Draft Lower Margaret River Foreshore Action Plan

Prepared for Nature Conservation Margaret River Region

by

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- Friends of the Cape to Cape Track
- Margaret River Coastal Residents Association
- Friends of the Margaret River
- Bushtucker Tours
- Josh Palmateer's Surf Academy
- Margaret River Off Road Cycling Organisation
- David Willcox, Common Ground Trails
- Department of Parks and Wildlife
- AMRSC fire officers
- Wallcliffe Bushfire Brigade
- Friends of the A class reserve
- Margaret River Regional Environment Centre

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Acronyms and terms requiring definition

AMRSC	Augusta-Margaret River Shire Council
DWER	Department of Water and Environmental Regulation
DBCA	Department of Biodiversity, Conservation and Attractions
MRFRAP	Margaret River Foreshore Reserve Action Plan
PAW	public access way
UCL	Unallocated Crown land
Goat track	Refers to narrow informal pedestrian track

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Introduction

1. Background to the report

The lower Margaret River foreshore reserves have been recognised by the Shire of Augusta-Margaret River (AMRSC) as having very high ecological, social and cultural values. In 2011 and 2013 management plans were developed for the Shire managed foreshore reserves east of Bussell Highway (Barrett St and Riverslea reserves). In 2016 the AMRSC identified the need for a comprehensive plan to determine the current condition of the reserves west of Bussell Highway to the coast and to identify actions required to manage threats to their environmental values.

This project began with field work to collect detailed information on the foreshore reserves and consultation with relevant stakeholder groups and the general community, undertaken in early 2017. The project was then put on hold to await the completion of relevant Aboriginal consultation being undertaken on behalf of the Shire and decision making regarding a contentious track on the southern foreshore of the river between Caves Rd and the St Alouarn public access way (known as the winter diversion track).

In March 2018 the Aboriginal consultation process was complete and a decision made on the winter diversion track by the AMRSC, enabling completion of this report.

It should be noted that, as described below, this report is focused specifically on the foreshore reserves and not on overall river ecology, condition and management. A Margaret River Protection Strategy is currently being prepared by the Margaret River Collaborative Management Group[1] to improve understanding and management of the whole river system.

2. Project scope and management objectives

The scope of the Lower Margaret River Foreshore Action Plan (LMRFAP) is to provide a detailed description of the current condition of the foreshore reserves and recommendations on the management required to ensure the values, attributes and functions of the Margaret River reserves are protected and conserved.

The plan also considers how to manage recreational pressure in the light of population increase whilst protecting the important environmental and cultural values of the area.

The management objectives for the Margaret River foreshore reserves are:

1. to protect and enhance the environmental values of the Margaret River foreshore from Bussell Highway to the coast; and

2. to provide public access and recreational opportunities which do not compromise the environmental or Aboriginal values of the river environment.

[1] The Margaret River Collaborative Management Group was formed in November 2017. Members of the group include Indigenous representation, AMRSC, Nature Conservation Margaret River Region, Department of Water and Environmental Regulation, Department of Biodiversity, Conservation and Attractions, and Department of Planning, Lands and Heritage.

3. Study area

The study area the subject of this plan includes approximately 14 km of the Margaret River and adjoining foreshore reserves between Bussell Highway and the coast (Figure 1). The river and foreshore is contained within 38 separate reserves making up approximately 119 ha. Most of the river channel is within unallocated Crown land (UCL). Where the river adjoins Wooditchup National Park (formerly Bramley) and the Leeuwin-Naturaliste National Park the foreshore and parts of the river are contained within National Park vested in the Department of Biodiversity, Conservation and Attractions (DBCA). The remainder of the foreshore is vested in AMRSC. The vesting purpose of the reserves includes public recreation, parks and recreation, parks and recreation (A class), foreshore protection, foreshore protection and recreation, and recreation.

Figure 1: Study area

For the purposes of mapping and condition descriptions in this report the river has been broken up into the following four sections:

Section 1: Bussell Highway to Kevill Rd East

Section 2: Kevill Rd East to Caves Rd.

Section 3: Caves Rd to St Alouarn public access way (PAW)

Section 4: St Alouarn PAW to the coast

4. Aboriginal cultural and heritage values

Aboriginal people have a very long and continuing connection to the Margaret River. Devil's Lair, south of Margaret River, is one of the earliest sites of human occupation in Australia and contains evidence of Noongar existence dating back at least 48,000 years. Aboriginal people managed the land in a sustainable and productive way over these many thousands of years.

To Noongar people, the Margaret River is known as Wooditchup, named after the magic man, Wooditch who created the river in the Nyitting or Dreaming. The river was of vital importance to traditional Aboriginal people for camping, hunting, foraging and fishing, and as a focal point for traditional ceremonial activity. Aboriginal people continue to place a very high value on the environmental and spiritual significance of the river.

The whole of the Margaret River and foreshore and the Wallcliffe cliffs and caves are registered Aboriginal sites under the Aboriginal Heritage Act 1972. These areas have been registered as they have been recognised as being of importance and special significance to Aboriginal people and the cultural heritage of Western Australia. The Register lists all known Aboriginal sites. It is very likely that there are significant sites not currently within the Register. Both registered and currently unregistered sites are afforded protection by the Aboriginal Heritage Act.

Preservation of Aboriginal sites and objects is afforded by Section 17 of the Aboriginal Heritage Act 1972 and Regulations 6 to 10 of the Aboriginal Heritage Regulations 1974. Destruction, damage or alteration to an Aboriginal site without the prior consent of the Minister for Aboriginal Affairs is an offence under Section 17 of the Aboriginal Heritage Act 1972.

The Aboriginal Heritage Due Diligence Guidelines 2013 recommend that if a land use activity is likely to impact upon Aboriginal heritage, early engagement and consultation with relevant Aboriginal people is recommended to identify ways to minimise and avoid damage to, or disturbance of, Aboriginal sites. Where it is concluded that impact to a site is unavoidable, the consent of the Minister is required under section 18 of the Act.

The recognition and preservation of Aboriginal cultural and heritage values is integral to best practice river management. To ensure this is achieved, it is essential that Aboriginal people are involved in all elements of planning, management and on-ground activities associated with the river.

5. River values and threats

The Margaret River is recognised as one of the healthier river systems in an urban and agricultural setting in the south west of Western Australia. The river has good water quality and is one of the few major river systems in south-western Australia that has not become impacted by salinisation (Morgan, Thorburn & Gill, 2003). The river retains fringing vegetation for most of its length, though narrow and degraded in places. The fringing native vegetation has many important ecological and functional values including habitat for many species of flora and fauna. It provides shade to maintain low water temperatures, links areas of remnant vegetation and provides a corridor of vegetation for fauna movement. The fringing vegetation also stabilises the river banks and protects water quality through retaining sediments and nutrients from overland flow.

The vegetation in the headwaters is intact and of a significant size. There are several different wetland types supporting at least 18 threatened species and 4 undescribed species. These flora records are currently known from isolated collections and additional field data is needed to understand the significance of these

large wetland areas. They may be the only wetland assemblages of their type, particularly within the Blackwood Plateau landform.

The river foreshore is a biodiverse environment and provides habitat for many species of flora and fauna including species that are listed as a priority for protection including western ringtail possum (*Pseudocheirus occidentalis*), Baudin's black cockatoo (*Calyptorhynchus baudinii*) and red-tailed black cockatoo (*Calyptorhynchus banksii naso*).

The permanent pools in the upper catchment have been identified by Murdoch University's Freshwater Fish Group and Fish Health Unit as one of the most important conservation priority areas for freshwater fishes and crayfishes in the south west region. Threatened species known from the upper river include Balston's pygmy perch (*Nannatherina balstoni*), western mud minnow (*Galaxiella mundo*), and the critically endangered hairy marron marron (*Cherax tenuimanus*) and Margaret River burrowing crayfish (*Engaewa pseodoreducta*). The hairy marron is found only in the upper reaches of the Margaret River and the burrowing crayfish only known populations are in the upper reaches of the river and the upper reaches of the nearby Carbunup River.

The Margaret River also provides habitat for other priority aquatic species including the water rat (*Hydromys chrysogaster*), pouched lamprey (*Geotri australis*) and Carter's freshwater mussel (*Westralunio carteri*). Recent genetic work indicates that populations of both the western pygmy perch (*Nannoperca vittata*) and nightfish (*Bostockia porosa*) in the Margaret River may be distinctive enough to warrant recognition as separate species that are endemic to the Margaret River.

The Margaret River provides valuable visual amenity and recreational opportunities for residents and tourists. It also provides a water supply for agricultural and urban use.

A further value identified during field assessments and community consultation is the 'wildness quality' of sections of river. Although in relatively good condition the Margaret River and its catchment have been significantly altered as a result of clearing, grazing, introduced plants, human access and the development of infrastructure. It is therefore significant that even within this highly modified environment there are areas of the river that retain a 'wildness quality'. This quality has not previously been documented and was identified as highly valued during community consultation.

The river faces many pressures. Climate change and diminishing streamflow are a major threat. Mean annual rainfall in the Margaret River catchment has declined by 11% for the period 2001-2014 compared to the long-term record (1975-2000) and mean annual flow has decreased by 50% over the same period (Greening cited in Storer *et al*, 2016). Prior to 1985 flow in the Margaret River was continuous throughout the year. The continuous flow period has declined by 22% for this period, possibly due to a reduction in groundwater flow (Greening cited in Storer *et al*, 2016). The reduction in groundwater is also likely to impact on the permanent pools in the river that rely on groundwater discharge from the Leederville aquifer.

Water quality is threatened by run off from agricultural and urban landuse and sediment pollution associated with subdivision and development. Increasing population and development is exacerbating pressures on the river. The river ecology is also threatened by introduced animals both terrestrial and aquatic, and by illegal marroning.

Degradation and loss of foreshore vegetation is continuing to occur as a result of climate change, grazing, established and emerging weeds (many of them spreading from surrounding properties where they are introduced to gardens, landscaping and shelter belts), fire management and recreational use. Vegetation is also threatened by Phytophthora dieback and tree decline caused by many interrelated factors.

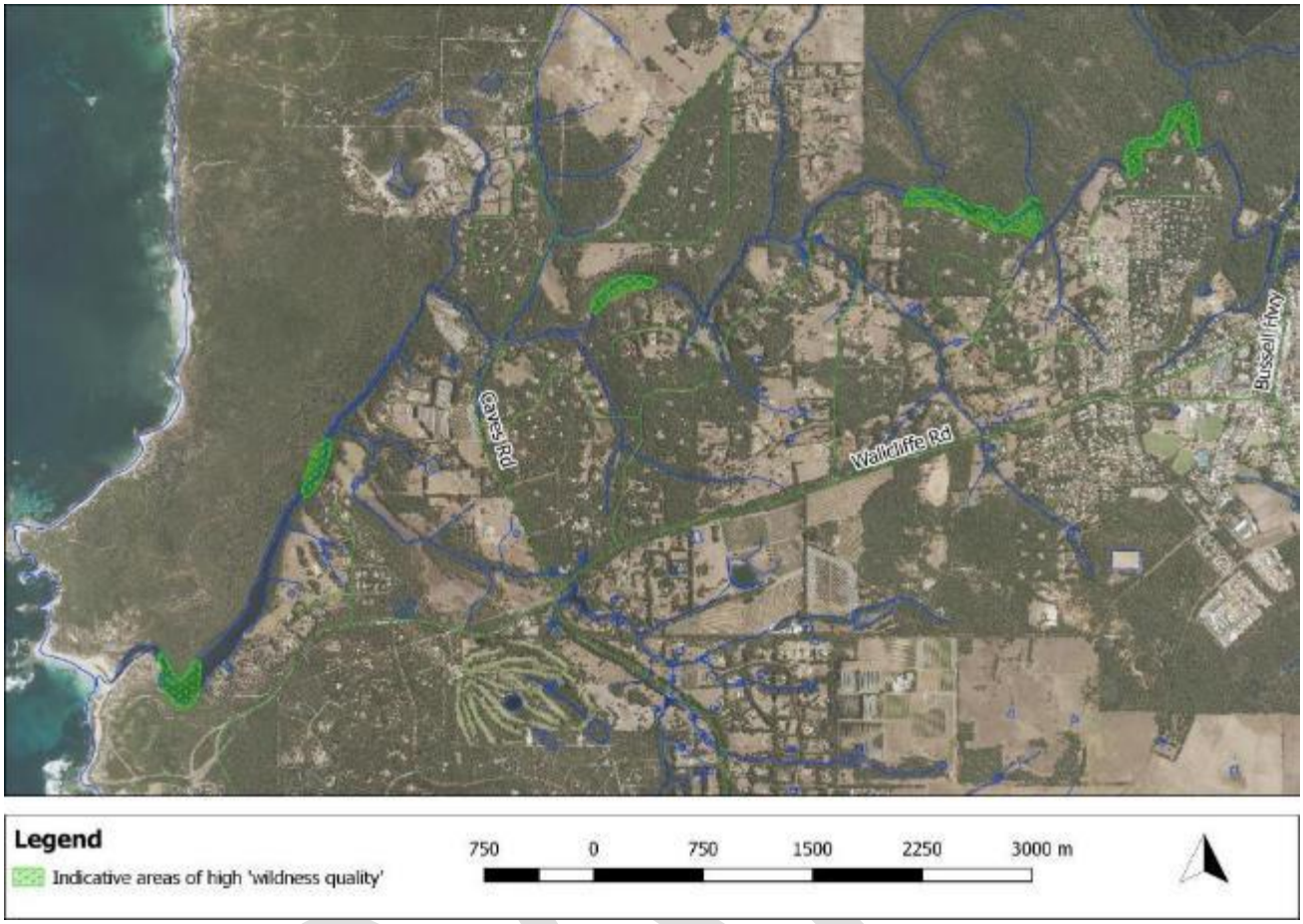

Figure 2: Indicative areas identified as having high 'wildness quality'

Study methodology

6. Consultation

Consultation was integral to the development of the Lower Margaret River Foreshore Action Plan (LMRFAP). Stakeholder and community input informed the guiding principles and management recommendations of the Plan.

Individual meetings and communication was conducted with the following key stakeholders:

- Friends of the Cape to Cape Track
- Margaret River Coastal Residents Association
- Friends of the Margaret River
- Bushtucker Tours
- Josh Palmateer's Surf Academy
- Margaret River Off Road Cycling Organisation
- David Willcox, Common Ground Trails
- Department of Parks and Wildlife
- AMRSC fire officers
- Wallcliffe Bushfire Brigade
- Friends of the A class reserve

Five community meetings were held on weekends in March 2017 with invitations mailed to rural and rural-residential landholders across the catchment of the river west of Bussell Highway. The meetings were held at the following locations along the river:

- Apex weir, off Carters Rd
- Waterfall, off Kevill Rd East
- Burnside, off Freshwater Drive
- McHenry Hohnen Cellar Door
- Rivermouth

The purpose of the stakeholder consultation was to share information with stakeholders and the community about the LMRFAP objectives and process of development, and to seek information on relevant values and management issues.

The key outcomes of the consultation were:

1. Environmental protection and improvement of the river is a high priority.
2. The 'wildness quality' of sections of the river is highly valued.
3. Recreational pressures are causing degradation at the rivermouth, Wallcliffe cliffs and caves, the waterfall, and Ashton St foreshore.
4. Demand for recreational opportunities associated with the river includes:
    a. Access to the river for recreation including swimming.
    b. Opportunities to walk along the river.
    c. Single use walking tracks.
    d. A route for walkers on the Cape to Cape Track to get from the north to the south of the river in winter and spring when the rivermouth is impassable.
    e. Cycling opportunities for 'off-road leisure cyclists'[2].
    f. Cycle linkage opportunities for mountain bikers.
5. Concern was raised about the appropriateness of dual use tracks and the negative impact on walker's safety and amenity.
6. Private infrastructure in the foreshore reserve and pumping from the river was considered contrary to environmental protection and recreational objectives.
7. Divergent values and aspirations regarding the river exist within the community. It is important that there is genuine, thorough consultation and involvement with stakeholders and the community when development within the foreshore reserve is planned.
8. Long term protection of the river requires improving people's knowledge, connection and responsibility for the river.

[2] 'Off-road leisure cyclists' and their trail requirements are defined in the South West Mountain Bike Master Plan as follows: Leisure cyclists are general cyclists of all ages and abilities. Typically they ride infrequently, often have limited appropriate skills and require very accessible trails. They are more likely to use highly accessible routes close to home, or make the journey to trail facilities with amenities and services. Trails considered suitable for these riders are 'Touring Trails'. These trails are typically of uniform surface condition and lower grades. Touring trails can include rail trails, access/ fire roads and single track. Touring trails can be ridden in sections making them accessible to all.

7. Reserve assessment

Field assessments were undertaken to collect detailed information on the following:

- Foreshore condition
- Vegetation condition
- Infrastructure presence
- Erosion hotspots
- Priority environmental weed presence
- Track and trail status
- Vehicle access
- Recreational issues
- Baseline photo point monitoring

Wildness Quality

In response to values identified during the field assessments and community consultation the river and foreshore was evaluated for 'wildness quality' using indicators of naturalness and remoteness. Naturalness refers to the quality of the foreshore and adjoining vegetation, and the degree to which the area is free of infrastructure and the obvious impacts of human activity. Remoteness refers to perceived distance from human elements such as houses, roads, developed access, noise and other infrastructure. Indicative areas identified as having a high 'wildness quality' are shown on Figure 2.

Vegetation and foreshore condition

Vegetation condition was assessed using two standard assessment methods. The riparian vegetation was assessed using the Pen-Scott method of foreshore assessment and the upland vegetation within the reserve was assessed using the Keighery scale of vegetation condition. These two methodologies are described below.

The field assessments occurred between February and April 2017. The timing of the field work was not ideal for recording some issues including priority weed species such as arum lily (*Zantedeschia aethiopica*) and other annual or geophyte species which are predominantly active and obvious within the landscape during the cooler wetter months.

Pen-Scott foreshore assessment[3]

A modified version of the Pen-Scott method of riparian zone assessment was used to assess the vegetation directly fringing the river. This system provides a graded description of the riparian vegetation that runs from pristine (A grade) through to a ditch (D grade). Relevant grades are described below. This method allows comparisons of waterway health across the south-west of Western Australia, and is used to prioritise management actions.

CONDITION	DESCRIPTION
A grade foreshore	*A1: Pristine* The river embankments and/or channel are entirely vegetated with native species and there is no evidence of human presence or livestock damage. This category, if it exists at all, would be found only in the middle of large conservation reserves where the impact of human activities

[3] Planning and management: foreshore condition assessment in farming areas of south-west Western Australia, River Restoration Manual Report No. RR3

	has been negligible. *A2: Near pristine* Native vegetation dominates but introduced weeds are occasionally present in the understorey, though not to the extent that they displace native species. Otherwise there is no human impact. A river valley in this condition is about as good as can be found today. *A3: Slightly disturbed* Here there are areas of localised human disturbance where the soil may be exposed and weed density is relatively heavy, such as along walking or vehicle tracks. Otherwise, native plants dominate and would quickly regenerate in disturbed areas should human activity decline. *A4: Disturbed* This foreshore is still dominated by native riparian species although in a narrow band only and sparsely vegetated. Very few weeds are present.
B grade foreshore	*B1: Degraded - weed infested* In this stage, weeds have become a significant component of the understorey vegetation. Although native species remain dominant, a few have probably been replaced or are being replaced by weeds. *B2: Degraded - heavily weed infested* In the understorey, weeds are about as abundant as native species. The regeneration of some tree and large shrub species may have declined. *B3: Degraded - weed dominated* Weeds dominate the understorey, but many native species remain. Some tree and large shrub species may have declined or have disappeared.
C grade foreshore	*C1: Erosion prone* While trees remain, possibly with some large shrubs or grasstrees, the understorey consists entirely of weeds, mainly annual grasses. Most of the trees will be of only a few resilient or long-lived species and their regeneration will be almost negligible. In this state, where short-lived weeds support the soil, a small increase in physical disturbance will expose the soil and render the river valley vulnerable to serious erosion. *C2: Soil exposed* Here, the annual grasses and weeds have been removed through heavy livestock damage and grazing, or other impacts such as a result of recreational activities. Low level soil erosion has begun, by the action of either wind or water. *C3: Eroded* Soil is being washed away from between tree roots, trees are being undermined and unsupported embankments are subsiding into the river valley.

Keighery vegetation condition scale[4]

This vegetation condition scale is well used across Western Australia and grades vegetation condition from pristine to completely degraded as described below:

CONDITION	DESCRIPTION
Pristine	Pristine or nearly so, no obvious signs of disturbance
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non aggressive
Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains

[4] Described in Keighery, B.J. (1994) Bushland Plant Survey. A guide to plant community survey for community. Wildflower Society of WA (Inc.), Nedlands, Western Australia.

	basic vegetation structure or ability to regenerate. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas re often described as 'parkland cleared' with the flora composing weed or crop species with isolated native trees or shrubs.

Description of foreshore reserves

Maps and a description of the condition of riparian and upland vegetation in the reserve, weed presence, erosion, access and recreational use, infrastructure and reserve width for each section of river is detailed below.

8. Section 1: Bussell Highway to Kevill Rd East

Overview

This section of the river contains a diversity of habitat zones including pools, rocky riffles, instream islands, backwaters and shallow runs. Much of this reach retains water during the summer and autumn months in a series of large and small pools. The larger of the pools have a very important ecological function as they provide a summer drought refuge essential to the survival of many aquatic species. An assessment of a large pool in this reach in summer 2016 (Storer *et al,* 2016) identified some concerns regarding water temperature and dissolved oxygen levels, which may impact on habitat values.

The Apex Weir previously represented a barrier to fish passage in the river and this has been addressed through the construction of a fishway on the weir.

The river receives stormwater from the Margaret River CBD in this reach via a stormwater detention basin (the rain garden).

Most of the northern side of the river is within Wooditchup National Park. The southern side is surrounded by rural residential properties, many of which contain significant native vegetation. Further subdivision south of the river is likely to occur under current regulations.

Foreshore condition

The condition of the riparian vegetation throughout this section is excellent with over 90% classified as A grade. A grade foreshore is dominated by native vegetation with very minimal weed infestation and disturbance. A small proportion of this A grade foreshore (3%) was considered to be A4 which indicates areas of riparian vegetation that are narrower and more sparsely vegetated.

Excellent quality A grade foreshore

Only 3.4% of the foreshore in this reach was classified as weed infested (B grade) including:

- 120 m of foreshore on the southern side of the river immediately downstream of the Wadandi Track; and
- 230 m of foreshore on the northern bank immediately downstream of the Apex Weir.

3.2 % of this reach was classified as C grade foreshore. These areas are cleared of all vegetation or have very limited native understorey and are susceptible to erosion. C grade sections within this reach include:

- the cleared banks adjoining Bussell Hwy;
- the northern side of the river between the Apex Weir and Minnie Keenan trail; and
- sections of the Ashton St foreshore.

There are a number of islands and areas of instream vegetation in this section of the river and significant summer pools. All of the instream vegetation is in very good to excellent condition.

Summer pools - important refuge for aquatic fauna

Instream islands containing 'upland' vegetation

Upland vegetation condition

The upland vegetation in this section of river is largely in very good to excellent condition. On the northern bank through Wooditchup National Park the vegetation is predominantly in excellent condition. On the southern side of the river there are two notable areas of excellent condition vegetation – one in the Illawarra Ave area and the other in front of the eastern portion of Ashton Street. These are the only two zones within the subject area that have excellent quality, near pristine vegetation on both sides of the river. As such they represent some of the most natural, highest value sections of river west of Bussell Highway.

These areas of very good to excellent condition vegetation contain a range of vegetation types including towering karri forest, unique granite outcrop communities and jarrah marri forest. The significance of the granite outcrop communities in the area are currently being considered by DBCA and are likely to be formally recognised as threatened ecological communities in the future.


Granite outcrop vegetation through the Illawarra Ave foreshore

The main area of the A Class Reserve adjacent to the river is in good to very good condition. The bulk of this area has been significantly impacted by sweet pittosporum (*Pittosporum undulatum*) infestations. Ongoing control efforts have significantly reduced the impact through most of this reach.

Three areas of degraded or completely degraded vegetation occur within the reach:

- Around the Maxwell St portion of the A Class Reserve; and
- The downstream and upstream portions of the Ashton St foreshore.

These areas have either been cleared in the past, heavily impacted by historical grazing and/or aggressive environmental weed infestations such as sweet pittosporum around Maxwell St. Continued unrestricted access within native vegetation and to stream banks along the Ashton St foreshore has prevented regeneration and in some instances is actively degrading the foreshore.


Degraded bare areas upstream from Kevill Rd East

Degraded weedy area in front of Lots 10 and 12 Ashton St

Weeds

The main weed issues in this section include blackberry and a range of woody weeds including sweet pittosporum, Sydney golden wattle (*Acacia longifolia*) and Flinders Range wattle (*A. iteaphylla*).

Small and scattered blackberry (*Rubus* spp.) occurrences are common throughout the upstream portion of this section. Consistent control over many years has ensured that most of these occurrences are small and contained except for a very large infestation of blackberry on the river at the Bramley Brook confluence.

Sweet pittosporum is well established in the upstream portion of this reach around town and the A Class Reserve, the Minnie Keenan trail and many surrounding private properties. Significant investment has been made in controlling and minimising the impact of this weed within the A Class Reserve including professional contractors, Green Army teams and ongoing work through the Friends of the A Class Reserve. The extent, density and impact of this weed has significantly reduced as a result of this effort. Maintenance and further control is required as well as awareness raising within the surrounding properties where mature seeding individuals remain.

Sydney golden wattle is scattered and relatively widespread downstream of Bramley Brook including in isolated patches in the Wooditchup National Park. Whilst not in high densities many of the plants recorded were mature, seed bearing individuals. Sydney golden wattle has very long lived seed and long term maintenance and ongoing control will therefore be required. Fire is likely to trigger germination of the soil seed bank. Control of this weed on adjoining properties and throughout the catchment will reduce its spread in the foreshore reserve.

Arum lily in this stretch of the reserve was observed only within a very confined patch either side of the Wadandi Track on the southern side of the river. These infestations are a high priority for control before they spread further and require more resources to control. It should be noted that the survey timing was not ideal for observing arum lily and additional populations may be evident once autumn rains have commenced.

Sweet pittosporum in front of Maxwell St

Pandora vine on the Minnie Keenan trail

The waterlily (*Nymphaea* spp) population near the Bussell Hwy bridge does not appear to have expanded over the last 10 years, however it should be monitored to ensure that its impact is contained and that it doesn't pose a threat to the values of the river.

Small weed infestations that are a priority for control include:

- Flinders Range wattle on both sides of the river including the large island upstream of Kevill Road East;
- watsonia (*Watsonia* spp.) and broom (*Genista spp*) along Minnie Keenan trail and the Bussell Hwy edge of the A Class Reserve;
- polygala (*Polygala* spp.) on both sides of the A Class reserve but particularly on the northern side immediately downstream of the Apex Weir,
- pandora vine (*Pandorea pandorana*) along the Minnie Keenan trail and
- blue periwinkle (*Vinca major*) through the upstream parts of the A Class Reserve and the near the confluence with the Merchant PAW.

Blue periwinkle near the Merchant waterway confluence

Erosion

This reach is stable and not erosion prone except for portions of the Ashton St foreshore where vegetation cover has been lost and the bank is progressively becoming undermined.

Management of access and rehabilitation works are required to contain the extent of impact and restore stability to the degraded bank.

Access and recreational use

The northern side of the river foreshore through this section has formal access for most of its length. There is pedestrian and cycle access along the A Class and Minnie Keenan trails up to the Wadandi Track and the strategic firebreaks of Mott and Umberto roads currently provide cycle, vehicle and pedestrian access along the foreshore in Wooditchup National Park. Illegal tent and vehicle camping was observed at multiple locations along this track within the National Park. At some points Umberto road is very close to the river (<5m). A significant level of unauthorised vehicle traffic was observed using this firebreak/track. The Leeuwin-Naturaliste capes area parks and reserve management plan recommends closing this area to unauthorised vehicles.

Close proximity of the Wooditichup NP firebreak to the river

Eroding track within the A Class Reserve

The extensive network of 'Creekside' mountain bike trails through this portion of Wooditchup National Park attracts large number of mountain bikers into this stretch of foreshore. The network of tracks in this area is earmarked to double in size in coming years and there is likely to be a subsequent increase in bike useage of the riverside track.

The current dual use status of Minnie Keenan is not sustainable with the high level of mountain bike usage of this narrow, winding track leading to erosion at several locations and safety concerns due to the potential for collision with walkers.

The A Class reserve contains a series of dual use tracks accessing most of the foreshore and a key access point for recreational use is the Apex Weir carpark – this area is degraded, eroding and in need of stabilisation and formalisation.

On the southern side of the river there are two significant areas of excellent, undisturbed vegetation with no formal access within the foreshore - the Illawarra Ave and east Ashton St zones. These areas are significant as they have had minimal historical disturbance, contain excellent condition vegetation, near pristine foreshore and very limited environmental weed impacts. These two areas are identified as containing high 'wildness quality' as described and discussed in section 7.

The main Ashton St portion of foreshore contains easy access and connection to the Illawarra, Merchant and Ashton St Public Access Ways (PAWs) for pedestrians, cyclists and authorised vehicles. It was reported on several occasions that this area is subject to frequent unauthorised vehicle access for camping and illegal marroning.

There are a number of informal, small tracks down to the river for marroning, pumping and other recreational access.

Minnie Keenan Trail

Unauthorised vehicle access through the area west of Kevill Rd

Infrastructure and encroachment

On the southern side of the river the boundary between the foreshore reserve and private property is unclear in many places. There is some encroachment of private activities within the reserve including:

- Storage of canoes/kayaks
- 8 pipes and/or pumps
- DWER gauging station
- Old fences
- Vehicle access

Private pump within the Ashton St foreshore DWER gauging station within Wooditchup National Park

Reserve width

Wooditchup National Park and the southern portion of the A Class Reserve provide good protection of river values through wide foreshore reserves. On the northern side of the river some sections of foreshore remain very narrow including:

- parts of the A Class reserve;
- the foreshore in front of Lot 18 Maxwell St; and
- parts of the Minnie Keenan trail adjacent Carters Road.

The remaining length of foreshore reserve on the southern portion of the river, excluding the A Class Reserve, generally represents a narrow band of foreshore vulnerable to edge effects, weed impacts and general degradation.

The Leeuwin-Naturaliste and capes area parks and reserves management plan 2015 recommends that the UCL containing the river adjacent to Wooditchup National Park be added to the National Park.

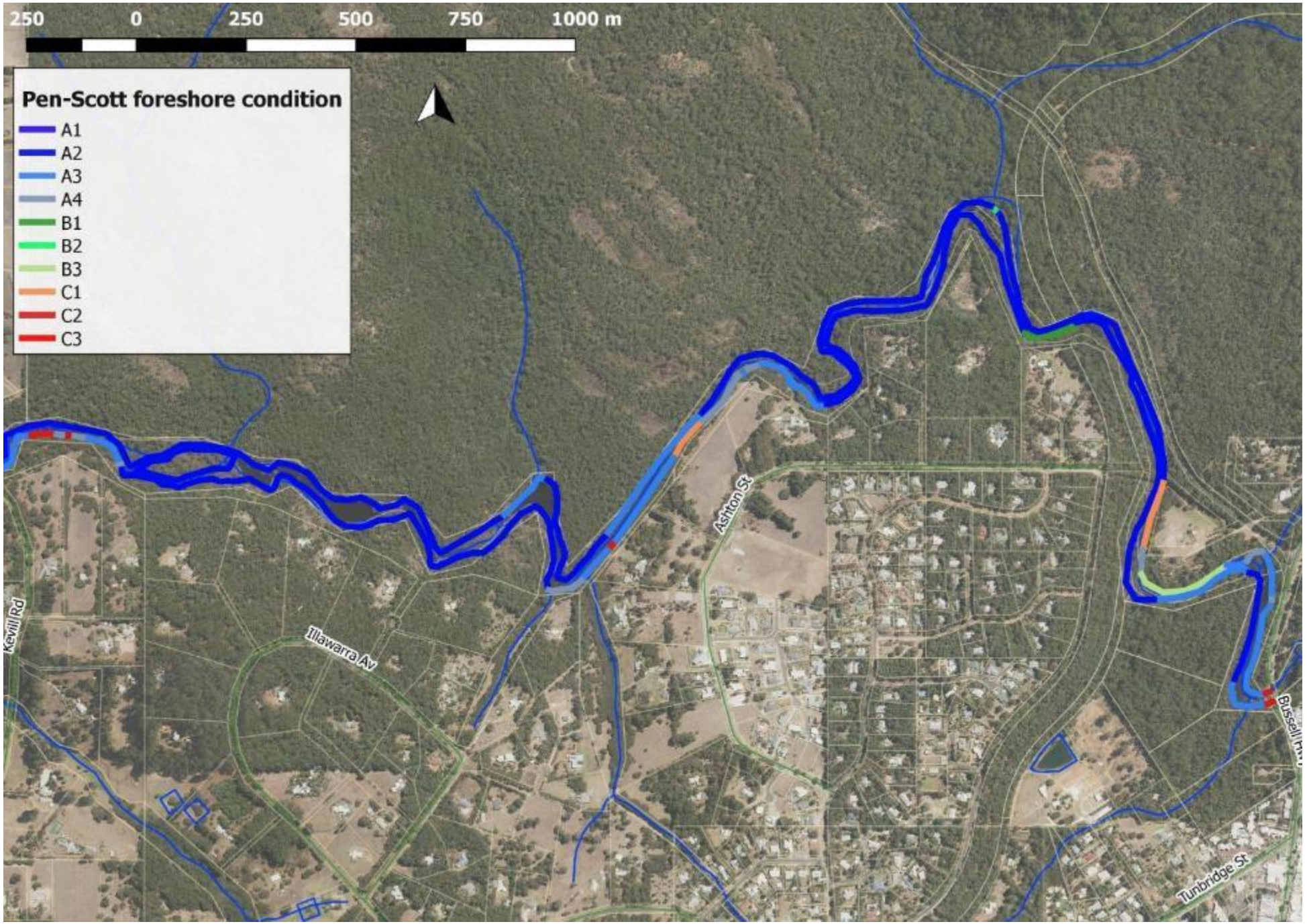

Figure 3: Section 1 riparian vegetation condition

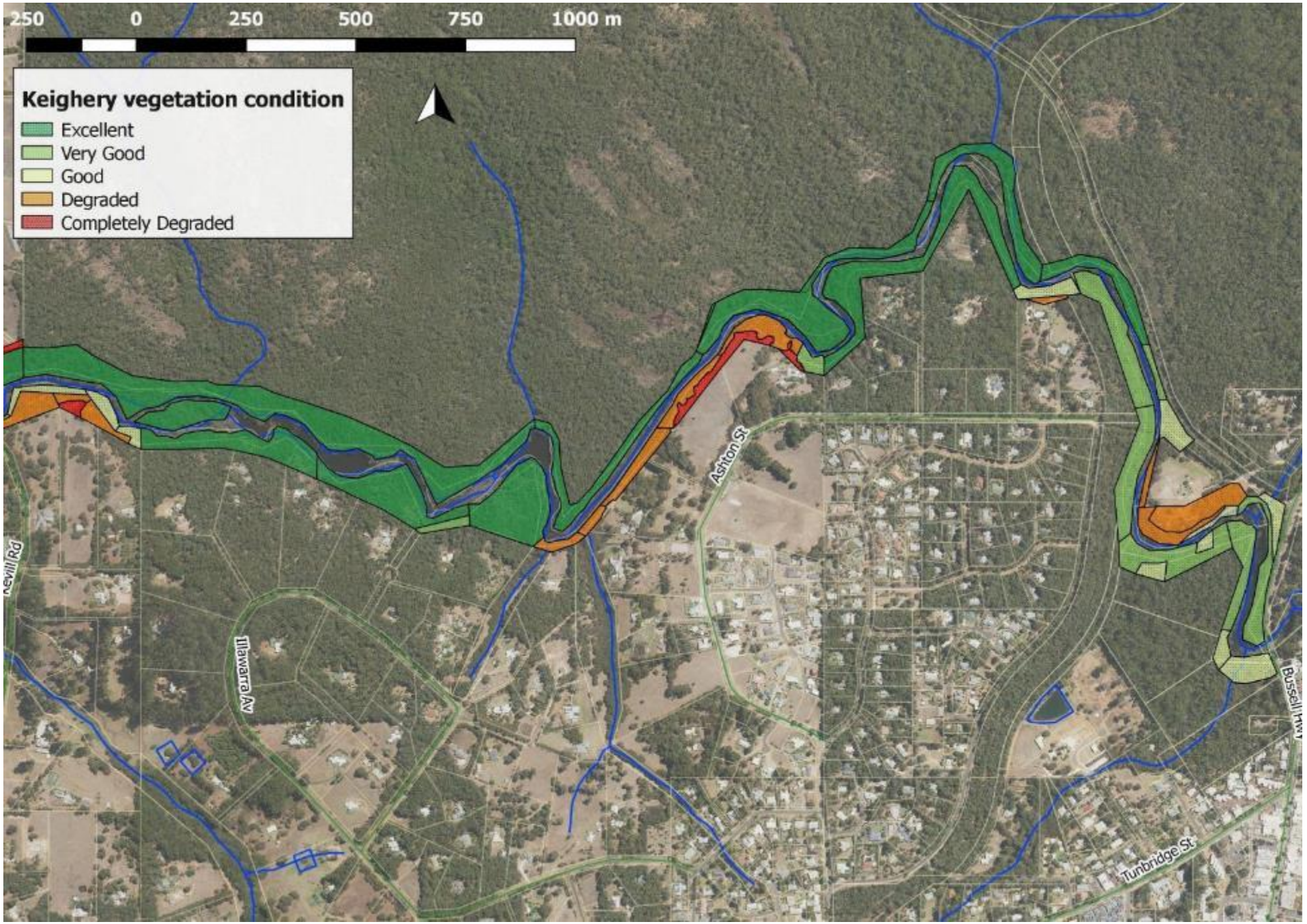

Figure 4: Section 1 upland vegetation condition

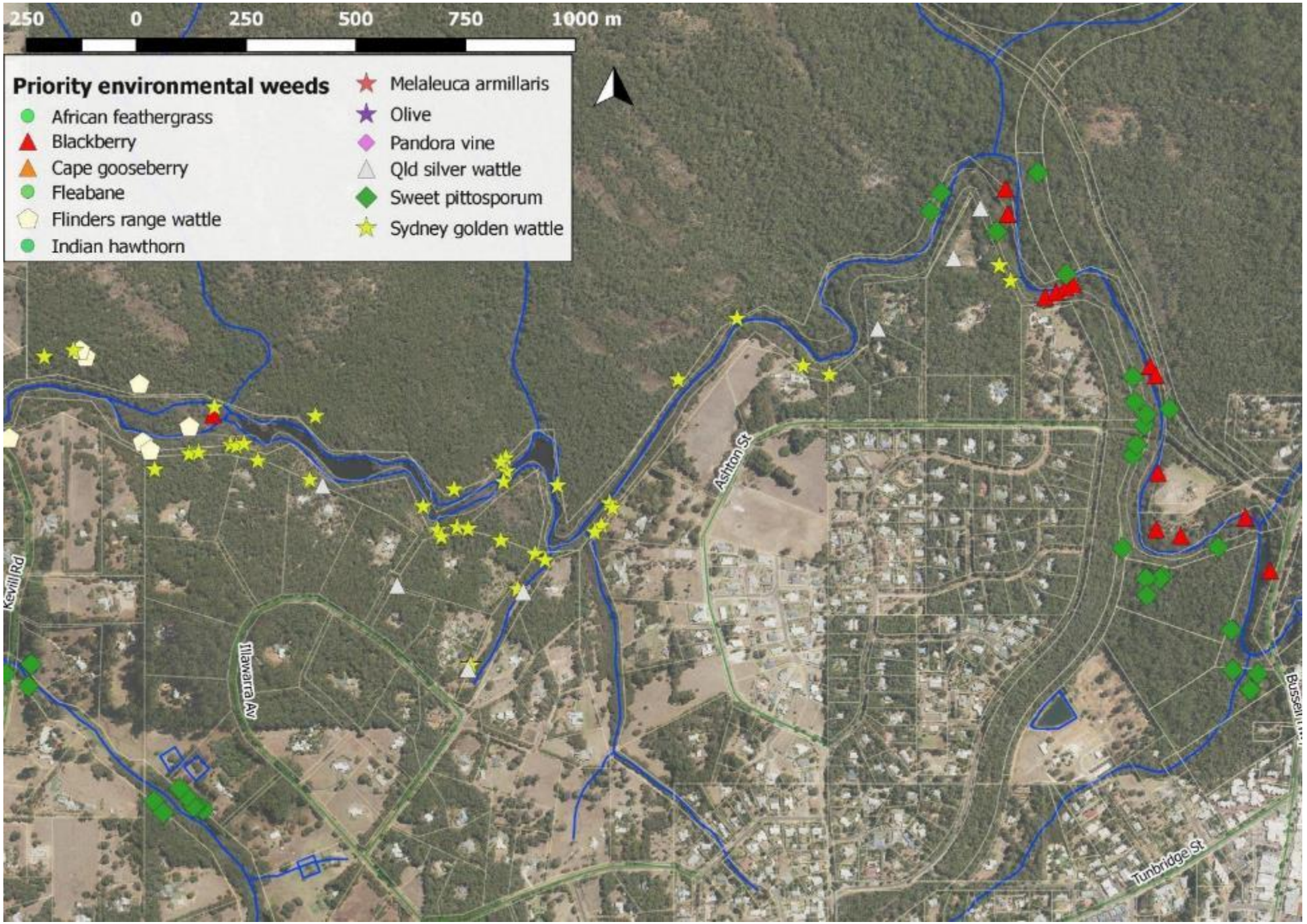

Figure 5: Section 1 priority environmental weeds

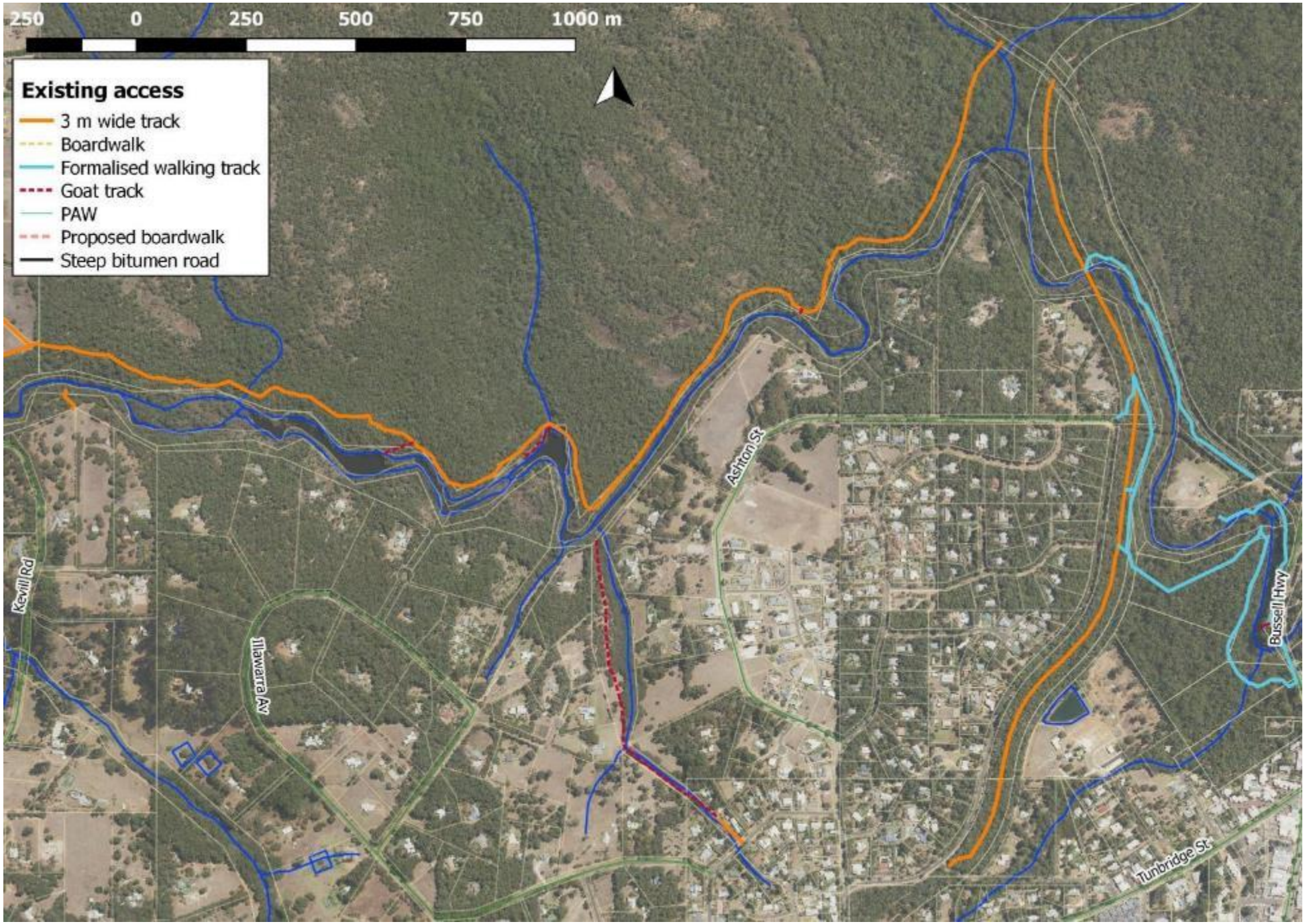

Figure 6: Section 1 existing access

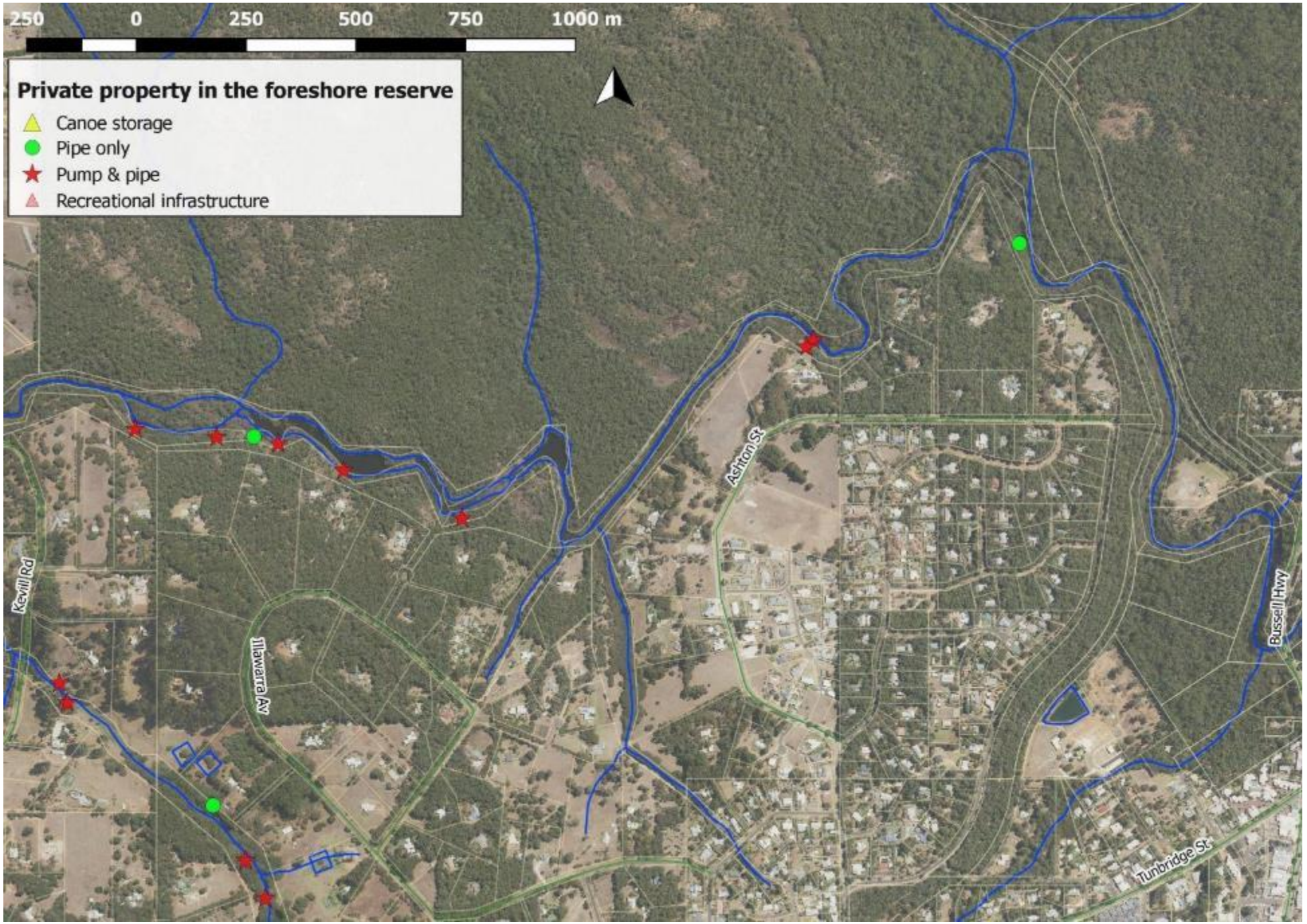

Figure 7: Section 1 private property within the foreshore reserve

9. Section 2: Kevill Rd East to Caves Rd.

Overview

This section of the river contains many habitat zones including the waterfall, rapids, rocky riffles, instream islands, backwaters, shallow runs and small pools. This variety of habitats supports a diverse array of plants and animals. Large sections of the river in this reach are dry during the summer and autumn months.

The waterfall, riffles and rapids throughout this section provide an important ecological function. In the winter and spring months while the river is flowing they help to oxygenate the water column, particularly important in south west rivers where aquatic plant and algae is minimal, and essential for aquatic life.

Part of this reach is contained within a steep and rocky river valley. Excellent quality upland vegetation includes an area of mainly undisturbed granite outcropping with associated vegetation community.

The river is primarily surrounded by rural residential properties with two larger rural zoned properties on the north side of the river. Further subdivision south of the river is likely to occur in the future.

Foreshore condition

Within this section over half of the river channel and embankment has good quality fringing riparian vegetation with minimal weed infestation and disturbance. A further 25% of the foreshore retains riparian vegetation that is mainly free of weeds but is narrow and sparse. This component of the A grade vegetation is vulnerable to further degradation.

Approximately 16% of the foreshore in this reach was classified as weed infested (B grade). From the west of the horseford off Kevill Rd much of the foreshore was previously dominated by arum lily. This weed has been controlled and the understorey in large parts of this section are now dominated by grasses. The waterfall and Yalgardup Brook confluence are also weedy areas of foreshore.

Nearly 5% of this reach is classified as C grade foreshore. These areas are cleared of all vegetation or have very limited native understorey and are susceptible to erosion. Most notable are upstream of Kevill Rd East, the horseford on both sides of the river and the southern bank close to Caves Rd.

There are many small islands and areas of instream vegetation in this rocky section of the river. The instream vegetation is often in very good condition although there is blackberry and African feather grass (*Pennisetum macrourum*) present throughout. There is one large island in the river that has good quality riparian vegetation and upland vegetation that ranges from degraded to excellent. There are large habitat trees on the island.

Interesting instream granite vegetation communities occur within the river channel in this reach with *Melaleuca lateritia*, *Darwinia citriodora*, *Kunzea ciliata*, *Astartea* spp, *Lepidosperma* spp and *Taxandria linearfolia*.

Upland vegetation condition

The condition of upland vegetation within the reserve varies considerably. There are some areas of excellent and very good condition vegetation on the northern side of the river in the Burnside area, and in the Doyle Rd area on the southern side. In the Doyle Rd area there are some high value granite communities that have a very low level of historical disturbance because they are rocky and unsuitable for agricultural use. There are also areas of very good to excellent condition marri (*Corymbia calophylla*)-peppermint (*Agonis flexuosa*) forest and woodland with diverse understorey and limited weed infestation.

Excellent quality vegetation in granite area

Excellent quality marri-peppermint woodland

There are large stretches of the reserve in this reach that are in a degraded condition. These poor condition areas have become degraded through clearing and grazing. Natural regeneration has been limited and these areas are often dominated by peppermints and marris over bracken and introduced annual grasses.

West of the horseford, the understorey in the degraded areas has been dominated for many years by arum lily and bridal creeper. Bridal creeper (*Asparagus asparagoides*) infestations have now been controlled and extensive arum lily control has been undertaken over the last few years. Following control of these invasive environmental weeds the degraded areas are now dominated by annual grasses.

Degraded foreshore

Weeds

Blackberry and African feather grass are widespread throughout this section primarily within the channel. African feather grass only occurs downstream of the Burnside tributary. This weed appears to have spread down this tributary from a number of infestations off Freshwater Drive. Sites of this invasive grass within the catchment are being located and landholders assisted to undertake control. Though the African feather grass is widespread in occurrence, on-going control over the last few years has resulted in most plants being small and contained.

Blackberry is also widespread within the channel in this area. The many islands and areas of instream vegetation create an ideal environment for blackberry and a challenging environment for control. Again extensive on-going control for many years has ensured that blackberry infestations are small and contained though widespread. There appears to be little blackberry in upland areas and on adjoining properties except

for 5903 Caves Rd where no blackberry control is undertaken. On-going reinfestation of the river foreshore from this property is occurring.

African feather grass

Blackberry

Sydney golden wattle is scattered through the foreshore and upland vegetation in this reach. There is a lot of Sydney golden wattle in adjoining private property as well as throughout the surrounding rural residential areas. Control of this weed on adjoining properties and throughout the catchment will reduce its spread in the foreshore reserve. On-going control is essential as this plant has very long lived seed.

Extensive control of arum lily within the reserve and on some adjoining properties has been on-going for the past few years. Arum lily infestations are drastically reduced as a result of this work. Follow up arum lily control within the reserve, as well as extending the work in the surrounding area in partnership with landholders, is essential to achieving long term control of this invasive widespread species.

August 2015 arum lily infested foreshore

August 2016 a year after arum lily control
Understorey now dominated by annual grasses

The foreshore in this section was heavily infested with bridal creeper for many years until this plant was controlled through the bridal creeper rust introduced to Australia in 2000 as a biological control agent. Small bridal creeper plants are still widespread throughout the foreshore though the rust has to date kept the plants small and contained.

The waterfall/Yalgardup confluence area has a number of weed issues including sweet pittosporum, kikuyu (*Pennisetum clandestinum*), buffalo grass (*Stenotaphrum secundatum*), Queensland silver wattle (*Acacia podalyriifolia*), Flinders Range wattle and Indian hawthorn (*Rhaphiolepis indica*). Some of these species are widespread on Yalgardup Brook.

There are a number of areas within the channel and the foreshore that have been the focus of blackberry and African feather grass control and that are now colonised by opportunistic weeds such as nightshade (*Solanum nigrum*), fleabane (*Conyza* spp), grasses, paspalum (*Paspalum dilatatum*), and umbrella sedge (*Cyperus eragrostis*).

Erosion

Areas of bank erosion in this reach include upstream of Kevill Rd East, and the horseford. Track erosion at the waterfall is also occurring.

Erosion on the northern bank at the horseford

Erosion on the southern bank at the horseford

Access and recreational use

The areas most heavily accessed on the river in this section are the waterfall and the horseford. On the southern side of the river both of these spots are easily accessed off Kevill Rd with parking very close to the river. On the northern bank access requires more walking and the level of use is not as heavy.

The waterfall on the southern bank is the most popular recreational area on the river in this reach. Uncontrolled access is leading to degradation in this area.

Degraded area at the horseford off Kevill Rd

There are approximately 4 km of tracks in this section developed as strategic firebreaks. These tracks are accessible for vehicles and this use is currently discouraged by signage and gates in some places. These tracks are suitable for walkers and cyclists.

There are also a number of informal goat tracks that have developed as a result of use by walkers. In some areas these goat tracks are very close to the edge of the river and could be formalised and realigned in places to move them further from the water's edge.

In front of Lot 972 Horseford Rd there is a constructed walkway. This walkway is on private property and/or within the reserve. It is the only access along the foreshore through this section where the embankment is very steep.

West of Laurel Crt walkers are directed by signage to walk along the road and down the PAW back to the river rather than in front of Lot 34 Ellen Place and Lot 35 Laurel Crt. The boundary between the reserve and Lot 34 Ellen Place and Lot 35 35 Laurel Crt is unclear. The boundary would need to be clarified to assess whether a track in front of these houses is possible or appropriate given the topography.

From the PAW off Ellen Place to Caves Rd there is a goat track. This track is not walker friendly due to fallen trees and branches and grassy weeds. This degraded section of river has a very narrow foreshore within the reserve.

There are a number of indistinct, small tracks down to the river for pumping and recreational access.


Strategic firebreaks providing walking/cycling tracks along the river


Strategic firebreaks providing walking/cycling tracks along the river

Informal tracks very close to river embankment

Infrastructure and encroachment

The boundary of the foreshore reserve is unclear in many places and there is some encroachment of private activities within the reserve including:

- 14 pipes and/or pumps
- Fence and garden
- Keep out signs
- Firebreak
- Old remnants of fencing

Reserve width

Although the reserve appears a reasonable width on the map it only provides a narrow band on the foreshore as the river itself is very wide throughout much of this reach with a large island, lots of smaller islands and large expanses of rock.

Figure 8: Section 2 riparian vegetation condition

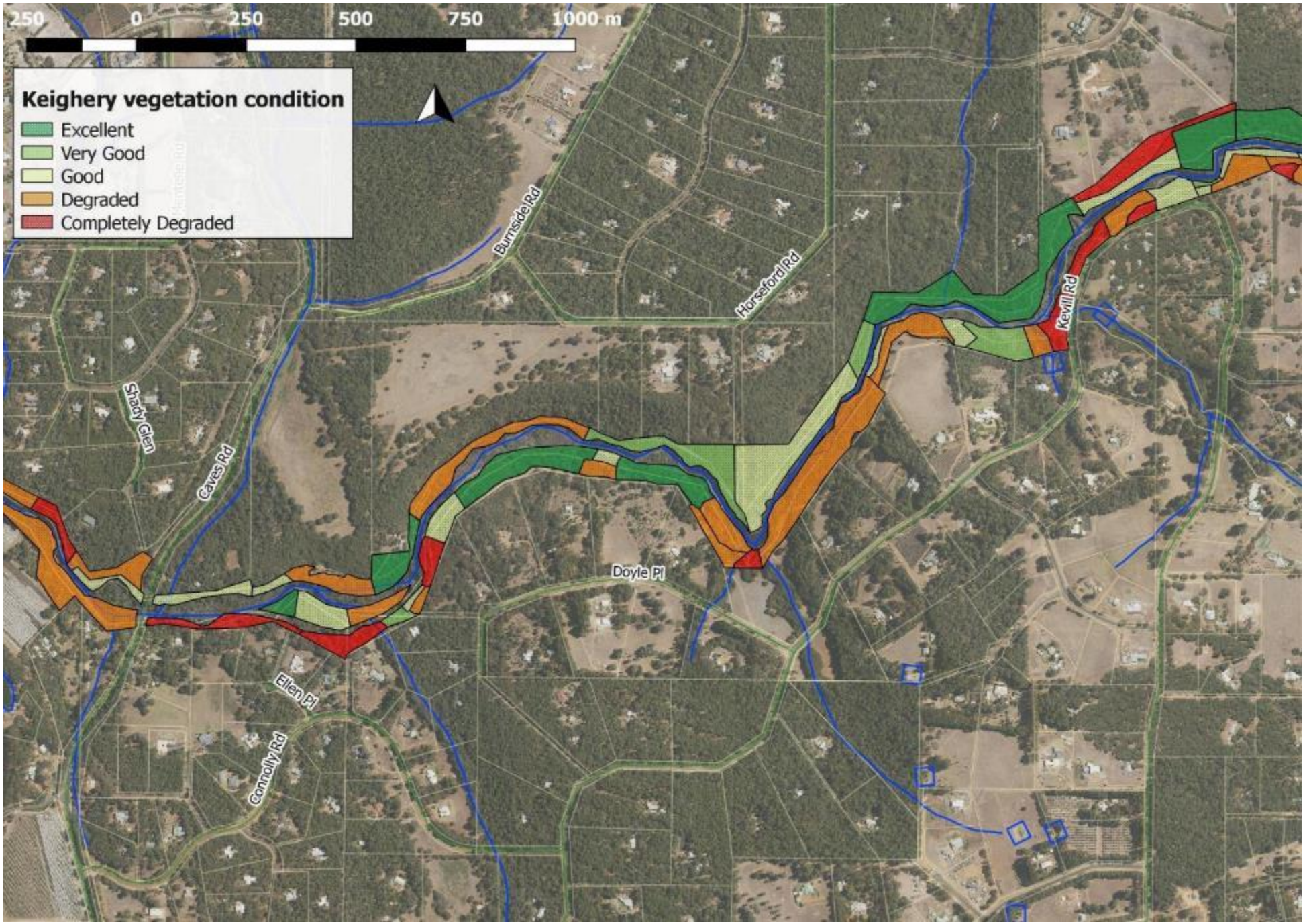

Figure 9: Section 2 upland vegetation condition

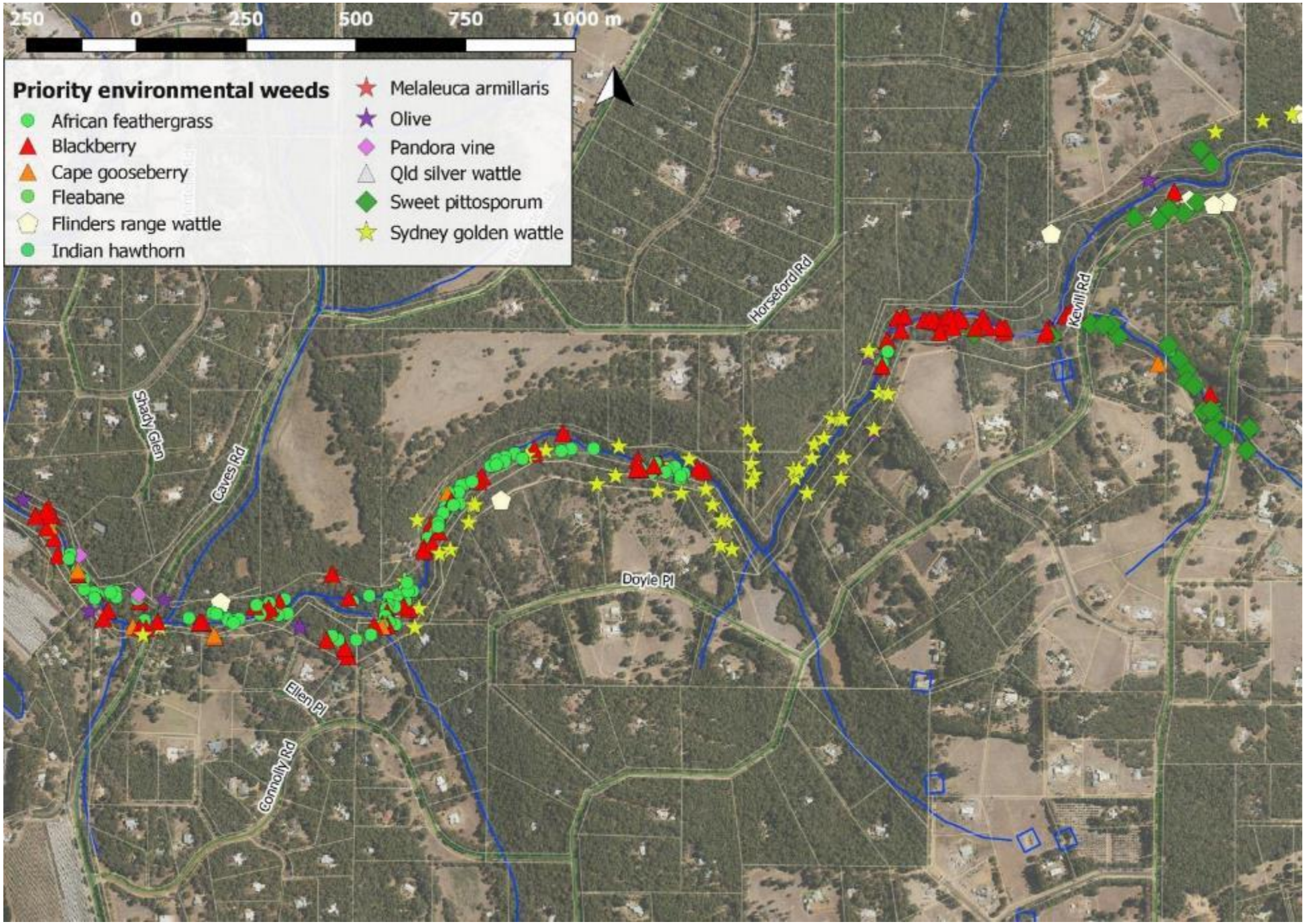

Figure 10: Section 2 priority environmental weeds

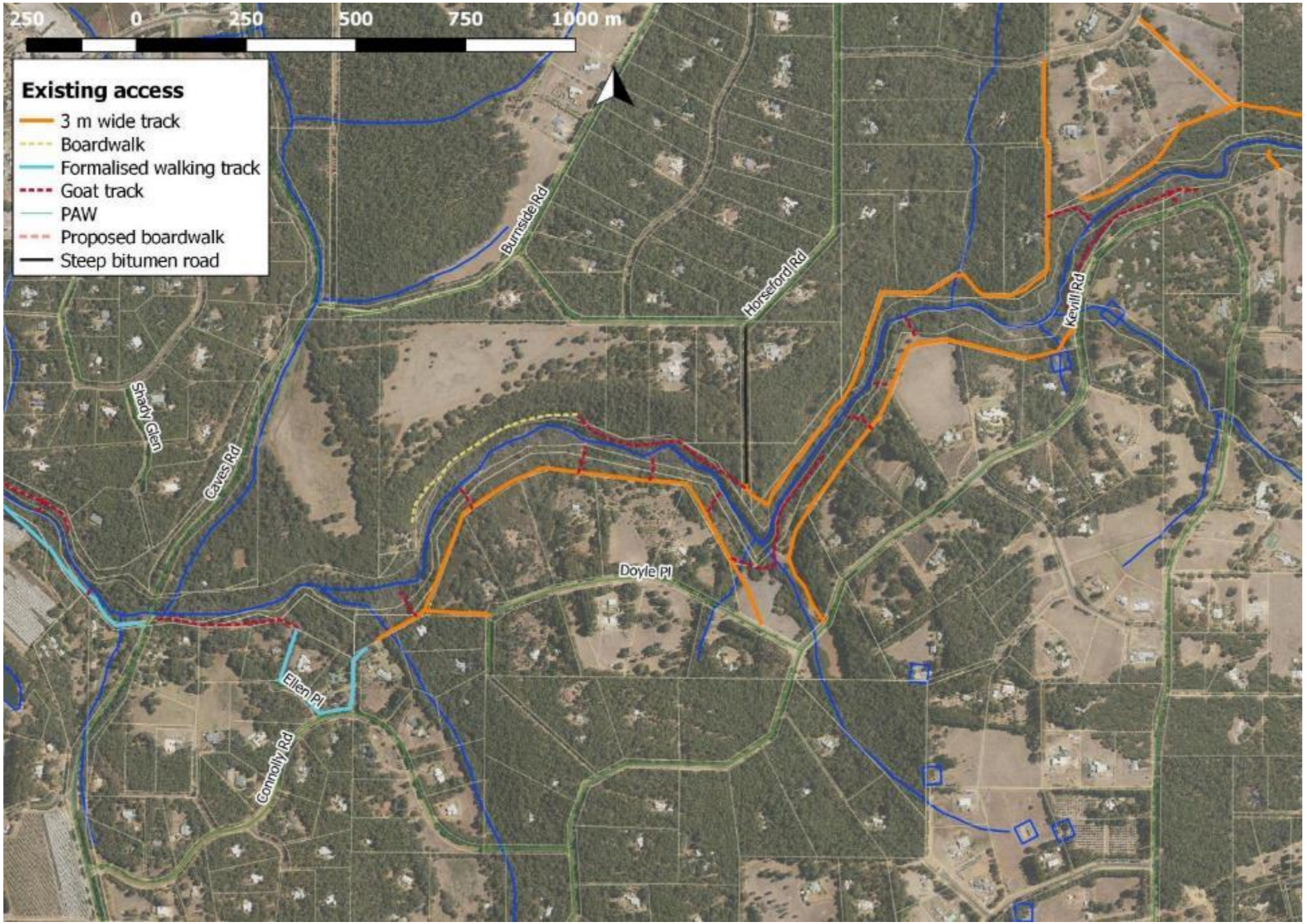

Figure 11: Section 2 existing access

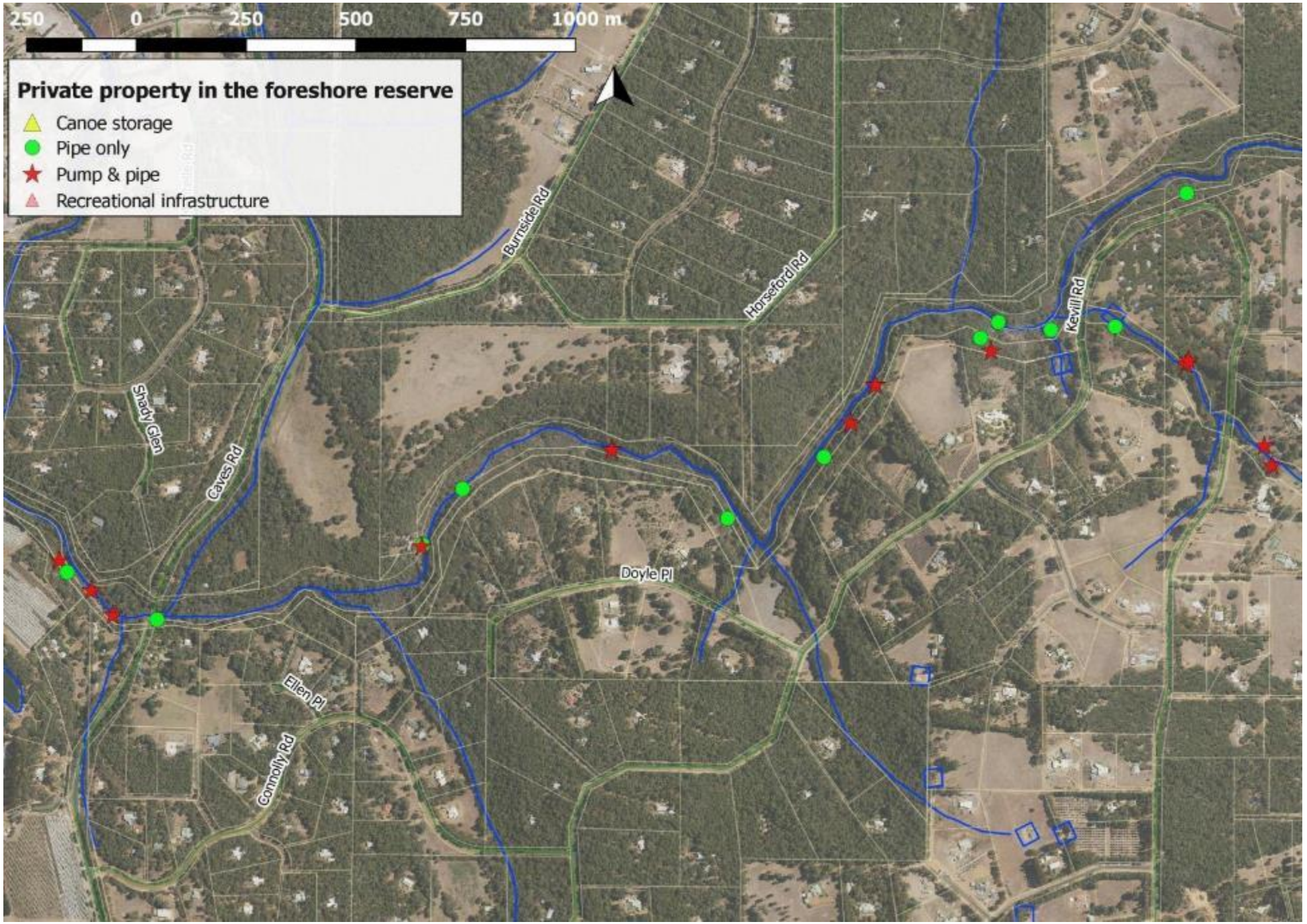

Figure 12: Section 2 private property within the foreshore reserve

10. Section 3: Caves Rd to St Alouarn Place Public Access Way

Overview

The section of river from Caves Rd to the coast has very high conservation values as it contains by far the largest area of permanent water on the river (approximately 4.5 km in length) and is in relatively natural condition. Most of this section of river is well vegetated and retains important habitat elements such as shade, leaf litter, snags, woody debris and areas of varied flow regime.

Like many of the river systems in south-west Western Australia the Margaret River ceases to flow during summer and autumn and is for many months a series of disconnected pools along an otherwise dry river bed. Pools and any reaches of permanent water provide an essential summer drought refuge for many river animals including waterbirds, turtles, water rats, pouched lamprey, frogs, fish, crayfish, shrimp, mussels and aquatic insects, and are integral to the survival of many fauna populations.

The value of this reach as a summer drought refuge for aquatic and terrestrial fauna is further amplified as a result of access restrictions in this area. Most of the northern bank, contained within the Leeuwin-Naturaliste National Park, is densely vegetated within a steep, high valley naturally restricting human access. Until recently, access on the southern bank has been very limited and the level of human visitation and disturbance has been low.

To date there has been little to no research undertaken to improve knowledge and understanding of this significant area of river either in regard to fauna habitat or ecosystem function. Research is needed to better understand and manage the area and enable careful decision making about development that may impact on conservation values.

The fortuitous location of this stretch of river adjacent to the Leeuwin-Naturaliste National Park, the extensive area of remnant vegetation to the north, the large area of permanent water, and the good natural condition of this section of river provides a unique opportunity to protect habitat and ecological values.

Foreshore condition

The first 700 m of the river downstream of Caves Rd is relatively degraded. For the first 180 m, the riparian vegetation is mainly cleared with trees and some large shrubs remaining and very little native understorey. Introduced grasses and other weeds dominate. This area is vulnerable to erosion and in some places active erosion is occurring. In this stretch the bank drops away sharply from close to the reserve boundary down to the channel. Within the channel there are some well vegetated small islands.

After the first 180 m the foreshore condition improves though weeds are still a significant component of the understorey. The riparian vegetation here is very narrow and the adjoining upland area of vegetation narrow and degraded.

After the sharp south west bend in the river, the foreshore condition improves and is in good condition with native species dominant. In places the riparian vegetation becomes narrow and sparse and is classified as A4.

There are broader low lying areas in this section in excellent condition where the riparian vegetation is wider and dominated by paperbarks (*Melaleuca rhaphiophylla*), rushes and sedges. They are partly inundated for most of the year. There was water present in some areas when foreshore assessments were done in March 2017. This *M. rhaphiopylla* vegetation community is extremely restricted within the Capes region and is very limited in extent on the Margaret River. Given its restricted nature, all areas of this vegetation community are regarded as highly significant. The 50% decline in the mean annual flow of the Margaret River for the

period 2001-2014 compared to the long-term record dictates that extreme caution be taken in regard to any disturbance of these restricted and vulnerable wetland areas.

Narrow, weed infested riparian vegetation

Excellent quality riparian vegetation

Paperbark wetland on the southern bank

Upland vegetation condition

The quality of the upland vegetation within the reserve follows a similar pattern to the riparian vegetation for the first 700 m of this reach. Here the vegetation has been severely disturbed on both the north and south bank with understorey lost through historical land use and weed invasion. There was very dense arum lily here but it is now well controlled for much of the area and the understorey has subsequently become dominated by introduced annual grasses.

The vegetation condition improves after the south west bend in the river. However, the vegetation varies considerably with less than 8% of the reserve in excellent condition, and 25% in very good condition.

The excellent condition areas include granite outcrops mapped as Wilyabrup (Wr) vegetation complex by Mattiske & Havel, 1998. This vegetation complex is naturally restricted with only 779 ha remaining uncleared within Western Australia and just 9% protected within formal reserves. Granite outcrops support a diversity of microhabitats and soil moisture regimes that have allowed disjunct populations from the Darling Plateau granites to persist and speciate. Some of the flora species are highly restricted and may be known from solitary rock outcrops. In addition to specific floristic value, the granite outcrops provide significant habitat for lichens, moss, algae, invertebrates and some reptiles. Granite outcrop communities are fragile habitats and susceptible to disturbance and degradation. Given the highly restricted nature of these complexes all their remnant vegetation needs to be regarded as regionally significant.

Excellent quality vegetation in the areas of granite outcrops

Degraded upland vegetation

Very good quality vegetation

The mapping of vegetation condition on the north-western bank does not have a high level of accuracy because of the timing of the field assessments. Arum lily is widespread throughout this section and it was difficult to accurately map its occurrence in autumn when the plant is dormant. Areas of dense infestations as shown in the adjacent photo were identified and these areas have been mapped as degraded to completely degraded. Where arum lily was not evident in the understorey the areas were mapped as good to very good depending on extent and diversity of native understorey species.

Weeds

Blackberry and African feather grass are both reasonably widespread in the first part of this reach. African feather grass is present throughout the first 350 m and blackberry presence is mainly within the first 850 m of foreshore with a few infestations further downstream.

A Pandora vine infestation is present in the foreshore at Kilcarnup. This invasive environmental weed is a priority to control before it gets larger and more widespread.


Pandora vine in the Kilcarnup foreshore reserve

Some small redhead cottonbush (*Asclepias curassavica*) infestations are present within the channel in the first 700 m of this reach. It is a priority to control this species before it becomes widespread.

The foreshore in this section was heavily infested with bridal creeper for many years until this species was controlled through the bridal creeper rust. Small bridal creeper plants are still widespread throughout the foreshore and adjacent private property though the rust appears to be keeping the plants small and contained.

Arum lily is very widespread in this reach. A coordinated control program began in this area in 2015. Much of the foreshore at Kilcarnup and most of the foreshore on the southern bank have been sprayed over the last couple of years. Arum lily is still very dense on Dallip Spring and at its confluence with the river. This coordinated program has not yet included the National Park on the northern bank.

Sydney golden wattle is present at St Alouarn tributary, surrounding properties and on the northern side of the river in this area. If this plant spreads on the northern side of the river it will be very difficult to control where the terrain and access make weed control very difficult.

Other weeds of concern are: a dense infestation of cape gooseberry (*Physalis peruviana*)at the Dallip Spring confluence and scattered throughout, kikuyu immediately downstream of Caves Rd on southern bank, edible asparagus (*Asparagus officinalis*) in the vicinity of the McHenry Hohnen vineyard; and twiggy mullein (*Verbascum virgatum*) scattered throughout.

Erosion

There is an area of severe bank erosion occurring on the northern embankment at Kilcarnup. This erosion is being caused by trees in the channel diverting water on to the northern bank.

The partly constructed track on the southern bank just to the west of Caves Rd has some areas of erosion occurring where water is draining across the track. The bank in this area is very susceptible to erosion as there is little vegetation to maintain bank stability.

Bank erosion at Kilcarnup

Short track down to river at Kilcarnup foreshore

Access

On the northern bank at Kilcarnup there is a goat track throughout part of the foreshore. This track links to strategic firebreaks/access tracks that are located on private property. There is an eroding access off this track down to the river.

Winter diversion track

On the southern bank a track has been partly constructed to provide a route for walkers on the Cape to Cape Track to get from the north to the south of the river in winter and spring when the rivermouth is impassable. This track was originally planned and constructed as a dual use path but the designated useage has since been changed by AMRSC to a walking only track.

Construction for dual use required earth moving and vegetation disturbance through an area of high 'wildness quality' and previously undisturbed granite vegetation. A large quantity of rock that was moved to construct the track has been left in piles along the route and rock paving has been constructed in two places. The rock piles and artificial paving negatively impact on the landscape character and 'wildness quality' of this previously undisturbed area of river.

Incised sections of track through granite communities


Track very close to river embankment


Piles of construction debris left on edge of track


Construction debris


Constructed rock paving

Boardwalks were proposed by the Friends of the Cape to Cape Track to traverse two sections of paperbark wetland that are inundated for part of the year. These sections are approximately 200 m and 45 m long. These areas are in excellent condition and provide valuable wildlife habitat.


Areas proposed for boardwalk construction

Towards the southern end of the constructed track the alignment is on the very edge of an area of paperbark wetland. This alignment does not allow a buffer to protect habitat values or restrict pedestrian access into this fragile area. The foreshore reserve is wide enough here to allow a buffer of up to 40 m between the track and the wetland.


Track constructed on the edge of a section of paperbark wetland

Granite rock area used for recreation

Along the winter diversion track there is an area of large granite rocks on the foreshore that are used by canoeing groups and others to jump into the water. The increased use at this site is leading to vegetation disturbance and erosion along the bank and surrounding the rock.

Riparian vegetation in the vicinity of the granite outcrop trampled by canoe groups and others

Vegetation damage and erosion at granite rocks

Infrastructure and encroachment

The boundary of the foreshore reserve is unclear in many places and there is some encroachment of private activities within the reserve including:

- 3 pipes and/or pumps
- Canoe storage at three sites
- Vineyard operational activity within the reserve

Reserve width

The foreshore reserve is very narrow in two sections of this reach including from Caves Rd to the end of the vineyard and in front of 89 Wooditch Rd.

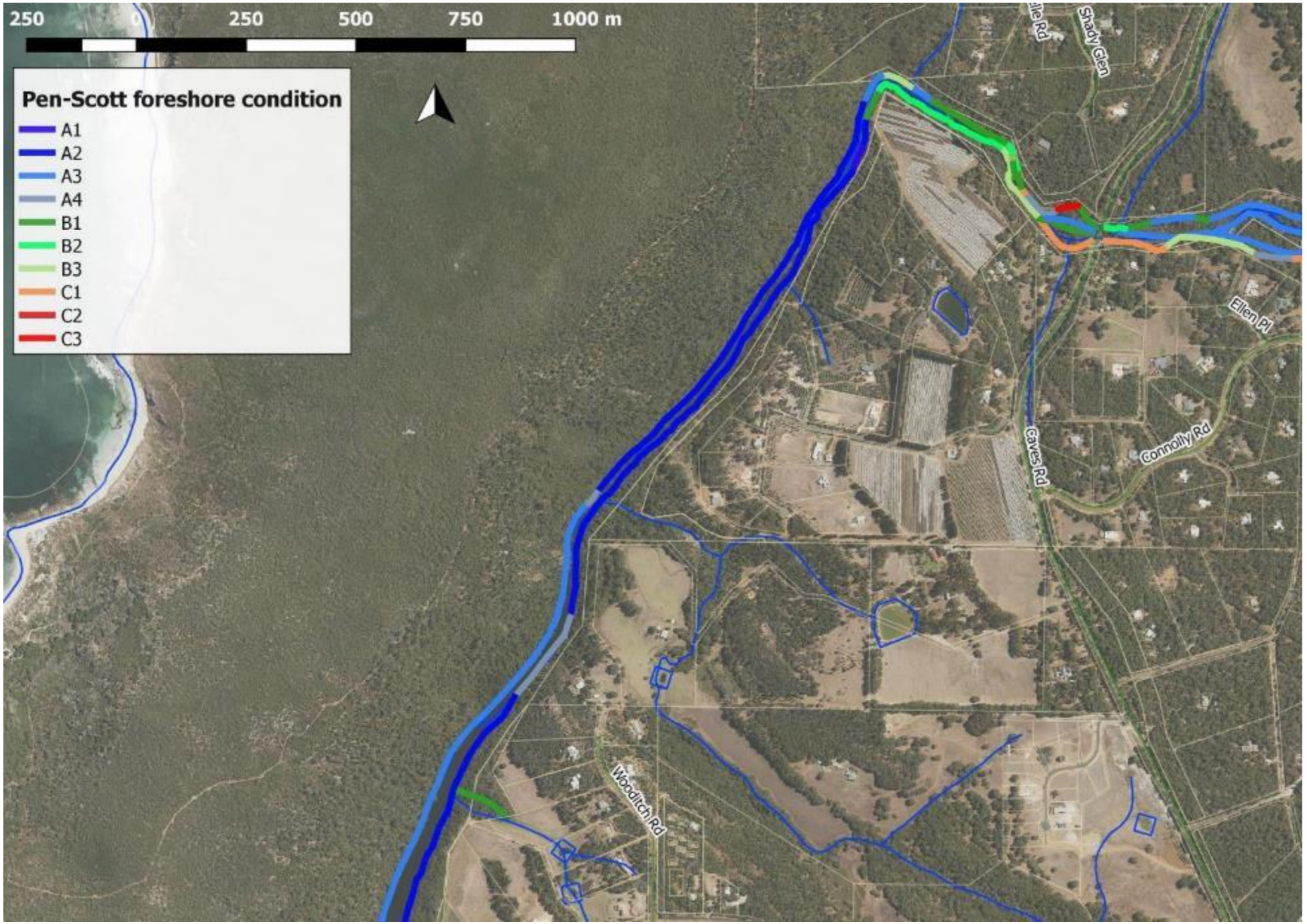

Figure 13: Section 3 riparian vegetation condition

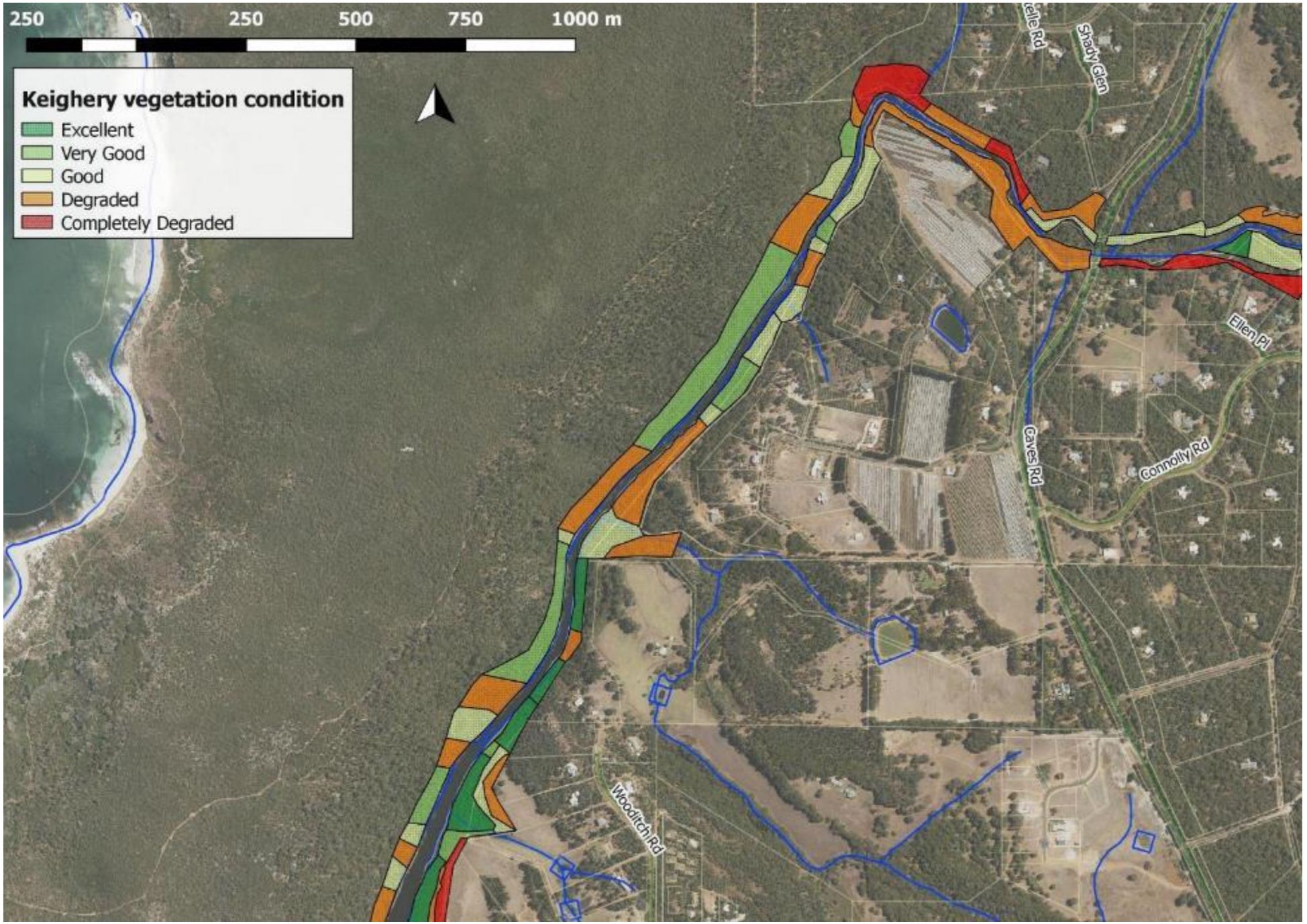

Figure 14: Section 3 upland vegetation condition

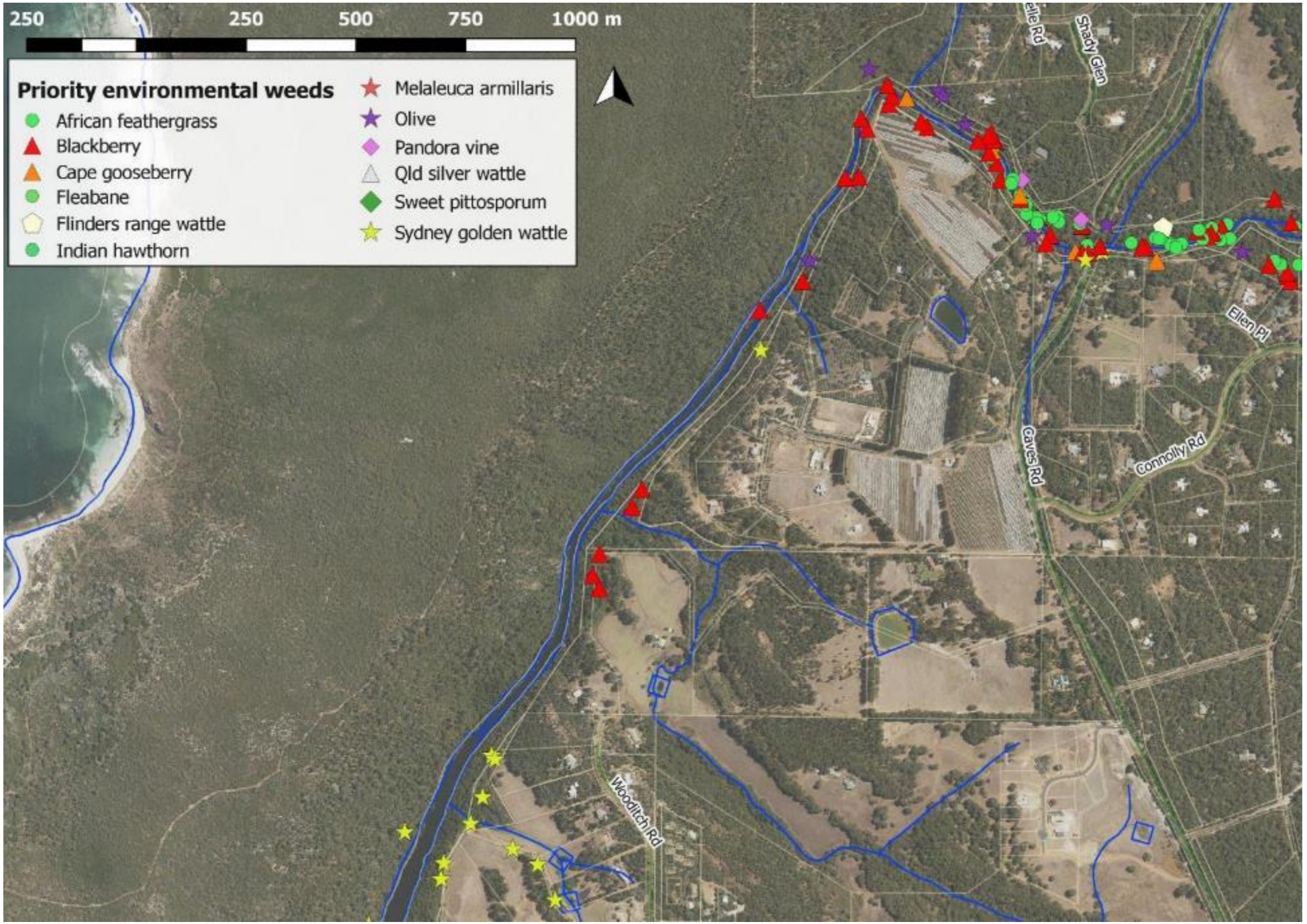

Figure 15: Section 3 priority environmental weeds

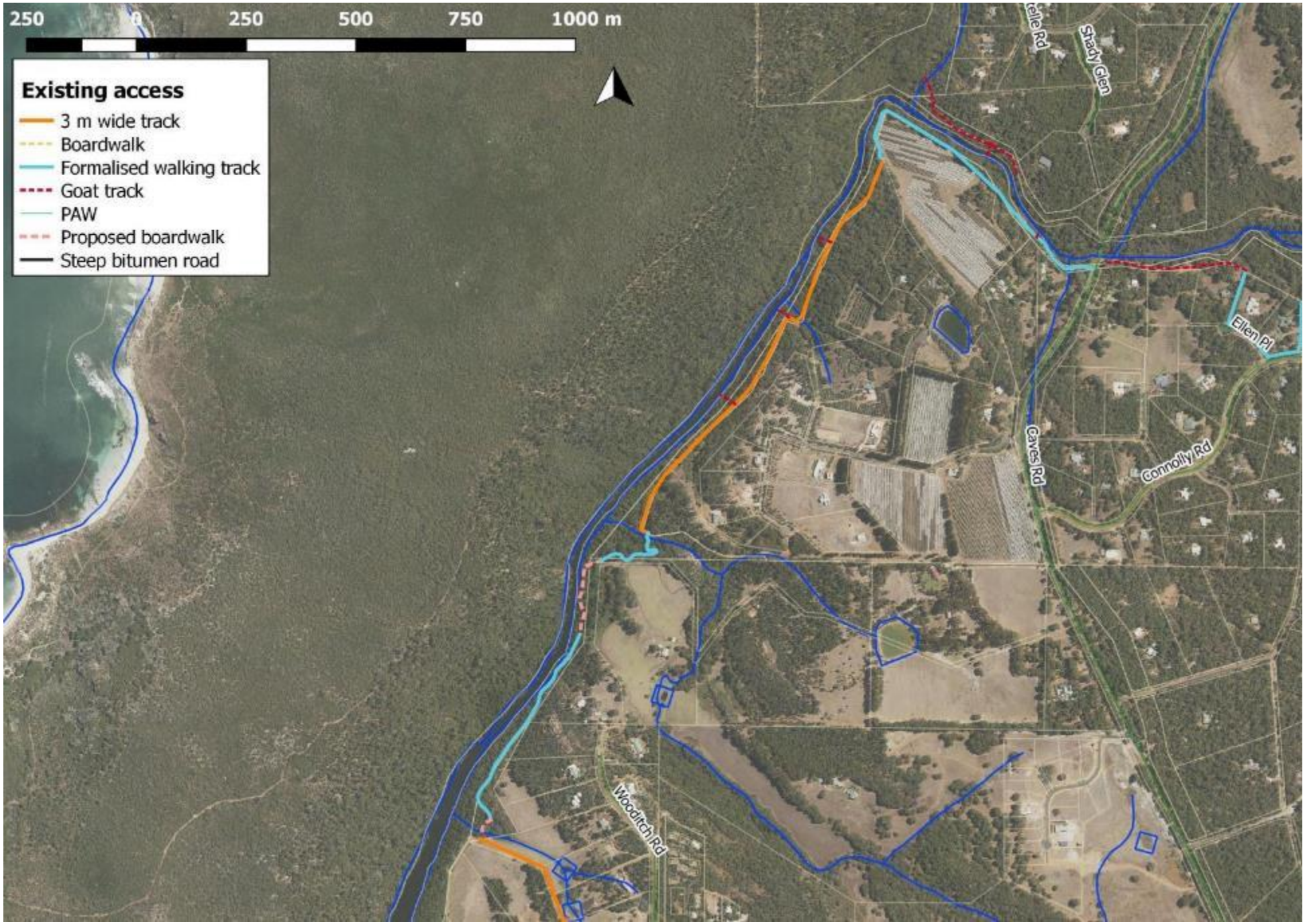

Figure 16: Section 3 existing access

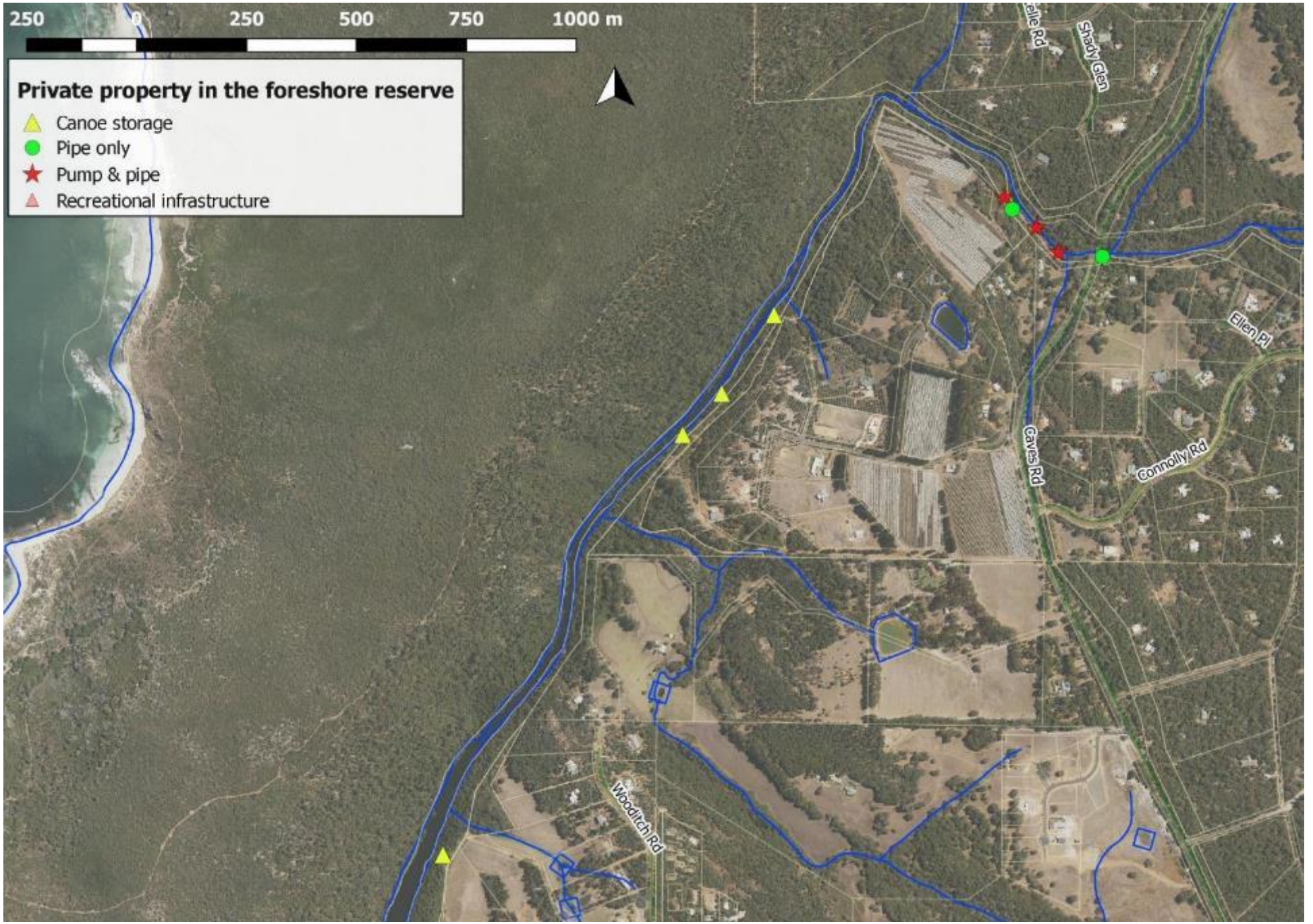

Figure 17: Section 3 private property within the foreshore reserve

11. Section 4: St Alouarn Public Access Way to the coast

Overview

In this section the river broadens and becomes estuarine. The estuary is considered to extend approximately 2 km upstream from the rivermouth and have a basin of about 20 ha (Brearley, 2005). Low level interaction with the ocean and intrusion of salt water occurs, primarily through wave action at the mouth. Water levels vary widely throughout the year based both on flow from upstream and the intermittent opening and closing of the rivermouth through early winter to early summer.

It is likely that the estuary is becoming shallower as it fills with sediment over time (Brearley, 2005). Concern is often expressed about the artificial opening of the rivermouth and potential ecological impacts which are unknown. Sampling by DWER in summer 2016 indicated the presence of water rats, long-necked turtles and a number of fish species in this area, including identifying the area as an important nursery area for black bream (*Acanthopagrus butcheri*).

This section of river contains limestone cliffs and caves highly valued by Aboriginal people and a registered Aboriginal site.

Foreshore condition

The foreshore condition along most of the northern side and much of the southern side, including the first 650 m of the river downstream of the St Alouarn PAW, is in very good to excellent condition. Weeds begin to encroach into the foreshore both upstream and downstream of the Rowing Club and downstream from the Wallcliffe cliffs.

The last 500m of foreshore on the southern bank before the rivermouth is degraded and erosion prone. The sparse native vegetation in this area combined with pedestrian traffic and seasonally high water levels is resulting in active erosion.

Degraded foreshore downstream of the Rowing Club

Excellent condition foreshore adjoining the estuary

Sparse foreshore vegetation near Wallcliffe House

Eroding foreshore at the rivermouth

Upland vegetation condition

The upland vegetation on the northern bank is largely in good to very good condition with a number of smaller patches identified as degraded due to a very sparse understorey and thick arum lily infestation. A patch of coastal dune at the rivermouth on the north side is also identified as degraded due to the dynamic nature of the rivermouth opening, coastal processes and the dominance of introduced marram grass (*Ammophila arenaria*) and other coastal weeds. On the southern side the vegetation condition is more variable.

A strip of excellent condition fringing vegetation occurs within the paperbark wetlands for the first 550m downstream of the St Alouarn PAW. Adjacent to the paperbark wetlands the vegetation condition declines to completely degraded along the private property boundary where the area is largely cleared and dominated by introduced grasses and bracken fern (*Pteridium esculentum*). Moving downstream the strip of paperbarks narrows and the native understorey diminishes as the area becomes more weed dominated and impacted by historical grazing.

In front of Wallcliffe House the vegetation is a relatively narrow strip with some introduced plantings and a range of weed incursions.

Under the Wallcliffe cliffs the vegetation has been heavily impacted by previous recreational access and lack of weed management following the 2011 fire. Much of this vegetation is degraded with significant arum lily, cape gooseberry, and apple of Sodom (*Solanum linnaeanum*) infestations.

Through to the coast on the southern side of the river, pyp grass (*Ehrharta villosa*) and a number of other coastal environmental weeds are well established. These weeds are dominating in the area and replacing native vegetation. As a result much of this lower stretch was classified as degraded or completely degraded.

vegetation under Wallcliffe caves

Degraded

Weeds

The foreshore in the upper portion of this section was heavily infested with bridal creeper for many years until this plant was controlled through the bridal creeper rust introduced to Australia in 2000 as a biological control agent. Small bridal creeper plants are still widespread throughout the foreshore and adjacent private property though the rust has to date kept the plants small and contained. The continued effectiveness of the rust needs to be monitored and ameliorative action taken if bridal creeper again takes hold in this area. It is noted that a low level presence of bridal creeper is required in an area to sustain the biocontrol rust as a source for annual reinfestation of seedlings.

Arum lily is widespread in this reach, particularly along the northern foreshore where it is scattered throughout much of the foreshore and surrounding vegetation. It is dense in pockets. It is understood that this area has not been the subject of any concerted control effort within the last decade.

On the southern side of the river arum lily is present at low densities for much of the length from St Alouarn PAW to the base of the Wallcliffe caves. This area has been the subject of some control in recent years.

Sydney golden wattle is scattered along the southern side of the river from the St Alouarn tributary to the Rowing Club and on surrounding properties. It was also recorded from two locations on the northern side of the river. These plants and clusters represent a high priority for control (particularly those on the north side).

Pyp grass is well established and dominant through much of the rivermouth zone on the southern side of the river. This species is an effective dune stabiliser and as such it serves an important function in this area where there is minimal native vegetation cover. Containment of this infestation is a high priority to ensure it does not spread into areas of good condition vegetation. Control of the main infestation is a very large project which would involve years of consistent control and revegetation, and would require long term funding and planning.

grass dominated dune and foreshore

Pyp

Degraded, weed infested area below Wallcliffe caves

Other weeds that are a priority for control include:

- cape gooseberry and apple of Sodom at the base of Wallcliffe caves,
- the isolated blackberry around the Rowing Club;
- the Norfolk Island Hibiscus on the northern bank opposite the canoe storage area at the rivermouth; and
- the bracelet honey myrtle (*Melaleuca armillaris*) in front of Lot 7 and Lot 8 Saint Alouarn Place

Erosion

The vast majority of the foreshore in this section is stable and not prone to erosion. The exceptions to this include:

- A small section of the river bank around the Rowing Club which is bare but currently being revegetated;
- The first 500m upstream of the rivermouth where recreational activity and pedestrian traffic has destabilised the dune vegetation. Both access management and rehabilitation works are required to contain the extent of impact and restore stability to the impacted dunes.

Eroding and sparsely vegetated dunes near the rivermouth

Degraded bare area at the Rowing Club

Access and recreational use

Downstream of the St Alouarn PAW there are no formal tracks, although the degraded edge of the reserve on the southern bank between the St Alouarn and Rowing Club PAWs allows passage through this area. The two PAWs provide access to the foreshore from Wallcliffe Rd.

Further downstream there are informal walk tracks to and through the base of Wallcliffe cliffs.

The last 500m of river on the south bank is accessible through fenced walkways and along the water's edge. During high water people are walking through the dunes to avoid the need to wade through the water. This is exacerbating damage to this area.

The northern side of the river receives some recreational and pedestrian traffic behind the dunes at the rivermouth beach. The rest of the northern bank has no formal or established access or tracks. Access to this area involves canoeing, kayaking or walking down from the Kilcarnup track and it appears that very little use is occurring.

The rivermouth is a major recreational node for swimmers, surfers, Cape to Cape Track walkers, families, kayakers, fishers and general beach goers. There is significant infrastructure in place to support this use.

The lower portion of the river receives significant use by recreational and commercial kayakers, canoeists and SUP paddlers generally originating from the rivermouth with additional rowers and kayakers starting from the Rowing Club.

The Wallcliffe caves and cliffs also represent a regularly used node of recreational and commercial operator use. The area is currently accessed via an informal access track off the Cape to Cape Track and by paddlers from the river. The area represents an important Aboriginal heritage site and is currently used for walking, rock climbing, sightseeing and caving. It has also been used for the storage of commercial operator's canoes.

At the Shire of Augusta Margaret River Ordinary Meeting of 28 March 2018 the following resolution was agreed to regarding the Wallcliffe caves:

That Council:

1. *Undertakes statutory public consultation by giving local public notice under clause 2.2 of the Local Government Property Local Law 2013 of its intention to make a determination prohibiting:*

    a) entry into the Cliffs caves after 30 June; and
    b) the storing/landing/launching of boats on the river bank other than in designated areas.

c) the traversing of any land between the Cliffs and the Cape to Cape track, including the trail marked in yellow on the plan below.

2. *Consults with local Indigenous groups regarding:*

a) the erection of signs at the entrance to the Cliff caves a safe distance from the burial sites and at the Rivermouth advising the public of the above determination;
b) the removal of climbing infrastructure and other means of restricting access to the site.
c) Construction of a viewing platform for photography on the western end of the Reserve on top of the cliff;
d) Revegetation and rehabilitation of degraded areas around the Cliffs, including the river bank and the trail to the caves.

3. *Varies the conditions of any Local Law Permit holders who use the Cliffs to prohibit entry into the caves.*

4. *Designates the following locations for the storing/landing/launching of boats/canoes, (for the purpose of local public notice and future permit conditions):*

a) Anywhere more than 100m north, but not more that 300m north of the Rivermouth Carpark;
b) 50m either side of the Margaret River Rowing Club building on 43268.

Canoe storage at the rivermouth

Fenced path at the rivermouth

Infrastructure and encroachment

The boundary between the foreshore reserve and private property is unclear in many places on the southern side, encroachment of private activities into the reserve includes:

- Storage of canoes/kayaks at the rivermouth and on the foreshore near the St Alouarn PAW
- Vehicle access around the St Alouarn PAW

Reserve width

The Leeuwin-Naturaliste National Park provides a very wide reserve and excellent buffer along the entire northern side of the river in this section.

Downstream of the St Alouarn PAW the reserve on the southern bank is very narrow through to non-existent at Wallcliffe House. The final 1 km of foreshore downstream of Wallcliffe House is contained within Reserve 41545 which provides a healthy and wide reserve.

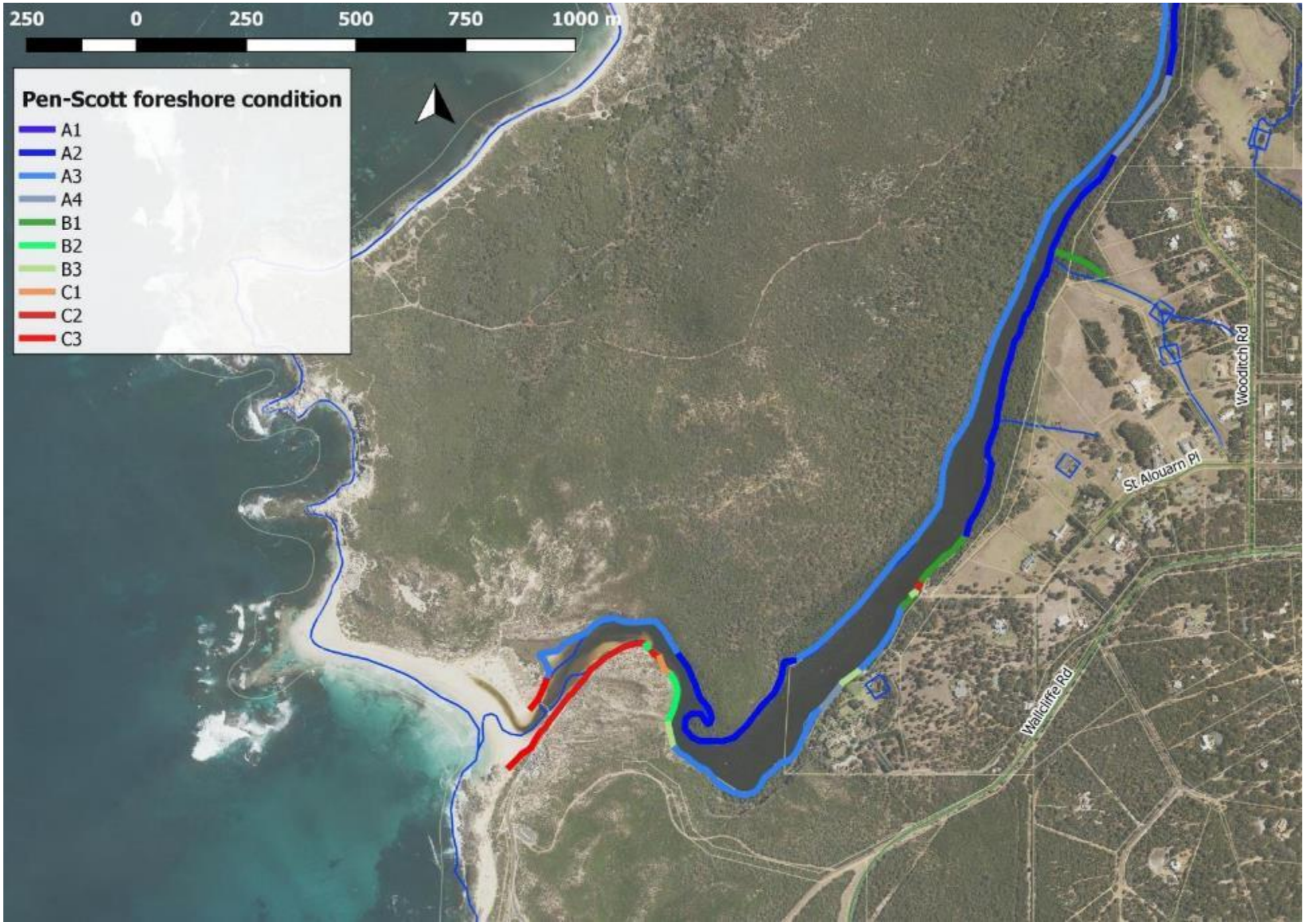

Figure 18: Section 4 riparian vegetation condition

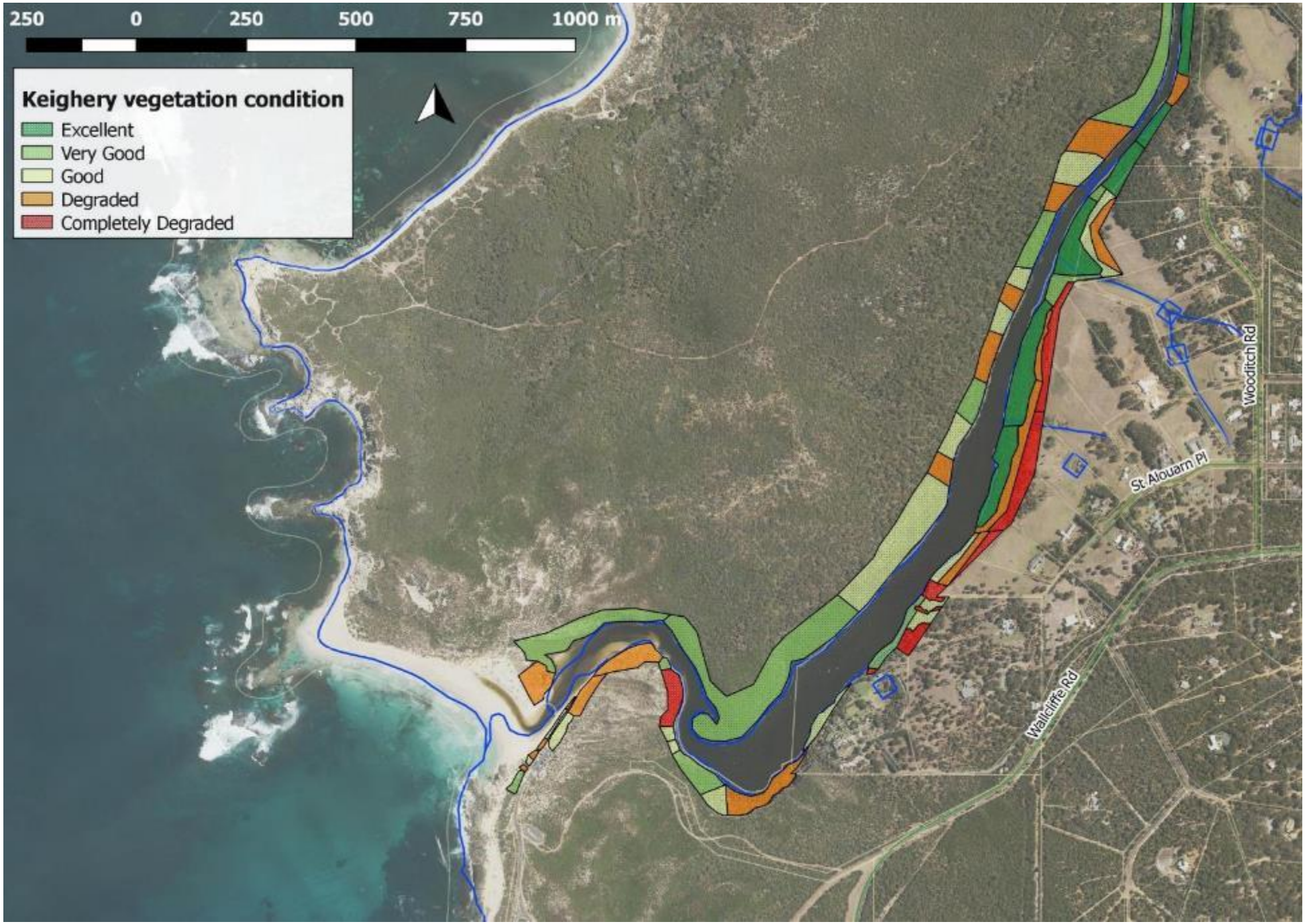

Figure 19: Section 4 upland vegetation condition

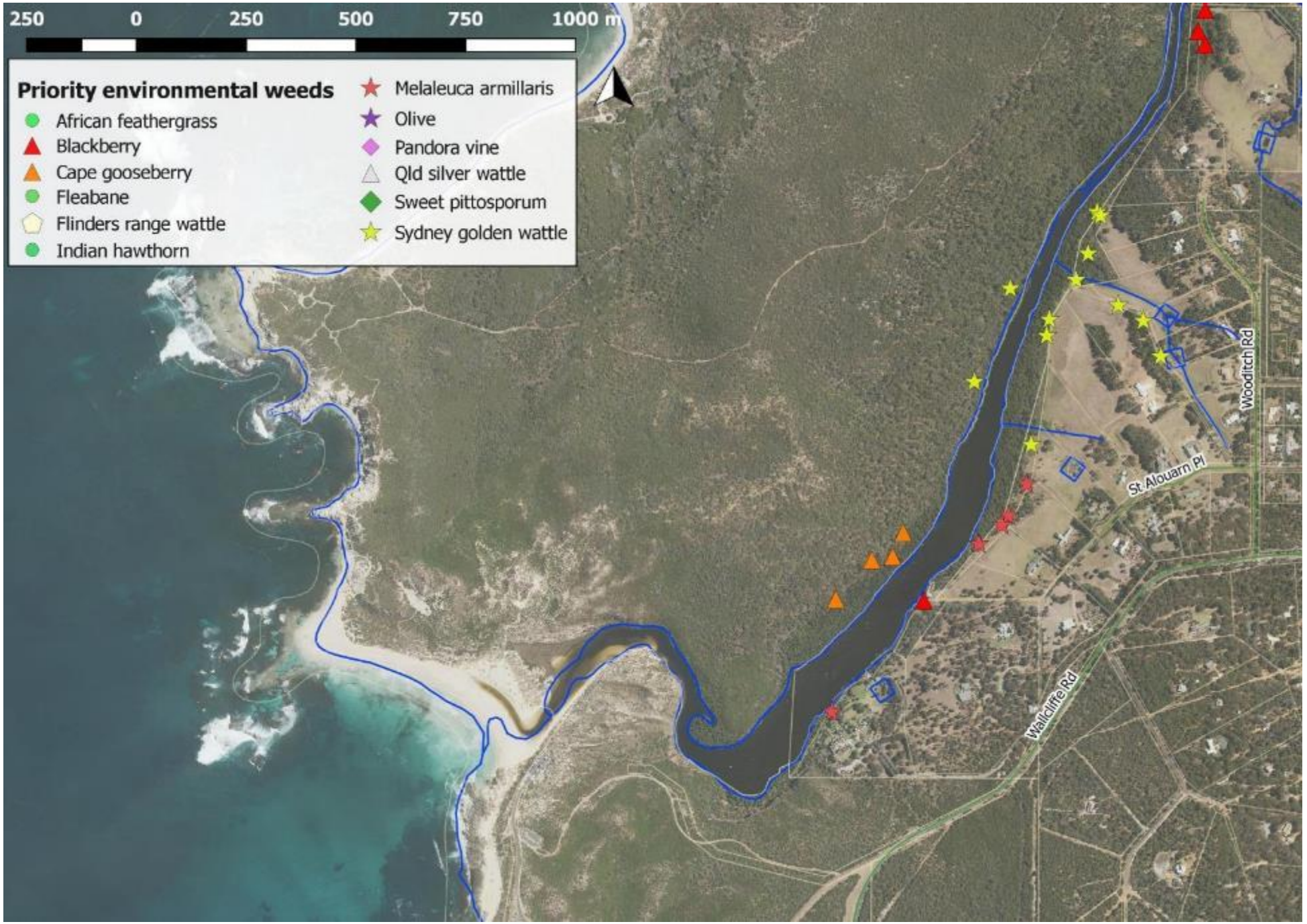

Figure 20: Section 4 priority environmental weeds

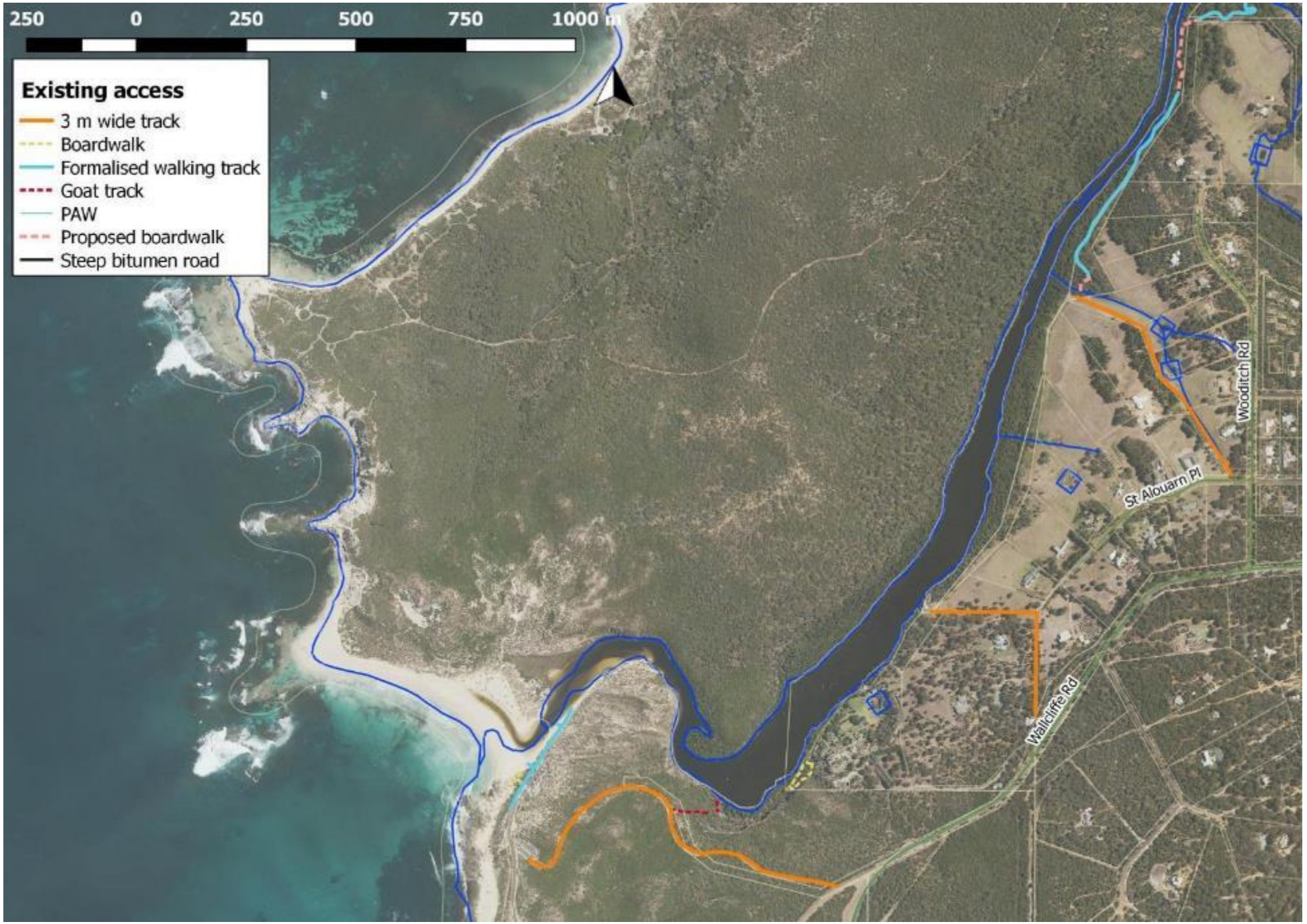

Figure 21: Section 4 existing access

Figure 22: Section 4 private property within the foreshore reserve

Management recommendations

Protecting and enhancing the environmental values of the Margaret River requires careful management. The river is a complex and dynamic natural system. The river is well recognised for its environmental and cultural values and faces numerous, often interrelated, threats. Current knowledge and understanding about this complex river ecosystem is limited.

Decisions regarding development and management associated with the Margaret River need to be made within a broad context to avoid degradation resulting from incremental and accumulative change. A clear vision, agreed management principles, comprehensive planning and collaborative management are highly recommended.

The following management principles and recommendations have been developed based on best practice river management, information on current river condition, and input from stakeholders and the community.

The management recommendations are in two sections:

- Overarching strategic management principles and recommendations relevant to the whole subject area; and
- Recommendations for on-ground activities broken down by section with accompanying map.

12. Overarching strategic management principles and recommendations

Aboriginal cultural and heritage values		Priority[5]
12.1	Undertake early consultation and regular engagement with relevant Aboriginal people regarding planning, management and on-ground activities associated with the Margaret River and Wallcliffe caves and cliffs.	H
12.2	Follow advice in the Aboriginal Heritage Due Diligence Guidelines 2013. Seek consent or authorisation from the Department of Planning, Lands and Heritage for activities that may impact on the Margaret River and Wallcliffe cliffs and caves.	H
12.3	Ensure Aboriginal people have a primary and active role in the planning and implementation of Aboriginal cultural and heritage education and interpretative activities and materials.	H
Community knowledge and participation		**Priority**
12.4	Divergent values and aspirations regarding the river exist within the community. Genuine, thorough consultation and involvement with stakeholders and the community should occur when development within the foreshore reserve is being considered.	H
12.5	The community want to be involved in the management of the foreshore reserves and programs such as the Friends of Reserves allow the community the opportunity to be engaged in and take ownership of their reserves. It is recommended that Friends of Reserve groups be formed and supported to facilitate and encourage community participation in planning and management.	H
12.6	There is strong community interest for deeper understanding and knowledge of the ecological, cultural and historical aspects of the river and its foreshore. Engagement	M

[5] Priorities: H= high, M=medium, L=low

	activities are important in connecting the community to the river and its reserves and ensuring the community understands the reasoning and values driving management decisions and actions. The use of signage to improve community knowledge about the river needs consideration and planning. It is recommended that an interpretative signage plan for the river be developed in consultation with Aboriginal and community representatives. Considerations include: appropriate information and messages; appropriate number of signs; suitable locations at key, well used, access points such as the A class reserve, Ashton St foreshore, the waterfall, the horseford, and the rivermouth; and avoiding installation of signage in areas where it may be intrusive on the natural environment.	
Reserve vesting and purpose		Priority
12.7	The classification, vesting and designated purpose of the foreshore reserves should reflect their environmental values and intended use, and should facilitate the best management outcomes. It is recommended that the DBCA recommendation within the Leeuwin-Naturaliste capes area parks and reserves management plan 2015 to add the UCL adjacent to the Wooditchup National Park into the National Park should be supported, subject to consultation with the Aboriginal community. It is recommended that subject to consultation with the Aboriginal community, the remainder of the UCL and all other reserves along the river be amalgamated into one reserve, with the vesting authority AMRSC and the vesting purpose changed to more accurately reflect the conservation values of the reserve and the management objectives for the area. For example, “Conservation and recreation” or “Conservation, foreshore protection and recreation”.	M
12.8	Management responsibilities for the Margaret River reserves should be clarified and consultation undertaken between management bodies to coordinate required management. It is recommended that AMRSC support and participate in the Margaret River Collaborative Management Group to ensure coordinated cross tenure management of foreshore reserves.	H
Planning		Priority
12.9	Where subdivision and development occurs adjacent to the foreshore reserve it should, whenever possible, result in improvements to river foreshore condition. For example, conditions of planning approval to include: control of invasive environmental weeds on properties adjoining the foreshore reserve and revegetation of priority areas.	H
12.10	Much of the foreshore reserve is narrow and increasing the width of the reserve should be a priority through rezoning and subdivision processes. For further information and guidance see the DOW Operational Policy 4.3 Identifying and establishing foreshore reserves for further information.	H
12.11	Management and development of the foreshore reserves should be considered within the broader context of the river and catchment. On-going consultation and collaboration through the Margaret River Collaborative Management Group is recommended.	H
Wildness quality		Priority

12.12	Field assessments and community consultation identified areas of the river that, for lack of a better descriptor, retain a 'wildness quality'. These areas remain in excellent natural condition, are relatively free of infrastructure and retain a feeling of remoteness due to the perceived distance from human elements such as houses, roads, developed access, noise and other infrastructure. Five 'wildness quality' areas were identified, together making up approximately 3 km of the river, about 21% of its length between town and the coast (Figure 2). These high quality remnants will require special protection if their current condition is to be maintained. The following recommendations relate to areas with high 'wildness quality': • The human footprint in areas with high 'wildness quality' to be restricted. This includes constructed walking/cycling/vehicle tracks, signs or other infrastructure. • Rehabilitation to be undertaken where appropriate to protect and restore areas with high 'wildness quality'. • Wherever possible, ground-disturbing activities required for fire management should not be conducted within areas of high 'wildness quality'. This includes construction and maintenance of access tracks, firebreaks, fuel-reduced buffers and water points. • Activities, including services and infrastructure, adjacent to areas of high 'wildness quality' that may impact on landscape values and/or otherwise degrade the quality of such areas should be avoided where possible. Such activities should not be permitted within areas of high 'wildness quality'. • Management activities considered beneficial to the protection of areas of high 'wildness quality' should be carried out on adjoining lands where possible. For example, control of invasive weeds.	
Public access and recreation		**Priority**
12.13	Development of trails in the subject area will be considered in detail in the Margaret River Walking and Off Road Cycling Trails Strategy (Trails Strategy) currently being developed. It is advised that the following recommendations should guide planning and development in relation to public access and recreation in the Margaret River foreshore reserves (including development of the Trails Strategy): • No new public access, signs or other infrastructure to be developed within areas identified as being of high conservation value (ie. excellent or very good condition vegetation or A grade foreshore (as shown on figures within Section 8 to 11) and/or having high 'wildness quality' (Figure 2). • Public access and recreational development to be located in areas of current use where environmental disturbance has already occurred and where appropriate development should include restoration to enhance environmental values. • Public access and recreational opportunities to remain low key and have low environmental impact (eg walking, picnicking, sightseeing and swimming at suitable locations). • Access and recreational infrastructure (walking tracks, car parking, picnic areas, and viewing areas) to remain low key, complement the natural environment and minimise disturbance and impact on environmental values.	H

12.14	The bike connection from town to the Wadandi Track has been identified as an issue requiring resolution. The Minnie Keenan trail is located very close to the edge of the river and erosion is evident along the track. The track is very narrow and winding. It presents a risk to the safety of walkers and riders, and the current dual use impacts negatively on walker's amenity due to the possibility of collision. The current dual use nature is inappropriate and unsustainable. The need for a safe connection from the Wadandi Track to Wooditchup National Park south of Carters Rd has also been identified. It is understood that the bike connection between town and the Wadandi Track, and the Wadandi Track to Wooditchup National Park will be addressed in the upcoming Margaret River Walking and Off Road Cycling Strategy.	H
12.15	As single use walking tracks are most appropriate in some areas a process to enable designation of tracks as single use walking tracks is needed.	M
12.16	Formally prohibit powerboats (both fuel and electric) from the river.	H
Vehicle access		Priority
12.17	Support the DBCA recommendation within the Leeuwin-Naturaliste capes area parks and reserves management plan 2015 to restrict access to vehicle tracks within Wooditchup National Park south-west of Carters Rd (Gan, Mott and Umberto roads)	H
Infrastructure and encroachment		Priority
12.18	It is recommended that private infrastructure be removed from the foreshore reserve including: a. pipes and/or pumps; b. canoes/kayaks; and c. any current fencing within the reserve.	H
12.19	It is recommended that the old fencing and degraded signs found throughout the foreshore reserves be removed.	L
12.20	It is recommended that the reserve boundary be clearly delineated in areas accessed by the public including Lot 1 Ashton St, Ellen Pl area, and the McHenry Hohnen subdivision.	M
12.21	It is recommended that unauthorised vehicle access to be excluded from within the foreshore reserves.	H
Fire management		Priority
12.22	It is recommended that AMRSC coordinate a collaborative approach to planning and management of all prescribed burning within the foreshore reserve involving AMRSC, DBCA, Aboriginal representatives and Nature Conservation Margaret River Region.	H
12.23	Management of fire risk can result in degradation to native vegetation communities as a result of ground and vegetation disturbance for firebreaks and firefighting access tracks, inappropriate fire regimes for particular vegetation types (for example, current knowledge indicates that granite outcrops and watercourses are best left unburnt if possible), increased weed invasion and/or uncontrolled vehicle and pedestrian access after fire. Wherever possible, management of fire risk associated with foreshore reserves should be undertaken in a way that will minimise degradation of native vegetation condition on	H

	both public and private land. It is recommended that a broad, strategic view of fire management along the river be taken and landholders of adjoining and nearby private properties be engaged in developing and implementing strategic fire management plans with the aim of minimising damage to native vegetation communities.	
12.43	Fire risk reduction actions to meet Bushfire Attack Level (BAL) requirements on private property should be achieved within the private property and not impact on adjoining reserves.	H
12.25	Current access to water for firefighting and strategic bushfire containment should be accommodated in rehabilitation and access plans. Firefighting access developed for fire risk management should not compromise the overall access strategy for the river.	H
Monitoring of foreshore condition		Priority
12.26	Monitor impacts of recreational activities to ensure natural, cultural and heritage values are not detrimentally affected.	H
12.27	Regularly monitor environmental condition of the foreshore reserves.	H
Weed control		Priority
12.28	Principles to guide weed management include: • Maintenance of previous weed control investment is a high priority. • Weed management should prioritise emerging weed problems that have a high potential to diminish foreshore condition. • Weed control to be followed up where appropriate with revegetation to outcompete colonising weed species and enhance environmental condition.	H
12.29	Support efforts to undertake catchment wide arum lily, blackberry, African feather grass and woody weed control programs on private property in the Margaret River catchment to reduce on-going infestation within the reserve.	M

13. Recommendations for on-ground works for Section 1 (Bussell Hwy to Kevill Rd East)

Vehicle access		Priority
14.1	Restrict vehicle access to the Ashton St foreshore via the Illawarra and Ashton St PAWs through the use of fencing and gates.	H urgent
14.2	Restrict vehicle access to the foreshore in front of Lots 56, 57 and 58 Kevill Rd East through fencing.	H urgent
Pedestrian and cycle access		**Priority**
14.3	The strategic firebreaks of Mott and Umberto roads currently provide cycle, vehicle and pedestrian access along the foreshore in Wooditchup National Park. At some points Umberto road is very close to the river. It is recommended that the appropriateness of the location and use of this road for cycling and/or walking should be reviewed within the overall planning for cycling and walking trails in Wooditchup National Park.	H
14.4	Informal goat tracks running parallel to the river (as shown on Figures 6, 11, 16 and 21) require realignment where they are very close to the river and it is appropriate to move them further from the river's edge. Where the tracks are part of the larger track network they should have track markers.	M
Recreational sites		**Priority**
14.5	The carparking, access and signage at the Apex Weir off Carters Rd on the northern side of the river requires rationalisation and stabilisation of parking and vehicle access to protect and improve this increasingly popular area. Provision of a rubbish bin and a picnic table is also recommended.	H
14.6	The Ashton St foreshore provides an opportunity for people to access the river for recreation. Improvements are required such as revegetation to rehabilitate degraded areas of foreshore, weed control and formalisation of a path. Grasses in this area restrict year round walking access. Vehicle access to the foreshore through PAW's needs to be restricted as recommended at 14.1	H
Erosion control		**Priority**
14.7	Control erosion along the A Class Reserve trails between Bussell Hwy and the Apex Weir carpark.	M
14.8	Control and prevent erosion along the Minnie Keenan Trail.	M
14.9	Stablise the C grade foreshore areas at: • the cleared banks at the bridge on Bussell Hwy; • the northern side of the river between the Apex Weir and Minnie Keenan trail; • parts of the Ashton St foreshore; and • upstream of Kevill Rd East.	M
Weed control		**Priority**
14.10	Implement an annual ongoing weed control program focusing on blackberry, African feather grass, arum lily, Sydney golden wattle, Flinders Range wattle, olives and sweet pittosporum.	H
14.11	Sweet pittosporum is well established around the A Class Reserve and the Minnie Keenan trail zone and surrounding private property. Continued control is required over the next few years to reduce the impact and spread of this species	M

14.12	Olive seedlings were found within the reserve. This plant has become a serious weed in other parts of Australia. Presence in the reserve should be monitored and control undertaken as necessary.	M
14.13	Control the following small weed infestations to minimise further spread: • blue periwinkle in the foreshore at Lot 2 Caves Rd, near the Merchant PAW confluence and in the A Class Reserve; • pandora vine at Minnie Keenan; • butterfly bush around the A Class reserve; and • broom bush through the Minnie Keenan trail; and • Flinders Range wattle on both sides of the river including the large island upstream of Kevill Road East.	M
Revegetation		Priority
14.14	There are many areas within the foreshore and upland vegetation that would benefit from revegetation to improve vegetation condition. Priority areas for revegetation are shown on Figures 28 to 31 in Appendix 1. More detail on the requirements for revegetation is included in Appendix 1. Listed below are the priority areas for revegetation in Section 1: 1. the foreshore upstream and downstream of Maxwell St; 2. adjoining Lot 13 and 14 Ashton St; 3. along the Ashton St foreshore and confluence with the Merchant St and Illawarra PAWs; 4. adjoining Lots 57 and 58 Kevill Rd East;	M
14.15	In Sections 1, 2 and 3 there are a number of areas within the channel and the foreshore that have been the focus of blackberry or African feather grass control and that are now colonised by opportunistic weeds such as nightshade, fleabane, grasses, paspalum, umbrella sedge and other species. Control of these weeds and revegetation with native riparian species is recommended.	L

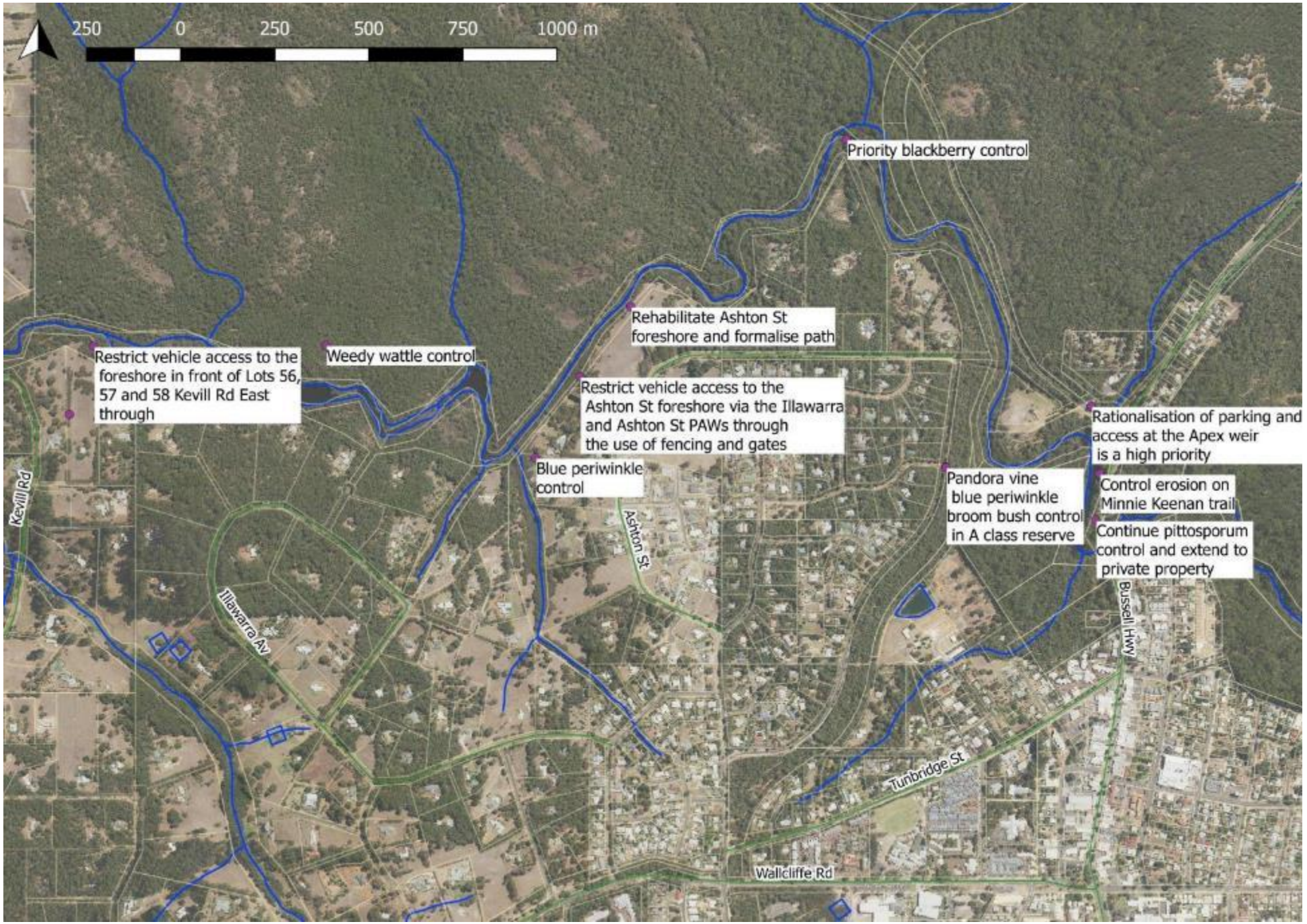

Figure 23: Section 1 management recommendations

14. Recommendations for on-ground works for Section 2 (Kevill Rd East to Caves Rd)

Vehicle access		Priority
15.1	Restrict the ability of vehicles to access strategic firebreak tracks off Doyle Place, Kevill Rd, Horseford Rd and Freshwater Drive through the use of fencing and gates.	H
Pedestrian and cycle access		**Priority**
15.2	Informal goat tracks running parallel to the river (as shown on Figures 6, 11, 16 and 21) require realignment where they are very close to the river and it is appropriate to move them further from the river's edge. Where the tracks are part of the larger track network they should have track markers.	M
Recreational sites		**Priority**
15.3	The waterfall zone on the southern bank requires rationalisation of parking and access to protect and improve this popular area. The parking and pedestrian access has evolved over time without any planning or control measures. With increased use this area is becoming degraded and improved parking and control of vehicle and pedestrian access is a very high priority. Access to fight fire on this section of river needs to be considered within any planned changes.	H
15.4	The track leading to the waterfall on the northern side of the river requires low key formalisation and erosion control measures. A bench seat in this area is recommended.	M
Erosion control		**Priority**
15.5	Control erosion and improve amenity at the horseford zone on the southern bank. This includes rationalisation of parking and access, and revegetation. Maintaining access for fire fighting vehicles to obtain water is required.	M
15.6	The horseford zone on the northern side of the river requires low key management actions to address erosion and compaction. This includes brushing, placement of woody debris and revegetation. Horse riders access the river here and any rehabilitation work needs to consider this on-going use.	M
Weed control		**Priority**
15.7	Implement an annual ongoing weed control program focusing on blackberry, African feather grass, arum lily, Sydney golden wattle, Flinders Range wattle, olives and sweet pittosporum.	H
15.8	Olive seedlings were found within the reserve. This plant has become a serious weed in other parts of Australia. Presence in the reserve should be monitored and control undertaken as necessary.	M
15.9	Monitor the continued effectiveness of the bridal creeper rust and undertake bridal creeper control if necessary.	M

15.10	Control the following small weed infestations to minimise further spread: • apple of Sodom in the foreshore reserve in front of Lots 32 and 33 Ellen Place; • dolichos pea at Lot 972 Horseford Rd; • tambookie in the channel in front of Lot 94, 2 Caves Rd and Kilcarnup; and • garden escapees in front of Lot 110 Caves Rd.	M
Revegetation		Priority
15.11	There are many areas within the foreshore and upland vegetation that would benefit from revegetation to improve vegetation condition. Priority areas for revegetation are shown on Figures on Figures 28 to 31 in Appendix 1. More detail on the requirements for revegetation is included in Appendix 1. Priority areas for revegetation in section 2 include: 5. the waterfall zone and Yalgardup Brook confluence; 6. horseford northern bank; 7. horseford southern bank; 8. adjoining Lot 972 Horseford Rd; 9. in front of Lot 3 Doyle Place; 10. Laurel Crt; and 11. East of Caves Rd zone.	M
15.12	In Sections 1, 2 and 3 there are a number of areas within the channel and the foreshore that have been the focus of blackberry or African feather grass control and that are now colonised by opportunistic weeds such as nightshade, fleabane, grasses, paspalum, umbrella sedge and other species. Control of these weeds and revegetation with native riparian species is recommended.	L

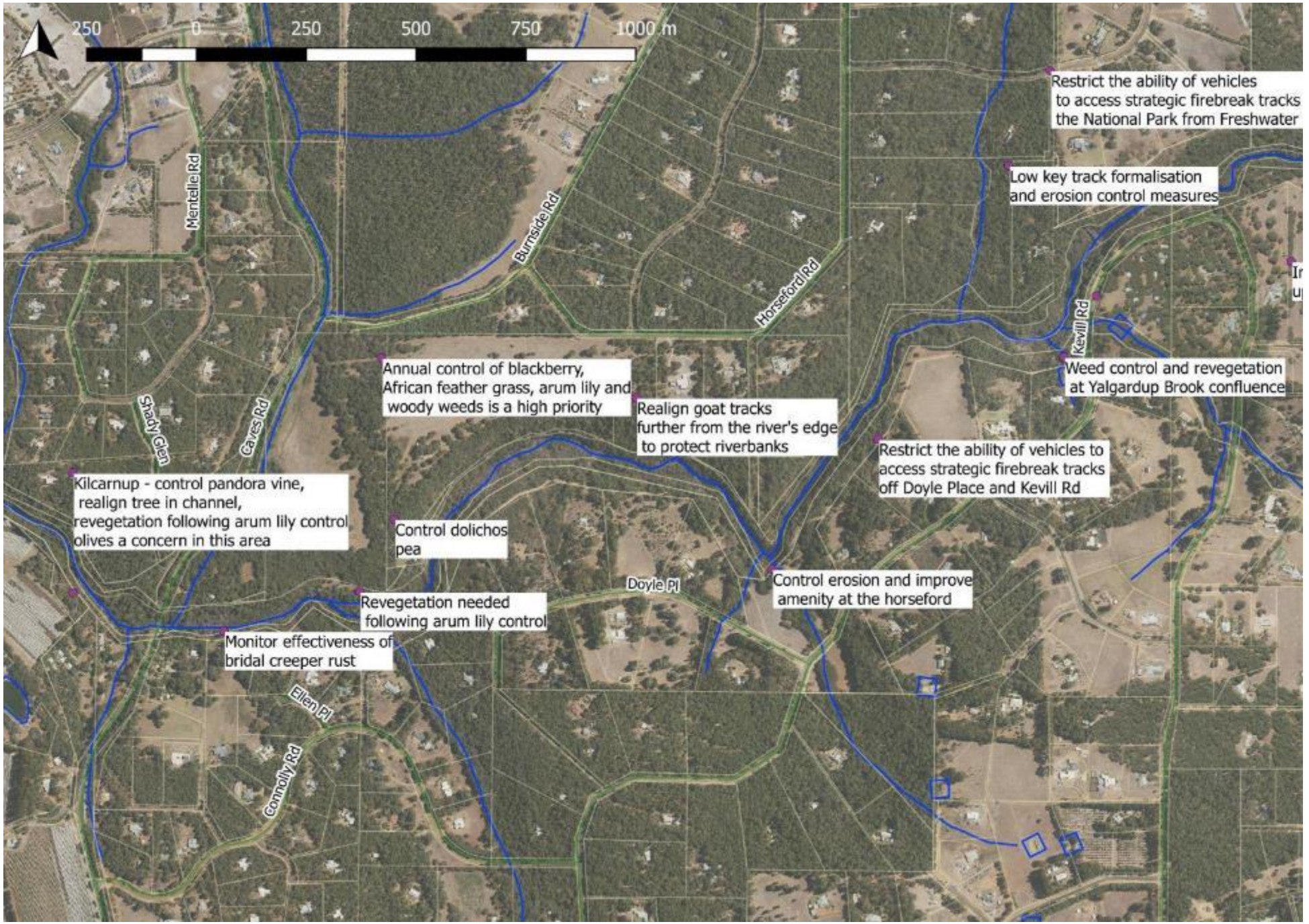

Figure 24: Section 2 management recommendations

15. Recommendations for on-ground works for Section 3 (Caves Rd to St Alouarn PAW)

Vehicle access		Priority
16.1	Work with the strata group to restrict vehicle access to the foreshore reserve adjoining the McHenry-Hohnen subdivision through the use of gates.	H Urgent
Pedestrian and cycle access		**Priority**
16.2	Informal goat tracks running parallel to the river (as shown on Figures 6, 11, 16 and 21) require realignment where they are very close to the river and it is appropriate to move them further from the river's edge. Where the tracks are part of the larger track network they should have track markers.	M
16.3	Nature Conservation participated in the working group to guide implementation of the winter diversion track along the Margaret River from Caves Rd to St Alouarn PAW in May 2018. The full report of the working group can be accessed at https://www.amrshire.wa.gov.au/library/file/1Council/Meetings/2018%20Council%20Meetings/20180605%20Attachment.pdf Nature Conservation's advice to the group regarding the track was included in the working group's recommendations to Council and was accepted by Council at the Special Council meeting 5 June 2018. Nature Conservation's report to the working group can be accessed in Appendix 1 of this report (see also Figure 26 on Page 74).	H
Recreational sites		**Priority**
16.4	Instigate options to minimise damage to vegetation and exacerbating erosion in the area of 'jump rock'. This may include a physical barrier and/or planting, licence conditions to restrict canoeing tour groups stopping here, formalising an area for parking canoes and discussion with the schools that regularly visit this area to explore management options and encourage best practice.	H
Erosion control		**Priority**
16.5	Stablise the C grade foreshore area directly downstream of Caves Rd.	M
16.6	Address the erosion on the northern bank of the river at Kilcarnup by realigning the large woody debris in the channel to a maximum of 30° from the bank.	M
Weed control		**Priority**
16.7	Implement an annual ongoing weed control program focusing on blackberry, African feather grass, arum lily, Sydney golden wattle, Flinders Range wattle, olives and sweet pittosporum.	H
16.8	Olive seedlings were found within the reserve. This plant has become a serious weed in other parts of Australia. Presence in the reserve should be monitored and control undertaken as necessary.	M
16.9	Monitor the continued effectiveness of the bridal creeper rust and undertake bridal creeper control if necessary.	M

16.10	Control the following small weed infestations to minimise further spread: • redhead cottonbush within the channel at Kilcarnup; • pandora vine at Kilcarnup; • cape gooseberry at the Dallip Spring confluence. This weed is increasingly common throughout the foreshore west of the Dallip Spring confluence with the river and control of this large infestation will minimise further spread downstream.	M
Revegetation		Priority
16.11	There are many areas within the foreshore and upland vegetation that would benefit from revegetation to improve vegetation condition. Priority areas for revegetation are shown on Figures 23 to 26 in Appendix 1. More detail on the requirements for revegetation is included in Appendix 2. Implement an annual on-going revegetation program. Listed below are the priority areas for revegetation: 12. Caves Rd to end of vineyard on southern bank; 13. Kilcarnup; and 14. West end of McHenry Hohnen.	M
16.12	In Sections 1, 2 and 3 there are a number of areas within the channel and the foreshore that have been the focus of blackberry or African feather grass control and that are now colonised by opportunistic weeds such as nightshade, fleabane, grasses, paspalum, umbrella sedge and other species. Control of these weeds and revegetation with native riparian species is recommended.	L

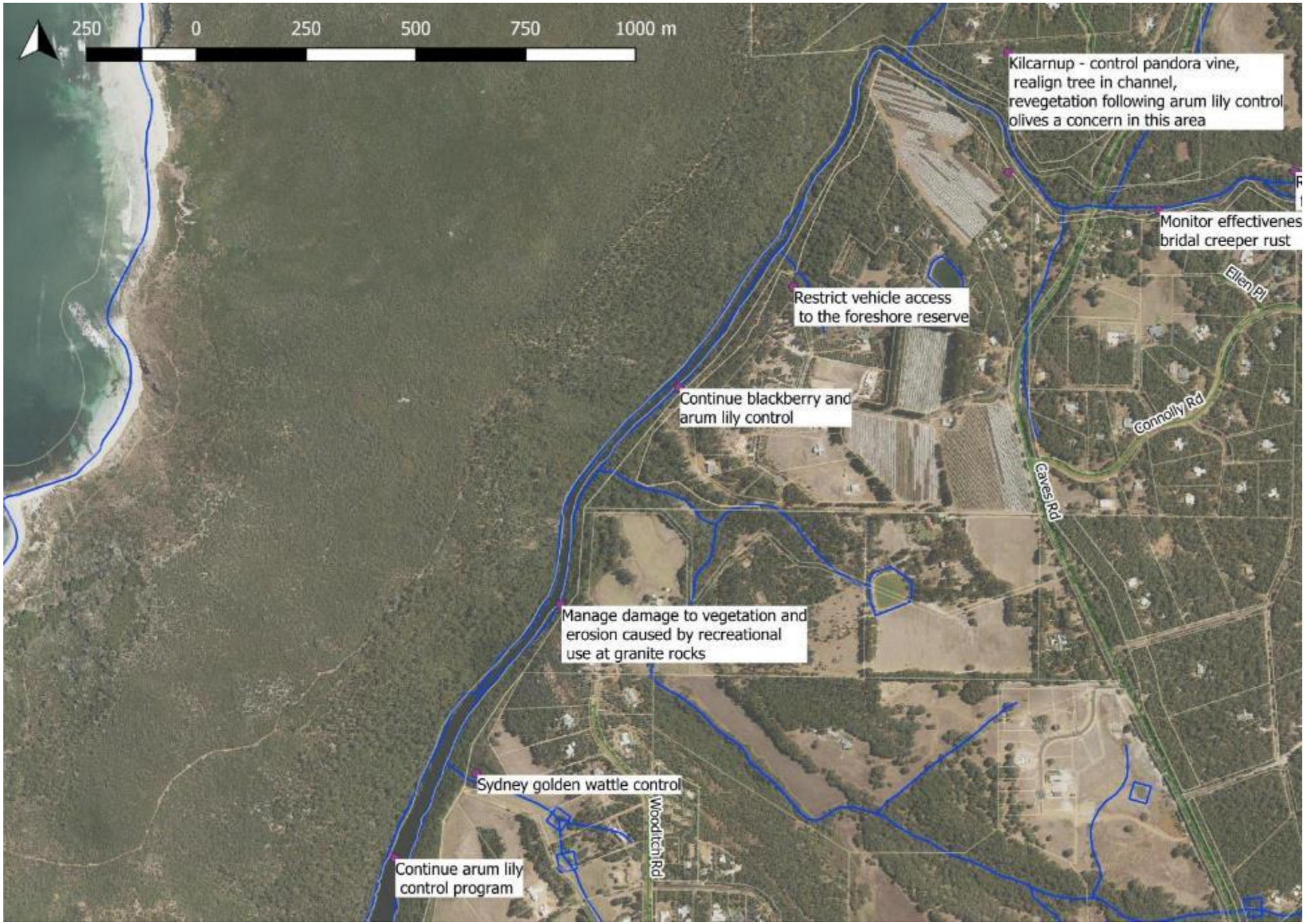

Figure 25: Section 3 management recommendations

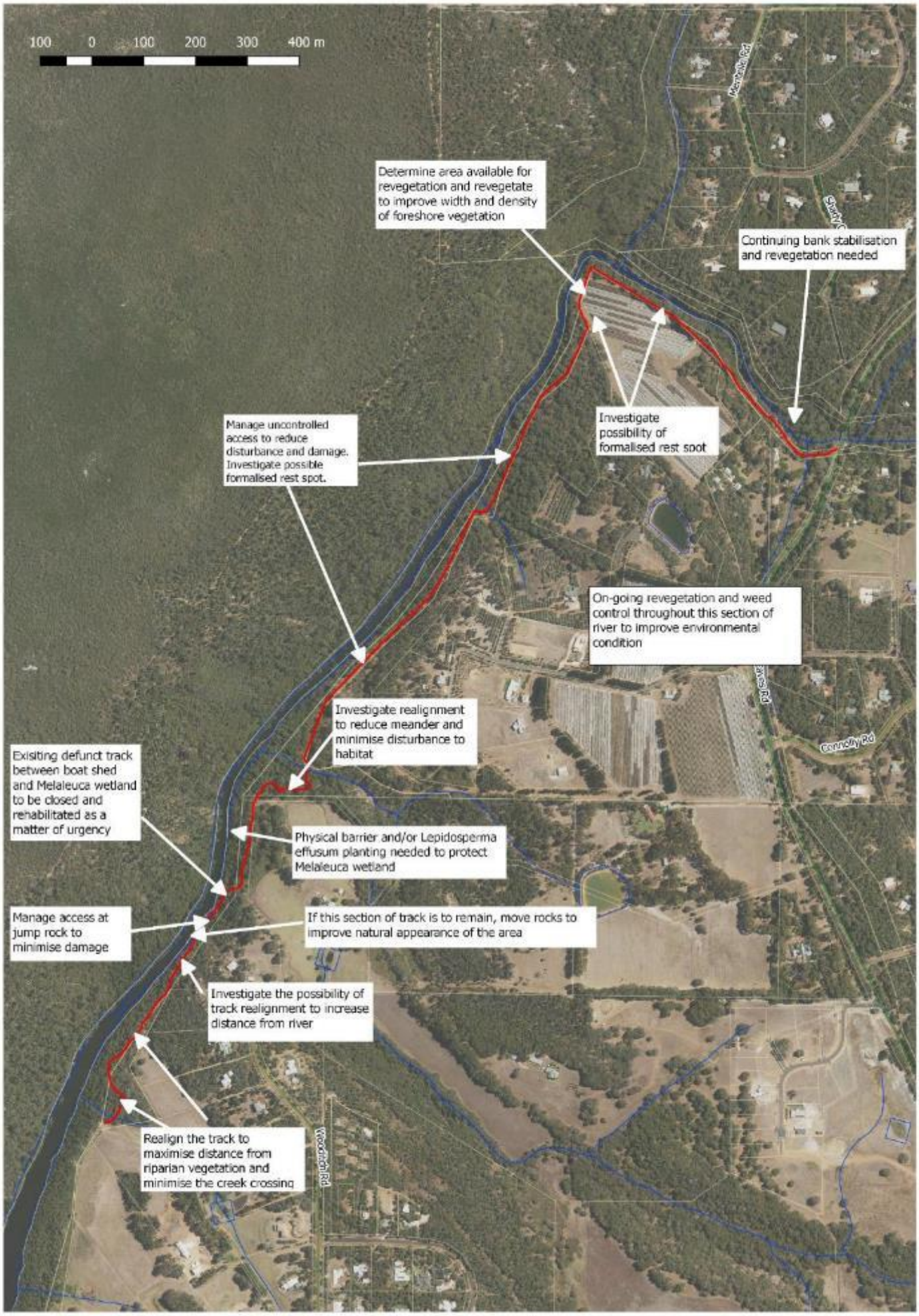

Figure 26: Section 3 management recommendations to Winter Diversion Track working group

16. Recommendations for on-ground works for Section 4 (St Alouarn PAW to the coast)

Pedestrian and cycle access		Priority
17.1	Fence the additional unfenced dunes on the southern bank of the rivermouth where recreational and pedestrian traffic are destabilising the area.	M
17.2	Work with the commercial operators to encourage and promote low impact movement through and along the dunes.	M
Recreational sites		**Priority**
17.3	Wallcliffe cliffs and caves – as per the outcomes of recent Aboriginal consultation and Council decision OM2018/85, commercial operators (through amendment to the conditions of any Local Law Permit holders) and recreational users (by a Local Law) will be restricted from accessing the Wallcliffe caves.	
17.4	The rivermouth area represents the area of highest recreational use in the study area and has recently received significant investment in infrastructure and interpretative signage. There remains a need for additional fencing and signage to protect dune areas, restriction of storage of unauthorised private canoes and kayaks on the foreshore, and ongoing monitoring of water quality to ensure public safety.	M
Erosion control		**Priority**
17.5	Stablise the C grade foreshore areas at: • the small section of bank at the Rowing Club; and • the southern bank of the first 500m upstream from the rivermouth.	M
17.6	Erosion and degradation of the foredunes at the rivermouth needs to be addressed through brushing, planting and access management.	H
Weed control		**Priority**
17.7	Implement an annual ongoing weed control program focusing on blackberry, African feather grass, arum lily, Sydney golden wattle, Flinders Range wattle, olives and sweet pittosporum.	H
17.8	Olive seedlings were found within the reserve. This plant has become a serious weed in other parts of Australia. Presence in the reserve should be monitored and control undertaken as necessary.	M
17.9	Monitor the continued effectiveness of the bridal creeper rust and undertake bridal creeper control if necessary.	M
4.10	Pyp grass is a major issue near the rivermouth where it dominates a very large area. A staged approach of containment, revegetation and broader control is required to strategically tackle this species without threatening the stability of the dune	M
17.11	Control the following small weed infestations in Section 4 to minimise further spread: a. cape gooseberry and apple of Sodom at the base of Wallcliffe caves, b. the Norfolk Island Hibiscus on the northern bank opposite the canoe storage area at the rivermouth; and c. the bracelet honey myrtle (*Melaleuca armillaris*) in front of Lot 7 and Lot 8 Saint Alouarn Place.	M

Revegetation		Priority
17.12	There are many areas within the foreshore and upland vegetation that would benefit from revegetation to improve vegetation condition. Priority areas for revegetation are shown on Figures 28 to 31 in Appendix 1. More detail on the requirements for revegetation is included in Appendix 1. Implement an annual on-going revegetation program. Listed below are the priority areas for revegetation in Section 4: 15. under the Wallcliffe cliffs; 16. & 17. along the foredunes of the rivermouth.	M

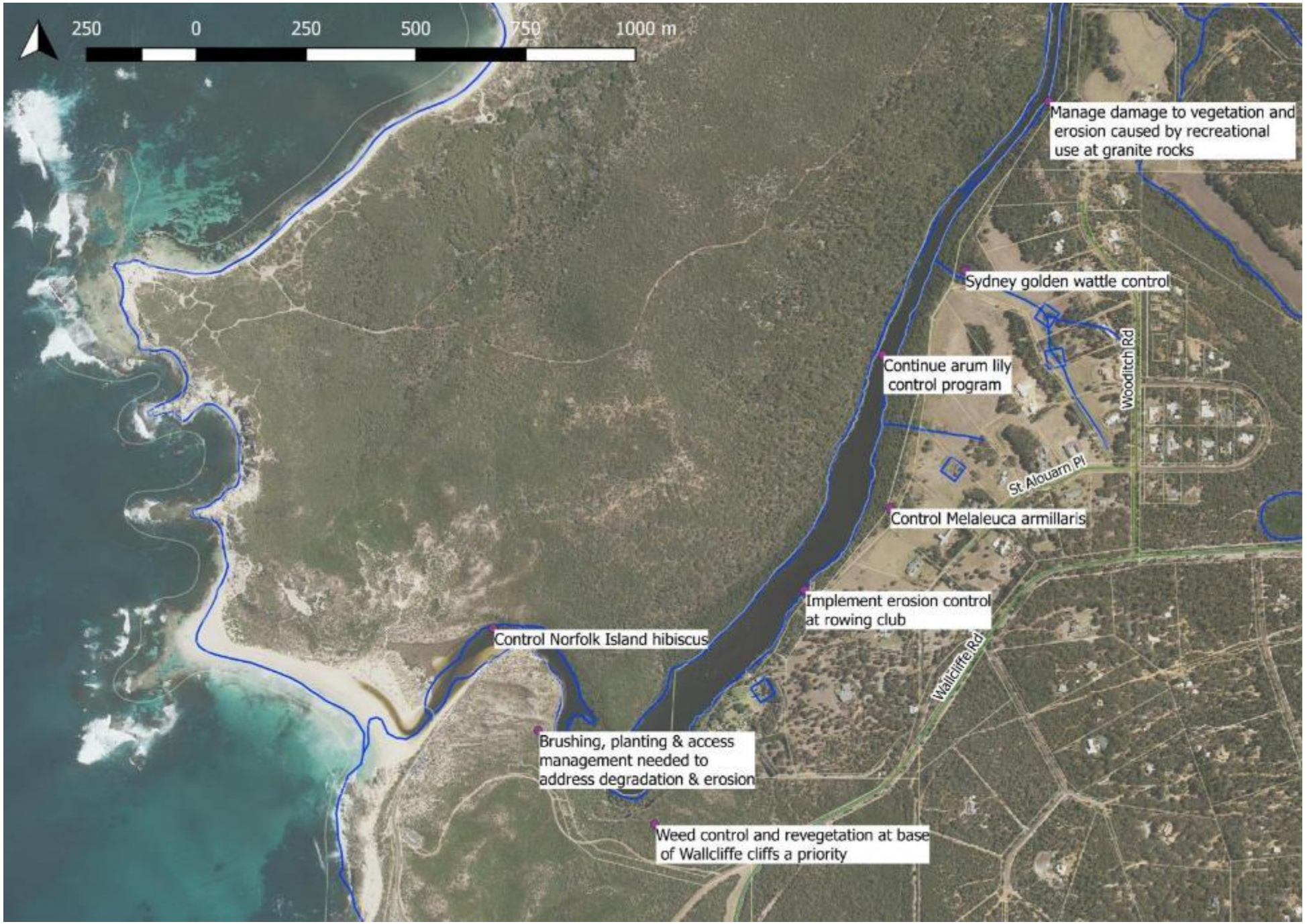

Figure 27: Section 4 management recommendations

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Appendix 1: Nature Conservation's May 2018 report to the Winter Diversion Trail Working Group

The subject area – southern bank of the Margaret River from Caves Rd to the St Alouarn public access way

The section of river from Caves Rd to the coast has very high conservation values as it contains by far the largest area of permanent water on the river (approximately 4.5 km in length) and is in relatively natural condition. Most of this section of river is well vegetated and retains important habitat elements such as shade, leaf litter, snags, woody debris and areas of varied flow regime.

Like many of the river systems in south-west Western Australia the Margaret River ceases to flow during summer and autumn and is for many months a series of disconnected pools along an otherwise dry river bed. Pools and any reaches of permanent water provide an essential summer drought refuge for many river animals including waterbirds, turtles, water rats, pouched lamprey, frogs, fish, crayfish, shrimp, mussels and aquatic insects, and are integral to the survival of many fauna populations.

The value of this reach as a summer drought refuge for aquatic and terrestrial fauna is further amplified as a result of access restrictions in this area. Most of the northern bank, contained within the Leeuwin-Naturaliste National Park, is densely vegetated within a steep, high valley naturally restricting human access. Until recently, access on the southern bank has been very limited and the level of human visitation and disturbance has been low.

To date there has been little to no research undertaken to improve knowledge and understanding of this significant area of river either in regard to fauna habitat or ecosystem function. Research is needed to better understand and manage the area and enable careful decision making about development that may impact on conservation values.

The fortuitous location of this stretch of river adjacent to the Leeuwin-Naturaliste National Park, the extensive area of remnant vegetation to the north, the large area of permanent water, and the good natural condition of this section of river provides a unique opportunity to protect habitat and ecological values.

The condition of the river foreshore and adjoining upland vegetation varies considerably. For the first 700 metres the foreshore vegetation is very narrow and degraded with some areas of steep, high banks vulnerable to erosion. After the sharp south west bend in the river, the foreshore condition improves considerably with riparian vegetation assessed as A grade and adjoining upland vegetation within the reserve varying from degraded to very good.

There are two vegetation communities in this stretch of river that have high conservation values and are currently in excellent condition. They are:

- *Melaleuca rhaphiophylla* wetlands. The wetland areas dominated by *M. rhaphiopylla* and sedges are extremely restricted within the Capes region and very limited in extent on the Margaret River. Given its restricted nature, all areas of this vegetation community are regarded as highly significant. The 50% decline in the mean annual flow of the Margaret River for the period 2001-2014 compared to the long-term record dictates that extreme caution be taken in regard to any disturbance of these restricted and vulnerable wetland areas.

- Granite outcrop areas mapped as Wilyabrup (Wr) vegetation complex by Mattiske & Havel, 1998. This vegetation complex is naturally restricted with only 779 ha remaining uncleared within Western Australia and just 9% protected within formal reserves. Granite outcrops support a diversity of microhabitats and soil moisture regimes that have allowed disjunct populations from the Darling Plateau granites to persist and speciate. Some of the flora species are highly restricted and may be

known from solitary rock outcrops. In addition to specific floristic value, the granite outcrops provide significant habitat for lichens, moss, algae, invertebrates and some reptiles. Granite outcrop communities are fragile habitats and susceptible to disturbance and degradation. Given the highly restricted nature of these complexes all their remnant vegetation needs to be regarded as regionally significant.

Recommendations regarding management of environmental impacts associated with the winter diversion track

Track alignment:

1. It is recommended that where practical the track be realigned in the section in front of 89 to 73 Wooditch Rd to maximise the distance between the track and the river; to maximise buffers between vulnerable vegetation communities and the track; to maximise areas of undisturbed habitat; and reduce the likelihood of walkers heading off the track. Specifically this includes:
    a. The meandering section of track within the reserve south of the McHenry Hohnen subdivision.
    b. In front of 89 and Lot 202 Wooditch Rd where an alignment further from the river would provide added protection to riparian vegetation and the river banks. It would also allow for rehabilitation of the track in the section through the granite rocks where construction of a dual use track resulted in considerable damage.
    c. At the southern end of the constructed track (in front of 73 and 83 Wooditch Rd) where the current alignment is located on the very edge of an area of paperbark wetland. This alignment does not allow a buffer to protect habitat values or restrict pedestrian access into this fragile area. The foreshore reserve is wide enough in this area to allow a buffer of 20 to 40 m between the track and the wetland. It is also recommended that rehabilitation of the existing track with revegetation and brushing be undertaken following track realignment, and revegetation be undertaken to create a buffer between the track and the wetland area.
    d. At the final creek crossing before reaching the St Alouarn PAW.

Access control

It is recognised that controlling access to the river from increased use as a result of the track is going to be very difficult. Uncontrolled access will result in damage to the river banks, riparian vegetation, disturbance to wildlife and reduction of habitat values.

2. It is recommended that a maximum of three areas be formalised as rest areas along the length of the track. These areas would be best placed where there is a view of the river but access to the bank is restricted by vegetation or terrain. It is recommended that a plan for determining the site of these areas and managing access throughout this section be developed with McHenry Hohnen residents as they are currently accessing the river at a number of key locations including for storage of canoes. If use at these current access points continues it will encourage walkers to visit these sites and result in increasing damage.

3. It is recommended that revegetation, brushing and/or fencing be used where necessary to restrict access to the river in areas other than the formalised rest areas.

4. It is recommended that physical barriers be put in place at either end of the track and in other areas as deemed necessary to restrict bike access.

5. It is recommended that sturdy physical barriers be put in place at the each end of the track to restrict pedestrian access to the site until the track is completed.

Protection of vulnerable areas

6. The *Melaleuca* wetland area that would have been affected by the defunct boardwalk proposal will need a physical and/or *Lepidosperma effusum* barrier to restrict access. Planting *Lepidosperma effusum* with the aim of restricting access to this area should be undertaken as soon as possible and the need for a physical barrier assessed.

7. Instigate options to minimise damage to vegetation and exacerbating erosion in the area of 'jump rock'. This may include a physical barrier and/or planting, licence conditions to restrict canoeing tour groups stopping here, formalising an area for parking canoes and discussion with the schools that regularly visit this area to explore management options and encourage best practice.

Rehabilitation and improvement of environmental condition

8. As a matter of urgency the existing track leading from the boat shed to the *Melaleuca* wetland area needs to be closed and rehabilitated as it is currently channelling walkers into this area resulting in further disturbance and damage.

9. Construction of the track through the area of granite outcropping has caused significant damage. A large quantity of rock that was moved to construct the track has been left in piles along the route and rock paving has been constructed in two places. The rock piles and artificial paving negatively impact on the environmental values and landscape character of this previously undisturbed area of river. It is recommended that rehabilitation be undertaken in this area.

10. Implement an annual ongoing weed control program with a focus on blackberry, African feather grass, olives, arum lily, Sydney golden wattle and Flinders Range wattle.

11. Develop and implement a detailed revegetation and bank stabilisation plan to improve environmental condition throughout this section of river.

Community engagement

12. Provide opportunities for the community to be involved in management of the foreshore reserves through Friends of Reserves.

Appendix 2: Proposed revegetation plan

Table of proposed revegetation sites

The location of proposed revegetation sites is shown on Figures 23 to 26 below.

Area No	Location	Description	Approx area m 2	Weed control/ Site preparation requirements	Estimated weed control budget – preparation and one follow up	Planting requirements and considerations	Estimated planting budget[6]	Priority
1	The foreshore upstream and downstream of Maxwell St	Area with minimal to no understorey or dominated by woody weeds such as sweet pittosporum	6530	Upstream portion is predominantly woody weed species including sweet pittosporum, polygala and cotoneaster and the downstream portion is predominantly blackberry and grass weeds/ weeds of disturbance.	$2000	Minimal natives excluding peppermint overstorey in the downstream portion. Species mix to include mix of core riparian overstorey and understorey species with ~ 25% *Lepidosperma effusum*. Estimated number of plants = 1000	$3600	H
2	The foreshore adjoining Lot 13 and 14 Ashton St	Degraded foreshore with multiple high priority weed species	1371	Control required for low level infestations of high priority species including arum, blackberry and edible fig. Some weeds of disturbance eg fleabane, grass weeds.	$1000	Some natives in and around the revegetation area to build upon and work from. Species mix to include core riparian species with ~ 50% *Lepidosperma effusum*. Estimated number of plants = 1000	$3600	M

[6] Estimated cost of planting includes plants and planting labour = $3.50/plant. For plants vulnerable to predation tree bags will be used for an additional 50c/plant. Cost saving may be possible if planting is undertaken by volunteers.

3	Along the Ashton St foreshore and confluence with the Merchant St and Illawarra PAWs	Refer AMR-02 ASHTON STREET SUBDIVISION FORESHORE MANAGEMENT PLAN COST REVIEW by Emerge Associates dated 3 August 2016						
4	Adjoining Lots 57 and 58 Kevill Rd East	Sparse native vegetation and grass dominated understorey	5660	Mainly annual grass control	$500	Some natives in and around the revegetation area to build upon and work from. Species mix to include core riparian species with ~ 50% *Lepidosperma effusum*. Estimated number of plants = 1000	$3600	M
5	Waterfall zone and Yalgardup Brook confluence	Area degraded as a result of disturbance and weed infestation.	7355	Kikuyu, buffalo grass, sweet pittosporum, Queensland silver wattle, Flinders Range wattle and Indian hawthorn. Grasses will need good follow up.	$2000	Some natives in and around the revegetation area to build upon and work from. Species mix to include core riparian species with ~ 50% *Lepidosperma effusum*. Estimated number of plants = 1000	$3600	H
6	Horseford, northern bank	Bare banks and low level erosion. Horses access the water here and planting needs to consider this use.	770	Minimal weed control required. Laying of woody debris and *Taxandria* brush would support seedling recruitment and growth in this bare area.	$350	Planting to be complemented with brushing. Estimated number of plants = 100	$350	M
7	Horseford, southern bank	Bare banks and surrounds, gravel carpark eroding.	1570	Careful planning needed in this area. Car parking, and fire vehicle access need to be considered when planning revegetation.	Detailed planning required			
8	Adjoining Lot 972 Horseford Rd	Extensive arum lily control has left this area dominated by annual grasses. Steep banks make revegetation a challenge.	6800	Annual grass control and follow up arum lily control. Laying woody debris on the embankment would assist plant	$1000	Planting to be complemented with brushing. Species mix to include mix of upland	$3600	M

				establishment. Planting to be done in small sections over many years.		species, core riparian overstorey and understorey species with ~ 20% *Lepidosperma effusum*. Estimated number of plants/year = 1000		
9	In front of Lot 3 Doyle Place;	Narrow fringing vegetation and degraded upland vegetation.	4780	Annual grasses	$500	Some natives in and around the revegetation area to build upon and work from. Species mix to include core riparian species with ~ 50% *Lepidosperma effusum*. Estimated number of plants = 1000	$3600	M
10	Laurel Crt	Extensive arum lily control has left this area dominated by annual grasses and other opportunistic weed species.	1220	Assess the area during winter prior to planting to ensure planting location and methods are appropriate. Control of grasses and follow up arum lily control required.	$500	Species mix to include core riparian species with ~ 50% *Lepidosperma effusum*. Estimated number of plants = 1000	$3600	H
11	East of Caves Rd zone (Ellen Place)	Narrow degraded foreshore with many weeds including garden escapees. Arum lily has been controlled in this area. Pockets of bridal creeper may need control.	4530	Kikuyu control. Follow up arum lily control. Pockets of bridal creeper may need control. Apple of Sodom control.	$600	Species mix to include core riparian species with ~ 50% *Lepidosperma effusum*. Estimated number of plants = 1000	$3600	H
12	Caves Rd to end of vineyard on southern bank	Begins with steep sided banks with very little native vegetation. In front of the vineyard extensive arum lily control has left this degraded area of foreshore with sparse understorey.	11900	Kikuyu, annual grasses and follow up arum lily control required.	$2000	Species mix to include core riparian species with ~ 50% *Lepidosperma effusum*. Estimated number of plants = 3000	$10,500	H
13	Kilcarnup	Extensive arum lily control has left this area dominated by annual grasses.	4300	Annual grasses and follow up arum lily control required.	$2000	Species mix to include core riparian species with ~ 50%	$7000	H

						Lepidosperma effusum. Estimated number of plants = 2000		
14	West end of McHenry Hohnen	This wet low lying area where a tributary flows to the river is degraded and susceptible to weed infestation. Adjoining this tributary is an area of degraded vegetation that is traversed by the winter diversion track. Revegetation began in this area in 2016.	12042	There are many weeds in this wet low lying area including grasses, arum lily, blackberry, bridal creeper and thistle.	$2000	Species mix to include core riparian species with ~ 50% *Lepidosperma effusum*. Estimated number of plants = 2000	$7000	H
15	Under the Wallcliffe cliffs	This area has long been degraded and now represents a mix of weedy and native regrowth following the 2011 fires which has not received much if any weed control in recent years. ***A significant cultural site needing consultation and involvement of Traditional Owners.***	7200	Weed burden consists primarily of kikuyu, arum lily, apple of Sodom and cape gooseberry	$3000	In fill planting in patches required ~1500 plants recommended – with a mix of fringing estuarine understorey species and both over and understorey upland species	$5250	H
16	Along the foredunes of the rivermouth.	Sparse, often eroding dunes with trampling and traffic continuing to undermine and degrade some areas. ***Good potential for volunteer labour and coastal funding to support this work.***	8400	Weed burden varies along the zone – key species include Pyp grass, Rose Pelargonium and Dune onion weed.	$1800	Revegetation and brushing recommended in areas once fencing has been completed ~ 2000 plants of coastal species mix deep dune planted.	$7000	H

Figure 28: Section 1 proposed revegetation sites

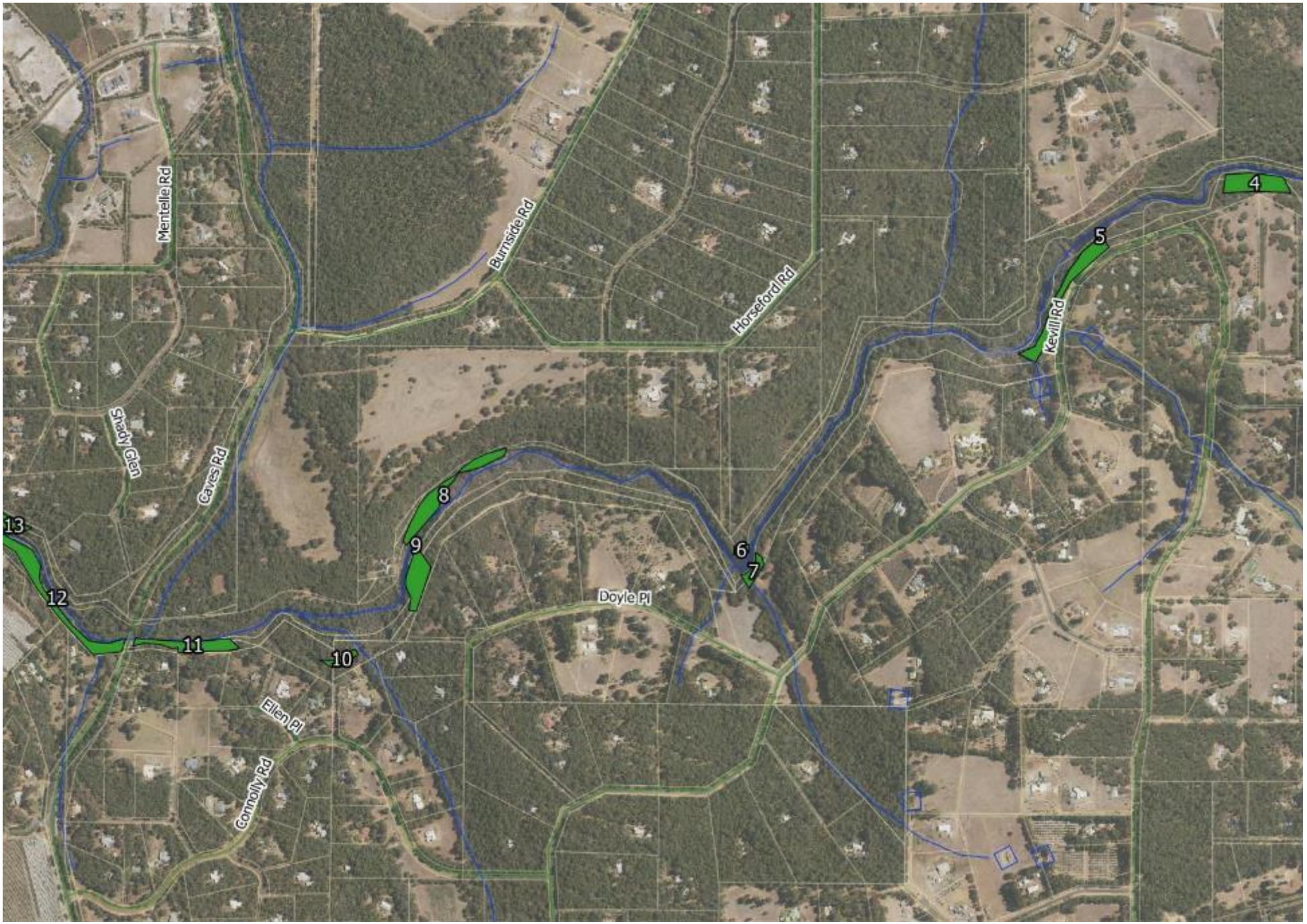

Figure 29: Section 2 proposed revegetation sites

Figure 30: Section 3 proposed revegetation sites

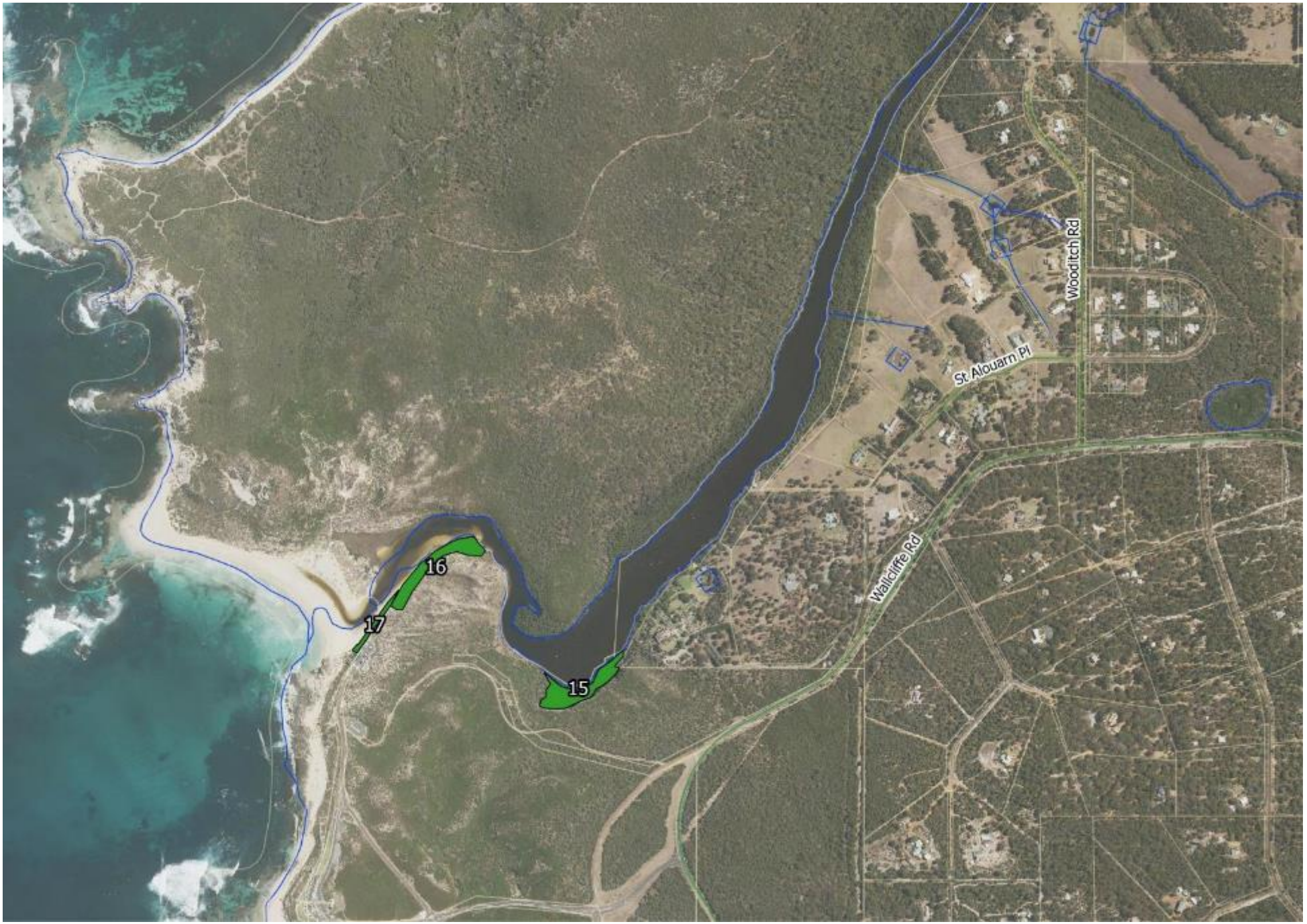

Figure 31: Section 4 proposed revegetation site