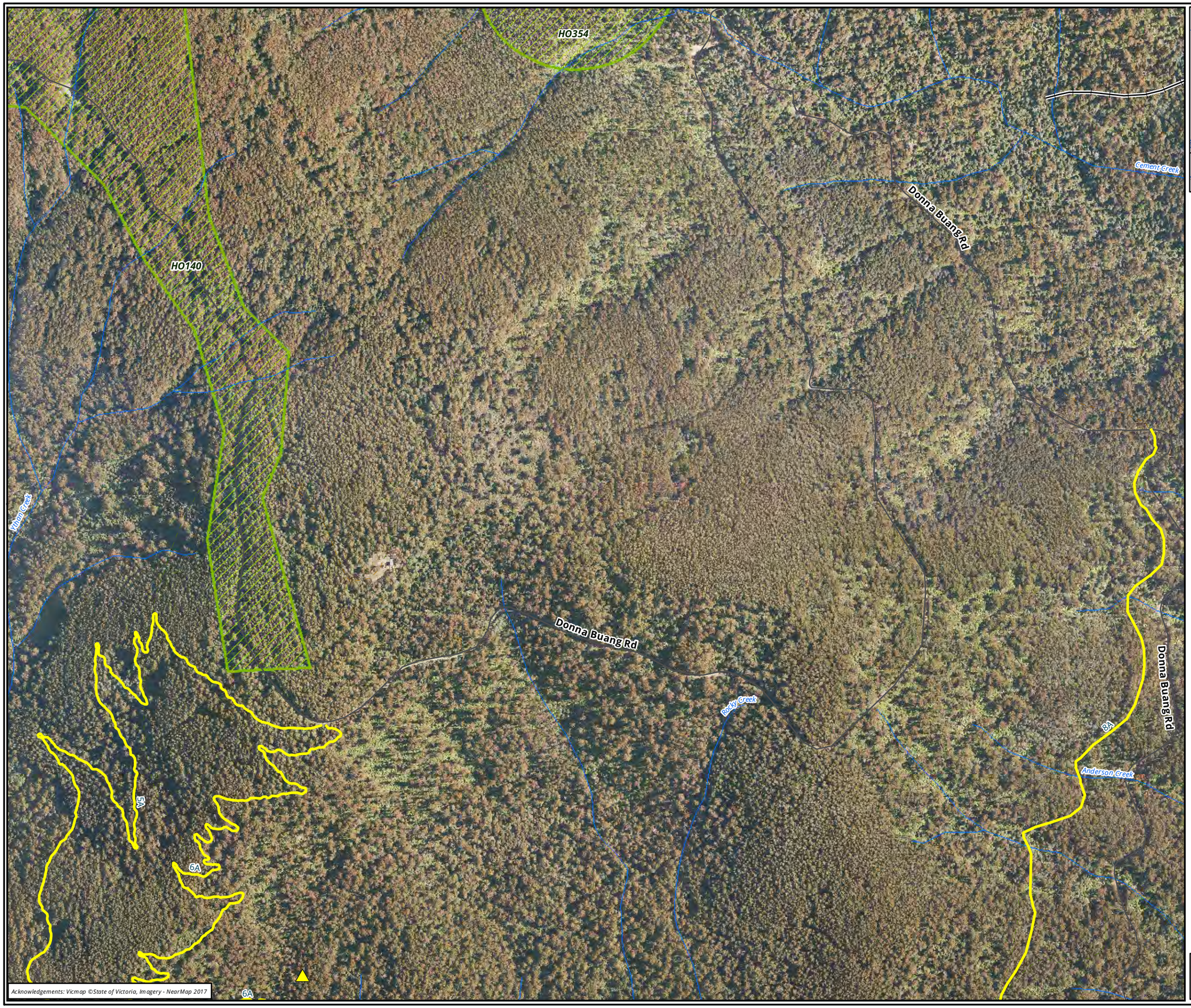

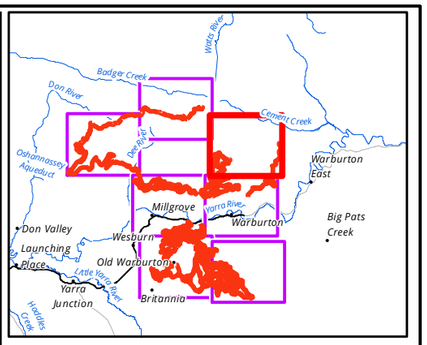

Legend

- Proposed tracks and trails
- Tramway
- Sawmill
- Heritage overlay

Figure 3.5 Areas of archaeological and heritage sensitivity

0 100 200 300 400 500

Meters
Scale: 1:10,000 @ A3
Coordinate System: GDA 1994 VICGRID94

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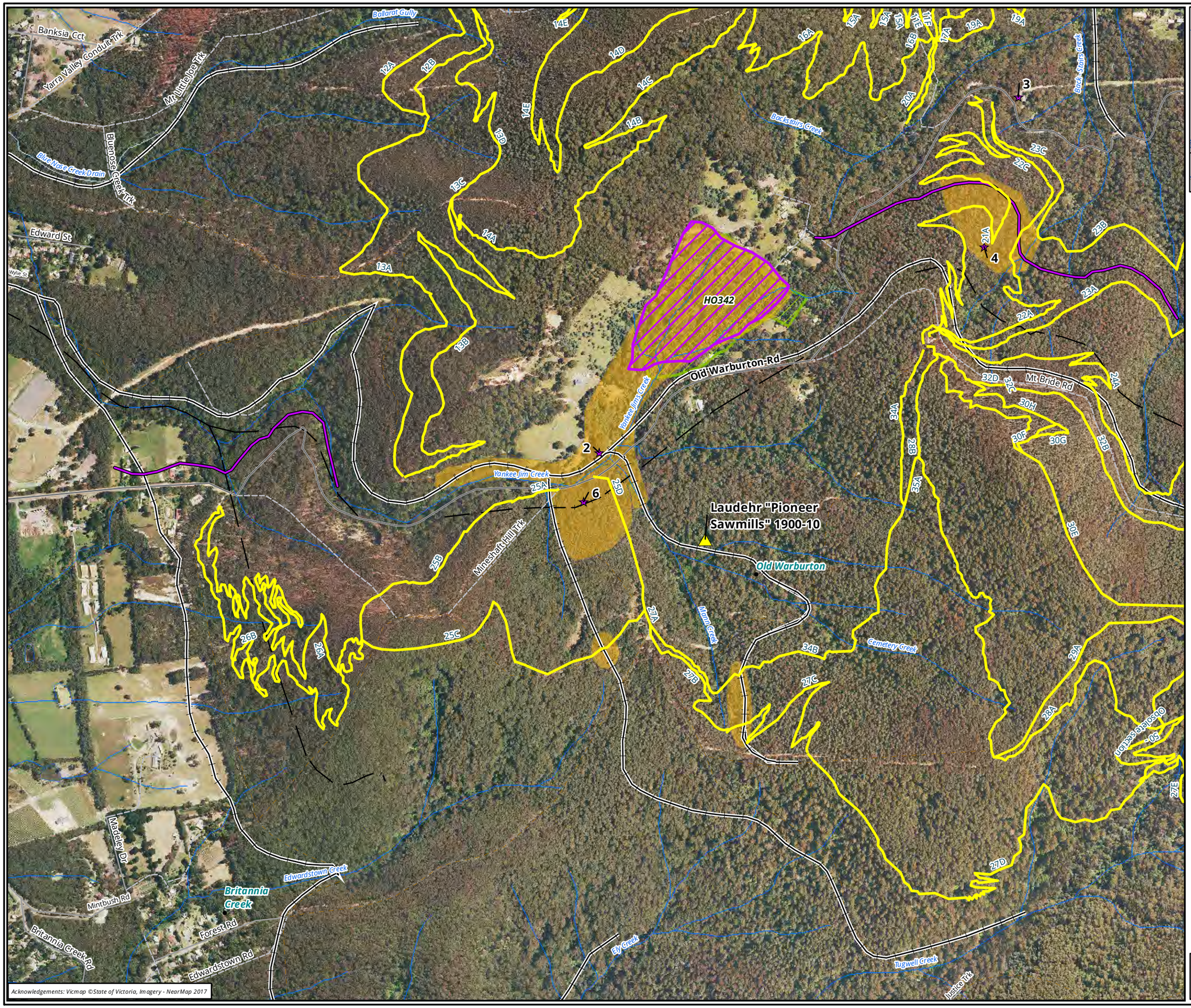

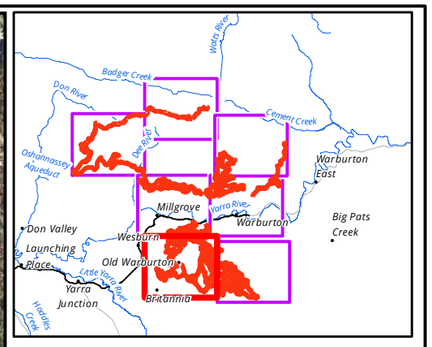

Legend

- Proposed tracks and trails
- Tramway
- Sawmill

Place name

- 2 Yankee Jim Mine
- 3 Evans Reward Mine
- 4 Lady Hopetoun Mine
- 6 Old Warburton Cemetery
- 10. Former water race
- Heritage place
- Area of archeological sensitivity
- Heritage overlay

Figure 3.6 Areas of archaeological and heritage sensitivity

0 100 200 300 400 500

Meters
Scale: 1:10,000 @ A3
Coordinate System: GDA 1994 VICGRID94

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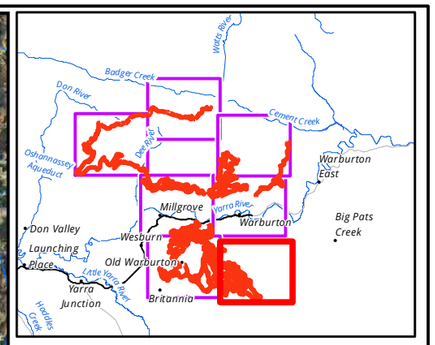
Hermon 1901-11
Warburton Timber
& Tramway Co
"No 6" 1911-16

Slocumb
& Walker
1917-19

Old Warburton Rd
Boronia Rd
Irruka Rd
Four Mile Creek
Ross Gully
Mindi Creek
Pheasant Creek
Sterling Creek
Scotsmans Creek
Calder Creek
Burns Rd
Groom Hill Trk
Obsolete Section
Tugwell Creek
Mt Bride Rd

23A
32B
31G
31F
33A
31E
31D
31B
30E
30D
30C
30B
59
29A
32A
30A
31A
24A
28A
27F
27E
36A

Hermon
1901-10



Legend

- Proposed tracks and trails
- Tramway
- Sawmill

Figure 3.7 Areas of archaeological and heritage sensitivity

0 100 200 300 400 500

Meters
Scale: 1:10,000 @ A3
Coordinate System: GDA 1994 VICGRID94

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Acknowledgements: Vicmap ©State of Victoria, Imagery - NearMap 2017

3.3.1 Yarra Yarra Hydraulic Sluicing works

The Yarra Yarra Hydraulic Sluicing Company undertook works in previously mined areas along creeks in the Old Warburton area. One area is included in the Yarra Ranges Heritage Overlay (HO342) which is located near the junction of Old Warburton Road and Mt Bride Road. Evidence of gold working by sluicing methods can be seen, however, along several of the tributary creeks both upstream and downstream of the Heritage Overlay area (Plate 18). One such location is just off the south side of the Old Warburton Road immediately east of the Cemetery reserve (see Plate 19).

Plate 18 Sluiced bank on tributary to Yankee Jim Creek (G.Vines 15/01/2019)

Plate 19 Looking east along water race that leads from Big Pats Creek to the Yankee Jim's Creek sluicing area (G.Vines 15/01/2019)

3.3.2 Yankee Jim Mine

The Yankee Jim Mine may refer to the alluvial workings along the creek or possibly the water powered crushing works located on the creek.

The creek bank in the Old Warburton area is heavily eroded, and deeply incised. Vegetation on the banks is very dense. No clear evidence of the mine or crushing plant was noted during the survey, although uneven ground with pits and mounds could be seen in most of the alluvial areas.

A geocaching site was established in the area, with concrete foundations noted, which were described as remnants of the Shining star mine. However, it is unclear if this actually depicts structures on Yankee Jim Creek.

Plate 20 Possible mining remains near Old Warburton (Geof, 2019)

3.3.3 Old Warburton Cemetery

The site of the Old Warburton cemetery lies between the Yankee Jim Creek and Mineshaft Hill Track. The site is mostly steeply sloping, with only small areas with less than 15 degrees slope and is densely vegetated with regrowth native Eucalypt forest and understorey plants, so it is difficult to identify any areas that may have burials. It is understood that there were several internments in the cemetery before it was closed and abandoned.

One unusual feature was a large single tree fern growing on an exposed north-west facing ridge some distance from any gulley. While isolated tree ferns can be found throughout the forest, they generally occur in the wetter gullies and more sheltered sites. They do, however, tend to colonised artificial depressions such as drains and other excavations, so it is possible this fern has grown on one of the grave sites.

Plate 21 Single isolated tree fern on exposed ridge in the cemetery reserve (G.Vines 15/01/2019)

3.3.4 Mt Donna Buang sites.

Several hut sites are known from historic maps along the Mt Donna Buang road and near the summit. These include the Melbourne Walking Club, hut, Ski Club of Victoria and Country Roads Board hut. The general location of these was inspected during the survey, however dense vegetation precluded identification of any historic features.

3.3.5 O'Shannassy Aqueduct

The O'Shannassy aqueduct is highly intact and visible, having been decommissioned in the late 1990s, and originally constructed to a high standard. The concrete lined channel has level areas on either side along with a maintenance track. At regular intervals, concrete and steel cross drains take surface runoff into the channel to capture rainwater from the slopes of Mt Donna Buang, without causing erosion of washing soil into the channel (Plate 22).

The Victorian Heritage Inventory site H8022-0111 O'Shannassy aqueduct sawmill and tramway site, identifies one section of the channel and associated structures. These may in part relate to the former timber tramway incline that crossed the aqueduct. There were also other inclines crossing the aqueduct at various points.

The O'Shannassy trail access carpark at the north end of Dee road appears to be at the site of a former MMBW maintenance camp. This area has a number of levelled benches and large concrete foundations remaining from former buildings. The Henry and Walker tramway can be discerned running across the site.

Plate 22 Surface diversion channel at O'Shannassy aqueduct (G.Vines 16/01/2019)

Plate 23 Concrete block at O'Shannassy Aqueduct car park (G.Vines 16/01/2019)

Plate 24 Concrete bridge over O'Shannassy Aqueduct at Andersons Tramway crossing (G.Vines 1/11/2019)

3.3.6 Timber Tramways and sawmill sites

The routes of a number of timber tramways can be discerned by subtle land forms resulting from excavation of level benches and cuttings across the hillsides. The tramways took a number of forms, some with relatively level formations snaking around the contours of the hillsides, while other cable hauled inclines followed straight steep routes directly up the slopes. The inclines are generally harder to identify as slippage of soil and tree-root throw on the steep slopes tends to destroy any formation.

The tramway around the base of Mt Little Joe is clearly evident with tracks following it in part, while Lauder and Platt's tramways running either side of the Cemetery Reserve can be traced in part, although ripping of four wheel drive tracks has occurred in these area.

3.3.7 Andersons Parbury's Mill & Tramway

The Heritage Inventory place H8022-0111 O'Shannassy Aqueduct Sawmill Site, was reinspected to determine potential impacts. This area straddles the O'Shannasy aqueduct and includes a large dam. Discernable features include various rough rock piles and the formation of former tramlines. The tramlines run up and down the slope along the gully of Ythan Creek, to the east of the creek. The formation is about 3 meteres wide with earth and rock embankments and spoil. None of the features suggested a sawmill site, as these are generally characterised by large level platforms with trenches for the saw pits and sawdust removal, and obvious benches for the log landings and transfer platforms. It is more likely that this area was used for transferring logs and later sawn timber from the incline tramway, to Parbury's Tramway, and later to road vehicles. Anderson's sawmill was located at the bottom of this tramway

Later, Horner's Mill was established at the top of the incline tramway, operating from 1932 to 1937 processing regrowth Mountain Ash and Black Wattle.

Plate 25 Alignment of Anderson & Barbury tramway looking south from near aqueduct (G.Vines 1/11/2019)

Plate 26 Rock piles in opine forest near andersons Tramway (G.Vines 1/11/2019)

Plate 27 Looking towards the site of Anderson's and Parbury's mill on the golf course (G.Vines 16/01/2019)

3.3.8 Lady Hopetoun Mine

The site of the Lady Hopetoun Mine is marked on Geovic mapping, but appears to be slightly off the actual location. Site inspection revealed extensive areas of benching on the steel slopes, at least two levels of tramway and/or water race, and the excavation for a mine adit (Plate 28), and rock and earth spoil heaps extending north from the mine, standing up to 20 metres above the bottom of the gully. The mine is known to have been supplied with water from a renovated race, which is clearly that constructed originally for the Yankee Jim Mine, and this is clearly on the upper level.

Plate 28 Looking towards collapsed adit at Lady Hopetoun Mine (compare with Plate 6)

Plate 29 Tramway formation near Yankee Jim Creek along the east side of the Old Warburton Cemetery Reserve (G.Vines 15/01/2019)

3.3.9 Other sites

A number of other mine and sawmill sites have been identified in the general region, but as these were not within the proposed mountain bike trail route, they were not inspected. They have been mapped on Figure 3. These include the Evans Reward Mine to the east of the study area, the Wesburn Water Race to the west, and a number of sawmill sites throughout the region.

Plate 30 Mining bench near Backstairs Creek (G.Vines 15/01/2019)

4 Impact Assessment and statutory requirements

4.1 Impact Assessment

Impacts of the proposed Warburton Mountain Bike Trails may occur from construction works involving excavation and grading to create new tracks, or from use by bike riders. Construction in the main will entail clearing vegetation and minor earthworks along the trail routes (Shire of Yarra Ranges, 2018). Trail Construction may include, but not limited to:

- Cut, fill and compaction of trails, dependant on terrain and slope (Figure 4)
- Benching
- Trail edging
- Tree and vegetation removal
- Rock beaching/armouring or other reinforced surfaces
- Drainage and diversions
- Switchback construction (sharp angled turns)
- Wooden, metal or formed bridges
- Jumps
- Boardwalks
- Removal of vegetation will be to the minimum extent required, usually approximately 1.2m width, and will not exceed 2.0 metre width
- Where steep slopes require cutting to bench, the maximum depth of excavation will be to 1200 millimetres
- Excavation will be completed by hand where possible for surface shaping, drainage/low area shaping, surface raking, shaping of dirt trail features, edge battering, rock work, vegetation pruning and naturalisation. Small rubber tracked mini excavators, where required, particularly for battering works.

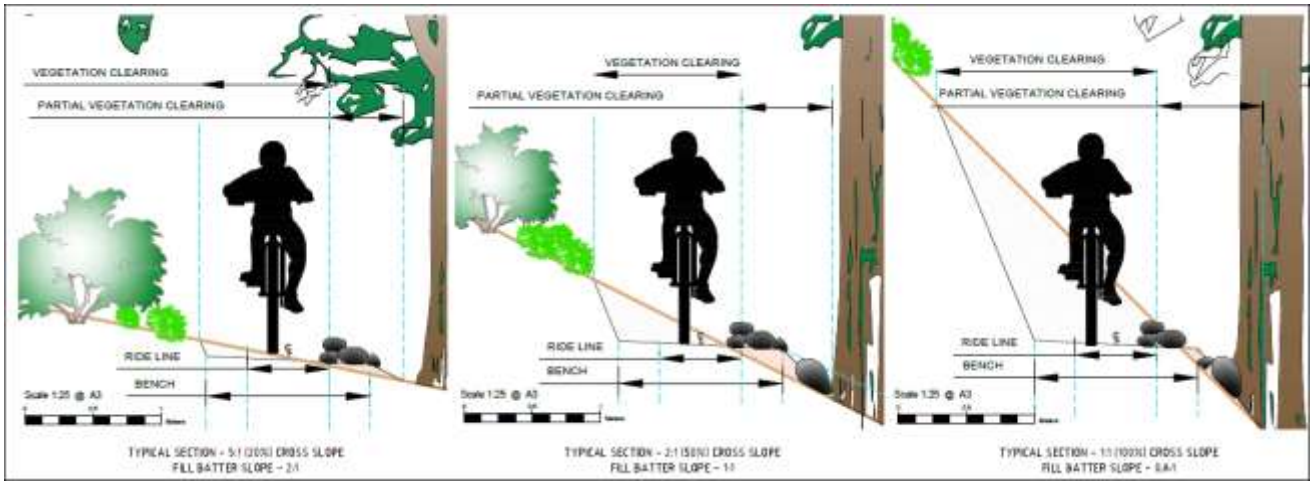

Figure 4 Examples of trail construction cut and fill benching and vegetation clearing distances

Markers and signage Installation are proposed comprising the following:

- Information boards
- Wayward and Trail signage
- Interpretative signage

4.2 Management of impacts

The proposed mountain bike trails are mostly to be constructed with minimal impact to ground conditions comprising only clearing of vegetation and earthworks to a depth of less than 200 mm. Where such works are undertaken through historic features such as mining remains, water races and tramway formations, minimisation of impacts can be achieved by avoiding excavation of soil altogether.

Recommendations have been provided for managing potential impacts

The following methods are proposed for specific location:

4.2.1 Heritage listed places:

Mountain Bike Trail alignments have been designed to avoid heritage listed places where possible.

Modifications were made to avoid trails in the Yankee Jim Creek mine area (HO342 Yarra Yarra Hydraulic Gold Sluicing Company) and Maroondah Water Supply Catchment (H2381) therefore no specific management related to these places is required.

The alignments pass through Mount Donna Buang-Bridle Tracks & Road (HO140) and the Warburton rail line (HO214). However, no fabric or definable features will be impacted in the areas through which the trails pass therefore no specific management is required.

4.2.2 Unlisted heritage places:

Design of track alignments has been determined to avoid unlisted heritage places where possible. Following detailed field assessment, the alignments were modified in some instances to ensure any impacts would be minimal. The general location of these unlisted historic places has been identified in order to define areas for specific management actions. The primary actions are to design and construct trails in these areas to minimise impacts to the ground surface, and to undertake monitoring of works in these areas shown in Figure 3, with a protocol to manage any unexpected finds.

Where potential impacts to features may occur – the following management actions are recommended:

Water races and tram lines

- Approach angles should be gentle, avoiding dropping down steep hills and especially turning sharply on the formation. Preferably the approach angle to any linear historic features including water races and tramway formation will be less than 10 degrees.
- Construction works should be confined to removing vegetation and adding new earth to the existing ground surface rather than excavating into the feature.

Mining features

- Substantial features such as adits, shafts, mullock heaps and tailings will be avoided by aligning tracks at least 5 metres from any identifiable or suspected historic land form..
- Tracks in the vicinity of mines should avoid steep descents that might create erosion or gullying and require larger earthworks.

4.3 Statutory requirements

The following summary of actions and statutory requirements is provided to guide the approval process and mitigation relation to the historic places in the WMBD study area. It is likely that the trail alignment will be modified during the course of construction and therefore the following are based on the most recent alignment plan. Changes may occur as a response to unexpected cultural heritage or other issues identified during construction works. These are also considered in the following.

Statutory approvals may be required in reference to the following:

4.3.1 Yarra Ranges Heritage Overlay:

- HO214 – Lilydale – Warburton Railway
- HO140 - Mount Donna Buang-Bridle Tracks & Road

The proposed trail alignments pass through or near the above places which are included on the Yarra Ranges Heritage Overlay. A permit is generally required for any works that impact on the heritage values of HO places. However, as the proponent is the Shire itself, then council staff may need to determine if a permit application should be prepared, or whether the works can be exempted. In considering the impacts, the appropriate management should be to avoid harming the fabric of the place, and to design the trails in such a way that they minimise impact to the cultural significance of the place. As the form of construction is likely to only involve removal of vegetation along the narrow trail corridor within these zones, meeting this criteria would be possible.

4.3.2 Heritage Victoria Victorian Heritage Inventory:

- H8022-0111 O'Shannassy Aqueduct Sawmill Site - Anderson, Richards and Robinson- established their plants in the area. Jas Henty & CO. log tramway was extended to convey logs from Mt Donna Buang (McCarthy).

The trail alignment has been modified to avoid this site, therefore a Consent to Damage from Heritage Victoria is not required as long as no works are proposed within the extent of the Victorian Heritage Inventory (VHI) place. Such works might involve excavation, construction of bridges, or other ground disturbance works. If existing road or track crossings of the site can be utilised, or if works are confined to only removing vegetation, then these works may be exempted. It will be necessary to consult Heritage Victoria to determine if an exemption is appropriate.

4.3.3 Places of Archaeological potential:

- Anderson Sawmill site - Warburton Golf course
- MWC Hut site Donna Buang summit
- SCV Hut site Donna Buang summit
- Old Donna Buang Road
- Henry (1907) and Slocumb & Walker (1907-12) mill and tramway site, Dee Rd
- Henry (1906-07) and Walker (1912-13) mill and tramway site, Mckenzie King Drive
- MMBW works site Dee Rd and O'Shannasy Aqueduct
- Yankee Jim Mine, Old Warburton (the alignment avoids this site)
- Old Warburton Cemetery (the alignment avoids this site)

- Big Pats Creek water race
- Laudehr (1900-10) tramway Old Warburton
- Lady Hopetoun Mine site

These places have been identified from historical sources, or may be represented by surface features. They are depicted in yellow on our mapping of places of archaeological potential (Figure 3). The Heritage Act protects all historic archaeological places and relics over 75 years old whether or not they are included on the VHI. The field survey has not identified any archaeological remains at these locations, however, there is still potential for them to occur. In order to manage this, a protocol should be put in place to evaluate the site during and after any construction works, and if archaeological remains are identified, to undertake site recording according to Heritage Victoria's Guidelines, and then either obtain a consent, or exemption, or modify the alignment in order to avoid the place. Management protocols are listed below.

4.3.4 The Victorian Heritage Register:

- H2381 MAROONDAH WATER SUPPLY SYSTEM (UPPER AND CENTRAL SECTIONS)

No works will occur within the VHR extent.

5 Management recommendations

It is an offence to damage or destroy historical sites without a permit or consent from the appropriate body. This section sets out a series of management measures developed in accordance with the requirements of *Heritage Act 2017* and *Planning and Environment Act 1987* to ensure compliance with the legislation and mitigate risk to the proposed works.

The following recommendations are provided to guide construction of mountain bike trails in such a manner that they will not have detrimental impacts on cultural heritage values in the study area.

5.1 Recommendation 1 Avoiding historic places

Identified historic archaeological and heritage places, and areas of historical and archaeological sensitivity marked on Figure 2 and Figure 3 should be avoided during construction.

If construction is proposed near areas of historical and archaeological sensitivity works should be designed to minimise impacts and assist in managing the place. For example, tracks may lead to areas where water races occur, in order to provide interpretation opportunities, but the tracks should not cut across the water races and banks. Similarly, if level areas from former timber tramways are to be used, approaches should avoid causing erosion or other damage to the features.

5.2 Recommendation 2 Induction and protocol for unexpected finds

A protocol should be implemented to inform contractors of the need to avoid historical and archaeological features, how to recognise them, and who to contact should unexpected historical and archaeological features or objects should be discovered during works. In order that contractors are able to fulfil this recommendation an induction should be presented by a suitably qualified heritage professional on site, which covers information needed.

5.3 Recommendation 3 Inspection and monitoring

During construction, a program of inspection and archaeological monitoring should be carried out in areas of historical and archaeological sensitivity or adjacent to these areas as shown in Figure 3 and as listed places of archaeological potential, as follows:

- Anderson Sawmill site - Warburton Golf course (the alignment avoids this site)
- MWC Hut site Donna Buang summit
- SCV Hut site Donna Buang summit
- Old Donna Buang Road
- Henry (1907) and Slocumb & Walker (1907-12) mill and tramway site, Dee Rd
- Henry (1906-07) and Walker (1912-13) mill and tramway site, Mckenzie King Dr
- MMBW works site Dee Rd and O'Shannasy Aqueduct
- Yankee Jim Mine, Old Warburton (the alignment avoids this site)
- Old Warburton Cemetery (the alignment avoids this site)

- Water races near Yankee Jim Creek
- Laudehr (1900-10) tramway Old Warburton
- Former water race Big Pats Creek to Yankee Jim mine
- Lady Hopetoun mine site

A suitably qualified heritage professional with an understanding of the type of historic and archaeological sites found within the study area should undertake the inspection. This inspection should occur when works are underway, once access has been arranged. If during the inspection potentially significant historical archaeological features are identified, options should be examined for realigning the trail to avoid impacts. If impacts cannot be avoided, and the site is deemed to be an archaeological site under the *Heritage Act 2017*, then recording and consent provisions should be enacted according to Recommendations 4 and 5.

5.4 Recommendation 4 Recording heritage places

If any historic archaeological sites are identified during trail construction works and inspection, an assessment should be made as to whether they fulfil the criteria for inclusion on the Victorian Heritage Inventory as historical archaeological sites. Such places are generally more than 75 years old and have a component that includes archaeological deposits. Consultation with Heritage Victoria should be undertaken to confirm whether criteria and thresholds for the VHI are met, and if so, a VHI site record card should be completed by a qualified archaeologist and submitted to Heritage Victoria.

Any place recorded in the VHI, will then be subject to Recommendation 5 if it is likely to be impacted by works.

5.5 Recommendation 5 Statutory approvals

Victorian Heritage Register

Where works are to be conducted within the boundaries of places listed on the Victorian Heritage Register, a Permit should first be obtained from Heritage Victoria.

- The Victorian Heritage Register H2381 MAROONDAH WATER SUPPLY SYSTEM (UPPER AND CENTRAL SECTIONS)

It is understood that the trail alignments avoid the VHR place and therefore a permit will not be required.

Victorian Heritage Inventory

If works are to be conducted within a place listed on the Victorian Heritage Inventory, Consent to Damage should first be obtained from Heritage Victoria.

- Victorian Heritage Inventory H8022-0111 O'SHANNASSY AQUEDUCT SAWMILL SITE - Anderson, Richards and Robinson- established their plants in the area. Jas Henty & CO. log tramway was extended to convey logs from Mt Donna Buang (McCarthy).

Yarra Ranges Heritage Overlay

If works are to be carried out within any area included on the Yarra Ranges Heritage Overlay, a planning permit or exemption should be sought from the Shire of Yarra Ranges.

- HO214 – Lilydale – Warburton Railway
- HO140 - Mount Donna Buang-Bridle Tracks & Road

5.6 Recommendation 6 Management protocols

The following are proposed should be enacted to ensure that works minimise any impacts to potential archaeological and heritage places, and if any historic or archaeological features are encountered during works, these can be appropriately managed.

- Design works to minimise impacts
- Avoid cutting across tramway formations, water races or sluice banks
- Induction for contractors in how to recognise and manage historic features, when to stop works, who to contact
- Heritage advisor inspection during works in sensitive area
- Realign to avoid features if possible
- If not possible to avoid, record and obtain heritage approval
- Implement a regular process of inspection in case use of the trails reveals historical or archaeological remains which should then be managed appropriately.

Bibliography

Melbourne and Metropolitan Board of Works, Water Supply Division. (2017, September 21). *Plan showing the Yan Yean, Maroondah and O'Shannassy systems*. Retrieved from State Library of Victoria: http://search.slv.vic.gov.au/MAIN:Everything:SLV_VOYAGER669881

Australia ICOMOS Inc. (2000). *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance.* Burwood: Australia ICOMOS Inc.

Australia ICOMOS Inc. (2013). *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance.* Burwood: Australia ICOMOS Inc.

Burke, H., & Smith, C. (2004). *The Archaeologist's Field Handbook.* Sydney: Allen and Unwin.

Calvert, S. (2018). *Sluicing for alluvial gold at Warburton, Upper Yarra.* Retrieved from State Library of Victoria: http://search.slv.vic.gov.au/primo-explore/fulldisplay?vid=MAIN&docid=SLV_VOYAGER1694222&context=L&search_scope=Everything

Chiu, L. (2017). *Construction Environmental Management Plan, Project - Harcourt Mountain Bike Park Construction, Location - Harcourt, Victoria.* Australia: DirtArt.

Cochrane, G., Quick, G., & Spencer-Jones, D. (1995). *Introducing Victorian Geology.* Geological Society of Australia.

Context Pty Ltd. (2000). *Shire of Yarra Ranges Heritage Study.* Shire of Yarra Ranges.

Daniel, M. (2018). *Warburton, on timber tram, 1902.* Retrieved from State Library of Victoria: http://search.slv.vic.gov.au/MAIN:Everything:SLV_VOYAGER1741881

Department of Natural Resources & Environment. (1999). *Victorian Goldfields Project: Historic Gold Mining Sites in St Andrews Mining Division.*

du Cros, H. (1988). *An Archaeological Survey of the Upper Yarra Valley and Dandenong Ranges.*

duCros, H. (1988). *An Archaeological Survey of the Upper Yarra and Dandenong Ranges.* Melbourne: Victorian Archaeological Survey.

Economic Development, Jobs, Transport and Resources. (2018). *Victorain Geomorphological Framework*. Retrieved from Victoria Resources Online: http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/landform_geomorphological_framework

Ellender, I., & Weaver, F. (1994). *An Archaeological Survey of Port Philip Bay.* Melbourne: Victorain Archaeological Survey.

Forest Fire Management Victoria. (2017). *Ash Wednesday 1983*. Retrieved from History and Incidents Forest Fire Mangement Victoria: https://www.ffm.vic.gov.au/history-and-incidents/ash-wednesday-1983

Forest Fire Management Victoria. (2017). *Black Friday 1939*. Retrieved from History and Incidents, Forest Fire Management Victoria: https://www.ffm.vic.gov.au/history-and-incidents/black-friday-1939

Geof. (2019). *UYHH#5 A Shining Star or A Wally With Water?* Retrieved from Geocaching.com: https://www.geocaching.com/geocache/GCTP43_uyhh5-a-shining-star-or-a-wally-with-water?guid=483c5b9d-441c-493f-adb8-14327fdf020a

Heritage Victoria. (2008). *Guidelines for Conducting Historical Archaeological Surveys.* Melbourne: Stae of Victoria Department of Planning and Community Development.

Heritage Victoria. (2014). *Guidelines for Investigating Historical Archaeological Artefacts and Sites.* Melbourne: State Government of Victoria Department of Transport, Planning and Local Infrastructure.

L.G. (1937, January 2). Old Warburton. *The Age*, p. 17.

McCarthy, M. (2001). *Mountains of ash : a history of the sawmills and tramways of Warburton and district.* Melbourne: Light Railways Research Society.

NFSA. (2017). *Black Sunday (1926)*. Retrieved from National Film and Sound Archive: https://aso.gov.au/titles/documentaries/black-sunday/clip1/

O.C.R. (1953, August 8). The O'Shannassy Water Reserve. *The Age*, p. 14.

Old Warburton Township Site. (2019). Retrieved from Rethink Warburton Mountain Bike Destination: https://rethink-warburton-mountain-bike-destination.com/issues/heritage/

Padula, B. (2017, September 21). *1911 to 1915- The O'Shannassay Aqueduct and Weir*. Retrieved from The Forests of Warburton - a Pictorial Heritage - 1853 to 2012: http://bpadula.tripod.com/warburtonforests/id3.html

Padula, B. (2018). *1889 to 1919- Mills in the Wesburn and Old Warburton Area*. Retrieved from The Forests of Warburton - a Pictorial Heritage - 1853 to 2012: http://bpadula.tripod.com/warburtonforests/id30.html

Padula, B. (2018). *1902 to 1906 - Anderson's Mill*. Retrieved from The Forests of Warburton - a Pictorial Heritage - 1853 to 2012: http://bpadula.tripod.com/warburtonforests/id11.html

Padula, B. (2018). *1905 to 1928 - Parbury's Brookfield Mill*. Retrieved from The Forests of Warburton - a Pictorial Hertiage - 1853 to 2012: http://bpadula.tripod.com/warburtonforests/id12.html

Padula, B. (2018). *1919 to 1920 - Slocum and Walker's Mill*. Retrieved from The Forests of Warburton - a Pictorial Hertiage - 1853 to 2012: http://bpadula.tripod.com/warburtonforests/id17.html

Padula, B. (2018). *1922 to 1932 - Enterprise Mill (La La)*. Retrieved from The Forests of Warburton - a Pictorial Heritage - 1853 to 2012: http://bpadula.tripod.com/warburtonforests/id16.html

Padula, R. J. (2012, September). *The Forests of Warburton - a Pictorial Heritage - 1853 to 2012*. Retrieved from http://bpadula.tripod.com/warburtonforests/index.html

Parkinson, E. (2017, September 21). *A Short History of Warburton*. Retrieved from Melbourne's Warburton Valley: https://www.visitwarburton.com.au/a-short-history-of-warburton

Rithie, E. (1934). Melbourne's Water Supply Undertaking. *Jounral of Institution of Engineers Australia*, 379-382.

Shire of Yarra Ranges. (2018). *Trail Construction Plan, Warburton Mountain Bike Trails.* Shire of Yarra Ranges.

Sisson, D. (2015). *Donna Buang: the forgotten ski resort*. Retrieved from Australian Mountains: articles on teh mountains of south-eastern Australia: https://www.australianmountains.com/donnabuang/

The Warburton District Progress Association. (2017, September 21). *Welcome back to Warburton: highlights in the history of Warburton and district*. Retrieved from State Library of Victoria: http://search.slv.vic.gov.au/MAIN:Everything:SLV_VOYAGER756718

The Water Wheel Gold Crusher Mill at Old Warburton. (1904, December 14). *Australian Town and Country Journal*, p. 33. Retrieved 3 15, 2019, from http://nla.gov.au/nla.news-article71517745

Unknown. (2017, September 21). *The Aqueduct*. Retrieved from The Untoild Story of the O'Shannassy Aqueduct, Victoria, Australia: http://oshannassyaqueduct.weebly.com/the-aqueduct.html

Vandenberg, A. (1971). *Explanatory Notes on the Ringwood 1:63,360 Geological Map. Geological Survey Report No. 3.* Department of Minerals and Energy.

Appendices

Appendix 1 Significance assessment

The following information has been extracted from Heritage Victoria's (2008) technical guide. In Victoria, there are three levels of protection:

State significance – the Victorian Heritage Register

> Cultural heritage places included on the register have outstanding heritage values and be a type or class of place associated with an event, a movement, person or group that is of particular importance to Victoria.

Local significance – the Heritage Overlay

> Cultural heritage places included on the overlay will be of historical, social, aesthetic or technical/research significance in a local geographic context. Given that the Heritage Overlay and the Victorian Planning Scheme operate at the municipal level, an assessment of local significance usually means within the local government area.

Archaeological significance – the Victorian Heritage Inventory

> Cultural heritage places included on the inventory include all historical archaeological sites older than 50 years. Archaeological significance is a measure of the integrity of a cultural heritage place. This includes whether it is rare or representative in terms of the extent, nature and preservation of archaeological deposits.

Assessments of the significance can be complex and include a range of heritage values. To provide a comparative framework with which to systematically assess the degree of significance of the cultural heritage place in relation to another, a summary of heritage values of the cultural heritage place can be defined under the four categories of heritage values defined in the Australia International Council on Monuments and Places Burra Charter (2013):

Aesthetic significance

> Includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; the smells and sounds associated with the place and its use.

Historical significance

> It has influenced – or been influenced by an historical figure, event, phase or activity. It may also have value as the location of an important event.

Scientific significance

> Reflects both the archaeological significance and more generally its scientific or research value. That is the potential of a cultural heritage place to contribute to our understanding of the past which is in turn dependent on the importance of the data involved, on its rarity, quality or representativeness and on the degree to which the cultural heritage place may contribute further information.

Social significance

> Embraces the qualities for which a place has become a focus of spiritual, political, national or cultural sentiment to a group.

The categories of significance listed in the Burra Charter are not an end, but provide a framework for making the assessment of significance more systematic, thereby enabling comparison of the cultural heritage place's values with other places. This comparative assessment is done to establish the relative degree of significance of the cultural heritage place, whether it is of significance at a local, regional or state level and therefore whether it should be recommended for inclusion on the Heritage Register, Heritage Overlay or Heritage Inventory.

Various government agencies, including the Australian Heritage Commission and Heritage Victoria, have developed formal criteria for assessing heritage significance. Based on the principles of the Burra Charter, the Victorian Heritage Council has identified eight criteria against which nominations for the Heritage Register can be assessed. These criteria can be used to develop a statement of significance for the cultural heritage place.

Table 7 Victorian Heritage Council heritage significance criteria.

Criterion	Description
A	The historical importance, association with or relationship to Victoria's history of the place or object.
B	The importance of a place or object in demonstrating rarity or uniqueness.
C	The place or object's potential to educate, illustrate or provide further scientific investigation in relation to Victoria's cultural heritage.
D	The importance of a place or object in exhibiting the principal characteristics or the representative nature of a place or object as part of a class or type of places or objects.
E	The importance of the place or object in exhibiting good design or aesthetic characteristics and/or in exhibiting a richness, diversity or unusual integration of features.
F	The importance of the place or object in demonstrating or being associated with scientific or technical innovations or achievements.
G	The importance of the place or object in demonstrating social or cultural associations.
H	Any other matter which the Victorian Heritage Council considers relevant to the determination of cultural heritage significance.