City of Nedlands

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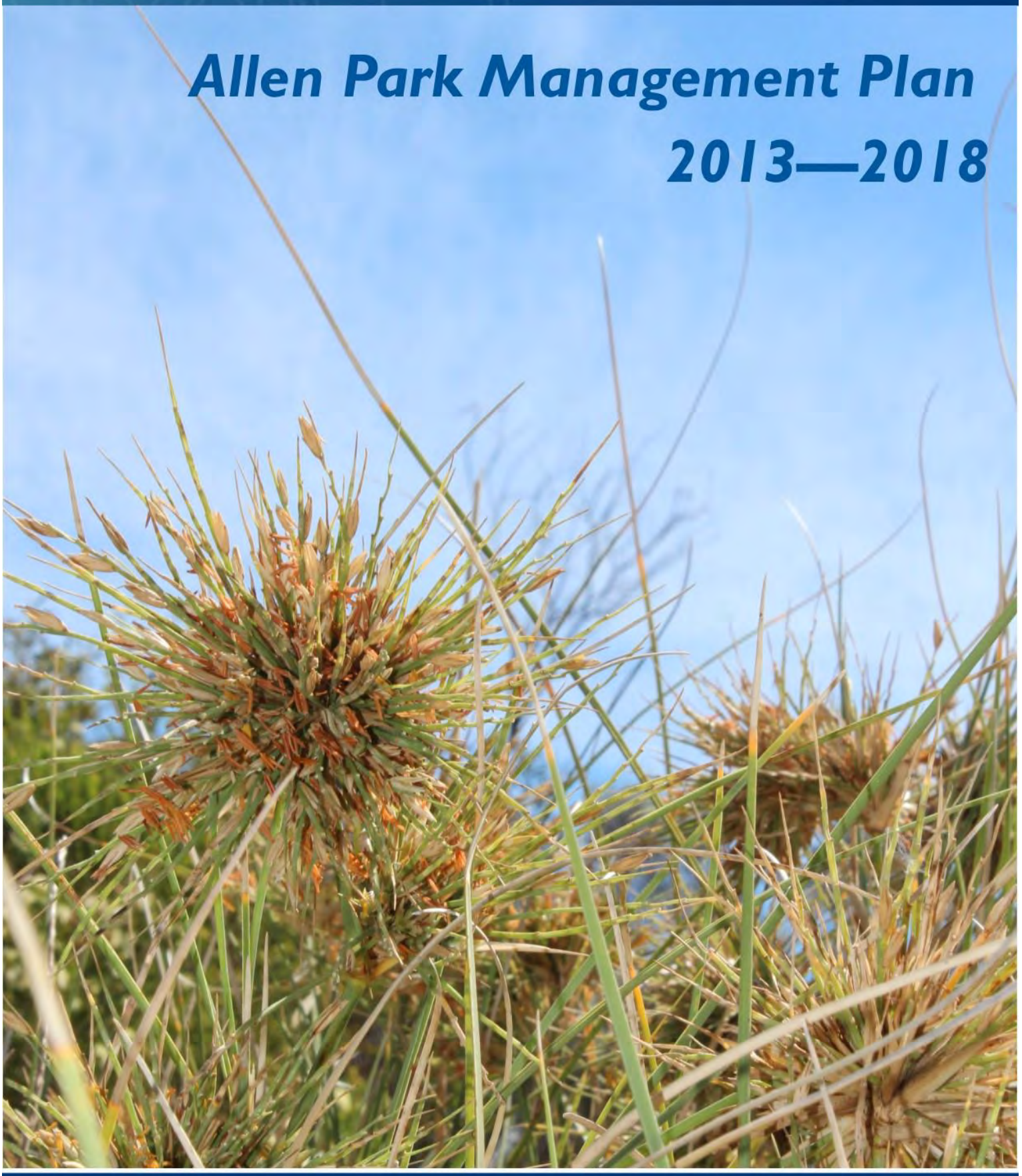
Allen Park Management Plan 2013—2018



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SUMMARY

This section of the City of Nedlands Natural Areas Management Plan 2013 - 2018 is dedicated specifically to the management of Allen Park. Detailed information that relates to all natural areas within the City such as mapping methodology, rehabilitation, environmental weed control, climate change, geomorphology and soils, planning information, interpretation, priority flora and fauna, fire management, community involvement, access and feral animal management has been detailed on pages 1 – 76 of the Natural Areas Management Plan 2013 - 2018.

The Allen Park Management Plan 2013 – 2018 has drawn heavily from the following documents:

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

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

Table 1: Summary of Allen Park Management Actions 2013 – 2018

ACTIONS	
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.
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.
REHABILITATION	
3.	Focus rehabilitation on *Good* condition bushland and Degraded areas directly adjacent to 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.
REVEGETATION	
6.	Work with local nurseries to grow species found in low abundance.
7.	Only plant overstorey species in areas where Black Flag is present.
8.	Due to maintenance issues no further planting of *Acacia rostellifera* or *Acacia cyclops* should occur on sectors east of the dog exercise oval.
WEED CONTROL	
9.	Annually monitor weeds with the potential to expand rapidly and map changes in their distribution if required.
10.	Monitor, control and document the distribution of new invasive weeds as they arise.
11.	Control priority weeds in accordance with management notes detailed in Appendix 4.
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.
13.	Do not use herbicides in bushland sectors to control Oxalis and Fumitory.
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.
15.	Seek funding to undertake an intensive control program of *Pelargonium capitatum.*
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* sp.
17.	To reduce erosion only undertake weed control in areas 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.
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*.
20.	Do not remove the Tamarix population on Flyash Hill unless as part of an intensive restoration project.
21.	Continue to collaborate with the Department of Defence for weed management on Melon Hill.
22.	Focus resources for Pretty Betsy control on Flyash Hill, Odern Crescent and the Boobook Sectors.
23.	Treat the Seaward Corridor and the Heritage Precinct as ongoing maintenance areas for weed control.
24.	Retain mature specimens of Coast Teatree (on Lot 150 Sayer Street) until sufficient habitat is established for resident Fairy – wrens.
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.
FIRE MANAGEMENT	
26.	Access tracks should be modified to better suit fire fighting vehicles where possible.
27.	Work with the Department of Defence to install a vehicle access firebreak behind Defence houses on Melon Hill.
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.
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.
30.	Change the wording of Friends of Allen Park rehabilitation signs to state they are demonstration sites.
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.
32.	Undertake maintenance to the existing vandalised “Let it Grow” signs.
33.	Install entry statements at the western entrance to the Seaward Corridor and at the entrance to Melon Hill on Sayer Street.
34.	Maintain the “Access Prohibited” signs on Melon Hill for their historical value.
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.
36.	Survey native fauna, including invertebrates of high conservation value, at regular intervals, when funding is available.
37.	Minimising fires that may destroy tree hollows.
38.	Retain hollows for refuges in large old and dead trees.
39.	Control feral European Bees as they can displace native animals.
40.	Protect the nests of Rainbow Bee-eaters if they are encountered.
41.	Continue the fox control program.
42.	Contribute to regional programs being undertaken for feral bird control by DPAW.

BACKGROUND

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 CBD, as shown in Figure 1. It covers approximately 18.9Ha (of which 2.9Ha 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". The vesting of these different reserves has been detailed on page 10 of the Natural Areas Management Plan 2013 - 2018. 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. Lot 1 has received significant funding through the Department of Planning's Coastwest Program and Australian Governments Coastcare Program over recent years.

The northern 2.9Ha portion (Melon Hill) is owned by the Commonwealth of Australia and vested with the Department of Defence for "Public Purposes". The Department of Defence, the City of Nedlands and the Friends of Allen Park have cooperatively managed this section of Allen Park since 1994. Allen Park (including Melon Hill) has received significant funding through the National Heritage Trust, Lotterywest and Perth Biodiversity Project over the years. The Friends of Allen Park do not distinguish between different vestings in terms of on ground works.

Figure 1: Allen Park Bushland

Implementation of Previous Management Plans

The Management Plan for *Allen Park and Environs*, (Ecoscape 1996) examined the entirety of Allen Park (32.9Ha). This covered the ovals where it divided areas into Recreation, Historic and Conservation Precincts. The 2005 – 2010 and the 2013 – 2018 Management Plans have only

examined the Conservation Precinct (bushland areas) within Allen Park and the Heritage Precinct bound by Kirkwood and Wood Street.

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 has been actively managed by the City of Nedlands and the Swanbourne Coastal Alliance.

The 2005 - 2010 Management Plan consolidated information regarding the activities undertaken since the development of the 1996 Management Plan along with reviewing and updating the 1996 Plan. Of the thirty seven recommendations that were developed for the 2005 -2010 Management Plan, twenty five were implemented, five were partially implemented and seven were not implemented.

The five recommendations that were partially implemented included two relating to the mapping of weeds, which was only undertaken only if weeds had increased their distribution. One that related to attaining the five year weed control targets assigned, of which the majority of targets were achieved. However, some were unrealistic as weeds such as Oxalis could not be reduced due to issues in relation to the use of herbicides. One recommendation in relation to the maintenance of pathways to a satisfactory standard, which is in the process of being implemented, however is restricted somewhat by available funding. One in relation to minimising watering in the bushland to discourage Coastal Brown Ants, however some target revegetation sites were watered to ensure plant survival such as on Flyash Hill.

The seven recommendations that were not implemented included one relating to the monitoring of indigenous species found in low abundance which will now aim to be implemented in the 2013 – 2018 Management Plan. One relating to mapping two new weed species annually, which is only considered necessary if new invasive weeds arise. One relating to modifying fire access tracks, which the City and the Friends Group will aim to work with the Department of Defence to implement in the future. One in relation to formalising the names of tracks within Allen Park and three final recommendations relating to signage, which will be addressed through the implementation of this Management Plan. A summary of the implementation of the 2005 – 2010 recommendations is shown in Appendix 5.

Management Challenges and Success

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

- Pelargonium (*Pelargonium capitatum*) – on Melon Hill,
- Century Plant (*Agave americana*),
- African Cornflag (*Chasmanthe floribunda),*
- Geraldton Carnation Weed (*Euphorbia terracina*),
- Marguerite Daisy (*Argyranthemum frutescens*),
- Lupinus sp (Lupins),
- Fountain Grass (*Pennisetum setaceum*),
- Perennial Veldt Grass (*Ehrharta calycina*),
- Annual Veldt Grass (*Ehrharta longiflora*),
- Wild Oat (*Avena fatua*),
- Freesia (*Freesia alba x leichtlinii*),

- African Boxthorn (*Lycium ferocissimum*),
- Brazilian Pepper Trees (*Schinus terebinthifolius),*
- White Arctotis *(Arctotis stoechadifolia*),
- Hare's Tail Grass (*Lagurus ovatus*); and
- Castor Oil Plant (*Ricinus communis*).

Large dense infestations of Bridal Creeper previously existed on Melon Hill and the Boobook Sector. These populations have been significantly reduced over the years and the release of biological controls such as the Rust and Leaf Hopper have been successful in stabilising its spread. Some infested plants do however 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.

Woody weeds such as African Boxthorn, Brazilian Pepper Trees, Tamarix (at Swanbourne Dunes) 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. The mapping of woody weeds in 2004 and again in 2012 shows a large reduction in their density and distribution at Allen Park.

Significant infestations of Fountain Grass (*Pennisetum setaceum*) have also been removed along the Sayer Street boundary of Melon Hill. Some plants reappear from time to time and therefore require ongoing monitoring. A new infestation has also recently been found in the Odern Crescent Sector that requires ongoing monitoring.

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 Swanbourne Dunes and Melon Hill and has established a similar vegetation community that is found further north on Campbell Barracks bushland.

Revegetation of Swanbourne Dunes with Acacia trees has also been very successful in establishing vegetation cover especially in the swale area along Marine Parade. This vegetation now constitutes the main vegetation cover in some areas previously devoid of native vegetation.

Black Flag (*Ferraria crispa*) is found in isolated patches throughout the bushland. It has reduced its density through herbicide spraying in some areas however its cover has not reduced. It is very difficult to control. Hand removal is not appropriate in most situations as all corms need to be removed from the soil by careful hand digging. Herbicide spraying can be effective at reducing density but this method is difficult to undertake when it grows amongst native plants. Careful consideration should be given to revegetating areas where Black Flag occurs as ongoing management of these areas will be difficult once vegetation re-establishes. 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 to stop them from seeding.

Pretty Betsy (*Centranthus macrosiphon*) is an annual weed widespread throughout the bushland (except Swanbourne Dunes). It has only been recorded in Allen Park since 2005. In order to remove Pretty Betsy from the bushland a significant amount of funding is required which would take needed resources away from other priority weeds. Pretty Betsy does however have some isolated populations on Flyash Hill, Odern Crescent and the Boobook Sectors and these areas should be a focus for management to limit its spread across the entire bushland.

White Bartsia (*Bartsia trixago*) has only been recorded since 2007 it is highly invasive in wetland environments. It is scattered across the bushland, except on Flyash Hill, Odern Crescent and Swanbourne Dunes. Like Pretty Betsy White Bartsia would require a significant amount of funding to manage which would take needed resources away from other priority weeds. Therefore White Bartsia is not currently recommended for management.

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 dog exercise oval.

Some non-indigenous species were historically planted such as Coastal Moort (*Eucalyptus utilis*) which now have established populations in some areas across the bushland. As Coastal Moort is not considered invasive, provides habitat and cover stopping other invasive weeds from spreading is not recommended for removal.

Management Actions 2013 - 2018

ACTIONS	
REVEGETATION	
1.	Only plant overstorey species in areas where Black Flag is present.
2.	Due to maintenance issues no further planting of *Acacia rostellifera* or *Acacia cyclops* should occur on sectors east of the dog exercise oval.
WEED CONTROL	
3.	Focus resources for Pretty Betsy control on Flyash Hill, Odern Crescent and the Boobook Sectors.
4.	Treat the Seaward Corridor and the Heritage Precinct as ongoing maintenance areas for weed control.

BIOLOGICAL ENVIRONMENT

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.

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).

Vegetation

Vegetation Complex Heddle et al (1980)

On a regional scale Allen Park is mapped as occurring on the Cottesloe Central and South Vegetation Complex. 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.

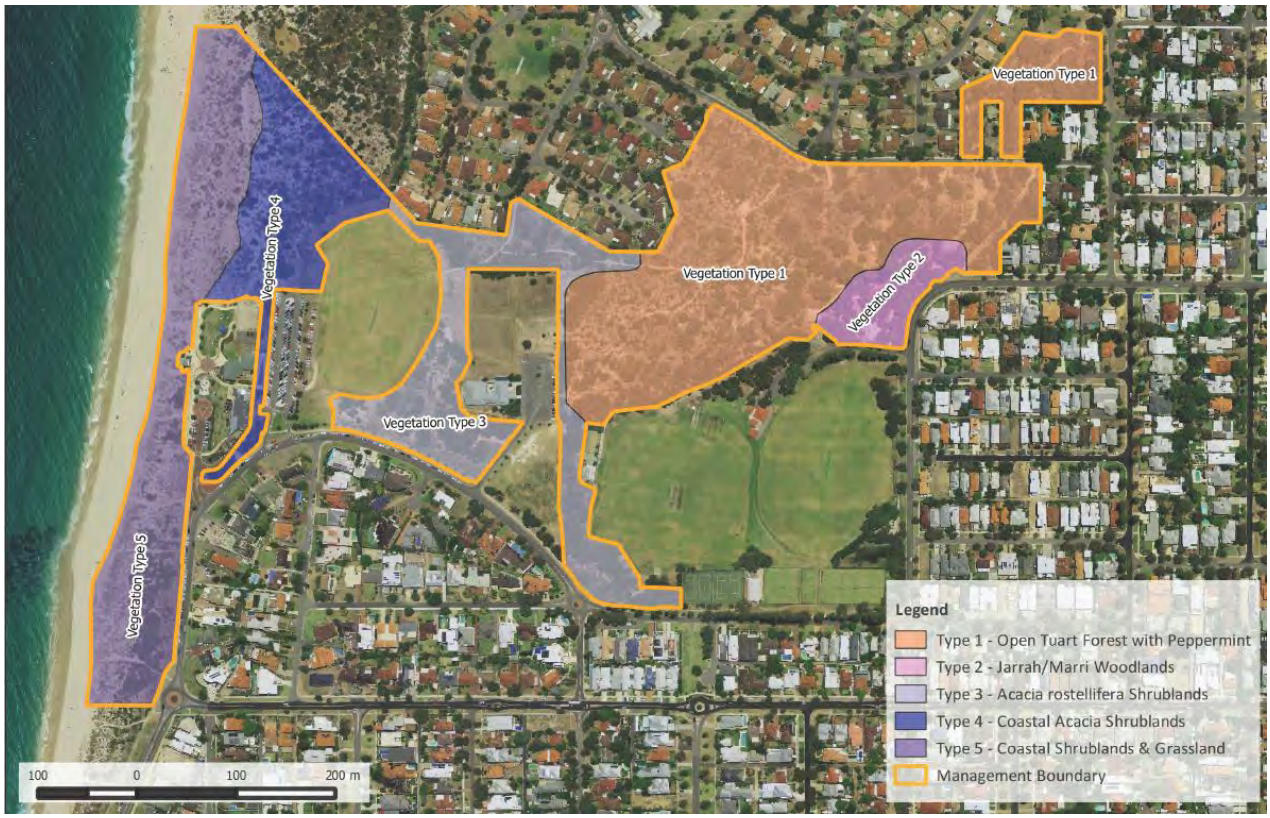
Structural Plant Communities - Natural Area Initial Assessments

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; and
- Jarrah/Marri woodlands.

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

Figure 2: 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 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.

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); and
- *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 16.

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); and
- Significant reptile species: Bardick (*Echiopsis curtu*).

The 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 so far 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."*

Bushland Condition

The methodology followed for bushland condition assessments undertaken in 2012/13 is detailed on pages 27 - 30 of the Natural Areas Management Plan 2013 – 2018. 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 has been mapped using different methods and scales. Bushland condition was not mapped in the 1996 Management Plan. It was mapped in the 2005 - 2010 Management Plan using the Kaesehagen Scale. These maps were digitised but they did not use 20 x 20m 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. However, this assessment of bushland condition was not necessarily supported by the community.

The bushland condition mapping undertaken in 2008 using the Keighery Scale through 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 like the 2005 mapping the condition ratings were allocated on the basis of local native species present. These maps were not digitised and did not use 20 x 20m polygons.

2012/13 Bushland Condition Assessment

The mapping in 2012/13 was undertaken in spring by adapting the Keighery Scale and divided the bushland into 20 x 20m polygons. The use of 20 x 20m polygons allows a systematic, measurable and repeatable means for collecting data overtime. Where each 20 x 20m polygon represents an individual unit with a GPS coordinate. When bushland condition is undertaken in future this method will allow a quantitative assessment to be undertaken to compare changes overtime.

In 2012/13 the Keighery Scale was adapted to assess the impact of disturbance on vegetation structure. Each 20 x 20m 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, selective removal of species (from plant pathogens, frequent fires, grazing and logging for example) and clearing. The existence on non-indigenous plants was not rated as a disturbance unless they were considered invasive to the area.

The majority of the bushland was assessed as *Good* with some small *Very Good, Degraded* and *Completely Degraded areas.*

Table 2. Extent of Bushland Condition 2012/13

Vesting	Very Good	Good	Degraded	Completely Degraded	Total Area
City of Nedlands	1Ha	13.1Ha	1.8Ha	0.02Ha	16.02Ha
Department of Defence	0.3Ha	2.6Ha	0Ha	0Ha	2.9Ha

The areas assessed as *Very Good* condition included parts of Melon Hill, Swanbourne Dunes and the Seaward Corridor. At Swanbourne Dunes some of the areas that were scored as *Very Good* condition were characterised by *Acacia rostellifera* thickets and others by low growing grassland/shrublands. Some of the areas on Melon Hill and the Seaward Corridor that were scored as Very Good were characterised by an overstorey of Tuarts and understorey of Sword Sedge or a native shrub layer and by *Acacia* trees with 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 (that were in low abundance or considered a low priority). However it needed to maintain a good native vegetation structure and/or cover. Some other areas along Swanbourne Dunes 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 consisted of a band of differing levels of *Good* condition bushland (some of these were more on the *Degraded* side of *Good* condition and others were more on the *Very Good* condition side of *Good* condition bushland). In the *Good* condition bushland areas some introduced native plants may also have formed part of the vegetation structure (such as *Eucalyptus utilis*, and Marram Grass and *Tetragonia decumbens* at Swanbourne Dunes) and this did not lead to a *Degraded* rating as these species provided vegetation structure, habitat and/or stabilisation and were also considered not invasive.

Some of the areas rated as *Degraded* were located along Swanbourne Dunes, the Swale adjacent to Flyash Hill, in the Heritage Precinct and on West Melon Hill. These areas had a combination of the following disturbances that lead to their *Degraded* rating:

- Extensive fire break/tracks,
- High density invasive weeds; and
- Lack of native vegetation cover.

There was also one area rated as *Completely Degraded* which was located near the oval adjacent to the Swanbourne Beach carpark. This area had little if any native vegetation cover and the site was dominated by aggressive weeds.

Flora

There are 152 flora species recorded at Allen Park as shown in Appendix 1, of these 68 are identified as native species and 84 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 are continually updated as additional species are discovered or renamed. These include:

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

<u>Changes in plants recorded in Allen Park since the 2005-2010 Management Plan.</u>

Around 2005 the weed Pretty Betsy *(Centranthus macrosiphon)* was recorded for the first time. Since then it has increased its distribution across the bushland. The last specimen of Corkybark *(Gyrostemon ramulosus*), which is dependent on fire for reproduction, died around 2006.

On a Defence community planting day in 2011 One-sided Bottlebrush *(Calothamnus quadrifidus*) was introduced to West Melon Hill. *Calothamnus quadrifidus* has not been found to locally occur in Allen Park prior to this introduction. *Eremophila glabra* was also planted on North Melon Hill on the same community planting day. There were already existing specimens of *Eremophila glabra* in the foredunes and on South Melon Hill. The specimens on the foredunes are considered to have been locally occurring and would not have been planted through revegetation activities over the years however it is unknown if the one on South Melon was original or whether it was planted.

Since 2005 the following native plants have been found of which have not been previously detailed as being recorded at Allen Park:

- Daucus *glochidiatus* (Australian Carrot),
- *Grevillea preissii* (unsure whether it is locally occurring or the nursery variety),
- *Lepidosperma* sp (one on West Melon Hill),
- *Lepidosperma squamatum* (South Melon Hill),
- *Eremophila glabra; and*
- *Hibbertia cuneiformis (*previously identified as *Hibbertia racemosa*).

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 3.

Table 3. Significant Flora in Allen Park

Species	Significance*	Confirmed in Allen Park	Plant Description (Florabase)
Agonis flexuosa	* northern most population with Bold Park	Yes	Tree or shrub 1-10m high Flowers white July-December Distribution includes coastal sand dunes
Allocasuarina lehmanniana	* most southern Significant population	Yes	Shrub 0.5-4 m high Distribution includes coastal areas
Chamelaucium uncinatum	*most southern significant population	Only planted varieties found	Erect shrub 0.5-4m high Flowers white or pink Distribution includes coastal areas Also see description of varieties of the species provided in Table 4 below
Callitris preissii	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)	Only one specimen found in Allen Park	Yes	Flowers. pink/purple-red/white/yellow-green, Aug to Dec or Jan. Variety of soils, often associated with limestone.
Grevillea preissii subsp. *Preissii*?	Only one specimen found in Allen Park	Yes but unsure whether it's naturally occurring or the introduced nursery variety.	Flowers red, Jun or Aug to Sep. Yellow sand, limestone soils, sandy clay. Coastal limestone, seasonally wet areas.
Jacksonia sericea	Poorly Known Taxa – Priority 4	No	Low spreading shrub up to 0.6 m high. Flowers orange Dec or Jan – Feb Calcareous and sandy soils
Leschenaultia linarioides	* 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 ar/Jun–Dec. Sand. Coastal limestone hills & sandplains.
Lepidosperma sp	Only one on West Melon Hill	Yes	Unsure of species (could be one of 3 or 4) Genus under review.
Leucopogon parviflorus	Only 2 on South Melon Hill	Yes	Flowers white. Feb to Mar or Jun to Oct. Sandy soils over limestone or granite. Coastal dunes & limestone.

Santalum acuminatum (Quandong)	Few in locality	Yes	Small tree or shrub to 6m high hemiparasitic on roots distinctive fruit
Hibbertia cuneiformis	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.
Eremophila glabra	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.

*as listed in Bush Forever

There is some conjecture associated with the occurrences of *Jacksonia sericea* and *Chamelaucium uncinatum* at Allen Park. *Jacksonia sericea* was recorded in the 1996 Management Plan (Ecoscape, 1996) and is a Priority 4 conservation species. However it has not been found since and any details of the original observation cannot be located. There is therefore some uncertainty as to whether this species was within the Park, or whether it was a misidentification for *Jacksonia calcicola* of which one specimen was planted on Melon Hill.

There is also 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. Geraldton Wax is a common garden plant in Perth but 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). There are subtle differences between Wembley Wax and Geraldton Wax. Table 4 provides a comparison of the two Waxes.

Table 4:Comparison of Wembley Wax and Geraldton Wax

Attribute	Wembley Wax	Geraldton Wax
Flowering Time	mid September to December	May to October
Very young bud shape	Elliptic	Globose
Flower diameter (petals flattened to horizontal)	< 17 mm	> 18 mm

Source: Barrett, cited in Ecoscape 2005[1]

Using the characteristics in the above table, Dr M Barrett determined that only Geraldton Wax is present within Allen Park.

Plant Pathogens

A survey of plant pathogens undertaken across the City's natural areas in 2011 isolated the following plant pathogens from 8 trees at Allen Park (2 Tuarts and 6 Marris):

- *Phytophthora sp. Ohioensis* (3 Marri's in carpark adjacent to the Allen Park Pavilion),

- *Phytophthora multivora* (2 Tuarts and 3 Marris in bushland); and
- *Quambalaria coyrecup* (2 Tuarts).

The identification and management of plant pathogens and other causes of tree decline has been detailed in the Natural Areas Management Plan 2013 - 2018. In summary strict hygiene protocols are required (of which many are already being implemented) such as ensuring no soil or plant material is transferred between natural areas or restoration sites by brushing excess soil off clothing, machinery and equipment and sterilising with 70% solutions of methylated spirits. Refer to pages 41 – 44 of the Natural Areas Management Plan 2013 - 2018 for management strategies and hygiene protocols.

Weeds

Of the 84 weeds recorded in Allen Park (listed in Appendix 1) the distribution of 13 of these and woody weeds were mapped. They are shown in the map section on page 41.

Some non-indigenous native plants listed in Appendix 1 were intentionally planted such as *Eucalyptus utilis* and *Melaleuca nesophila*. Non-indigenous plants provide habitat and should only be removed only if they are outcompeting native vegetation which is largely site dependant.

Weed mapping

Over the years weeds have been mapped using different methods and cover classes therefore it is difficult to make a quantitative assessment to date. The 2005 Management Plan was digitised and assessed weeds across the bushland, however it did not use 20 x 20m polygons to score cover classes. The mapping in 2012/13 was undertaken in spring using 20 x 20m polygons and DPAW cover classes detailed in their weed mapping Standard Operating Procedure 22.1. Which include:

- Individual plants (mapped as GPS points),
- Less than 5%,
- 6-75%; and
- 76-100%.

This method allows a systematic, measurable and repeatable means for collecting weed cover and density overtime. Where each 20 x 20m polygon represents an individual unit with a GPS coordinate. When weed mapping is undertaken in future this method will allow a quantitative assessment to be undertaken to compare changes overtime.

Target Species for Weed Mapping 2012/13

In 2012/13 the following weeds were mapped Marguerite Daisy *(Argyranthemum frutescens*), Bridal Creeper *(Asparagus asparagoides*), Pretty Betsy *(Centranthus macrosiphon),* African Cornflag *(Chasmanthe floribunda*), Perennial Veldt Grass *(Ehrharta calycina),* Geraldton Carnation Weed *(Euphorbia terracina),* Black Flag *(Ferraria crispa),* Freesia *(Freesia alba x leichtlinii*), *Fumitory sp*, Rose Pelargonium *(Pelargonium capitatum*), Wild Radish *(Raphanus raphanistrum*) and Brassica sp that were mapped together on one map, woody weeds and Sea Spurge *(Euphorbia paralias*).

Limitations of weed mapping

Only the above listed priority weeds could be mapped due to the time and the cost involved with the mapping. Unfortunately there are limitations encountered with weed mapping. These include:

Timing of mapping

Mapping should always be undertaken in spring when weeds are active. There are six natural areas that require mapping and they all cannot all be mapped simultaneously. This means that some weeds that may have germinated may not be flowering at the time of survey, may be covered over

by taller weeds and therefore not visible when the surveying is undertaken or have been removed through weeding activities.

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 mapping could have concluded.

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. Recommendations from the 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 has had 460 species of macrofungi recorded (Bold Park Management Plan 2011-2016).

Native Fauna
A total of 33 birds, 2 mammals, 14 reptiles and 3 invertebrates have been recorded in Allen Park these are listed in Appendix 3.

Birds
A total of 33 native bird species have been identified these include two species listed under the Environmental Protection Biodiversity Conservation Act 1999 (EPBC Act) the Carnaby's Cockatoo *(Calyptorhynchus latirostris)* which is listed as *Endangered* and the Rainbow Bee-eater *(Merops ornatus)* which is listed as a *Migratory* and a *Marine* species.

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 Cockatoos are regularly seen foraging on *Banksia sessilis* (Parrot Bush) in the bushland.

Allen Park is also used as a corridor for the movement of birds along the coast and further inland such as the Variegated Fairy-wren (*Malurus lamberti*) of which are found on Melon Hill and Swanbourne Dunes and the White-winged Fairy-wren (*Malurus leucopterus*) which occupy Swanbourne Dunes. The sandy dunes are also used for nesting by migratory birds such as the Rainbow Bee-eater.

Mammals
Two mammals have been recorded in Allen Park these include Brushtail Possums (*Trichosurus vulpecula*) and Gould's Wattle Bats (*Chalinolobus gouldii)*.

Brushtail Possums have been sighted in 2004, 2005 and on a night stalk around 2008 (Shaw, 2013). Brushtail Possums are among the most adaptable of the native mammals and they can survive some disturbance and often flourish when other species struggle. They live in a variety of habitats, though favouring open forest and woodland with sufficient older trees to provide hollows.

Gould's Wattle Bats have been found using the bat boxes installed within the bushland. Gould's Wattle 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 species are 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 at Sayer Street.

Despite its healthy condition the Carpet Python had to be euthanased due to a head injury. The Department of Parks and Wildlife officer who captured the python indicated that it is difficult to determine whether the python was wild or a pet that escaped or was released. Therefore it cannot be confirmed if there are other Carpet Pythons within Allen Park.

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

The invertebrate fauna has not been researched to the same extent as the vertebrate fauna. 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]); and
- 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]).

Three native invertebrates have been confirmed onsite. These are Jewel Beetles, Yellow Admiral Butterflies and the snail *Bothriembryon bulla.* 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]). 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); and
- 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]).

Introduced Fauna

Please refer to pages 65 – 69 of the Natural Areas Management Plan 2013 - 2018 for details of feral animal control strategies.

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 resident of Allen Park, 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 six known introduced 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 Long-billed Corella (*Cacatua tenuirostris*).

PLAN FOR MANAGEMENT

Please refer to pages 31 - 40 of the Natural Areas Management Plan 2013 – 2018 for general management principles and weed control strategies that relate to all natural areas.

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, bollards and fencing.

Internal Boundaries

In the 2005 – 2010 Management Plan the bushland was divided into 12 Sectors which has formed the basis for management since 2005. Following the incorporation of the Swanbourne Coastal Alliance these 12 Sectors have now been separated into two large Sectors consisting of Swanbourne Dunes (which includes the Coastal Foredunes and the Coastal Swale Sub Sectors) and the remainder of Allen Park (which includes 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 Sub Sectors). The Friends of Allen Park focus on all Sectors except the Coastal Swale and Foredunes of which have been actively managed by the City of Nedlands and the Swanbourne Coastal Alliance since 2008.

The North and East Melon Hill and 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. As previously stated, the Friends of Allen Park do not distinguish between the different vesting's in terms of on ground works.

Figure 3: Management Sectors in Allen Park.

The 12 Sub Sectors form the basis of general management and are intended to facilitate the establishment of guidelines for managing areas of similar terrain 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

Four areas have been flagged as potential future natural areas for inclusion within the Allen Park management boundary. They include the embankment behind the Naked Fig Cafe, Lot 150 Sayer Street (which at the time of writing this Management Plan had informally been agreed to be returned to bushland), Jones Park and the Peppermint Grove adjacent to the Allen Park Pavilion.

The embankment behind the Naked Fig Cafe was included in mapping that was undertaken in 2012/13 primarily due to the priority weeds present onsite and their ability to infest adjacent bushland areas. If and when Lot 150 (11 Sayer Street) is reinstated to bushland the site should form part of the Boobook Sector and be managed for priority weeds. It could also be the focus of a grant funding project to restore the area to natural bushland.

If these areas are included in the management boundary of Allen Park they will require ongoing operational funding through the City's annual budget process in order to undertake restoration work and maintenance.

Figure 4: Potential Future Natural Areas for inclusion within the Allen Park management boundary.

Management Actions 2013 – 2018

ACTIONS	
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.
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.

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. The Seaward Corridor and the Heritage Precinct are to be treated as maintenance areas for all year round maintenance of numerous annual and perennial broadleaf and grass weeds. Ongoing restoration and rehabilitation through planting is required in the *Good* bushland condition areas or *Degraded* areas directly adjacent to *Good* bushland condition areas in the following sectors:

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

Asbestos – Odern Crescent Sector

Previously an asbestos contamination was remediated from the Sayer Street Sector in 2010. More recently, an asbestos contamination has been identified on the embankment behind the Rugby Club in the Odern Crescent Sector. Asbestos is a building material that was used widely between the 1940's to late 1980's. 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.

Following an assessment the asbestos contamination behind the Rugby Club was determined to be approximately 10m x10m and 500cm deep. Due to the extent of the contamination significant funding will be required of which will be requested through the 2013/14 Council budget review (commencing in February 2014). Until then any works carried out in the area should be planned to prevent the generation of air borne asbestos fibres such as vegetation clearance or digging. If any further asbestos contamination is found within the bushland it should be reported to the City.

Management Actions 2013 – 2018

ACTIONS	
1.	Focus rehabilitation on *Good* condition bushland and Degraded areas directly adjacent to 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.

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 numbers within Allen Park and special consideration should be given to maintain these populations. They should be mapped, monitored and if possible propagated for revegetation at reconstruction sites. These species include:

- *Agonis flexuosa,*
- *Allocasuarina lehmanniana,*
- *Callitris preissii,*
- *Exocarpos sparteus* (limited to Coastal Swale since last two individuals died on Melon Hill),
- *Hibbertia cuneiformis,*
- *Leschenaultia linarioides,*
- *Leucopogon parviflorus* (two individuals remain),
- *Macrozamia riedlei* (one specimen); and
- *Santalum acuminatum* (several recorded in Boobook Sector and Lot 150).

Management Actions 2013 - 2018

ACTIONS	
1.	Work with local nurseries to grow species found in low abundance.

Environmental Weed Control

A total of 32 priority weeds have been listed for management in Allen Park (Table 5). Each priority weed has been provided management notes and the Invasive Plant Prioritisation Process rating (DEC, 2008). Priority weeds will be managed according to management notes provided on DPAW's Florabase website at http://florabase.dec.wa.gov.au and are detailed in Appendix 4. Priority weeds have been selected from:

- The Swan Region Assessment 2008 (Invasive Plant Prioritisation Process (DEC)),
- 30 highest priority weeds for the Swan Region 2008,
- State and federal weed lists; and
- Their ability to be controlled without causing disturbance.

Table 5: Priority Weeds for Control – Allen Park (Ratings taken from DEC Invasive Plant Prioritisation Process 2008 (Swan Region)).

SPECIES NAME		COMMON NAME	NOTES	RATING
1	*Avena fatua*	Wild Oat	Ongoing control required in conjunction with grass spraying program.	Very High
2	*Agave americana*	Century Plant	Requires ongoing monitoring for re-infestation.	Medium
3	*Arctotis stoechadifolia*	White Arctotis	Requires ongoing monitoring for re-infestation.	Unrated
4	*Argyranthemum frutescens*	Marguerite Daisy	Ongoing control required.	FAR (Further Assessment Required)
5	*Asparagus asparagoides*	Bridal Creeper	Ongoing biological control required, removal of berries and/or hand removal of small populations.	Very High
6	*Brachychiton populneus*	Kurrajong	Requires ongoing monitoring and control.	High
7	*Brassica barrelieri subsp. oxyrrhina*	Smooth Stem Turnip	Ongoing hand weeding required.	Medium
8	*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.	Medium/High
9	*Chamelaucium uncinatum*	Geraldton Wax	Undertake staged removal followed by revegetation.	Medium
10	*Centranthus macrosiphon*	Pretty Betsy	Due to its extensive distribution control should focus on Flyash Hill, Odern Crescent and the Boobook Sector.	Medium/High
11	*Chasmanthe floribunda*	African Cornflag	Requires ongoing monitoring and control for re-infestation.	Medium
12	*Cynodon dactylon*	Couch	Focus control in restoration sites.	Very High
13	*Ehrharta calycina*	Perennial Veldt Grass	Ongoing control required.	Very High
14	*Ehrharta longiflora*	Annual Veldt Grass	Ongoing control required in conjunction with grass spraying program.	FAR
15	*Euphorbia paralias*	Sea Spurge	Isolated populations along the primary dunes require control.	Medium
16	*Euphorbia terracina*	Geraldton Carnation Weed	Ongoing hand weeding required.	Very High
17	*Ferraria crispa*	Black Flag	Ongoing control required.	Very High
18	*Freesia alba x leichtlinii*	Freesia	Ongoing control required.	Very High
19	*Fumaria capreolata*	Climbing Fumitory	Ongoing hand weeding required if resources allow.	Medium/High
20	*Lachenalia bulbifera*	Soldiers	Two patches require control: Swanbourne Dunes and the Boobook Sector.	High
21	*Lagurus ovatus*	Hare's Tail Grass	Ongoing control required.	High
22	*Lupinus angustifolius*	Narrowleaf Lupin	Ongoing control required.	Unrated
23	*Lupinus cosentinii*	Sandplain Lupin	Ongoing control required.	Unrated
24	*Lycium ferocissimum*	African Boxthorn	Requires ongoing monitoring for re-infestation/ resprouting.	Very High
25	*Olea europaea*	Olive	Requires ongoing monitoring for re-infestation/ resprouting.	High
26	*Pelargonium capitatum*	Rose Pelargonium	Ongoing control required. Only remove large infestations as part of an intensive restoration project.	Medium/High
27	*Pennisetum clandestinum*	Kikuyu Grass	Focus control in restoration sites.	High
28	*Pennisetum setaceum*	Fountain Grass	Requires ongoing monitoring for re-infestation.	Medium
29	*Raphanus raphanistrum*	Wild Radish	Ongoing hand weeding required.	FAR
30	*Schinus terebinthifolius*	Brazilian Pepper	Requires ongoing monitoring for re-infestation/ resprouting.	Very High
31	*Tamarix aphylla*	Athel Pine	Requires ongoing monitoring for re-infestation/ resprouting. No control of mature trees on Flyash Hill.	High
32	*Trachyandra divaricata*	Dune Onion Weed	Only control when native vegetation has established.	FAR

Table 6: Alert Weeds for Allen Park

Species Name	Common Name	Notes
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

Strategy

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

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

High priority weeds to control in 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 Sub Sectors include:

- Geraldton Carnation Weed,
- Bridal Creeper,
- Marguerite Daisy,
- African Cornflag,
- Perennial Veldt Grass,
- Annual Veldt Grass and Wild Oats,
- Black Flag,
- Freesia,
- Fumitory,
- Woody Weeds; and
- Rose Pelargonium.

Geraldton Carnation Weed

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

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 as many infestations still persist.

Fumitory and Oxalis

With the removal of many annual and perennial grass weeds Whiteflower Fumitory (*Fumaria capreolata*) and Oxalis (*Oxalis compressa*) have increased particularly in the Boobook Sector. Spraying low levels of selective herbicide can control Oxalis and Fumitory when growing amongst native plants. However this is costly and some native plants are particularly sensitive to herbicides. As Fumitory and Oxalis are not considered as high a priority as some other priority weeds, spraying Fumitory and Oxalis is not recommended. Fumitory can however be successfully removed by hand provided a sufficient amount of labour and funding is available.

Coast Teatree (Victorian Teatree)
Coast Teatree has been listed as an alert weed for Allen Park. There are some populations at Campbell Barracks that have been a management issue due to their invasiveness along the coast. They should be monitored to ensure they do not establish populations within Allen Park. There are however 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 for Fairy-wrens who have been seen moving across Sayer Street into the Boobook Sector. They are therefore not recommended for removal until other native vegetation has established.

Geraldton Wax
A similar situation exists with Geraldton Wax of which many have previously been removed from Allen Park. Some mature specimens of these species remain and they are not recommended for removal as they also provide habitat and cover for Fairy-wrens. However, any juvenile seedlings that emerge should be removed as required.

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

Defence land on Melon Hill and Seaward Corridor
The Department of Defence provides funding towards Geraldton Carnation Weed control 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 and the Heritage Precinct. These areas have weeds such as *Conyza bonariensis (*Tall Fleabane), *Hypochaeris glabra (*Smooth Catsear), *Lactuca serriola (*Prickly Lettuce), *Oxalis glabra* and *pes-caprae (*Sour Sob), *Solanum nigrum* (Blackberry nightshade), *Ricinus communis* (Castor Oil Bush) and Marshmallow *(Malva parviflora*). These areas require ongoing maintenance so that weeds do not threaten nearby bushland areas within Allen Park.

<u>Management Notes for Priority Weeds in the Swanbourne Coastal Alliance Managed Sectors</u>

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

- Geraldton Carnation Weed,
- Sea Spurge,
- *Trachyandra divaricata*,
- Tamarix,
- Pelargonium; and
- *Lupinus* sp.

Pelargonium
The Coastal Swale and Foredunes 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. Consideration should however be provided to not removing Pelargonium in areas that lack native vegetation so that erosion does not occur. Also if it is removed in areas lacking native vegetation cover its removal should form part of an intensive restoration project. Due to the

high density and wide distribution of Pelargonium both on Melon Hill and Swanbourne Dunes funding should be sought to undertake an intensive control program within Allen Park.

Tamarix
A *Tamarix* infestation has been removed from the southern part of the Coastal Swale Sector. However, individual plants tend to re-sprout from time to time. Therefore, ongoing monitoring and control of previously treated populations is required.

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 collaborate with the Department of Defence to undertake control of these weeds so that they do not invade the Coastal Swale Sector.

Monitoring
Of the 84 weeds identified as occurring within Allen Park, the distributions and densities of 13 weeds were mapped along with woody weeds. These should continue to be mapped every five years as part of management plan reviews.

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 necessary.

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; and
- Sea Spurge.

Management Actions 2013 - 2018

ACTIONS	
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 Tambookie Grass, Coast Teatree and White Broom so that they do not establish populations within Allen Park.
5.	Do not use herbicides in bushland sectors to control Oxalis and Fumitory.
6.	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.
7.	Seek funding to undertake an intensive control program of *Pelargonium capitatum.*
WEED CONTROL – Coastal Swale and Foredunes	
8.	Control the following weeds as a priority: Geraldton Carnation Weed, Sea Spurge, *Trachyandra divaricata*, *Tamarix*, *Pelargonium*, Woody Weeds and *Lupinus* sp.
9.	To reduce erosion only undertake weed control in areas with sufficient vegetation cover or as part of an intensive restoration project.
10.	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 Gully and the Seaward Corridor	
11.	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*.
12.	Do not remove the Tamarix population on Flyash Hill unless as part of an intensive restoration project.
13.	Continue to collaborate with the Department of Defence for weed management on Melon Hill.
14.	Focus resources for Pretty Betsy control on Flyash Hill, Odern Crescent and the Boobook Sectors.
15.	Treat the Seaward Corridor and the Heritage Precinct as ongoing maintenance areas for weed control.
16.	Retain mature specimens of Coast Teatree (on Lot 150 Sayer Street) until sufficient habitat is established for resident Fairy – wrens.
17.	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.

FIRE MANAGEMENT

Fire management actions for all natural areas have been detailed on pages 45 - 50 of the Natural Areas Management Plan 2013 – 2018 and the fire history map shown in the map section on page 41. The City recently 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). As a result of these assessments the following actions are to be implemented for the Allen Park Heritage Precinct:

- Remove gutters or fit with mesh to reduce cleaning costs and risk of ignition of material in gutters during a fire event; and
- Reduce fuel loads within 25m of Heritage Precinct.

In addition to the above listed actions fire bans should be maintained at all times at Allen Park and reduction of fuel loads through grass weed control along with annual maintenance of fire access ways are also ongoing fire hazard reduction strategies that need to be implemented for Allen Park.

Two issues have been discussed in regards to fire management specifically within Allen Park over the years. They include modifying access tracks to better suit fire fighting vehicles and collaborating with the Department of Defence to maintain a vehicle access track behind the defence houses on Melon Hill.

In regards to modifying fire access tracks to better suit fire fighting vehicles provided the narrowness of existing paths and steepness of the path network. It is difficult to modify fire access tracks to better suit fire fighting vehicles in some locations. The fire access track behind the Defence houses on Melon Hill is one area that could potentially be upgraded to allow for vehicle access. Therefore the City and the Friends of Allen Park should continue to work with the Department of Defence to install a vehicle access track behind Defence houses on Melon Hill.

Management Actions 2013 - 2018

	ACTIONS
1.	Access tracks should be modified to better suit fire fighting vehicles where possible.
2.	Work with the Department of Defence to install a vehicle access firebreak behind Defence houses on Melon Hill.

ACCESS

The "*Objectives for Access*" have been detailed for all natural areas on pages 51 – 54 of the Natural Areas Management Plan 2013 - 2018. 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 within the bushland does not allow for disability access. However, there is some disability access available around the Heritage Precinct.

The stabilised limestone paths are in the process of being upgraded with full upgrades of all pathways to be completed in 2014/15. Specific issues in relation to Allen Park access detailed on pages 51 – 54 include:

- Undertaking beach fencing maintenance every 18 months,
- Collaborating with the Department of Defence to repair eroded pathways on Melon Hill,
- Formalising the fire track behind defence housing to allow for fire fighting vehicles; and
- Investigating the installation of fencing along the Rugby Club and dog exercise ovals at Allen Park to reduce informal access.

One other issue that needs to be addressed is the installation of bollards at entry points to stop illegal access. Two areas exist where illegal access is possible these include the fire break access point along Sayer Street adjacent to defence housing and the Seaward Corridor access point from the dog exercise oval.

Management Actions 2013 - 2018

	ACTIONS
1.	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.

CULTURAL HERITAGE, INTERPRETATION & EDUCATION

Cultural Heritage, Interpretation and Education has been detailed for all natural areas on pages 55 - 62 of the Natural Areas Management Plan 2013 - 2018.

Background

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

New signage is in the process of being developed for the Whadjuk Trails Project that traverses Allen Park which is a collaboration between Lotterywest, natural area friends groups across the Western Suburbs, WESROC Councils, the Botanic Gardens and Parks Authority and the Cities of Stirling and Fremantle. A website displaying information about the trails including Allen Park is also being developed where people can download a map and App of sections of the trail network. The Friends of Allen Park have also recently developed interpretive signage and limestone walls at two entry locations to the bushland with funding received from Lotterywest. A second funding application has recently been approved that will install further interpretive signage and limestone entry walls within the bushland.

Strategy

Information Shelter

The information shelter on West Melon Hill has recently been upgraded with a lockable perspex window. This allows information to be displayed including work undertaken by the Friends of Allen Park and a map of the reserve and informal track network. Ongoing maintenance of the information shelter should be undertaken as required.

Maintenance and Addition of Signs

At present the information shelter is the only place where the public can view a map of the Reserve, and the track network. Given the convoluted shape of the bushland and the fact that it is fragmented by a street and playing fields, it would be preferable to install signage that includes a map of the Reserve, and the track network at least at one point in addition to the information shelter. The installation of such a sign would be useful for the public to orientate themselves, particularly in the north east of the Reserve.

The Friends of Allen Park rehabilitation signs installed at various locations should be upgraded to state they are demonstration sites and installed at focus rehabilitation sites. All other signage within Allen Park should be low key such as ‘Let it Grow’ signs. The existing ‘Let it Grow’ signs that are erected on timber stands through the bushland require maintenance and upgrading. When they are upgraded consideration should be given to the addition of “dogs on leash” signs. There is one sign on defence land on Melon Hill that states “Access Prohibited” which should be left for its 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 trample native vegetation, create erosion on steep slopes and soil disturbance which in turn favours weeds against native species through nutrient enrichment. Recently two dog poo bins have been installed at Sayer Street and the Seaward Corridor entrances to Melon Hill to address this issue. If this does not assist with the current issues of dogs off leash then a ‘keep your dog on a leash in bushland areas’ education program may be required.

Walking Tracks

As part of the indigenous consultation for the Whadjuk Trails project the names of the walking tracks within Allen Park have been formalised using indigenous names. Neville Collard, a Noongar Elder, has provided indigenous names for walking tracks within Allen Park of which are detailed on Figure 5 below.

Figure 5: 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 2013 - 2018

ACTIONS	
1.	Provide a map of Allen Park with indigenous names on the notice board and at the crossing near the Boobook Sector.
2.	Change the wording of Friends of Allen Park rehabilitation signs to state they are demonstration sites.
3.	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.
4.	Undertake maintenance to the existing vandalised “Let it Grow” signs.
5.	Install entry statements at the western entrance to the Seaward Corridor and at the entrance to Melon Hill on Sayer Street.
6.	Maintain the “Access Prohibited “signs on Melon Hill for their historical value.

NATIVE ANIMALS

Background

There are 52 confirmed native animal species in Allen Park (33 birds, 2 mammals, 14 reptiles and amphibians, and 3 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 control of feral animals which have the potential to predate, compete with or displace native animals. This is discussed under the section on feral animal management on pages 65 – 69 of the Natural Areas Management Plan 2013 - 2018.

Strategy for Protection of Native Animals

Goulds Wattle Bat (*Chalinolobus gouldii)*

Gould's Wattle 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]).

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 onsite. 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 33 native bird species recorded onsite there are two species protected under the EPBC Act 1999. These include the Carnaby's Cockatoo *(Calyptorhynchus latirostris)* which is listed as *Endangered* and the Rainbow Bee-eater *(Merops ornatus)* which is listed as a *Migratory* and a *Marine* species.

Carnaby's Cockatoos are regularly seen foraging at Allen Park. They have roost sites at Perry Lakes (R15) and Hollywood Hospital (R3). There are a further two unconfirmed roost sites being researched by the Threatened Cockatoos Project in close proximity to Allen Park. These include one on Narla Road in Swanbourne and another in Cleland Street in Mount Claremont.

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 undertaken does not disturb their nests. Feral fox control should also be implemented as they can predate on their 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. DPAW have been undertaking a five year regional feral bird control program focussing on Rainbow Lorikeets and Long Billed Corellas. They 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:

- Minimising fires that may destroy tree hollows,
- Retaining hollows for refuges in large old and dead trees,
- Controlling feral European Bees as they can displace native animals,
- Protecting nests of Rainbow Bee-eaters if they are encountered,
- Continuation of the fox control program; and
- Contributing to regional program being undertaken by DPAW for feral bird control.

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 food and 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 7 below.

Table 7. 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). Seed collected from onsite. 5th redistribution of seed. Native Pellitory covers approximately 10m along the length 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	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 and in Seaward Corridor.

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

Management Actions 2013 - 2018

ACTIONS	
1.	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.
2.	Survey native fauna, including invertebrates of high conservation value, at regular intervals, when funding is available.
3.	Minimising fires that may destroy tree hollows.
4.	Retain hollows for refuges in large old and dead trees.
5.	Control feral European Bees as they can displace native animals.
6.	Protect the nests of Rainbow Bee-eaters if they are encountered.
7.	Continue the fox control program.
8.	Contribute to regional programs being undertaken for feral bird control by DPAW.

COMMUNITY INVOLVEMENT

The objectives and strategies for Community Involvement for the City's Community Friends Groups are detailed on pages 63 - 64 Natural Areas Management Plan 2013- 2018. In summary the activities of bushland community 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 groups remain sustainable through advertising and the volunteer referral centre.

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 400 hours of volunteer work in the reserve annually (Shaw, 2013). Projects the Friends of Allen Park are involved in include:

- Revegetation,
- Seed collection,
- Environmental weed management,
- Community education,
- Development of management actions for Allen Park; and
- 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
Ph: 9384 7983

Secretary Judy Herring
20 Lynton Street SWANBOURNE 6010
Ph: 93831501

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.

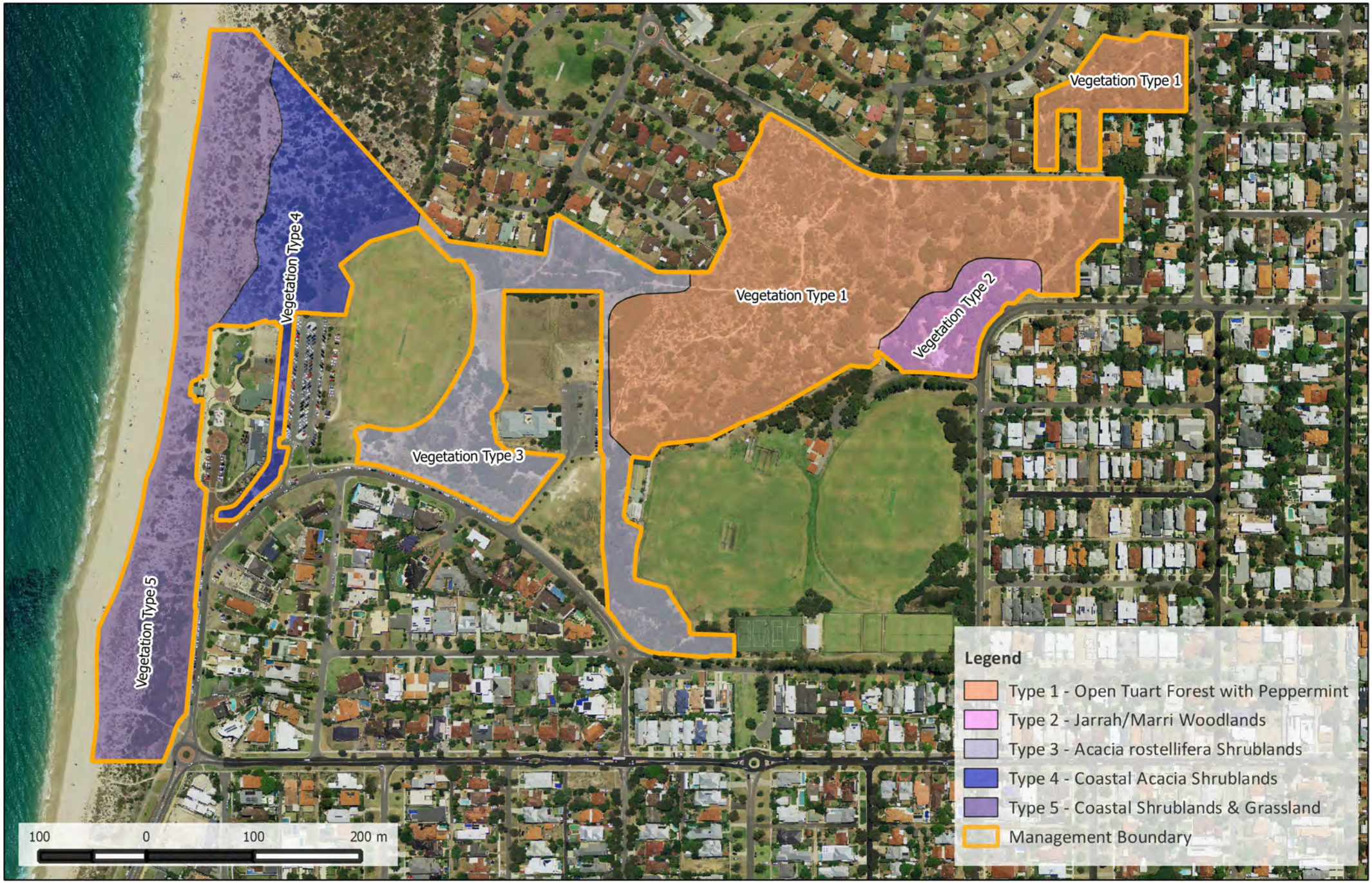
The Swanbourne Coastal Alliance hold annual planting and weeding activities through winter and spring. Projects the Swanbourne Coastal Alliance are involved in include:

- Revegetation,
- Environmental weed management,
- Community education,
- Contribution to flora and fauna inventories; and
- 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

MAPS



City of Nedlands

Map 1: Vegetation Communities

Allen Park Management Plan

October 2013

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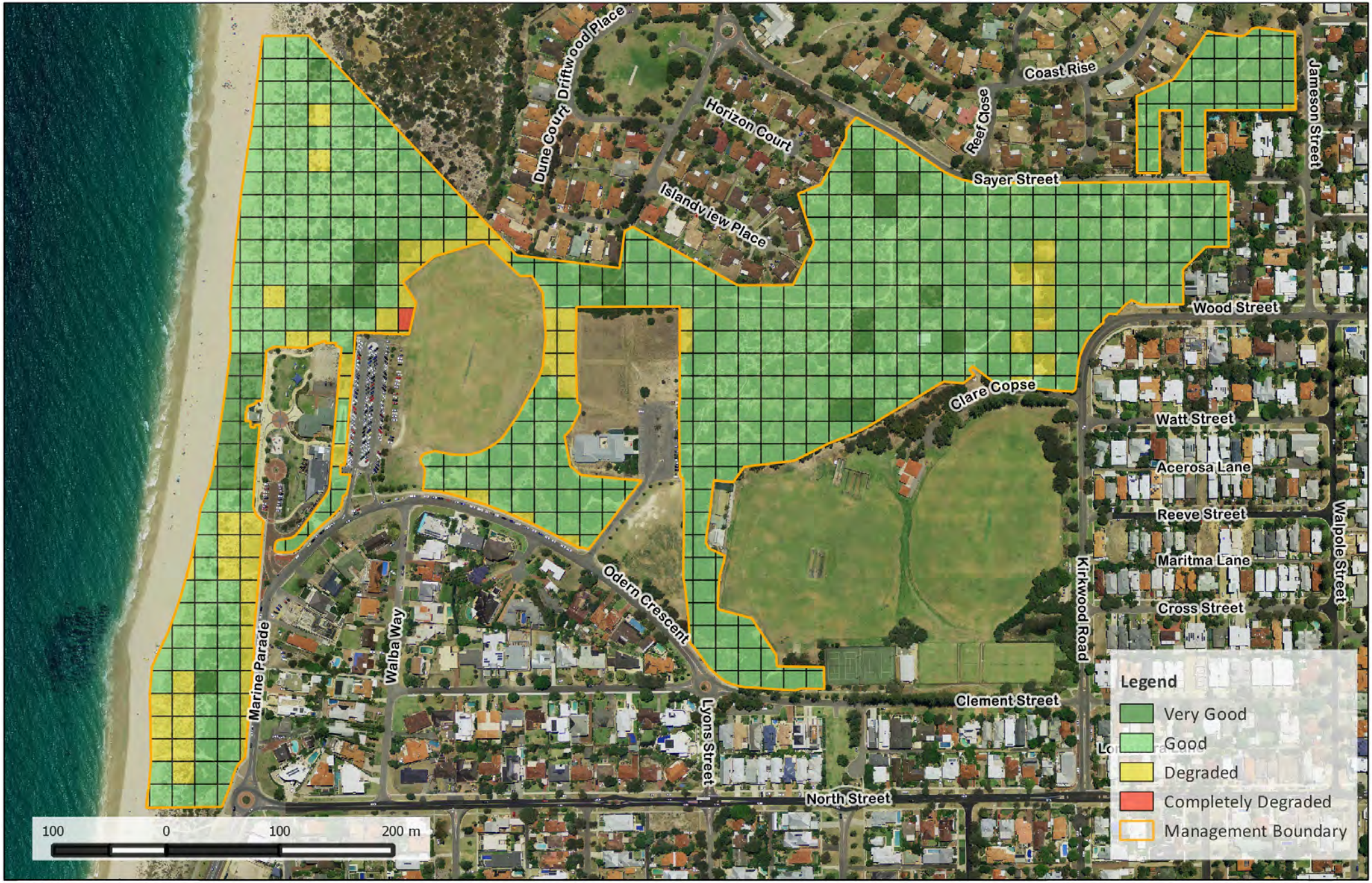

City of Nedlands

Map 2: Bushland Condition

Allen Park Management Plan

October 2013

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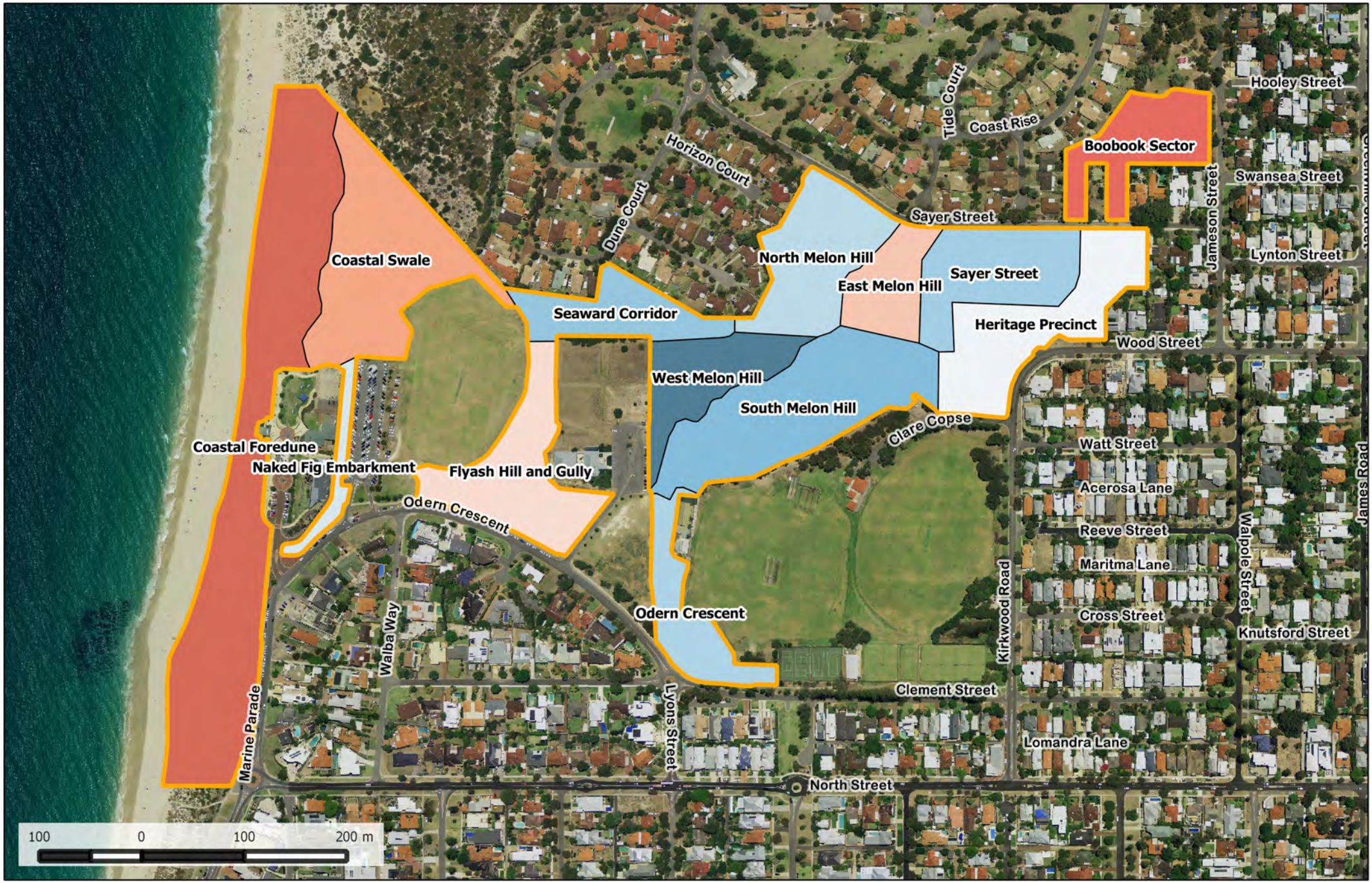

City of Nedlands

Map 3: Management Zones

Allen Park Management Plan

October 2013

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City of Nedlands

Map 4: Potential Future Natural Areas

Allen Park Management Plan

October 2013

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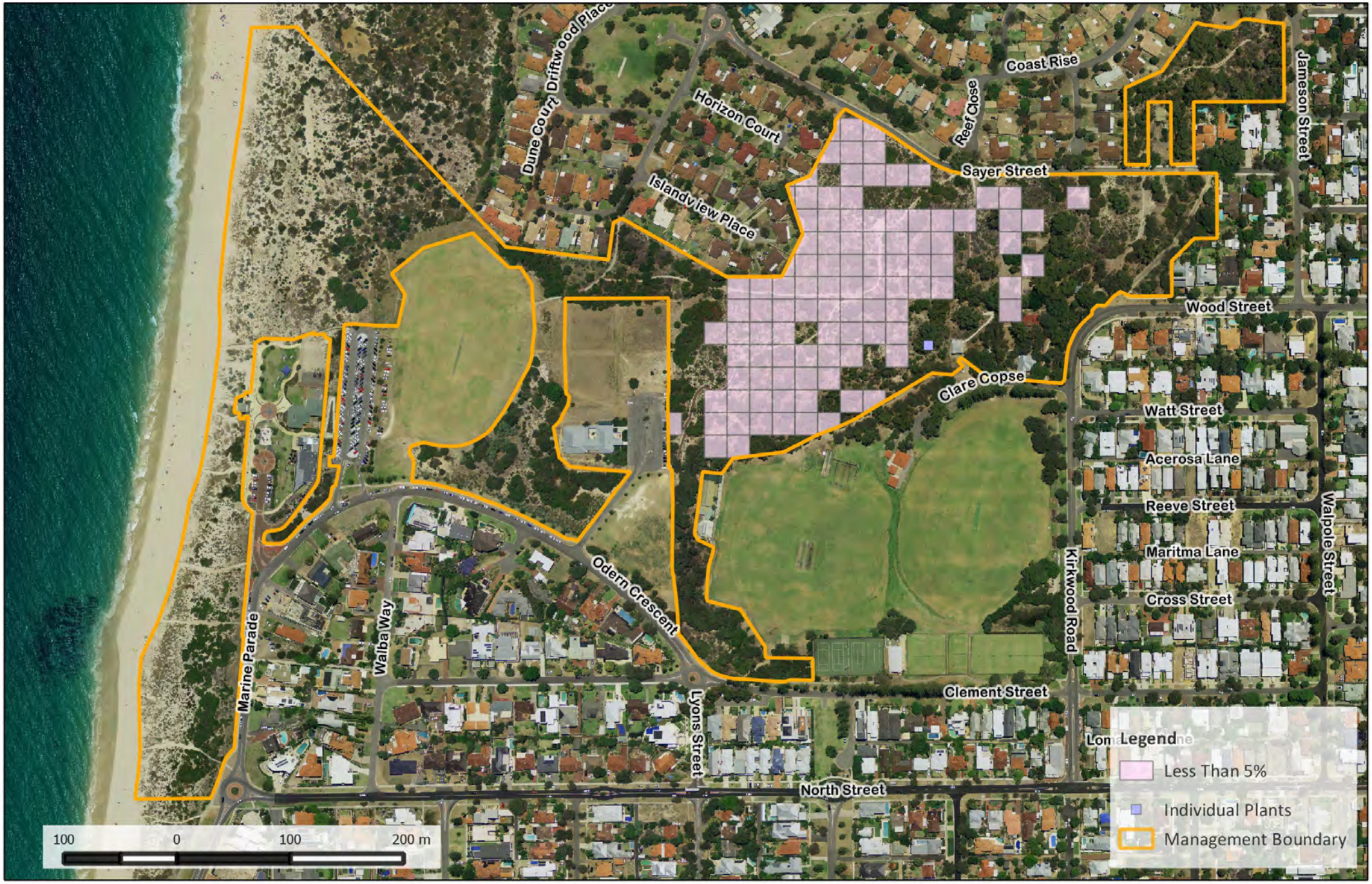

Map 5: *Argyranthemum frutescens* - Marguerite Daisy

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Allen Park Management Plan

October 2013

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Map 6: *Asparagus asparagoides* - Bridal Creeper

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October 2013

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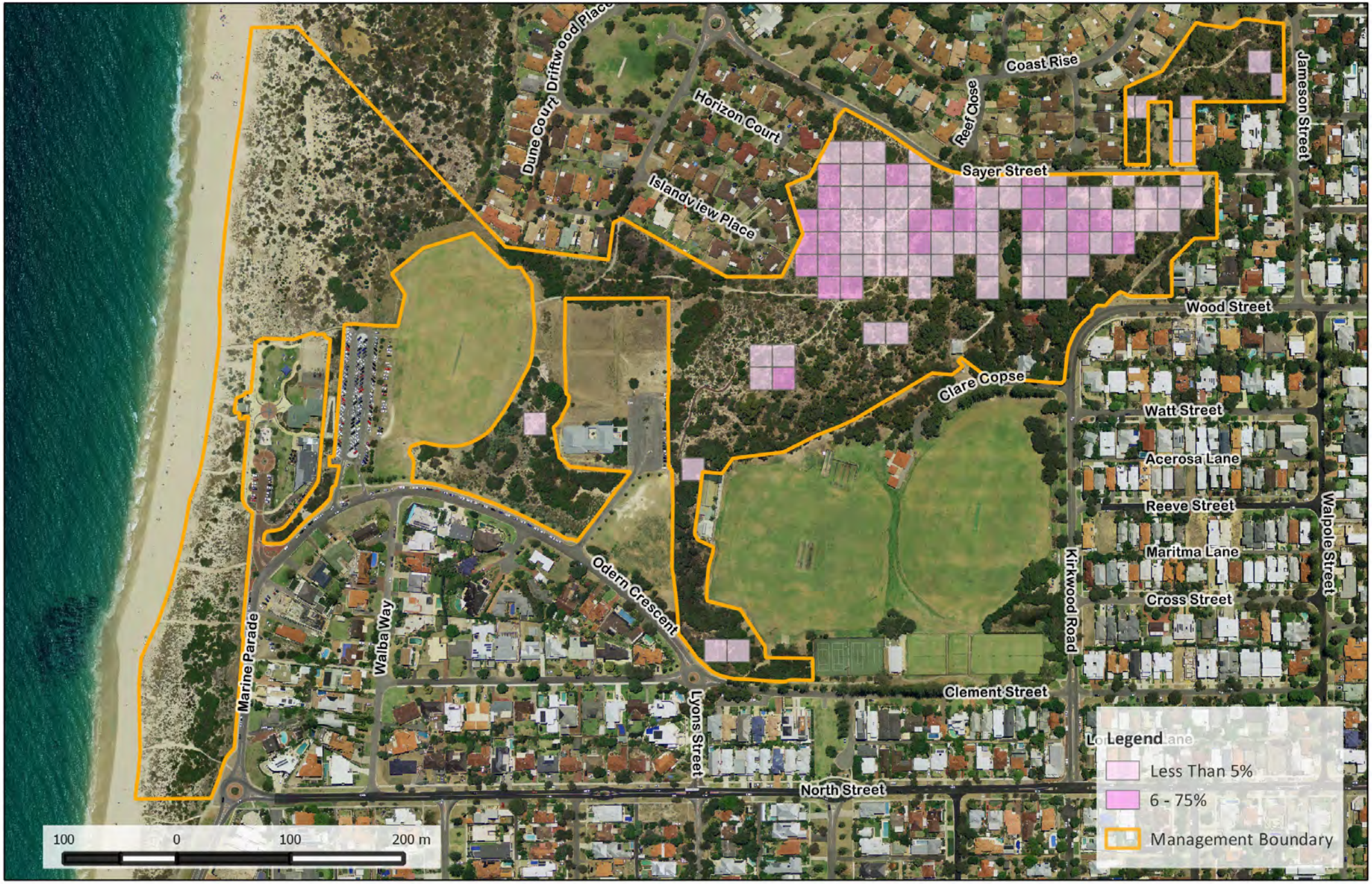

City of Nedlands

Map 7: *Centranthus macrosiphon* - Pretty Betsy

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October 2013

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Map 8: *Chasmanthe floribunda* - African Cornflag

Allen Park Management Plan

October 2013

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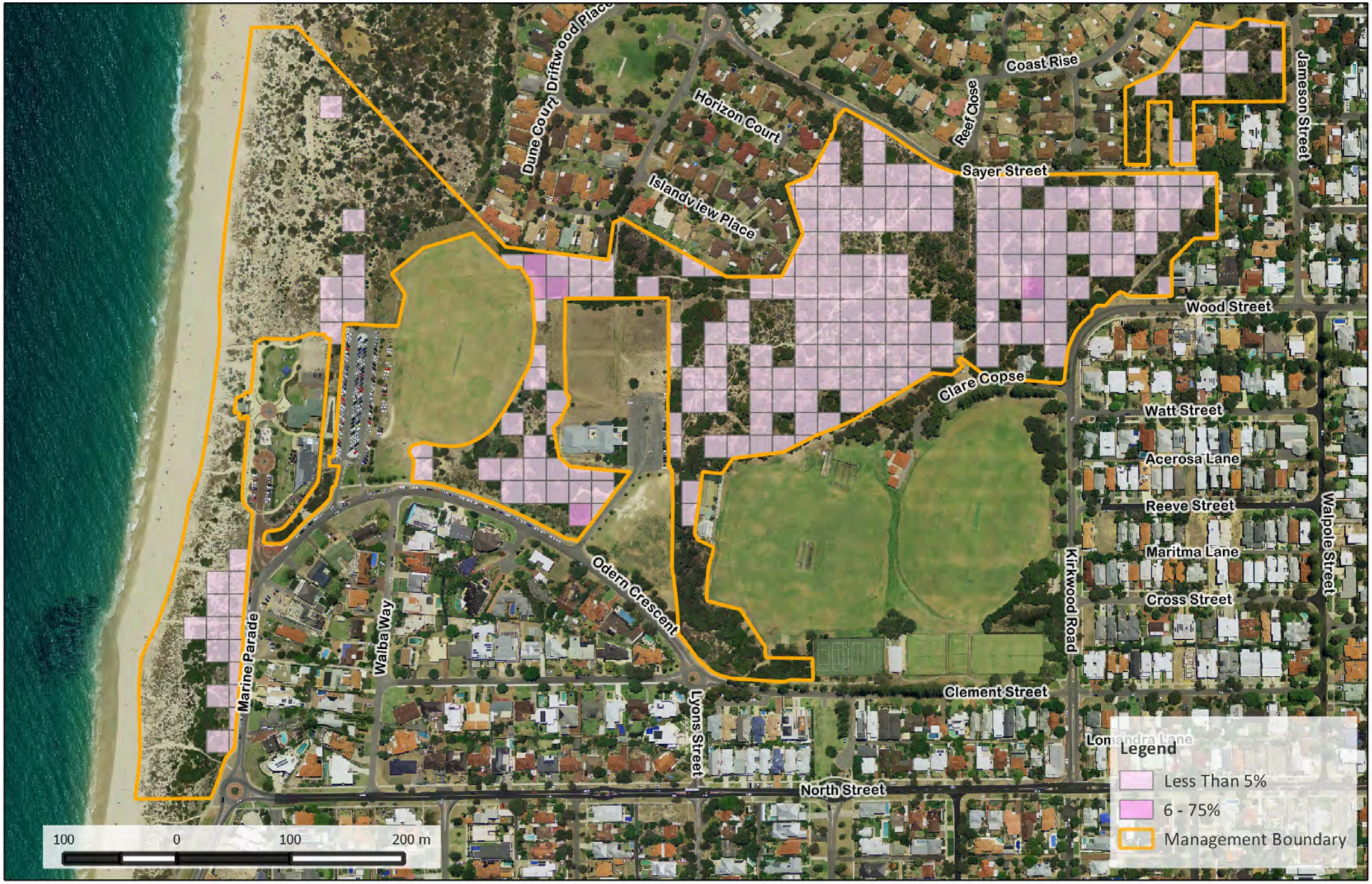

City of Nedlands

Map 9: *Ehrharta calycina* - Perennial Veldt Grass

Allen Park Management Plan

October 2013

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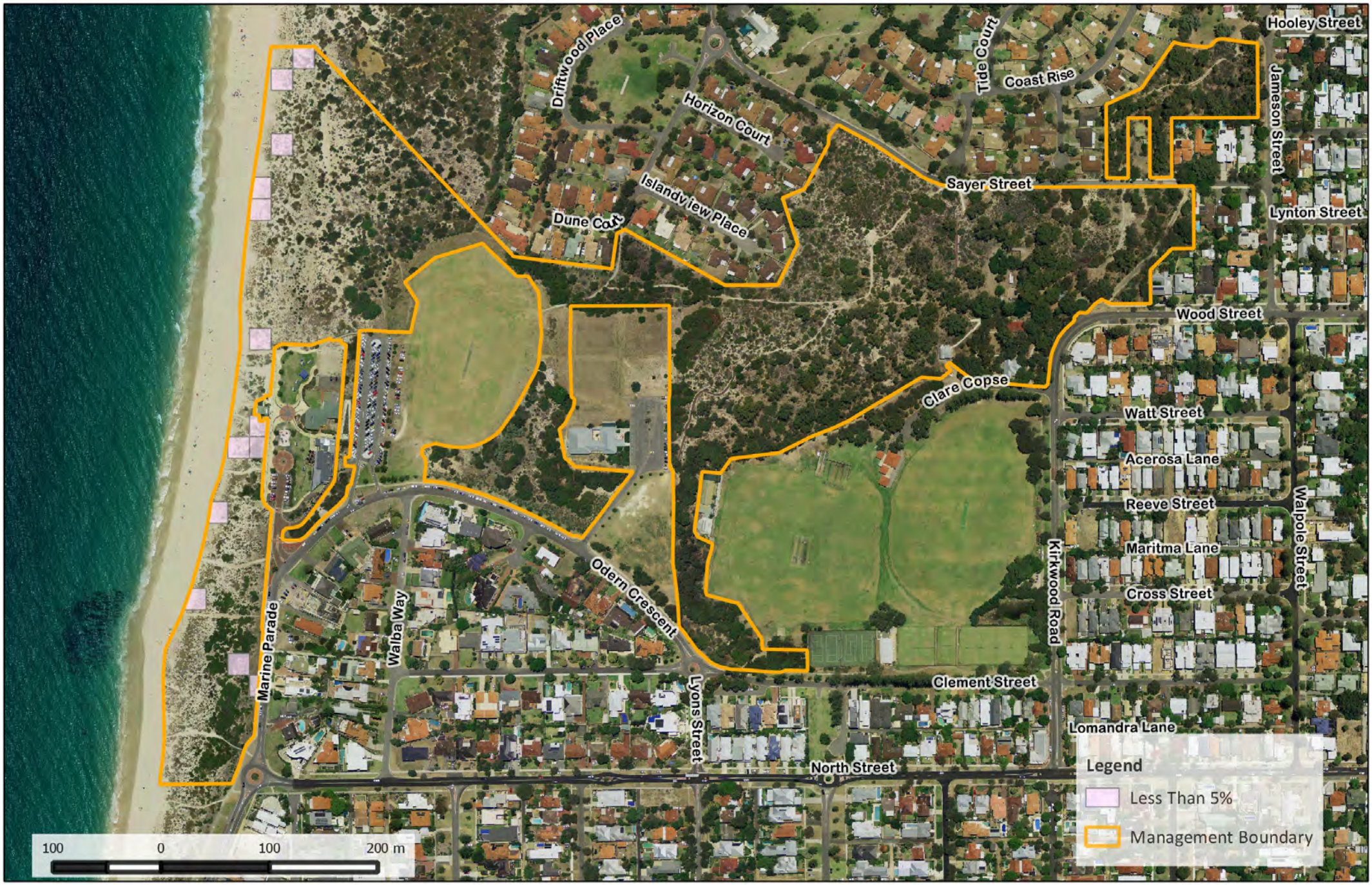

Map 10: *Euphorbia paralias* - Sea Spurge

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Allen Park Management Plan

October 2013

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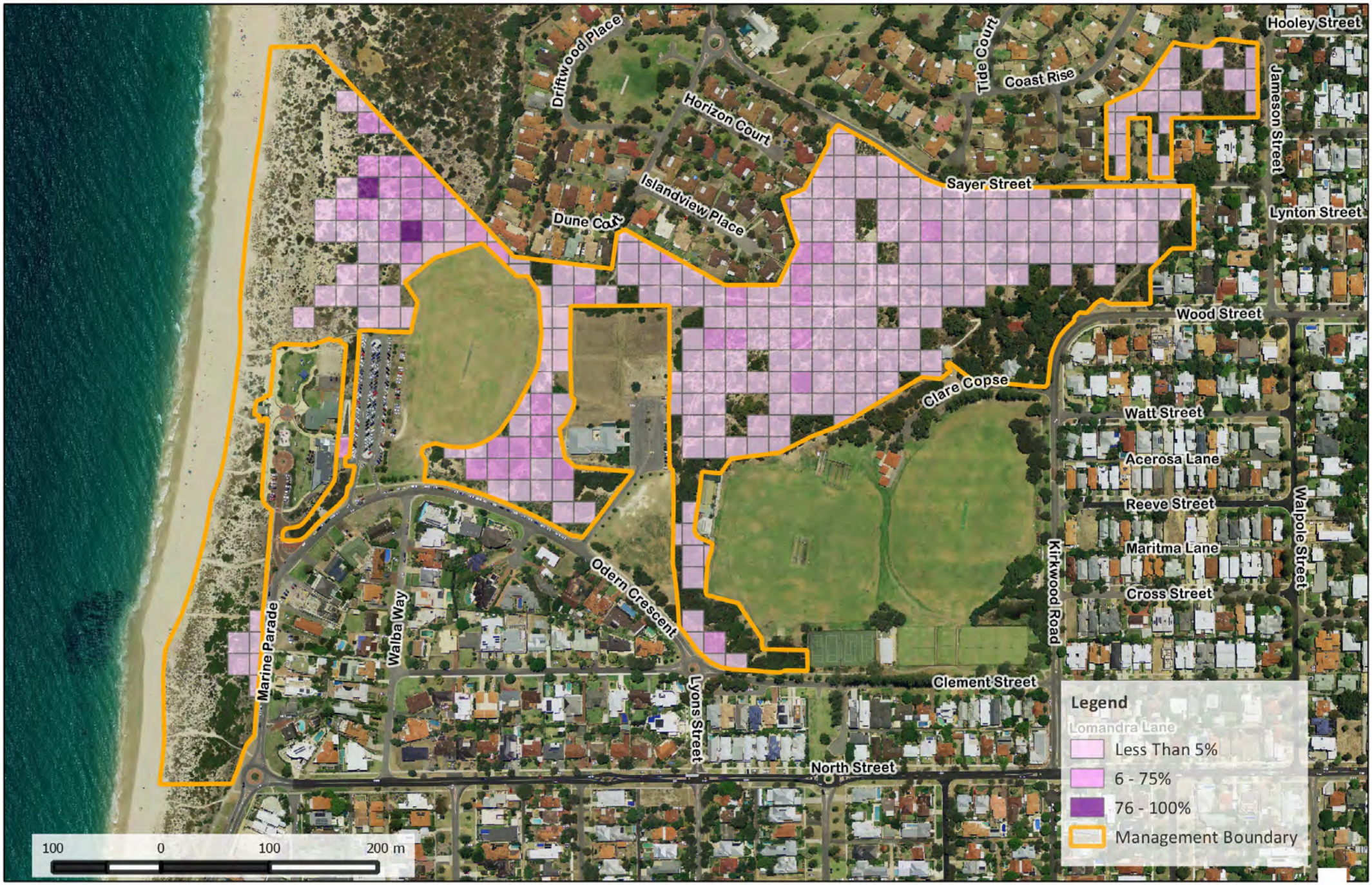

City of Nedlands

Map 11: *Euphorbia terracina* - Geraldton Carnation Weed

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Map 12: *Ferraria crispa* - Black Flag

Allen Park Management Plan

October 2013

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Map 13: *Freesia alba x leichtlinii* - Freesia

Allen Park Management Plan

October 2013

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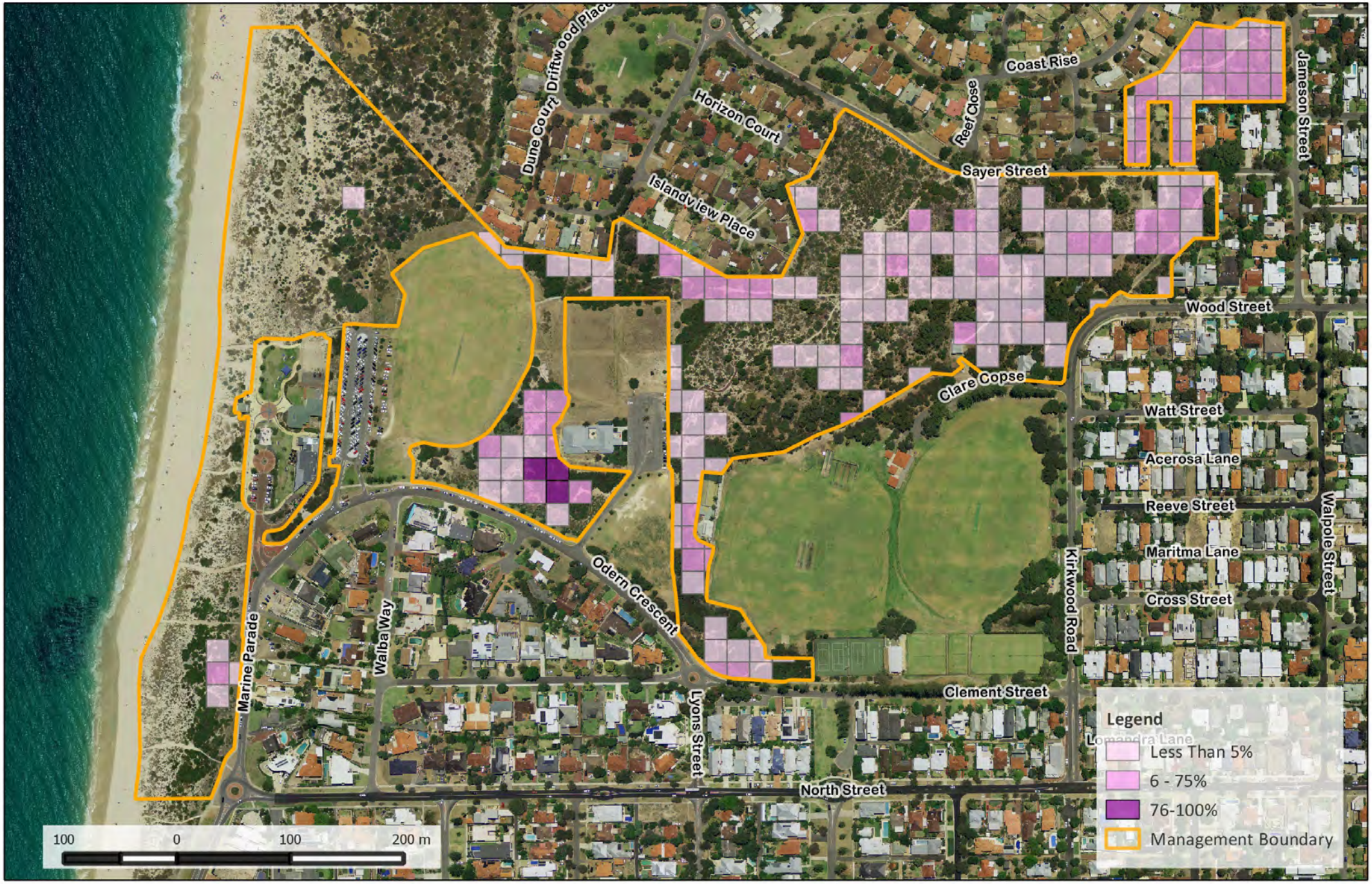
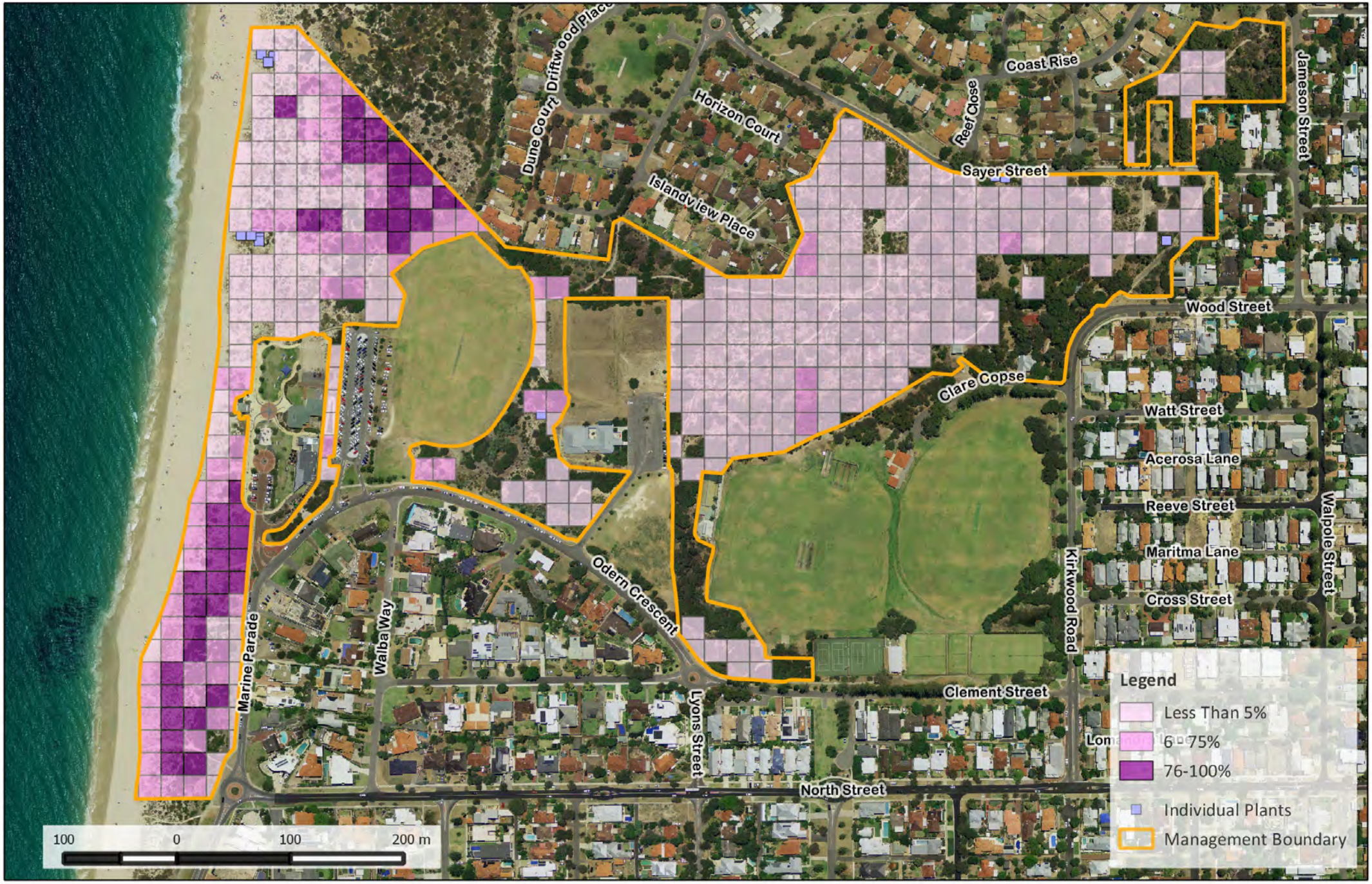


City of Nedlands

Map 14: *Fumaria sp* - Fumitory

Allen Park Management Plan

October 2013

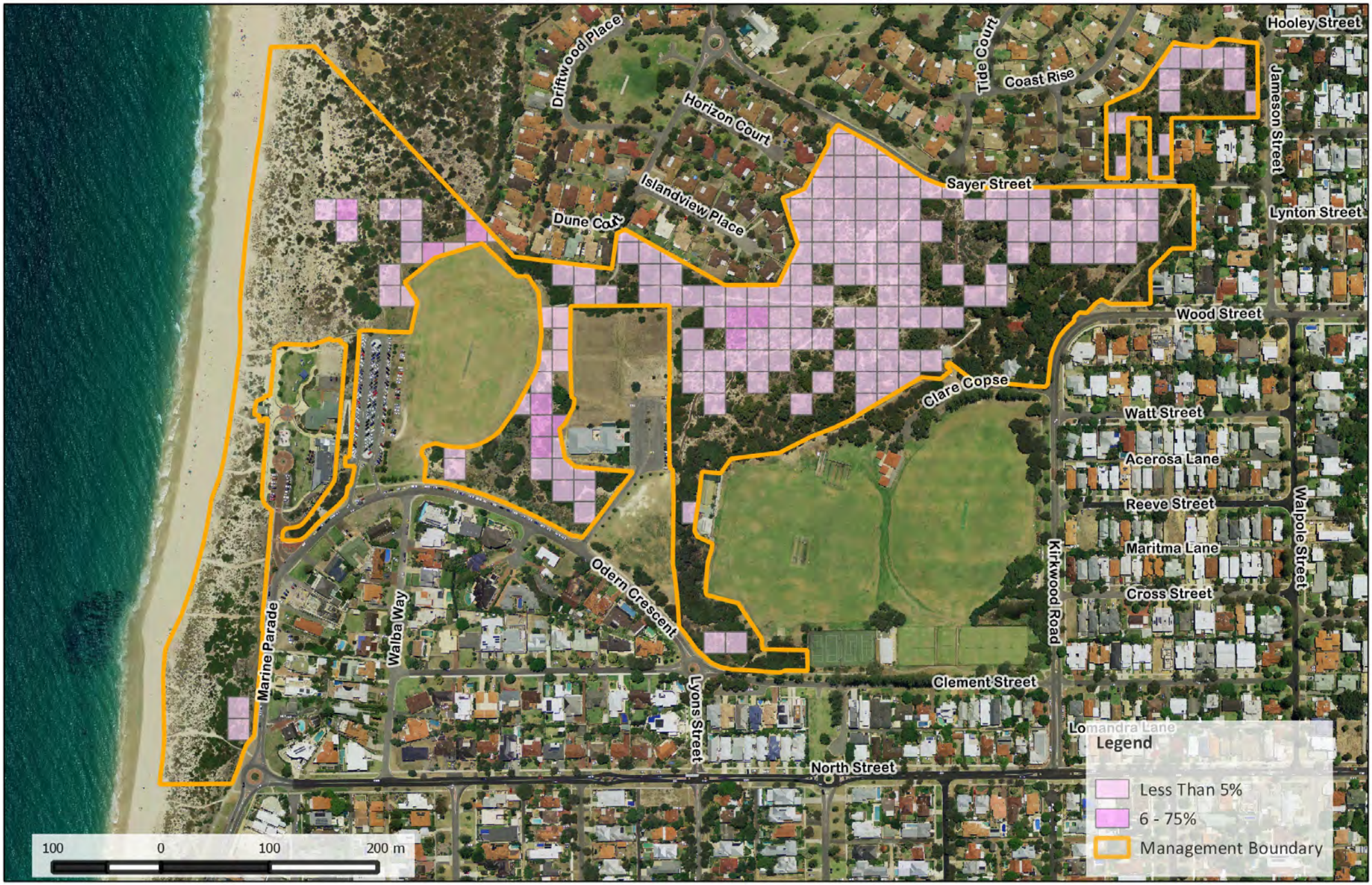


Map 15: *Pelargonium capitatum* - Rose Pelargonium

City of Nedlands

Allen Park Management Plan

October 2013



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Map 16: *Raphanus raphanistrum* and *Brassica barrelieri* subsp. *oxyrrhina*
Wild Radish and Smooth Stem Turnip

Allen Park Management Plan

October 2013

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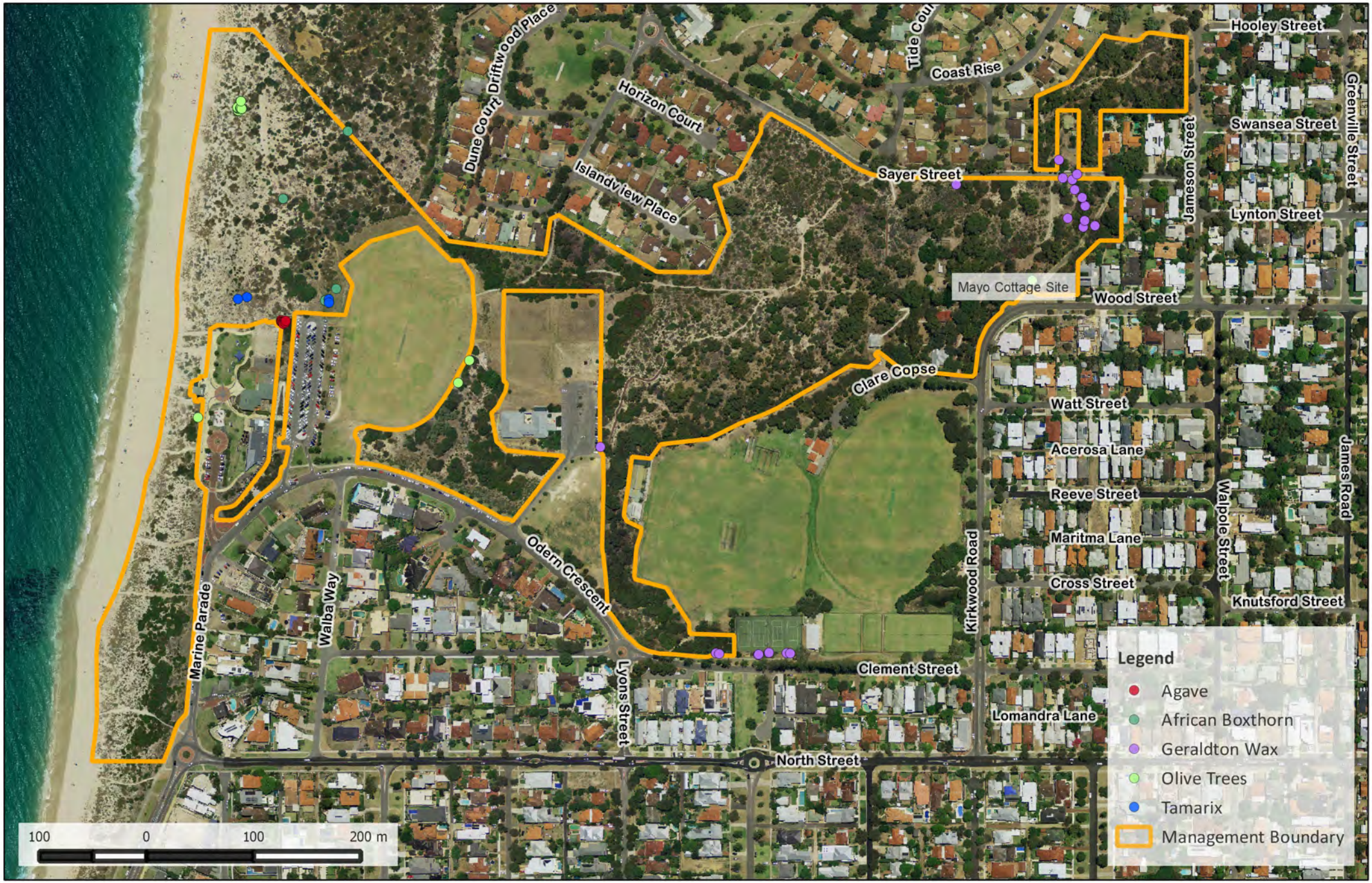

City of Nedlands

Map 17: Woody Weeds

Allen Park Management Plan

October 2013

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Map 18: Fire History

Allen Park Management Plan

October 2013

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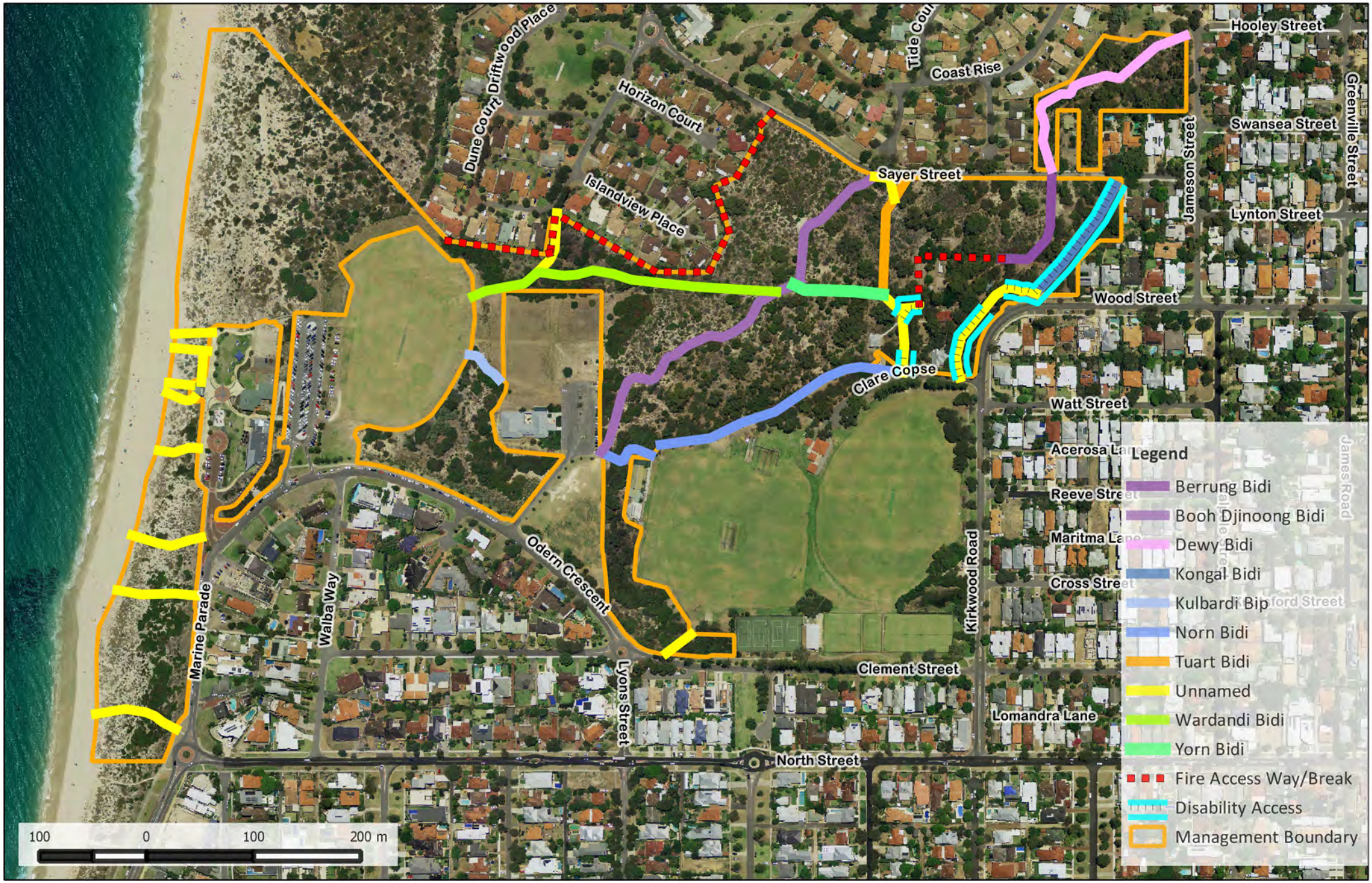

City of Nedlands

Map 19: Access and Walking Tracks

Allen Park Management Plan

February 2014

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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		One on Flyash Hill Possibly planted?
Acanthocarpus preissii	Prickle Lily	
Agonis flexuosa	Peppermint	
Anthocercis littorea	Yellow Tailflower	
Austrostipa elegantissima		
Austrostipa flavescens		
Banksia nivea	Honeypot Dryandra	Only one in Odern Crescent Sector
Banksia sessilis	Parrot Bush	
Brachyscome iberidifolia	Swan River Daisy	
Carpobrotus virescens	Coastal Pigface	
Caladenia latifolia	Pink Fairy Orchid	
Calothamnus quadrifidus	One-sided Bottlebrush	Introduced by Defence on Melon Hill
Callitris preissii	Rottnest Island Pine	
Cassytha racemosa	Dodder Laurel	
Clematis linearifolia		
Conostylis candicans	Grey Cottonhead	
Corymbia calophylla	Marri	
Corynotheca micrantha	Sand Lily	
Crassula colorata	Dense Stonecrop	
Daucus *glochidiatus*	Australian Carrot	Behind Mayo cottage site
Desmocladus flexuosus		
Dianella divaricata		
Eucalyptus gomphocephala	Tuart	
Eucalyptus marginata	Jarrah	
Eucalyptus rudis	Flooded Gum	Planted
Eremophila glabra	Tar Bush	
Exocarpos sparteus	Broom Ballart	
Gompholobium tomentosum	Hairy Yellow Pea	
Grevillea crithmifolia		
Gyrostemon ramulosus	Corkybark	Last specimen died approx 2006
Hardenbergia comptoniana	Native Wisteria	
Hemiandra pungens	Snakebush	
Hibbertia cuneiformis	Cutleaf Hibbertia	
Ficinia nodosa	Knotted Club Rush	
Jacksonia calcicola		Planted
Jacksonia sternbergiana	Stinkwood	
Leschenaultia linarioides	Yellow Leschenaultia	
Lepidosperma gladiatum	Coast Sword-sedge	
Lepidosperma sp.		

SPECIES	COMMON NAME	NOTES
Lepidosperma squamatum		
Leucopogon parviflorus	Coast Beard-heath	
Lomandra caespitosa	Tufted Mat Rush	
Macrozamia riedlei	Zamia Palm	One individual
Melaleuca huegelii	Chenille Honeymyrtle	
Melaleuca systena		
Microtis sp	Mignonette Orchid	
Myoporum insulare	Blueberry Tree	
Olearia axillaris	Coastal Daisybush	
Opercularia sp.		
Parietaria cardiostegia	Pellitory	Planted
Pterostylis sp	Snail Orchid	
Rhagodia baccata	Berry Saltbush	
Santalum acuminatum	Quandong	Boobook Sector and Lot 150 Sayer St
Scaevola crassifolia	Thick-leaved Fan-flower	
Scaevola holosericea	Silky Scaevola	
Scaevola thesioides		
Senecio pinnatifolius		
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		
Xanthorrhoea preissii	Grass Tree	Adjacent to Allen Park Pavilion

Weed Inventory

SPECIES	COMMON NAME	NOTES
Agave americana	Century Plant	
Aira caryophyllea	Silvery Hairgrass	
Ammophila arenaria	Marram Grass	
Arctotheca calendula	Cape Weed	
Arctotis stoechadifolia	White Arctotis	
Argyranthemum frutescens	Marguerite Daisy	
Asparagus asparagoides	Bridal Creeper	
Asphodelus fistulosus	Onion Weed	
Avena fatua	Wild Oat	
Bartsia trixago	White Bartsia	
Brachychiton populneus	Kurrajong	
Brassica barrelieri subsp. oxyrrhina	Smooth-stem Turnip	
Brassica tournefortii	Mediterranean Turnip	
Briza maxima	Blowfly Grass	
Briza minor	Shivery Grass	
Bromus madritensis	Madrid Brome	
Cakile maritima	Sea Rocket	
Carpobrotus edulis	Hottentot Fig	
Centranthus macrosiphon	Pretty Betsy	
Chamelaucium uncinatum	Geraldton Wax	Planted
Chasmanthe floribunda	African Cornflag	
Conyza bonariensis	Flaxleaf Fleabane	
Cynodon dactylon	Couch	
Eucalyptus utilis	Coastal Moort	Planted
Ehrharta calycina	Perennial Veldt Grass	
Ehrharta longifolia	Annual Veldt Grass	
Emex australis	Doublegee	
Euphorbia paralias	Sea Spurge	
Euphorbia terracina	Geraldton Carnation Weed	
Ferraria crispa	Black Flag	
Foeniculum vulgare	Fennel	
Freesia alba x leichtlinii	Freesia	
Fumaria capreolata	Whiteflower Fumitory	
Gazania linearis		
Hordeum leporinum	Barley Grass	
Hypochaeris glabra	Smooth Catsear	
Hypochaeris radicata	Flat Weed	
Lachenalia bulbifera		
Lactuca serriola	Prickly Lettuce	
Lagurus ovatus	Hare's Tail Grass	
Leptospermum laevigatum	Coast Teatree	
Lolium rigidum	Wimmera Ryegrass	
Lupinus angustifolius	Narrowleaf Lupin	
Lupinus cosentinii	Sandplain Lupin	

SPECIES	COMMON NAME	NOTES
Lycium ferocissimum	African Boxthorn	
Lysimachia arvensis	Pimpernel	
Malva parviflora	Marshmellow	
Medicago sp		
Melaleuca nesophila		Planted
Melia azedarach	White Cedar	
Melinis repens	Red Natal Grass	
Morus sp	Mulberry	
Narcissus tazetta	Jonquil	
Nerium oleander	Oleander	
Nicotiana glauca	Tree Tobacco	
Oenothera drummondii	Beach Evening Primrose	
Olea europaea	Olive Tree	
Orobanche minor	Lesser Broom Rape	
Oxalis glabra		
Oxalis pes-caprae	Sour Sob	
Paspalum dilatatum	Paspalum	
Paspalum vaginatum	Salt Water Couch	
Pelargonium capitatum	Rose Pelargonium	
Pennisetum clandestinum	Kikuyu Grass	
Pennisetum setaceum	Fountain Grass	
Petrorhagia dubia	Velvet Pink	
Raphanus raphanistrum	Wild Radish	
Ricinus communis	Castor Oil Bush	
Romulea rosea	Guildford Grass	
Rumex acetosella	Sorrel	
Rumex crispus	Curled Dock	
Schinus terebinthifolius	Brazilian Pepper	
Silene gallica	French Catchfly	
Solanum nigrum	Black Berry Nightshade	
Solanum hermannii	Apple of Sodom	
Stenotaphrum secundatum	Buffalo Grass	
Tamarix aphylla	Athel Pine	
Tetragonia decumbens	Sea Spinach	
Trachyandra divaricata	Dune Onion Weed	
Trifolium campestre	Hop Clover	
Tropaeolum majus	Garden Nasturtium	
Ursinia anthemoides	Ursinia	
Vicia sativa	Common Vetch	
Wahlenbergia capensis	Cape Bluebell	

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) and a survey conducted August 2013 (Roz Hart with assistance from Judith Herring).

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

Common Name	Scientific Name	J. Luyer 2013	National Trust 1995	*S. Lipple & RAOU[1] 1995*
Pacific Black Duck	*Anas superciliosa*	X		
*Laughing Dove	*Streptopelia senegalensis*	X		X
*Spotted Dove	*Streptopelia chinensis*	X		
Tawny Frogmouth	*Podargus strigoides*			X
Black-shouldered Kite	*Elanus axillaris*	X		
Brown Goshawk	*Accipiter fasciatus*			X
Silver Gull	*Chroicocephalus novaehollandiae*	X		
Carnaby's Cockatoo	*Calyptorhynchus latirostris*	X	X	X
Galah	*Eolophus roseicapilla*	X		X
*Long-billed Corella	*Cacatua tenuirostris*	X		
Little Corella	*Cacatua sanguinea*	X		
*Rainbow Lorikeet	*Trichoglossus haematodus*	X		X
Australian Ringneck	Barnardius zonarius	X		X
Fan-tailed Cuckoo	*Cacomantis flabelliformis*	X		
Southern Boobook	*Ninox novaeseelandiae*	X	X	X
*Laughing Kookaburra	*Dacelo novaeguineae*	X		X
Rainbow Bee-eater	*Merops ornatus*	X		
White-winged Fairy -wren	*Malurus leucopterus*	X		X
Variegated Fairy-wren	*Malurus lamberti*	X		X
[2] White-browed Scrubwren	*Sericornis frontalis*			
Spotted Pardalote	*Pardalotus punctatus*			X
Striated Pardalote	*Pardalotus striatus*	X		

Common Name	Scientific Name	J. Luyer 2013	National Trust 1995	*S. Lipple & RAOU[1] 1995*
Singing Honeyeater	*Lichenostomus virescens*	X		X
Western Wattlebird	*Anthochaera lunulata*	X		
Red Wattlebird	*Anthochaera carunculata*	X		X
Brown Honeyeater	*Lichmera indistincta*	X		
New Holland Honeyeater	*Phylidonyris novaehollandiae*	X		
White-cheeked Honeyeater	*Phylidonyris nigra*	X		X
Black-faced Cuckoo- shrike	*Coracina novaehollandiae*	X		X
Grey Butcherbird	*Cracticus torquatus*	X		X
Australian Magpie	*Cracticus tibicen*	X		X
Grey Fantail	*Rhipidura albiscapa*	X		
Willy Wagtail	*Rhipidura leucophrys*	X		X
Australian Raven	*Corvus coronoides*	X		X
Magpie-lark	*Grallina cyanoleuca*	X		X
Silvereye	*Zosterops lateralis*	X		X
Welcome Swallow	*Hirundo neoxena*	X		X
Tree Martin	*Hirundo nigricans*			X

Mammals, Reptiles and Invertebrate Inventory

Mammals (Shaw, Friends of Allen Park, 2013)		**Introduced**
Black Rat	*Rattus rattus*	*
Brushtail Possum	*Trichosurus vulpecula*	
Cat	*Felis catus*	*
Fox	*Vulpes vulpes*	*
Gould's Wattle Bat	*Chalinolobus gouldii*	
House Mouse	*Mus musculus*	*
Rabbit	*Oryctolagus cuniculus*	*
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)		
Yellow Admiral Butterflies	*Vanessa itea*	
Coastal Brown Ants	*Pheidole megacephala*	*
Native Snail	*Bothriembryon bulla*	
Jewel Beetles	*Stigmodera* species	
Black Portuguese Millipede	*Ommatoiulus moreleti*	*

Appendix 4 Priority Weed Management Notes (from Florbase)

	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	*Chamelaucium uncinatum*	Geraldton Wax	Cut to base and paint with 50% glyphosate. Control seedlings following fire.	All Year
10	*Centranthus macrosiphon*	Pretty Betsy	Hand remove isolated populations.	Aug - Sept
11	*Chasmanthe floribunda*	African Cornflag	Dig out isolated plants.	June - Sept
12	*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
13	*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)
14	*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
15	*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).
16	*Euphorbia terracina*	Geraldton Carnation Weed	Manually remove populations. Undertake control after any fire event.	June – Nov
17	*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

Species Name		Common Name	Management Strategy	Timing (optimal)
18	*'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
19	*Fumaria capreolata*	Climbing Fumitory	Hand remove seedlings in good bushland areas.	July – Aug
20	*Lachenalia bulbifera*	Soldiers	Two small patches in degraded areas – dig out making sure to remove all bulbils.	July - Aug
21	*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
22	*Lupinus angustifolius*	Narrowleaf Lupin	Manually remove populations.	June - Oct
23	*Lupinus cosentinii*	Sandplain Lupin	Manually remove populations.	June - Oct
24	*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
25	*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
26	*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
27	*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
28	*Pennisetum setaceum*	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
29	*Raphanus raphanistrum*	Wild Radish	Manually remove populations.	June - Oct
30	*Schinus terebinthifolius*	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
31	*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.
32	*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 2005 – 2010 Management Plan.

RECOMMENDATIONS		Implemented Yes/No/ Partially
MANAGEMENT BOUNDARIES		
1.	Continue to manage on the basis of established sectors within Allen Park, with the addition of two new sectors to the west.	Yes
REHABILITATION		
2.	Rehabilitate Poor condition bushland in the following Sectors: Boobook, Sayer St Hill, East Melon Hill, North Melon Hill, South Melon Hill, West Melon Hill and the Seaward Corridor.	Yes
REVEGETATION		
3.	Develop Rehabilitation Plans for all sites to be intensively managed. These should include as a minimum the boundary of works, a planting list and native plants present that require protection.	Yes
4.	Use only plant species for rehabilitation if they would have naturally occurred at the sites.	Yes
5.	Continue to compile a comprehensive list of species present.	Yes
6.	Use only forms of plants that would have naturally occurred onsite.	Yes
7.	Document all rehabilitation undertaken including weed control and tree planting.	Yes
8.	Establish a monitoring program for indigenous species, with the location and abundance of species in very low abundance recorded.	No
WEED CONTROL		
9.	Use an integrated approach to weed control including herbicides, manual removal, modifying microclimates (in terms of shade, moisture etc) and biological controls (such as Bridal Creeper Leafhopper and the rust, *Puccinia myrsiphylli*).	Yes
10.	Map the distribution of four highly invasive weeds with the potential to expand rapidly each year.	Partially
11.	Map the distribution of four moderately invasive weeds with potential to become major problems every two to three years.	Partially
12.	Map two weed species not previously mapped each year.	No
13.	Manage weeds such that the 5 year targets listed in Appendix 5 are achieved.	Partially
DISEASE MANAGEMENT		
14.	Establish standard hygiene protocols for Council operations within bushland reserves.	Yes
15.	Ensure that any soil or plant material used for bushland restoration is disease free.	Yes
FIRE MANAGEMENT		
16.	Ban all open fires at all times should be instigated within the study area.	Yes

17.	Reduce fuel loads through control of weeds such as Perennial Veldt Grass.	Yes
18.	Suppress and contain any wildfires within the study area as quickly as possible.	Yes
19.	Document fire history with the extent of fires mapped, and dates and causes recorded.	Yes
20.	Control access into burnt areas as soon as possible after the fire. Access to any burnt areas should be limited to management vehicles only for the first six to twelve months. Seed germination and resprouting of vegetation or regeneration should be monitored for a year following fire.	Yes
21.	Revise weed control works after any fires to ensure potential damage to repsrouting and germinating plants are minimised and efficiencies are maximised.	Yes
22.	Access tracks to be modified to better suit fire fighting vehicles.	No
ACCESS		
23.	The Council consider formalising the names of tracks within Allen Park.	No
24.	Encourage the Department of Defence to review the status of the Log and Chain Track, and link the Tuart and Melon Hill Tracks.	Yes
25.	Regularly prune along all paths to be retained.	Yes
26.	Develop standards for bushland paths.	Yes
27.	Maintain all bushland paths to satisfactory standard.	Partially
COMMUNITY INVOLVEMENT		
28.	Continue to support the activities of community groups such as the Friends of Allen Park Bushland Group.	Yes
CULTURAL HERITAGE, INTERPRETATION & EDUCATION		
29.	Upgrade the current information shelter.	Yes
30.	Install signage that includes a map of the reserve, and the track network at least at one point in addition to the information shelter.	No
31.	Encourage the Department of Defence to remove signs that state that access is prohibited.	No
32.	Change wording of signs for Friends of Allen Park rehabilitation sites to state they are demonstration sites and erect them at focus rehabilitation sites, and use low key signs at all other sites (e.g. ‘Let it Grow’ signs).	No
NATIVE ANIMALS		
33.	Continue program of establishing and monitoring Native Pellitory as food and habitat for the Yellow Admiral Butterfly.	Yes
34.	Maintain tree hollows where possible as refuges for Brushtail Possums.	Yes
FERAL ANIMALS		
35.	Minimise watering of bushland areas to discourage Coastal Brown Ant Infestations.	Partially
36.	Avoid using materials such as pavers or concrete slabs within the bushland which encourage Coastal Brown Ant infestations.	Yes
37.	Continue to monitor and control feral animals including bees.	Yes