City of Nedlands

Allen Park Bushland Management Plan

2019–2024

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ACRONYMS AND ABBREVIATIONS

ACRONYM/ ABBREVIATION	DESCRIPTION
DBCA	Department of Biodiversity Conservation and Attractions
DEC	Department of Environment and Conservation
DFES	Department of Fire and Emergency Services
DPaW	Department of Parks and Wildlife
EPBC Act	Environmental Protection and Biodiversity Conservation Act
GPS	Global Positioning System
ha	Hectare
the City	City of Nedlands
WALGA	Western Australian Local Government Association
WESROC	Western Suburbs Regional Organisation of Councils

Cover photo:
Cockies Tongues *(Templetonia retusa)*
Internal photos courtesy of Sally Wallace

Contents

2. ACKNOWLEDGEMENTS

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City of Nedlands Health and Compliance Department
Department of Defence (Environmental Department)
Friends of Allen Park Bushland Group
Ian Fordyce and Associates
Syrinx Environmental Pl
Technology One Limited

3. SUMMARY

This Management Plan is dedicated specifically to the management of Allen Park bushland. Detailed information and actions relating to all natural areas within the City such as surveying methods, rehabilitation, environmental weed control, climate change, geomorphology and soils, planning context, interpretation, priority flora and fauna, fire management, community involvement, access and feral animal management has been detailed on pages 1-102 of the Natural Areas Management Plan 2019-2024.

The Allen Park Bushland Management Plan 2019-2024 has drawn heavily from the following documents:

- Allen Park Management Plan 2013-2018 (City of Nedlands, 2014)
- Allen Park Management Plan 2005-2010 (Ecoscape, 2005)
- City of Nedlands Natural Area Initial Assessments (Orsini, 2008)
- Allen Park and Environs Management Plan 1996 (Ecoscape, 1996).

A five year management plan has been developed that provides management actions and strategies for the conservation and restoration of the bushland at Allen Park. A summary of key actions for Allen Park are listed below.

Table 1: Summary of Actions Allen Park Bushland Management Plan 2019-2024

Management Actions 2019-2024	
MANAGEMENT BOUNDARIES	
1.	Manage Allen Park on the basis of twelve Sectors in conjunction with the Friends of Allen Park and the Swanbourne Coastal Alliance.
2.	Include Jones Park, the Oval Greenway, the Overflow Carpark Greenway, the Allen Park Pavilion Peppermint Grove and Lot 150 as potential future management areas within Allen Park.
REHABILITATION	
3.	Focus rehabilitation on *Good* to *Very Good* condition bushland and Degraded areas directly adjacent to Good and *Very Good* bushland condition as a priority.
4.	Develop a rehabilitation plan to prioritise sensitive environments based on their susceptibility to erosion.
5.	Any asbestos material found in the bushland should be left alone and reported to the City.
6.	Implement 'Asbestos', 'Plant Pathogen' and 'Rehabilitation' actions detailed in the Natural Areas Management Plan 2019-2024.
7.	Undertake ongoing treatment and monitoring *Armillaria* in the Heritage Precinct using a combination of systemic and soil treatments.
8.	Undertake ongoing monitoring of *Armillaria* infected areas to guide revegetation programs.
9.	Annually remove soil away from the trunk of trees within *Armillaria* infected areas where it has the potential to accumulate on the trunk.
10.	Maintain existing views when undertaking revegetation programs along Marine Parade and the Oval Greenway.
REVEGETATION	
11.	Work with local nurseries to grow species found in low abundance.

12.	Careful consideration should be provided to the types of revegetation species used in areas where Black Flag is present.
13.	Where native vegetation exists, mature Black Flag plants that have the potential to set seed should be hand wiped with herbicides or hand weeded to stop them from seeding.
14.	Due to maintenance issues no further planting of *Acacia rostellifera* or *Acacia cyclops* should occur on Sectors east of the bowling greens.
15.	Implement 'Revegetation' actions detailed in the Natural Areas Management Plan 2019-2024.
WEED CONTROL	
16.	Annually monitor weeds with the potential to expand rapidly and map changes in their distribution if required.
17.	Monitor, control and document the distribution of new invasive weeds as they arise.
18.	Control priority weeds in accordance with management notes detailed in Appendix 4.
19.	Maintain vigilance on alert weeds such as Arum Lily, Coast Teatree, *Euphorbia maculata*, Golden Crownbeard, Coast Teatree, Tambookie Grass and White Broom.
20.	Undertake ongoing maintenance of weeds in restoration sites including the Seaward Corridor, the Swale, Odern Crescent, the Rugby Club Embankment, the Heritage Precinct, Coastwest restoration sites and the Walkway.
21.	Control One-leaf Cape Tulip (*Moraea flaccida*) and Long Tubed Painted Lady/Wild Gladiolus populations before they establish.
22.	Seek funding to undertake an intensive control program of *Pelargonium capitatum.*
23.	Implement actions for 'Weed Control' in the Natural Areas Management Plan 2019-2024.
WEED CONTROL – Coastal Swale and Foredunes	
24.	Control the following weeds as a priority: *Gazania*, Geraldton Carnation Weed, Sea Spurge, *Trachyandra divaricata*, *Tamarix*, *Pelargonium*, woody weeds and *Lupinus.*
25.	To reduce erosion only undertake weed control in areas with sufficient native vegetation cover or as part of an intensive restoration project.
26.	Work with the Department of Defence to undertake control of priority weeds on adjacent land.
WEED CONTROL – North, East, South and West Melon Hill, the Boobook Sector, the Heritage Precinct, Sayer Street, Odern Crescent, Flyash Hill and Swale and the Seaward Corridor	
27.	Control the following weed as a priority: *Gazania*, Geraldton Carnation Weed, Bridal Creeper, Marguerite Daisy, African Cornflag, Perennial Veldt Grass, Annual Veldt Grass, *Oxalis*, Wild Oats, Black Flag, Freesias, Fumitory, woody weeds and *Pelargonium*.
28.	Control Cape Weed and Bur Medic along pathways to reduce their establishment into areas of good condition bushland.
29.	Control Flickweed to stop its establishment.
30.	Only remove the *Tamarix* population on Flyash Hill as part of an intensive restoration project.

31.	Continue to collaborate with the Department of Defence for weed management on Melon Hill.
32.	Focus resources for Pretty Betsy control on Flyash Hill, Odern Crescent, the Coastal Swale and the Boobook Sectors.
33.	Retain mature Cape Lilac trees as Black-Cockatoo habitat, with juvenile seedlings removed as required.
34.	Retain mature specimens of Coast Teatree and Geraldton Wax (in areas adjacent to or on Lot 150 Sayer Street) until sufficient habitat is established for resident Fairy-wrens.
FIRE MANAGEMENT	
35.	Implement 'Fire Management' actions detailed in the Natural Areas Management Plan 2019-2024.
ACCESS	
36.	Implement 'Access' actions in the Natural Areas Management Plan 2019-2024.
CULTURAL HERITAGE, INTERPRETATION AND EDUCATION	
37.	Raise awareness of the issues relating to the impact of dogs in natural areas.
38.	Maintain the "Access Prohibited "signs on Melon Hill for their historical value.
NATIVE ANIMALS	
39.	Continue to map and establish Native Pellitory as habitat for the Yellow Admiral Butterfly.
40.	Survey native fauna, including invertebrates of high conservation value, at regular intervals, when funding is available.
41.	Minimise fires that may destroy tree hollows.
42.	Retain tree hollows for their habitat value.
43.	Undertake ongoing control of feral European Bees.
44.	Protect Rainbow Bee-eater nests.
45.	Continue implementing feral cat and fox control programs.
46.	Contribute to regional feral bird control programs coordinated by WALGA.
47.	Implement 'Feral Animal' actions detailed in the Natural Areas Management Plan 2019-2024.

4. BACKGROUND

4.1 Study Site

Allen Park is bordered by Swanbourne Beach to the west, Campbell Army Barracks to the north and the Town of Cottesloe to the south. It is located within the City of Nedlands approximately 9 km west south west of the Perth Central Business District, as shown in Figure 1. It covers approximately 18.9 ha (of which 2.9 ha is vested in the Department of Defence).

The City of Nedlands administered land at Allen Park consists of a number of A and C Class reserves, which are primarily vested in the City of Nedlands for “Recreation”, or “Parks and Recreation”. Currently the City is working with the Department of Planning, Heritage and Lands (DPHL) to re-classify all C Class Reserves to A Class. The current vesting and reserve classification is detailed on page 12 of the Natural Areas Management Plan 2019-2024. Lot 1 (which contains Bush Forever Site 315) is Freehold land owned by the City. Lot 1 is actively managed in conjunction with the Swanbourne Coastal Alliance it has received significant funding over a number of years through the Western Australian Planning Commission’s Coastwest Program.

A 2.9 ha portion is owned by the Commonwealth of Australia and vested with the Department of Defence for “Public Purposes” and consists of North Melon Hill and the Seaward Corridor Sectors. The Department of Defence, the City of Nedlands and the Friends of Allen Park have cooperatively managed this section of Allen Park since 1994. The Friends of Allen Park do not distinguish between the different vesting areas in terms of on ground works. The entire bushland area at Allen Park has received significant grant funding over a number of years from agencies including the Natural Heritage Trust, Lotterywest, Swan Alcoa Landcare and the Western Australian Local Government Association (WALGA) Perth Biodiversity Project.

Figure 1: Allen Park Bushland

4.2 Implementation of Previous Management Plans

The Management Plan for Allen Park and Environs, (Ecoscape 1996) examined the entirety of Allen Park (32.9 ha). This covered the ovals where it divided areas into Recreation, Historic and Conservation Precincts. Management plans developed since 2005 have only examined the bushland areas within Allen Park as shown in Figure 1 above.

Following the development of the 1996 Management Plan the bushland has been actively managed by the City of Nedlands, the Friends of Allen Park and the Department of Defence. In 2007 the Swanbourne Coastal Alliance became incorporated and since 2008, the Swanbourne Dunes portion of Allen Park (consisting of the Coastal Swale and Foredune Sectors) has been actively managed by the City of Nedlands and the Swanbourne Coastal Alliance.

The 2019-2024 Management Plan consolidates information regarding conservation activities that have been undertaken since the development of the 2013 Management Plan along with reviewing and updating the 2013 Plan. Of the forty two actions that were developed for the 2013 Management Plan, thirty three were implemented, five were partially implemented and four were not implemented as shown in Table 2 below.

Table 2: Actions from the 2013-2018 Allen Park Management Plan not implemented.

	ACTIONS	ACTIONED	REASON
MANAGEMENT BOUNDARIES			
1.	Develop a rehabilitation plan to prioritise sensitive environments based on their susceptibility to erosion.	Partially	Only undertaken at Coastwest grant funded sites.
WEED CONTROL			
2.	Do not use herbicides in bushland sectors to control *Oxalis* and Fumitory.	No	This is being undertaken to address the increasing density of *Oxalis* and Fumitory which are replacing other controlled weeds. They are being targeted at the same time, using the same method that is already being used to control Freesias.
3.	Where native vegetation exists, mature Black Flag plants that have the potential to set seed should be hand wiped with herbicides to stop them from seeding.	Partially	Black Flag was generally hand weeded rather than wiped with herbicide.
FIRE MANAGEMENT			
4.	Access tracks should be modified to better suit firefighting vehicles where possible.	No	This 2005 Management Plan action was not implemented as it would result in significant clearing. Furthermore, Allen Park is

			small and fragmented and fire vehicles are unlikely to drive up Melon Hill during a fire for safety reasons. In 2005 Helitacs were not available these will now assist in the event of a fire.
5.	Work with the Department of Defence to install a vehicle access firebreak behind Defence houses on Melon Hill.	No	It is unlikely a hard surface vehicle track will be installed in this area. Currently the sand track is providing a fire break and access in the event of a fire.
ACCESS			
6.	Install bollards on Sayer Street (adjacent to Defence Housing) and the Seaward Corridor (adjacent to the dog exercise oval) to stop informal and illegal access.	Partially	Bollards only installed at the entrance to the Seaward Corridor.
CULTURAL HERITAGE, INTERPRETATION AND EDUCATION			
7.	Change the wording of Friends of Allen Park rehabilitation signs to state they are demonstration sites.	No	This is not necessary as the Friends of Allen Park are now using a mobile triangle information sign.
NATIVE ANIMALS			
8.	Survey native fauna, including invertebrates of high conservation value, at regular intervals, when funding is available.	Partially	Only informal surveys undertaken.
9.	Contribute to regional programs being undertaken for feral bird control by DPaW.	Partially	This is being undertaken at a WESROC Council level.

4.3 Management Challenges and Success

Over the years significant reduction in the density and/or distribution of the following environmental weeds has occurred:

- African Boxthorn (*Lycium ferocissimum*)
- African Cornflag (*Chasmanthe floribunda)*
- Annual Veldt Grass (*Ehrharta longiflora*)
- Black Flag (*Ferraria crispa*) – density only
- Brazilian Pepper Trees (*Schinus terebinthifolia)*
- Century Plant (*Agave americana*)
- Coast Tea Tree (*Leptospermum laevigatum*)
- Castor Oil Plant (*Ricinus communis*)
- Fountain Grass (*Cenchrus setaceus*)
- *Freesia* (*Freesia alba x leichtlinii*)

- Geraldton Carnation Weed (*Euphorbia terracina*)
- Hare's Tail Grass (*Lagurus ovatus*)
- Lupins (Lupinus)
- Marguerite Daisy (*Argyranthemum frutescens*)
- *Pelargonium* (*Pelargonium capitatum*) – on Melon Hill
- Perennial Veldt Grass (*Ehrharta calycina*)
- White Arctotis *(Arctotis stoechadifolia*)
- Wild Oat (*Avena fatua*).

Dense infestations of Bridal Creeper (a Weed of National Significance) previously existed on Melon Hill and the Boobook Sector. These populations have significantly reduced over the years through an ongoing program to release biological controls including the Rust and Leaf Hopper and they have been successful in stabilising its spread. Some infested plants do still produce berries and new individuals tend to appear from time to time, as seeds are often dispersed by berry eating birds. Control of Bridal Creeper should therefore be an ongoing priority for Allen Park including an ongoing program to transfer the Rust and the Leaf Hopper to new populations and removing fruiting berries in November/December each year.

Woody weeds such as Coast Tea Tree, African Boxthorn, Brazilian Pepper Trees, *Tamarix* (in the Coastal Swale and Foredune Sectors) and Olive trees have largely been removed from Allen Park. Occasionally some isolated plants reseed or resprout from previously removed infestations and these require ongoing monitoring and control. Cape Lilacs have historically been removed from Allen Park. A few large specimens still remain in the Heritage Precinct and these are being reserved for Black-Cockatoo habitat. However, juvenile seedlings of Cape Lilacs are removed as required.

Significant infestations of Fountain Grass (*Cenchrus setaceus*) have also been removed along the Sayer Street boundary of Melon Hill. Some plants reappear from time to time and therefore ongoing monitoring and control is required. A new infestation was found 2013 in the Odern Crescent Sector which also requires ongoing monitoring and control.

Figure 2: Fountain Grass distribution at on the West Melon Hill Sector

Revegetation of the Seaward Corridor has been very effective in controlling invasive weeds which originally constituted the main vegetation cover. The dense overstorey of *Acacia rostellifera* thickets provide an important wildlife corridor between the Coastal Foredunes and Melon Hill and this has established a similar vegetation community that is found further north on Campbell Barracks bushland.

Revegetation of the Coastal Swale and Foredune areas with Acacia trees has also been very successful in establishing vegetation cover especially in the Foredune area along Marine Parade. This vegetation now constitutes the main cover in some areas previously devoid of native vegetation and it was recently rated as '*Very Good'* condition in the 2018 bushland condition survey.

There has been significant decline in these *Acacia* thickets in the Seaward Corridor, the Swale (between Flyash and the Seaward Corridor) and the Coastal Swale areas. *Armillaria* has been identified in the Seaward Corridor and it's likely that *Acacias* are declining in these areas as they are at the end of their natural life. Given *Acacias* only live for 10 to 15 years it is likely that natural processes such as *Armillaria* are leading to their decline. The City and the Friends of Allen Park have been planting substitution species in the Seward Corridor for several years and this practise should continue so that these areas maintain sufficient native vegetation cover.

The planted *Acacia rostellifera* and *Acacia cyclops* trees in the Seaward Corridor have become a maintenance issue as they send shoots of new seedlings into the firebreak contributing to ongoing maintenance. There is a significant amount of new seedlings produced naturally and therefore no further planting of *Acacia rostellifera* and *Acacia cyclops* should occur on Sectors east of the old bowling greens.

Black Flag (*Ferraria crispa*) is found in isolated patches throughout the bushland. It has reduced its density significantly through herbicide spraying and the use of the herbicide Dalapon is assisting in controlling Black Flag where it.grows amongst native plants. As Black Flag is difficult to control and hand removal is not appropriate, careful consideration should be given to revegetating areas with dense ground covers or spreading shrubs where Black Flag occurs. These species will prove challenging where they are establishing if Black Flag is present. Black Flag also seeds prolifically and where native vegetation exists mature plants that have the potential to set seed should be hand wiped with herbicides or hand weeded to stop them from seeding.

Pretty Betsy (*Centranthus macrosiphon*) is an annual weed widespread throughout Melon Hill and isolated in other Sectors. It was recorded at Allen Park in 2005 for the first time and became well established quickly. In order to remove Pretty Betsy from the bushland a significant amount of funding is required which would take resources away from other higher priority weeds. Therefore over recent years control programs have focussed on outlying populations on Flyash Hill, Odern Crescent and the Boobook Sectors. According to the 2018 mapping the Flyash Hill and Boobook Sector populations have been eradicated however there is a new outlying population in the Coastal Swale. Monitoring and controlling should continue where infestations occurred previously and in outlying areas to limit its spread across the entire bushland.

White Bartsia (*Bartsia trixago*) was only recorded at Allen Park in 2007 it is highly invasive in wetland environments. It is scattered across Melon Hill however it is not

located on any other Sectors. Its density and distribution appears to be stable which likely reflects its status as a wetland weed. Like Pretty Betsy, White Bartsia would require a significant amount of funding to eradicate which would take needed resources away from other higher priority weeds. Therefore White Bartsia is not currently recommended for management.

Flickweed (*Cardamine hirsut*a) recently colonised areas within Allen Park in the Heritage Precinct and Sayer Street and Boobook Sectors. Its distribution is detailed in the map section within this plan. Provided Flickweed only recently established infestations at Allen Park, it is important to control it before its population expands like Pretty Betsy and White Bartsia.

In 2014 herbicide resistance was discovered in the Annual Veldt Grass population at Hollywood Reserve following scientific testing of both Annual and Perennial Veldt Grass. Furthermore, in 2018 herbicide resistance in Perennial Veldt Grass, whilst not scientifically tested, has been presumed to be occurring at certain isolated areas across a few reserves including Shenton Bushland, Birdwood Parade and Point Resolution. In order to address herbicide resistance the City has modified its grass spraying program ensuring that at all reserves hand weeding of Perennial Veldt Grass (and annual grasses provided resources are available) occurs following completion of the annual grass control program. This program includes Allen Park.

Following long term restoration programs at Allen Park native vegetation is naturally regenerating. This is a testament to the ongoing successful rehabilitation of Allen Park where natural regeneration is now possible due to the reduction of invasive weeds and other disturbance factors such as informal access.

This is evident in winter and spring when large patches of *Senecio pinnatifolius* (Coastal Groundsel) are seen colonising bare areas. Its distribution is most obvious in areas such as the Walkway (Lot 353), the Seaward Corridor, the Swale, Coastwest sites along Marine Parade, Flyash and Melon Hill. Furthermore, natural regeneration of other species is occurring across areas of the bushland including species such as Olearia, Grevillea and Banksia. Pink Fairy, Snail and Mignonette Orchids are also being found in new areas far from where they were historically recorded.

In addition to this, following the initiative by the Friends of Allen Park to re-introduce Native Pellitory (*Parietaria cardiostegia*) in 1999 it is now colonising areas far from where it was originally seeded (in the Boobook Sector). The bushland condition and weed surveying undertaken in spring 2018 located Native Pellitory in the Coastal Swale and Foredune areas (refer to Native Pellitory distribution map in the native animal section).

In 2011/12 a spraying contractor located Native Pellitory in the Seaward Corridor. The contractor contacted the City to inform of this discovery. As a result each year since 2012 the contractor as carefully sprayed around the Native Pellitory population and this has led to an extensive distribution of Native Pellitory in the Seaward Corridor.

Some non-indigenous species were historically planted such as Coastal Moort (*Eucalyptus utilis*) which now have established populations in some areas across the bushland. Coastal Moort is not considered invasive as it provides habitat and cover

stopping other invasive weeds from spreading, and therefore is not recommended for removal. These species (which were likely planted in the 1980s) have been in decline especially in the Odern Crescent and Heritage Precinct Sectors. Substitution planting with local provenance species should be undertaken before these individuals die Which will allow vegetation cover to be maintained or replaced as quickly as possible.

Since the adoption of the 2013 Management Plan two additional plant pathogens which are causing decline of native vegetation have been located at Allen Park. These include Armoured Scale *(Maskiella globosa*) which is causing decline of mature Tuart trees in several areas and *Armillaria luteobubalina* which is also causing decline of mature Tuart trees in the Heritage Precinct as well as other native vegetation in the Seaward Corridor and Odern Crescent Sectors. This is detailed further in the Plant Pathogen section on pages 23-26.

Seedling survival of winter revegetation programs can be challenging as Allen Park contains very hydrophobic soils. Often when planting in July, following winter rainfall, some sites are totally dry below the top few centimetres. This results in low seedling survival even at sites planted as early as mid-June. Seedling survival rates may be increased by early planting and watering seedlings on installation if resources are available.

Management Actions 2019-2024	
REVEGETATION	
1.	Careful consideration should be provided to the types of revegetation species used in areas where Black Flag is present.
2.	Where native vegetation exists, mature Black Flag plants that have the potential to set seed should be hand wiped with herbicides or hand weeded to stop them from seeding.
3.	Due to maintenance issues no further planting of *Acacia rostellifera* or *Acacia cyclops* should occur on Sectors east of what were formally the old bowling greens.
WEED CONTROL	
4.	Focus resources for control of Pretty Betsy on Flyash Hill, Odern Crescent, the Coastal Swale and Boobook Sectors.
5.	Control Flickweed to stop its establishment.
6.	Implement actions for 'Weed Control' in the Natural Areas Management Plan 2019-2024.
7.	Control One-leaf Cape Tulip (*Moraea flaccida*) and Long Tubed Painted Lady/Wild Gladiolus populations before they establish.
8.	Retain mature Cape Lilac trees as Black-Cockatoo habitat, with juvenile seedlings removed as required.

5. BIOLOGICAL ENVIRONMENT

5.1 Landscape Features

Some special landscape features of Allen Park include remnant dune vegetation, mature remnant trees and 360 degree views from the top of Melon Hill. The native vegetation provides visual stimulation through its diversity in form and texture. Views and vistas vary from institutional to a bushland context.

Allen Park creates an attractive vista for pedestrians and cyclists. Much of the bushland is visible from roads surrounding the area, including the North Street feeder road to West Coast Highway/Servetus Street, and from the northwest portion of Claremont Hill including the railway line between Grant Street station and Servetus Street.

Melon Hill, at 40 meters in height, is a high point in the landscape. The 360° views offered towards the ocean, recreational fields and the nearby urban area are, for the most part, outstanding and is one of the most attractive features of the landscape. Local residents estimate that over 15 000 people use the site annually (National Trust Documentation, cited in Ecoscape 2005[1]).

The woodland ranges from Tuart woodland with some remnant understorey and parkland cleared Marri/Jarrah/Peppermint areas around and near the Walkway, which provides a largely unbroken canopy (National Trust Document, cited in Ecoscape 2005[1]). Both the remnant bushland and trees provide significant natural heritage value.

5.2 Soils and Geomorphology

Previous management plans have stated that the western portion of Allen Park lies on Safety Bay Sand of the Quindalup Dune System. However, according to regional scale landform mapping by Heddle et al. (1980) and detailed geological mapping by Gozzard (1986), Allen Park lies on the Spearwood Dune System, just east of the narrow belt of Safety Bay Sand along the Cottesloe shoreline and just south of the large mass of Quindalup Dune System on Department of Defence land.

The substrate is either Tamala Limestone or sand derived from it. In the nomenclature of Bolland (1998), the soil is probably ‘Cottesloe Sand’, where the quartz grains have a distinctive iron coating. There is a thin calcareous soil, as well as occasional, pale-coloured kankar deposits, over limestone outcrops, like Melon Hill. Even in deep sand pockets, the underlying limestone is sometimes reflected in the presence of limestone indicator species such as Tuart (*Eucalyptus gomphocephala*) and Parrot Bush (Dryandra sessilis) (Ecoscape 2003).

5.3 Vegetation

Vegetation Complex Heddle et al (1980)

On a regional scale Allen Park is mapped as occurring on the Cottesloe Complex – Central and South. This Complex is characterised by a mosaic woodland of Tuart-Jarrah and Marri with closed heath on limestone outcrops.

Floristic Community Type Gibson (1994)

Floristic Community Types (FCTs) classify vegetation into groups of plant species that tend to co-occur in small to medium areas. All the City’s natural areas belong to Super Group 4 – Uplands Centred on Spearwood and Quindalup Dunes. Allen Park has not been sampled to determine if there are any FCTs present.

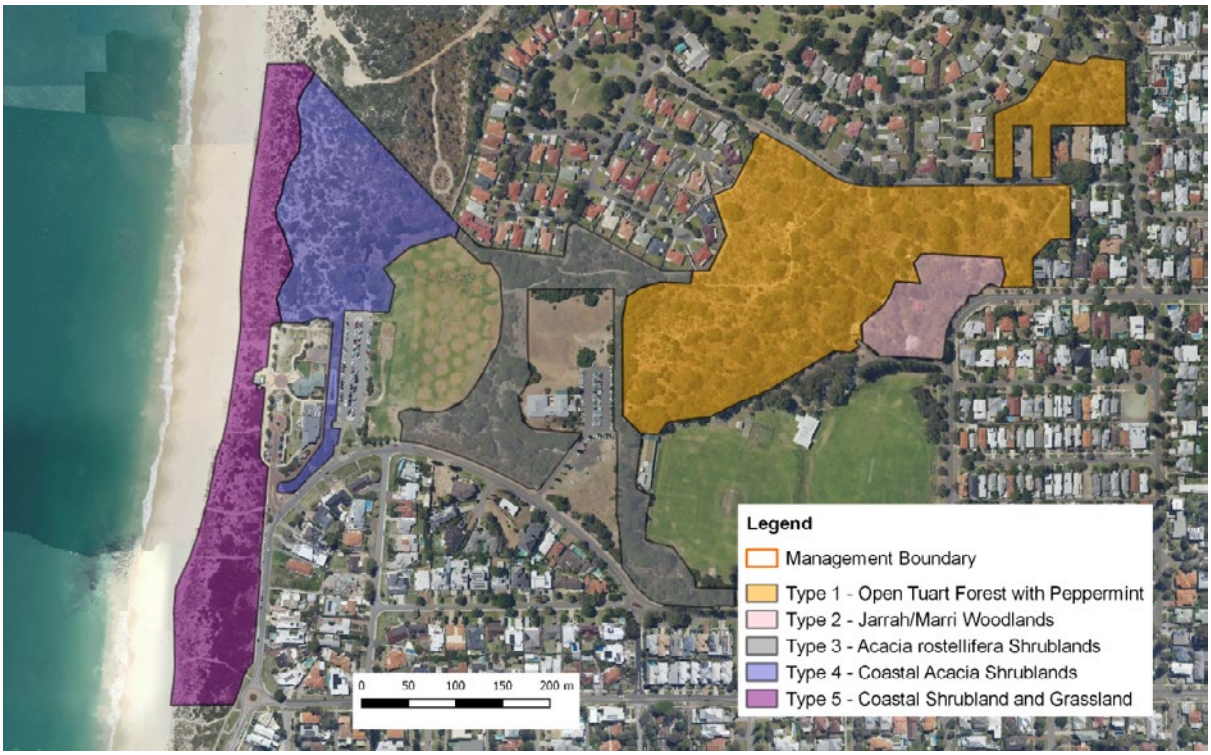
Structural Plant Communities - Natural Area Initial Assessments

In the Natural Area Initial Assessments undertaken in 2008 five structural plant communities were identified as occurring across the bushland. These include:

- Coastal foredune shrubland and grassland
- Coastal *Acacia* shrublands
- Coastal *Acacia rostellifera* shrublands with mixed shrub layer
- Open Tuart (*Eucalyptus gomphocephala*) forest with Peppermint (*Agonis flexuosa*) in places and mixed shrub layer
- Jarrah/Marri woodlands.

This information is detailed on the WALGA Local Biodiversity Program Natural Area Initial Assessment database for Allen Park. Structural Plant communities at Allen Park are shown in Figure 2 below.

Figure 3: Structural Plant Communities at Allen Park



The Coastal foredune shrubland and grasslands are dominated by *Spinifex longifolius* and *Spinifex hirsutus* interspersed with shrubs such as *Olearia axillaris and Scaevola crassifolia* and *some Acacia cyclops and Acacia rostellifera* trees. The coastal Acacia shrublands occur in Bush Forever Site 315 and are dominated by *Acacia cyclops* and *Acacia rostellifera* trees along with shrubs such as *Scaevola crassifolia*, *Olearia axillaris* and the native grass *Spinifex longifolius*. The coastal Acacia shrublands with mixed shrub layer cover Odern Crescent, Flyash Hill, the Seaward Corridor (a restoration site) as well as the base of the south-western slopes of Melon Hill. They are dominated by *Acacia cyclops* and *Acacia rostellifera* trees and shrubs including *Scaevola crassifolia, Melaleuca systena and Rhagodia baccata* along with some patches of *Spinifex longifolius*.

The open Tuart (*Eucalyptus gomphocephala*) forest with Peppermint (*Agonis flexuosa*) in places and mixed shrub layer structural plant community type occurs on Melon Hill and the Boobook Sector. Dominant tall shrubs include *Acacia cyclops, Acacia rostellifera and Banksia sessilis.* Dominant smaller shrubs include *Grevillea crithmifolia, Olearia axillaris, Melaleuca systena, Spyridium globulosum*, *Rhagodia baccata and Acacia lasiocarpa* with dominant herbs and sedges including *Acanthocarpus preissii, Conostylis candicans* and *Lepidosperma gladiatum*.

The Jarrah/Marri woodlands occur at the base of the eastern slopes of Melon Hill and are dominated by stands of Marri (*Corymbia calophylla*) with some Jarrah (*Eucalyptus marginata*) and patches of Tuart. With *Spyridium globulosum, Lepidosperma gladiatum* and *Hardenbergia comptoniana* occurring in the understorey layer.

5.4 Bush Forever Site 315 and Corridor Value

Allen Park forms important ecological linkages with the Campbell Barracks bushland, Cottesloe Dunes, Cottesloe Golf Club, Swanbourne Estate bush blocks, Mount Claremont Oval bushland, Lake Claremont and Bold Park. The north-western most portion of Allen Park is identified as regionally significant through its inclusion in Bush Forever Site 315: Swanbourne Bushland, Swanbourne/City Beach. Bush Forever Site 315 extends north through Campbell Barracks, Cottesloe Golf Course, Bold Park and Floreat Beach. Plant species of significance, noted as occurring in Bush Forever Site 315, include:

- *Leschenaultia linarioides*
- *Allocasuarina lehmanniana*
- *Callitris preissii*
- *Agonis flexuosa (*with Bold Park as the northern most population)
- *Chamelaucium uncinatum* (with Bold Park the southern most population).

The question of whether Allen Park contains examples of each of these species is discussed under “Native Flora Species of Significance” on page 37.

Animal species of significance, noted as occurring in Bush Forever Site 315, include:

- Significant populations of insectivorous passerine birds including Splendid, Variegated and White-winged Fairy-wrens and White-browed Scrubwren
- Significant bird species category 1 (1), category 3 (8) and category 4 (5)
- Significant reptile species Bardick (*Echiopsis curtu*).

The Chestnut (previously Variegated) and White-winged Fairy-wrens and White-browed Scrubwren have all been recorded in Allen Park however the Splendid Fairy-wren and the Bardick have not been recorded.

The Bush Forever Recommendation for Part B of Swanbourne Bushland, Swanbourne/City Beach is to protect through ‘*Local Reserve Mechanism’*. The foredunes were also identified in the System 6 Conservation Reserve System (the precursor of Bush Forever) as Site M46 – (Swanbourne Beach and Rifle Range) the recommendation for this area in the system 6 report included:

> *“That the Nedlands City Council, in consultation with the Department of Conservation and Environment prepare a management plan for Reserves A23729 and A27250, and the vacant Crown land.”*

5.5 Bushland Condition

The methodology followed for bushland condition assessments undertaken in 2018 is detailed on pages 34-36 of the Natural Areas Management Plan 2019-2024. Bushland condition is useful in tracking large changes over time and should continue to be measured each time this Management Plan is reviewed. This allows changes to be regularly monitored and recorded.

Historical Bushland Condition Assessment Data

Over the years bushland condition was mapped using different methods and scales. Bushland condition was not mapped in the 1996 Management Plan. It was mapped in the 2005 Management Plan using the Kaesehagen Scale. These maps were digitised however they did not use 20 x 20 m polygons and condition ratings were allocated strictly on the basis of local native species present.

In 2005 the overall condition of the bushland was assessed as *Poor – Very Poor* with some small patches of *Very Good* to *Fair* bushland. This was identified as the result of a number of factors, including the proliferation of tracks prior to the period of active management since 1996. This assessment of bushland condition was not supported by the community.

Bushland condition mapping undertaken in 2008 using the Keighery Scale for the Natural Area Initial Assessments assessed the majority of the bushland as *Good* condition with some localised *Degraded, Completely Degraded* and *Very Good* patches. This survey was undertaken in spring 2008 and condition ratings were not allocated strictly on the basis of local native species present. These maps did not use 20 x 20 m polygons.

2013 and 2018 Bushland Condition Assessment

Bushland condition mapping in 2013 and 2018 was undertaken in spring by adapting the Keighery Scale and divided the bushland into 20 x 20 m polygons.

The Keighery Scale was adapted to assess the impact of disturbance on vegetation structure. Each 20 x 20 m polygon was provided a rating from *Very Good, Good, Degraded* to *Completely Degraded.* The main disturbance factors that influenced the condition rating included fire, environmental weeds, clearing and the selective removal of species (for example from plant pathogens, frequent fires, grazing and logging). The existence on non-indigenous native plants such as *Eucalyptus utilis*, did not reduce the condition rating (except in the *Very Good* rated areas) unless they were considered invasive to the site and/or if they were found in isolation with no other local provenance species present.

In 2018 the majority of the bushland was assessed as *Good* with some small *Very Good, Degraded* and *Completely Degraded* areas as shown in Table 3 below.

Table 3: Extent of Bushland Condition by Class 2018

Vesting	Very Good	Good	Degraded	Completely Degraded	Total Area
City of Nedlands	1.09	11.07	3.25	0.55	15.96
Department of Defence	0.04	2.7	0.08	0.03	2.85
Total	1.13 ha	13.77 ha	3.33 ha	0.58 ha	18.81 ha

The areas rated as *Very Good* condition included small areas on north Melon Hill, Odern Crescent, Flyash Hill, the Cafe Embankment and the Coastal Swale and Foredune Sectors. In the Coastal Swale and Foredune Sectors the areas that were rated as *Very Good* condition were characterised by *Acacia rostellifera* thickets or low growing grassland/shrublands. The areas on North Melon Hill, Odern Crescent, Flyash Hill and the Cafe Embankment that were rated as *Very Good* were characterised by an overstorey of Tuarts and/or or a mixed native shrub layer.

In order to attain a *Very Good* condition rating the area could be impacted by some disturbance such as frequents fires, clearing and aggressive weeds (in low abundance or considered a low priority). However, it needed to contain good vegetation strata expected for the location, show signs of natural recruitment and contain established local provenance species with a similar abundance and diversity that would be expected naturally. Some other areas in the Coastal Swale and Foredune Sectors and on Melon Hill had a very good vegetation structure and/or cover however these areas only attained a *Good* rating as they also had aggressive weeds such as Geraldton Carnation Weed, Perennial Veldt Grass and/or *Pelargonium*.

The *Good* condition rated areas consist of a band of differing levels of condition (some of these were considered more on the *Degraded* or the *Very Good* side of *Good* condition). In the *Good* condition bushland areas, weed cover consisted of mostly annual species or invasive weeds in low abundance. Some introduced native Western Australian plants may also have formed part of the vegetation structure (such as *Eucalyptus utilis or Melaleuca nesophila*), however they needed to be found cohabiting with local provenance native species and considered to provide good habitat value.

Areas in the Coastal Swale and Foredune areas that contained weeds such as Marram Grass and *Tetragonia decumbens*, were also rated as *Good* condition as, the weed species occurred in low abundance and were found in combination with with local provenance native species that formed the dominant cover.

Small areas in all Sectors were rated as *Degraded.* These areas had a combination of the following criteria that resulted in their *Degraded* rating:

- Sparse native vegetation cover
- High density of invasive weeds
- Comprised of newly revegetated areas.

There were also small areas in the Boobook, North Melon Hill, the Heritage Precinct; and the Coastal Swale and Foredune areas that were rated as *Completely Degraded*.

These areas had a combination of the following criteria that resulted their *Completely Degraded* rating:

- Lawn, building or infrastructure that covered entire quadrat
- No local provenance or Western Australian native flora
- Only a small proportion of native shrubs or seedlings and the remainder weed species.

5.6 Flora

There are 200 flora species recorded at Allen Park which are detailed in Appendix 1, of these 78 are identified as native species and 122 as introduced weed species.

The flora list for Allen Park is comprehensive and has been based on a number of surveys undertaken over the years which have been updated as additional species are discovered or renamed. These include:

- Ian Fordyce 2018
- Ongoing observations by the Friends of Allen Park, the Swanbourne Coastal Alliance and the City of Nedlands
- Ecoscape 2005
- Ecoscape 1996
- Keighery 1993.

Changes in plants recorded in Allen Park since the 2013-2018 Management Plan.

Since 2013, the below listed native plants were surveyed which were not previously recorded in flora inventories at Allen Park:

- *Hibbertia racemosa (*Stalked Guinea Flower)
- *Acacia xanthina (*White-stemmed Wattle)
- *Acacia saligna*
- *Anigozanthos manglesii (*Mangles Kangaroo Paw) - planted in the cottage garden
- *Anthocercis littorea (Yellow Tailflower)*
- *Atriplex isatidea (Coast Saltbush)*
- *Enchylaena tomentosa (*Barrier Saltbush)
- *Lomandra maritima*
- *Melaleuca lanceolata* (Rottnest Teatree) - this is a planted variety and should not be used for revegetation
- *Rhodanthe chlorocephala* (Pink and White Everlasting) - planted in the cottage garden)
- *Grevillea preissii* (likely non-provenance)
- Wembley Wax ((*Chamelaucium*) - possibly two local provenance species in the Odern Crescent Sector and one hybrid adjacent to the Tennis Courts on Odern Crescent).

Native Species of Significance or of Low Abundance within the Bushland

Plant species that are either rare in Western Australia or in Allen Park and/or noted as occurring in Bush Forever Site 315 are listed in Table 4.

Table 4: Significant Flora in Allen Park

Species	Significance*	Confirmed in Allen Park	Plant Description (Florabase)
Chamelaucium uncinatum (Wembley Wax)	*most southern significant population	Yes. Possibly 2 local specimens in the Odern Crescent Sector. All other non-provenance.	Erect shrub 0.5-4m high Flowers white or pink Distribution includes coastal areas. Further described in Table 5.
Callitris preissii (Rottnest Island Pine)	Natural populations are restricted	Yes	Tree or shrub 1-9 m high Upper surface of leaf rounded Cones usually more than 2cm across
Daucus *glochidiatus* (Australian Carrot)	Several specimens.	Yes	Flowers. pink/purple-red/white/yellow-green, Aug to Dec or Jan. Variety of soils, often associated with limestone.
Enchylaena tomentosa (Barrier *Saltbush)*	Few in locality	Yes	Prostrate to erect shrub, 0.1-0.6(-2) m high. Fl. May to Sep. Variety of soils, often saline.
Eremophila glabra (Tar Bush)	Few in locality	Yes	Shrub, 0.1-3 m high. Fl. Green-yellow-orange-red-brown, Mar to Dec. Sand to clay soils, sometimes saline, stony loam, limestone. Winter-wet depressions, sandplains & dunes.
Exocarpos sparteus (Broom Ballart)	Many in the Coastal Swale and Foredunes. Only one on Melon Hill.	Yes	Weeping shrub, 1-4 m high, hemiparasitic on roots. Fl. yellow/yellow-green/white, Feb to Oct. White sand over limestone, red sand, laterite. Variety of habitats including coastal & desert sand dunes, sandplains.
Grevillea preissii	Only one specimen found in Allen Park	Yes. However unsure whether it's the naturally occurring or introduced nursery variety.	Flowers red, Jun or Aug to Sep. Yellow sand, limestone soils, sandy clay. Coastal limestone, seasonally wet areas.
Hibbertia cuneiformis (Cutleaf Hibbertia)	Few in locality	Yes	Erect or sprawling shrub, (0.5-)1-3 m high. Fl. yellow, Jan to Mar or Jun to Nov. White/grey sand, loamy soils. Coastal dunes, swampy plains.

Species	Significance*	Confirmed in Allen Park	Plant Description (Florabase)
*Hibbertia racemosa (*Stalked Guinea Flower)	Few in locality	Yes	Erect or ascending, spreading shrub, 0.1-0.75 m high. Fl. yellow, Jul to Dec. Grey, white or yellow sand. Coastal areas: dunes, plains & limestone.
Leschenaultia linarioides (Yellow Leschenaultia)	* not stated but is towards southern end of distribution	Yes	Tangled, erect or prostrate shrub 0.15–1.5 m high. Flowers yellow or red in /Jun–Dec. Sand. Coastal limestone hills & sand plains.
Lepidosperma	West Only one on Melon Hill	Yes	
Leucopogon parviflorus (Coast Beard-heath)	Only one on South Melon Hill	Yes	Flowers white. Feb to Mar or Jun to Oct. Sandy soils over limestone or granite. Coastal dunes & limestone.
Macrozamia fraseri	Only one specimen in the Heritage Precinct	Yes	Tree or (cycad), trunk variable; dull strongly keeled leaves with narrow to medium leaflets; large, broad cones. Sand. Sub-heath (no jarrah).
Santalum acuminatum (Quandong)	Few in locality. 3 new specimens found on the foredunes.	Yes	Small tree or shrub to 6m high hemiparasitic on roots distinctive fruit
Scaevola thesioides	Few in locality	Yes	Perennial, herb or shrub, 0.15-1 m high. Fl. blue-white, Aug to Dec or Jan to Mar. Sand or clayey soils, loam, limestone. Coastal areas, sandplains, creek beds.
Threlkeldia diffusa (Coast Bonefruit)	Few in locality	Yes	Much-branched, prostrate to erect perennial, herb, 0.1-0.4(-1) m high. Fl. green, Oct to Nov. White/grey sand over limestone, clay. Coastal are*as, saline flats.

*as listed in Bush Forever

There is some uncertainty as to the 'natural' distribution of *Callitris preissii* due to a combination of the extinction of many natural populations since European settlement and its subsequent widespread cultivation. Allen Park is within its natural distribution which appears to be centered in the Garden Island/Fremantle area and extends as far north as Mullaloo. The Allen Park population also has a mixture of glaucous (blue-grey) and non-glaucous (green) forms which is characteristic of natural but not cultivated

populations, (Keighery, Gibson & Keighery, cited in Ecoscape 2005[1]). It is therefore assumed that the *Callitris preissii* in Allen Park is a natural population.

There are two forms of *Chamelaucium uncinatum*. These are commonly known as Geraldton Wax and Wembley Wax they have subtle differences which are detailed in Table 5 below Geraldton Wax is a common garden plant in Perth however it does not naturally occur in the City and would only occur in Allen Park as the result of plantings. Wembley Wax is restricted to the vicinity of Bold Park and would be assumed to be indigenous to Allen Park if present (Barrett, 2004). Geraldton Wax has historically been planted at Allen Park where there are several mature populations in the Sayer Street and Heritage Precinct Sectors.

Wembley Wax also has populations establishing in the Sayer Street and Heritage Precinct Sectors that have been planted since 2015 using non-provenance seedlings. There are also possibly two local provenance specimens and one hybrid that were located in spring 2018 in the Odern Crescent sector. Further identification of these specimens is required. Management of Wembley and Geraldton Wax populations at Allen Park is detailed in the "Plan for Management" section.

Table 5. Comparison of Wembley Wax and Geraldton Wax

Attribute	Wembley Wax	Geraldton Wax
Habit, general appearance	Bushy shrub 0.5-2 m	Open shrub 0.5-4 m, often untidy
Foliage	Shorter internodes (in general), leaves crowded towards twig-tip	Leaves evenly spaced along twig (i.e. equal internode lengths)
[1]Leaf length (mm)	12-20	30-40
[2]Bud width (mm)	< 17	> 18
Flower shape	Cup-shaped, semi-closed	Flat-topped, open
Flower colour	Always pink & white	Wild & self-seeded plants – pink-white; nursery cultivars – bright pink, purple or white
[1]Flower width (mm)	12-17	20-30
Flowering season	Mid-late Spring, short	Mid-Winter – early Summer, protracted
Substrate	Known only from Quindalup Dunes	Generally near-coastal sand (but many exceptions)

[1]Keighery, G. 2009
[2] Barrett, M. (cited in Ecoscape 2005)

5.7 Plant Pathogens

A survey of plant pathogens undertaken across the City's natural areas in 2010 isolated the below listed plant pathogens from 8 trees at Allen Park (2 Tuarts and 6 Marris):

- *Phytophthora sp. Ohioensis* (3 Marris in carpark adjacent to the Allen Park Pavilion)
- *Phytophthora multivora* (2 Tuarts and 3 Marris in bushland)
- *Quambalaria coyrecup* (2 Tuarts).

Since 2010 a further two plant pathogens have been confirmed at Allen Park, these include *Armillaria luteobubalina* (Honey Fungus) and *Maskiella globosa* (Armoured Scale).

Armillaria has been confirmed impacting vegetation at one location in Allen Park (the Heritage Precinct) and two other unconfirmed locations (the Seaward Corridor and Odern Crescent Sectors) their locations are detailed on the below map.

Figure 4: *Armillaria* locations at Allen Park

The Heritage Precinct infestation has caused significant decline primarily to mature Tuart trees. Other vegetation impacted in the Heritage Precinct include *Acacia* and *Melaleuca* trees and one mature Marri. However, the adjacent patches of *Lepidosperma gladiatum* currently appear unaffected.

In the Seaward Corridor fruiting bodies of *Armillaria* were discovered in 2018. *Acacia* thickets have been declining for several years in the Seaward Corridor and considering that *Acacias* natural life span is 10 to 15 years and that this area was planted in the late 1990s these species are most likely coming to the end of their natural life. The third *Armillaria* infestation is located on the south eastern end of the Odern Crescent sector adjacent to the Rugby Club oval. In this area severe decline of vegetation has occurred of species primarily including *Acacia* and *Callitris* trees. Again, like the Heritage Precinct the adjacent *Lepidosperma gladiatum* patches are currently unaffected.

Unlike *Phytophthora*, movement of soil does not affect the spread of the *Armillaria*. However, its spread is thought to be favoured by disturbance, irrigation, and the use of diseased, untreated mulch and movement of plant material. None of the infected *Armillaria* areas are irrigated or mulched and therefore reducing these disturbances to assist in managing *Armillaria* is not required. Once established management is extremely difficult and expensive as it requires removing all infected stumps and roots from the site. No commercial fungicides or chemicals are currently known to control or eradicate this pathogen, furthermore, *Armillaria* can be found on a range of host species and there has not been any published literature regarding resistant species. However, there has been some success in improving the crown health of diseased trees through systemic treatments.

Strategy

Management of *Maskiella globosa* is detailed in the Natural Areas Management Plan 2019-2024 and consists of reducing disturbance and applying systemic and/or soil treatments provided funding is available.

The *Armillaria* infestation in the Heritage Precinct is a high priority due to the striking stands of Tuart and Marri in this location and because it is the only area at Allen Park comprising of the Jarrah/Marri Woodland plant community. Currently the City is managing *Armillaria* in the Allen Park Heritage Precinct using a combination of systemic and soil treatments as well as manually removing soil build up directly around the base of some trees where soil build up on the trunks of trees has the potential to occur. These treatments are being monitored and the City should continue to manage *Armillaria* in this location.

In regards to the Odern Crescent and Seaward Corridor infestations unfortunately there is not a lot that can be done in these areas. They are best managed by undertaking ongoing monitoring of revegetation programs, noting the species that remain unaffected and including them in future revegetation programs. Also, if soil build up occurs at the base of any trees in these locations it should be dug away from accumulating around the trunk.

The identification and management of plant pathogens and other causes of tree decline has been detailed further in the Natural Areas Management Plan 2019-2024.

Management Actions 2019-2024	
1.	Undertake ongoing treatment and monitoring of *Armillaria* in the Heritage Precinct using a combination of systemic and soil treatments.
2.	Undertake ongoing monitoring of *Armillaria* infected areas to guide revegetation programs.
3.	Annually remove soil away from the trunk of trees within *Armillaria* infected areas where it has the potential to accumulate on the trunk.

5.8 Weeds

Of the 122 weeds recorded in Allen Park (listed in Appendix 1) the distribution of 18 of these and woody weeds were mapped in spring 2018. 15 of the most invasive of these weeds are shown in the map section in Appendix 6 the other species are available from on the City of Nedlands Intra-maps program.

Some non-indigenous native plants listed in the native flora inventory in Appendix 1 were intentionally planted such as *Eucalyptus utilis* and *Melaleuca nesophila.* These are not listed as weeds at Allen Park as they provide much needed habitat and are not causing environmental management issues. Non-indigenous native plants at Allen Park should only be removed if they are invasive. However, as these species come to the end of their natural life they should be replaced with local provenance species.

Weed mapping

The methodology applied for weed mapping is detailed on pages 34-36 of the Natural Areas Management Plan 2019-2024. Weed mapping was undertaken in spring 2018 using 20 x 20 m polygons and the Department of Environment and Conservation (DEC)

Standard Operating Procedure SOP 22.1. *Techniques for Mapping Weed Distribution and Cover in Bushland and Wetlands*. These procedures were developed to address the subjectivity that can be encountered when different people undertake mapping. In order to address this subjectivity, the below listed broad cover classes were developed and were used to undertake the 2013 and 2018 weed mapping:

- Individual plants (mapped as GPS points – this was limited to woody weeds)
- Less than 5%
- 6-75%
- 76-100%.

Using SOP 22.1 for the weed mapping undertaken in spring 2013 and 2018 addressed the subjectivity involved in mapping weed cover. However, in order to refine weed management for the 2014-2019 Management Plan actual cover was also mapped. These cover classes included:

- Less than 1%
- 2-5%
- 6-10%
- 11-20%
- Then 9% increments until 100%.

The purpose of additionally mapping actual cover in 2018 was to allow for more refined and focussed reporting of weed cover and density. Whilst the broad cover classes assisted with standardising the mapping process, addressing issues with subjectivity; and identifying focus areas and actions. The cover classes did not accurately reflect weed management programs success or failures. For example, if a weed species was mapped as 6-75% in the 2013-2018 Management Plan it may have undergone a significant reduction after five years of management however it had the potential to still be mapped in the same cover class for the 2019-2024 Management Plan.

Furthermore, the City has undertaken long term management of some species such as Perennial Veldt Grass which was primarily mapped as less than 5% in 2013. However, in reality the cover of Perennial Veldt grass is now less than 1% in some reserves and it would have still been mapped as less than 5% in 2018 if the broad cover classes were used in isolation.

In the map section in Appendix 6 only four ‘Actual Cover’ maps have been provided. These maps are for the species that had high weed cover above 5%. Generally, the majority of the weed species mapped had broad cover classes of less than 5% and an actual cover of less than 1%.

Target Species for Weed Mapping 2018

In 2018 the weeds listed in Table 6 on the next page were mapped:

Table 6: Weed Species Mapped in 2018

No	SPECIES	Included In Map Section
1.	African Cornflag *(Chasmanthe floribunda*)	Yes
2.	Annual Veldt Grass *(Ehrharta longifolia)*	Yes
3.	Black Flag *(Ferraria crispa)*	Yes
4.	Bridal Creeper *(Asparagus asparagoides*)	Yes
5.	Flickweed (*Cardamine hirsuta*), mapped as presence/absence	Yes
6.	Fountain Grass *(Cenchrus Setaceus)*	No
7.	*Freesia (Freesia alba x leichtlinii*)	Yes
8.	Fumitory	Yes
9.	Geraldton Carnation Weed *(Euphorbia terracina)*	Yes
10.	*Gladiolus undulatus* and *angustus* (Wild ladiolus/Long-tubed Painted Lady) these were mapped together as they could not be differentiated at the time of surveying	No
11.	Marguerite Daisy *(Argyranthemum frutescens*)	Yes
12.	*Moraea flaccida* (One-leaf Cape Tulip)	No
13.	*Oxalis Pes-Caprae* (Soursob)	Yes
14.	Perennial Veldt Grass *(Ehrharta calycina)*	Yes
15.	Pretty Betsy *(Centranthus macrosiphon)*	Yes
16.	Rose Pelargonium *(Pelargonium capitatum*)	
17.	*Sea Spurge (Euphorbia paralias)*	Yes
18.	Wild Radish *(Raphanus raphanistrum) and Brassica* that were mapped together on one map	Yes
19.	Woody weeds	Yes

Limitations of weed mapping

Only the above listed priority weeds were mapped due to the time and the cost involved with mapping. Unfortunately, there are always going to be limitations encountered with weed mapping including timing of the survey and weather variations. These are detailed further below.

Timing of Survey

Surveying should always be undertaken in spring when weeds are active. There are six natural areas in the City that require mapping and they all cannot all be surveyed simultaneously. Therefore at the time of surveying some weeds may have germinated, may not be flowering, may be covered over by taller weeds (and therefore not visible) or they may have been removed through weeding activities. Also some weeds do not flower every year and therefore they may be difficult to identify at the time of the survey.

Weather variations from year to year

Some years can have early rain which will provide an early flowering and germination period. Other years have late rain that extends into spring which provides successive germination events by which time the survey could have concluded.

5.9 Fungi

29 species of fungi have been recorded in Allen Park these are listed in Appendix 2. The fungi list was compiled from a Fungi Foray conducted by the Perth Urban Bushland Fungi Project in June 2005 and a survey undertaken in 2013 by Roz Hart with assistance from Judith Herring from the Friends of Allen Park. The fungi inventory is also continually updated with ongoing observations by the Friends of Allen Park and City staff (with identification confirmed by Roz Hart). Recommendations from the 2005 Fungi Foray report identified the importance of retaining dead wood such as logs where a high proportion of fungi were observed. It is likely that there is a significantly higher number of fungi than has been recorded given that nearby Bold Park had 460 species of macrofungi recorded (Bold Park Management Plan 2011-2016).

5.10 Native Fauna

A total of 37 birds, 3 mammals, 14 reptiles and 5 invertebrates have been recorded in Allen Park these are listed in Appendix 3.

Birds

A total of 37 native bird species have been identified these include three species listed under the Environmental Protection Biodiversity Conservation Act 1999 (EPBC Act) the Carnaby's Black-Cockatoo *(Calyptorhynchus latirostris)* which is listed as *Endangered*, the Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii)* which is listed as *Vulnerable* and the Rainbow Bee-eater *(Merops ornatus)* which is listed as a *Marine* species. In 2018 a Buff Banded Rail (*Gallirallus philippensis*) was recorded for the first time at Allen Park.

Remnant trees provide nesting sites for birds such as Boobook Owls (*Ninox novaeseelandiae*). Tuart and Peppermint trees often provide nesting hollows for pardalotes, parrots and other birds. Large flocks of Carnaby's are regularly seen foraging on *Banksia sessilis* (Parrot Bush) in the bushland. In recent years the Forest Red-tailed Black-Cockatoos have started foraging in the bushland.

Allen Park is also used as a corridor for the movement of many other birds along the coast and further inland such as the Chestnut Fairy-wren (*Malurus lamberti*) which are found in most Sectors in Allen Park and the White-winged Fairy-wren (*Malurus leucopterus*) which occupy the Coastal Swale and Foredune areas. The sandy dunes are also used for nesting by the migratory Rainbow Bee-eater.

Mammals

Three mammals have been recorded in Allen Park these include Brushtail Possums (*Trichosurus vulpecula*), *the* White-striped Freetail Bat (*Tadarida australis*) and the Gould's Wattled Bat (*Chalinolobus gouldii)*.

Brushtail Possums have been sighted in 2004, 2005, 2008, 2014, 2016 and 2018 (Shaw, 2019). They are one of the most adaptable of native mammals which can survive disturbance and often flourish when other species struggle. They live in a variety of habitats, though they favour open forest and woodland with sufficient older trees that provide hollows.

White-striped Freetail Bats roost in singular or in small groups in tree hollows and are common and widespread across parts of southern Australia. It is the largest of all the

free-tail bats and is one of the few microbats with echolocation calls that can be heard by humans (Australian Museum, 2019). Gould's Wattled Bats have been found using the bat boxes installed within the bushland. Gould's Wattled Bats are common throughout mainland Australia, except for Cape York Peninsula. They roost in tree hollows and buildings and occur in many towns and cities, (Menkhorst & Knight, cited in Ecoscape 2005[2]).

Herpetofauna (Reptiles & Amphibians)

A total of 14 herpetofauna species have been confirmed in Allen Park. These include the South Western Spiny Tailed Gecko (*Strophurus spinigerus subsp. Spinigerus*), the Southern Heath Dragon (*Ctenophorus adelaidensis*), the Western Bearded Dragon (*Pogona minor*), the Sands Gould's Monitor (*Varanus gouldii*), the Fence Skink (*Cyptoblepharus buchananii*), the West Coast Ctenotus (*Ctenotus fallens*), the Western Slender Bluetongue (*Cyclodomorphus celatus*), the Southwestern Crevice Skink (*Egernia napoleonis*), the Two Toed Mulch Skink (*Hemiergis quadrilineata*), the West Coast Worm Lerista (*Lerista praepedita*), the Bobtail (*Tiliqua rugosa*), the Dugite (*Pseudonaja affinis*), Jan's Banded Snake (*Simoselaps bertholdi*) and an injured female Carpet Python (*Morelia spilota imbricate*) that was found in 2010 along the edge of the bushland on Sayer Street.

Despite its healthy condition the Carpet Python had to be euthanised due to a head injury. The Department of Biodiversity, Conservation and Attractions officer who captured the python indicated that it would be impossible to determine whether the python was wild or a pet escapee.

Jan's Banded Snake or Banded Sand Snake, grows to a total of 30 cm and is common in Swanbourne Dunes and adjacent sandplains, supporting heath with banksia/eucalypt woodland. This snake derives its name from its distinctive yellow and black bands, which unfortunately results in many of these harmless snakes being killed in Western Australia after being mistaken for dangerous Tiger Snakes, (Bush *et al.*, cited in Ecoscape 2005[1]).

The 14 species listed above would only form part of the herpetofaunal species in Allen Park. An indication of the diversity of herpetofauna that would be present at Allen Park can be obtained by examining the species recorded in the nearby Bold Park. An average of 20 species of herpetofauna are recorded annually in four habitats including mixed coastal heath, Parrot Bush shrubland, Banksia woodland and Tuart woodland (Bold Park Management Plan 2011-2016).

Invertebrates

Invertebrate fauna has not been researched to the same extent as the vertebrate fauna in Allen Park. This is typical of most areas of WA and is due in part to the relatively specialised nature of invertebrate survey and research. It would be reasonable to expect that there will be a wide range of invertebrate species onsite given that:

- A total of 126 species were recorded in degraded woodland in Bold Park (Koch & Majer cited in Ecoscape 2005[1])
- It is believed that more than 750 invertebrates are associated with Jarrah and Marri, and Tuarts are likely to support even more species (Powell & Keighery, cited in Ecoscape 2005[1]).

Five native invertebrates have been confirmed onsite. These are Jewel Beetles, Yellow Admiral Butterflies, the snail *Bothriembryon bulla, Tadarida australis* s (*Urodacus novaehollandiae*) and Trapdoor Spiders *(likely Idiosoma sigillatu).*

Fifteen Yellow Admiral Butterflies (*Vanessa itea*) were first recorded in Allen Park after the introduction of Native Pellitory (*Parietaria cardiostegia*) into the Park in 1999 (Shaw, cited in Ecoscape 2005 [1]). Native Pellitory and Yellow Admiral Butterfly populations have increased considerably since 1999 and are now observed colonising areas far from they were historically seeded and recorded (in the Boobook Sector). This species, which occurs in all states and territories, is common in urban backyards and wasteland (Museum Victoria, cited in Ecoscape 2005[1]).

The Yellow Admiral Butterfly, otherwise known as the Australian Admiral Butterfly, has the following distinguishing features:

- Wingspan of 52 mm
- Upper wings are black (the forewing has an orange base and a broad central cream patch, and the hindwing a large red central area)
- The underneath of the wings are similar but with less red on the hindwings and mottled with grey and brown obscure patterns, (Museum Victoria, cited in Ecoscape 2005[1]).

The larvae are covered in rows of short branched spines. They rest in curled-up leaves on the plant during the day, emerging at night to feed. The pupae are usually dark brown and often have golden spots. They are often found away from the food plant, suspended head down from a silken pad on a nearby fence, wall or other structure. This species begins flying in early spring, producing several generations throughout the warmer months of the year (Museum Victoria, cited in Ecoscape 2005[1]).

5.11 Introduced Fauna

Feral animal management strategies have been detailed on pages 85-90 of the Natural Areas Management Plan 2019-2024.

Mammals

Allen Park has the following introduced mammals: rabbits (*Oryctolagus cuniculus)*, foxes *(Vulpes vulpes*), cats (*Felis catus*), the house mouse (*Mus musculus*) and the black (house) rat (*Rattus rattus)*. Domestic dogs, though not a feral animal, are regularly exercised through the Park and are often let off leash through the bushland.

Invertebrates

Two introduced invertebrates of concern in Allen Park include Coastal Brown Ants (*Pheidole megacephala)* and European Honey Bees *(Apis mellifera).* A third exotic invertebrate recorded onsite is the Black Portuguese Millipede (*Ommatoiulus moreleti).*

Introduced Birds

There are seven known introduced or feral birds within Allen Park these include the Rock Dove (*Columba livia*), Spotted Dove (*Streptopelia chinensis*), Laughing Dove (*Streptopelia senegalensis*), Rainbow Lorikeet (*Trichoglossus haematodus*), Laughing Kookaburra (*Dacelo novaeguineae*) and Little and Long-billed Corellas' (Cacatua sanguinea and *tenuirostris*).

6. PLAN FOR MANAGEMENT

General management principles and weed control strategies that relate to all natural areas has been detailed in the 'Plan For Management' section on pages 39-51 of the Natural Areas Management Plan 2019-2024.

6.1 Management Zones

External Boundaries

For management purposes it is important to distinguish between parkland and bushland zones. At Allen Park, the boundaries between bushland and parkland areas are well defined by tracks and bollard. However, fencing is required along the Rugby Club playing fields (adjacent to the Odern Crescent sector) and the dog exercise area (adjacent to Flyash Hill) to reduce informal access in these areas.

Internal Boundaries

Allen Park has been managed on the basis of 12 management Sectors since 2005 as shown in Figure 3 below. Following the incorporation of the Swanbourne Coastal Alliance (SCA) in 2008 these 12 Sectors were divided between the Friends of Allen Park (FOAP) and the SCA. The FOAP focus their activities on all Sectors east of the Swanbourne Beach oval these include North, East, South and West Melon Hill, the Boobook Sector, the Heritage Precinct, Sayer Street, Odern Crescent, Flyash Hill and Swale and the Seaward Corridor. The SCA focus their activities on the Coastal Foredune and the Coastal Swale Sectors.

North and East Melon Hill and the Seaward Corridor Sectors are located on land vested with the Department of Defence. All other Sectors are located on land vested with the City of Nedlands. The Friends of Allen Park do not distinguish between the different vestings in terms of on ground works.

Figure 5: Management Sectors in Allen Park

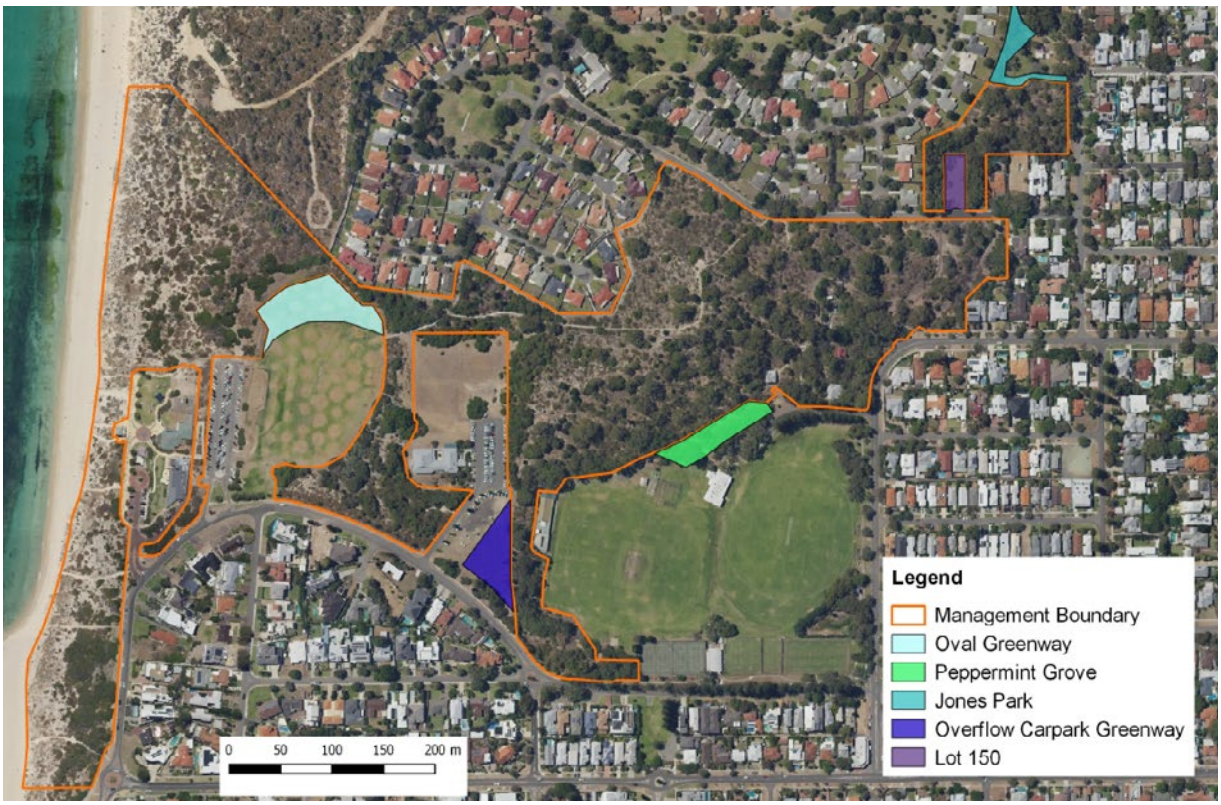
The 12 Sectors form the basis of management and are intended to facilitate the establishment of guidelines for managing areas of similar terrain, vegetation types and degradation. Specific sites are targeted areas for rehabilitation within Sectors. They demarcate the extent of areas where specific works should occur.

Potential Future Natural Areas

Five areas have been flagged as potential future natural areas for inclusion within the Allen Park management boundary. They include Lot 150 (11 Sayer Street which at the time of writing the 2013 Management Plan had informally been agreed to be returned to bushland), Jones Park, the Peppermint Grove adjacent to the Allen Park Pavilion, the Oval Greenway and the Overflow Car Park Greenway as shown in figure 4 below.

The revegetation of the Oval Greenway and the Overflow Car Park Greenway (located behind the Rugby Club) are outcomes of the adoption of the Allen Park Masterplan 2017. These areas have also been included in the Swanbourne Beach Oval Enviro-scape Precinct Master Plan that was adopted by Council in 2018. The Oval Greenway at the time of writing this plan was put forward for inclusion in the 2019/20 capital works budget for approval by Council. This area is to be revegetated with low growing coastal species so that existing views from the oval are maintained. This is consistent with previous planting programs that have been undertaken along Marine Parade which have worked to maintain existing views along Marine Parade. Following restoration of these 'future' areas they will need to be incorporated into the management boundary of Allen Park and be managed as part of the City's natural area management operations for Allen Park.

Figure 6: Potential Future Natural Areas



Management Actions 2019-2024	
1.	Manage Allen Park on the basis of twelve Sectors in conjunction with the Friends of Allen Park and the Swanbourne Coastal Alliance.
2.	Include Jones Park, the Oval Greenway, the Overflow Carpark Greenway, the Allen Park Pavilion Peppermint Grove and Lot 150 as potential future natural areas within Allen Park.
3.	Maintain existing views when undertaking revegetation programs along Marine Parade and the Oval Greenway.

6.2 Rehabilitation

Sites

Sites are areas within Sectors where resources for rehabilitation and monitoring are focused. Areas where rehabilitation has previously occurred are also considered sites. A rehabilitation plan should be developed for each area requiring reconstruction to minimise any possible detrimental impacts such as trampling, erosion, spraying native species in low abundance or the introduction of weed species. This rehabilitation plan should also prioritise sensitive environments based on their susceptibility to erosion (such as deep sands on steep slopes and areas covered with moss) so that damage to sensitive environments caused by restoration activities can be minimised.

The priority for rehabilitation is the consolidation and expansion of better condition bushland in all Sectors. The Bradley Method should be followed which focuses on targeting better condition bushland areas within these Sectors. Restoration of the more *Degraded* bushland areas should only be a focus if resources allow and should occur directly adjacent to *Good* bushland condition areas. If internal funding is not available then these sites could be the focus of grant funded projects.

Ongoing priority weed control is required in all Sectors for selected priority weeds. Previous restoration including the Seaward Corridor, the Swale, Odern Crescent, the Rugby Club Embankment, the Heritage Precinct, Coastwest restoration sites and the Walkway are to be treated as maintenance areas for ongoing maintenance of annual and perennial broadleaf and grass weeds. Ongoing restoration and rehabilitation through planting is required in *Good* condition bushland areas or *Degraded* areas directly adjacent to *Good* condition bushland in the following Sectors:

- Boobook Sector
- North, South, East and West Melon Hill
- Flyash Hill and Swale
- Seaward Corridor
- Coastal Swale and Foredunes.

Asbestos Management

The management of asbestos and its related actions has been detailed on pages 52-54 of the Natural Areas Management Plan 2019-2024. Asbestos is a building material that was used widely between the 1940s to late 1980s. After many years of use in the building industry in Western Australia, the tiny fibres in asbestos were found to pose health risks. If left untouched, asbestos poses no immediate danger. However, if asbestos products are broken or disturbed they can release hazardous fibres. Asbestos contaminated material must only be removed by appropriately qualified and trained personnel.

At Allen Park asbestos, consisting primarily of bonded asbestos, has previously been removed from several locations including:

- Sayer Street (in the area surrounding Lot 139)
- The Heritage Precinct Houses
- On the west side of the Associates Rugby Club Building
- The Flyash Swale and old bowling greens
- The embankment behind the Shorehouse Restaurant
- Bushland areas adjacent to Marine Parade
- Various isolated locations in bushland areas including Department of Defence bushland.

If any further asbestos contaminations are found within the bushland they should be reported to the City. The areas surrounding Lot 139; and the Flyash Swale and old bowling greens have had several remedial activities implemented over the years and they require ongoing management. The other areas where asbestos fragments have been removed also require ongoing monitoring because more fragments will become exposed following soil erosion after rain events. As Allen Park requires ongoing asbestos management an asbestos management plan should be developed for the entire bushland.

Management Actions 2019-2024	
1.	Focus rehabilitation on *Good* to *Very Good* condition bushland and Degraded areas directly adjacent to Good and *Very Good* bushland condition as a priority.
2.	Develop a rehabilitation plan to prioritise sensitive environments based on their susceptibility to erosion.
3.	Any asbestos material found in the bushland should be left alone and reported to the City.
4.	Implement 'Asbestos', 'Plant Pathogen' and 'Rehabilitation' actions detailed in the Natural Areas Management Plan 2019-2024.

6.3 Revegetation

Ideally species used for revegetation in reconstruction sites would consist of the entire collection of plants that naturally occur at the sites. This is not always possible as not all species can be propagated and there are also situations where certain species provide specific management functions such as *Acacia lasiocarpa* and *Banksia sessilis* which help to restrict access, as they have spiny leaves.

Species of Significance or Low Abundance

There are a number of species of significance, or species found in very low abundance within Allen Park and special consideration should be given to maintain these populations. Those found in low abundance should be mapped monitored and if possible propagated for revegetation at reconstruction sites. A map of some species found in low numbers has been developed and is shown in Figure 6 below. Species of significance, or found in very low include:

- *Callitris preissii* (Rottnest Island Pine)
- *Chamelaucium uncinatum* (Wembley Wax)
- *Daucus glochidiatus* (Australian Carrot)
- *Enchylaena tomentosa* (Barrier Saltbush)

- *Eremophila glabra* (Tar Bush)
- *Exocarpos sparteus* (primarily found on the Coastal Swale one individual found on Melon Hill near Mayo Cottage)
- *Grevillea preissii*
- *Hibbertia cuneiformis* (Cutleaf Hibbertia)
- *Hibbertia racemosa* (Stalked Guinea Flower)
- *Leschenaultia linarioides* (Yellow Leschenaultia)
- *Lepidosperma*
- *Leucopogon parviflorus* (Coast Beard-heath)
- *Macrozamia fraseri* (one specimen)
- *Santalum acuminatum* (Quandong) (new population found on the coastal foredunes in 2015 and several recorded in Boobook Sector and Lot 150)
- *Scaevola thesioides*
- *Threlkeldia diffusa* (Coast Bonefruit).

Figure 7: Species found in Low Abundance

Management Actions 2019-2024	
1.	Work with local nurseries to grow species found in low abundance.
2.	Implement 'Revegetation' actions detailed in the Natural Areas Management Plan 2019-2024.

6.4 Environmental Weed Control

A total of 38 priority weeds have been listed for management in Allen Park (Table 7). Each priority weed has been provided management notes and the Weed Prioritisation Process rating (DBCA 2016). Priority weeds will be managed according to management notes provided on the DBCA Florabase website at https://florabase.dpaw.wa.gov.au and are detailed in Appendix 4.

Priority weeds have been selected from:

- Swan Region Weed Prioritisation Process (DPaW 2013)
- Swan Impact and Invasiveness Ratings (DBCA 2016)
- Local knowledge from 'Friends of' groups and City staff that assisted with the development of the priority weed list
- Their ability to contribute to fuel loads
- State and federal weed lists
- Their ability to be controlled without causing disturbance.

Table 7: Priority Weeds for Control – (Ratings taken from DBCA 2016 (Swan Region))

No	SPECIES	COMMON NAME	MANAGEMENT NOTES	RATING
1.	*Avena fatua*	Wild Oat	Ongoing control required in conjunction with grass spraying program.	High/Medium
2.	*Agave americana*	Century Plant	Requires ongoing monitoring for re-infestation.	Medium/Medium
3.	*Arctotis stoechadifolia*	White Arctotis	Requires ongoing monitoring for re-infestation.	Unrated/Slow
4.	*Arctotheca calendula*	Cape Weed	Ongoing control required in conjunction with Bur Medic along pathways.	High/Rapid
5.	*Argyranthemum frutescens*	Marguerite Daisy	Ongoing control required.	Unknown/Slow
6.	*Asparagus asparagoides*	Bridal Creeper	Ongoing biological control required, removal of berries and/or hand removal of small populations.	High/Slow
7.	*Brachychiton populneus*	Kurrajong	Ongoing monitoring and control.	High/Rapid
8.	Brassica tournefortii	Mediterranean Turnip	Ongoing hand weeding required.	High/Medium
9.	*Cardamine hirsuta*	Flickweed	Handweeding required if resources allow.	Unrated.
10.	*Carpobrotus edulis*	Hottentot Fig	Monitor for re-infestation. Control only to take place when in flower so that it's not confused with native Pigface.	High/Rapid
11.	*Chamelaucium uncinatum*	Geraldton Wax	Undertake staged removal.	Medium/Slow
12.	*Cenchrus clandestinus*	Kikuyu Grass	Focus control in restoration sites.	High/Slow
13.	*Cenchrus setaceus*	Fountain Grass	Requires ongoing monitoring for re-infestation.	High/Rapid
14.	*Centranthus macrosiphon*	Pretty Betsy	Due to its extensive distribution control should focus on Flyash Hill, Odern Crescent and the Boobook Sector.	Medium/High
15.	*Chasmanthe floribunda*	African Cornflag	Requires ongoing monitoring and control for re-infestation.	High/Medium
16.	*Cynodon dactylon*	Couch	Focus control in restoration sites.	High/Rapid
17.	*Ehrharta calycina*	Perennial Veldt Grass	Ongoing control required. Follow up hand weeding after spraying required.	High/Rapid
18.	*Ehrharta longiflora*	Annual Veldt Grass	Ongoing control required. Follow up hand weeding after spraying required.	Medium/Rapid
19.	*Euphorbia paralias*	Sea Spurge	Isolated populations along the primary dunes require control.	High/Rapid

No	SPECIES	COMMON NAME	MANAGEMENT NOTES	RATING
20.	*Euphorbia terracina*	Geraldton Carnation Weed	Ongoing hand weeding required.	High/Rapid
21.	*Ferraria crispa*	Black Flag	Ongoing control required.	High/Rapid
22.	*Freesia alba x leichtlinii*	Freesia	Ongoing control required.	High/Rapid
23.	*Fumaria capreolata*	Climbing Fumitory	Ongoing control required.	High/Medium
24.	*Gazania linearis*	Gazania	Ongoing control required along bushland edges.	High/Rapid
25.	*Lachenalia bulbifera*	Soldiers	Two patches require control Swanbourne Dunes and the Boobook Sector.	High/Unknown
26.	*Lagurus ovatus*	Hare's Tail Grass	Ongoing control required.	High/Rapid
27.	*Lupinus angustifolius*	Narrowleaf Lupin	Ongoing control required.	High/Medium
28.	*Lupinus cosentinii*	Sandplain Lupin	Ongoing control required.	High/Medium
29.	*Medicago polymorpha*	Burr Medic	Control required in conjunction with Bur Medic along pathways.	Unrated/Rapid
30.	*Moraea flaccida*	One-leaf Cape Tulip	Control required in conjunction with Freesia control.	High/Rapid
31.	*Lycium ferocissimum*	African Boxthorn	Requires ongoing monitoring for re-infestation/ resprouting.	High/Medium
32.	*Olea europaea*	Olive	Requires ongoing monitoring for re-infestation/ resprouting.	High/Rapid
33.	*Oxalis pes-caprae*	Soursob	Ongoing control required. Undertake control in conjunction with Freesias.	High/Slow
34.	*Pelargonium capitatum*	Rose Pelargonium	Ongoing control required. Only remove large infestations as part of an intensive restoration project.	Medium/High
35.	*Raphanus raphanistrum*	Wild Radish	Ongoing hand weeding required.	Unknown/Medium
36.	*Schinus terebinthifolia*	Brazilian Pepper	Requires ongoing monitoring for re-infestation/ resprouting.	High/Medium
37.	*Tamarix aphylla*	Athel Pine	Requires ongoing monitoring for re-infestation/ resprouting. No control of mature trees on Flyash Hill.	High/Rapid
38.	*Trachyandra divaricata*	Dune Onion Weed	Only control when native vegetation has established.	Medium/Rapid

Table 8: Alert Weeds for Allen Park

Species Name	Common Name	Notes
Euphorbia maculata	Spotted Spurge	Found on the periphery of Allen Park.
Hyparrhenia hirta	Tambookie Grass	Found on west coast highway north of Allen Park
Leptospermum laevigatum	Coast Teatree (Victorian Teatree)	Found north on Campbell Barracks Bushland near Swanbourne Dunes.
Retama raetam	White Broom	Found on west coast highway north of Allen Park
Verbesina encelioides	Golden Crownbeard	Found near the entrance to Coastal Swale. DBCA alert weed.
Zantedeschia aethiopica	Arum Lily	Previously removed from Mayo Cottage in Allen Park. Requires monitoring.

Strategy

Priority weeds should be controlled in all management Sectors at Allen Park in accordance with management notes in Appendix 4.

Management Notes for Priority Weeds in the Friends of Allen Park Sectors

High priority weeds to control in North, East, South and West Melon Hill, the Boobook, the Heritage Precinct, Sayer Street, Odern Crescent, Flyash Hill and Swale and the Seaward Corridor Sectors include:

- African Corn Flag (*Chasmanthe floribunda)*
- Annual Veldt Grass (*Ehrharta longifolia*)
- Black Flag (*Ferraria crispa*)
- Bridal Creeper (*Asparagus asparagoides*)
- Burr Medic (*Medicago polymorpha*)
- Cape Weed (*Arctotheca calendula)*
- Flickweed (*Cardamine hirsuta*)
- *Freesia* (*Freesia alba x leichtlinii*)
- Fumitory (*Fumaria*)
- *Gazania* (*Gazania linearis*)
- Geraldton Carnation Weed (*Euphorbia terracina*)
- Marguerite Daisy (*Argyranthemum frutescens*)
- One-leaf Cape Tulip (*Moraea flaccida*)
- *Oxalis Pes-Caprae* (Soursob)
- Perennial Veldt Grass (Ehrharta calycina)
- Pretty Betsy (Centranthus macrosiphon)
- Rose Pelargonium (Pelargonium capitatum)
- Sea Spurge (Euphorbia paralias)
- Wild Gladiolus/Long-tubed Painted Lady (*Gladiolus undulatus and angustus*)
- Wild Radish (*Raphanus raphanistrum*) and Brassica
- Wild Oats (*Avena fatua*)
- Woody weeds (various species).

Geraldton Carnation Weed
Geraldton Carnation Weed is a highly invasive weed found across the bushland. Its impact has had a significant decrease over the years due to persistent hand removal. Ongoing removal is required to stop it from increasing in distribution and density.

One-leaf Cape Tulip and *Gladiolus undulatus and angustus*
New populations of highly invasive bulbous weeds including One-leaf Cape Tulip and Long Tubed Painted Lady or Wild Gladiolus *(Gladiolus undulatus and angustus)*. have been found occurring in small isolated patches on Flyash Hill and Odern Crescent. These populations require ongoing management before they expand into good bushland areas.

Figure 8: One-leaf Cape Tulip in the Odern Crescent Sector

Pelargonium
Pelargonium is a highly invasive weed widely distributed across the bushland. Its population on Melon Hill has declined considerably over the years due to an active control program which needs to be continued.

Cape Weed, Burr Medic and *Gazania*
Cape Weed and Burr Medic have increased considerably over recent years. They are found primarily along pathways and are establishing in good bushland areas. A management program needs to commence before their population increases to uncontrollable levels. Likewise, *Gazania* infestations are found along the verge on the southern edge of Flyash Hill. This infestation is being controlled through an ongoing hand weeding program which needs to continue to stop its expansion.

Fumitory and *Oxalis*
With the removal of many annual and perennial grass weeds Fumitory (*Fumaria*) and *Oxalis* (*Oxalis*) are continuing to increase across the bushland. *Oxalis* and Fumitory can be targeted at the same time, using the same method that is already being used to control Freesi*as* and they need to be incorporated into the environmental weed control program before their distribution increases to levels where they cannot be

controlled. Fumitory can also be successfully removed by hand provided a sufficient amount of labour and funding is available.

Coast Teatree

Coast Teatree is been listed as an alert weed for Allen Park. There are some populations on the Foredunes at Campbell Barracks on the boundary of the Coastal Foredune Sector that are a management issue. They should be monitored to ensure they do not establish populations within the Coastal Foredunes. There are also some mature specimens on Lot 150 Sayer Street. These populations are not considered invasive. There has been no control undertaken over the years on these populations and they are not increasing their distribution. They also provide habitat and cover for Fairy-wrens moving from Sayer Street into the Boobook Sector. They are therefore not recommended for removal until other native vegetation has established or as part of a staged removal program.

Geraldton Wax

A similar situation exists with mature Geraldton Wax plants that occur in the Sayer Street and Heritage Precinct Sectors. These specimens also provide habitat and cover for resident Fairy-wrens moving from Sayer Street into the Boobook Sector and they are not recommended for removal, unless part of a staged removal program. However, any juvenile seedlings that emerge should be removed as required.

Geraldton Wax have the ability to hybridise with the newly planted Wembley Wax. Therefore, in order to maintain the genetic integrity of Wembley Wax ongoing vigilance is required to remove Geraldton Wax seedlings that may have self seeded. The planted Wembley Wax seedlings have been marked with Jarrah stakes so that they can easily be identified as the local provenance variety.

Tamarix

No removal of the *Tamarix* population on Flyash Hill is recommended. This population consists of large trees of which are not expanding their distribution. A significant amount of resources would be required to remove these trees and it would create large open areas potentially exposing Flyash Hill to erosion and informal access.

Defence land on Melon Hill and Seaward Corridor

The Department of Defence provides funding towards weed management on Melon Hill. The City and the Friends of Allen Park should continue to collaborate with the Department of Defence for management of weeds on Melon Hill.

Maintenance Areas

Numerous weeds are present in restoration sites including the Seaward Corridor, the Swale (between Flyash Hill and the Seaward Corridor) and the Heritage Precinct. Weed invasion in these areas include species such as *Conyza bonariensis (*Tall Fleabane), *Hypochaeris glabra (*Smooth Catsear), *Lactuca serriola (*Prickly Lettuce), *Oxalis glabra* and *pes-caprae (*Soursob), *Solanum nigrum* (Blackberry nightshade), *Ricinus communis* (Castor Oil Bush) and Marshmallow *(Malva parviflora*). Ongoing management of weeds in restoration sites is required so that they do not threaten adjacent bushland areas within Allen Park.

Management Notes for Priority Weeds in the Swanbourne Coastal Alliance Managed Sectors

High priority weeds for management in the Coastal Swale and Foredune Sectors include:

- Athel Pine (*Tamarix*)
- Black Flag (*Ferraria crispa*)
- Bridal Creeper (*Asparagus asparagoides*) – new population found 2018
- Dune Onion Weed (*Trachyandra divaricata*)
- *Gazania* (*Gazania linearis*)
- Geraldton Carnation Weed (*Euphorbia terracina*)
- Marguerite Daisy (*Argyranthemum frutescens*) - new population found 2018
- Narrowleaf and Sandplain Lupin (*Lupinus*)
- Pretty Betsy (*Centranthus macrosiphon*) - new population found 2018
- Rose Pelargonium (*Pelargonium capitatum*)
- Sea Spurge (*Euphorbia paralias*)
- Wild Gladiolus/Long-tubed Painted Lady (*Gladiolus undulatus and angustus*) - new population found 2018
- Woody weeds (various species).

Pelargonium

The Coastal Swale and Foredune Sectors have significant infestations of *Pelargonium* across the whole site with some areas containing 76-100% cover. *Pelargonium* is a high priority weed and it should be targeted for removal. However, consideration should be provided to not removing *Pelargonium* in areas that lack native vegetation cover so that erosion is not inadvertently caused. *Pelargonium* should only be removed in areas lacking native vegetation cover when part of an intensive restoration project. Due to the high density and wide distribution of *Pelargonium* both on Melon Hill and the Coastal Swale and Foredune areas funding should be sought to undertake an intensive control program within Allen Park.

Tamarix

A *Tamarix* infestation was previously removed from the southern part of the Coastal Swale Sector. Individual plants tend to re-sprout from time to time and therefore ongoing monitoring and control of previously treated populations is required.

Gazania

Gazania infestations are found along the Café Embankment and the southern end of the Coastal Swale and Foredune Sectors. It is being targeted through an ongoing hand weeding program to stop its expansion and this program needs to be continued.

Long Tubed Painted Lady/Wild Gladiolus

A new population of a highly invasive bulbous weed has been found occurring in a small isolated patch along the fence line in the Coastal Swale. It is either Long Tubed Painted Lady or Wild Gladiolus as they could not be differentiated at the time of surveying. This population requires management before it expands its distribution.

Figure 9: Long Tubed Painted Lady/Wild Gladiolus Flyash Hill and Coastal Swale

Defence land adjacent to the Coastal Swale.
Weeds including *Pelargonium*, Geraldton Carnation Weed, Coast Teatree and African Boxthorn occur along the fence line at Campbell Barracks directly adjacent to the Coastal Swale. The City and the Swanbourne Coastal Alliance should continue to collaborate with the Department of Defence to undertake control of these weeds so that they do not invade the Coastal Swale Sector.

6.5 Monitoring

Of the 122 weeds identified as occurring within Allen Park, the distribution and density of 18 weeds were mapped along with woody weeds. These should continue to be mapped every five years when management plans are reviewed.

Highly invasive weeds with the potential to expand their distributions should be monitored and mapped annually (if they have increased their distribution) so that their current distribution can be monitored and controlled as required. New invasive weeds that are encountered should also be mapped as they arise and controlled as required.

Weeds with the potential to expand rapidly and which therefore should be monitored and mapped (if they have increased their distribution) annually include:

- Black Flag
- Bridal Creeper
- Freesias
- Wild Gladiolus/Long-tubed Painted Lady
- One-leaf Cape Tulip
- Sea Spurge.

Management Actions 2019-2024	
WEED CONTROL	
1.	Annually monitor weeds with the potential to expand rapidly and map changes in their distribution if required.
2.	Monitor, control and document the distribution of new invasive weeds as they arise.
3.	Control priority weeds in accordance with management notes detailed in Appendix 4.
4.	Maintain vigilance on alert weeds such as Arum Lily, Coast Teatree, *Euphorbia maculata*, Golden Crownbeard, Coast Teatree, Tambookie Grass and White Broom.
5.	Seek funding to undertake an intensive control program of *Pelargonium capitatum.*
6.	Undertake ongoing maintenance of weeds in restoration sites including the Seaward Corridor, the Swale, Odern Crescent, the Rugby Club Embankment, the Heritage Precinct, Coastwest restoration sites and the Walkway.
WEED CONTROL – Coastal Swale and Foredunes	
7.	Control the following weeds as a priority: *Gazania*, Geraldton Carnation Weed, Sea Spurge, *Trachyandra divaricata*, *Tamarix*, *Pelargonium*, woody weeds and *Lupinus*.
8.	To reduce erosion only undertake weed control in areas with sufficient native vegetation cover or as part of an intensive restoration project.
9.	Work with the Department of Defence to undertake control of priority weeds on adjacent land.
WEED CONTROL – North, East, South and West Melon Hill, the Boobook Sector, the Heritage Precinct, Sayer Street, Odern Crescent, Flyash Hill and Swale and the Seaward Corridor	
10.	Control the following weed as a priority: *Gazania*, Geraldton Carnation Weed, Bridal Creeper, Marguerite Daisy, African Cornflag, Perennial Veldt Grass, Annual Veldt Grass, *Oxalis*, Wild Oats, Black Flag, *Freesia*, Fumitory, woody weeds and *Pelargonium*.
11.	Control Cape Weed and Bur Medic along pathways to reduce their establishment into areas of good condition bushland.
12.	Only remove the *Tamarix* population on Flyash Hill as part of an intensive restoration project.
13.	Continue to collaborate with the Department of Defence for weed management on Melon Hill.
14.	Retain mature specimens of Coast Teatree and Geraldton Wax (on Lot 150 Sayer Street) until sufficient habitat is established for resident Fairy-wrens.

7. FIRE MANAGEMENT

Fire management actions for all natural areas has been detailed on pages 61-67 of the Natural Areas Management Plan 2019-2024 and the fire history map shown in the map section in Appendix 6.

Summary of Current Practices
The City undertakes the following fire management practices at Allen Park:

- Annual review of the Allen Park Fire Pre-Plan with Department of Fire and Emergency Services (DFES)
- Maintenance of firebreaks prior to the 30th November annually
- Annual program to manually reduce fuel loads by removing fine fuels especially within asset protection zones
- Ongoing management of grass weeds
- Fuel load assessments (as required) to monitor fuel loads and respond accordingly
- Follow up maintenance of bush fire risk assessment actions.

DFES has a Fire Pre-Plan for Allen Park which was developed in conjunction with relevant stakeholders and is reviewed annually. This plan details: site information, ecological requirements, vulnerable property, risk management strategies and responsibilities; a communications plan, hazards and fire suppression strategies and tactics.

In 2013 the City undertook bushfire risk assessments in all of City's natural areas using Australian Standard AS 3959 (Buildings in Bush Fire Prone Areas) and ISO AS/NZ 31000-2009 (Risk Management - Principles and Guidelines). Whilst this was not a requirement for the City and is only a legislative requirement for developments occurring in bush fire prone areas. It was undertaken as a proactive measure by the City to assist in managing fire risk. As a result of these assessments several actions were identified and implemented for Allen Park and follow up maintenance has been scheduled (as required) in order to maintain these actions.

Fuel load assessments were undertaken for all natural areas in 2015 using methodology described within the DFES Visual Fuel Load Guide for the Swan Coastal Plain and Darling Scarp (DFES, 2015). Following these assessments a number of actions were undertaken to reduce fuel loads at Allen Park. In addition to this the City also has an annual grass weed management program that reduces fuels loads and a manual fuel load reduction program.

Management Actions 2019-2024	
1.	Implement 'Fire Management' actions in the Natural Areas Management Plan 2019-2024.

8. ACCESS

The "*Objectives for Access*" has been detailed for all natural areas on pages 68-73 of the Natural Areas Management Plan 2019-2024. In summary the following actions are identified for Allen Park:

- Undertake maintenance of beach fencing every 24 months
- Collaborate with the Department of Defence to repair eroded pathways on Melon Hill
- Investigate the installation of fencing along the Rugby Club and dog exercise ovals to reduce informal access
- Install bollards on Sayer Street (adjacent to Defence Housing) to stop informal and illegal access.

Generally, the fences, bollards and path network at Allen Park are considered appropriate. Due to the steepness of the site the majority of the path network does not allow for disability access. There is however some limited disability access available around the Heritage Precinct.

All stabilised limestone pathways were upgraded between 2012 and 2015. These works included stabilising the pathways with limestone retaining, installing spillways at intervals to address water runoff and upgrading the paths to red asphalt. The path network and firebreaks are detailed in the map section in Appendix 6.

Management Actions 2019-2024	
1.	Implement 'Access' actions in the Natural Areas Management Plan 2019-2024.

9. CULTURAL HERITAGE, INTERPRETATION & EDUCATION

Cultural Heritage, Interpretation and Education has been detailed for all natural areas on pages 74-82 of the Natural Areas Management Plan 2019-2024.

Background

The Heritage Precinct is established within Allen Park and it has its own management plan and therefore this area is not considered further within this Plan. The signs, cairn and information shelter in the bushland are considered here.

The Whadjuk Trail Network is a project that is being undertaken by the Western Suburbs Regional Organisation of Councils (WESROC) and natural area 'Friends of' groups in the Western Suburbs. The Whadjuk Trail Network consists of a series of walking trails that link all natural areas in the Western Suburbs, including the Cities of Stirling, Fremantle and Perth.

Currently six out of seven trails have been installed. The trail that traverses Allen Park is the Bush to Beach Trail and it extends from Rosalie Park in Subiaco to Grant Marine Park in Cottesloe. It connects to the Yange Kep Bidi, the Bidi Bo Djinoong and the Wardun Beelier Bidi trails within the Whadjuk Trail Network. Directional signage on pathways and bollards directs walkers through Allen Park on the Bush to Beach Trail. Interpretive signage is also located along the trail detailing the environmental, Aboriginal and European significance of Allen Park.

The Friends of Allen Park also installed interpretive signage on Melon Hill and at the entrance to the Boobook Sector along with two limestone walls at the Bridge Club car park entry to Melon Hill and the Jameson Street entry to the Boobook Sector with funding received from Lotterywest.

Strategy

Information Shelters

There are two information shelters in the bushland. One is located on West Melon Hill and consists of a lockable perspex window the second one is located in the Heritage Precinct in replacement of the degraded noticeboard on Odern Crescent. The information shelters allow information to be displayed including work undertaken by the Friends of Allen Park, a map of the reserve and informal track network. Ongoing maintenance of the information shelters should be undertaken as required.

Maintenance and Addition of Signs

The existing 'Let it Grow' signs that were erected on timber stands through the bushland were removed and upgraded. Recyclable bollards were installed as a replacement at several places through the bushland and along Marine Parade. These bollards provide multiple conservation messages including dogs on leash, snake habitat, no bikes, no fires and Let it Grow. There are two remaining signs on defence owned land on Melon Hill which state "Access Prohibited". These signs should be retained for their historical significance.

Dog Control

The bushland around Mellon Hill is used as a dog exercise area, which is not a compatible use with conservation and bushland rehabilitation. Dogs cause disturbance by trampling native vegetation and causing erosion and soil disturbance.

This in turn favours weeds through nutrient enrichment which can cause native vegetation to decline. Two bins were installed to assist reducing issues of dog owners not cleaning up after their dogs. Both were installed at entrances to Melon Hill, one on Sayer Street and the other adjacent to the Seaward Corridor. This has assisted with reducing these issues however periodic notices in the local papers may assist further by educating dog owners to leash and clean up after their dogs.

Walking Tracks

As part of the indigenous consultation for the Whadjuk Trails project the names of the walking tracks within Allen Park were formalised using indigenous names. Neville Collard, a Noongar Elder, provided indigenous names for walking tracks within Allen Park these are detailed on Figure 10 below.

Figure 10: Walking Tracks within Allen Park

The meaning of these names and their old names are as follows:

NOONGAR NAME	NOONGAR MEANING OR NAME	OLD NAME
Dewy Bidi	Owl	Boobook Sector
Berrung Bidi	Scrub or Bushland	Goat Track
Booh Djinoong Bidi	Looking Out (pronounced boooooooo Ginning)	Melon Hill Walk
Yorn bidi	Blue tongue Lizard	Log and Chain
Wardandi Bidi	Indian Ocean Corridor	Seaward Corridor
Kongal Bidi	South	The Walkway
Norn Bidi	Snake Path	Rugby Walk
Tuart Bidi	Existing	Tuart Walk
Kulbardi Bip	Magpie Hill	Flyash Hill

Management Actions 2019-2024	
1.	Raise awareness of the issues relating to the impact of dogs in natural areas.
2.	Maintain the “Access Prohibited “signs on Melon Hill for their historical value.

10. NATIVE ANIMALS

Background

There are 58 confirmed native animal species in Allen Park (37 birds 3 mammals, 14 reptiles and amphibians, and 5 invertebrate species). Ongoing surveying of native fauna within Allen Park should be undertaken, including invertebrates of high conservation value, if funding is available.

The only animal species being directly managed at present is the Yellow Admiral Butterfly, with all other species managed indirectly through improving bushland condition and controlling feral animals which have the potential to predate, compete with or displace native animals. This is discussed in the feral animal management section on pages 85-90 of the Natural Areas Management Plan 2019-2024.

Strategy for Protection of Native Animals

Gould's Wattled Bat (*Chalinolobus gouldii)*

Gould's Wattled Bat is common throughout mainland Australia, except for Cape York Peninsula. They roost in tree hollows and buildings and occur in many towns and cities, (Menkhorst & Knight, cited in Ecoscape 2005[2]).

White-striped Freetail Bat (*Tadarida australis*)

The White-striped Freetail Bat occurs across the southern half of mainland Australia. It is the largest of all the free-tail bats and is one of the few microbats with echolocation calls that can be heard by humans (Australian Museum, 2019).

Brushtail Possum

Brushtail Possums are among the most adaptable of the native mammals. They live in a variety of habitats often favouring open forest and woodland areas with older trees that provide hollows.

Due to the adaptability and resilience of the Brushtail Possum, no specific measures are proposed to manage them. However, hollows in larger old and dead trees should be retained as refuges and the ongoing control of feral European Honey Bees should be undertaken as they can displace native animals from hollows.

Birds

Of the 37 native bird species recorded onsite there are three species protected under the EPBC Act 1999. These include the Carnaby's Black-Cockatoo *(Calyptorhynchus latirostris)* which is listed as *Endangered, the* Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii)* which is listed as *Vulnerable* and the Rainbow Bee-eater *(Merops ornatus)* which is listed as a *Marine* species.

Carnaby's and Red-tailed Black-Cockatoos are regularly seen foraging at Allen Park. Carnaby's have nearby roost sites at Perry Lakes and Hollywood Hospital and the Forest Red-tailed Black-Cockatoos have a roost site near McGillivray Oval.

Rainbow Bee-eaters migrate annually in summer and nest in Perth's sandy soils where they are regularly seen nesting and foraging in Allen Park. If nests are encountered in the bushland they should be protected so that any restoration work

that is undertaken does not disturb their nests. Ongoing feral cat and fox control should also be undertaken as they can predate on Rainbow Bee-eater nests.

Feral birds

Feral birds compete with native birds for foraging material and nesting hollows. Some also carry diseases which have the potential to infect native bird populations such as Rainbow Lorikeets that carry Beak and Feather disease. The Department of Biodiversity Conservation and Attractions (DBCA) undertook a five year regional feral bird control program focussing on Rainbow Lorikeets and Long-billed Corellas. This program has now been taken over by the Western Australian Local Government Association who are currently seeking funding from Local Governments to continue this program.

The protection of the mammals and birds in Allen Park can be achieved through:

- Fire risk management to minimise fires that may destroy tree hollows
- Retaining hollows for refuges in large old and dead trees
- Controlling feral European Bees
- Protecting nests of Rainbow Bee-eaters
- Ongoing feral cat and fox control programs
- Contributing to regional feral bird programs coordinated by WALGA.

Yellow Admiral Butterfly

Since 1999 Yellow Admiral Butterflies have been encouraged into Allen Park through the provision of specific habitat. The main food for Yellow Admiral Butterfly larvae are the leaves of native and introduced nettles (members of the Urticaceae family). Included in this group is the Native Pellitory (*Parietaria cardiostegia*) which was established within Allen Park in 1999 by the Friends of Allen Park to provide habitat for the Yellow Admiral Butterfly. Ongoing monitoring and seeding of Native Pellitory by the Friends of Allen Park should continue. A summary of the Yellow Admiral Butterfly is shown in Table 9 below.

Table 9: Yellow Admiral Butterfly Program in Allen Park

Year	Date	Actions/Observations
1999	April 1999	The Native Pellitory program commences in conjunction with Mr Robert Powell (CALM) to provide habitat for the Yellow Admiral Butterfly. 1st distribution of Pellitory seeds at 3 sites within Allen Park. Most successful sites below peppermints, along the northern edge of the path in the Boobook Sector.
2000	December	2nd release of Pellitory seeds in the Boobook Sector under most trees. A 10 m x 10 m quadrat was established for monitoring - *Oxalis* took over the quadrat. The site north of the path was again successful.
2001	September 2005	Survival was best certainly under the peppermints near the entry from the north east. 3rd distribution of seeds in this area.
	27/11	Seed collected from onsite.
	21/05	4th distribution of seed in the same area with more seeds germinating than what had been broadcast.
	30/08	1st sighting of Yellow Admiral butterfly (a total of 15 larvae).

Year	Date	Actions/Observations
		Seed collected from onsite. 5th redistribution of seed. Native Pellitory covers approximately 10m along the len th of the path and up to 1.5 m in from the path.
2011	Unknown	Overhead canopy reduced at original site understorey more exposed due to dying Peppermints. Not enough dappled light. Self seeded Pellitory smaller and affected by fungal attack.
2012	Unknown	Pellitory found in the Seaward Corridor.
2012	Unknown	Peppermints no longer provide dappled light at original site and Pellitory patch reduced in size and health. However new patches evident south towards Sayer Street under Acacia thickets.
2013	July/August	Widespread under tall shrubs approximately 15m north of Sayer St and the embankment behind Lot 150.
2013	September	Pellitory found in triangle on South West Melon Hill.
2018	Unknown	Pellitory confirmed on Flyash Hill, the Heritage Precinct, East Melon Hill, Odern Crescent and the Coastal Swale and Foredune Sectors.

The protection of Yellow Admiral Butterflies in Allen Park can be achieved through the continuation of establishing Native Pellitory as habitat.

Management Actions 2019-2024	
1.	Continue to map and establish Native Pellitory as habitat for the Yellow Admiral Butterfly.
2.	Survey native fauna, including invertebrates of high conservation value, at regular intervals, when funding is available.
3.	Minimise fires that may destroy tree hollows.
4.	Retain tree hollows for their habitat value.
5.	Undertake ongoing control of feral European Bees.
6.	Protect Rainbow Bee-eater nests.
7.	Continue implementing feral cat and fox control programs.
8.	Contribute to regional feral bird control programs coordinated by WALGA.
9.	Implement ‘Feral Animal’ actions detailed in the Natural Areas Management Plan 2019-2024.

11. COMMUNITY INVOLVEMENT

The objectives and strategies for community involvement for the City's 'Friends of' groups is detailed on pages 83-84 Natural Areas Management Plan 2019-2024. In summary the activities of community 'Friends of' groups should continue to be supported by the City through implementation of the Community Friends Group Policy and assistance should be provided to help 'Friends of' groups remain sustainable through advertising and the volunteer referral centre.

The City holds an annual appreciation event for all City of Nedlands 'Friends of' groups which is highly supported by the Friends of Allen Park. Specific details of the Friends of Allen Park Bushland Group (FOAPBG) and the Swanbourne Coastal Alliance (SCA) are detailed below.

Friends of Allen Park Bushland Group (FOAPBG)
The Friends of Allen Park was formed in response to proposals in December 1993 to build a retirement village within Allen Park. A residents' consultative committee (which later became the FOAPBG) was formed in January 1994 for the purpose of establishing community views for the use of public land in the Allen Park vicinity, and promoting effective consultation between the community and the Council about land use and other issues.

The concerns of residents resulted in December 1994 in a Supreme Court injunction preventing the development of the retirement village, and the site was subsequently rezoned to recreational thus ensuring the preservation of the site. Since 1994 the FOAPBG has flourished and accomplished extensive bush regeneration work in Allen Park Bushland and volunteer work has been supported by several Natural Heritage Trust and Lotterywest grants.

The Friends of Allen Park are very active in the management of Allen Park and have completed as many as 900 hours of voluntary work in the Park within a single calendar year. At present the FOAPBG meet every Tuesday and the first Saturday of every month and generally undertake in the order of 700 hours of volunteer work in the reserve annually (Shaw, 2019). Projects the FOAPBG are involved in include:

- Revegetation and seed collection
- Environmental weed management
- Community education
- Development of management actions for Allen Park
- Contribution to flora and fauna inventories.

The Friends of Allen Park are keen to involve anyone interested in caring for Allen Park. The contact details for the Friends of Allen Park are:

President Lesley Shaw
9 Greenville St SWANBOURNE 6010
SWANBOURNE 6010
Ph: 9384 7983

Secretary Judith Herring
20 Lynton Street
SWANBOURNE 6010
Ph: 9383-1501

Urban Bushland Council
http://www.bushlandperth.org.au/member-groups/3-north-of-the-river/44-friends-of-allen-park-bushland

Swanbourne Coastal Alliance (SCA)

The Swanbourne Coastal Alliance formed in response to development proposals for Volleyball Courts and a Marina in the Swanbourne Beach area. Several meetings were held with surrounding residents who voted unanimously in favour of the formation of an action group to oppose any development of the coastal environment and to contribute to the conservation of the area.

In 2008, the Swanbourne Coastal Alliance became incorporated and have collaborated with the City of Nedlands and Perth Region NRM to manage the restoration and conservation of Swanbourne Dunes. Since 2009, several grants have been received from both Coastcare and Coastwest grant funding programs for restoration of the Swanbourne Dunes.

The Swanbourne Coastal Alliance hold annual planting and weeding activities through winter and spring. Projects the Swanbourne Coastal Alliance are involved in include:

- Revegetation
- Environmental weed management
- Community education
- Contribution to flora and fauna inventories
- Development of management actions for Swanbourne Dunes.

The Swanbourne Coastal Alliance are keen to involve anyone interested in caring for Swanbourne Dunes. The contact details for the Swanbourne Coastal Alliance are:

Convenor Jean-Paul Orsini
Contact details available on the Urban Bushland Council website:
http://www.bushlandperth.org.au/member-groups/3-north-of-the-river/173-swanbourne-coastal-alliance

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Appendix 1: Flora Inventory
Native Plant Inventory

SPECIES	COMMON NAME	NOTES
Acacia cyclops	Coastal Wattle	
Acacia lasiocarpa	Panjang	
Acacia rostellifera	Summer-scented Wattle	
Acacia truncata		1 on Flyash Hill Possibly planted not seen recently.
Acacia saligna	Orange Wattle	
Acacia xanthina	White-stemmed Wattle	
Acanthocarpus preissii	Prickle Lily	
Agonis flexuosa	Sweet Peppermint	
Anigozanthos manglesii	Mangles' Kangaroo Paw	
Anthocercis littorea	Yellow Tailflower	
Atriplex isatidea	Coast Saltbush	
Austrostipa elegantissima		
Austrostipa flavescens		
Banksia dallanneyi	Honeypot Dryandra	
Banksia grandis	Bull Banksia	Non-provenance planted.
Banksia sessilis	Parrot Bush	
Brachyscome iberidifolia	Swan River Daisy	Planted in cottage garden.
Carpobrotus virescens	Coastal Pigface	
Caladenia latifolia	Pink Fairy Orchid	
Calothamnus quadrifidus	One-sided Bottlebrush	Introduced on Melon Hill
Callitris preissii	Rottnest Island Pine	
Cassytha racemosa	Dodder Laurel	
Chamelaucium uncinatum	Wembley Wax	Possibly 2 individuals in Odern Crescent.
Clematis linearifolia		
Conostylis candicans	Grey Cottonhead	
Corymbia calophylla	Marri	
Corynotheca micrantha	Sand Lily	
Crassula colorata	Dense Stonecrop	
Daucus *glochidiatus*	Australian Carrot	
Desmocladus flexuosus		
Dianella revoluta var. *divaricata*	Flax Lily	
Enchylaena tomentosa	Barrier Saltbush	
Eucalyptus gomphocephala	Tuart	
Eucalyptus marginata	Jarrah	
Eucalyptus rudis	Flooded Gum	Planted. Not seen in recent years.
Eremophila glabra	Tar Bush	
Exocarpos sparteus	Broom Ballart	
Ficinia nodosa	Knotted Club Rush	

SPECIES	COMMON NAME	NOTES
Gompholobium tomentosum	Hairy Yellow Pea	1 or 2 local provenance. Recently planted non-provenance.
Grevillea crithmifolia		
Gyrostemon ramulosus	Corkybark	Last specimen died 2006
Hardenbergia comptoniana	Native Wisteria	
Hemiandra pungens	Snakebush	
Hibbertia cuneiformis	Cutleaf Hibbertia	
Hibbertia racemosa	Stalked Guinea Flower	
Jacksonia sternbergiana	Stinkwood	
Lechenaultia linarioides	Yellow Leschenaultia	
Lepidosperma gladiatum	Coast Sword-sedge	
Lepidosperma sp.		One individual requires ID.
Lepidosperma squamatum		ID confirmation required.
Leucopogon parviflorus	Coast Beard-heath	One individual left.
Lomandra caespitosa	Tufted Mat Rush	
Lomandra maritima	Coast Mat-rush	
Macrozamia fraseri	Zamia Palm	One individual
Melaleuca huegelii	Chenille Honeymyrtle	
Melaleuca lanceolata	Rottnest-Tea Tree	Non-provenance variety.
Melaleuca systena		
Microtis media	Tall Mignonette Orchid	
Myoporum insulare	Blueberry Tree	
Olearia axillaris	Coastal Daisybush	
Opercularia sp.		
Parietaria cardiostegia	Native Pellitory	Planted
Pterostylis ectypha	Snail Orchid (Short sepals)	
Rhagodia baccata	Berry Saltbush	
Santalum acuminatum	Quandong	New population found on coastal foredunes.
Scaevola anchusifolia		
Scaevola crassifolia	Thick-leaved Fan-flower	
Scaevola thesioides		ID confirmation required.
Senecio pinnatifolius	Grounsel	
Schoenus grandiflorus	Large Flowered Bog Rush	
Spyridium globulosum	Basket Bush	
Spinifex hirsutus	Hairy Spinifex	
Spinifex longifolius	Beach Spinifex	
Templetonia retusa	Cockies Tongues	
Threlkeldia diffusa	Coast Bonefruit	
Thysanotus multiflorus	Many-flowered Fringe Lily	No seen in 2018 survey.
Thysanotus sparteus		
Xanthorrhoea preissii	Grass Tree	Adjacent to Allen Park Pavilion

Native plant inventory reviewed and updated by Ian Fordyce and Associates.

Weed Inventory

SPECIES	COMMON NAME	NOTES
Acanthus mollis	Oyster Plant	
Agave americana	Century Plant	
Aira caryophyllea	Silvery Hairgrass	
Ammophila arenaria	Marram Grass	
Araucaria heterophylla	Norfork Island Pine	
Arctotheca calendula	Cape Weed	
Arctotis stoechadifolia	White Arctotis	
Argyranthemum frutescens	Marguerite Daisy	
Asparagus asparagoides	Bridal Creeper	
Asparagus declinatus	Bridal Veil	
Asphodelus fistulosus	Onion Weed	
Avena barbata	Bearded Oat	
Avena fatua	Wild Oat	
Bartsia trixago	White Bartsia	
Brachychiton populneus	Kurrajong	
Brassica tournefortii	Mediterranean Turnip	
Briza maxima	Blowfly Grass	
Briza minor	Shivery Grass	
Bromus diandrus	Great Brome	
Bromus madritensis	Madrid Brome	
Cakile maritima	Sea Rocket	
Callistemon sp.	Bottlbrush	
Cardamine hirsuta	Flickweed	
Carpobrotus edulis	Hottentot Fig	
Casuarina glauca	Swamp She-oak	
Centranthus macrosiphon	Pretty Betsy	
Cenchrus Setaceus	Fountain Grass	
Chamelaucium uncinatum	Geraldton Wax	Planted non-provenance
Chasmanthe floribunda	African Cornflag	
Citrus limon	Lemon	
Conyza bonariensis	Flaxleaf Fleabane	
Cotula turbinata	Funnel Weed	
Crassula glomerata	Clustered Crassula	
Cuscuta epithymum	Lesser Dodder	
Cynodon dactylon	Couch	
Ehrharta calycina	Perennial Veldt Grass	
Ehrharta longifolia	Annual Veldt Grass	
Emex australis	Doublegee	Previously removed. Needs monitoring.
Erodium moschatum	Musky Crowfoot	
Erythrina × sykesii	Coral Tree	
Eucalyptus camaldulensis subsp. *obtusa*	River Red Gum	
Eucalyptus cornuta	Yate	

SPECIES	COMMON NAME	NOTES
Eucalyptus leucoxylon	Yellow Gum, Rose-flowered Gum	
Eucalyptus utilis	Coastal Moort	Planted.
Euphorbia paralias	Sea Spurge	
Euphorbia paralias	Sea Spurge	
Euphorbia terracina	Geraldton Carnation Weed	
Ferraria crispa	Black Flag	
Ficus benjamina	Weeping Fig	
Ficus carica	(Edible) Fig	
Foeniculum vulgare	Fennel	
Freesia alba x leichtlinii	Freesia	
Fumaria capreolata	Whiteflower Fumitory	
Gazania linearis		
Geranium molle	Dove's Foot, Crane's Bill	
Gladiolus undulatus and angustus	Wild Gladiolus/Long-tubed Painted Lady	
Hordeum leporinum	Barley Grass	
Hypochaeris glabra	Smooth Catsear	
Hypochaeris radicata	Flat Weed	
Jacaranda mimosifolia	Jacaranda	
Lachenalia bulbifera		
Lactuca serriola	Prickly Lettuce	
Lagurus ovatus	Hare's Tail Grass	
Leptospermum laevigatum	Coast Teatree	
Lobularia maritima	(Sweet) Alyssum	
Lolium perenne	Perennial Ryegrass	
Lolium rigidum	Wimmera Ryegrass	
Lupinus angustifolius	Narrowleaf Lupin	
Lupinus cosentinii	Sandplain Lupin	
Lycium ferocissimum	African Boxthorn	
Lycopersicon esculentum	Tomato	
Lysimachia arvensis	Pimpernel	
Malva parviflora	Marshmellow	
Moraea flaccida	One-leaf Cape Tulip	
Medicago polymorpha	Burr Medic	
Melaleuca nesophila		Planted
Melia azedarach	Cape Lilac	
Melilotus indicus	Common Melilot	
Melinis repens	Red Natal Grass	
Morus sp	Mulberry	
Narcissus tazetta	Jonquil	
Nerium oleander	Oleander	
Nicotiana glauca	Tree Tobacco	
Oenothera drummondii	Beach Evening Primrose	

SPECIES	COMMON NAME	NOTES
Olea europaea	Olive Tree	
Orobanche minor	Lesser Broom Rape	
Oxalis glabra		
Oxalis pes-caprae	Soursob	
Paspalum dilatatum	Paspalum	
Paspalum vaginatum	Salt Water Couch	
Pelargonium capitatum	Rose Pelargonium	
Pennisetum clandestinum	Kikuyu Grass	
Pennisetum setaceum	Fountain Grass	
Petrorhagia dubia	Velvet Pink	
Phoenix dactylifera	Date Palm	
Polycarpon tetraphyllum	Fourleaf Allseed	
Punica granatum	Pomegranate	
Raphanus raphanistrum	Wild Radish	
Ricinus communis	Castor Oil Bush	
Romulea rosea	Guildford Grass	
Rumex acetosella	Sorrel	
Rumex crispus	Curled Dock	
Schinus molle var. *areira*	Peruvian Pepper	
Schinus terebinthifolia	Brazilian Pepper	
Silene gallica	French Catchfly	
Solanum nigrum	Black Berry Nightshade	
Solanum hermannii	Apple of Sodom	
Sonchus oleraceus	Common Sowthistle	
Stellaria media	Chickweed	
Stenotaphrum secundatum	Buffalo Grass	
Tamarix aphylla	Athel Pine	
Tetragonia decumbens	Sea Spinach	
Thinopyrum distichum	Sea Wheat Grass	
Trachyandra divaricata	Dune Onion Weed	
Trifolium arvense	Hare's Foot Clover	
Trifolium campestre	Hop Clover	
Tropaeolum majus	Garden Nasturtium	
Urospermum picroides	False Hawkbit	
Ursinia anthemoides	Ursinia	
Vicia sativa	Common Vetch	
Vulpia myuros	Rats Tail Fescue	
Wahlenbergia capensis	Cape Bluebell	

Weed inventory reviewed and updated by Ian Fordyce and Associates.

Appendix 2: Fungi Inventory

Scientific Name	Common Name	Habitat
Bolbitius vitellinus	Egg Yolk Fungus	Decomposer
Clitocybe semiocculta	Shy Funnel Cap	Decomposer
Coprinus plicatilis	Parasol Ink Cap	Decomposer
Cortinarius ochraceofulvus	Golden Tuart Cortinarius	Mycorrhizal
Crepidotus eucalyptorum	Eucalypt Crepidotus	Decomposer
Crepidotus nephrodes		Decomposer
Exidia sp.		Decomposer
Galerina sp.		Decomposer
Laccaria lateritia	Brick Red Laccaria	Mycorrhizal
Laetiporus portentosus	White Punk	Decomposer
	Lilac Bracket fungus	Decomposer
Marasmiellus sp.		Decomposer
Morchella elata	Black Morel	
Mycena sp.		Decomposer
Mycoacia subceracea	Golden Splash Tooth	Decomposer
Omophalatus nidiformis	Ghost fungus	
Peziza sp.	Cup Fungus	Decomposer
Piptoporus australiensis	Curry Punk	Decomposer
Poria sp.		Decomposer
Psathyrella candoleana		Decomposer
Pycnoporus coccineus	Scarlet Bracket Fungus	Decomposer
Ramaria gracilis	Slender Coral Fungus	Mycorrhizal
Rhodocollybia sp.		Decomposer
Scleroderma sp.	Earthball	Mycorrhizal
Stemonitis sp.	Slime Mould	Decomposer
Tremella mesenterica group	Yellow Brain Fungus	Decomposer
Unknown Resupinate	Skin Fungus	Decomposer
Volvariella speciosa	Common Rosegill	Decomposer
Xylaria sp.		Decomposer

List compiled from Fungi Foray June 2005 (Perth Urban Bushland Fungi Project) survey conducted August 2013 (Roz Hart with assistance from Judith Herring) and ongoing observations by City staff and the Friends of Allen Park.

Appendix 3: Fauna Inventory

Bird Inventory

John Luyer (2004 & 2013), Stephen Lipple & RAOU (1995) and National Trust (1995). [1] Now BirdLife Australia, [2] Identified by Jean-Paul Orsini 2013, [3] Identified by Joan Sharp 2019.

Common Name	Scientific Name	J. Luyer 2013	National Trust 1995	*S. Lipple & RAOU[1] 1995*
Australian Magpie	*Cracticus tibicen*	X		X
Australian Raven	*Corvus coronoides*	X		X
Australian Ringneck	Barnardius zonarius	X		X
[3] Barn Owl	*Tyto alba*			
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*	X		X
Black-shouldered Kite	*Elanus axillaris*	X		
Brown Honeyeater	*Lichmera indistincta*	X		
Brown Goshawk	*Accipiter fasciatus*			X
[3] Buff Banded Rail	*Gallirallus philippensis*			
Carnaby's Black-Cockatoo	*Calyptorhynchus latirostris*	X	X	X
[3] Crested Pigeon	*Ocyphaps iophotes*			
Fan-tailed Cuckoo	*Cacomantis flabelliformis*	X		
[3] Forest Red-tailed Black-Cockatoo	*Calyptorhynchus banksii*			
Galah	*Eolophus roseicapilla*	X		X
Grey Butcherbird	*Cracticus torquatus*	X		X
Grey Fantail	*Rhipidura albiscapa*	X		
*Laughing Dove	*Streptopelia senegalensis*	X		X
*Laughing Kookaburra	*Dacelo novaeguineae*	X		X
*Little Corella	*Cacatua sanguinea*	X		
*Long-billed Corella	*Cacatua tenuirostris*	X		
Magpie-lark	*Grallina cyanoleuca*	X		X
New Holland Honeyeater	*Phylidonyris novaehollandiae*	X		

Common Name	Scientific Name	J. Luyer 2013	National Trust 1995	*S. Lipple & RAOU[1] 1995*
Pacific Black Duck	*Anas superciliosa*	X		
[3] Pallid Cuckoo	*Cacomantis pallidus*			
Rainbow Bee-eater	*Merops ornatus*	X		
*Rainbow Lorikeet	*Trichoglossus haematodus*	X		X
Red Wattlebird	*Anthochaera carunculata*	X		X
[3] Sacred Kingfisher	*Todiramphus sanctus*			
[3] Shining Bronze-Cuckoo	*Chrysococcyx lucidus*			
Silver Gull	*Chroicocephalus novaehollandiae*	X		
Singing Honeyeater	*Lichenostomus virescens*	X		X
Silvereye	*Zosterops lateralis*	X		X
Southern Boobook	*Ninox novaeseelandiae*	X	X	X
*Spotted Dove	*Streptopelia chinensis*	X		
Spotted Pardalote	*Pardalotus punctatus*			X
Striated Pardalote	*Pardalotus striatus*	X		
Tawny Frogmouth	*Podargus strigoides*			X
Tree Martin	*Hirundo nigricans*			X
Chestnut Fairy-wren	*Malurus lamberti*	X		X
Welcome Swallow	*Hirundo neoxena*	X		X
Western Wattlebird	*Anthochaera lunulata*	X		
Willy Wagtail	*Rhipidura leucophrys*	X		X
[2]White-browed Scrubwren	*Sericornis frontalis*			
White-cheeked Honeyeater	*Phylidonyris nigra*	X		X
White-winged Fairy-wren	*Malurus leucopterus*	X		X

Mammals, Reptiles and Invertebrate Inventory

Mammals (Shaw, Friends of Allen Park, 2013 and 2019)		**Introduced**
Black Rat	*Rattus rattus*	*
Brushtail Possum	*Trichosurus vulpecula*	
Cat	*Felis catus*	*
Fox	*Vulpes vulpes*	*
Gould's Wattled Bat	*Chalinolobus gouldii*	
House Mouse	*Mus musculus*	*
Rabbit	*Oryctolagus cuniculus*	*
White-striped Freetail Bat	*Tadarida australis*	
Reptiles (Shaw, Stuart and Shannon 2013)		
Western Spiny Tailed Gecko	*Strophurus spinigerus subsp. Spinigerus*	
Southern Heath Dragon	*Ctenophorus adelaidensis*	
Western Bearded Dragon	*Pogona minor*	
Sands Gould's Monitor	*Varanus gouldii*	
Fence Skink	*Cyptoblepharus buchananii*	
West Coast Ctenotus	*Ctenotus fallens*	
Western Slender Bluetoungue	*Cyclodomorphus celatus*	
Southwestern Crevice Skink	*Egernia napoleonis*	
Two toed mulch skink	*Hemiergis quadrilineata*	
West Coast Worm Lerista	*Lerista praepedita*	
Bobtail	*Tiliqua rugosa*	
Dugite	*Pseudonaja affinis*	
Jan's Banded Snake	*Simoselaps bertholdi*	
Carpet Python	*Morelia spilota imbricate*	
Invertebrates (Shaw, Friends of Allen Park, 2013 and 2019)		
Black Portuguese Millipede	*Ommatoiulus moreleti*	*
Coastal Brown Ants	*Pheidole megacephala*	*
Jewel Beetles	*Stigmodera* species	
Native Snail	*Bothriembryon bulla*	
Scorpion	*Urodacus novaehollandiae*	
Trapdoor Spider	*Idiosoma sigillatu*	
Yellow Admiral Butterflies	*Vanessa itea*	

Appendix 4: Priority Weed Management Notes (Compiled from WA Herbarium DBCA Florabase Website)

Species Name		Common Name	Management Strategy	Timing (optimal)
1.	*Avena fatua*	Wild Oat	Spray at 3-5 leaf stage with Fusilade Forte at 16 ml/10 L and wetting agent. Repeat treatment over following 2 years. Prevent seed production and seedbank inputs each year. For small infestations hand removal may be feasible.	Aug - Nov
2.	*Agave americana*	Century Plant	Dig out and/or hand remove small infestations. Stem inject into base of leaves 1 part Tordon/5 parts diesel.	Nov - Jan
3.	*Arctotis stoechadifolia*	White Arctotis	Manually remove populations.	Mar - Oct
4.	*Argyranthemum frutescens*	Marguerite Daisy	Manually remove populations.	June - Oct
5.	*Asparagus asparagoides*	Bridal Creeper	Dig out juvenile seedlings in degraded areas. Spray 0.2 g metsulfuron methyl + Pulse in 15 L water (or 2.5 - 5g /ha + Pulse). Best results achieved when flowering. Biological control agents available.	July - Aug
6.	*Brachychiton populneus*	Kurrajong	Hand pull seedlings. For mature plants try stem injection with 50-100% glyphosate or apply 250 ml Access in 15 L of diesel to basal 50 cm of trunk (basal bark) or cut and paint with 50% glyphosate.	Sept - April
7.	*Brassica barrelieri subsp. oxyrrhina*	Smooth Stem Turnip	Manually remove populations.	June - Oct
8.	*Carpobrotus edulis*	Hottentot Fig	Manual methods appear to be the most effective means of control. Roll up large mats removing all roots and stem fragments and remove from site. Follow up with removal of any germinating plants. Only remove when flowering.	Sept - Nov
9.	Cenchrus setaceus	Fountain Grass	Dig out small infestations, slash in winter and/or spray with 1% glyphosate + penetrant in spring to autumn. Follow up seedling control and treatment until regrowth ceases. Use unplanned fire events to effectively control any regrowth.	March - April and Nov - Dec
10.	*Centranthus macrosiphon*	Pretty Betsy	Hand remove isolated populations.	Aug - Sept
11.	*Chamelaucium uncinatum*	Geraldton Wax	Cut to base and paint with 50% glyphosate. Control seedlings following fire.	All Year

	Species Name	Common Name	Management Strategy	Timing (optimal)
12.	*Chasmanthe floribunda*	African Cornflag	Dig out isolated plants.	June - Sept
13.	*Cynodon dactylon*	Couch	Spray Fusilade Forte at 8 ml/L + wetting agent when plants are small and beginning new growth, or 1% glyphosate (at degraded sites) in late spring/summer and autumn when rhizomes are actively growing.	Nov - Feb
14.	*Ehrharta calycina*	Perennial Veldt Grass	For small infestations, cut out plants ensuring crown removal. Do not slash. Alternatively spray with Fusilade Forte 13 ml/L or 3.3-6.6 L/ha + wetting agent on actively growing and unstressed plants. Use higher rate in dense undergrowth or on older less vigorous plants. Follow-up in subsequent years. Use unplanned fires to spray regrowth and seedlings within 4-6 weeks of germination.	June - Sep (herbicide) and Nov - Feb (manual)
15.	*Ehrharta longiflora*	Annual Veldt Grass	Hand remove small infestations. Alternatively spray with Fusilade Forte 30 ml/10 L or 1.6 L/ha (based on 500 L water/ha) + wetting agent before flowering stem emerges, or at 3-5 leaf stage.	Aug - Oct
16.	*Euphorbia paralias*	Sea Spurge	Hand remove small isolated infestations, ensuring use of appropriate personal protective equipment and safety guidelines. When actively growing, spray with 50 mL glyphosate (360 g/L) + 0.2 g metsulfuron + Pulse in 10 L water.	Sept - Jan (herbicide) All year (manual).
17.	*Euphorbia terracina*	Geraldton Carnation Weed	Manually remove populations. Undertake control after any fire event.	June - Nov
18.	*Ferraria crispa*	Black Flag	Hand remove very small populations in degraded sites. Sift soil to find all corms. Spray 2,2 DPA 10 g/L + Pulse when flowering. In degraded sites try glyphosate 1% + metsulfuron methyl 0.2 g/15 L + Pulse. Takes a number of years to control populations.	Aug - Sept
19.	*Freesia alba x leichtlinii*	Freesia	Spot spray metsulfuron methyl 0.2 g/15 L + Pulse or 2.5-5 g/ha + Pulse. Apply just on flowering at corm exhaustion.	July - Aug

	Species Name	Common Name	Management Strategy	Timing (optimal)
20.	*Fumaria capreolata*	Climbing Fumitory	Hand remove seedlings in good bushland areas.	July – Aug
21.	*Lachenalia bulbifera*	Soldiers	Two small patches in degraded areas – dig out making sure to remove all bulbils.	July - Aug
22.	*Lagurus ovatus*	Hare's Tail Grass	Prevent seed set. Hand removal small isolated infestations. In selective situations spray with 16 ml/10 L (800 ml/ha) Fusilade Forte + spray oil any time before flowering. A lower rate of 13 ml/10 L Fusilade Forte can be used in winter at the 2-8 leaf stage before stem elongation.	June - Aug
23.	*Lupinus angustifolius*	Narrowleaf Lupin	Manually remove populations.	June - Oct
24.	*Lupinus cosentinii*	Sandplain Lupin	Manually remove populations.	June - Oct
25.	*Lycium ferocissimum*	African Boxthorn	Hand pull or dig out small seedlings ensuring removal of all roots. For mature plants cut and paint with 50% glyphosate and follow up treatment on regrowth or apply 250 ml Access in 15 L of diesel to basal 50 cm of stem (basal bark).	March – May Sept-Nov
26.	*Olea europaea*	Olive	Hand pull or dig out seedlings and small plants ensuring removal of all roots. For mature plants cut to base and paint 50% glyphosate or apply 250 ml Access in 15 L of diesel to base 50 cm of trunk (basal bark). Monitor sites for seedling recruitment.	March – May and Oct - Dec
27.	*Pelargonium capitatum*	Rose Pelargonium	Only control when native vegetation has established. Hand pull isolated plants taking care to remove the entire stem as it can reshoot from below ground level. Spot spray metsulfuron methyl 5 g/ha + Pulse. Easily controlled after fire.	June - Oct
29.	*Pennisetum clandestinum*	Kikuyu Grass	Difficult to manually control as all rhizomes must be removed. Spray with 1% glyphosate or Fusilade Forte at 16mL/L + wetting agent. 2-3 sprays over a single growing season are often required. Use unplanned fire events to effectively control regrowth.	Nov - Jan
30.	*Raphanus raphanistrum*	Wild Radish	Manually remove populations.	June - Oct
31.	*Schinus terebinthifolia*	Brazilian Pepper	Hand pull seedlings ensuring removal of all root material. Stem inject older plants using 50% glyphosate or basal bark with 250 ml Access in 15 L of diesel to bottom 50 cm of trunk during summer. Avoid root disturbance until trees are confirmed dead.	Dec - March

	Species Name	Common Name	Management Strategy	Timing (optimal)
32.	*Tamarix aphylla*	Athel Pine	Inject 100% glyphosate into root crown. In pasture or degraded areas, manually removal all plant parts and follow up control any regrowth. In sensitive environments, cut stem to ground level, immediately paint with Access 17ml/L in diesel (using glyphosate with cut stump is ineffective). Where there is limited risk of off-target damage or impacts on waterways try foliar spray with triclopyr 600g/L at 1.7 to 10ml/L in water.	All year.
33.	*Trachyandra divaricata*	Dune Onion Weed	Only control when native vegetation has established. Manually remove isolated or small infestations prior to flowering. Wipe with 50% glyphosate solution before flowering. For dense infestations in degraded areas spot spray 0.4 g chlorosulfuron plus 25 ml wetting agent in 10 L of water when plants actively growing.	June - August

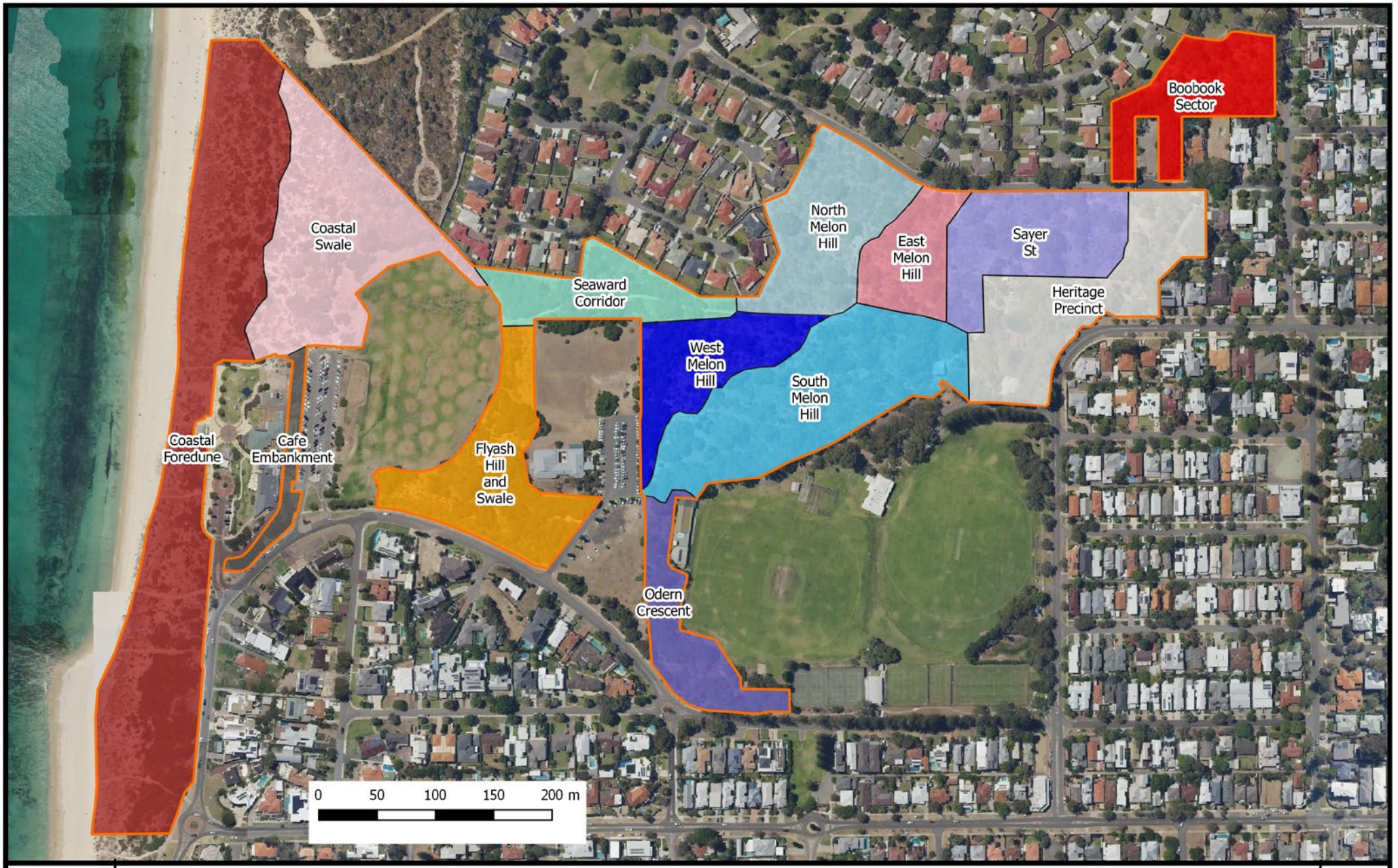
Appendix 5: Implementation of the 2013-2018 Management Plan.

ACTIONS		IMPLEMENTED
MANAGEMENT BOUNDARIES		
1.	Manage Allen Park on the basis two sectors and twelve sub sectors in conjunction with the Friends of Allen Park and the Swanbourne Coastal Alliance.	Yes
2.	Include Jones Park, the embankment behind the Naked Fig Cafe, the Allen Park Pavilion Peppermint Grove and Lot 150 as potential future management areas within Allen Park.	Yes
REHABILITATION		
3.	Focus rehabilitation on *Good* condition bushland and Degraded areas directly adjacent to Good bushland condition as a priority.	Yes
4.	Develop a rehabilitation plan to prioritise sensitive environments based on their susceptibility to erosion.	Partially
5.	Any asbestos material found in the bushland should be left alone and reported to the City.	Yes
REVEGETATION		
6.	Work with local nurseries to grow species found in low abundance.	Yes
7.	Only plant overstorey species in areas where Black Flag is present.	Yes
8.	Due to maintenance issues no further planting of *Acacia rostellifera* or *Acacia cyclops* should occur on sectors east of the dog exercise oval.	Yes
WEED CONTROL		
9.	Annually monitor weeds with the potential to expand rapidly and map changes in their distribution if required.	Partially
10.	Monitor, control and document the distribution of new invasive weeds as they arise.	Yes
11.	Control priority weeds in accordance with management notes detailed in Appendix 4.	Yes
12.	Maintain vigilance on alert weeds such as Tambookie Grass, Coast Teatree and White Broom so that they do not establish populations within Allen Park.	Yes
13.	Do not use herbicides in bushland sectors to control *Oxalis* and Fumitory.	No
14.	Where native vegetation exists, mature Black Flag plants that have the potential to set seed should be hand wiped with herbicides to stop them from seeding.	Partially
15.	Seek funding to undertake an intensive control program of *Pelargonium capitatum*.	Yes
WEED CONTROL – Coastal Swale and Foredunes		
16.	Control the following weeds as a priority: Geraldton Carnation Weed, Sea Spurge, *Trachyandra divaricata*, *Tamarix*, *Pelargonium*, woody weeds and *Lupinus*.	Yes
17.	To reduce erosion only undertake weed control in areas	Yes

	ACTIONS	IMPLEMENTED
	with sufficient vegetation cover or as part of an intensive restoration project.	
18.	Work with the Department of Defence to undertake control of priority weeds on adjacent land.	Yes
WEED CONTROL – North, East, South and West Melon Hill, the Boobook Sector, the Heritage Precinct, Sayer Street, Odern Crescent, Flyash Hill and Gully and the Seaward Corridor		
19.	Control the following weed as a priority: Geraldton Carnation Weed, Bridal Creeper, Marguerite Daisy, African Cornflag, Perennial Veldt Grass, Annual Veldt Grass, Wild Oats, Black Flag, *Freesia*, Fumitory, woody weeds and *Pelargonium*.	Yes
20.	Do not remove the *Tamarix* population on Flyash Hill unless as part of an intensive restoration project.	Yes
21.	Continue to collaborate with the Department of Defence for weed management on Melon Hill.	Yes
22.	Focus resources for Pretty Betsy control on Flyash Hill, Odern Crescent and the Boobook Sectors.	Yes
23.	Treat the Seaward Corridor and the Heritage Precinct as ongoing maintenance areas for weed control.	Yes
24.	Retain mature specimens of Coast Teatree (on Lot 150 Sayer Street) until sufficient habitat is established for resident Fairy-wrens.	Yes
25.	Retain mature specimens of Geraldton Wax (on Lot 150 Sayer Street) until sufficient habitat is established for resident Fairy-wrens and remove juvenile seedlings as required.	Yes
FIRE MANAGEMENT		
26.	Access tracks should be modified to better suit firefighting vehicles where possible.	No
27.	Work with the Department of Defence to install a vehicle access firebreak behind Defence houses on Melon Hill.	No
ACCESS		
28.	Install bollards on Sayer Street (adjacent to Defence Housing) and the Seaward Corridor (adjacent to the dog exercise oval) to stop informal and illegal access.	Partially
CULTURAL HERITAGE, INTERPRETATION AND EDUCATION		
29.	Provide a map of Allen Park with indigenous names on the notice board and at the crossing near the Boobook Sector.	Yes
30.	Change the wording of Friends of Allen Park rehabilitation signs to state they are demonstration sites.	No
31.	Assess the effectiveness of the relocation of dog poo bins on Melon Hill. If they are unsuccessful consider undertaking a community education program about the disturbance dogs can cause the bushland.	Yes
32.	Undertake maintenance to the existing vandalised “Let it Grow” signs.	Yes

	ACTIONS	IMPLEMENTED
33.	Install entry statements at the western entrance to the Seaward Corridor and at the entrance to Melon Hill on Sayer Street.	Yes
34.	Maintain the “Access Prohibited” signs on Melon Hill for their historical value.	Yes
NATIVE ANIMALS		
35.	Develop a map to monitor Native Pellitory distribution and abundance and continue a program of establishing Native Pellitory as food and habitat for the Yellow Admiral Butterfly.	Yes
36.	Survey native fauna, including invertebrates of high conservation value, at regular intervals, when funding is available.	Partially
37.	Minimising fires that may destroy tree hollows.	Yes
38.	Retain hollows for refuges in large old and dead trees.	Yes
39.	Control feral European Bees as they can displace native animals.	Yes
40.	Protect the nests of Rainbow Bee-eaters if they are encountered.	Yes
41.	Continue the fox control program.	Yes
42.	Contribute to regional programs being undertaken for feral bird control.	Partially

Appendix 6
Maps



Map 1: Management Zones

Allen Park Bushland Management Plan 2019-2024

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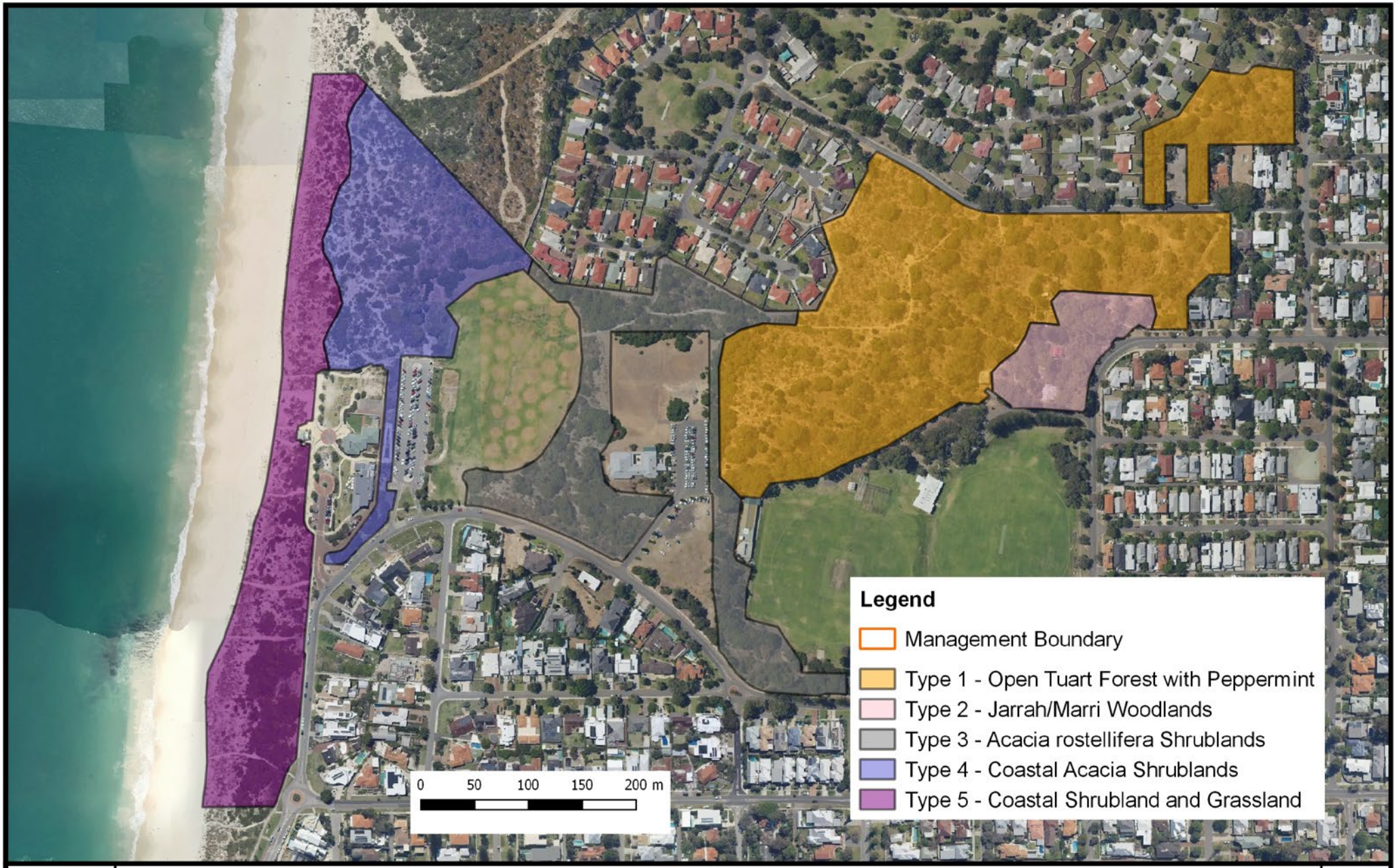

Map 2: Vegetation Communities

Allen Park Bushland Management Plan 2019-2024

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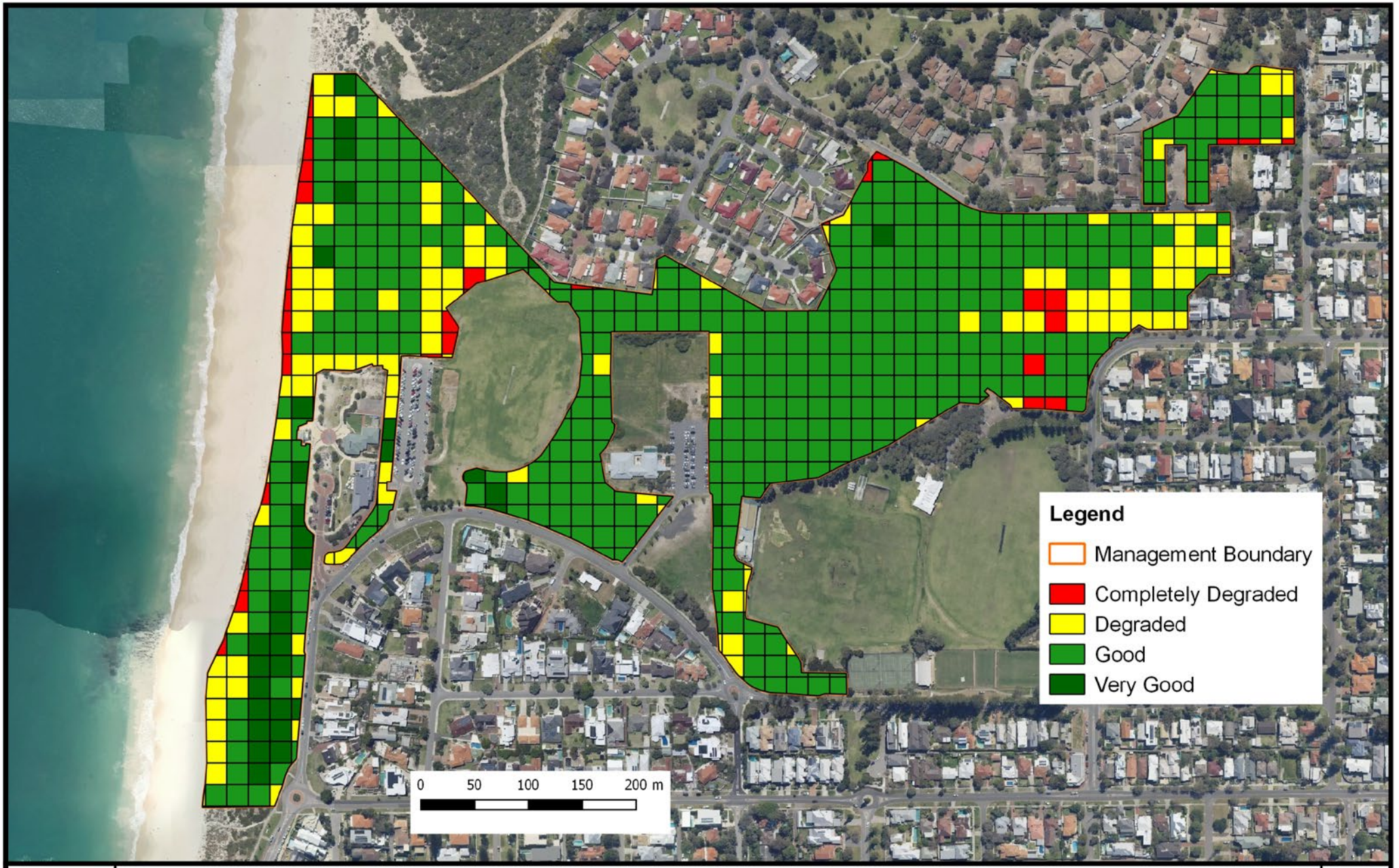

Map 3: Bushland Condition

Allen Park Bushland Management Plan 2019-2024

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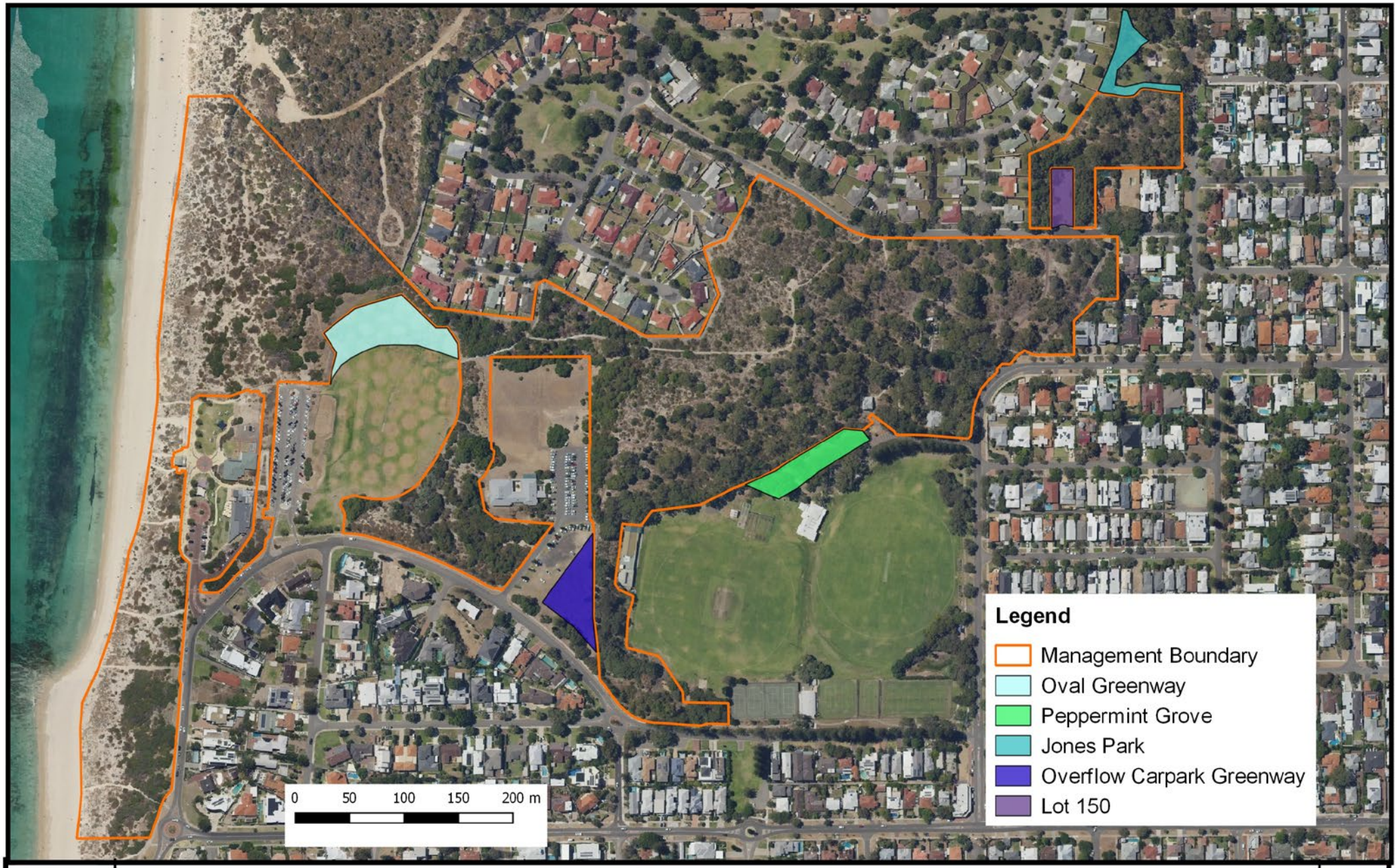

Map 4: Potential Future Natural Areas

Allen Park Bushland Management Plan 2019-2024

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Map 5: Fire History

Allen Park Bushland Management Plan 2019-2024

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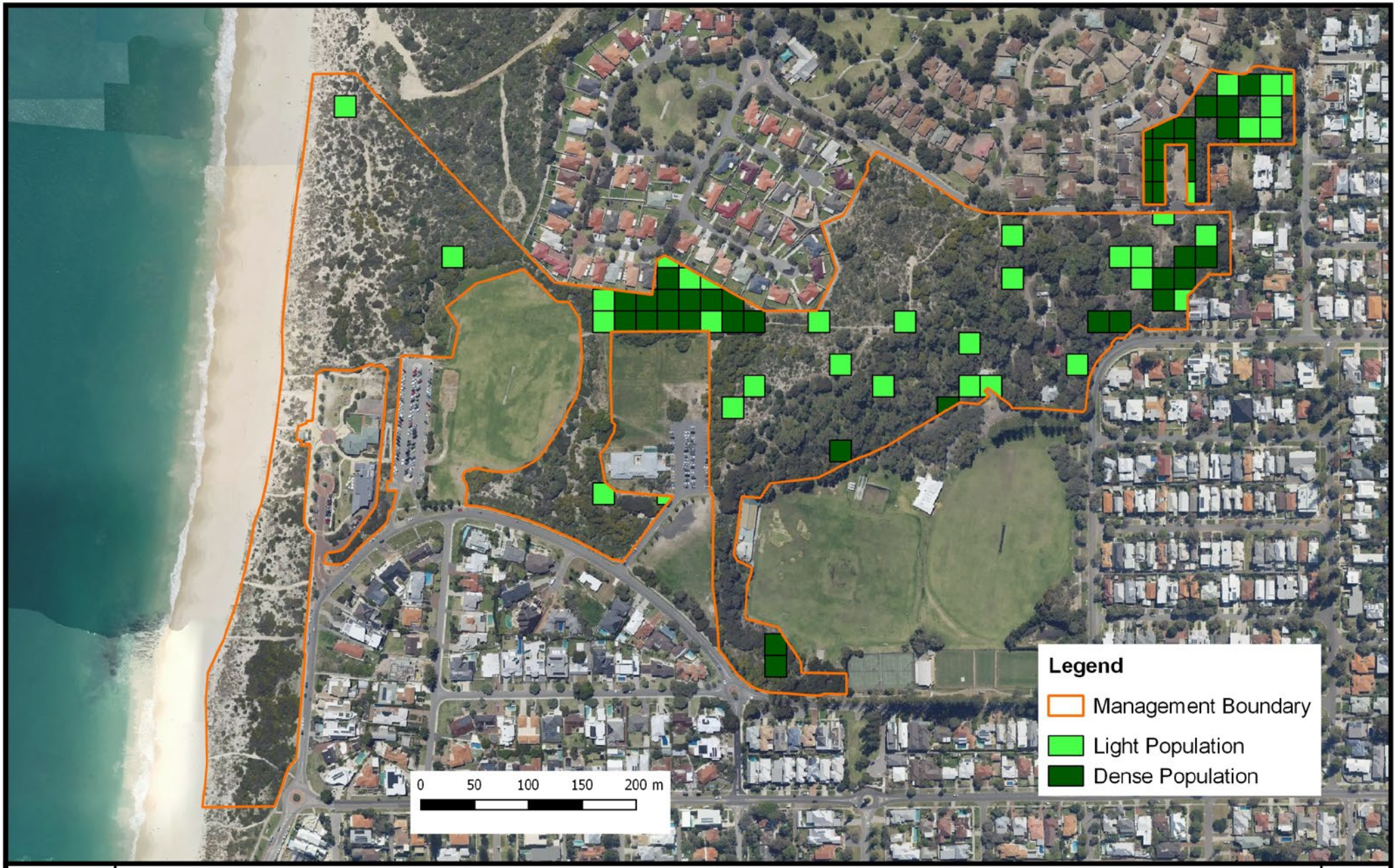

Map 6: *Parietaria cardiostegia* - Native Pellitory

Allen Park Bushland Management Plan 2019-2024

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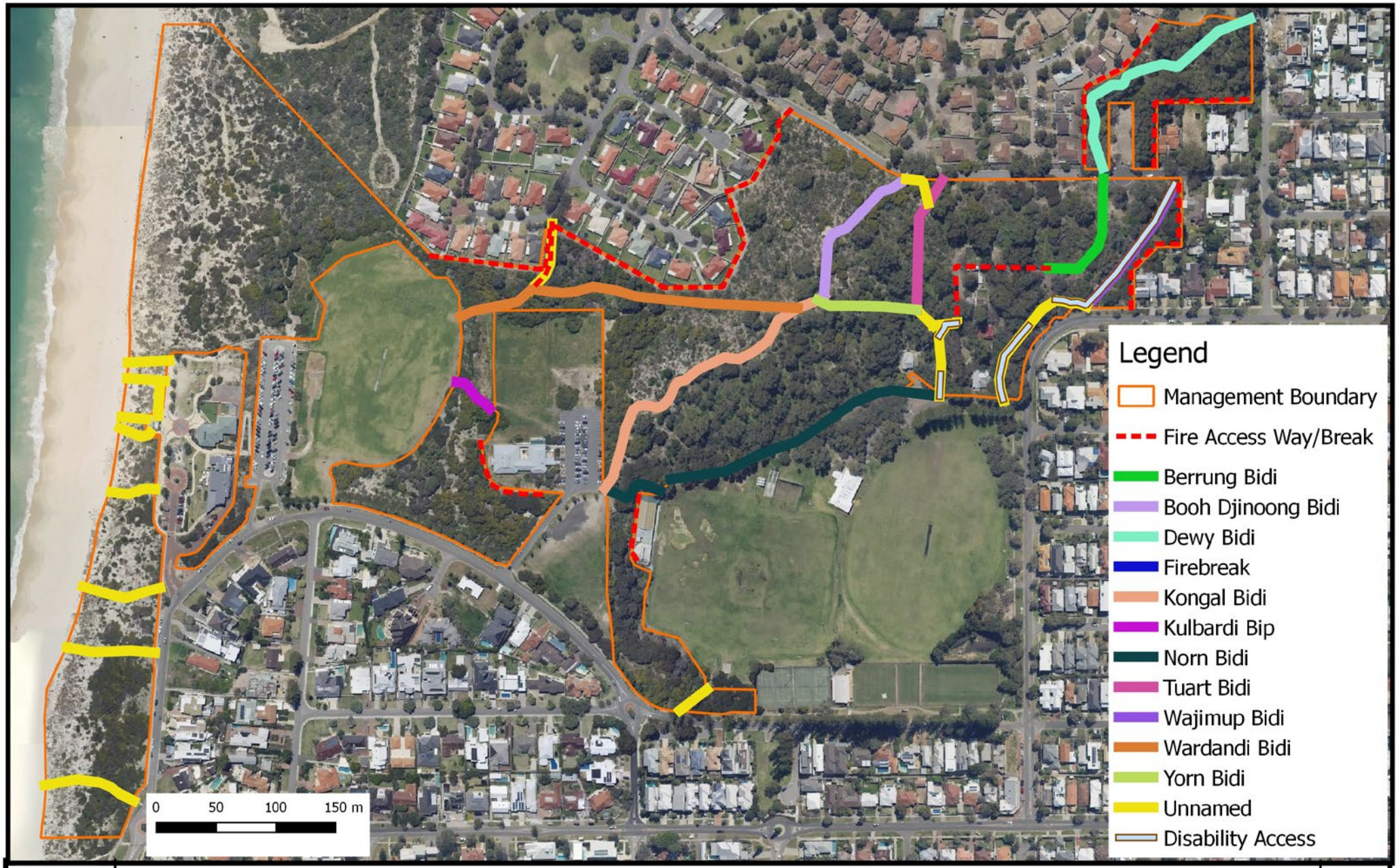

Map 7: Walking Tracks

Allen Park Bushland Management Plan 2019-2024

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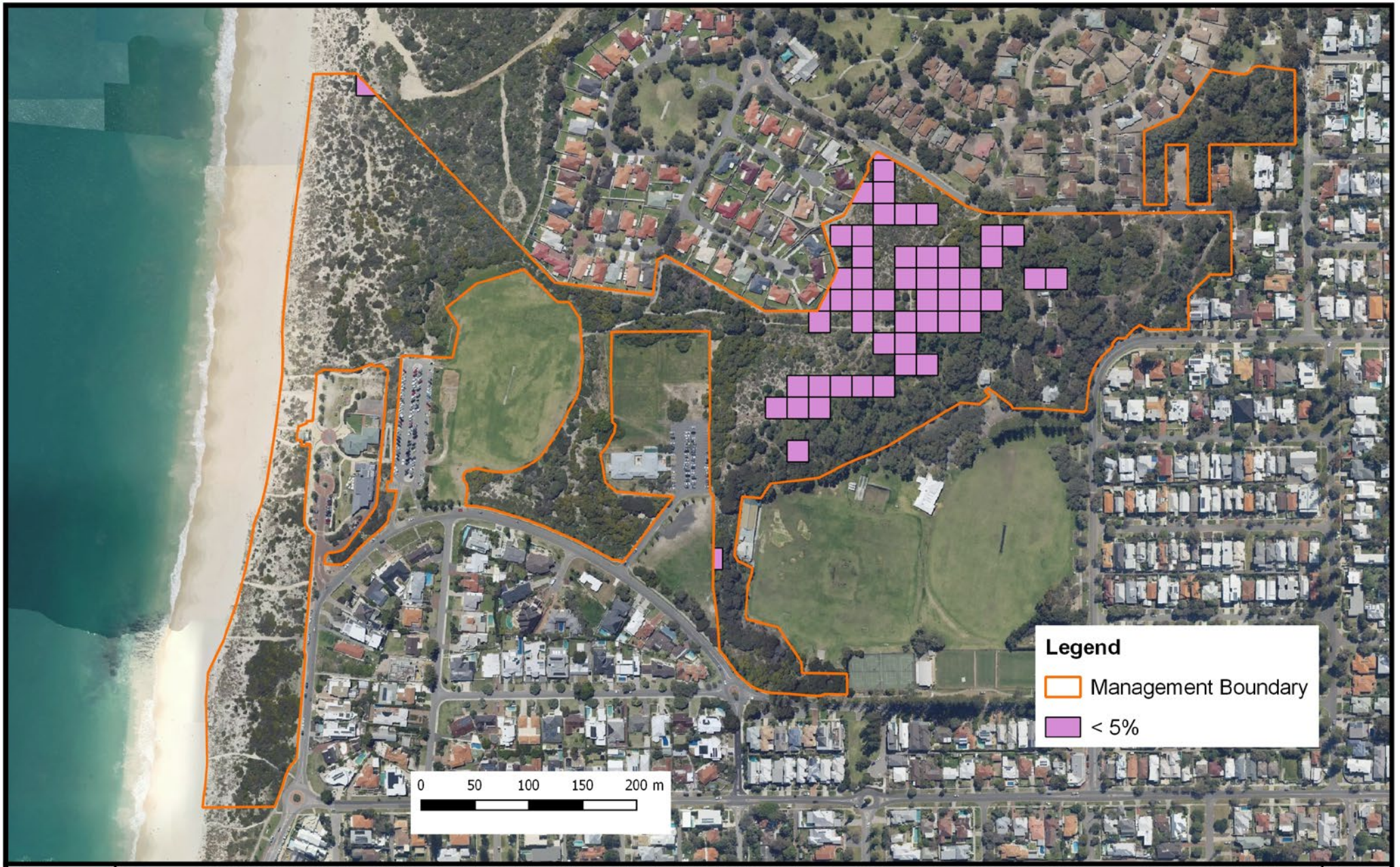

Map 8: *Argyranthemum Frutescens* - Marguerite Daisy

Allen Park Bushland Management Plan 2019-2024

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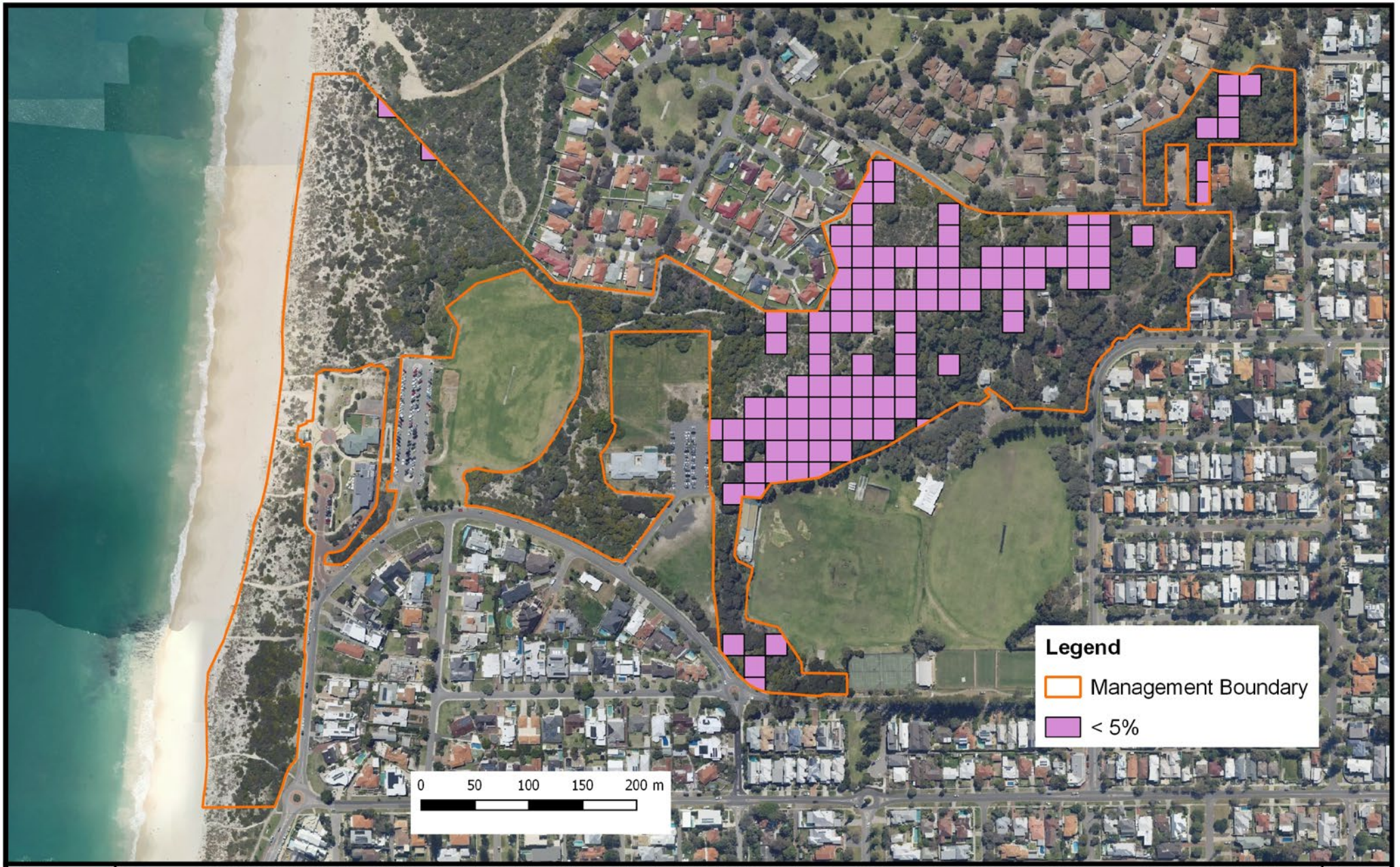

Map 9: *Asparagus asparagoides* - Bridal Creeper

Allen Park Bushland Management Plan 2019-2024

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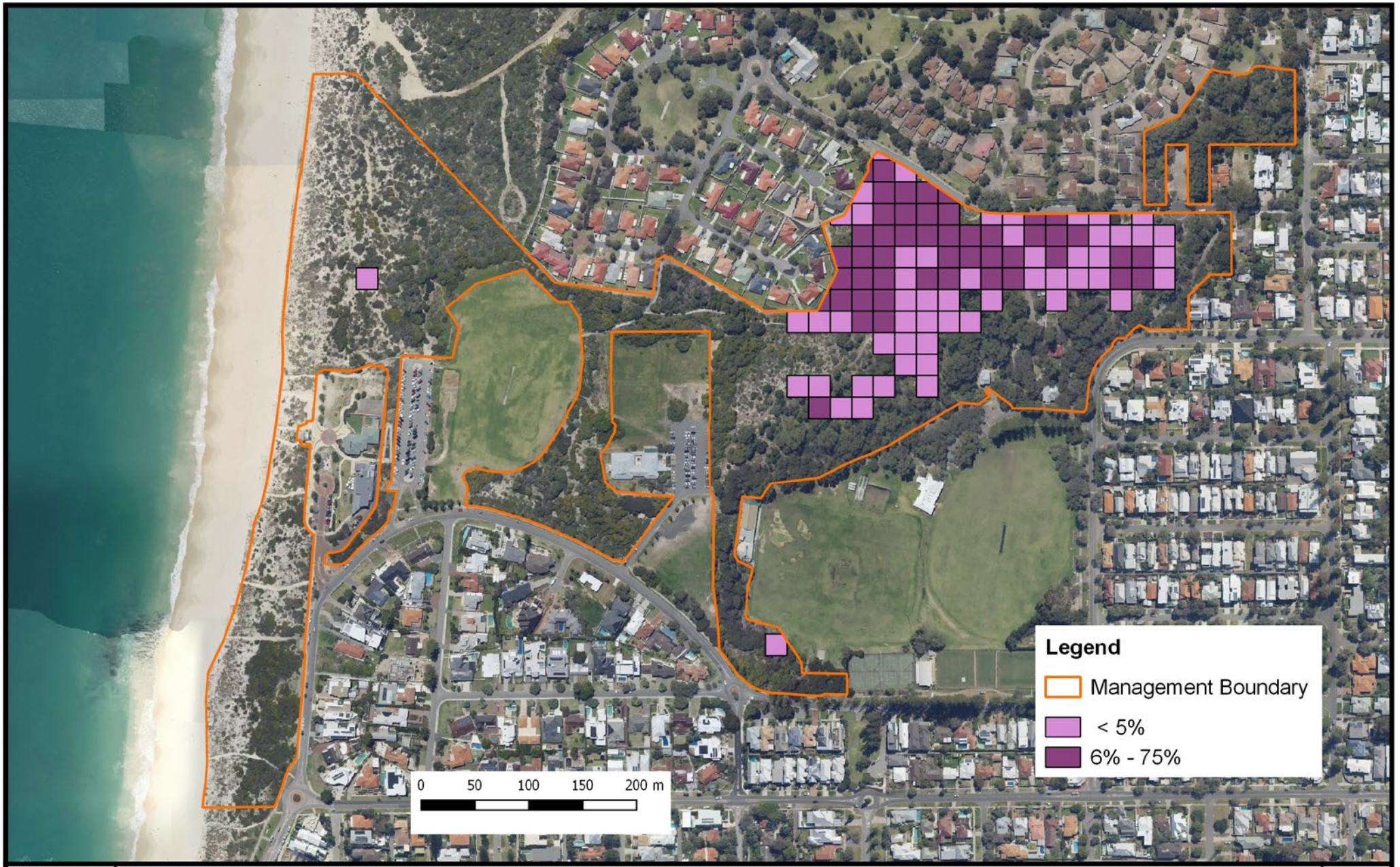

Map 10: *Centranthus macrosiphon* - Pretty Betsy

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\\admgisserv01\Management Plan Maps\QGIS\New Base Projects\Argyranthemum Frutescens - Marguerite Daisy.qgs

Map 11: *Chasmanthe Floribunda* - African Cornflag

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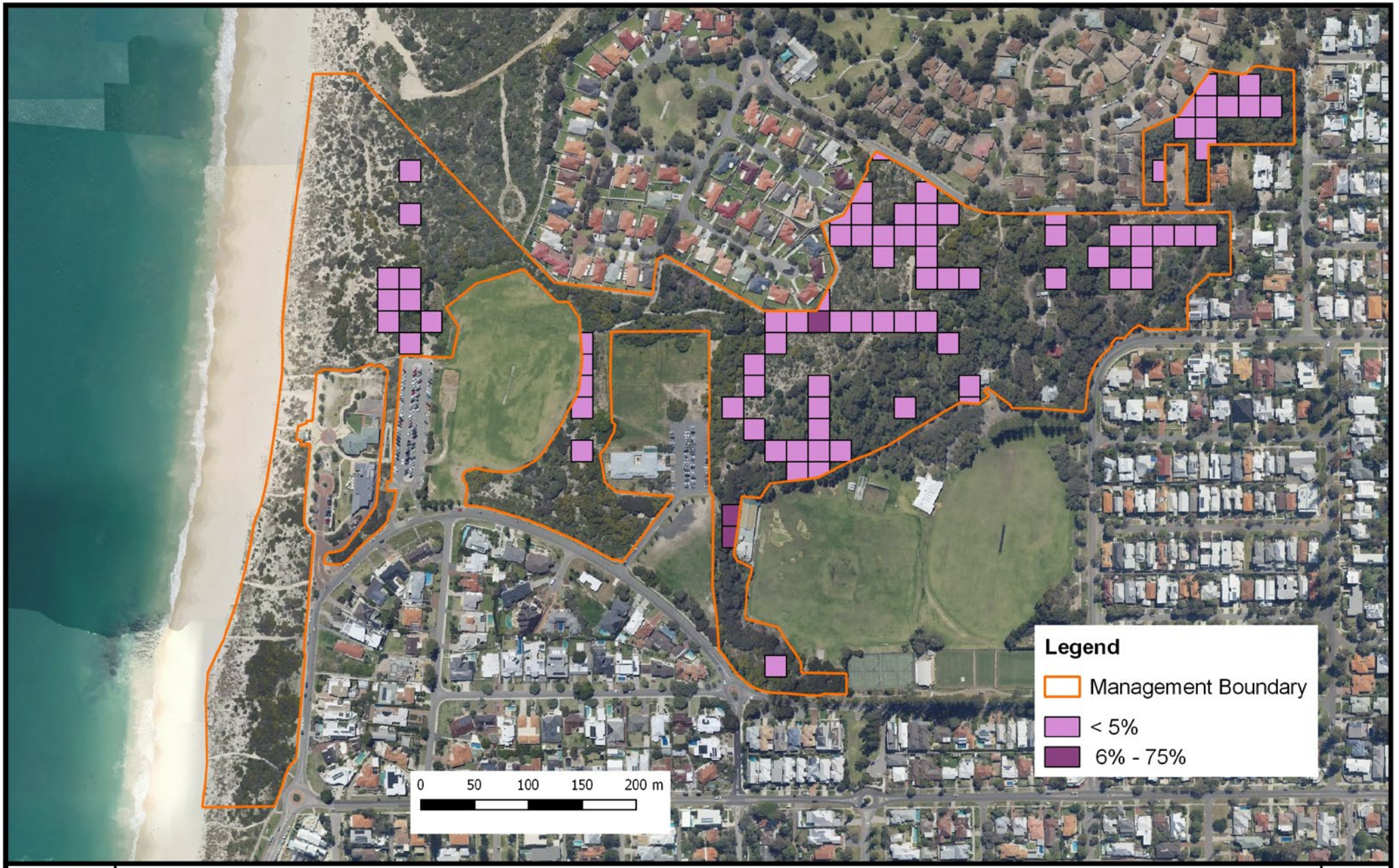
\\admgisserv01\Management Plan Maps\QGIS\New Base Projects\Pretty Betsy.qgs

Map 12: Presence of *Cardamine hirsuta* - Flickweed

Allen Park Bushland Management Plan 2019-2024

\\acmgisserv01\Management Plan Maps\QGIS\New Base Projects\Allen Park\Allen Park Woody Weeds.qgs



Map 13: *Ehrharta calycina* - Perennial Veldt Grass

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\\admgisserv01\Management Plan Maps\QGIS\New Base Projects\Annual Veldt Grass.qgs

Map 14: *Euphorbia paralias* - Sea Spurge

Allen Park Bushland Management Plan 2019-2024

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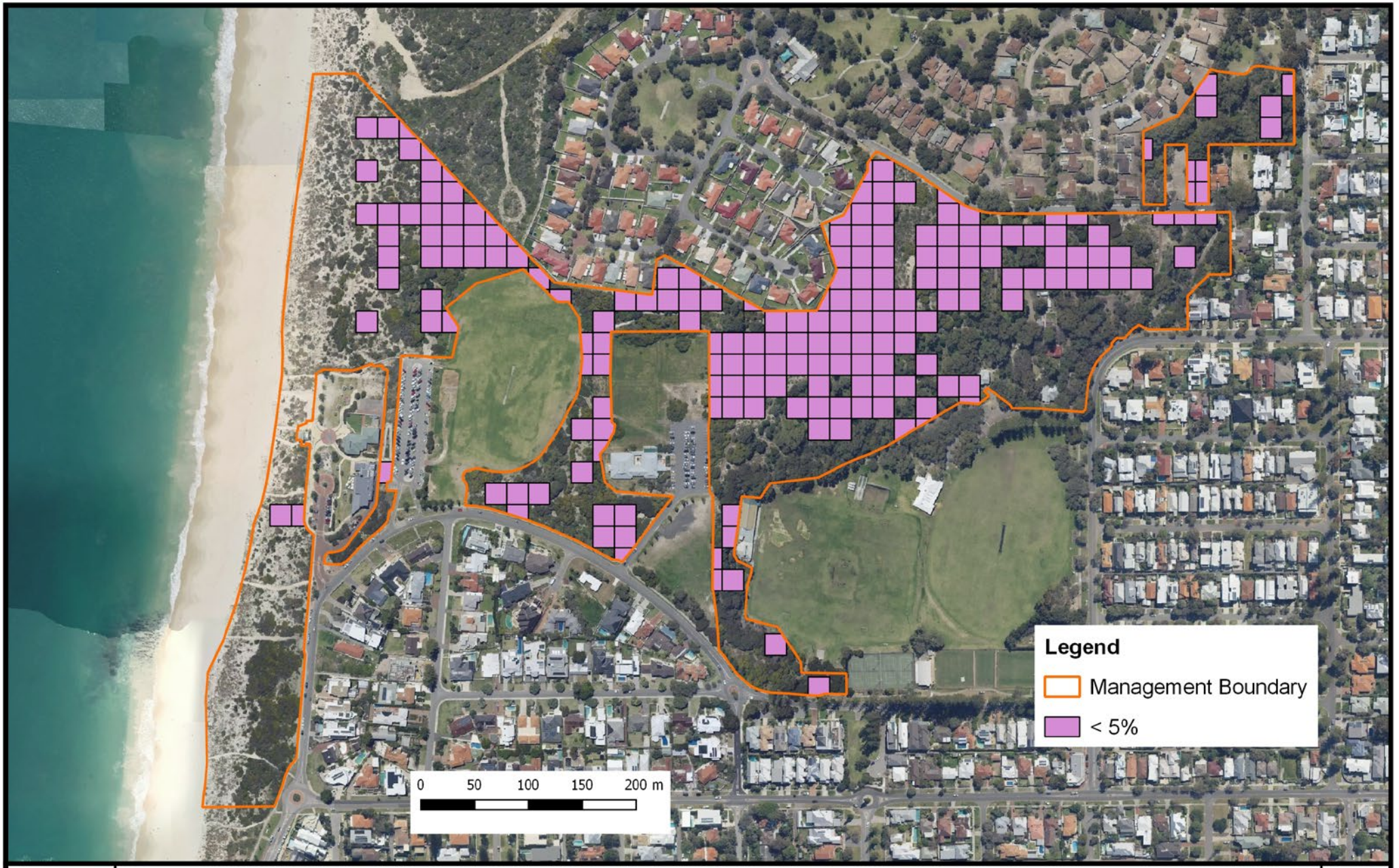

Map 15: E*uphorbia terracina* - Geraldton Carnation Weed

Allen Park Bushland Management Plan 2019-2024

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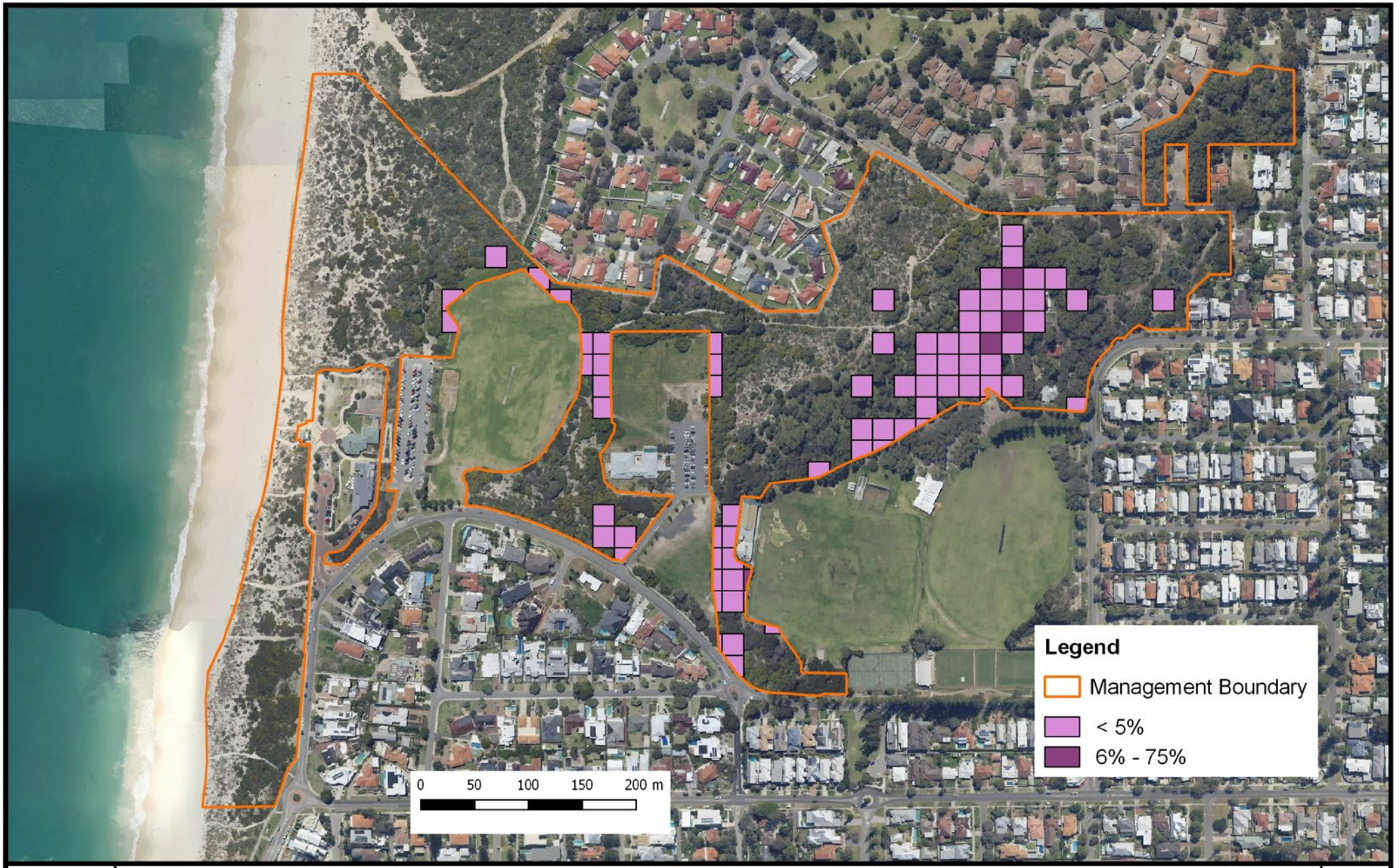

Map 16: *Ferraria crispa* - Black Flag

Allen Park Bushland Management Plan 2019-2024

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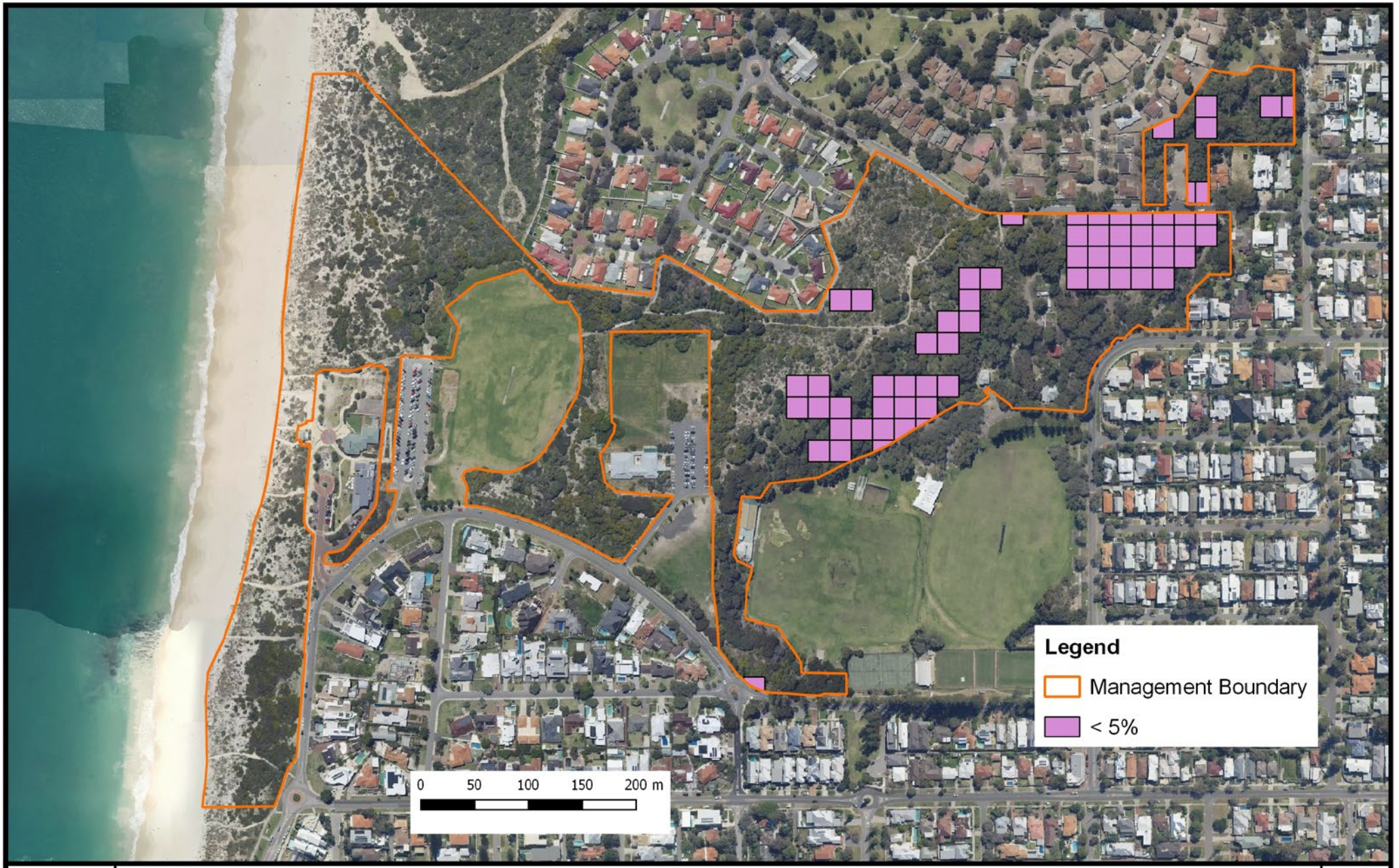

Map 17: *Freesia alba × leichtlinii - Freesia*

Allen Park Bushland Management Plan 2019-2024

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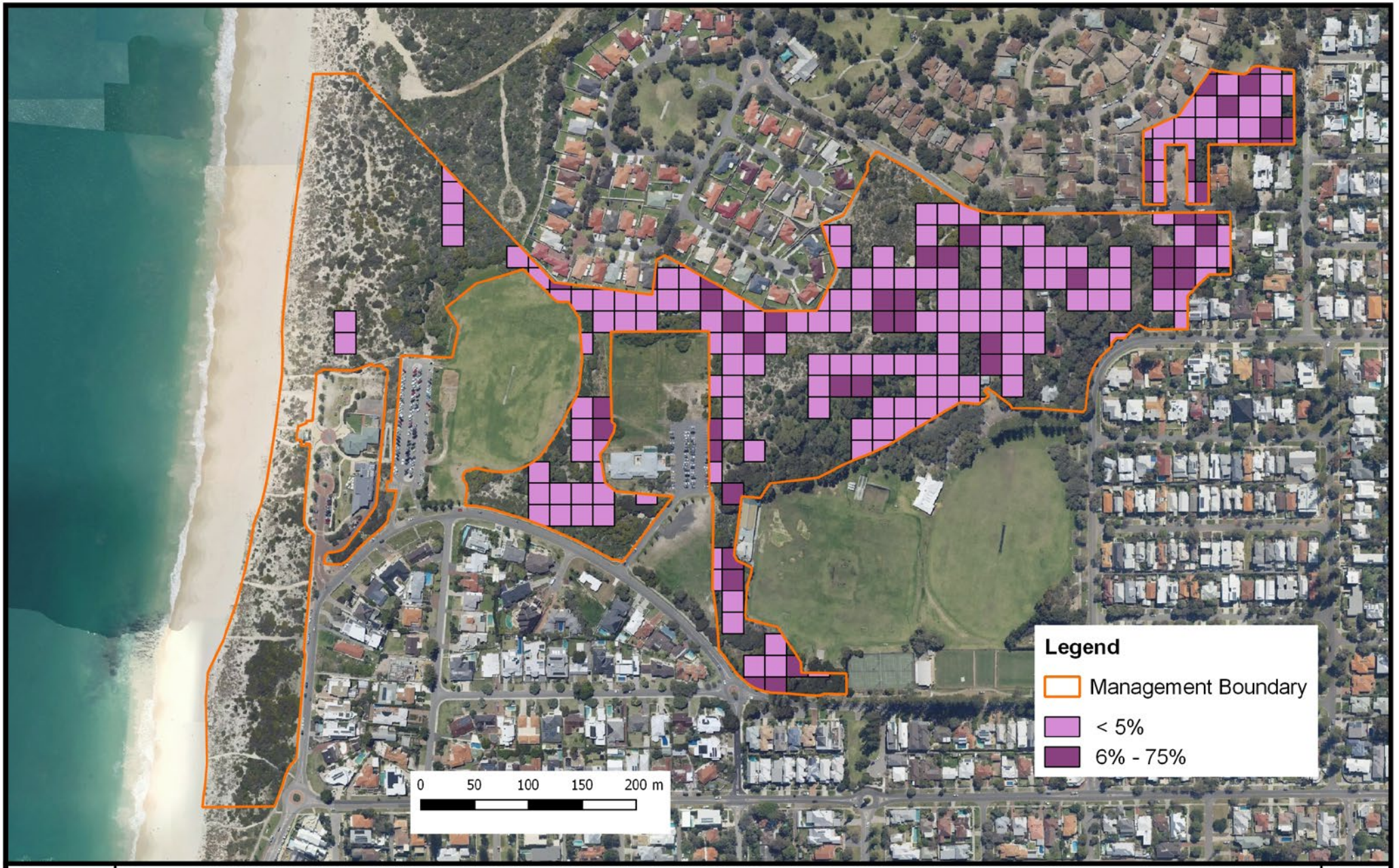

Map 18: *Fumaria* - Fumitory

Allen Park Bushland Management Plan 2019-2024

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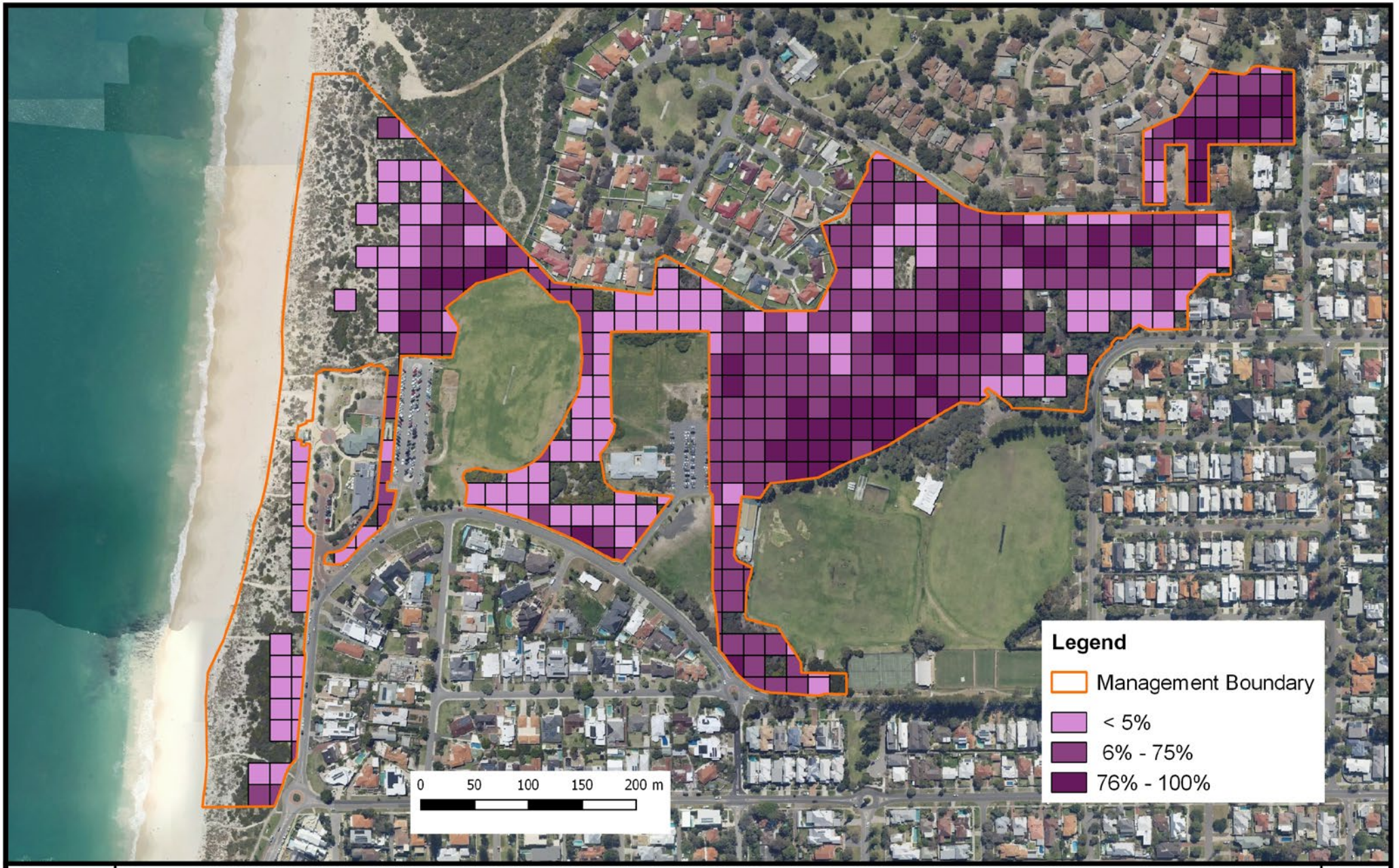
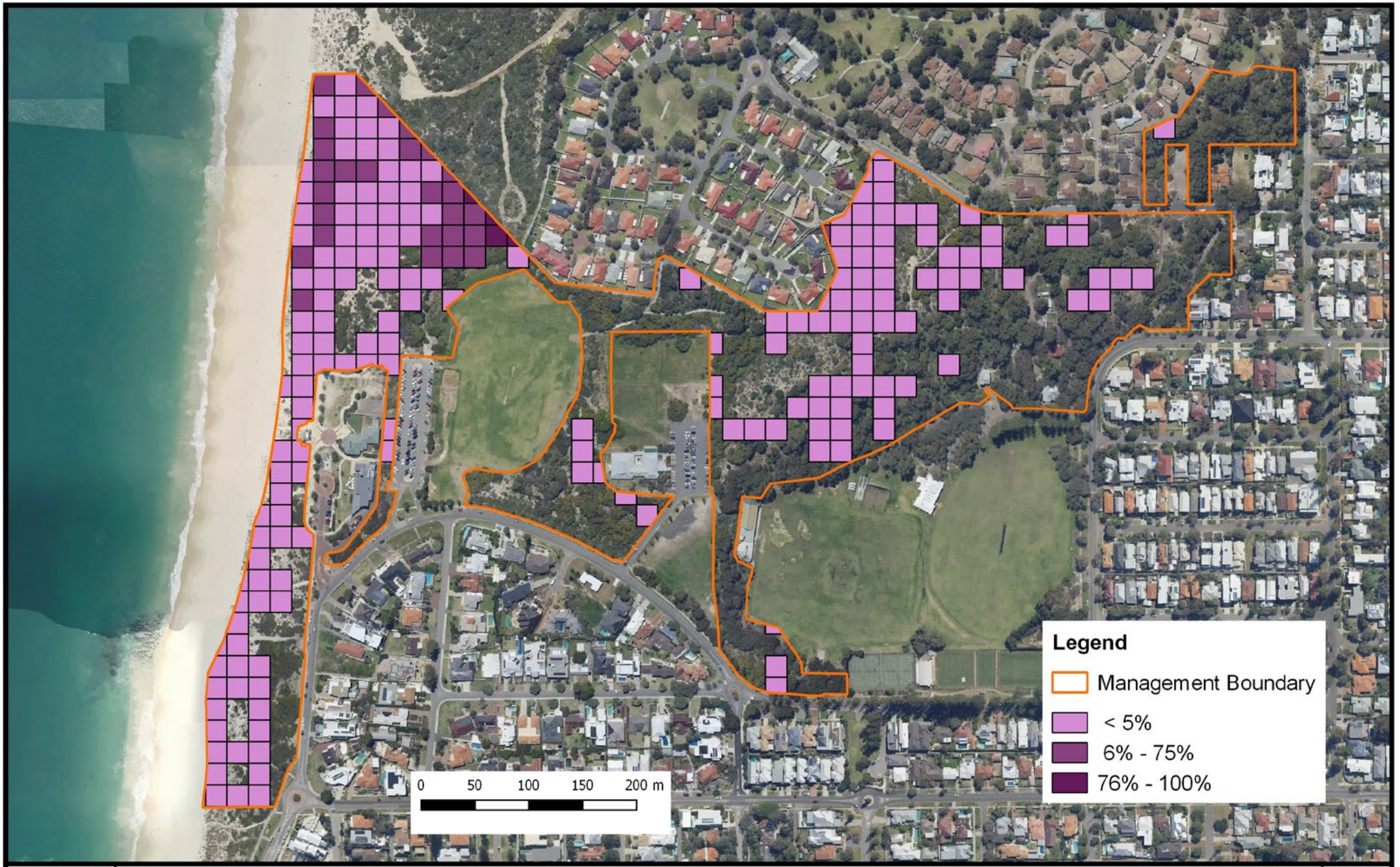


Map 19: *Oxalis* - Soursob

Allen Park Bushland Management Plan 2019-2024

\\acmgisserv01\Management Plan Maps\QGIS\New Base Projects\Moraea flaccida (One – leaf Cape Tulip) Allen Park.qgs



Map 20: *Pelargonium capitatum* - Rose Pelargonium

Allen Park Bushland Management Plan 2019-2024

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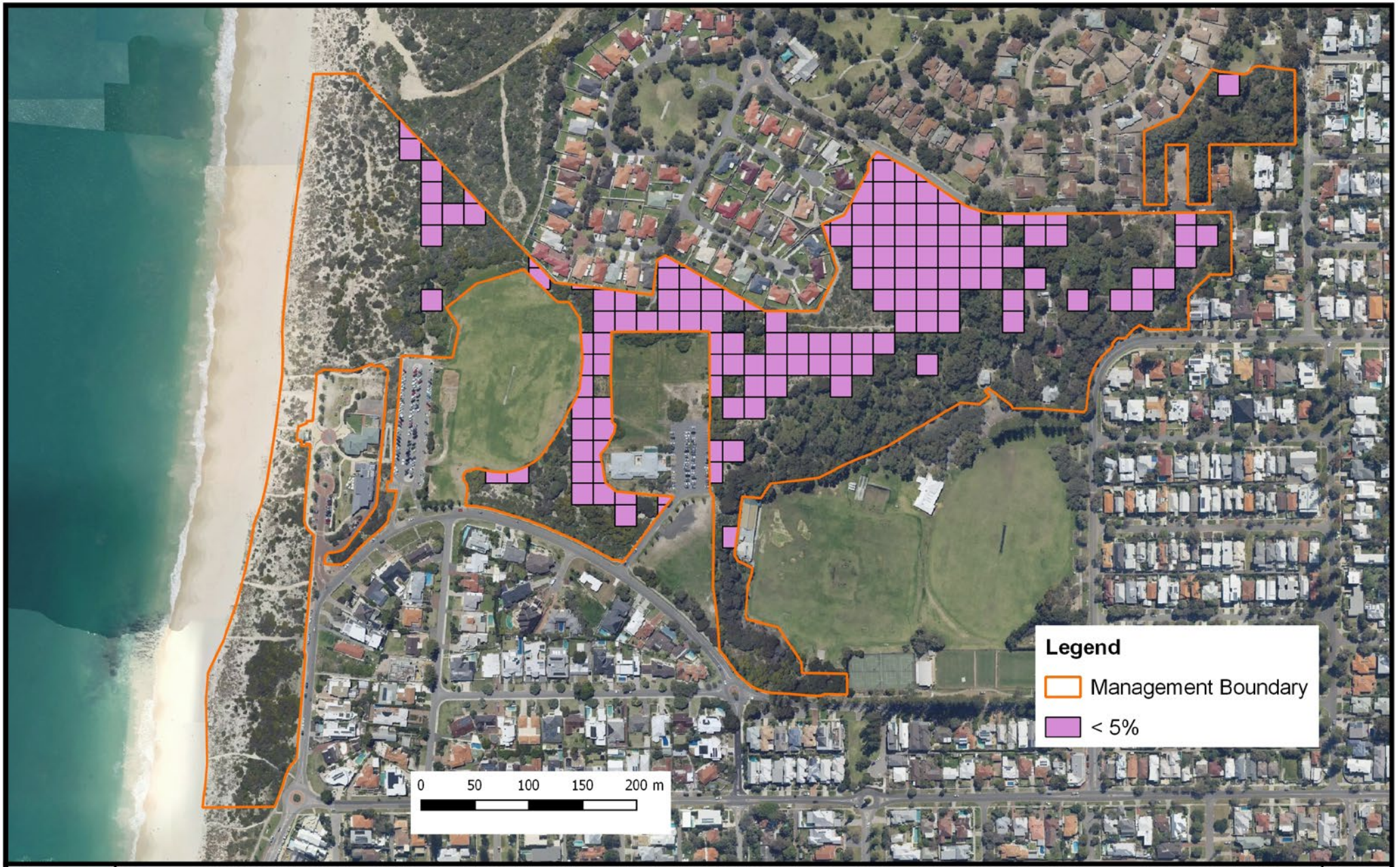

Map 21: *Raphanus raphanistrum* and *Brassica* - Wild Radish and Brassicas

Allen Park Bushland Management Plan 2019-2024

\\admgisserv01\Management Plan Maps\QGIS\New Base Projects\Wild Radish and Brassica sp.qgs

Map 22: Woody Weeds

Allen Park Bushland Management Plan 2019-2024

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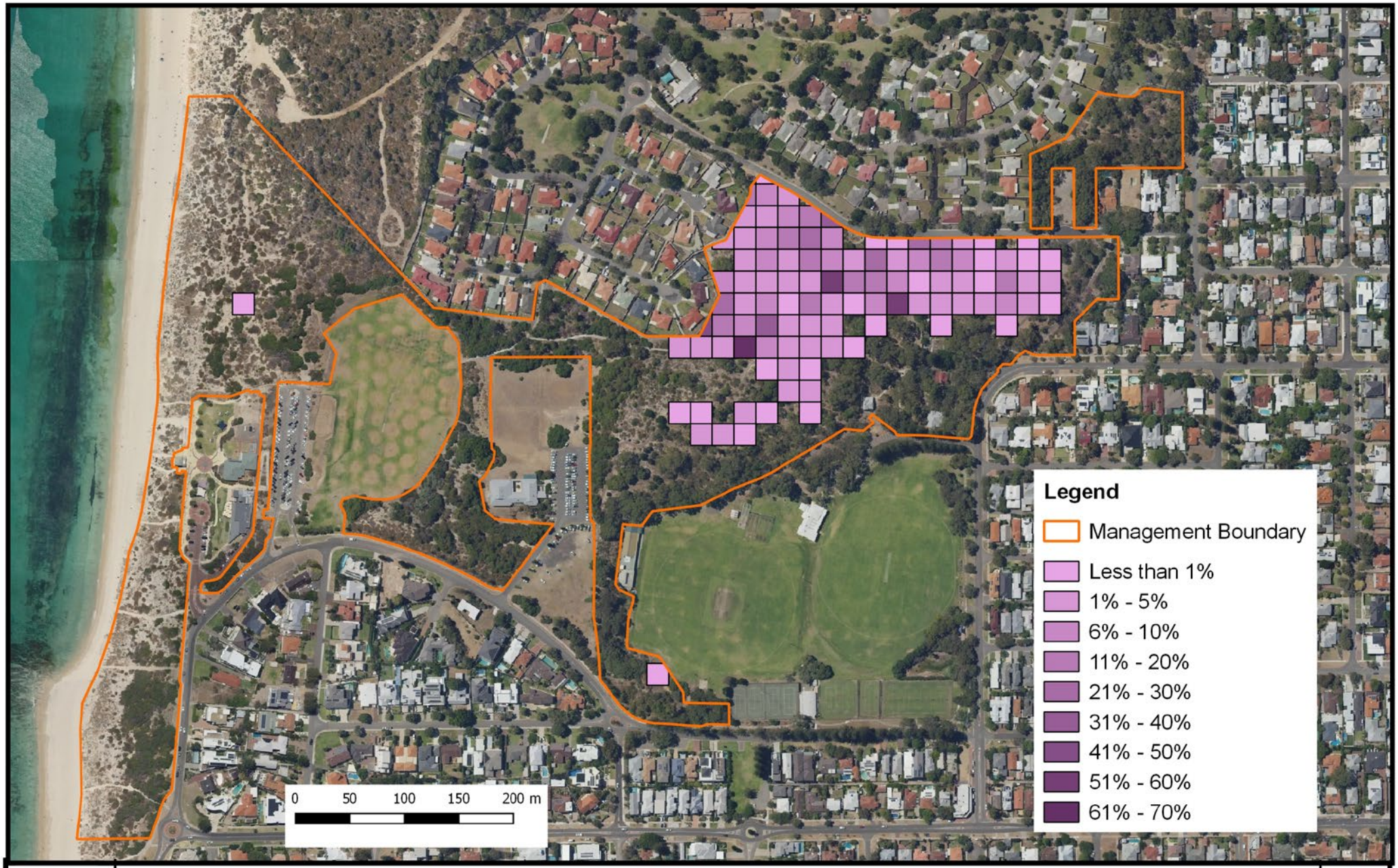

Map 23: *Centranthus macrosiphon* - Pretty Betsy Actual Cover

Allen Park Bushland Management Plan 2019-2024

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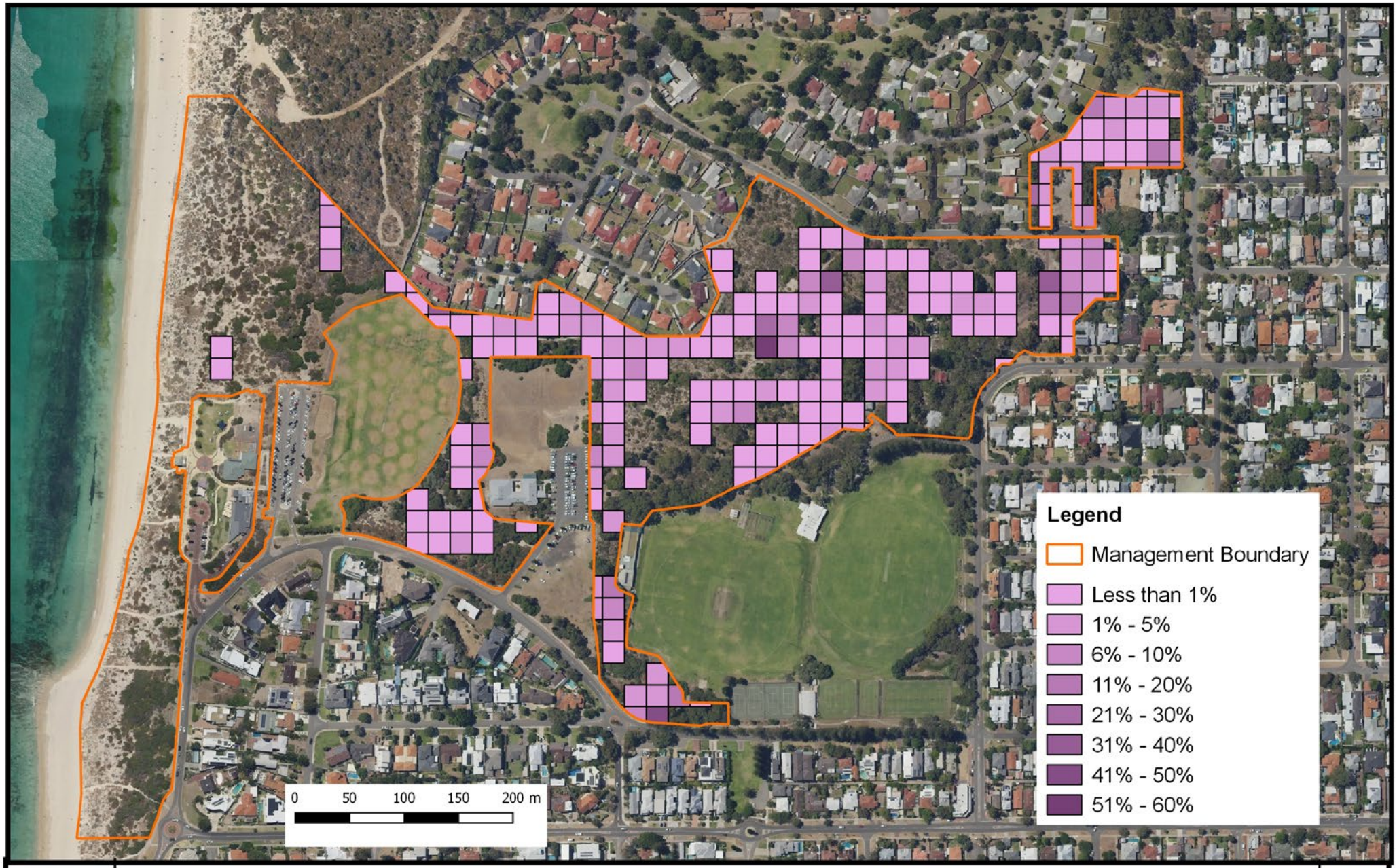

Map 24: *Fumaria* – Fumitory Actual Cover

Allen Park Bushland Management Plan 2019-2024

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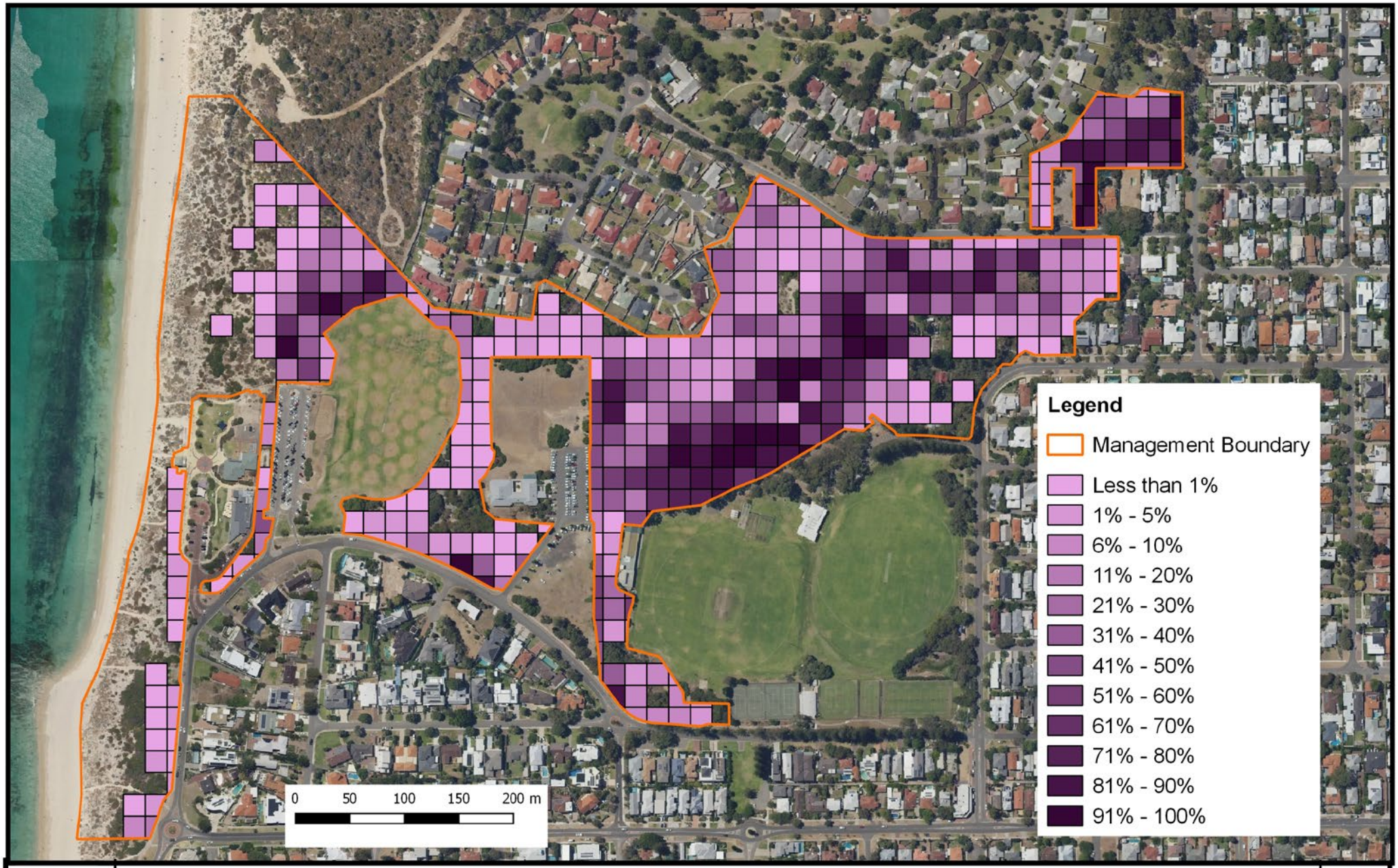
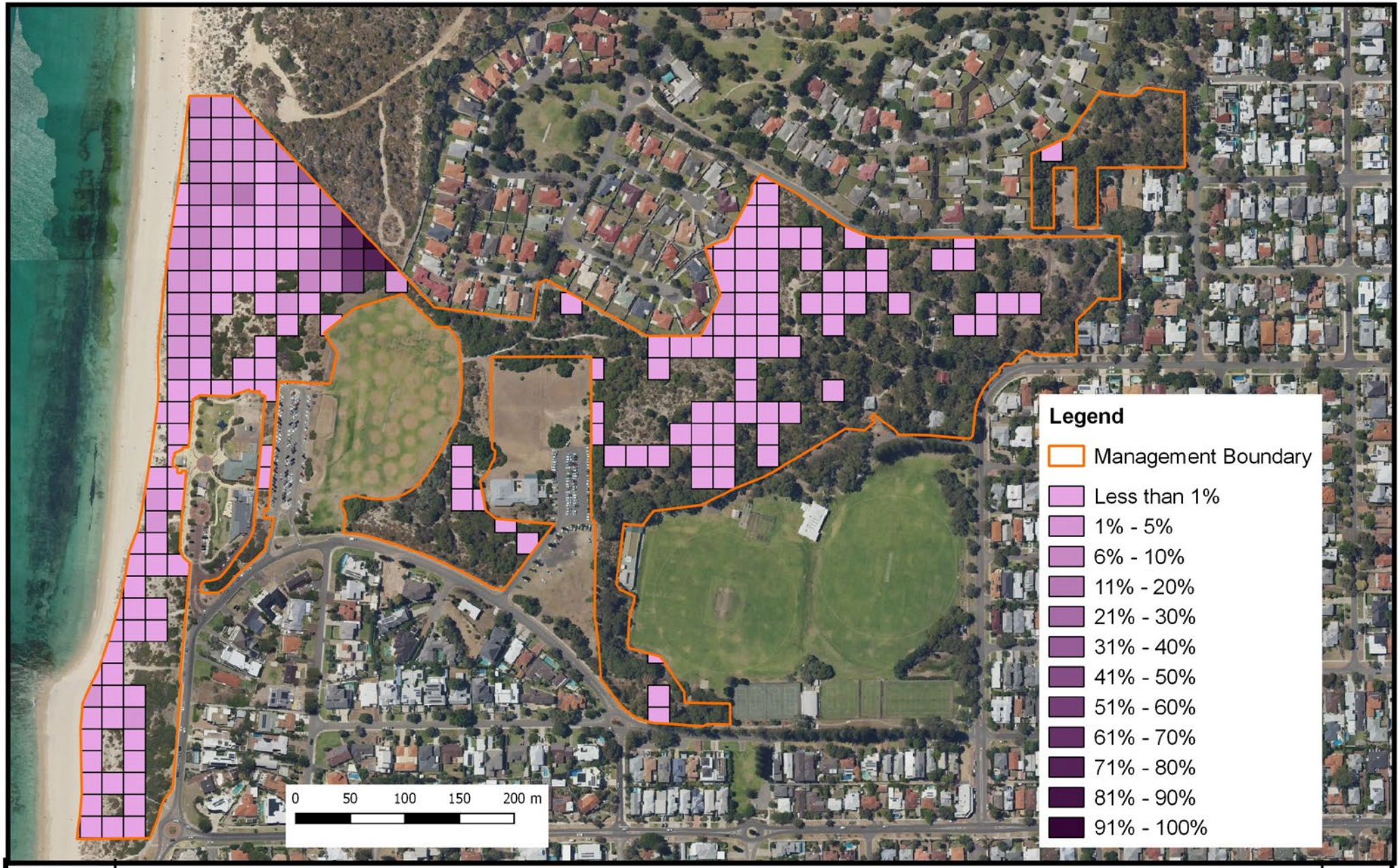


Map 25: Actual Cover *Oxalis* - Soursob

Allen Park Bushland Management Plan 2019-2024

\\admgisserv01\Management Plan Maps\QGIS\New Base Projects\Allen Park\Allen Park Fumaria sp – Fumitory Actual Cover .qgs



Map 26: Actual Cover *Pelargonium capitatum* - Rose Pelargonium

Allen Park Bushland Management Plan 2019-2024

\\admgisserv01\Management Plan Maps\QGIS\New Base Projects\Allen Park\Allen Park - Actual Cover Centranthus macrosiphon - Pretty Betsy.qgs

Appendix 7
Natural Areas Management Plan 2019-2024

City of Nedlands

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