



Reserve Activity Plan 2014 – 2018

AVOCA HILL BUSHLAND RESERVE AND NORTH WARRANE BUSHLAND RESERVE

ADVICE PREPARED BY
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FOR THE
CLARENCE CITY COUNCIL





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COVER PHOTO: HILLTOP IN AVOCA HILL BUSHLAND RESERVE (C. SOUTHERN)

1. BACKGROUND

The Clarence City Council municipal area incorporates a significant number of remnant bushland areas that form part of the open space network, provide refuge for native plant and animal species, recreational opportunities for residents and visitors and contribute to the scenic skyline backdrop of the city. The bushland areas range in size from the extensive Meehan Range Conservation Area to smaller urban bushland remnants.

North Warrane Bushland Reserve and **Avoca Hill Bushland Reserve** are two small remnants of dry eucalypt forest located within the suburbs of Warrane/Rosny Hill, owned and managed by the Clarence City Council (see Figure 1).

This Reserve Activity Plan (RAP) has been developed to document the environmental, recreational and social values of the two bushland reserves, and provide a practical guide for their management into the future. The RAP has an emphasis on community input, and the development of good working partnerships to ensure that values within these reserves are protected, and that they can be developed to provide sustainable opportunities for the community.

The RAP follows the basic structure of equivalent plans for other bushland reserves within the Clarence City Council municipal area. It combines the two small reserves into one management document, given their small size, proximity to each other, and similarities in relation to values and issues.

The main issues affecting the reserves are management of the natural values, weed management, fire management, recreational opportunities and improved public access and amenity.

Aim of the Reserve Activity Plan

The aim of this RAP is to develop a prioritised list of on-ground activities to be undertaken in each Reserve by both Council and Landcare/Bushcare Groups in order to enhance the natural, cultural and recreational values of each reserve.

1.1. REVIEW OF RESERVE ACTIVITY PLAN

This plan has been prepared for a period of 5 years from 2014 - 2018. An informal review of actions and priorities should be undertaken annually and a complete review of the plan undertaken at the end of the 5 year period.

2. SITE DESCRIPTIONS

The two bushland reserve areas are described in brief below, and illustrated in Figure 1.

North Warrane Bushland Reserve

This reserve is approximately 8.5ha in size, and includes: the North Warrane Oval and associated clubroom buildings; regrowth bushland west of the North Warrane Oval; the vegetated drainage line to the south of the Eastside Lutheran College access road; and other vegetated areas around the perimeter of the broader sports ground site bounded by the Flagstaff Gully Link (Figure 1).

The area containing the North Warrane Bushland Reserve is characterised by sandstone bedrock, and resulting sandy soils, with outcrop and smaller boulders evident – particularly on the College property to the west of the reserve. The native vegetation within the reserve is generally degraded with white gum (*Eucalyptus viminalis*) woodland occurring along the drainage line and adjacent to the Lutheran College and regrowth vegetation dominated by silver wattle and exotic species on the hill above the oval and around the margins. The understory amongst the regrowth vegetation is sparse and typical of vegetation that had a history of disturbance and been frequently burnt.

This reserve is accessed by vehicle via the eastern end of Bounty Street. The access road into the oval is secured by a locked gate maintained by the sporting clubs that are based at the oval. Pedestrian and cycling access is largely informal, with people entering the reserve from number of points off Flagstaff Gully Road, Flagstaff Gully Link, through the Eastside Lutheran College Grounds, and through adjacent residences off Bounty Street. A number of tracks and trails traverse the area, and are the result of frequent use over many years, rather than constructed trails as part of a planned network.

Avoca Hill Bushland Reserve

This irregular shaped reserve is approximately 3ha in size and located on the hilltop between Flagstaff Gully Road and Gordons Hill Road. It is bounded to the east (Gordons Hill Road) and west (cul-de-sacs off Dampier Street) by residential streets, and the Fairway Rise Lifestyle Village to the south (Figure 1). The land to the north of the reserve is also residential, however there is a contiguous corridor of bushland and regenerating pasture to the north, connecting the bushland within Flagstaff Gully, and the Meehan Range Conservation Area. A communications tower is located on the western side of the reserve. The remains of small sandstone quarries are also evident within the boundaries of the reserve.

The geology of Avoca Hill area is similar to that of the North Warrane Oval Bushland area, characterised by sandstone, with a significant outcrop on the eastern side overlooking Lindisfarne (on private land – 19A Avoca Street). Native vegetation within this reserve is more intact and overall, in better condition than that within the North Warrane Bushland Reserve. The vegetation in the reserve is classified as black peppermint (*E. amygdalina*) forest and woodland and white gum (*E. viminalis*) forest and woodland and has a more intact understory and lower levels of weed infestation.

Access to the reserve is via Radiata Drive and Avoca Street, where there is limited parking in cul-de-sacs. There is a short access road from the end of Radiata Drive to the communications tower, which is gated. An informal track also accesses the reserve along a private driveway that extends to the south-eastern boundary of the reserve, off Gordons Hill Road. There is an informal network of tracks and trails through the reserve with some sections traversing private land near Gordons Hill Road. These tracks and trails result from frequent use over many years – some appear to be the remains of access roads, rather than a planned and purposefully constructed network.

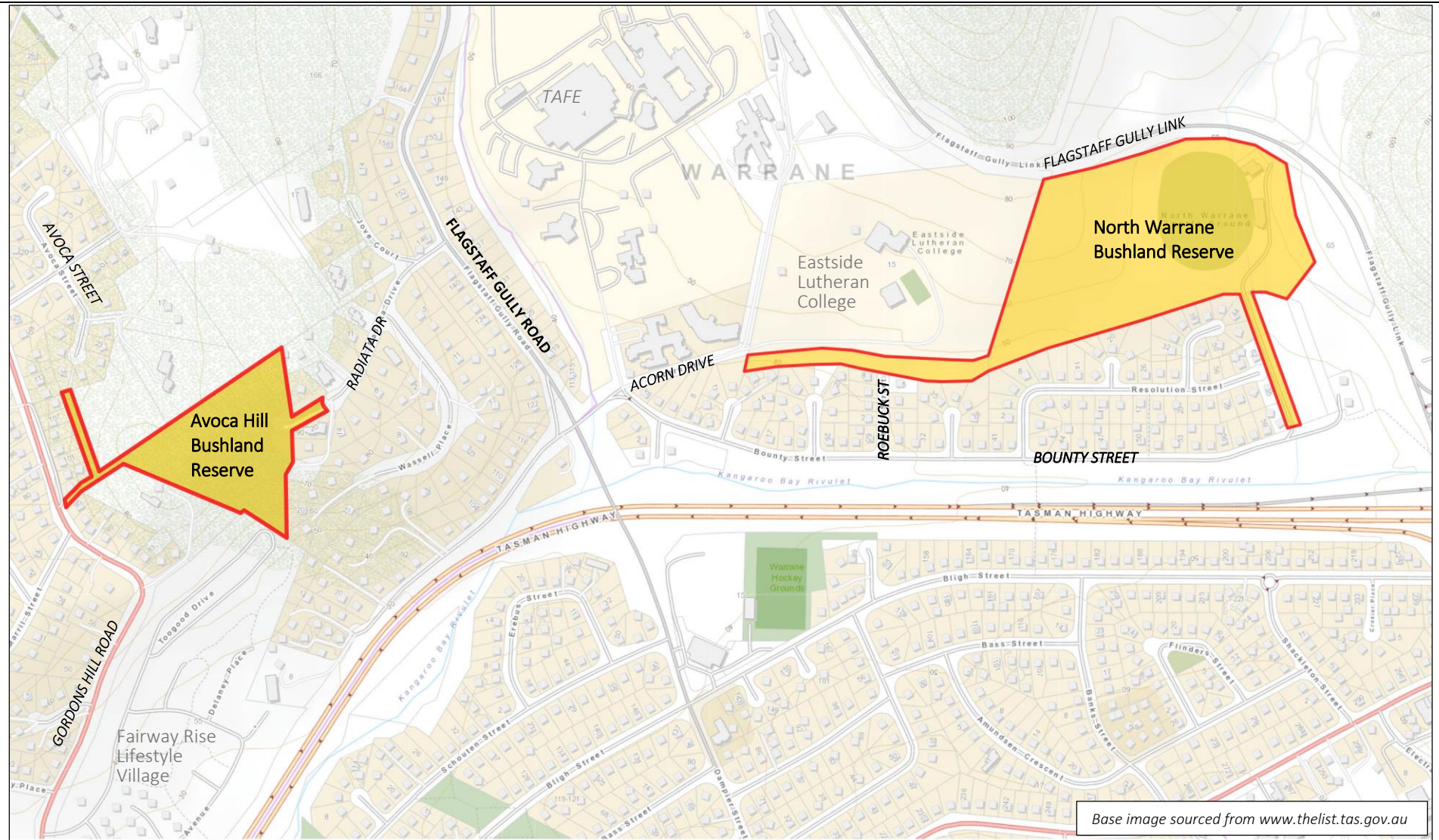


Figure 1 – Location Plan for North Warrane Bushland Reserve and Avoca Hill Bushland Reserve

3. NATURAL VALUES OF SITE

3.1. NATIVE VEGETATION COMMUNITIES

There are two (2) native vegetation communities and two (2) disturbance induced vegetation communities occurring within the two reserves. Descriptions of these communities are provided in Appendix 1 and their distribution is indicated in Figures 2 and 3.

- *Eucalyptus amygdalina* forest and woodland on sandstone (DAS)
- *Eucalyptus viminalis* forest and woodland (DVG)
- Regenerating cleared land (FRG)
- Urban Miscellaneous (FUM)

Eucalyptus amygdalina forest and woodland on sandstone is a threatened vegetation community listed as vulnerable under the Schedule 3A of the *Nature Conservation Act 2002*. The DVG community is considered to be adequately reserved on a state-wide and bioregional basis.

3.2. NATIVE FLORA VALUES

North Warrane Bushland Reserve - there were 68 native plant species and 36 exotic or introduced species recorded in the reserve (including a section of Eastside Lutheran College land) (refer to species lists in Appendix 2);

Two (2) threatened flora species were recorded in the North Warrane Bushland Reserve;

Knotty speargrass (*Austrostipa nodosa*) – Listed as rare under *Threatened Species Protection Act 1995*.

Knotty speargrass is tufted, perennial grass growing up to 80cm tall. It is found on the east coast of the state in grasslands or open forest.

A number of specimens were identified amongst the degraded vegetation in the North Warrane Bushland Reserve however the species is likely to be more widespread. As such its location is not shown in Figure 2.

Spreading knawel (*Scleranthus fastigatus*) – Listed as vulnerable under *TSPA*.

Spreading knawel is a straggling, ground dwelling perennial plant with small, usually hairy incurved leaves occurring in clusters. This species occurs in a few locations in the midlands and south east Tasmania amongst grassland and grassy woodland.

A small number of plants (<10) were recorded amongst the white gum forest remnant above the open drain at the southern side of North Warrane Bushland Reserve (Figure 2).

Avoca Hill Bushland Reserve – there were 61 native plant species and 21 exotic or introduced species recorded in this reserve (refer to species lists in Appendix 2).

No threatened flora species were recorded in the Avoca Hill Bushland Reserve.

Seven (7) threatened flora species have been recorded within 500m of the reserves (as per Natural Values Atlas Database (DPIPWE) and flora survey from an adjacent lot) (refer to Appendix 3 for list of these species). Whilst none of these species were recorded in the reserves during the survey, some can be difficult to detect or overlooked and as such they may occur in the North Warrane Bushland Reserve.

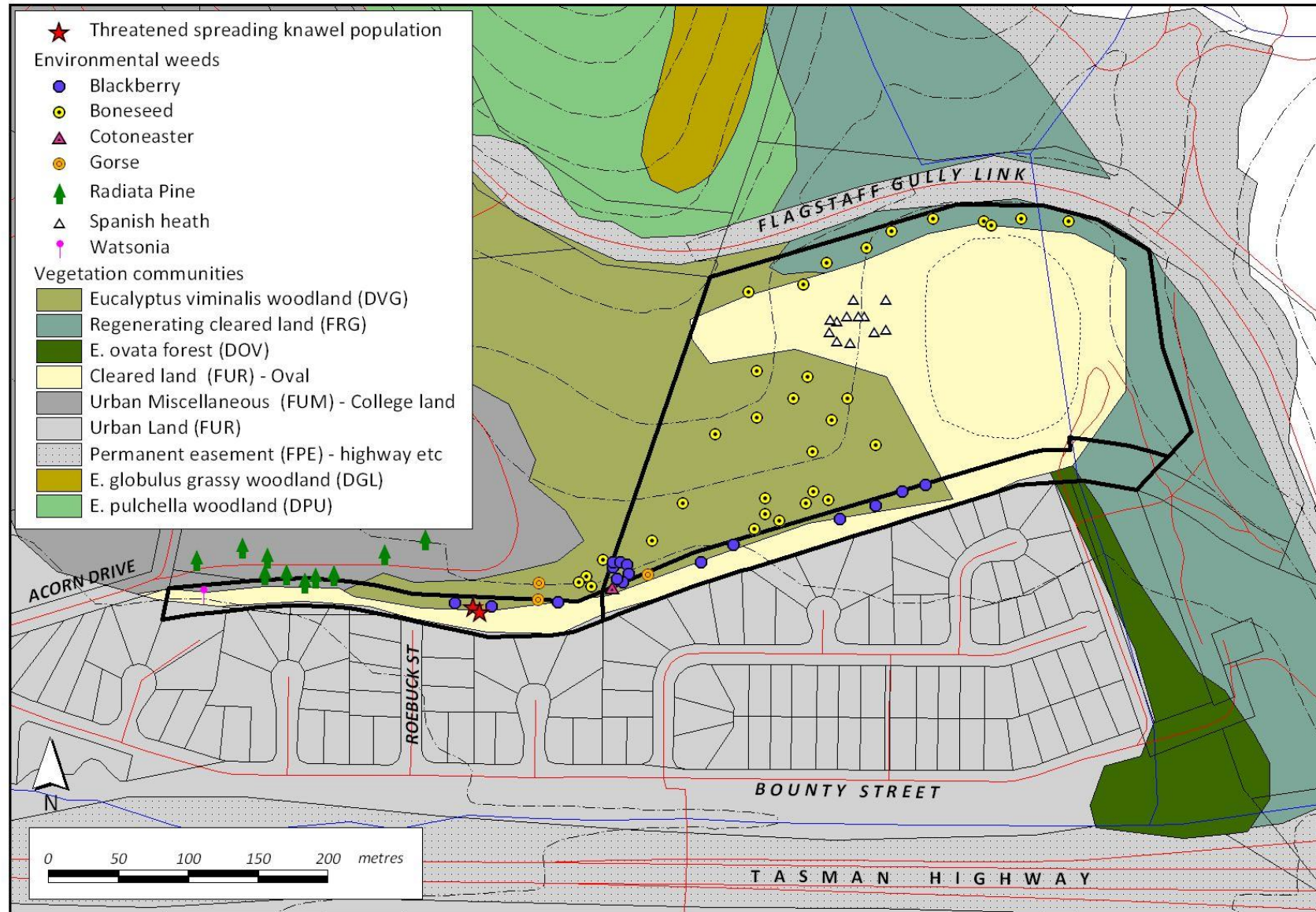


Figure 2 – Recorded natural values for the North Warrane Bushland Reserve.

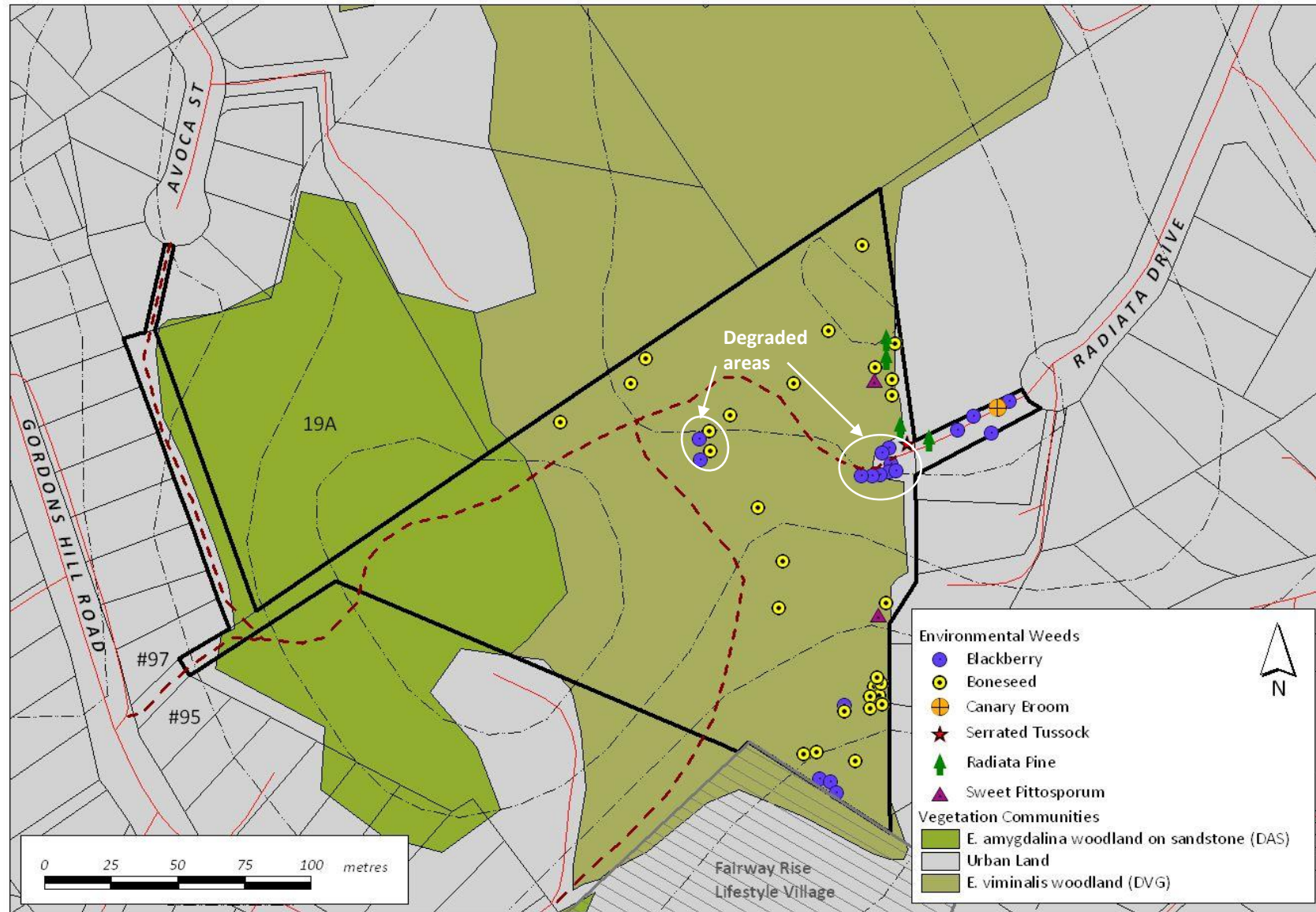


Figure 3 – Recorded natural values for the Avoca Hill Bushland Reserve

Weed Species

A wide range of exotic plant species were recorded within both reserves. Exotic grasses and herb were most common and are dominant in heavily disturbed areas such as the margins of the vegetation, along tracks and trails and in areas that are frequently disturbed (refer to Appendix 2 for a list of exotic species).

A number of declared weeds, Weeds of National Significance (WONS) and environmental weeds were also recorded in the reserves. Weed management efforts will be concentrated on these species as they have the potential to spread rapidly, out-compete native species for water nutrients and light and increase fire hazards.

Four (4) declared weeds (3 WONS) were also recorded in the **North Warrane Bushland Reserve** – blackberry (WONS), boneseed (WONS), gorse (WONS) and spanish heath. Minor infestations of the environmental weeds including agapanthus, cotoneaster, briar rose, radiata pine and watsonia were also present (refer to Figure 2).

Four (4) declared weeds (all 4 WONS) were recorded in the **Avoca Hill Bushland Reserve** – blackberry, boneseed, canary broom and serrated tussock. Minor infestations of the environmental weeds sweet pittosporum, radiata pine and agapanthus were also present (refer to Figure 3).

3.3. NATIVE FAUNA VALUES

The small reserves provide limited habitat for a range of native fauna species including mammals such as wallabies and echidnas, woodland bird species, reptile species and a range of invertebrates.

North Warrane Bushland Reserve

The North Warrane Bushland Reserve contains highly degraded vegetation which has limited habitat value for native fauna species. Larger mammals such as wallabies utilise the reserve and small resident populations may be present. The reserve is bordered by residential lots to the south, Flagstaff Gully Link to the north and east and the intact native vegetation on the Eastside Lutheran College land to the west. Linkages to the Meehan Range Conservation Area are across a significant road, however the reserve can be considered to having connectivity to other intact vegetation which allows movement by native fauna species.

Mammals

The habitat provided by the North Warrane Bushland Reserve is of lower value than the Avoca Hill Bushland Reserve with few mature trees, lower plant diversity and fewer habitat types. Despite this a good range of native mammals have been recorded within the reserve and the adjoining ELC land by college staff and students including bennetts wallaby, long nosed potoroo, bettong, pademelon, bandicoots, possums, echidnas, Tasmanian devil and quolls.

Reptiles

The North Warrane Bushland Reserve provides more limited habitat for reptiles although skink species (including blue tongued lizards) and snakes have been regularly recorded in the reserve and adjacent college bushland (pers. comm. K Hawes). Rocky sandstone outcrops occur within the

bushland on the Eastside Lutheran College land and this feature provides potential habitat for reptile species.

Birds

The bird fauna within the reserve was assessed during bird surveys carried out by members of Birdlife Tasmania.

Species lists for birds recorded in the reserves are contained in Appendix 4. The bird survey, whilst not representing a comprehensive list of birds occurring in the reserves, provides a basis for management actions which aim to enhance bird habitat and increase diversity.

Avoca Hill Bushland Reserve

The more intact Avoca Hill Bushland Reserve contains habitat for a range of species and is likely to contain resident populations of larger mammals such as wallabies, woodland birds, small reptiles and a range of invertebrate species. There are a number of larger trees within the reserve which contains small hollows which provide potential habitat for possums or hollow nesting bird species.

The reserve is bordered by smaller residential lots to the east, Fairway Rise Lifestyle Village to the south and larger vegetated or partially vegetated lots to the north and west. The intact vegetation to the north currently provides a greenway corridor between the Avoca Hill Bushland Reserve and larger areas of intact native vegetation in the Meehan Range. This allows for the movement of native mammals such as wallabies between the two areas (across Flagstaff Gully) and maintain genetic diversity for resident populations. The reserve also provides a stepping stone for bird species between the Meehan Range and Gordons Hill Reserve which is an otherwise isolated remnant surrounded by urban development.

Mammals

Resident populations of bennett's wallabies are reported to occur within Avoca Hill Bushland Reserve (community feedback), whilst local residents also reported seeing long nosed potoroos, pademelons, brown and barred bandicoots and echidnas in the reserve. Brush-tailed possums are also likely to be present within the Avoca Hill Bushland Reserve given the presence of trees with hollows.

The threatened eastern barred bandicoot has been recorded within 2km of the reserves and this species is known to persist in urban areas fringed by vegetation. The Avoca Hill Bushland Reserve provides suitable habitat for bandicoots species which may also forage in the yards of adjacent houses and bandicoots have been reported as common by a local resident.

Reptiles

The Avoca Hill Bushland Reserve provides potential habitat for native reptile species including the metallic skink, blue tongue lizard and the mountain dragon. Rocky outcrops and leaf litter are important habitat elements for reptile species occur within this reserve. Local residents did not report seeing snakes within or originating from the reserves.

Birds

The bird fauna within the reserve was assessed during bird surveys carried out by members of Birdlife Tasmania. They reported that the Avoca Hill Bushland Reserve contained '*a surprising group of birds for such a small patch of bush, hemmed in by housing and major roads*'. A further species list compiled by local resident Mrs M Pinkard over many years indicates a much higher diversity of species occurring within the Avoca Hill Bushland Reserve and surroundings over time.

A species list for birds recorded in the reserve is contained in Appendix 4. The bird survey, whilst not representing a comprehensive list of birds occurring in the reserves, provides a basis for management actions which aim to enhance bird habitat and increase diversity.

A list of threatened fauna species that have been recorded within 5km of the reserves and a comment on the likelihood of them occurring in the reserves is provided in Appendix 3.

3.4. GEOCONSERVATION VALUES

There are no listed geoconservation sites within 1km of the reserves.

3.5. CULTURAL HERITAGE

The original owners and occupiers of the land where the reserves are located are the Moomairemner people of the Oyster Bay Nation. Traditional Aboriginal oral evidence suggests that the hill where the Avoca Hill Reserve is located was called 'wiena' by the local Moomairemner people which means 'rocky hill with small trees'. *'It was this hill that the Moomairemner retreated to from Kangaroo Bay foreshore are during adverse weather. The Avoca Bushland Reserve stood upon their traditional path when travelling between Risdon Cove and Kangaroo Bay area (Via Flagstaff Gully), but was not a site of habitation'* (letter from Lance R. LeSage – aboriginal elder on behalf of Moomairemner people – refer to Appendix 9).

There are no known artifact sites within the reserves (TASI search and on ground search of Avoca Hill Bushland Reserve).

3.6. EUROPEAN HISTORY

The Avoca Hill Bushland Reserve and surrounding land has a diverse and interesting European history. The Avoca Hill area (broadly bordered by Flagstaff Creek, Begonia Street, Tasman Highway and Gordon Hill Road) was purchased by the Lane family in the early 1900's and was known as 'The Turning'. The Lane family constructed the original house around 1910 and cleared and farmed the east facing hillside. The hilltop area that contains the current Avoca Hill Bushland Reserve was never substantially cleared or farmed during this time. Over the years the land was divided amongst the Lane family with the Avoca Hill Bushland Reserve formed as part of a subdivision undertaken in the 1950's (pers comm. Mr. G Lane).

Sandstone was quarried from various locations on the hill during the early 1900's with some stone used in the construction of the GPO in Hobart. Further sandstone and gravel quarrying was undertaken on the hill following WWII (pers comm. Mr. G Lane) and a number of small quarry areas are still apparent within the Avoca Hill Bushland Reserve today.

A more detailed history of the Lane Family and the Avoca Hill area can be found at the Clarence Heritage Archives.

4. COMMUNITY CONSULTATION

Community consultation was undertaken as part of the development of the Reserve Activity Plan. This included consultation with the major reserve users and stakeholders surrounding the reserves and with the local community through a community ‘walk and talk’ event and feedback forms. The aim of the consultation was to capture local knowledge and issues of importance from interested community members.

Feedback forms were posted out to approximately 800 local residents as part of the consultation process.

Following the initial community consultation process further consultation will be sought following the release of the ‘Draft Avoca Hill and North Warrane Bushland Reserve Activity Plan’.

Stakeholder Consultation

The following stakeholders were consulted regarding the use and management of the reserves.

North Warrane Bushland Reserve

Eastside Lutheran College – included Principal, Landcare coordinator and property manager.

TAFE – teacher of Conservation and Land Management Course + students.

Eastside Rugby Club - tenant of Warrane Oval with clubrooms.

St Aidan’s Cricket Club – tenant of North Warrane Oval with clubrooms - no feedback received.

Avoca Hill Bushland Reserve

Fairway Rise Lifestyle Village

Owners of larger bushland lots to north of reserve

Community Consultation

Two ‘walk and talk’ events were held and feedback forms were mailed to local residents as part of the community consultation.

North Warrane Bushland Reserve

Five (5) people attended the North Warrane Bushland Reserve event.

No written comments were received.

The following is a brief summary of the main points from both the meetings and the community walk and talks.

Avoca Hill Bushland Reserve

16 people attended the Avoca Hill Bushland Reserve event.

Written comments (inc. feedback forms) were received from 6 people in relation to Avoca Hill Bushland Reserve.

Identified opportunities, issues and impacts

North Warrane Bushland Reserve

The opportunities identified include:

- the Eastside Lutheran College bushland adjoining the North Warrane Oval Bushland has significant conservation and educational values, which the College would like to enhance and formalise (e.g. re-establishment of locally indigenous threatened species)
- potential for the Eastside Lutheran College and TAFE Conservation and Land Management students to contribute to the on-ground management and enhancement of the reserves – TAFE students are a low-cost semi-skilled labour force in need of local bushland areas to learn land management skills
- enhancement and stabilisation of the informal trail networks in the reserve, including signage and interpretation, to provide opportunities for walking for health, cycling, and dog walking
- improving connections between the reserves and surrounding residential areas and destinations, including for elderly residents within the area (e.g. at the Presbyterian Care Tasmania facility).
- development of an orienteering course within the North Warrane Oval Bushland, for schools and the public to use
- installation of a public playground and barbeque at the North Warrane Oval Bushland
- enhancing the accessibility of the reserve will lead to increased use and passive surveillance – community act as ‘eyes and ears’
- possibility of using the internal, private road network within the TAFE, Oakdale, Presbyterian Care, and College precinct to improve pedestrian and cycling access between the facilities and to the two bushland reserves
- opportunities to enhance the accessibility of the North Warrane Oval Bushland for rugby and other sporting club training programs, including trail circuits

The issues and impacts identified include:

- significant weed infestations are evident within the reserve – includes weeds of state significance such as boneseed.
- spraying of weeds in the North Warrane Oval Bushland may have contributed to the lack of understory species, and dominance of colonisers such as silver wattle
- security issues associated with public access through the Eastside Lutheran College bushland, including liability concerns, and the potential to re-establish the fence between the properties
- use of trail bikes in the reserves and surrounding areas, and the associated noise, intimidation, and damage to trails
- dumping of rubbish in the Eastside Lutheran College bushland and adjoining North Warrane Oval Bushland, along the Flagstaff Gully Link, which is unsightly, and is also a fire hazard
- recent destruction of black wattle trees in the College bushland and surrounding area, by people looking for wattle grubs
- the North Warrane Bushland Reserve has a degraded appearance, which does not engender community pride or a sense of care
- dog waste, and the lack of dog tidy bags and rubbish bins

Avoca Hill Bushland Reserve

The opportunities identified include:

- enhancement and stabilisation of the informal trail networks in reserve, including signage and interpretation, to provide opportunities for walking for health, cycling, and dog walking
- potential to create an entrance to the Avoca Hill Bushland Reserve from the Fairway Rise Lifestyle Village, for the use of Fairway Rise resident only.
- enhancing the accessibility of the reserve will lead to increased use and passive surveillance – community act as ‘eyes and ears’
- potential for residents at the Fairway Rise Lifestyle Village and local residents to be involved in Landcare activities

The issues and impacts identified include:

- significant weed infestations are evident within the reserve – in particular weeds of state significance such as boneseed.
- concerns amongst some residents regarding fire risk associated with Avoca Hill Bushland Reserve and adjoin bushland
- access to Avoca Hill Bushland Reserve is unclear, requires signage and improved tracks
- some concern expressed regarding browsing of gardens from wallabies living in Avoca Hill Bushland Reserve
- dog waste, and the lack of dog tidy bags and rubbish bins

A more detailed summary of feedback gathered during the community consultation phase is provided in Appendix 5. This initial feedback was then considered during the development of the draft RAP.

5. MANAGEMENT ISSUES AND THREATS

As a result of the on-site surveys and public consultation process the following primary management issues have been identified in relation to the reserves. The management issues have been divided into those relating to natural values and those relating to public amenity. All management actions are summarised in Table 1 - Section 6.

Natural Values Management Issues

- rehabilitation of degraded areas;
- bushfire management;
- weed management;
- management of fauna/habitat; and
- purchase of vacant land (enlargement of reserve).

Public Amenity Management Issues

- access to reserves (including reserve linkages and entrance upgrade);
- development/improvement of walking tracks;
- reserve signage; and
- other issues including illegal access, rubbish, stormwater and trail bikes.

5.1. REHABILITATION OF DEGRADED AREAS

North Warrane Bushland Reserve

Much of the North Warrane Oval Bushland can be considered to be degraded due to weed infestations, rubbish dumping and dominance of exotic grasses and the vegetation has low diversity. Minimal natural regeneration is likely to occur within this area and as such active revegetation to increase diversity and improve the habitat values will be required.

Issues with weed infestation are addressed in the weed management section. Rehabilitation within the reserve to be undertaken as a collaboration between the council, the ELC Landcare group and TAFE. This may include the development of a strategic rehabilitation program as part of coursework by students at TAFE and carried out by TAFE students, ELC Landcare Group and sports clubs using the ground. Revegetation works should include collecting local provenance seed and growing plants for use in the revegetation.

Three (3) broad areas have been identified within North Warrane Bushland Reserve as requiring rehabilitation and regeneration;

AREA 1 – along the drain at southern side of reserve

- *R1 – remove weeds and control erosion and revegetate as required, upgrade/formalise track in mown area (refer to Section 5.7)*



Photo 1 – Degraded drainage line in North Warrane Reserve.

AREA 2 – degraded hillside

- *R2– remove weeds and rubbish.*
- *R3 – Develop a strategic rehabilitation and track plan including priority areas for revegetation (collaboration between council, TAFE and ELC Landcare).*
- *R4 – Undertake planting of 1000 plants in degraded areas. Plants to be grown from local provenance seed.*
- *WT1 - Develop new loop tracks (refer to Section 5.7) (routes as per strategic rehabilitation Plan developed by TAFE and ELC).*



Photo 2 – Weed and rubbish on degraded hillside, North Warrane Bushland Reserve.

Avoca Hill Bushland Reserve

There are a small number of degraded areas within the Avoca Hill Bushland Reserve which are weed infested and contain rubbish.

Issues with weed infestation are addressed in the weed management section. Rehabilitation of degraded areas should be undertaken to restore native vegetation, provide additional fauna habitat and improve the amenity of the reserves. Rehabilitation can be achieved by encouraging natural regeneration or by actively revegetating areas.

As a general rule encouraging natural regeneration is a more successful and cost effective method of regenerating an area than active revegetation as the regenerating plants are more suitable to the local environmental than nursery grown species.

Two areas are identified within Avoca Hill Bushland Reserve for regeneration (Figure 3);

AREA 1 – area surrounding communication tower and entrance off Radiata Drive.

- *R5 – remove weeds, level soil heaps. Landscape entrance - refer to Section 5.6.3*

AREA 2 – small quarried areas (historic sandstone quarrying) on south facing slope;

- *R6 – remove weeds and rubbish, control any erosion of banks and revegetate as required.*

5.2. BUSHFIRE MANAGEMENT

Bushfire Management was identified as a concern for a number of residents surrounding the Avoca Hill Bushland Reserve (refer to Appendix 5). Whilst it was not raised as an issue for the North Warrane Bushland Reserve, bushfire management is an important management issue for the reserve in vegetation management terms and for the protection of infrastructure.

The Avoca Hill Bushland Reserve is surrounded by residential properties and the Fairway Rise Lifestyle Village with lots to the west and north containing significant amounts of native vegetation. As such uncontrolled fire within the vegetation poses a threat to the natural values and processes within the reserve and the assets surrounding the reserve.

The development of a bushfire management plan is therefore recommended. The plan should be developed as a priority to allow preparations for the 2014/15 summer.

- *BF1 – Develop Bushfire Management Plan for North Warrane Bushland Reserve, Eastside Lutheran College bushland and adjacent bushland.*
- *BF2 – Develop a Bushfire Management Plan for Avoca Hill Bushland Reserve. Large adjoining private bushland lots to be included in overall plan.*

There are a number of key factors to be considered when developing the bushfire management plans;

- management of the ecological values of the reserves such as maintaining some leaf litter and fallen logs to maintain habitat for reptiles and invertebrates and undertaking mosaic burns to stimulate new growth and manage habitat.

- minimising fuel loads to reduce risks to adjoining residences and infrastructure.
- bushfire management plans should include adjacent bushland areas for each reserve.
 - Avoca Hill Bushland Reserve – large properties with intact vegetation to north and west of reserve (*any future development of fire breaks to protect private assets on the adjoining properties should be undertaken on the private land and not within the reserve*).
 - North Warrane Bushland Reserve – Eastside Lutheran College bushland and potentially bushland on Oakdale Industries land.
- maintain existing fire breaks along the eastern (rear of residences off Radiata Drive) and northern side of the reserve (Photos 3) and along southern boundary of North Warrane Bushland Reserve adjacent to private residences (Photo 4).



Photo 3 – Existing firebreak along eastern boundary of Avoca and Photo 4 – Cleared land behind houses at southern edge of North Warrane Bushland Reserve.

5.3. WEED MANAGEMENT

The overall weed management strategy for the reserves will be to prioritise the control declared weeds, WONS and environmental weeds within small isolated infestations targeted first and then more widespread species targeted. Monitoring and follow-up control of the weeds will be vital to the overall success of the weed eradication program.

A maintenance program for exotic grasses and herbs will be also be implemented and a community education campaign undertaken.

Currently active management of weed species within the Avoca Hill Bushland Reserve is restricted to sporadic slashing of fire breaks only. Weed control in North Warrane Bushland Reserve includes the slashing of grass around the oval and rear of residences on the southern boundary, and some control of spanish heath, blackberry and boneseed in open areas.

Weed Management Actions.

Descriptions of weed species that are to be controlled, their extent and control methodology is provided in Appendix 7.

- Control of WONS and declared weeds – Weed management actions within the reserves should prioritise the control of the declared and WONS weed species recorded in the reserves. If limited funds are available for weed control actions then the control of declared weeds which have limited distribution should be undertaken in preference to the control of more widespread weeds.
 - *WC1, WC2 - Control all declared weeds and WONS species in the reserves. Prioritise the control of isolated population in preference to more widespread weed species.*
- Control of Declared weeds outside reserves – Small populations of some declared weed species occur on land outside the reserves (such as within the black gum forest at entrance to North Warrane Oval)(Figure 3). The control of these species on adjoining land or roadsides should be addressed in conjunction with the control of weeds within the reserve to maximise control efforts.
 - *WC3– Approach adjoining landholders/land managers to coordinate control of declared weeds adjoining the reserves.*
- Control of Environmental weeds - The environmental weeds that occur in the reserves are generally restricted to isolated populations. Ideally the control of the environmental weed species in the reserves should be undertaken in conjunction with the control of the declared weeds species. If there are limited funds available, environmental weeds should be controlled following control of the declared weeds. Priority should then be given to the control of species that have isolated distribution followed by more widespread species.
 - *WC4 & WC5 - Control environmental weeds species in the reserves in conjunction with the control of declared weeds. If insufficient funds are available control isolated environmental weed species following control of declared weeds as funds become available.*
- Control of non-priority weeds – Exotic grasses and broadleaf weeds are widespread within the remnants. The control of these weeds is only a priority in areas that are to be revegetated and to reduce fuel loads for fire protection. As such slashing of the cleared land along the rear of properties adjoining the reserves and brushcutting and foliage spraying of grasses and other broadleaf weeds around revegetated areas should occur on an annual basis.
 - *WC6 - Control grasses and broadleaf weeds in revegetated areas and along the cleared land on an annual basis.*
- Community Education – A number of the weed infestations and weed species present in the reserves have been introduced as a result of inappropriate disposal of garden waste into the reserve. In addition to degrading the natural values of the reserve this disposal also degrades the amenity of the reserve and increases the fire risk in areas directly bordering residences. Educational material that highlights the impacts of weed dumping in bushland reserves and provides suggestions for more appropriate plantings should be circulated to residents that border the reserves.
 - *WC7 - Mail out NRM South brochure 'Creeping Back Yards' brochure to local residents.*
- Monitoring and Maintenance – The successful eradication of declared and environmental weeds from the reserves will require ongoing monitoring and follow-up weed control for a

number of years to come. There is likely to be seedling regrowth from seed stored in the soil, re-sprouting of treated plants and reintroduction of weeds from seed sources outside the reserves (through bird droppings and mammal movements) which will require treatment.

- *WC8 - Conduct an annual survey of the reserve and remove seedlings and retreat any re-sprouted declared and environmental weeds.*

5.4. MANAGEMENT OF FAUNA HABITAT

The reserves contain habitat for a range of native fauna species from wallabies and echidnas to woodland bird species, lizards and butterflies. The close proximity of the reserves to residential areas provides for close interactions between residents and wildlife and is one of the most valued aspects of the reserve (community consultation).

The ongoing management of the habitat provided by the reserves and the surrounding vegetation is important to maintain fauna diversity and provide recreational links. The maintenance of links to other larger areas of native vegetation is also vital for maintaining genetic diversity and ensuring the long term viability of wildlife populations. As such the fauna habitat management issues include the following;

- Connectivity to other reserves – The North Warrane Bushland Reserve is broadly connected to the Meehan Range however the Flagstaff Gully Link does present a barrier to wildlife movement.

Movement of wildlife across Flagstaff Gully Link road leads to high road kill especially during drought periods when animals are crossing to the North Warrane Bushland Reserve to access grass. To minimize this a reduce speed from dusk to dawn sign should be erected.

- *FH1 – Install a ‘reduce speed from dusk to dawn’ sign along Flagstaff Gully Link Road*

The Avoca Hill Bushland Reserve is largely surrounded by residential development, however there is remnant native vegetation to the north on private land that provides a direct connection to the Meehan Range Conservation Area. This vegetation provides a physical connection and allows for movement of fauna species between reserves during periods of restricted foraging resources. This limited connectivity to the larger bushland areas is important for the long term viability of the reserves and the persistence of wildlife includes mammals, birds, reptiles and invertebrates within the reserves. The Avoca Hill Bushland Reserve also provides an important stepping stone link (for bird species) from the Gordon Hill Reserve (which is surrounded by residential development) to the Meehan Range.

- *FH2 - It is recommended that any future development of the adjoining lots to the north (which contain native vegetation and provide a link to the Meehan Range) should consider the provision of public open space to maintain a greenway link to the Meehan Range.*
- Management of leaf litter, dead spars and fallen timber – the leaf litter, dead trees and fallen timber on the floor of the reserves and on adjoining private land provides important habitat for invertebrate species and reptiles as well as sub soil species and fungi. These species in turn provide a food source to native birds and mammals and as such provide a vital component in the health and diversity of the bushland.
- *FH3 (BF2) – consider the retention of leaf layer and fallen timber when developing bushfire plan for Avoca Hill Bushland Reserve. Retention of these values in bushland*

that is located within an urban setting is often counter to perceptions regarding fire fuel minimisation. It is however important that habitat requirements are considered (refer to Section 5.2).

- *FH4 – educate private landholders about the need for balance between asset protection from bushfire and natural values, as an attempt to reduce excessive clearing of bushland around assets that could lead to further habitat loss.*
- Dog access to reserve – the Avoca Hill and North Warrane Bushland Reserves are popular areas for dog walking. Dogs are currently allowed in the reserves and as such it is recommended that within the reserve dogs must be under effective control at all times. There was some feedback during the consultation process that called for off leash dog exercise within the reserves however this needs to be balanced with the protection of native fauna that reside in the reserves.
The provision of dog litter bags and bins also needs to be considered.
 - *FH5 - Review status of dog walking in Avoca Hill and North Warrane Bushland Reserves as part of the CCC Dog Management Policy Review Process.*
- Cat Control (domestic and feral cats) – feral cats are known to have significant impacts on native fauna through the predation of small mammals, birds and lizards and the spread of disease such as toxoplasmosis. Domestic cats that are allowed to roam bushland can have similar impacts to feral cats. The Clarence City Council supports the recently ratified Cat Management Act 2012 which recommends de-sexing, micro chipping and keeping cats under control and in inside at night
 - *The Clarence City Council supports the recently ratified Cat Management Act 2012 which recommends de-sexing, micro chipping and keeping cats under control and in inside at night.*
- Weed management – weed species out compete native flora species and can reduce the diversity in a bushland reserve. In some instances weed infestations do provide good habitat on the absence of other native habitat – i.e. blackberry can provide good shelter for bandicoots and mainland grevillea and wattles provide a food source for nectar gathering birds and mammals.
 - *Refer to Weed Management Actions WC1 – WC8. The weed infestations in the reserves are not considered to provide significant habitat for native fauna species and will be controlled as per Section 5.3.*

5.5. PURCHASE OF VACANT LAND

Due to the small size of the Avoca Hill Bushland Reserve and its location within an urban context its long-term viability is threatened by edge effects and future urban development. At the time when the Avoca Hill RAP was developed there was an opportunity to expand the size of the reserve through the purchase of vacant land at 19A Avoca Street. An analysis of the benefits of purchasing this land was carried out as part of the plan development and is included in Appendix 8.

This land has recently been sold and as such the opportunity to purchase the land has now passed. It is however recommended that the status of the land is monitored in the future and if the land comes up for sale its purchase be considered as per the grounds outlined in Appendix 8.

- *PUR1 – council to maintain a ‘watch’ on the adjacent land at 19A Avoca Street and if the lot goes onto the market in the future its purchase should be considered as per benefits outline in Appendix 8*

5.6 ACCESS TO RESERVES AND LINKAGES

5.6.1 Access to Reserves

The two reserves are currently accessed from a number of formal and informal access points as detailed below.

North Warrane Bushland Reserve

There is one main vehicle access to the North Warrane Oval and a number of informal entrances to the reserve.

- Main vehicle access to the reserve from end of Bounty Street - also provides informal pedestrian access.
- Entrance from north-east corner – a well-established, informal track into the reserve from Flagstaff Gully Link and through Eastside Lutheran College. This entrance needs to be formalised and track relocated to the east to avoid ELC land.
 - *A1 – Form new connection from Flagstaff Gully Link to North Warrane Bushland Reserve to avoid crossing ELC land. To prevent continued use of track on ELC land by public, boundary fencing to be installed along boundary in corner of the reserve.*
- Entrance off from Flagstaff Gully Link at eastern side - there are multiple entrances and trails on public land adjacent to eastern side of reserve utilised by pedestrians, motorbikes and mountain bikes to access Meehan Range (mountain bike park) and Mornington.
 - *A2 - Investigate improved or formalised access from Flagstaff Gully Link opposite Clarence Mountain Bike Park in conjunction with expansion of track network. Incorporate direction signage.*
- Entrance of end of Roebuck Street - current pedestrian access through fence onto informal track along behind houses. Potential for formal access to reserve at this location if track network expanded (refer to Track Section 5.7).
 - *A3 – Develop formal access off Roebuck Street in conjunction with track expansion.*
 - *A4 - Negotiate temporary access to the reserve from Acorn Drive with ELC. Consider options such as realigning fences, land purchase/exchange through CCC POS funds or lease agreement. If proposed subdivision off Acorn Drive proceeds in the future ensure permanent access/linkage to reserve via footpath network is incorporated into the subdivision.*

Avoca Hill Bushland Reserve

There are currently four access points into the Avoca Hill Bushland Reserve;

- Entrance off Radiata Drive – main access into reserve and onto main trail (also provides access to communication tower) (Photo 5). Access point is flat and wide and suitable for enhancement.

Enhancement to include landscaping - retain native trees and landscape under using low shrubs and groundcover plants; weed control; installing sandstone boulders at entrance to link in with quarrying history of reserve; install winding compacted gravel path into reserve (vehicle access to tower needs to be maintained); install removable bollards to soften entrance and install reserve signage (may incorporate sign into sandstone boulders).



Photo 5 – Radiata Drive entrance to reserve

- A5 - Enhance access point off Radiata Drive (access to communication tower to be retained). Indicative entrance plan provided in Appendix 10.
- Entrance from end of Avoca Street between No's 27 and 32 (Photo 6) – rough, steep track accesses the reserve along the bottom of 19A Avoca Street before winding up to hilltop. The current track requires improvement to provide better access to the reserve. The access from this location would be greatly improved by the purchase of vacant land at 19A Avoca Street which would allow the track to be benched into the hillside and wind gently up in to the reserve.

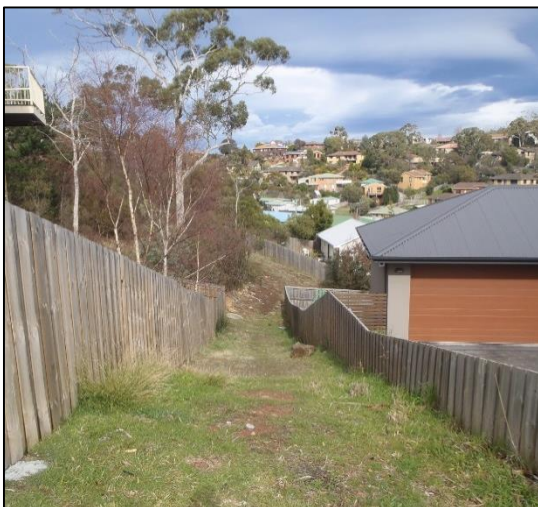


Photo 6 – Avoca Street entrance



Photo 7 - Gordon Hill Road entrance.

- Entrance from Gordon's Hill Road – this access point is not obvious and appears to be used infrequently (Photo 7). The entrance is narrow and steep at this location and joins onto track from Avoca Street. Entrance needs to be formalized and track rerouted to avoid private land. This entrance would also be improved through the purchase of land at 19A Avoca Street.
 - A6 – *Improve access from Avoca Street and Gordons Hill Road, include signage.*
- Entrance from corner of Gordon Hill Road – informal access on old vehicle track into the reserve across the south east boundary of 79 Gordons Hill Road. Formal access arrangement needs to be reached to utilise this entrance or informal track needs to be closed. Improved footpath access along Gordons Hill Road and road crossing facilities will also need to be addressed prior to formalization of this entrance.
 - A7 - *Council to investigate option to lease/purchase land from landowner of 79 Gordons Hill Road to formalise and improve reserve access from Gordon Hill Road following construction of improved footpath access.*

5.6.2 Future track and biodiversity corridors

As part of the development of the reserve activity plan track corridors to other reserves in the local area were investigated. Future track corridors from the reserves to adjoining streets and the strengthening of links to Kangaroo Bay Rivulet and Kangaroo Bay and the Clarence Mountain Bike Park are recommended. This will provide additional recreational opportunities (new trails) and increase connectivity (refer to Section 5.4).

The following track corridors should be strengthen or new corridors considered to increase the connectivity of the reserves and increase recreational opportunities (Figure 4).

Corridor 1- Avoca Hill to Fairway Rise and Kangaroo Bay Rivulet (through reserve and along street network connections);

Corridor2 – Flagstaff Gully Creek and TAFE to Avoca Hill Bushland Reserve, Kangaroo Bay Rivulet, Fairway Rise and Meehan range through North Warrane.

Corridor 3 – From Flagstaff Gully Link through North Warrane Bushland Reserve to Clarence Mountain Bike Park, Mornington and Kangaroo Bay Rivulet.

Biodiversity Corridor Link - Avoca Hill to Pilchers Hill, Flagstaff Gully Rivulet and Meehan Range.

In addition to track corridors between reserves and adjoining streets it is recommended that the maintenance of a 'biodiversity' or 'greenway' corridor be considered when developing private land to the north of the Avoca Hill Bushland Reserve into the future.

For the purposes of this document a biodiversity or greenway corridor is defined as;

"a corridor that seeks to conserve, maintain and enhance native vegetation communities both on private and public land along a broad sweep or narrow strip of vegetation connecting two or more major remnants".

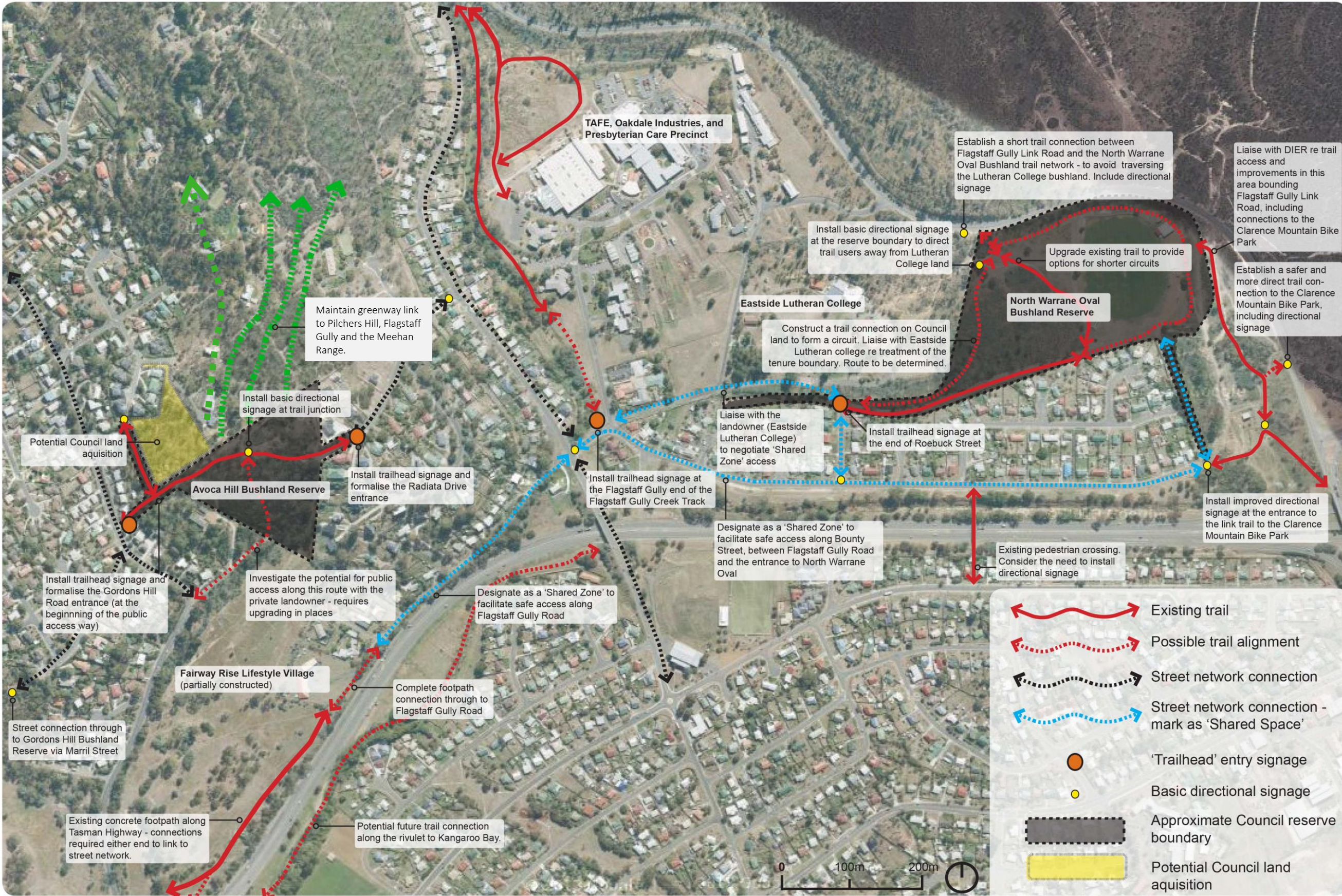
In this case the connection is between Avoca Hill and Pilchers Hill, Flagstaff Gully Creek and the Meehan Range. The current intact vegetation between these reserves allows for some transfer or movement of wildlife (mammal species as well as birdlife, reptiles and invertebrates) and also

maintains amenity, sense of place and a scenic framework for quality suburban lifestyle and wellbeing.

The significance of the vegetation between the reserve and the Meehan Range has also been identified under the Biodiversity Overlay of the Clarence Draft Interim Planning Scheme 2013 (Figure 5).

It is recognised that the vegetated land to the north of the reserve is privately owned and partially zoned for future residential development and as such the current situation will not be maintained into the future. This plan recommends the maintenance of some level of connection between Avoca Hill and Pilchers Hill, Flagstaff Gully Creek and the Meehan Range and have the broader landscape linkages considered when land is developed in the future. It is also recognised that the retention of greenway corridors is a shared responsibility between private and public landholders and that this view of shared responsibility will need to be developed over time and may require some incentive based scheme to change attitudes and behaviour towards valuing remnant native vegetation.

- *A8 - It is recommended that any future development of the adjoining lots to the north should consider the maintenance of a biodiversity or greenway link to the Pilchers Hill, Flagstaff Gully Rivulet and Meehan Range from Avoca Hill.*



AVOCA HILL AND NORTH WARRANE BUSHLAND RESERVES CONCEPTUAL TRAIL PLAN

Figure 4 -Trail Plan

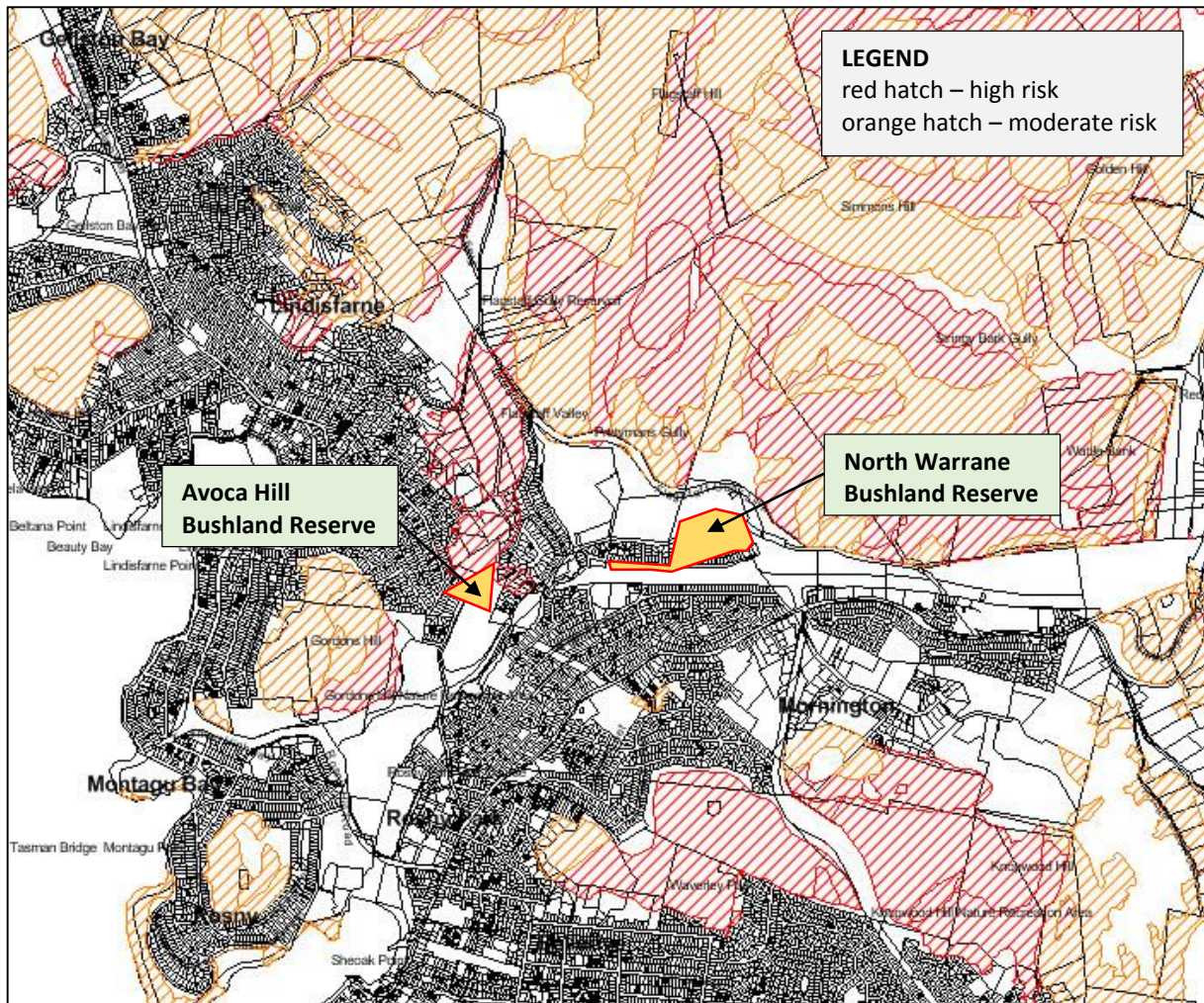


Figure 5 – Biodiversity Overlay as per Clarence Draft Interim Planning Scheme 2013

5.6.3 Entrance Upgrades

There are no formal pedestrian entrances to the North Warrane Bushland Reserve or signage.

- A9 - Entrances treatment and signage for North Warrane Bushland Reserve to be investigated as part of future track development. Content for signage to be developed in coordination with ELC and TAFE students.

There are currently no formal entrances to Avoca Hill Bushland Reserve although informal access is provided from the end of Radiata Drive and from Avoca Street and Gordons Hill Road. The community consultation process identified a desire to improve the entrances and install signage in the Avoca Hill Bushland Reserve.

- A6 – Improve access from Avoca Street and Gordons Hill Road, include signage.

The history of the Avoca Hill area is intrinsically linked to the Lane family who originally owned and farmed the area from the early 1900's (refer to Section 3.5 European history). Marion Pinkard (formerly Lane) is a long term resident of the hill (over seventy years), bird watcher and a tireless community worker. To acknowledge the association of the family and Mrs Pinkard with the local

area, the main entrance to the reserve off Radiata Street is to be named Marion Pinkard entrance and the main track named the 'Lane Track'

- *A10 - Council to name Radiata Street entrance the 'Marion Pinkard' Entrance..*

5.7 WALKING TRACKS

North Warrane Bushland Reserve

Walking and cycling tracks with the North Warrane Bushland Reserve are largely informal, with people entering the reserve from number of points off Flagstaff Gully Road, Flagstaff Gully Link, through the Eastside Lutheran College Grounds, from the end of Roebuck Street and through adjacent residences off Bounty Street. A number of tracks and trails traverse the area, and are the result of frequent use over many years, rather than constructed trails as part of a planned network. The main tracks run along the back of the houses off Bounty Street, up the edge of the cleared land from the oval towards the Flagstaff Gully Link and from behind the clubrooms along the bank to the Mountain Bike Park and along the road to Mornington (Figure 4).

Any formalisation or creation of new tracks within this reserve will be dependent on future demand and collaboration between the council, the ELC and TAFE (refer to Section 5.5).

During the consultation process the TAFE expressed an interest to undertake on-ground activities as part of the Conservation and Land Management Course. This could include designing and constructing a trail network through the reserve. Based on the community consultation a new trail network may include the following;

- Track from corner of reserve at Flagstaff Gully Link adjacent to Road to Mountain Bike Park and around oval to connect with other existing track. This needs to include the closing and rehabilitation of the informal track that currently traverses ELC land. This may include some fencing.
- Formalise track along edge of cleared land around southern end of oval and along behind houses to Roebuck Street. A new access through to Acorn Drive may be negotiated with ELC as part of future residential development in this area as per rezoning suggested in the Draft Clarence City Planning Scheme.
 - *WT1 – Develop tracks within North Warrane Bushland Reserve - as per rehabilitation plan for Reserve developed by TAFE students and ELC Landcare group (R5) (Figure 5 provides suggested track route only).*
 - *A1 – Form new connection from Flagstaff Gully Link to North Warrane Bushland Reserve to avoid crossing ELC land. To prevent continued use of track on ELC land by public, boundary fencing to be installed along boundary in corner of the reserve.*
 - *A4 – Negotiate temporary access to the reserve from Acorn Drive with ELC. Consider options such as realigning fences, land purchase/exchange through CCC POS funds or lease agreement. If proposed subdivision off Acorn Drive proceeds in the future ensure*

permanent access/linkage to reserve via footpath network is incorporated into the subdivision.

Avoca Hill Bushland Reserve

The Avoca Hill Bushland Reserve contains an informal network of tracks and trails used for walking and bike riding. The tracks and trails are primarily between Radiata Drive and Gordons Hill Road and Avoca Street (Figure 4) and result from frequent use over many years – some appear to be the remains of access roads, rather than a planned and purposefully constructed network. Portions of the tracks occur on private land and in places the tracks are steep and in poor condition.

No new trails are required in this reserve however the existing trail require some upgrading and tracks need to be reroute where they traverse private land or agreement reached with landowners to lease/purchase additional ground.

- *WT2 – Upgrade existing walking track between Radiate Drive and Gordons Hill Road adjacent to 95 Gordons Hill Road and Avoca Street (in conjunction with recommendation A3).*
- *WT3 – Develop new track from Avoca Street and Gordons Hill Road entrances if land at 19A Avoca Street can be purchased.*
- *WT4 – Name main track through Avoca Hill Bushland Reserve the ‘Lane Track’.*

5.8 RESERVE SIGNAGE

The community consultation stage identified a need for signage for both reserves. This should include directional signage to guide users to the reserves entrances and linkages, interpretative signage and entrance signage.

Interpretation signage can outline the values of the reserve and provide the following information:

- *Natural Values* - vegetation communities, flora and fauna values.
- *Landscape value* – highlight importance of remnant for riparian connectivity and providing landscape link between other bushland remnants.
- *History of Avoca Hill* – farming, sandstone quarrying, bushfires etc.
- *Aboriginal heritage*
- *Recreational values* – walking, bird watching, cycling, bouldering.

Other information that may be included on new signage includes;

- Directional signs to other track, Mountain Bike Park and city centre.
- No trial bike and no rubbish dumping signs.
- *S1 – Provide signage for the reserves as per the Trail Map (Figure 4).*
- *S2 – Council to erect no rubbish dumping signage along Flagstaff Gully Link*

5.9 RENAMING THE AVOCA HILL RESERVE

During the consultation and feedback period for the RAP it was suggested that an aboriginal name could be applied to the Avoca Hill Reserve to recognize the aboriginal heritage of the area. The Palawi Kani name 'Wiena' which means 'rocky hill with small trees' has been suggested by elders of the Aboriginal Corporation of Tasmania. Traditional Aboriginal oral evidence suggests that the hill where the reserve is located was called 'wiena' by the local Moomairemner people.

A letter from the Aboriginal Corporation of Tasmania outlining information about the area is provided in Appendix 9.

- *N1 – Change name of the reserve from Avoca Bushland reserve to the Wiena Bushland Reserve.*
- *N2 – Produce new RAP document with amended reserve name.*

5.10 OTHER MANAGEMENT ISSUES

5.10.1 Access to private land through reserve.

There is currently an issue with access of the ELC grounds by the public originating from the Reserve and Flagstaff Gully Link. This presents a security risk of the college and was raised as an issue by the college during the consultation process. This issue can be resolved by provide an access to the reserve further east along Flagstaff Gully Road which does not traverse the college land. Some signage and fencing delineating the property boundary will also need to be considered. Part of the problem arises as the access track from the Flagstaff Gully Link traverses the college land before entering the reserve.

- *M1 – Investigate fencing off corner of reserve to prevent unauthorized access to ELC land through reserve.*
- *A1 – Form new connection from Flagstaff Gully Link to North Warrane Bushland Reserve to avoid crossing ELC land. To prevent continued use of track on ELC land by public, boundary fencing to be installed along boundary in corner of the reserve.*

5.10.2 Rubbish

Both reserves contain piles of illegally dumped rubbish (including tyres) and debris and scattered rubbish discarded by reserve users or originating from properties neighbouring reserves.

The dumping of trailer loads of rubbish in the reserves is now limited by access barriers however dumping rubbish along the Flagstaff Gully Link and into the top side of the reserve still occurs regularly (community feedback).

Increased use and ownership is likely to lead to a reduction in this behaviour however some additional signage and monitoring will also be required.

An initial clean-up of all existing rubbish within the reserve should be undertaken and then regular 'clean-up' days held where the local community can assist to maintain the reserve rubbish free.

- *M2 – Clean up rubbish and debris in reserves. Conduct regular ‘Clean-up’ days.(volunteers should not undertake rubbish clean-up along Flagstaff Gully Link do to safety issues)*
- *S2 – Council to erect no rubbish dumping signage along Flagstaff Gully Link.*

5.10.3 Trail Bike access

The use of trail bikes in the reserves was identified as a management issue by a number of stakeholders especially within the North Warrane Bushland Reserve and adjoining bushland areas. Access to the reserve is generally from the Meehan Range across the Flagstaff Link Road or from nearby residences. Whilst the use of trail bikes in the reserve is prohibited by the Clarence City Council there are still instances where trial bikes are seen or heard within the reserve and on adjoining land.

Trail bike use in the adjacent Meehan Range (especially around the mountain bike park) has reduced over the past years to due increased signage, entrance restrictions, enforcement and the higher rate of use by mountain bikers. It is envisaged that an increase in public use of the North Warrane Bushland Reserve as a result of track development and rehabilitation will lead to a reduction in trail bike use. Addition signage and measures to prevent access by trial bikes will also be required (Refer to section 5.8).

- *M3 – entrance treatments and signage to include measures and messages to prevent access by trial bikes.*

5.10.4 Stormwater Management

The management of stormwater within the North Warrane Bushland Reserve is limited to the open drain along the southern boundary. The management of this drain will involve weed management and some revegetation (refer to relevant sections). Future Urban Sensitive Water Design (WSUD) principals may be incorporated in this drainage line in the future.

5.10.5 Landcare Group formation/Collaboration with stakeholders

The ongoing management of the bushland reserves following primary weed control and rehabilitation actions will require significant effort. Whilst the Council is primarily responsible for the reserve maintenance, the formation of a local ‘Landcare’ group can provide an invaluable contribute to reserve maintenance and engender a sense of community ownership. The 30formalization of tracks and installation of signage in the reserve is likely to increase the profile and use of the reserves and as such may lead to interest in the formation of a Local Landcare group.

- *M4 – Council to facilitate the formation of Landcare/Bushcare group for Avoca Hill Bushland Reserve.*

Assistance with the formation of a Landcare group can be provided by the following people and organisations;

Chris Johns – Natural Areas Volunteer Coordinator – email cjohns@ccc.tas.gov.au; Ph 62458773

Justin Burgess – Natural Assets Officer, Clarence City Council – email jburgess@ccc.tas.gov.au; Ph (03)6245 8785

Phil Watson – NRM Planner, Clarence City Council – email pwatson@ccc.tas.gov.au; Ph
(03)62458619
email pwatson@ccc.tas.gov.au

Tasmanian Landcare Association – admin@landcaretas.org.au

5.10.6. Collaboration between CCC, Eastside Lutheran College and TAFE

The adjacent Eastside Lutheran College land contains a significant area of native vegetation which adjoins the North Warrane Bushland Reserve. This vegetation is in good condition relative to the bushland in the reserve as weeds have been controlled and the diversity is greater. The management of the weeds and vegetation in the reserve in isolation is not considered to be strategic due to its poor condition; however its management in conjunction with the management of the vegetation on the ELC land reserve is of higher benefit to the local community.

As such a collaborative management approach between the council, the Eastside Lutheran College and TAFE (Conservation and Land Management) would be beneficial to the ongoing management of the bushland. Both the ELC and TAFE have expressed a desire to utilise the reserve for Landcare and native vegetation rehabilitation activities as well as projects such as track building. This collaboration can provide a lost cost labour force to carry out management actions and follow-up maintenance with assistance provided by the council.

This collaboration provides an excellent opportunity to rehabilitate the reserve and increase the recreational potential of the reserve and adjoining land.

The sporting clubs that utilise the North Warrane Oval (Rugby Club, Cricket Club and Soccer clubs) should also be included in collaborations to undertake works in the reserve as they can provide a significant contribution to works and are likely to benefit from the development of tracks and improvement of the condition of the reserve.

- *M5 – Council to develop collaboration between the Eastside Lutheran College Landcare group and TAFE to manage of North Warrane Bushland Reserve and bushland remnant on ELC land.*

5.11 MONITORING AND EVALUATION

An informal review of the actions and outcomes of the Avoca Hill and North Warrane Bushland Reserve Activity Plan should be undertaken annually and a complete review of the plan undertaken at the end of the 5 year period.

Ongoing monitoring and maintenance of areas where weed control actions and revegetation actions have occurred should be undertaken on an annual basis. In addition the remaining areas of the site (such as the intact remnants) that do not currently contain weeds should be monitored on an annual basis to ensure new weed infestations do not become established.

In addition to monitoring the reserves for new weed infestations or regrowth of treated infestations the condition of the vegetation should also be monitored. This can be achieved through vegetation condition assessments and establishing photopoint monitoring.

Monitoring programs for the reserve may be developed by the ELC and TAFE students as part of their curriculum.

5.11.1 Vegetation Condition Assessment

To undertake a vegetation condition assessment of the reserve assessment zones or transects that contain/traverse different vegetation types or vegetation communities of varying condition should be established.

The vegetation condition assessments should be undertaken as per standard guidelines contained in the DPIWE document '*A Manual for Assessing Vegetation Condition in Tasmania (Ver. 1 2006)*'.

5.11.2 Photopoints

It is recommended that the photo points are set-up to record current condition of the site and future achievements in weed control and revegetation. These photopoints should be photographed annually and the photos stored for future reference. The procedure for setting up photopoints is outlined in Appendix 12.

6. IMPLEMENTATION PLAN

The following section provides a plan for the implementation of all actions identified in the plan for a 5 year period from 2014 to 2018.

Separate implementation plans have been developed for each reserve as management is likely to be carried out by different groups supported by council with minimal cross reserve actions occurring.

The implementation plans outline the actions to be undertaken and their location, treatment methods, desired outcomes, timing, estimated costing and priorities for each action.

Actions are prioritised into three categories based on their strategic importance, achievability, timing and the availability of funds.

- **1. high** priority – to be implemented within years 1-3
- **2. medium** priority – to be implemented as required years 4-5;
- **3. low** priority – to be implemented as funding allows.

Many of the actions are dependent on the availability of funding and as such priorities may change over the course of the plan period. Other actions will be carried out on a collaborative approach between the council, Landcare Groups and adjacent stakeholder groups to achieve implementation. A review of action priorities should be undertaken on an annual basis and changes made as required.

The actions outlined in this plan should form the basis for future funding applications through internal council grant sources and external grants from State and Federal programs.

Table 1 – Implementation Plan for **North Warrane Bushland Reserve**

Action #	Action	Outcome	Timing	Responsibility	Cost	Priority
REHABILITATION OF DEGRADED AREAS						
R1	Remove weeds and revegetation drainage line in North Warrane Bushland Reserve as required (AREA 1)	Maintain open space for fire break, improve amenity	2014-2018	CCC, ELC, TAFE	\$3000/yr	2
R2	Remove rubbish and weeds from degraded hillside (AREA 2)	Rubbish removed, aesthetic value of reserve improved.	2014-2018	CCC, ELC, TAFE, sports clubs	\$3000/yr	2
R3	Develop rehabilitation and trail plan for reserve	Strategic plan developed to target suitable areas. Planning exercise for TAFE students	2014-2016	TAFE, ELC, CCC	\$1000	1
R4	Plant 1000 trees in reserve as per rehabilitation plan developed by TAFE, ELC and CCC	Revegetation commenced to improve values of reserve. On ground experience gained by TFE students.	2014-2016 – grow & plant 2016-2018 - monitor	TAFE, ELC, CCC and spots clubs	\$2000/yr 1 & 2 \$500/yr	1
BUSHFIRE MANAGEMENT						
BF1	Develop Bushfire Management Plan for North Warrane Bushland Reserve, ELC bushland area and adjacent bushland..	Bushfire Management Plan developed and implemented	2014 -15	Consultant	\$10000	1
WEED CONTROL						
WC1	Eradicate gorse (as per Appendix 6).	Gorse eradicated from reserve	Spring-summer for foliage spraying. All year round for others methods. 2014/15	CCC, ELC, TAFE	\$1000	1
WC2	Control boneseed, blackberry and spanish heath (as per Appendix 6).	Infestations reduced with aim of long term eradication	Spring-summer for foliage spraying. All year round for others methods.	CCC, ELC, TAFE	\$3000/yr	1
WC3	Control declared weeds outside reserves	Reduce re-infestation or reserves from declared weeds outside reserve	Spring - summer for foliage spraying. All	CCC, landholders, land managers	Nil	1

			year round for others methods.			
WC4	Undertake primary control of agapanthus, briar rose, cotoneaster and watsonia (as per Appendix 6).	Infestations of environmental weeds controlled within reserves	Spring- summer 2014-2016	CCC, ELC, TAFE	\$500	2
WC5	Undertake primary control of radiata pines within reserve (as per Appendix 6).	Pines removed seed source reduced.	2015-2018	CCC/Contractor	\$1000-\$2000	3
WC6	Slash exotic grasses on annual basis to minimise fuel risk	Fire risk is reduced; aesthetics of reserve enhanced.	Annually during early summer.	CCC/Contractor	\$1000-\$2000/yr	1
WC7	Distribute weed information	Garden dumping reduced and inappropriate planting of weed species reduced.	All year round	CCC, ELC, TAFE	Nil	1
WC8	Weed control follow-up. Undertake annual survey of reserve and conduct follow up control when as required	Weeds species do not re-establish and no new infestation establish.	Annually for duration of plan.	CCC, ELC, TAFE, sports clubs	\$3000 per year	2
<u>FAUNA MANAGEMENT</u>						
FH1	Install a 'reduce speed from dawn to dusk' sign along Flagstaff Gully Road	Reduce level of road kill on Flagstaff Gully Road	2014-2018	CCC	\$2000	1
FH4	Educate private landholders about the need for balance between asset protection from bushfire and natural values.	Reduce excessive clearing of bushland around assets that could lead to further habitat loss.	2014-2018	CCC	\$1000	2
FH5	Review status of dog walking in Roscommon as part of the CCC Dog Management Policy Review Process	Assess dog requirements in Reserves through established process. Reduce dog litter in Reserves	2014	CCC	\$500	1
<u>ACCESS TO RESERVE AND LINKAGES</u>						
A1	Develop new access to north east corner of North Warrane Bushland Reserve off Flagstaff Gully Road.	Prevent access to the reserve through ELC land.	2014-2016	CCC	\$5000	2
A2	Upgrade access to Clarence Mountain Bike Park from North Warrane Oval.	Strengthen linkage between CMBP and NWR.	2015-2017	CCC, Contractor, TAFE	\$3000 - \$5000	2
A3	Upgrade entrance/access from Roebuck Street into reserve	Increase access options to NWR and increase usage.	2015-2017	CCC	\$2000	2

A4	Negotiate temporary access to the reserve from Acorn Drive with ELC. Incorporate footpath access to reserve if future subdivision proceeds.	Provides temporary link into reserve from Flagstaff Gully Creek track. Ensures permanent access is provided in future.	2014-2018	CCC, ELC	\$20000	1
A9	Enhance entrances to reserve	Increase awareness and usage of reserve	2016-2018	CCC	\$10000	2
<u>WALKING TRACKS</u>						
WT1	Plan and develop trial network through North Warrane Bushland Reserve and ELC bushland (where appropriate).	Collaboration provides new trails in reserve and training opportunity for TAFE students.	2014-2018	TAFE, ELC, CCC	\$10000	2
<u>SIGNAGE</u>						
S1	Develop and install signs North Warrane Bushland Reserve as per Figure 4.	Signage plan developed and Interpretative and directional signage erected to increase use of and awareness of reserve.	All year round	CCC, ELC, TAFE	\$5000	1
S2	Erect 'no rubbish dumping' sign along Flagstaff Gully Link.	Reduce rubbish dumping in reserve	2014	CCC	\$300	2
<u>OTHER MANAGEMENT ISSUES</u>						
M1	Construct fence along boundary with ELC to control access.	Prevents unauthorised access to ELC land	2014-2015	CCC, ELC	\$2000	1
M2	Clean up rubbish in reserves (initial clean up followed by regular 'Clean-up' days – volunteers are not to undertake clean up along Flagstaff Gully Link)	Rubbish is removed from both reserves	2014 - ongoing	CCC, ELC	\$200	2
M3	Ensure entrances to reserves include measures to prevent motor bike access	Prevent access to reserve by motorbikes.	2014-2018	CCC.	Nil – part of entrance cost	2
M5	Support Eastside Lutheran College Landcare Group and TAFE with management of North Warrane Bushland Reserve and college bushland remnant.	Existing Landcare group is supported to assist with rehabilitation of North Warrane Bushland Reserve.	2014-2018	CCC, ELC, TAFE	Nil	1

Table 2 – Implementation Plan for **Avoca Hill Bushland Reserve**

Action #	Action	Outcome	Timing	Responsibility	Cost	Priority
REHABILITATION OF DEGRADED AREAS						
R5	Remove weeds and soil heaps around communication tower off Radiata Drive. Landscape as required (AREA 1).	Main entrance area rehabilitated.	Autumn – winter	CCC	\$2000	1
R6	Remove weeds and rubbish from old quarry area in Avoca Hill Bushland Reserve (AREA 2). Undertake revegetation as required.	Degraded area improved.	2013-2014	CCC	\$2500	2
BUSHFIRE MANAGEMENT						
BF2	Develop Bushfire Management Plan for Avoca Hill Bushland Reserve and adjoining woodland.	Bushfire Management Plan developed and implemented	2014 -15	Consultant	\$10000	1
WEED CONTROL						
WC1	Eradicate serrated tussock infestation (as per Appendix 6).	Serrated tussock eradicated from reserve	Foliage spraying during Spring-summer. 2014/15	CCC/Contractor	\$1000	1
WC2	Control boneseed, blackberry and canary broom (as per Appendix 6).	Infestations reduced with aim of long term eradication.	Spring-summer for foliage spraying. All year round for others methods. 2014/15	CCC/Contractor	\$3000	1
WC3	Control declared weeds outside reserves	Reduce re-infestation or reserves from declared weeds outside reserve	Spring – summer for foliage spraying. All year round for others methods.	CCC, landholders, land managers	Nil	1
WC4	Undertake primary control of agapanthus and sweet pittosporum (as per Appendix 6).	Infestations of environmental weeds controlled within reserve	Spring- summer 2015 – 2017	Contractor	\$2000/yr	2
WC5	Undertake primary control of radiata pines within reserve (as per Appendix 6).	Pines removed seed source reduced	2014-2018	Contractor	\$2000	3

WC6	Slash exotic grasses on annual basis to minimise fuel risk	Fire risk is reduced; aesthetics of reserve enhanced.	Annually during early summer. 2014-18	CCC/Contractor	Nil	1
WC7	Distribute weed information	Garden dumping reduced and inappropriate planting of weed species reduced.	All year round	CCC/Landcare Group	Nil	1
WC8	Weed control follow-up. Undertake annual survey of reserves and conduct follow up control when as required	Weeds species do not re-establish or new infestation establish	Annually for duration of plan 2015-2018	CCC/Contractor	\$3000 per year	2
<u>FAUNA MANAGEMENT</u>						
FH2	Council to consider impacts on fauna movement between Meehan Range and Avoca Hill if future lots contain intact vegetation are to be developed.	Maintain vegetation link to larger areas of intact vegetation for wildlife movement.	2014-2018	CCC	Nil	1
FH3	Council to consider retention of leaf litter, dead wood and trees for fauna habitat when developing bushfire plan.	Important fauna habitat elements are retained in the reserve	2014-15	CCC	Nil	2
FH4	Educate private landholders about the need for balance between asset protection from bushfire and natural values.	Reduce excessive clearing of bushland around assets that could lead to further habitat loss.	2014-2018	CCC	\$1000	2
FH5	Review status of dog walking in Roscommon as part of the CCC Dog Management Policy Review Process	Assess dog requirements in Reserves through established process. Reduce dog litter in Reserves	2014	CCC	\$500	1
<u>PURCHASE OF ADJACENT LAND</u>						
PUR1	Council to investigate purchase of 19A Avoca Street using Public Open Space funding	Protect important vegetation and fauna habitat, improve habitat, protect aboriginal heritage site, incorporate important recreational site into reserve, protect skyline and scenic backdrop, and significantly improve access to the reserve.	2014-15	CCC	TBD	1

<u>ACCESS TO RESERVE AND LINKAGES</u>						
A5	Enhance main access to Avoca Hill Bushland Reserves off Radiata Drive to be upgraded.	Enhance access, increase usage of reserve.	2014-2016	CCC	\$10,000	1
A6	Improve access from Avoca Street and Gordons Hill Road	Improves access to reserve, leads to increased usage	2015-2017	CCC	\$4000	2
A7	Council to investigate lease arrangement with landowner at 79 Gordons Hill Road to gain formal access of Gordons Hill Road following improvement of footpath network on Gordons Hill Road	Footpath network and road crossing improved along Gordons Hill Road to ensure proposed new entrance is safe. Formalise existing entrance to reserve that is on private land.	2014-2018	CCC	\$20000	1
A8	Council to consider provision of greenway corridor from Avoca Hill to Pilchers Hill, Flagstaff Gully and the Meehan Range when assessing future development proposals on land to north of reserve	Corridor between Avoca Hill and Pilchers Hill, Flagstaff Gully and Meehan Range is maintained	2014 – 2018 as required.	CCC, landholders	Nil	1 to 3
A10	Council to name Radiata Street entrance the 'Marion Pinkard' Entrance.	Recognise previous ownership of area the contribution of Marion Pinkard to the community.	All year round	CCC	\$1000	2
<u>WALKING TRACKS</u>						
WT2	Upgrade existing track from Radiata Drive through to Gordons Hill Road and Avoca Street. Construct steps as required from Gordon Hill Road entrance. Reroute to avoid private land.	Improve condition of track to encourage use by wider public. Improve access from western side of reserve. Remove track from private land	2014	CCC	\$10000	1
WH3	Develop new tracks into reserve from Avoca Street and Gordons Hill Road if 19A Avoca Street can be purchased.	Improve access into reserve, remove informal tracks from private land	2016-2018	CCC	\$15000	2
WT4	Name main track through Avoca Hill Reserve the 'Lane Track'	Recognises the long history of the Lane family with the local area.	2014	CCC	\$1500 (signage)	1

<u>SIGNAGE</u>						
S1	Develop and install signage for Avoca Hill Bushland Reserve as per Section 5.8 and as shown in Figure 4	Signage plan developed and Interpretative and directional signage erected to increase use of and awareness of reserves.	All year round	CCC	\$5000	1
<u>RESERVE NAMING</u>						
N1	Change name of the reserve from Avoca Bushland Reserve to the 'Wiena Bushland Reserve'.	Recognise aboriginal heritage of area	2014	CCC	\$2000	1
N2	Produce new version of the Reserve Activity Plan to incorporate new name		2014 – before launch on website as final plan	CCC	\$1000	1
<u>OTHER MANAGEMENT ISSUES</u>						
M2	Clean up rubbish in reserves (initial clean up followed by regular 'Clean-up' days.	Rubbish is removed from both reserves	2014 - ongoing	CCC, ELC	\$300	2
M4	Support formation of new Landcare group for Avoca Hill Bushland Reserve	Landcare Group established	2013	CCC, Tas Landcare	Nil	1

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APPENDIX 1 – VEGETATION COMMUNITY DESCRIPTIONS

Vegetation Descriptions

TASVEG Unit - *Eucalyptus amygdalina* forest and woodland on sandstone

TASVEG Code – DAS

This community occurs across the north western portion of the Avoca Hill Bushland Reserve including the remnant vegetation on surrounding private lots (Figure 2).

Black peppermint is the dominant tree species with scattered white gum (*E. viminalis*) also present. The tall shrub layer is dominated by black wattle (*Acacia mearnsii*), black sheoak (*Allocasuarina littoralis*), silver wattle (*A. dealbata*) and native cherry (*Exocarpos cupressiformis*) with hopsbush (*Dodonaea viscosa*) dominant on the lower south facing slope. The understorey is dominated by grass and sedge species including speargrass (*Austrostipa* sp.), tussockgrass (*Poa* sp.), kangaroo grass (*Themeda triandra*), sagg (*Lomandra longifolia*), thatch sawsedge (*Gahnia radula*) and sword sedge (*Lepidosperma* spp.).

Common herb and orchid species present include running postman (*Kennedia prostrata*), dwarf riceflower (*Pimelea humilis*), bulbine lily (*Bulbine glauca*), bluebell (*Wahlenbergia* sp.), tiger orchid (*Diuris sulphurea*) and sun orchid (*Thelymitra* sp.)

TASVEG Unit - *Eucalyptus viminalis* grassy forest and woodland

TASVEG Code - DVG

This community occurs on the south and east facing hillside of the North Warrane Bushland Reserve and extends along the edge of the drain at the southern boundary and fringes Flagstaff Gully Link (Figure 3). The community also occurs across the eastern side of the Avoca Hill Bushland Reserve (Figure 2).

White gum is the dominant tree species with occasional blue gums (*E. globulus*) and black peppermint (*E. amygdalina*) also present. The tall shrub layer is dominated by black wattle (*Acacia mearnsii*) and black sheoak (*Allocasuarina littoralis*) with broadleaf hopsbush (*Dodonaea viscosa*) and silver wattle (*A. dealbata*) also common. The understorey is dominated by sedge species including sagg and sword sedge species (*Lepidosperma* sp.) with few low shrubs present. Native grasses such as speargrass (*Austrostipa* sp.), tussockgrass (*Poa* sp.) and loose plume grass (*Dichelachne inaequiglumis*) are abundant whilst tiger orchid (*Diuris sulphurea*), bulbine lily (*Bulbine glauca*), dwarf riceflower (*Pimelea humilis*) and bluebell (*Wahlenbergia* sp.) are also common.

The North Warrane vegetation is in generally in poor condition with low diversity and significant weed infestation dominating the understorey. This is due to frequent disturbance events most such as fire. The vegetation on the top side of the drain and adjacent to the ELC is more intact and contains a high number of low shrub, native grass and herb species.

The community within the Avoca Hill Bushland Reserve is in good condition with a more intact understorey dominated by native species. There are scattered environmental weed species in the reserve and exotic grasses and herbs are common around the margins and along the tracks. There is significant dieback in the mature white gum in the reserve (especially on the hilltop).

TASVEG Unit – Regenerating cleared land

TASVEG Code - FRG

This vegetation community describes areas that have been previously cleared and are now regenerating with predominantly native species. This community occurs along the northern and eastern margins of the North Warrane Bushland Reserve and also includes some vegetation on the hill side before it merges into white gum woodland (Figure 2). Blackwattle is the dominant trees species with isolated emergent white gums. The understory is largely exotic grasses with a mixture of native shrubs and grasses including speargrass (*Austrostipa* sp.), tussockgrass (*Poa* sp.) and wallabygrass (*Rhytidosperma* sp.). Due to the previously disturbed nature of this community, its proximity to roads and its generally low management regime there are a number of environmental weeds present including blackberry and boneseed.

TASVEG Unit – Urban Miscellaneous

TASVEG Code - FUM

This community includes the playing fields and clubrooms at the North Warrane Oval (Figure 2). The community is dominated by exotic grasses such as cocksfoot (*Dactylis glomerata*, *Fescue* (*Vulpia bromoides*), bentgrass (*Agrostis* sp.) and soft broom (*Bromus hordeaceus*) and herbs. There are also scattered native species within this community including native grasses such as speargrass (*Austrostipa* sp.), tussockgrass (*Poa* sp.) and wallabygrass (*Rhytidosperma* sp.) and silver wattle, eucalypt species and native shrubs and herbs. A number of environmental weed species also occur within this community including boneseed, spanish heath and blackberry.

APPENDIX 2 – FLORA SPECIES LISTS

Flora species list recorded at Avoca Hill and North Warrane Bushland Reserves.

Recorder: A. Welling

Date: Nov 2013

ANBR = Avoca Hill Bushland Reserve

NWBR = North Warrane Bushland Reserve

e = endemic i = introduced d = declared weed

DICOTYLEDONAE

AHBR	NWBR	Name	Common Name	TSPA	EPBCA	End.	Family
x		<i>Carpobrotus rossii</i>	native pigface				AIZOACEAE
x	x	<i>Arctotheca calendula</i>	capeweed			i	ASTERACEAE
	x	<i>Bellis perennis</i>	english daisy			i	ASTERACEAE
x	x	<i>Cassinia aculeata</i> subsp. <i>aculeata</i>	dollybush			n	ASTERACEAE
		<i>Chrysanthemoides</i>					
x	x	<i>monilifera</i> subsp. <i>monilifera</i>	boneseed			i, d	ASTERACEAE
x	x	<i>Chrysocephalum</i>	common				ASTERACEAE
		<i>apiculatum</i>	everlasting				ASTERACEAE
x		<i>Chrysocephalum</i>	clustered				ASTERACEAE
		<i>semipapposum</i>	everlasting				ASTERACEAE
x	x	<i>Cirsium vulgare</i>	spear thistle			i	ASTERACEAE
x	x	<i>Hypochaeris radicata</i>	rough catsear			ni	ASTERACEAE
x	x	<i>Leontodon saxatilis</i>	hairy hawkbit			ni	ASTERACEAE
x	x	<i>Leptorhynchus squamatus</i>	scaly buttons				ASTERACEAE
	x	<i>Logfia gallica</i>	narrow cudweed			i	ASTERACEAE
	x	<i>Olearia ramulosa</i>	twiggy daisybush				ASTERACEAE
			tree				
x	x	<i>Ozothamnus ferrugineus</i>	everlastingbush				ASTERACEAE
	x	<i>Ozothamnus obcordatus</i>	yellow everlastingbush				ASTERACEAE
	x	<i>Senecio glomeratus</i>	purple fireweed				ASTERACEAE
		<i>Senecio linearifolius</i> var. <i>linearifolius</i>	fireweed groundsel				ASTERACEAE
x	x	<i>Sonchus asper</i>	prickly sowthistle			i	ASTERACEAE
x	x	<i>Taraxacum officinale</i>	common dandelion			i	ASTERACEAE
x		<i>Hirschfeldia incana</i>	hoary mustard			i	BRASSICACEAE
x	x	<i>Wahlenbergia stricta</i> subsp. <i>stricta</i>	tall bluebell			n	CAMPANULACEAE
	x	<i>Scleranthus fasciculatus</i>	spreading knawel	v			CARYOPHYLLACEAE
x	x	<i>Allocasuarina littoralis</i>	black sheoak				CASUARINACEAE
x	x	<i>Allocasuarina verticillata</i>	drooping sheoak				CASUARINACEAE
		<i>Einadia nutans</i> subsp. <i>nutans</i>	climbing saltbush				CHENOPODIACEAE
x	x	<i>Dichondra repens</i>	kidneyweed				CONVOLVULACEAE
x	x	<i>Crassula sieberiana</i>	rock stonecrop				CRASSULACEAE
x	x	<i>Hibbertia hirsuta</i>	hairy guineaflower			e	DILLENIACEAE
	x	<i>Drosera peltata</i>	pale sundew				DROSERACEAE
x	x	<i>Astroloma humifusum</i>	native cranberry				EPACRIDACEAE
	x	<i>Erica lusitanica</i>	spanish heath			i, d	ERICACEAE
	x	<i>Bossiaea prostrata</i>	creeping bossia				FABACEAE
	x	<i>Daviesia ulicifolia</i>	spiky bitterpea				FABACEAE

x	x	<i>Genista monspessulana</i>	montpellier broom	i, d	FABACEAE
x		<i>Indigofera australis</i>	native indigo		FABACEAE
x		<i>Kennedia prostrata</i>	running postman		FABACEAE
	x	<i>Pultenaea juniperina</i>	prickly beauty		FABACEAE
	x	<i>Ulex europaeus</i>	gorse	i, d	FABACEAE
	x	<i>Vicia sativa</i>	vetch	i	FABACEAE
		<i>Fumaria muralis subsp. muralis</i>	wall fumitory	i	FUMARIACEAE
	x	<i>Gonocarpus tetragynus</i>	common raspwort		HALORAGACEAE
x	x	<i>Acacia dealbata subsp. dealbata</i>	silver wattle		MIMOSACEAE
x	x	<i>Acacia longifolia</i>	coast wattle		MIMOSACEAE
x	x	<i>Acacia mearnsii</i>	black wattle		MIMOSACEAE
x	x	<i>Eucalyptus amygdalina</i>	black peppermint	e	MYRTACEAE
	x	<i>Eucalyptus globulus</i>	blue gum		MYRTACEAE
		<i>Eucalyptus viminalis subsp. viminalis</i>	white gum		MYRTACEAE
x	x	<i>Oxalis perennans</i>	grassland woodsorrel		OXALIDACEAE
		<i>Bursaria spinosa subsp. spinosa</i>	prickly box		PITTOSPORACEAE
x		<i>Pittosporum undulatum</i>	pittosporum	i	PITTOSPORACEAE
x	x	<i>Plantago coronopus</i>	buckshorn plantain	i	PLANTAGINACEAE
x		<i>Comesperma volubile</i>	blue lovecreeper		POLYGALACEAE
x	x	<i>Acetosella vulgaris</i>	sheep sorrel	i	POLYGONACEAE
x	x	<i>Lysimachia arvensis</i>	scarlet pimpernel	ni	PRIMULACEAE
x	x	<i>Ranunculus sp.</i>	buttercup		RANUNCULACEAE
x	x	<i>Acaena echinata</i>	spiny sheepsburr		ROSACEAE
	x	<i>Acaena novae-zelandiae</i>	common buzzy		ROSACEAE
		<i>Cotoneaster glaucophyllus var. serotinus</i>	largeleaf cotoneaster	i	ROSACEAE
	x	<i>Prunus sp.</i>	plum	i	ROSACEAE
	x	<i>Rosa rubiginosa</i>	sweet briar	i	ROSACEAE
x	x	<i>Rubus sp. Tasmania</i>	blackberry	i, d	ROSACEAE
x	x	<i>Galium aparine</i>	cleavers	i	RUBIACEAE
x	x	<i>Exocarpos cupressiformis</i>	common native-cherry		SANTALACEAE
		<i>Dodonaea viscosa subsp. spatulata</i>	broadleaf hopbush		SAPINDACEAE
x	x	<i>Pimelea humilis</i>	dwarf riceflower		THYMELAEACEAE

GYMNOSPERMAE

AHBR	NWBR	Name	Common Name	TSPA	EPBCA	End.	Family
x	x	<i>Pinus radiata</i>	radiata pine			i	PINACEAE

MONOICOTYLEDONAE

AHBR	NWBR	Name	Common Name	TSPA	EPBCA	End.	Family
	x	<i>Carex appressa</i>	tall sedge				CYPERACEAE
x	x	<i>Gahnia radula</i>	thatch sawsedge				CYPERACEAE
	x	<i>Lepidosperma concavum</i>	sand swordedge				CYPERACEAE
	x	<i>Lepidosperma curtisiae</i>	little swordedge				CYPERACEAE
	x	<i>Lepidosperma inops</i>	fan sedge			e	CYPERACEAE
			variable				
x	x	<i>Lepidosperma laterale</i>	swordsedge				CYPERACEAE
	x	<i>Watsonia meriana</i>	watsonia			i	IRIDACEAE
	x	<i>Juncus articulatus</i>	jointed rush			i	JUNCACEAE

	x	<i>Juncus pallidus</i>	pale rush				JUNCACEAE
x		<i>Luzula sp.</i>	woodrush				JUNCACEAE
x		<i>Agapanthus sp.</i>	agapanthus		i		LILIACEAE
x	x	<i>Bulbine glauca</i>	bluish bulbine-lily				LILIACEAE
x	x	<i>Dianella revoluta</i> var. <i>revoluta</i>	spreading flaxlily				LILIACEAE
x	x	<i>Thysanotus patersonii</i>	twining fringelily				LILIACEAE
x		<i>Caladenia sp.</i>					ORCHIDACEAE
	x	<i>Chiloglottis reflexa</i>	autumn bird-orchid				ORCHIDACEAE
x	x	<i>Diuris sulphurea</i>	tiger orchid				ORCHIDACEAE
	x	<i>Microtis unifolia</i>	common onion-orchid				ORCHIDACEAE
x		<i>Pterostylis pedunculata</i>	maroonhood				ORCHIDACEAE
	x	<i>Thelymitra bracteata</i>	leafy sun-orchid	e			ORCHIDACEAE
	x	<i>Agrostis capillaris</i>	browntop bent		i		POACEAE
x	x	<i>Aira caryophyllea</i> subsp. <i>caryophyllea</i>	silvery hairgrass		i		POACEAE
	x	<i>Aira elegantissima</i>	delicate hairgrass		i		POACEAE
x	x	<i>Austrodanthonia caespitosa</i>	common wallabygrass				POACEAE
	x	<i>Austrostipa nodosa</i>	knotty speargrass	r			POACEAE
x	x	<i>Austrostipa pubinodis</i>	tall speargrass				POACEAE
x	x	<i>Austrostipa rudis</i> subsp. <i>australis</i>	southern speargrass				POACEAE
x	x	<i>Austrostipa semibarbata</i>	fibrous speargrass				POACEAE
x	x	<i>Briza maxima</i>	greater quaking-grass		i		POACEAE
	x	<i>Briza minor</i>	lesser quaking-grass		i		POACEAE
	x	<i>Bromus hordeaceus</i>	soft brome		i		POACEAE
x	x	<i>Dactylis glomerata</i>	cocksfoot		i		POACEAE
	x	<i>Deyeuxia quadriseta</i>	reed bentgrass				POACEAE
	x	<i>Dichelachne rara</i>	common plumegrass				POACEAE
	x	<i>Distichlis distichophylla</i>	australian saltgrass				POACEAE
	x	<i>Holcus lanatus</i>	yorkshire fog		i		POACEAE
x	x	<i>Microlaena stipoides</i> var. <i>stipoides</i>	weeping grass				POACEAE
x		<i>Nassella trichotoma</i>	serrated tussock		i, d		POACEAE
	x	<i>Phalaris aquatica</i>	toowoomba canarygrass		i		POACEAE
	x	<i>Poa labillardierei</i>	tussockgrass				POACEAE
x	x	<i>Poa rodwayi</i>	velvet tussockgrass				POACEAE
x	x	<i>Rytidosperma caespitosum</i>	common wallabygrass				POACEAE
x	x	<i>Themeda triandra</i>	kangaroo grass				POACEAE
x	x	<i>Vulpia bromoides</i>	squirreltail fescue		i		POACEAE
x	x	<i>Lomandra longifolia</i>	sagg				XANTHORRHOACEAE
PTERIDOPHYTA							
AHBR	NWOR	Name	Common Name	TSPA	EPBCA	End.	Family
x	x	<i>Pteridium esculentum</i>	bracken				DENNSTAEDTIACEAE

APPENDIX 3 – THREATENED FLORA AND FAUNA RECORDS

THREATENED FLORA RECORDED WITHIN A 500M RADIUS OF RESERVES

Species	Status TSPA	Status EPBCA	Comments
<i>Austrostipa blackii</i> Crested speargrass			Recorded in DVG grassland adjacent to North Warrane Reserve. Was not identified but may occur within the reserve.
<i>Eryngium ovium</i> blue devil	v		Found in gullies, roadsides, <i>Themeda</i> grassland and open grassy woodlands, often in damp clays. Distinctive species. Not recorded in reserves.
<i>Eucalyptus risdonii</i> risdon peppermint	r		Occurs amongst scrub and low open forest on Permian mudstone soils. Not present in reserves.
<i>Lepidium pseudotasmanicum</i> shade peppergrass	r		Usually occurs on bare ground in grassland and grassy woodland. Not recorded in reserves
<i>Senecio squarrosa</i> leafy fireweed	r		Recorded in DVG grassland adjacent to North Warrane Reserve. Was not identified but may occur within the reserve.
<i>Velleia paradoxa</i> spur velleia	v		Known from grassland and grassy woodland from the south through the Midlands to Launceston. Recorded in DVG grassland adjacent to North Warrane Reserve. Was not identified within the reserves.
<i>Vittadinia muelleri</i> Narrowleaf new-holland-daisy	r		Recorded in DVG grassland adjacent to North Warrane Reserve. Was not identified but may occur within the reserve.

Notes on preferred habitats for threatened plants sourced from the Threatened Species Unit (DPIPWE)

THREATENED FAUNA RECORDED WITHIN A 500M RADIUS OF SITE.

Species	Status TSPA	Status EPBCA	Comments
<i>Perameles gunnii gunnii</i> Eastern barred bandicoot		r	Bandicoots prefer grassy woodland areas with dense cover and pasture areas nearby. No sign recorded during surveys however reserves provide some suitable habitat.
<i>Sarcophilus harrisii</i> tasmanian devil	e	EN	No denning habitat in reserves. Devil records from Flagstaff Gully Road so may utilise North Warrane Oval Bushland from Meehan Range. Due to urban nature of Avoca Hill Bushland Reserve species unlikely to utilise this reserve.

Notes on preferred habitats sourced from Bryant and Jackson 1999

APPENDIX 4 – BIRD SURVEYS

Bird surveys within the reserves was under taken by members of Birdlife Tasmania in October 2013. Additional bird species to those recorded are likely to utilise the reserves, however where not apparent at the time of the one off survey. An additional species list compiled by local resident Mrs M. Pinkard is also included which provides a record of species seen in the Avoca Hill Bushland Reserve and surrounds over a 40 year period.

Bird Surveys - Clarence City Council Reserves

Observers: Denis Abbott, Sue Drake and Bruce Longmore

Avoca Reserve, Warrane - access off Radiata Drive, walking past the communications tower and along the ridge

Date, 22/10/13, Time, 12.25 – 12.45

Birds seen/heard:

Blackbird (i)
Black-headed Honeyeater
Dusky Woodswallow
Forest Raven
Green Rosella
Grey Fantail
House Sparrow (i)
Pallid Cuckoo
Scarlet Robin
Silvereye
Starling (i)
Striated Pardalote
Superb Fairy Wren
Welcome Swallow
Yellow-rumped Thornbill

This was a surprising group of birds for such a small patch of bush, hemmed in by housing and major roads.

North Warrane Oval Bushland – access from parking area below Eastside Lutheran College, following rough track uphill and across to sports oval

Date, 22/10/13, Time, 1.05 -1.25

Birds seen/heard:

Blackbird (i)
Brown Thornbill
Forest Raven
Grey Fantail
Masked Lapwing
Spotted Pardalote
Starling (i)

This certainly is a degraded patch of bushland, riddled with boneseed bushes throughout and blackberry vines on the fringes. From a birding point of view, it is overwhelmed with noise pollution from the highway, such that it was very difficult to hear bird calls and do the survey.

Birds (alphabetical order)	~1970s?	Jan 1981?	12-04-84	02-01-91
Black faced cuckoo shrike	✓	✓		✓
Blackbird (i)	✓	✓	✓	✓
Boobook owl	✓			
Cockatoo black	✓			
Cuckoo bronze	✓	?✓		
Cuckoo pallid	✓	?✓		
Currawong black/grey	✓			
Currawong clinking	✓	✓		
Dove spotted turtle (i)	✓			
Dusky woodswallow	✓	✓	✓	
Golden whistler	✓	✓	✓	
Goldfinch (i)	✓	✓	✓	✓
Green rosella	✓			
Greenfinch (i)	✓	✓		
Grey butcherbird	✓	✓		✓
Grey fantail	✓		✓	✓
Grey shrike thrush	✓	✓	✓	✓
Ground thrush	✓	✓		✓
Hawk	✓			
Honeyeater black headed	✓	✓	✓	✓
Honeyeater crescent	✓		✓	
Honeyeater Eastern spinebill	✓	✓	✓	✓
Honeyeater little wattlebird	✓	✓		✓
Honeyeater new holland	✓	✓	✓	✓
Honeyeater strong billed	✓	✓	✓	
Honeyeater yellow throated	✓	✓	✓	✓
Honeyeater yellow wattlebird	✓	✓		✓
Kookaburra	✓	✓		✓
Pigeon (local racing?)(i)	✓			
Raven (crow)	✓			
Robin dusky	✓		✓	
Robin scarlet	✓	✓	✓	
Sacred kingfisher	✓			
scrub tit			?	
White/Silver eye	✓	✓	✓	✓
Sparrow (i)	✓	✓		
Spotted pardolote	✓	?✓	✓	?✓
Striated pardolote	✓	?✓		?✓
Superb blue wren	✓	✓	✓	✓
Swallow welcome	✓	✓		
Thornbill Brown		✓	✓	?✓
Thornbill Tasmanian	✓	✓		?✓
Thornbill yellow rumped	✓	✓	✓	✓

APPENDIX 5 - SUMMARY OF COMMUNITY CONSULTATION

Initial Community Consultation

As part of the development of the Reserve Activity Plan for the Avoca Hill and North Warrane Bushland Reserves, consultation was undertaken with adjoining landowners and stakeholders, user groups and the broader community. Direct consultation was undertaken with the following stakeholders – Eastside Lutheran College (Inc. principal and Landcare Coordinator), TAFE, Eastside Rugby Club, St Aidens Cricket Club and Fairway Rise Lifestyle Village. In addition ‘walk and talk’ sessions were held in the reserves on the 17th November 2013. These events were facilitated by the Clarence City Council and Andrew Welling.

The Avoca Hill event was attended by 16 residents whilst the North Warrane events was attend by 4 residents.

In addition to information gathered at the community events, six (6) written feedback forms or emails were received regarding the for the Avoca Hill Bushland Reserve. The responses received during stakeholder meetings, the ‘walk and talk’ session and through the feedback forms is summarised in the following table.

AVOCA HILL BUSHLAND RESERVE

Management Issue/comments	Number of responses
Concerned about fire management, want fuel levels reduced	5
Would like improved signage	5
Better access to reserve, improve tracks	4
Improve and/or establish walking track in reserve	3
Concerns about native wildlife in reserve and browsing in gardens during dry spells and winter. Also roadkill from wildlife moving between reserves	3
Concern re access to reserve through private property (1 landowner)	2

NORTH WARRANE BUSHLAND RESERVE

Management Issue/comments	Number of responses
Would like links to other areas improved	5
Trail bikes in reserve and surrounds a concern	5
Improve and/or establish walking track/s loop in reserve	4
Vandalism of clubrooms	1
Concern re access to reserve through private property (ELC)	3
Weed Management	3
Would like to utilize the reserve for Landcare activities	3
Dumping of rubbish in reserve and along adjacent roadways	3
Would like playground and BBQ area in reserve	2
Damage to trees (wattle grubs)	1
Need dog waste dispenser	1

The feedback gathered from major stakeholders is summarised below;

Ralph Zapart - Principal, Eastside Lutheran College

General Discussion:

- are around 90 students at the College
- have a good arrangement with one of the parents (Karen), who runs Landcare activities at the College, and has been instrumental in managing the bushland area
- recently had a Landcare day with the students, who were involved in hands on activities
- intend to hold four Landcare days per year, where students spend all day working in the bushland
- have removed up to 80% of the boneseed on the site
- trails through bushland are informal, and have developed over the years
- would like to establish a formal reserve for threatened flora and fauna from the local area on the bushland within the College property - this could become a covenant on the title if thought to be the best course of action
- the College would like to share the bushland reserve with the public, but in a managed way, to ensure safety and that visitors have respect for the environment
- the College do not have a Bushfire Management Plan for the reserve
- the College values the bushland as an educational tool for students
- Bunnings have recently supplied sponsorship to aid in the clean up of the College grounds, including supplying protective clothing for students, equipment and tools
- have also been working along the edge of the road to the College to remove exotic pines and replant with other species
- have recently had discussions with Tas Fire re a management burn
- are interested to explore the possibility of working in partnership with TAFE, Council and others to manage the bushland on the College campus and adjoining area
- would like to explore the option of re-establishing the fence between the College bushland and Council land, with contribution from Council as the adjoining land owner
- there is the opportunity for the development of an orienteering course for both college and public use
- college is considering the opportunity to develop a playground and barbecue on their land, which would be available for the community to use

Issues:

- public access through the reserve via the informal trails network - concerned about liability and security issues (e.g. if a member of the public is injured on College land)
- dumping of rubbish occurs frequently, particularly off Flagstaff Link Road - unsightly and a fire hazard
- weeds - on College grounds and surrounding areas
- recent destruction of black wattle trees within the school property by a person/people looking for wattle grubs
- the fence that bounded the College was removed illegally and has not been replaced
- trail bikes are an issue on the College land and surrounding area, including the Council land at North Warrane Oval - police recently confiscated a motorbike from a person on the College grounds, following a complaint from the public
- some students walk to school, but there is a concern regarding safety of trails etc (indicates that Avoca Hill bushland could be used as a link for students to walk to school, if trail network improved)

Karen Hawes - Volunteer Landcare Coordinator, Eastside Lutheran College

- large number of weeds within the Council bushland area around the oval
- community Landcare group are keen to undertake weed control on this site, to minimise spread of weeds into Lutheran College bushland and surrounding area - particularly boneseed into college bushland
- Council have done a lot of spraying of weeds around the oval - suggests this may have contributed to the lack of understory in this area (dominated by silver wattle)
- have focused on controlling perennial weeds around the College and other reserves where the group is working
- opportunity to establish locally indigenous species back into the College bushland area, such as *E. risdonii*, (e.g. that are found in the Meehan Range), but now absent from remnant bushland (reserve for rare and threatened species)
- almost all of the black wattle trees found on the college land have been destroyed by people looking for wattle grubs – occurs during spring.

- as a parent of children at the Lutheran College, is concerned about the significant number of people traversing the bushland area, and through the College grounds - people assume it is public/Council land
- public access through the College grounds is a significant security risk
- suggests need to reintroduce the fence between the two properties to deter people from crossing onto the College property
- dumping of rubbish is a big problem - along the edge of both the Council reserve and College land (off Flagstaff Link Road), including garden waste, tyres, and general household rubbish
- Council don't appear to be taking responsibility for cleaning up rubbish along road verges - needs to be removed straight away, to try to deter others from doing the same
- suggest signage indicating dumping of rubbish will attract a fine may help
- suggest that the degraded appearance of the Council reserve around the oval doesn't engender community pride, and may exacerbate activities such as dumping of rubbish
- Karen and others involved with the College clean up rubbish
- would like to see the profile of the Council reserve upgraded, and it made more accessible for the community
- would like to see the development of an orienteering course within the Council reserve, that could be used by schools
- could also develop a loop track for dog walking and general community access, but not onto College land
- would also like to see the playground associated with the oval replaced, including a community bbq area
- supports the concept of establishing safe pedestrian and cycling connections within and between the reserves and surrounds residential areas
- trail bikes are an issue around the oval and on the College grounds - using these areas to access the Meehan Range - evidence that they are spreading weeds, in particular Spanish heath

Glynn Howells, Conservation and Land Management Teacher, TAFE (and students)

General Discussion:

- the work that TAFE has undertaken to develop the Flagstaff Gully Track has been very well-received, and is popular with the local community, and staff and students based at the Clarence Campus (e.g. lunch time 'power walks')
- improved infrastructure and recreational trail lead to the local community acting as the 'eyes and ears', and self-policing is happening in the area
- residents of the Presbyterian Care Tasmania facility use this track everyday to encourage general health and wellbeing, and would likely be interested in other nearby routes, that were easily accessible to the elderly
- mountain bikers also use the TAFE trail network
- bushland is an important component of the educational program - it is the 'classroom' for a lot of skill areas
- dog walkers frequent both Council bushland reserves
- pedestrians also regularly use a short cut through the Lutheran College bushland
- suggests the College could leverage off National Tree Day for their Landcare activities, and this may be something TAFE students could be involved in
- the Conservation and Land Management course requires new bushland areas close by to use as teaching locations, where land management skills can be practiced (e.g. weed management, rehabilitation and trail construction)
- the degraded bushland around the North Warrane Oval could be a good site for this
- potential to work in partnership with Council to undertake land management works at both reserves, with TAFE students as a free semi-skilled labour force, with support from Council (e.g. assistance with the costs of chemicals for weed eradication, removal of rubbish from the site etc)
- are interested in exploring opportunities to work in partnership with the Lutheran College to manage bushland areas and assist with skill development/education
- would be particularly interested in being involved in the development of an interpretive trail

Issues:

- dog waste - need dog tidy bags and bins at the start of trails or entry points to reserves
- trail bikes are still an issue in the area, but the frequency of use seems to have declined recently
- have considered the possibility of developing a trail through the TAFE Campus - along the southern side of Flagstaff Link Road, between TAFE and the Oakdale private road - indicates that the terrain is steep, and Oakdale may not be open to public access through their site
- suggests utilising the private road network, with little traffic on it, may be more practical option

- Flagstaff Link Road is very busy, with large vehicles, and not safe for cyclists or pedestrians

Carol Joseph - Fairway Rise Lifestyle Village

General Discussion:

- walking opportunities are important for health - there are opportunities for easily accessible loops of varying length close to Fairway Rise that could include bushland areas
- residents organise walking groups among themselves
- Fairway Rise was required to construct a footpath along the Tasman Highway boundary of the property - this is already popular with residents from the lifestyle village, as well as general public (e.g. many local people use it to access Eastlands Shopping Centre)
- there are residents at Fairway Rise who may be interested in being able to access the adjacent bushland as part of their walking loop
- there is potential for Fairway Rise to create a pedestrian connection through to the adjacent Council bushland, that could connect to their internal path system (near the aged care facility in the north-western corner), but this would be for residents only - wouldn't be advertised or open to the general public to use for security reasons
- indicates that soccer is played at the North Warrane Oval as well as rugby and cricket

Issues:

- currently difficult for residents and general public to access the southern section of the adjacent council bushland - no street frontage - have to cross private land
- there are short missing sections of the new footpath along the Tasman Highway boundary at both ends (to connect to Flagstaff Gully Road to the north, and to Gordons Hill Road to the south)
- Flagstaff Gully Road does not have a footpath - people walk on the road – this is generally fairly safe, residential traffic only
- trail bikes are seen around the area, particularly around Selby Place
- signage is needed so that people can find their way around trails and streets
- there is an over-population of wallabies in the area - live in the Council reserve - damaging new landscaping, and suggests need to be controlled
- there is also a lot of road kill along Gordons Hill Road

Jim Hobden - Eastside Rugby Club

- club has been based at the North Warrane Oval since 1964 - self-funded, but supported by council
- has experienced vandalism over the years, although this has improved over recent years - facility is fairly secure and hard to break into now
- St Aidens Cricket club share the clubrooms and ground during the summer months, and rugby has a good relationship with the cricket club
- Adult soccer is also played on the ground (6 teams, around 300 members), but doesn't share the same level of responsibility for the facility, or help with maintenance/cleaning
- regularly use trails through the College land and onto Council reserve from Dampier Street and pedestrian access to oval
- club training includes use of the trails around the oval and in the college grounds
- also use the short hill on the college road (below tennis court) for fitness training
- local running group would use the smaller bush reserves if the trails were upgraded
- there are a lot of people that walk dogs through the oval and surrounding Council land, and onto College property
- trail bikes are sometimes an issue, and are generally people that live very close to the oval - dig up dirt tracks around the oval
- would like to see better trail systems through the reserves, particularly circuits

Community Consultation Period for Draft Reserve Activity Plan

The draft Avoca Hill and North Warrane Bushland Reserve Activity Plan was released for public comment in February 2014 with the comment period closing on the 8th April 2014.

APPENDIX 6 –REVEGETATION NOTES AND SPECIES LIST

Revegetation may be undertaken in some areas of the North Warrane Reserve. The following general notes are provided as a guide however if the revegetation work is carried by the College and TAFE determining the methodology will form part of the educational exercise.

Site preparation – Areas to be planted should be foliage sprayed prior to planting to kill exotic grasses and reduce competition for the seedlings. In addition the ground should be scalped at the time of planting to remove the root mass and break up the ground.

Species selection – Species selected for the revegetation projects should occur locally and plants grown for the site should ideally be grown from seed of local provenance and be well-established and hardened off prior to planting. Refer to table below for a suggested revegetation species list.

Plant protection – All trees and shrubs should be protected from browsing by native animals by tree guards. The condition of these guards should be monitored and any damaged or missing guards replaced until the plants are well established. Plantings along the creekline should not be bagged as they can be washed downstream during flood or storm events.

Watering – dependent on the weather conditions following revegetation projects some plants may require supplementary watering during warm, dry periods until they become established.

Suggested Revegetation Species list

Species name	Common Name	Form	Location to be planted - revegetation site#
<i>Eucalyptus amygdalina</i>	Black peppermint	tree	North Warrane and Avoca Hill.
<i>Eucalyptus viminalis</i> subsp. <i>viminalis</i>	white gum	tree	North Warrane and Avoca Hill
<i>Eucalyptus risdonnii</i>	Risdon peppermint	tree	North Warrane
<i>Acacia dealbata</i> subsp. <i>dealbata</i>	silver wattle	tree	North Warrane and Avoca Hill
<i>Acacia mearnsii</i>	Black wattle	Small tree	North Warrane
<i>Allocasuarina littoralis</i>	black sheoak	tall shrub	North Warrane
<i>Allocasuarina verticillata</i>	drooping sheoak	tall shrub	North Warrane
<i>Bursaria spinosa</i> subsp. <i>spinosa</i>	prickly box	tall shrub	North Warrane
<i>Dodonaea viscosa</i> subsp. <i>spatulata</i>	broadleaf hopsbush	shrub	North Warrane and Avoca Hill.
<i>Pultenaea juniperina</i>	heartleaf bushpea	shrub	North Warrane and Avoca Hill
<i>Ozothamnus obcordata</i>	yellow everlasting	small shrub	North Warrane
<i>Dianella</i> sp.	flaxlily	lily	North Warrane and Avoca Hill
<i>Lomandra longifolia</i>	sagg	sedge	North Warrane and Avoca Hill
<i>Lepidosperma concavum</i>	sand swordedge	sedge	North Warrane

APPENDIX 7 – WEED SPECIES WITHIN RESERVE

Declared Weeds

Five (5) declared weed species occur in the two reserves with four recorded at Avoca Hill Bushland Reserve and another four (4) at North Warrane.

Blackberry (*Rubus fruticosus*).



Photo - www.weeds.asn.au

Extent of infestation – Common weed of North Warrane Bushland Reserve with significant infestations along the drainage line and on bank and along roadside (Figure 3). Scattered plants occur in Avoca Hill Bushland Reserve at Radiate Drive entrance and around communication tower and along south eastern boundary (Figure 2).
Control Technique – Foliage spray larger infestations; cut and paste isolated plants. Remove all debris from site.

Boneseed (*Chrysanthemoides monilifera* subsp. *monilifera*).



Photo – www.stca.tas.gov.au

Extent of infestation - Boneseed is scattered through the Avoca Hill Bushland Reserve and widespread and common in the North Warrane Bushland Reserve (Figure 4).

Control Technique – Hand pull small plants; cut and paste larger plants. Remove all debris from site.

Gorse (*Ulex europaeus*).



Photo – www.stca.tas.gov.au

Extent of infestation – Isolated plants occur within the North Warrane Bushland Reserve (Figure 3).

Control Technique – Hand pull small plants when soil is moist or spot spray. Remove all debris from site.

Serrated tussock (*Nassella trichotoma*)



Photo: Birgitte Verbeek

Extent of infestation – A small population of approximately 15 plants occurs near the communication tower in the Avoca Hill Bushland Reserve (Figure 2).

Control Technique – Foliage spray all plants using selective herbicide. Monitor site.

Spanish heath (*Erica lusitanica*)



Extent of infestation – Isolated plants were recorded amongst the remnant bushland above the drain in North Warrane Bushland Reserve (Figure 3).

Control Technique – Foliage spray larger plants. Hand pull seedlings when soil is moist to ensure all roots are removed. Hand. Remove all debris from site.

Gorse, blackberry, boneseed and canary broom are also listed as Weeds of National Significance (WONS).

Environmental Weeds

Environmental weeds have the ability to out-compete native species and reduce diversity in the reserve. They can also increase fire risk and degrade important threatened fauna habitat.

Four (4) environmental or potential environmental weeds were recorded in the North Warrane Bushland Reserve and three (3) species were present in the Avoca Hill Bushland Reserve.

The following section outlines the weed species that occur in the reserves that require active management. The distribution of these weeds is indicated in Figures 2 & 3.

Agapanthus (*Agapanthus* sp.)



Photo – www.weeds.org.au

Extent of infestation – A cluster of plants occurs in the Avoca Hill Bushland Reserve nearby to neighbouring properties (Figure 4).

Control Technique – Dig out plants or spot spray infestation. Repeated treatment is likely to be required.

Remove all debris from site.

Briar rose (*Rosa rubifginosa*)



Extent of infestation – Scattered plants occur across the North Warrane Bushland Reserve (Figure 3).

Control Technique – Cut and paste larger plants. Hand-pull seedlings. Remove debris from site.

Cotoneaster (*Cotoneaster* sp.)



Photo - www.weeds.asn.au

Extent of infestation – Isolated plants recorded amongst the intact vegetation along the southern boundary of the North Warrane Bushland Reserve (Figure 4).

Control Technique – Cut and paste larger plants. Hand-pull seedlings. Remove debris from site.

Sweet pittosporum (*Pittosporum undulatum*).



Photo – Colin Bower - www.floraphoto.com.au

Extent of infestation – Isolated plants and seedlings were recorded in the Avoca Hill Bushland Reserve (Figure 3).

Control Technique – Hand pulls seedlings; cut and paste larger plants. Remove debris from site.

Radiata Pine (*Pinus radiata*).



Extent of infestation – Scattered trees occur in DVG vegetation at North Warrane and isolated trees occur within the Avoca Hill Bushland Reserve.

Control Technique – Foliage spray plants or physically remove during erosion control works.

Disposal of Debris.

All weed debris from the reserves should be bagged (where appropriate) and disposed at an approved waste management facility.

APPENDIX-8 – PURCHASE OF ADJACENT LAND

The benefits of purchasing the vacant land include the following;

- Protection of a threatened vegetation community and enlargement of reserve area – this will increase the area of the reserve by approximately 30% and improve the long-term viability of the urban remnant.
- improve access to the reserve from Avoca Street and Gordon hill Road. Current access to the reserve from Avoca Street and Gordons Hill Road is via narrow strip of land with steep tracks and across areas of private land. Purchase of this land will provide enough space to wind the tracks into the reserve and reduce the slope and make them more user friendly. In addition the portions of the track that are on private can be removed.
- Improve the visual amenity from the reserve – the eastern end of the hilltop on the vacant land affords significant views out to Lindisfarne and the River Derwent.
- Protects skyline vegetation and secures the scenic backdrop and sense of place
- Improve bushfire management by including the bushland remnant in the reserve fire management plan
- Protects an important aboriginal heritage site (sandstone caves)
- Incorporates a recreational rock climbing site into public land – the rocky outcrop is currently used by rockclimbers with the site listed on an online website promoting bouldering sites around the greater Hobart area (<http://thesarvo.com/confluence/display/thesarvo/Gordons+Hill+bouldering>). The purchase of the vacant land into the reserve will provide legal access to the site and allow for the risk and access to the site to be controlled to protect the values of the site.
 - *PUR1 – council to investigate option to use Public Open Space Funds to purchase vacant land at 19A Avoca Street to extend reserve, improve access, increase habitat, protect cultural heritage, improve fire management and incorporate recreational area.*

The potential acquisition of the land would need to be undertaken using Public Open Space Funds. As part of this process an analysis of how the purchase of the land meets the requirements of the POS Policy would need to be undertaken. The following has been provided by the council in relation to POS acquisitions.

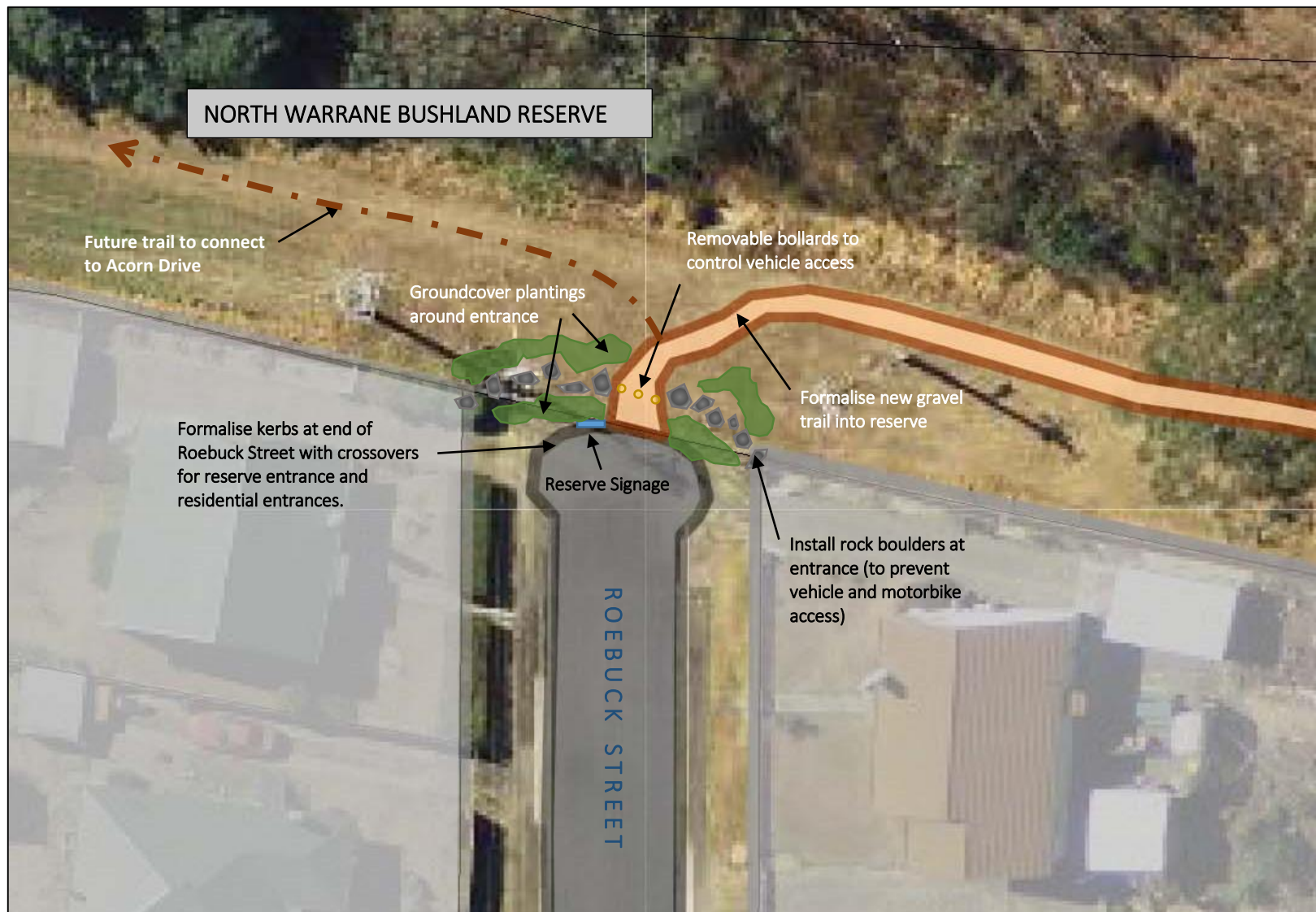
"Council's' POS Policy provides guidance on the utilisation of accumulated POS funds. Section 10 of the policy articulates the desire to direct POS funds towards longer term, strategic land acquisitions and capital improvement of major facilities rather than capital improvement of current assets. In this instance the adoption of this Avoca Hill Bushland and North Warrane Bushland Reserve Activity Plan would be sufficient to warrant consideration of the acquisition of the subject land under the policy. However, the quantum of Council's accumulated POS funds is limited and all potential capital purchases should be assessed according to the recourses available, the cost of the improvement/acquisition and the potential benefit against competing priorities. On this basis whether or not to enter negotiations with current land owner with view to purchase the land will be a matter for Council to consider in the context of other POS related projects."

APPENDIX-9 – ENTRANCE LANDSCAPE PLAN

The following entrance landscape plans provide indicative planting layouts only and actual layouts are to be determined on site.



Indicative Entrancement Landscape Plan for Radiata Drive Entrance – Avoca Hill Bushland Reserve



Indicative Entrancement Landscape Plan for Roebuck Street Entrance – North Warrane Bushland Reserve

APPENDIX 10 – LETTER FROM ABORIGINAL CORPORATION TASMANIA

ABORIGINAL CORPORATION TASMANIA

149 Cambridge Road Bellerive 7018

Phone: 62448467

email: aboriginaltiger@gmail.com

SERVICE PROVIDERS for AUSTRALIAN GOVERNMENT Dept of Indigenous Business Australia

ATTENTION TO: CLARENCE CITY COUNCIL

9th April 2014

RE: PALAWA KANI NAMES FOR AVOCA BUSHLAND RESERVE

Elders of Aboriginal Corporation Tasmania (ACT) has consulted with traditional owners of the Clarence area in regards to selecting one or more Palawa Kani names suitable for the re-naming or co-naming of the AVOCA BUSHLAND RESERVE if, and when, the CCC may decide to do so.

Traditional Aboriginal Oral Evidence exists that informs us that the hill in which the Avoca Bushland Reserve lies, is referred to by the local Moomaiermner people as "WIENA".

The Palawa Kani word "WIENA" can only be interpreted as meaning:
"ROCKY HILL WITH SMALL TREES".

It was this hill that the Moomaiermner retreated to from the Kangaroo Bay foreshore area during adverse weather. The Avoca Bushland Reserve stood upon their traditional path when travelling between Risdon Cove and Kangaroo Bay area (via Flagstaff Gully), but was not a site of usual habitation. The Avoca Bushland Reserve area including the lower valley of Kangaroo Bay abounded with more wallaby than Kangaroo and was a favourite hunting ground.

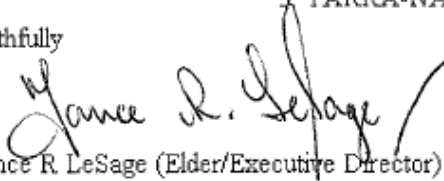
The Palawa Kani word for wallaby was "TARRA" with the name "NALA" for the area in which they lived, which included the Avoca Bushland Reserve.

Taking into consideration that the Hobart GPO was built with stone mined from the Avoca Bushland Reserve, there is a strong relationship with the Palawa Kani word of "WIENA" which refers to either rock or stone, which we believe is worth some positive thought.


We therefore submit to CCC, that the following names be considered for either re-naming or co-naming the Avoca Bushland Reserve.

1. WIENA Bushland Reserve
2. TARRA Bushland Reserve
3. TARRA-NALA Bushland Reserve

Faithfully


Lance R. LeSage (Elder/Executive Director)
On behalf of the Moomaiermner Community

APPENDIX 11 – SETTING UP PHOTOPPOINTS




Photopoint Monitoring
FACT SHEET

WHAT IS PHOTOPPOINT MONITORING ?

Photopoint monitoring is a simple, fast and inexpensive technique to record and monitor visual changes in the natural environment over time. It involves taking a series of images of a fixed area or subject at regular time intervals, which can then be compared to show physical change at a given location.

Consistency is critical to the success of photopoint monitoring. Photos must be taken at the same location, with the same camera direction angle, focus points and preferably camera settings at each time point, for an effective permanent visual record of environmental change.

Photopoint monitoring is most effective only when its strengths as a method match the objectives of the study, in terms of the nature and magnitude of the change that is expected to occur. When considering using photopoint, you need to be clear about the **appropriateness**, **capabilities** and **limitations** of the method.

Appropriateness

Photopoint monitoring is a useful technique for recording the effectiveness of on-ground management actions at the site scale (10m-100m) and is most appropriate when used to capture environmental changes which are visible to the eye. Photopoint monitoring may be best used to support other monitoring efforts aimed to quantify environmental change.

The photo series can detect change in condition due to:

- Weed growth/management
- Grazing pressure/management
- Feral animal impacts/management
- Erosion impacts/management
- Recreational or human impacts/management
- Revegetation
- Reintroduction of native animals
- Regeneration
- Dieback

Capabilities

- Low measurement error and variation
- Requires minimal training
- Readily obtainable equipment
- Low impact on monitoring site
- Provides a standardised and precisely replicable result that can be achieved by different people at different points in time
- Generally, it can be conducted by one person; however two people may be preferable due to safety considerations and transporting of equipment
- Complements quantitative monitoring techniques/data i.e. vegetation condition monitoring and species survival counts
- Potential to store data electronically and link to site records and/or GIS maps/data point
- Photos provide a permanent visual record of site conditions that transcends periodic changes in staff and expertise
- Photos may be a more effective communication/extension tool when dealing with the public and decision makers than highly quantitative charts, tables and graphs

Limitations

- Will only detect changes large enough to be seen by the eye from the camera position
- Is a qualitative rather than quantitative monitoring technique. These limitations can be overcome if additional quantitative techniques are applied, such as counts (*see Appendix 1*).
- May not provide any evidence of cause of change in the variable of interest
- External effects, such as light may make detection of changes more difficult. Extreme wind and rain also present challenges
- Cannot be used in dense woody vegetation as branches and foliage obscure camera field of view.
- Overtime representation of objects may be restricted by the size and number of fields of view or photopoint markers can become obscured by vegetation, or lost due to soil erosion or vandalism
- Results will almost always be relative to the site where they are taken and comparison between sites may be limited
- Interpretation requires collection of 'metadata', e.g. date, time, plant species names
- Changes in operators or technology/equipment may affect results. This can be avoided by following a set method.

One picture is worth a thousand words

Page 1

Photopoint Monitoring

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THE METHOD

There are five stages to photopoint monitoring:

1. Project planning
2. Equipment acquisition
3. Photopoint monitoring
4. Photo archiving
5. Repeat monitoring

It is essential that all stages are implemented to ensure that the photopoint standard is maintained and that the project goals and objectives are achieved.

Project Planning

There is no guarantee that photopoint monitoring will produce useful data for every kind of restoration or management project. In the planning phase consideration should be given to:

- the aims of the project,
- the management actions to be conducted,
- relevant indicators and other supporting monitoring techniques, (*see Appendix 1*),
- the nature, magnitude, and time frames of the expected change, (*see Appendix 1*),
- the monitoring frequency, (*see Appendix 1*),
- the level of confidence in monitoring results required to inform further management, and
- the archiving systems and requirements.

Tips for selecting monitoring sites:

- The location of a photopoint monitoring site should be carefully chosen. Choose an easily recognizable location with minimal access issues. Proximity to a road or track will aid efficiency for future monitoring. Remember to obtain permission to restricted areas or private land.
- Avoid steep slopes, where possible, as this can make photo consistency more difficult and complicate interpretation.
- The photo view needs to illustrate a distinct feature that you want to monitor, e.g. a boundary between grazed and un-grazed vegetation, an area subject to weed control, or the growth of revegetation or plants regenerating. Choose a location which will clearly capture the feature you want to monitor. The more specific the photo, the easier it will be to interpret the sequence of photos.
- The view through the camera to the central focus point needs to be uncluttered. Anticipate things like plant growth which may obscure views in future monitoring.
- The photos need to be representative of the site and maximize subject matter in the field of view.

How to select monitoring frequency:

Photos can be taken at different time intervals depending on the changes expected at the site. Baseline photos should be taken to capture the site before management actions are implemented or environmental changes are expected e.g. revegetation or weed control, before an area is opened up for recreation

Following the baseline photos, timeframes for further comparison may be:

- **Short:** before and after. This will help capture short events such as implementation of management actions.
- **Medium:** very 6 – 12 months, when a site is changing quite rapidly or a lot of visible work is being carried out.
- **Long:** every year to few years, when more subtle changes are occurring.

The frequency of monitoring may change over time as management actions or condition improvement/decline on the site. For example, photos may be taken frequently as management works are implemented, and then drop to a medium and then long timeframe as management actions slow or cease and the environment responds over time.

Additionally, photos can be taken at any point in time, of anything of interest occurring on the site, e.g. a new species occurs at the site.



Above: Photopoint monitoring series of regeneration after a fire.

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Photopoint Monitoring

Equipment

For each monitoring point you will need:

- 2 steel or aluminum posts/star dropper (with protectors), approx 1.8m long, per photopoint site.
- Hammer or post driver for driving in star droppers
- Tape measure (up to 50m)
- Coloured flagging tape (optional)
- Camera
- GPS
- Map or aerial photo of the site/location
- Aluminium tags and soft tie-wire or cable ties (or other means of identifying the photopoint position)
- Field Data Sheet
- Data Board
- Marker pen
- Clipboard

Conducting photopoint monitoring

At your chosen site, fix a 'camera post' and 'sighter post' firmly into the ground so they are difficult to remove. If vandalism is likely to be a problem, marker pegs can be placed at the base of each post to mark their location in a less conspicuous manner.

- The 'camera post' is where the photos will be taken from and should have approximately the eye height of the average person (1.5m) remaining above the ground). An identification tag should be permanently tied to the 'camera post'. An identical tag can also be attached to a marker peg on the ground if vandalism is a problem.
- The 'sighter post' is approximately 10m away from the 'camera post' in the direction that you want to take the photo (Fig. 1a). Place the Data Board in the field of view, with the site identification and relevant monitoring information visible, e.g. date, time etc. The writing on the Data Board needs to be large enough to be visible.
- Hold the camera on the 'camera post', facing the 'sighter post', and focus the centre of view on the top of the 'sighter post' (Fig. 1b).

Fill in the Photopoint Field Data Sheet, making sure it corresponds with the information on the Data Board. When taking the compass bearing of the 'sighter post', be careful to keep the compass away from the metal star dropper as this can influence the reading. Take two steps back and line up both droppers before taking the reading.

Ideally use the same type of camera with the same settings each time. A good choice is a SLR camera with 50mm lens. The 'auto' setting allows for ease of use and consistency, but if you use manual settings remember to record them. Zoom should not be used as it changes the width of the field of view. Turn on date stamping features on the camera if available and unlikely to obscure important elements of the picture (see *Hints and Tips* for more).

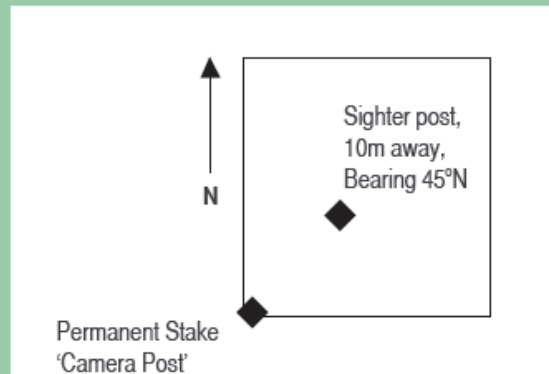


Figure 1: Example of Photopoint set up - aerial view

Source: Pedlar et al., 2007

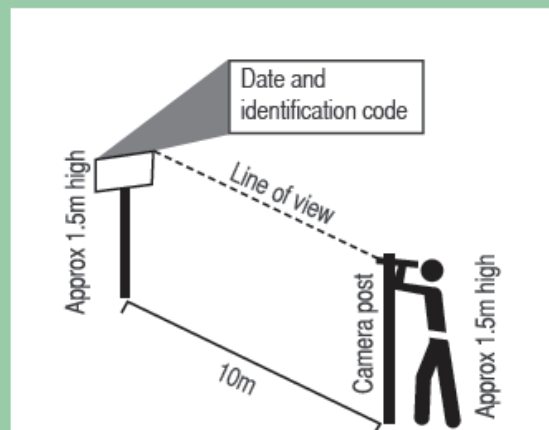


Figure 2: Example of Photopoint set up - side view

Source: Friends of Stuart Gorge, 2010

Photo Archiving

At the time of taking the photo it is important to collect supporting data to support the interpretation of the image and enhance the value of the monitoring effort. The more complete the supporting information the more you will be able to assess the environmental change and, if relevant, the impacts of management actions. See the 'Photopoint Field Data Sheet' template for essential information fields.

When downloading photos, clearly label each photograph with the site ID, site no. and date. Filing photos and corresponding field data sheet either electronically or in hard copy a folder system will help accessibility and efficiency in the future.

There is no substitute for reliable monitoring to help determine the success or failure of management action

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Photopoint Monitoring

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ADDITIONAL PHOTO MONITORING TECHNIQUES



Spot photograph

A spot photograph is an image taken looking vertically down on a marked spot or a quadrat from head height (Fig. 3). This is used for recording ground cover, species and organic litter for a standard sized area.

Figure 3: Spot photograph monitoring
Source: Grodecki & van Willing 2010

Photo Quadrat Monitoring

The purpose of photo quadrat monitoring is to derive more detailed quantitative data, which can be compared between the baseline and subsequent data sets taken at the same location over time. This additional data can also be spatially related to the contents of the photopoint photos over time. Like photopoint monitoring, you must be clear about your objectives when considering photo quadrat monitoring. If the additional data is not needed then time will be wasted. Additionally, the 'site observations' section of the Photopoint Field Data Sheet can be used to collect as much or as little supporting data as the user requires and can fill information gaps to support photopoint photos. Appendix 1 in this booklet suggests when alternative measurements could be taken to support photopoint monitoring. Photo quadrat monitoring could be used as a method to 'count' where this is indicated.

To undertake photo quadrat monitoring, divide the most distant 5m section of the photopoint into 10 (1m x 1m) quadrats (see Figure 4). Within each quadrat, record the information required, for example mark a point for species present, species height and so on. If revegetation or regeneration survival rates is one of the variables you want to monitor, pegs can be used to mark the seedlings planted or new germinants. If seedlings/germinants are no longer present when your return you could conclude that the plants have died, unless the plants experience prolonged dormancy or the site has been tampered with.

This technique should not be used to assess the condition of vegetation community. The Vegetation Condition Assessment method has been developed for this purpose (<http://www.dpiw.tas.gov.au/inter.nsf/WebPages/PWOD-7PM7CH?open>).

There are several variations on photopoint monitoring using quadrats, please research the best one for your site. All methods require knowledge about plant species.

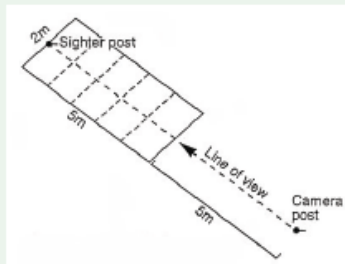


Figure 4: An example of photo quadrat monitoring for further vegetation monitoring data, aerial view.

Source: Friends of Sturt Gorge, 2010

HINTS AND TIPS:

- In addition to the fixed photopoint shots, consider taking multiple photos to create a panorama, to help with interpretation of context and subject in the future.
- Do not use a wide angle or telephoto lens as this alters the perspective of the photo and makes it difficult to repeat.
- Minimize sun glare in the photo and try to take photos at the same time of day. Although not always possible, locate photopoint posts north – south, and take the photo facing south with the sun behind you and the sunlight shining on the landscape facing you. This helps prevent glare and avoid direct sun light in the shot.
- Taking photos on a cloudy but bright day can help avoid strong shadows.
- Photos taken between 9am and 3pm will help reduce shadowing and different colour cast which may conceal some features. Auto settings used appropriately for different light levels can help reduce the problems of over exposure. Set the light exposure levels for the monitoring site by excluding the sky. To do this lower the camera and obtain exposure whilst the top of the camera is no higher than the horizon and lock the exposure at that level.
- Photos repeated annually should be taken at the same point in the season.
- Take a copy of the previous or original photo to the site with you and use it to compare with the field of view to ensure consistency.

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FOR MORE INFORMATION

Please contact the Biodiversity Coordinator, NRM South
Phone: 6221 6111 Website: www.nrmsouth.org.au



CARING
FOR
OUR
COUNTRY



Tasmania
Defining the possibilities



Photopoint Sighter Board:

Date:	
Time:	
Property / Site ID:	
Photopoint Site No:	
GPS Coordinates:	
Purpose of Photo:	



APPENDIX 12 – AVOCA HILL BUSHLAND RESERVE REPORT CARD