



Niergarup Track Three Year Management Plan – Weed and Revegetation Strategy

Prepared for the Town of East Fremantle – August 2020



Landscape Architecture

Prepared by Ann Forma (B. Landscape Arch, Dip. Env. Sc)

Apac Natural Design

1 Johannah St, North Fremantle 6159

Tel. (08) 9336 1262 Fax (08) 9430 5729

Email: landscape@apacewa.org.au

w: <https://apacewa.org.au/>

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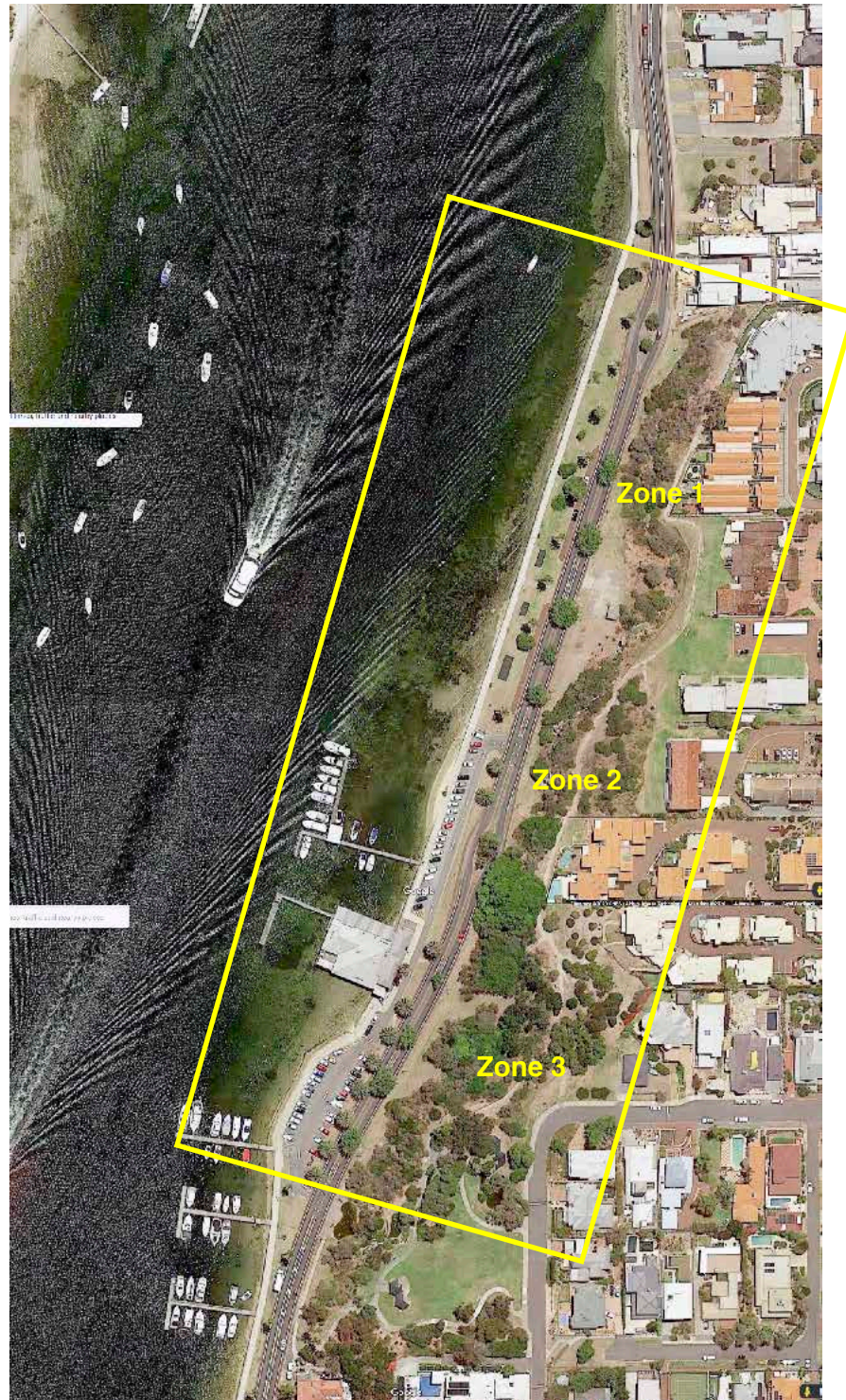
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Niergarup Track Three Year Management Plan – Weed and Revegetation Strategy

Prepared for the Town of East Fremantle by APACE Natural Design, August 2020

1. Location and extent of site

The Niergarup Track runs along the cliff top in East Fremantle, offering stunning views of the Swan River and its foreshore. Signs along the way offer interpretative insights gathered from the local knowledge of the Noongar people, early settlers and more recent communities that have made their homes in this area. The Track begins at Merv Cowan Park via steps up from the foreshore at the Bicentennial Falls. It links back down to the Foreshore DUP (Dual Use Path) via steps near Pier Street. The foreshore pedestrian/cycle route now extends around the river via the John Tonkin Reserve and beyond past the Swan Yacht Club.



An aerial view of the Track. The Study area is outlined in yellow.

2. History of Niergarup Track

In 1993 Council adopted the East Fremantle Foreshore Landscape Strategy, and during the implementation of the study, a decision was made to formalise and protect the scenic dirt path that runs above the escarpment from Merv Cowan Park.

As a WA 2001 Community Centenary Project, work was carried out to upgrade what was once known as the East Fremantle Federation Trail by laying crushed limestone, and installing plantings, seating, signage, stairs, and intermittent fencing along the path. To do this, the Town received a grant of \$23,500 based on a 1:2 funding arrangement with Council's contribution of \$47,675 being mainly through in-kind donations of labour and materials.

The Friends of the East Fremantle Foreshore assisted with the funding application and consultation process.

Connection to Country

Before construction, advice was sought for the plan from the late Patrick Hume, a Noongar Elder, who suggested the name *Niergarup Track*. The illustrations and interpretive signs along the Track were devised with support from the former Department of Conservation and Land Management (CALM), on advice from Noongar elders.

The then Mayor Andrew Smith and Patrick Hume officially opened the Track on 1 May 2001.

3. Background to this study

The 2015 East Fremantle Foreshore Master Plan recommended that an Environmental Management Plan for the bushland along the cliff be prepared to include weed control and revegetation with local native species, working with Friends groups and local residents, improving access and managing fire threats.

In 2020 the path was resurfaced and this Management Plan commissioned by the Town of East Fremantle.

The overarching aim of this Management Plan is to develop a vegetation complex along the Track that includes the following characteristics:

- 1 Local Native plants that are adapted to surviving in the local climate and soil type, needing minimal long-term maintenance, attracting native fauna, and propagating naturally.
- 2 Choosing species suited to bushfire mitigation in those areas where this is an important factor.
- 3 Dense and possibly prickly vegetation in areas where deterring human access is desirable; areas such as the tops of cliffs where safety is a priority.
- 4 Of a stature that will not impede the views of nearby residents. In determining stature the topography where the planting will occur will be an important determining factor.
- 5 Of a stature that will offer walkers many suitably framed vistas of the river. Most walkers find framed views intriguing when compared with 180° views.
- 6 In cliff areas choosing plants that will control erosion and not exacerbate the loosening of the limestone.
- 7 Choosing and positioning plants along the Track edge that will provide a dense edge but minimise maintenance by not spreading onto the Track surface. This can be achieved by designating sub-areas within the revegetation zone for particular species.

4. Topography

The track meanders along the top of the scarp, with a variable width of accessible ground before the outcropping limestone cliffs. On the uphill side there are two sections where the way narrows with housing next to the path, then opens out into a wider reserve in the central portion (Zone 2) and at the southwest end near the Merv Cowan Park. (Zone 3)

5. Original Vegetation communities

The Niergarup Track is in the Cottesloe Vegetation Complex (Hedde 1980)

There are different vegetation communities on the shallow soils and limestone ridges as distinct from deeper soils on slopes and flats near the foreshore.

In shallower soils and limestone ridges the Complex supports:

- A heath of Melaleuca and Acacia species, as well as Cockies' Tongues (*Templetonia retusa*)
- Coastal Daisy Bush (*Olearia axillaris*) and Berry Salt Bush (*Rhagodia baccata*)
- Rottnest Island Pine (*Callitris preissii*) and shrublands including Mallee trees.

In deeper soils the Complex is characterised by a Woodland community of Tuart (*Eucalyptus gomphocephala*) with various understory species.

There is a Tuart tree growing in the garden of a property in Zone 1, which suggests that in the past the top of the scarp supported a woodland-type vegetation community.

6. Vegetation Condition

The top of the scarp has a very degraded understory with extensive weed cover, including many intransigent bulbous weeds and limited local plant diversity.

The surviving understory and Heath vegetation is limited to White-stemmed Wattle (*Acacia xanthina*), Red Eyed Wattle (*Acacia cyclops*), Chenille Honeymyrtle (*Melaleuca huegelii*) Cockies' Tongues (*Templetonia retusa*), Berry Salt Bush (*Rhagodia baccata*) and Native Wisteria (*Hardenbergia comptoniana*).

Good stands of local trees exist, mainly in Zone 3 near Merv Cowan Park, where Rottnest Island Pine (*Callitris preissii*), Fremantle Mallee (*Eucalyptus foecunda*) and Rottnest Tea Tree (*Melaleuca lanceolata*) are creating a woodland environment. However there is little local plant understory.

In Zone 1 several WA Peppermint (*Agonis flexuosa*) trees have died and had to be removed. The cause of death is unknown.

In Zone 2 there is a section of shrub-land of *Acacia xanthina*, but again with little or no local plant understory.

Weedy alien trees such as Brazilian Pepper (*Schinus terebinthifolia*) are widespread. Some grow in the cliff face and other difficult to access places.

Before any new planting occurs at least a year of weed control and removal will be necessary.

7. Weed and Revegetation Strategy by Zone

Definitions – Planting Areas

The “Low Shrub Mix” includes climbers and tufted plants from the Revegetation List (p 28) that have a maximum height of 1 metre or less.

The “Medium Shrub Mix” includes any Revegetation List species up to 2 metres or less height. Therefore this mix will also include a variety of small shrubs and tufted plants.

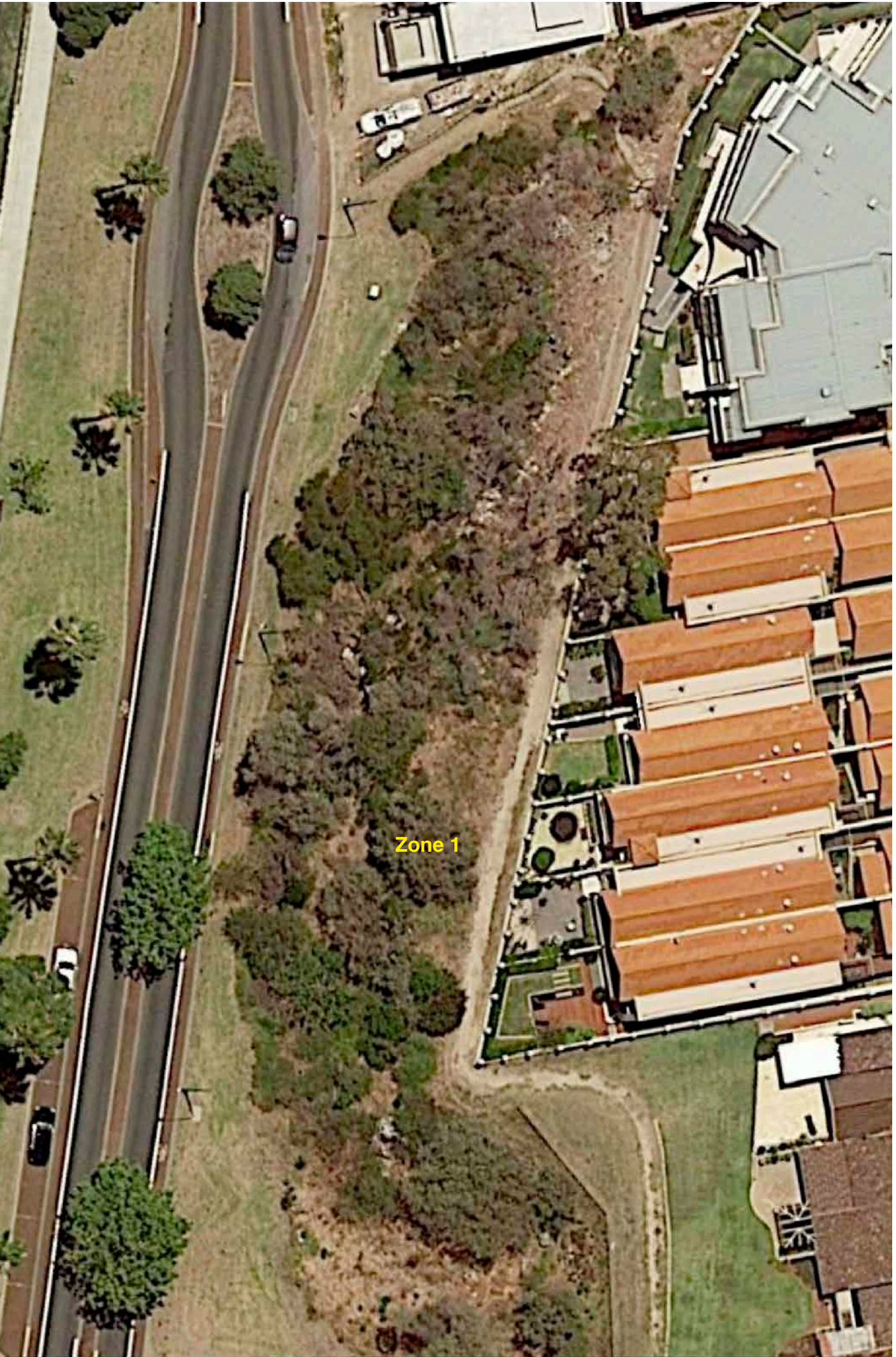
The “Tall Shrub and Tree Mix” will include both Low and Medium shrubs.

Zone 1

Zone 1 extends from the steps from Riverside Road to the first pinch point or narrowing in front of housing. The reserve is narrow, varying in width between 4 and 10 metres.

A set of limestone block steps with a steel hand-rail on one side leads up to the scarp. To deal with erosion along the steep climb up the steps, there is a limestone rock batter and two retaining gabions between the steps and the house to the east, below the top of the scarp. A WA peppermint tree shades the top of the stairs.

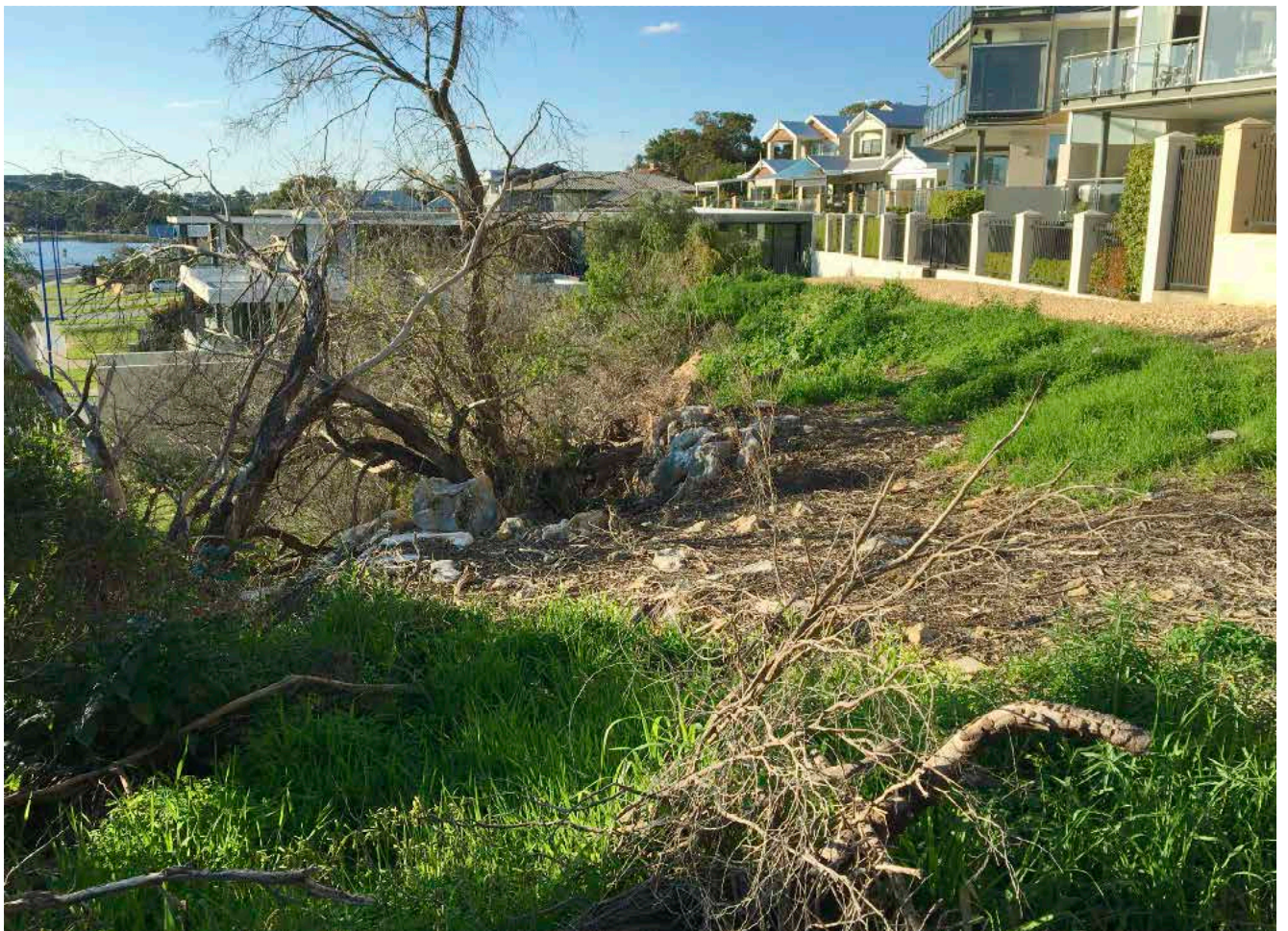
Along the scarp much of the tree cover has been lost due to the death of several WA Peppermint trees.



Zone 1

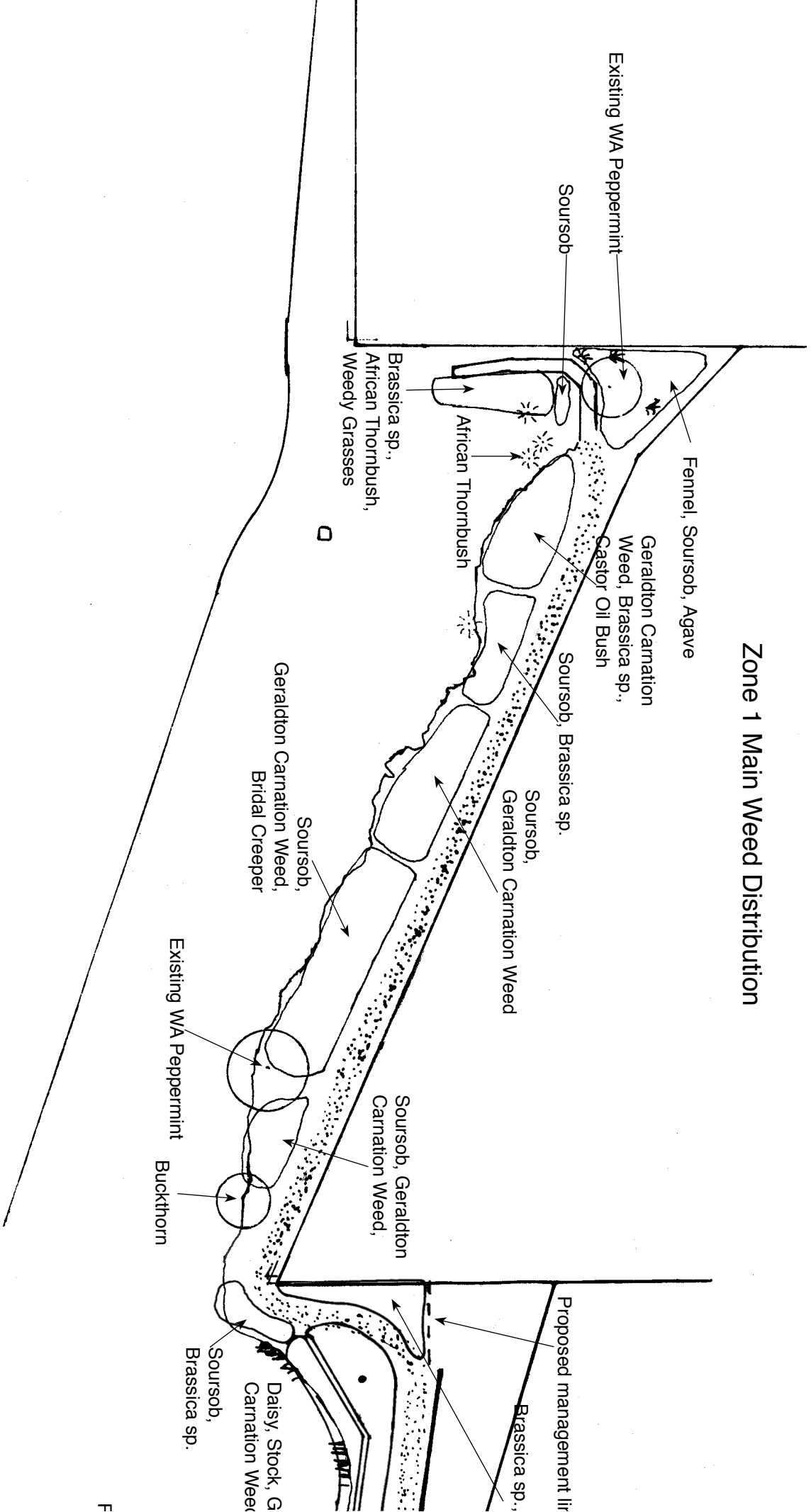


Zone 1 Looking South



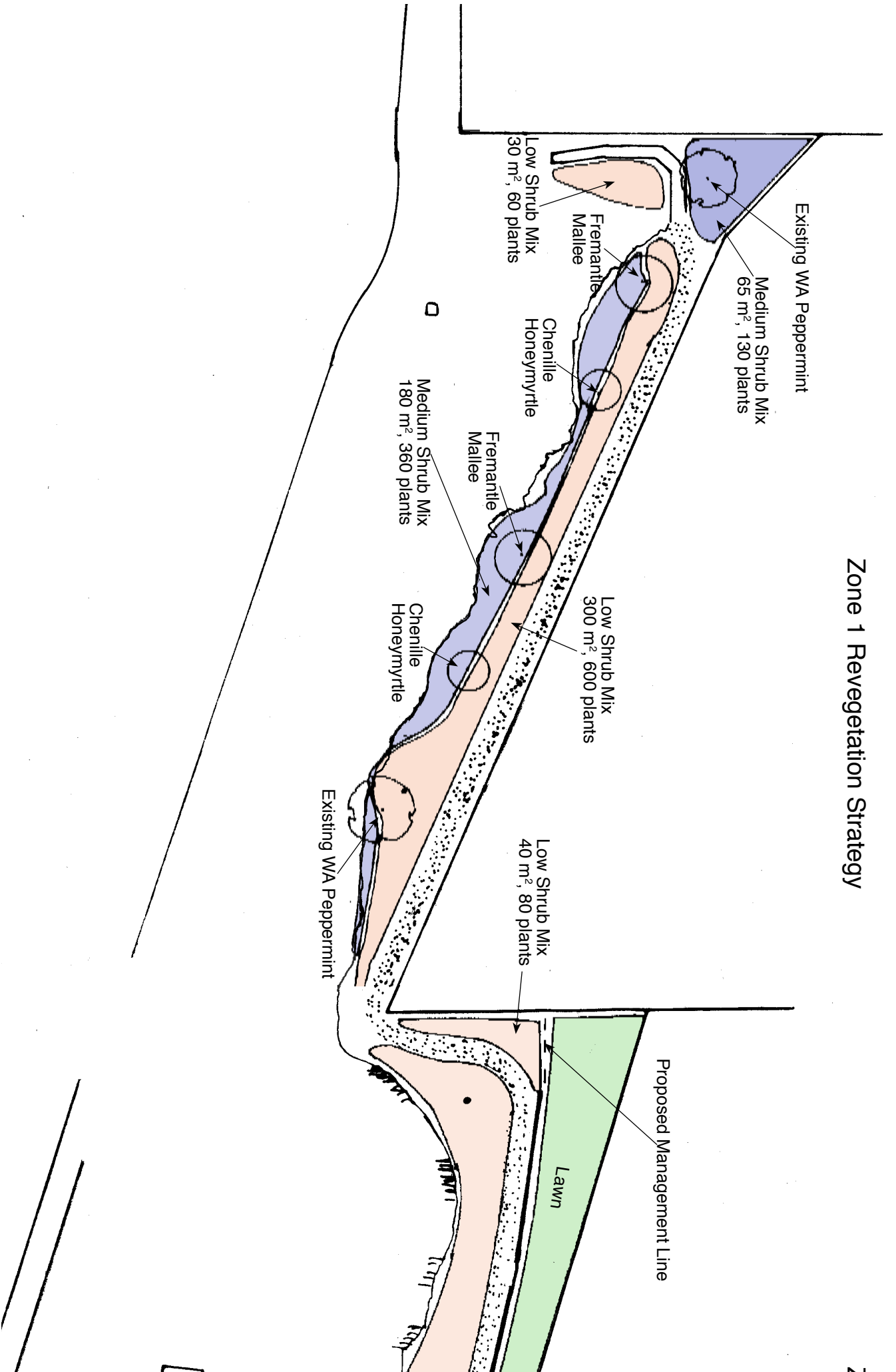
Zone 1 Looking North

Zone 1 Main Weed Distribution



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Zone 1 Revegetation Strategy



Existing local Native Vegetation

<i>Agonis flexuosa</i>	WA Peppermint
<i>Acacia cyclops</i>	Red Eyed Wattle
<i>Rhagodia baccata</i>	Berry Salt Bush
<i>Templetonia retusa</i>	Cockies' Tongues
<i>Hardenbergia comptoniana</i>	Native wisteria



Foreground soursob, background Bridal creeper on natives

Weed Strategy Zone 1

This Zone has several African Thornbush (*Lycium ferocissimum*) and Agave that need removing. Remove the Buckthorn (*Rhamnus alaternus*) after replacement native plants have established. The main understory weeds to target in this section are Soursob, (*Oxalis pes-caprae*), Geraldton Carnation Weed (*Euphorbia terracina*) and Bridal Creeper (*Asparagus asparagoides*)

In Year One target the main understory weeds as above and remove *Agave americana*, and African Thornbush. In Year Two continue weed control until planting.

Adapt the strategy over time. See Table of Adaptive Weed Strategy by species p 32

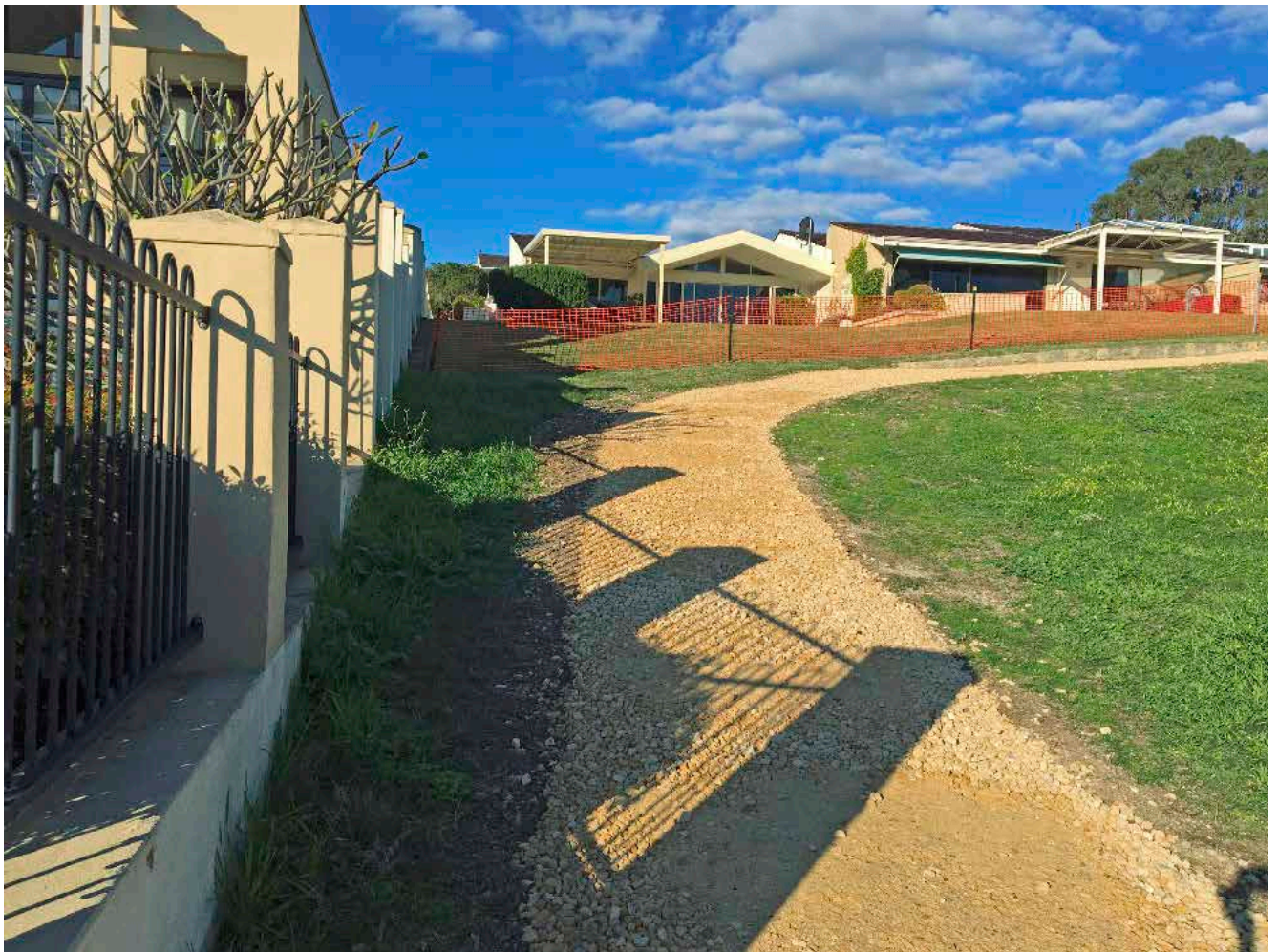
Revegetation Strategy Zone 1

Zone 1 has an area of approximately 600 square metres and will be planted at 2 plants per square metre.

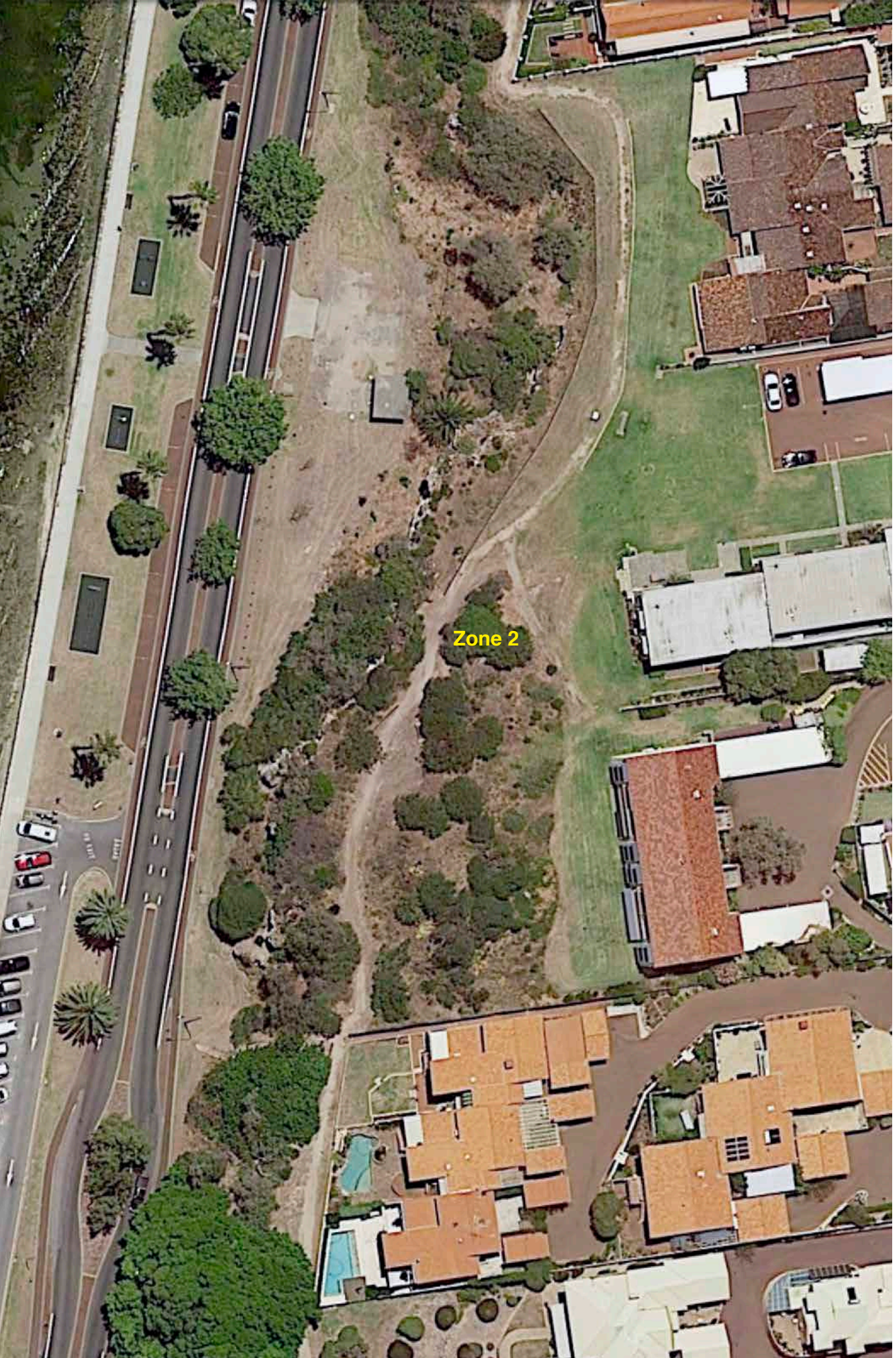
A Low Shrub mix (1 m height) selected from the Revegetation Species List, (p 28) will extend along the track close to the path, then merge into a Medium Shrub mix (1 to 2 m). Fremantle Mallee (*Eucalyptus foecunda*) will be planted, as well as *Melaleuca huegelii*, a tall shrub that is capable of shading the path when mature, to replace the removed WA Peppermint trees. This planting will take place in Year Two (2021), with follow up planting in Year Three (2022), (See Year Two Planting Schedule, p 30)

Zone 2

About two-thirds of this central portion broadens out to a reserve varying in width from 13 to 30 metres. At the south end a set of steps links to the foreshore and the reserve narrows again in front of housing to less than 10 metres. There is an Interpretation panel and seat in the wider area with another two seats under trees further south. Part of the reserve above a one block limestone retaining wall on the path is maintained by neighbouring residents as a lawn.

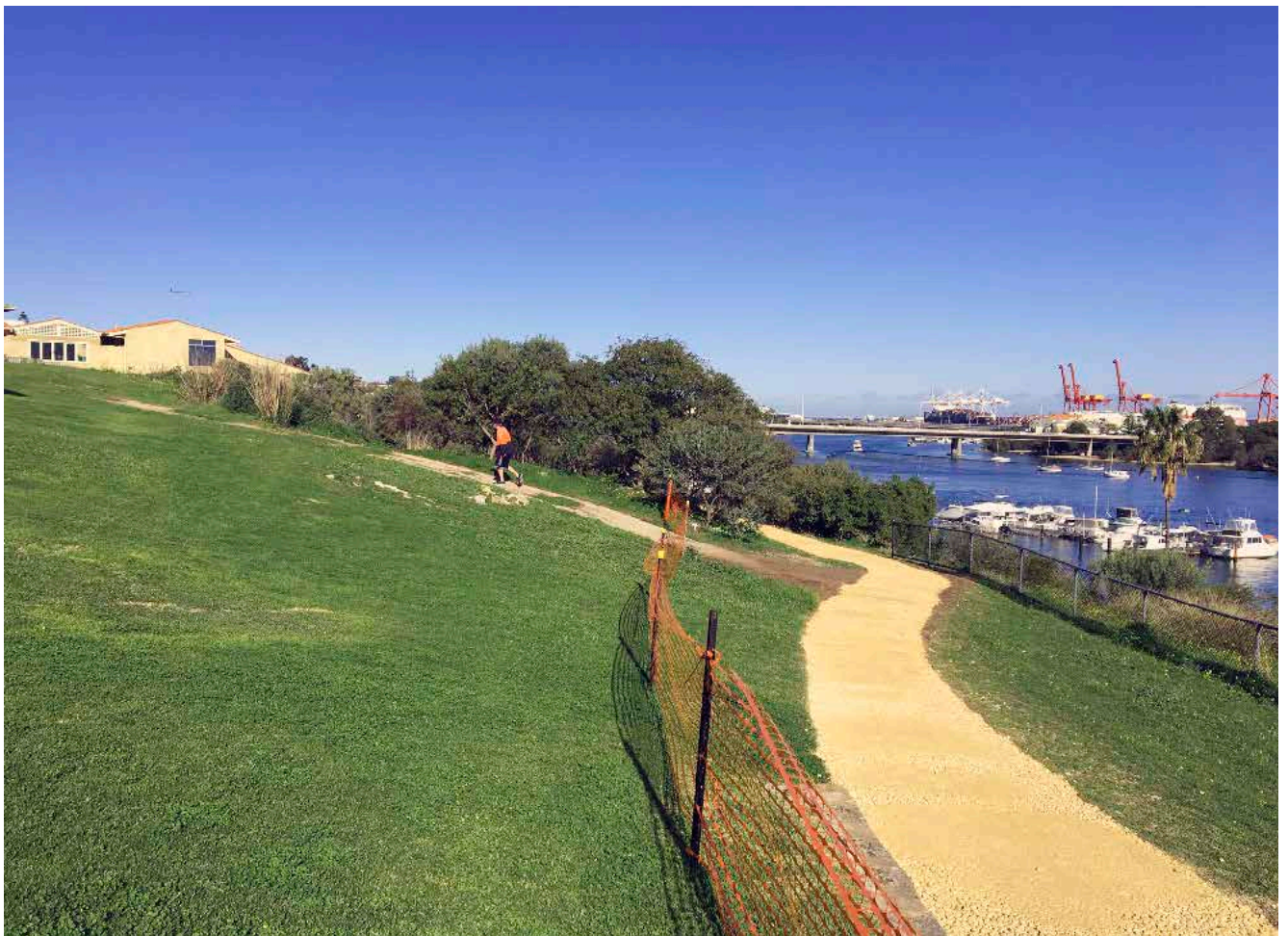


From Zone 1, the reserve opens out into Zone 2 showing lawns and single block limestone retaining behind the path

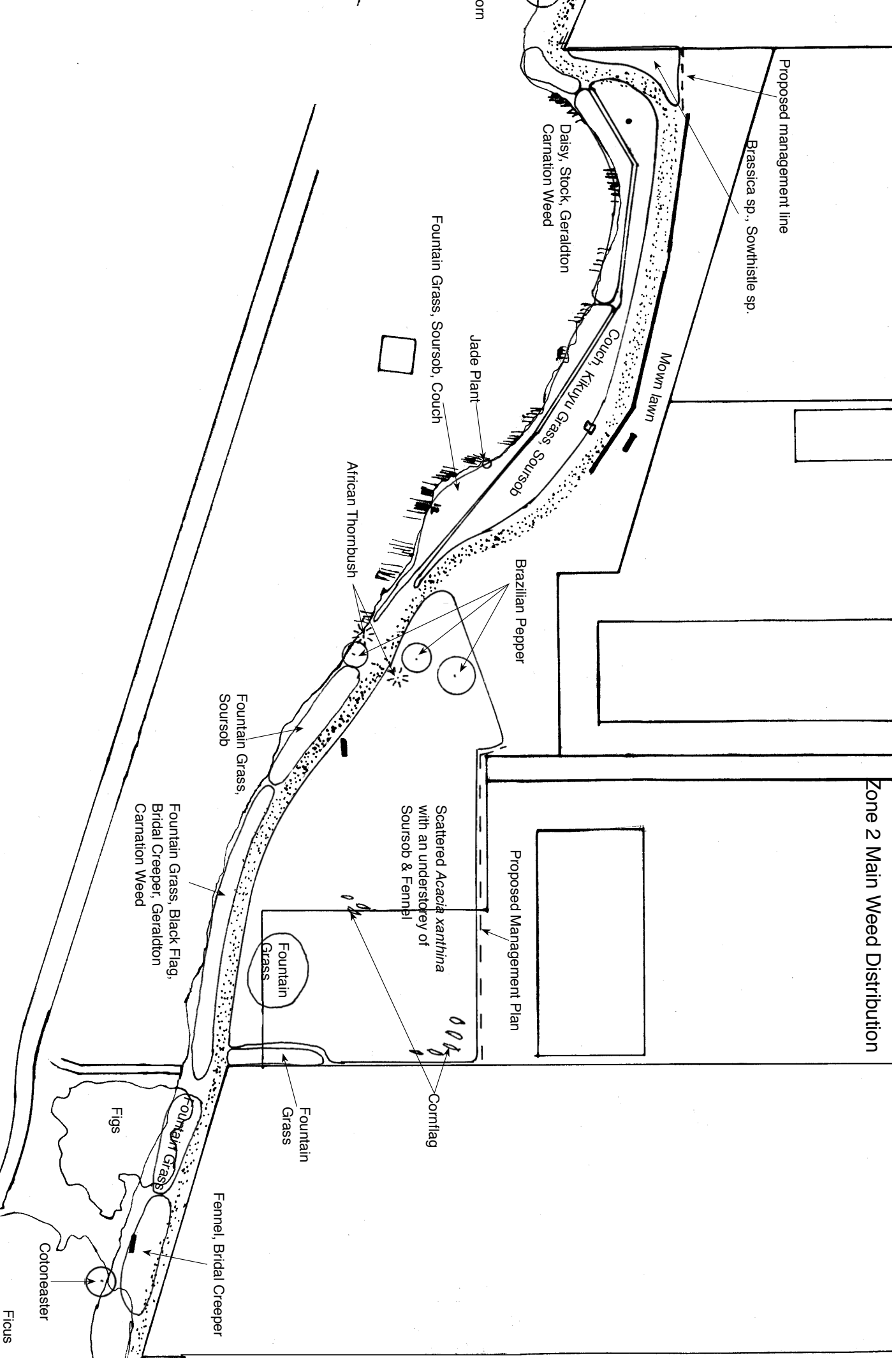


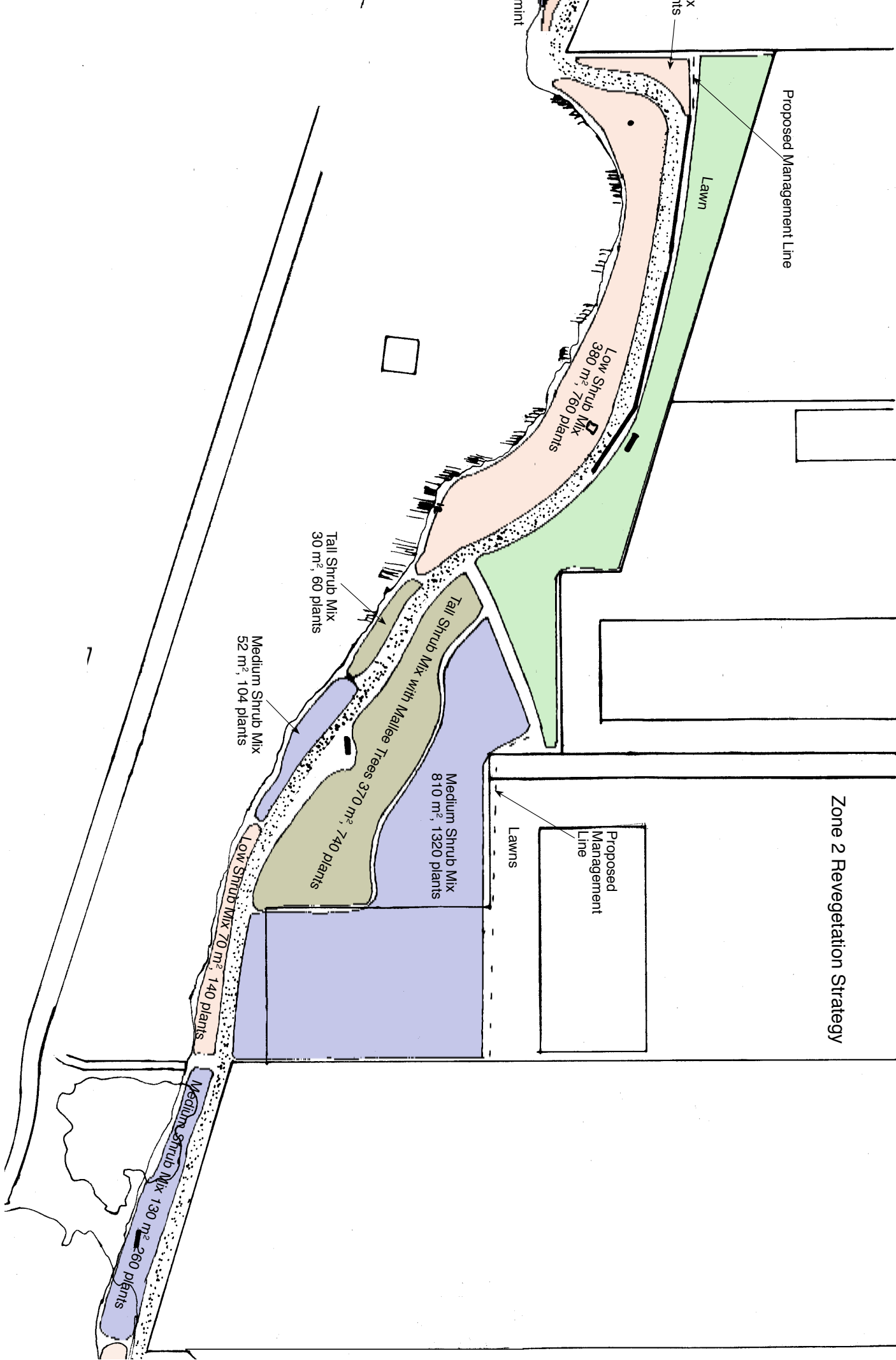


Interpretation panel and seat



Looking south. An informal access coming in on the left leads up the hill towards the Memorial Gardens. In the background is a hillside with scattered *Acacia xanthina*. The mown area to the right of the path will be revegetated







From the narrow point the reserve opens out to the south

Existing local Native Vegetation

<i>Agonis flexuosa</i>	WA Peppermint
<i>Acacia xanthina</i>	White-stemmed Wattle
<i>Dianella revoluta</i>	Blueberry Lily
<i>Hardenbergia comptoniana</i>	Native Wisteria
<i>Rhagodia baccata</i>	Berry Salt Bush
<i>Templetonia retusa</i>	Cockies' Tongues

Weed Strategy Zone 2

Clear management lines are needed between areas maintained as mown lawn and areas that will be revegetated with native plants. This could be achieved on the north end by extending the single block retaining by 8 metres to complete the line to the wall. Above the hillside of *Acacia xanthina*, the lawn is growing into the revegetated area and a management line should be established. This could be a strip free of vegetation that is mulched, or a flush kerbing of a limestone-look material.

The African Thornbush should be removed. The Brazilian Pepper above the path could be removed after replacement trees and shrubs have established.

The main weeds to target in this area are, Soursob, Black Flag, Cornflag, Fountain Grass, Kikuyu, Couch and Bridal Creeper. (See Adaptive Weed Strategy by species p 32)



African Boxthorn on the right with soursob on the left and in the background



Black Flag



Soursob, Cornflag and Fennel, underlying *Acacia xanthina*



Clear management line needed where lawn meets revegetation area

Revegetation Strategy Zone 2

Zone 2 has a revegetation area of approximately 1890 square metres and will be planted at 2 plants per square metre, except next to housing in the south where the plant density will be reduced to 1 plant per square metre within ten metres of the boundary.

The current mown area below the path will be revegetated with Low Shrubs. The hillside will be planted in 2 sections. There will be medium shrubs and lower planting density within the APZ (Asset Protection Zone or firebreak) of buildings. On the lower hillside, there will be taller shrubs and mallee trees, where the steep topography allows taller vegetation without affecting residents' views.

Zone 3

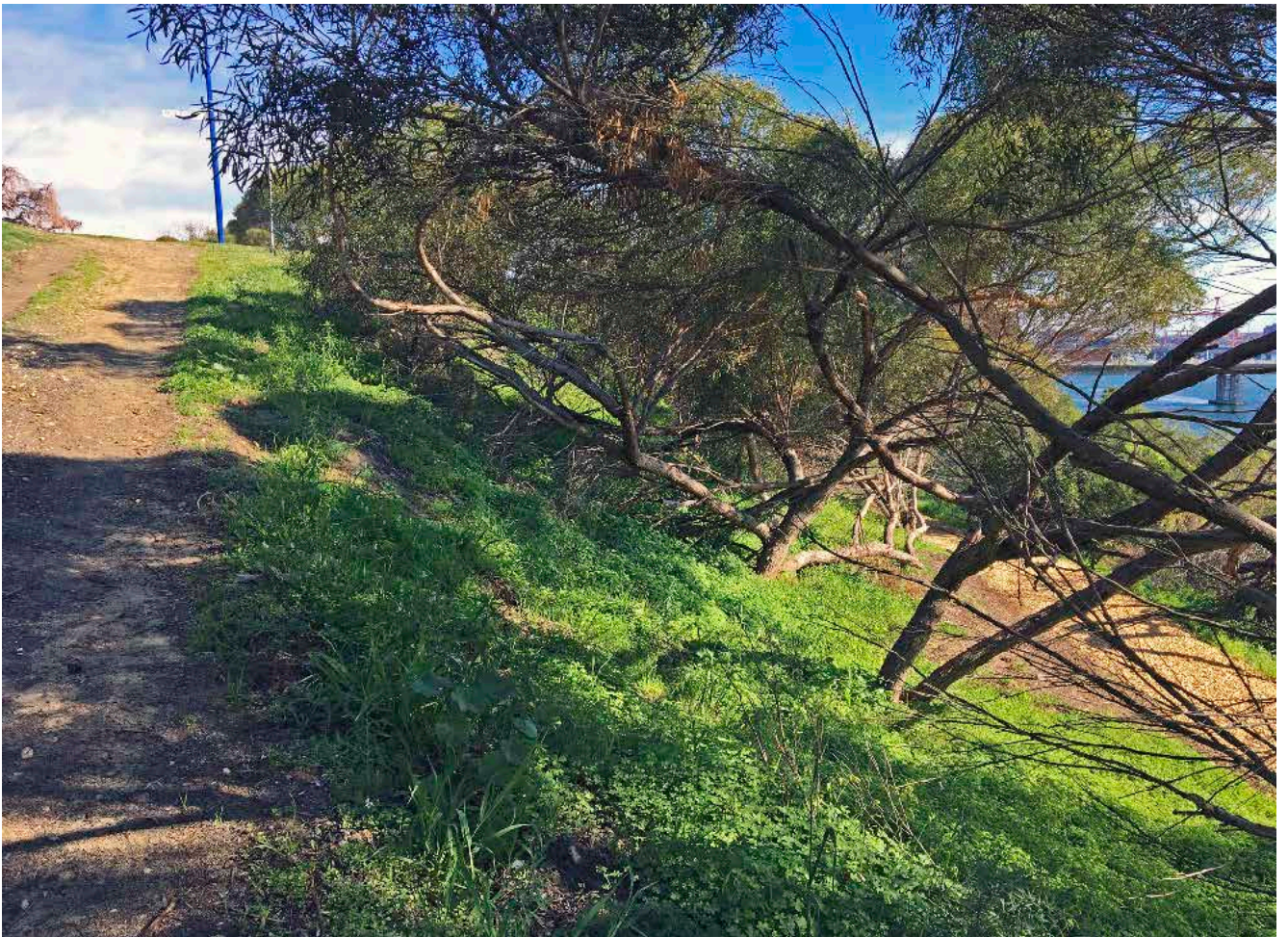
This portion of the track extends from the narrow point south of Zone 2 to the cultivated area of Merv Cowan Park. The reserve varies in width between 20 to 30 metres and contains an important access road for materials and maintenance vehicles.

Steep banks above the track pose a challenge for maintenance and revegetation. A set of steps leads down to the foreshore just south of the narrow point. In a grove of local native trees there is a seat on the upper side of the path. The understory is mainly Soursob and Black Flag. Opposite is an Interpretation plinth. Near Merv Cowan Park there are two Interpretation plinths and a seat. One sign has the main orientation map for the track. From Merv Cowan Park a set of steps lead down beside the *Left Bank* and the Bicentennial Waterfall.



View to harbour from Merv Cowan park

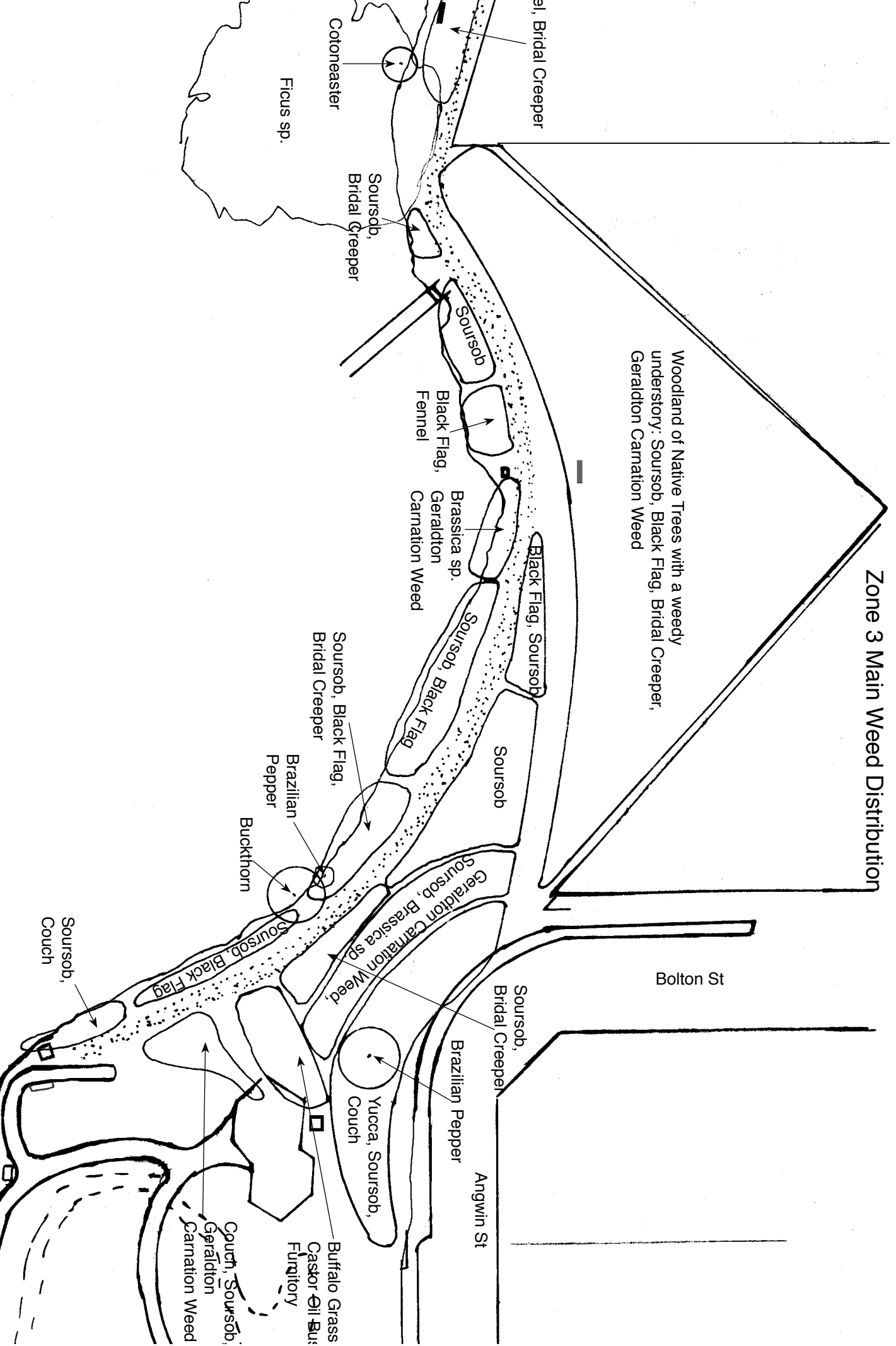


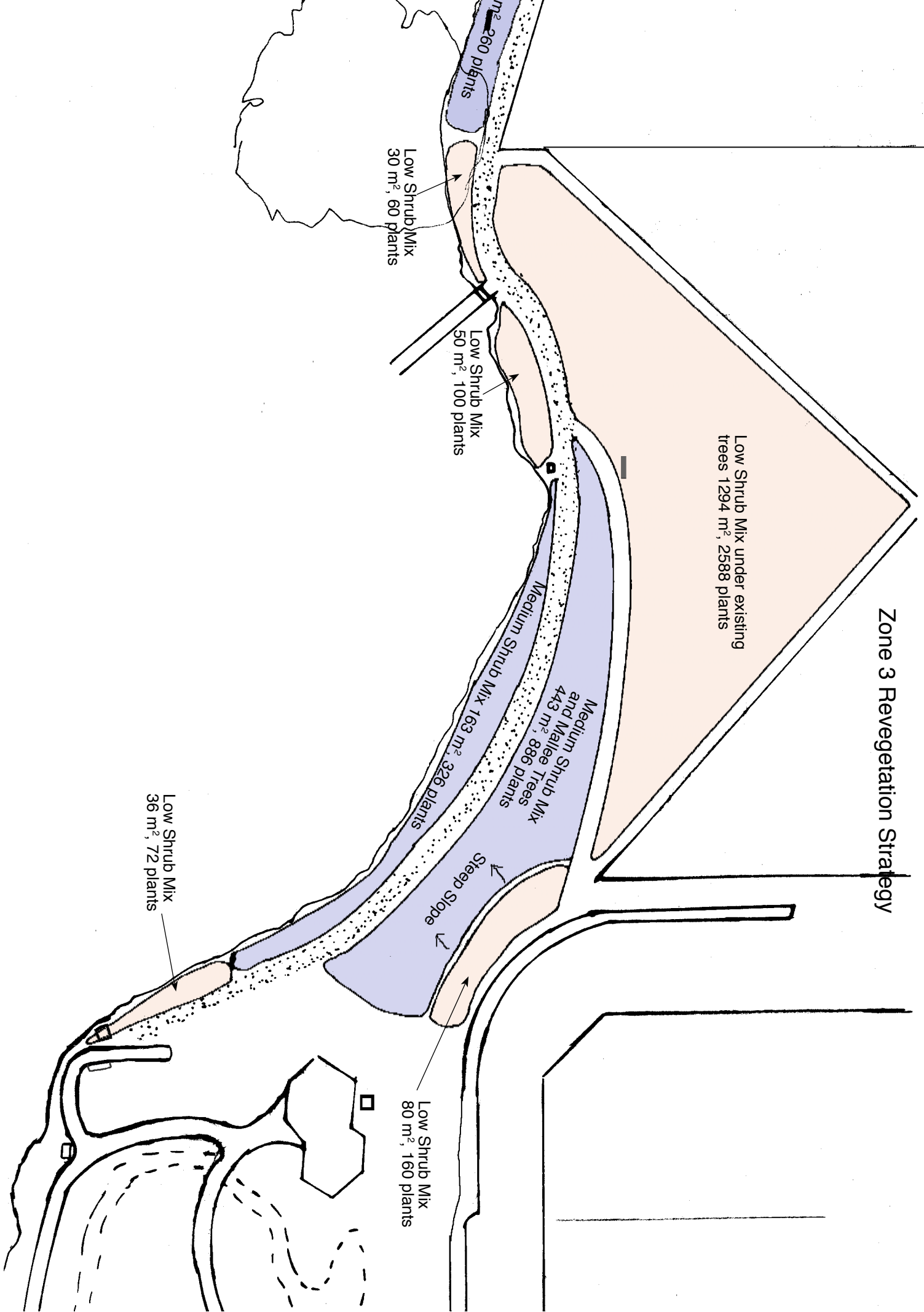


Maintenance access road, with Niergarup track below

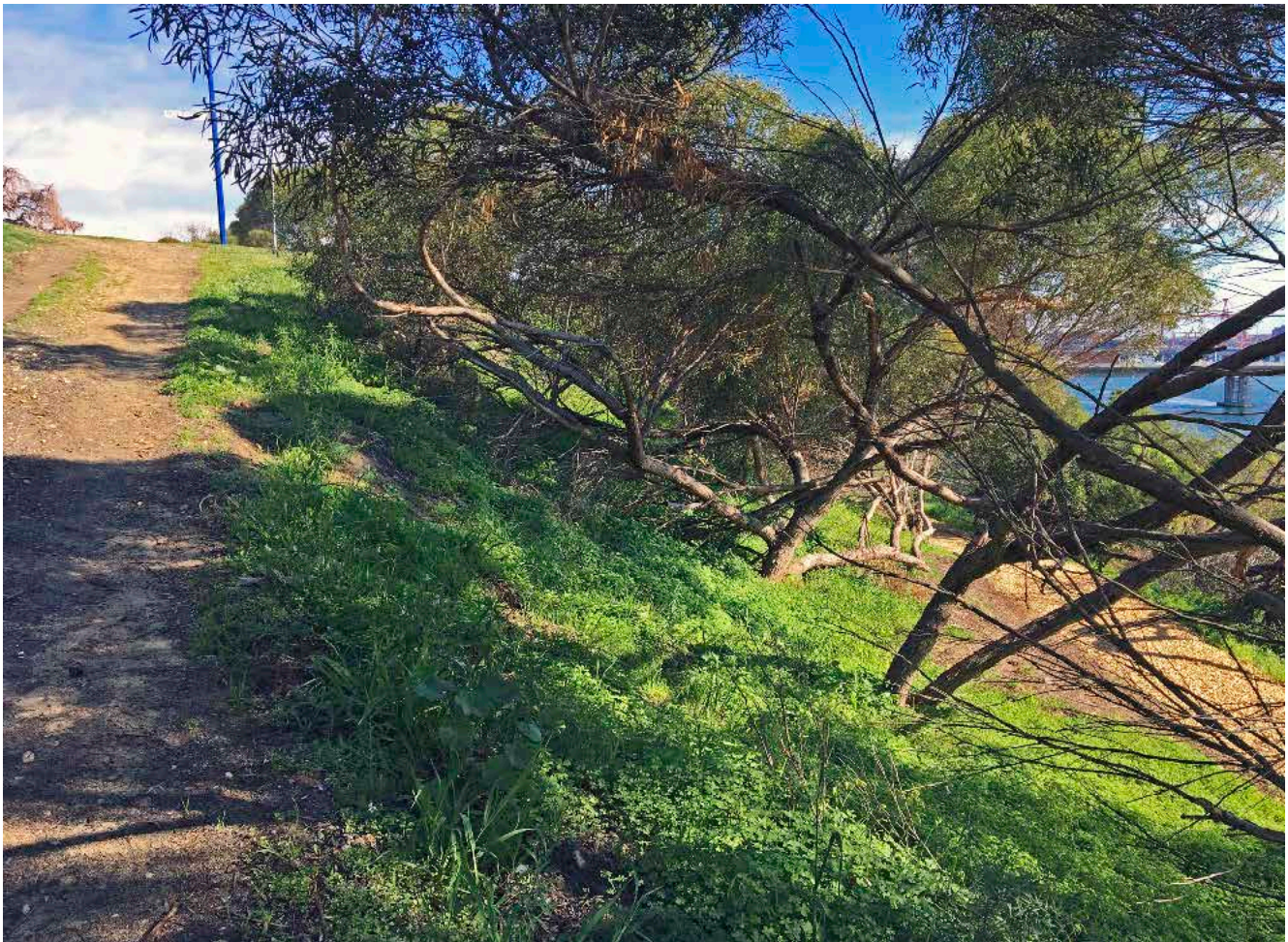


Looking north towards Zone 2





Zone 3 Revegetation Strategy



Maintenance access road, with Niergarup track below



Looking north towards Zone 2

Existing local Native Vegetation

<i>Acacia xanthina</i>	White-stemmed Wattle
<i>Agonis flexuosa</i>	WA Peppermint
<i>Callitris preissii</i>	Rottnest Island Pine
<i>Eucalyptus foecunda</i>	Fremantle Mallee
<i>Melaleuca huegelii</i>	Chenille Honey myrtle
<i>Melaleuca lanceolata</i>	Rottnest Island Tea Tree
<i>Rhagodia baccata</i>	Berry Salt Bush
<i>Templetonia retusa</i>	Cockies Tongues

Weed Strategy Zone 3

Weed control will begin in Zone 3 in Year 2 of the project. The main weeds to target are Soursob, Black Flag and Bridal Creeper. The Yucca and debris on the bank below Anstie Street should be removed so that the bank can be accessed for weed control. There are several Brazilian Peppers. The smaller ones should be removed and one larger one on Anstie Street should be assessed for removal during the project.



Yucca below bank along Anstie Street



Steep bank

Revegetation Strategy Zone 3

This Zone has an area of approximately 2100 square metres and will be revegetated at 2 plants per square metre. Lower density will apply in the APZ next to housing.

Revegetation will begin in 2022 in the second year of weed control. The triangular area with a cover of local native trees will be revegetated with an understory of low shrubs.

There is an opportunity to plant taller shrubs and trees, as indicated on the map, where the ground descends steeply below Anstie St.

8 General recommendations for Weed Control and Revegetation

1. Many of the most difficult and widespread weeds on the site benefit from disturbance. Disturbance helps spread their corms/ bulbs/ bulbils. Hand weeding must target specific weeds that do not spread in this way, and use methods that need least disturbance of soil. Any other maintenance works should aim at minimal disturbance.
2. Any spraying must be carried out by suitably qualified and licensed contractors in wind-still, dry conditions. During spraying the Track should be closed with appropriate signage and barriers.
3. Establishing clear Management Lines in Zone 2 between Mown Lawns and Revegetation areas is important.
4. Forming a Friends of Niergarup Track to engage in practical activities to support the revegetation of the Track. Various training courses are open to community members interested in joining.
5. Information about and signage on the Track should make it clear that the Track is not suitable for bicycles, and dogs must be on leads.

Interpretation and Signage

There are five original Interpretation plinths and seats, one being beside Riverside Drive at the

northern end. The original Interpretation signs and seats need maintenance. Future consideration could be given to developing a mobile App for the interpretation information and maps.

The Track needs an orienting map at either end in a location at the base of the stairs, or on the riverside path, as well as one on Anstie Street in Merv Cowan Park.



Riverside sign northern end of Track



Way marker sign located in Zone 3

Way-marker signs – There is one Way-marker sign located in Zone 3. A series of these along the track would clarify the route.

Cliff Risk signs – At the north end of Zone 2 are two adjacent signs, both about cliff risk.

Old signage should be removed and a standard approach to signage for way marking and cliff risk should be applied. The lower signs are less intrusive.

Seating

In addition to the existing seating, consideration could be given to informal seating under the WA Peppermint, Zone 1. This could take the form of a shaped log or similar natural form rather than a constructed seat.

Access for Maintenance

There is one access road for maintenance from Anstie St to Zone 3. However the narrow point at the end of Zone 3 makes it difficult to access any other part of the Track by vehicle. There is an access way owned by the State Government into the central portion of land connecting back to the Memorial Park. This access-way could provide a more visible route for pedestrian access and an access for light maintenance vehicles. Plantings currently block this access-way.

Pedestrian access from Merv Cowan Park.



A connection from the shelter at Merv Cowan Park to the track would simplify what is currently a somewhat confusing route from Anstie St

Fencing

There are portions of cyclone mesh and steel fencing at critical points along the track

Native Fauna

The scarp has the potential to provide excellent habitat for birds, reptiles and other native fauna. An indication of the species that potentially could live along the track is in the North Fremantle foreshore list. (See p 35)

9 Revegetation Species List

Trees/Tall shrubs

Acacia cyclops
Acacia saligna
Acacia xanthina
Agonis flexuosa
Allocasuarina fraseriana
Allocasuarina lehmanniana
Banksia attenuata
Banksia grandis
Callitris preissii
Dodonaea hackettiana
Eucalyptus decipiens
Eucalyptus foecunda
Eucalyptus gomphocephala
Eucalyptus petrensis
Hakea ruscifolia
Melaleuca huegelii
Myoporum insulare
Pittosporum phillyreoides
Santalum acuminatum
Spyridium globulosum

Medium Shrubs and climbers

Acacia cochlearis
Acacia truncata
Allocasuarina humilis
Alyxia buxifolia
Billardiera fusiformis
Calothamnus quadrifidus
Diplolaena dampieri
Dodonaea aptera
Grevillea crithmifolia
Grevillea vestita
Hakea lissocarpha
Hakea trifurcata
Hardenbergia comptoniana
Logania vaginalis
Melaleuca cardiophylla
Olearia axillaris
Templetonia retusa
Xanthorrhoea preissii

Small shrubs and Groundcovers

Acacia lasiocarpa
Banksia dallanneyi
Bossiaea eriocarpa

Calothamnus sanguineus
Conostylis aculeata
Conostylis candicans
Dianella revoluta
Enchylaena tomentosum
Eremophila glabra
Frankenia pauciflora
Grevillea preissii
Guichenotia ledifolia
Isolepis nodosa
Jacksonia sericea
Kennedia coccinea
Kennedia prostrata
Lechenaultia linarioides
Leucophyta brownii
Melaleuca systema
Melaleuca trichophylla
Orthrosanthus laxus
Patersonia occidentalis
Phyllanthus calycinus
Rhagodia baccata
Scaevola crassifolia
Thomasia cognata

Year Two Planting Zone 1 and 2

Botanical name	Common Name	Zone 1	Zone 2	Total
Trees/Tall Shrubs				
<i>Acacia cyclops</i>	Red Eyed Wattle		37	37
<i>Agonis flexuosa</i>	WA Peppermint		3	3
<i>Allocasuarina lehmanniana</i>	Dune Sheoak		10	10
<i>Banksia attenuata</i>	Candle Banksia		20	20
<i>Banksia grandis</i>	Bull Banksia		20	20
<i>Eucalyptus foecunda</i>	Fremantle Mallee	2	30	32
<i>Eucalyptus petrensis</i>	Limestone Mallee		20	20
<i>Melaleuca huegelii</i>	Chenille Honeymyrtle	2	30	32
<i>Myoporum insulare</i>	Blueberry Tree		20	20
<i>Spyridium globulosum</i>	Basket Bush		10	10
Medium Shrubs and Climbers				
<i>Acacia cochlearis</i>	Rigid Wattle	40	20+80	140
<i>Acacia truncata</i>		80	20+80	100
<i>Allocasuarina humilis</i>	Dwarf Sheoak	40	40+80	120
<i>Billardiera fusiformis</i>	Native Bluebell	40	40	80
<i>Calothamnus quadrifidus</i>	One-sided Bottlebrush	40	40	80
<i>Grevillea crithmifolia</i>		20	40	60
<i>Hakea lissocarpa</i>	Honey Bush	30	80	110
<i>Melaleuca cardiophylla</i>	Umbrella Bush	40	40+80	160
<i>Olearia axillaris</i>	Coastal Daisy Bush	80	40+80	200
<i>Templetonia retusa</i>	Cockies' Tongues	80	40+80	200
Small Shrubs and Groundcovers				
<i>Acacia lasiocarpa</i>	Dune Moses	40	40+40	120
<i>Banksia dallaneyi</i>	Couch Honeypot	40	40+40	80
<i>Calothamnus sanguineus</i>	Silky Leaved Blood Flower	80	40+80+80	280
<i>Conostylis candicans</i>	Grey Cottonheads		40+40+80	160
<i>Dianella revoluta</i>	Flax Lily	40	40+80+80	240
<i>Eremophila glabra</i>	Tar Bush	80	40+80+100	300
<i>Grevillea preissii</i>		80	40+80+120	320
<i>Guichenotia ledifolia</i>		60	40+80+80	260
<i>Isolepis nodosa</i>	Knotted Club Rush		40	40
<i>Leucophyta brownii</i>	Cushion Bush	40	80+80	200
<i>Melaleuca systema</i>	Coastal Honeymyrtle	40	40+80+80	240
<i>Melaleuca trichophylla</i>		40	40+120+80	280
<i>Rhagodia baccata</i>	Berry Salt Bush	40	60+80+40	220
<i>Scaevola crassifolia</i>	Thick Leaved Fan Flower	40	20+40+40	140
<i>Thomasia cognata</i>		40	40+80	160
Total		1154	3540	4494

10 Weed List

<i>Agave americana</i>	Century plant
<i>Asparagus asparagoides</i>	Bridal creeper. C3 Declared pest and Weed of National Significance
<i>Brassica tournefortii</i>	Wild Turnip
<i>Cenchrus clandestinus</i>	Kikuyu
<i>Cenchrus setaceus</i>	Fountain Grass formerly <i>Pennisetum setaceum</i> . Declared Weed WA
<i>Chasmanthe floribunda</i>	Cornflag
<i>Conyza bonariensis</i>	Fleabane
<i>Cynodon dactylon</i>	Couch
<i>Euphorbia terracina</i>	Geraldton Carnation Weed
<i>Ferraria crispa</i>	Black Flag
<i>Ficus carica</i>	Fig
<i>Foeniculum vulgare</i>	Fennel
<i>Fumaria capreolata</i>	Whiteflower Fumitory
<i>Hypochaeris radicata</i>	Flat Weed
<i>Lobularia maritima</i>	Sweet Alyssum
<i>Lupinus cosentinii</i>	WA Blue Lupin
<i>Lycium ferocissimum</i>	African Boxthorn. Declared Weed WA
<i>Malva parviflora</i>	Marshmallow
<i>Matthiola incana</i>	Common Stock
<i>Oxalis pes-caprae</i>	Soursob
<i>Portulacaria afra</i>	Jade Plant
<i>Rhamnus alaternus</i>	Mediterranean Buckthorn
<i>Raphanus raphanistrum</i>	Wild Radish
<i>Vicia sativa</i>	Common Vetch
<i>Ricinus communis</i>	Castor Oil plant
<i>Schinus terebinthifolia</i>	Brazilian Pepper
<i>Solanum nigrum</i>	Blackberry nightshade
<i>Sonchus</i> spp.	Sowthistles
<i>Stenotaphrum secundatum</i>	Buffalo Grass
<i>Yucca aloifolia</i>	Yucca

11. Table of Adaptive Weed Strategy by species. Over time, change this Strategy

Weed Species	Control method	Timing	Annual Frequency	Chemical
<i>Agave americana</i> Century Plant Sap an irritant	Hand remove leaves. Stem inject base. Eye protection	Stem injection most effective Nov/Dec/Jan	Remove in Year 1. Follow up if required.	Glyphosate Biactive
<i>Asparagus asparagoides</i> Bridal Creeper C3 declared pest and Weed of National Significance	Biological Control using rust transfer from the wild or herbicide.	Rust transfer in spring. Herbicide when flowering, mid June – Aug	Treat in Year 1, 2 and 3,	Metsulfuron methyl 0.02, and Pulse in 10 L of water in bushland.
<i>Brassica tournefortii</i> Mediterranean Turnip	Cut stem below base when small before flowering	April – Jun	Treat annually after germination April to June	
<i>Cenchrus clandestinus</i> Kikuyu grass	Herbicide in growing season	Nov – Jan	Year 1 two to three treatments. Adapt after that	Glyphosate Biactive 1% or Fusilade Forte@16 mL/L plus wetting agent
<i>Cenchrus setaceus</i> Fountain Grass A Declared Weed in WA	Remove flower heads regularly and dispose carefully, by burning or bagging. Herbicide	Summer growing. Treat Spring to Autumn	Remove seed heads as often as possible. Herbicide two treatments annually over summer	Glyphosate Biactive 1% and penetrant
<i>Chasmanthe floribunda</i> Cornflag	Herbicide Remove flower heads	Best Jun/July grows May – Nov	Twice in Year 1 Adapt thereafter	Glyphosate Biactive 1% + Pulse
<i>Conyza bonariensis</i> Fleabane	Handpull if small Cut below base and bag seed on larger plants	Optimum time Jun – Sep	Three times in Year 1	
<i>Cynodon dactylon</i> Couch Grass	Herbicide	Nov – Feb	Three times in Year 1	Glyphosate Biac-tive 1% or Fusi-lade Forte@13 mL/L + wetting agent
<i>Ehrharta brevifolia</i> Annual Veldt Grass	Hand pull at small seedling stage or herbicide	Optimum Herbicide time Jul/ Aug/Sep	Monthly Jul to Sep in Year 1 Adapt after this	Glyphosate Biactive 1%
<i>Euphorbia terracina</i> Geraldton Carnation Weed sap is poisonous and an irritant.	Avoid hand Pulling. Control young plants with herbicide	Herbicide Jun-Aug	Two treatments in Year One. Adapt after this	Logran @12.5 g/100 L+ Pulse
<i>Ferraria crispa</i> Black flag	Herbicide	Aug/Sep Grows Apr – Nov	Twice annually	2,2 DPA 10 g/L + Pulse

Weed Species	Control method	Timing	Annual Frequency	Chemical
<i>Ficus carica</i> Fig	Hand pull small plants. Prune larger plants and assess erosion risk before removal	Prune to inhibit fruiting in large plants.	Prune in Year Two. Consider removal in Year Three	
<i>Foeniculum vulgare</i> Fennel	Hand remove small outbreaks. Slash and spot spray regrowth on larger outbreaks	Sep – Nov	Twice in Year 1	Spot spray with 1.5% Glyphosate Biactive + Pulse
<i>Fumaria capreolata</i> White flower fumitory	Remove new germinants from May onwards	Jun/Jul	Twice annually Jun/Jul	
<i>Hypochaeris radicata</i> Flatweed	Cut stem beneath soil level	Jun – Nov	Three times annually	
<i>Lupinus cosentinii</i> Lupin	Hand remove isolated plants	Jun – Sep	Annually July	
<i>Lycium ferocissimum</i> African Boxthorn	Cut and paint small stems. Inject larger stems with herbicide	Late winter/early spring May – Oct	Three checks annually of regrowth	Glyphosate Biactive 50% solution
<i>Malva parviflora</i> Marshmallow	Cut stem under ground level	April – Sep	Twice annually	
<i>Oxalis pes-caprae</i> Soursob	Herbicide	Winter Jun/Jul optimum. Grows Apr – Oct	Three times in Year One. Adapt after this	Glyphosate Biactive 1%
<i>Raphanus raphanistrum</i> Wild Radish	Cut stem below ground or hand pull small plants	Any time of year	Regularly	
<i>Rhamnus alaternus</i> Mediterranean Buckthorn	Cut larger plants. Paint stump with herbicide	Autumn or Spring		Glyphosate 50% mixture for stump painting
<i>Ricinus communis</i> Castor Oil Bush	Handpull small plants. Cut larger plants and paint stump with herbicide	September to December best. Remove seed capsules.	Annual	Glyphosate 50% mixture for stump painting
<i>Schinus terebinthifolia</i> Brazilian Pepper. Sap a skin irritant	Manual removal of small plants. Cut large plants and stem inject	Manual anytime. Herbicide in warmer months Dec – Feb	Once annually	Stem inject with Glyphosate Biactive 50% solution
<i>Solanum nigrum</i> Blackberry Nightshade	Handpull small plants. Cut larger plants below ground. Bag fruit	Jun – Nov	Three times in Year 1	

Weed Species	Control method	Timing	Annual Frequency	Chemical
<i>Sonchus oleraceus</i> . Sowthistle	Handpull small plants. Cut stem of large plants below ground level	Jun – Oct	Three times in Year 1	
<i>Stenotaphrum secundatum</i> Buffalo Grass	Handpull small outbreaks. Herbicide large outbreaks	Nov – May	Three times in Year 1	Glyphosate Biactive 1% & wetting agent
<i>Vicia sativa</i> Purple vetch	Hand remove small outbreaks. Herbicide larger	Jul – Sep	Three times in Year 1	Metsulfuron 0.1 g/10 L + wetting agent
<i>Yucca aloifolia</i> Yucca	Manually remove		Remove in Year 2	

12 Fauna inventory

Family	Common Name	Scientific Name	Conservation Category
Mammalia	European Fox	<i>Vulpes vulpes</i>	Introduced
	European Rabbit	<i>Oryctolagus cuniculus</i>	Introduced
	Feral Cat	<i>Felis catus</i>	Introduced
	House Mouse	<i>Mus musculus</i>	Introduced
	Brown Rat	<i>Rattus norvegicus</i>	Introduced
Aves (Birds)	Australasian Darter	<i>Anhinga novaehollandiae</i>	
	Australasian Grebe	<i>Tachybaptus novaehollandiae</i>	
	Australian Hobby	<i>Falco longipennis</i>	
	Australian Kestrel	<i>Falco cenchroides</i>	
	Australian Magpie	<i>Cracticus tibicen</i>	
	Australian Pelican	<i>Pelecanus conspicillatus</i>	
	Australian Raven	<i>Corvus coronoides</i>	
	Australian Ring neck	<i>Platycercus zonarius</i>	
	Australian Shelduck (Mountain Duck)	<i>Tadorna tadornoides</i>	
	Barn Owl	<i>Tyto alba</i>	
	Baudin's Cockatoo	<i>Calyptorhynchus baudinii</i>	EPBC – vulnerable
	Black Swan	<i>Cygnus atratus</i>	
	Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	
	Black Shouldered Kite	<i>Elanus caeruleus</i>	
	Black-winged Stilt	<i>Himantopus himantopus</i>	
	Brown Goshawk	<i>Lichmera indistincta</i>	
	Brown Honeyeater	<i>Lichmera indistincta</i>	
	Carnaby's Cockatoo	<i>Calyptorhynchus latirostris</i>	EPBC – Endangered
	Caspian Tern	<i>Hydroprogne caspia</i>	
	Common Sandpiper	<i>Actitis hypoleucos</i>	
	Crested Tern	<i>Thalasseus bergii</i>	
	Eastern Osprey	<i>Pandion haliaetus</i>	EPBC – migratory, protected
	Fairy Tern	<i>Sternula nereis</i>	
	Feral Pigeon (Rock Dove)	<i>Columba livia</i>	Introduced
	Forest Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii naso</i>	EPBV – vulnerable
	Galah	<i>Eolophus roseicapilla</i>	
	Grey Butcherbird	<i>Cracticus torquatus</i>	
	Laughing Kookaburra	<i>Dacelo novaeguineae</i>	Introduced
	Little Corella	<i>Cacatua sanguinea</i>	
	Little Black Cormorant	<i>Phalacrocorax fuscescens</i>	
	Little Pied Cormorant	<i>Microcarbo melanoleucos</i>	
	Western Long-billed Corella	<i>Cacatua pastinator</i>	
	Magpie-lark	<i>Grallina cyanoleuca</i>	

Family	Common Name	Scientific Name	Conservation Category
	Mistletoe Bird	<i>Dicaeum hirundinaceum</i>	
	Nankeen Night Heron	<i>Nycticorax caledonicus</i>	
	New Holland Honeyeater	<i>Phylidonyris novaehollandiae</i>	
	Pacific Black Duck	<i>Anas superciliosa</i>	
	Peregrine Falcon	<i>Falco peregrinus</i>	WC – Schedule 7
	Pied Cormorant	<i>Phalacrocorax varius</i>	
	Pied Oystercatcher	<i>Haematopus longirostris</i>	
	Rainbow Bee-eater	<i>Merops ornatus</i>	EPBC – migratory
	Rainbow Lorikeet	<i>Trichoglossus moluccanus</i>	Introduced
	Red Wattlebird	<i>Anthochaera carunculata</i>	
	Sacred Kingfisher	<i>Todiramphus sanctus</i>	
	Senegal Dove (Laughing Turtle-dove)	<i>Spilopelia senegalensis</i>	Introduced
	Silver Gull	<i>Chroicocephalus novaehollandiae</i>	
	Silvereye	<i>Zosterops lateralis</i>	
	Singing Honeyeater	<i>Gavicalis virescens</i>	
	Splendid Fairy Wren	<i>Malurus splendens</i>	
	Spotted Pardalote	<i>Pardalotus punctatus</i>	
	Spotted Turtle-dove	<i>Spilopelia chinensis</i>	Introduced
	Straw-necked Ibis	<i>Threskiornis spinicollis</i>	
	Striated Pardalote	<i>Pardalotus striatus</i>	
	Tree Martin	<i>Petrochelidon nigricans</i>	
	Variigated Fairy-wren	<i>Malurus lamberti</i>	
	Welcome Swallow	<i>Hirundo neoxena</i>	
	Western Gerygone	<i>Gerygone fusca</i>	
	Western Wattlebird	<i>Anthochaera lunulata</i>	
	Whistling Kite	<i>Haliastur sphenurus</i>	
	White-browed Scrubwren	<i>Sericornis frontalis</i>	
	White Cheeked Honeyeater	<i>Phylidonyris niger</i>	
	White-faced Heron	<i>Egretta novaehollandiae</i>	
	White-necked Heron	<i>Ardea pacifica</i>	
	Willie Wagtail	<i>Rhipidura leucophrys</i>	
Reptilia	Blue-tongue Lizard (Western Bluetongue)	<i>Tiliqua occipitalis</i>	
	Dugite	<i>Pseudonaja affinis</i>	
	Bobtail		Tiliqua rugosa
	King's Skink	<i>Egernia kingii</i>	
	Shrubland Morethia Skink	<i>Morethia obscura</i>	

