GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 10219/1
Permit Holder:	City of Joondalup
Duration of Permit:	From 13 July 2024 to 13 July 2039

ADVICE NOTE

Allocation of offset site

In relation to *condition* 11 of this permit, it is noted that 0.76 hectares of Lot 10789 on Diagram 67314, Mullaloo (Reserve 39497) and Lot 15445 on Deposited Plan 40340, Hillarys (Reserve 47831), will be attributed to the offset for this project. The nominated 0.76 hectare area contains vegetation within a significant remnant within an extensively *cleared* landscape, in addition to other environmental values.

- 0.11 hectares within Reserve 39497 and Reserve 47831, Mullaloo contains vegetation representative of Priority 3 Ecological Community - *FCT 24: Northern Spearwood shrublands and woodlands* and is a significant remnant within an extensively *cleared* landscape, in addition to other environmental values.
- 0.65 hectares of the nominated area within Reserve 47831, Hillarys contains vegetation representative of the Priority 3 Ecological Community - *FCT 29a: Coastal shrublands on shallow sands* and is a significant remnant within an extensively *cleared* landscape, in addition to other environmental values.

An additional 0.38 hectares of native vegetation within Reserve 47831, Hillarys will be banked for future offsets within the City of Joondalup.

The permit holder is authorised to *clear native vegetation* subject to the following *conditions* of this permit.

PART I – CLEARING AUTHORISED

1. Clearing authorised (purpose)

The permit holder is authorised to *clear native vegetation* for the purpose of upgrading and widening sections of the Coastal Shared Path.

2. Land on which clearing is to be done

Lot 1 on Diagram 15098, Mullaloo

Lot 3 on Deposited Plan 10519, Kallaroo

Lot 500 on Deposited Plan 417015 (Reserve 40802), Hillarys

Lot 500 on Deposited Plan 417135 (Reserve 39497), Hillarys / Kallaroo

Lot 5392 on Deposited Plan 166245 (Reserve 23563), Hillarys

Lot 8891 on Deposited Plan 9195 (Reserve 32074), Mullaloo

Lot 10789 on Deposited Plan 67314 (Reserve 39497), Kallaroo

Lot 13455 on Deposited Plan 220334 (Reserve 39197), Hillarys

Lot 15445 on Deposited Plan 40340 (Reserve 47831), Hillarys / Kallaroo / Mullaloo

Mullaloo Drive / Oceanside Promenade road reserve (PIN 11755270), Mullaloo

Oceanside Promenade road reserve (PIN 1217046, 1341044, 1341045, 1341059, 11755273), Mullaloo

Oceanside Promenade / Warren Way road reserve (PIN 1341063), Mullaloo

Northshore Drive / Merrifield Place road reserve (PIN 1341090), Mullaloo

Northshore Drive / Merrifield Place road reserve (PIN 1341095), Kallaroo / Mullaloo

Whitfords Avenue road reserve (PIN 1166946), Hillarys

3. Clearing authorised

The permit holder must not *clear* more than 0.38 hectares of *native vegetation* within the combined areas cross-hatched yellow in Figure 1, Figure 2, Figure 3, Figure 4, Figure 5, Figure 6, Figure 7, Figure 8 and Figure 9 of Schedule 1.

4. Period during which clearing is authorised

The permit holder must not *clear* any *native vegetation* after 13 July 2029.

PART II – MANAGEMENT CONDITIONS

5. Avoid, minimise, and reduce impacts and extent of clearing

In determining the *native vegetation* authorised to be *cleared* under this permit, the permit holder must apply the following principles, set out in descending order of preference:

(a) avoid the *clearing* of *native vegetation*;

(b) minimise the amount of *native vegetation* to be *cleared*; and

(c) reduce the impact of *clearing* on any environmental value.

6. Weed and dieback management

When undertaking any *clearing* authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds* and *dieback*:

(a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be *cleared*;

(b) ensure that no known *dieback* or *weed*-affected soil, *mulch*, *fill*, or other material is brought into the area to be *cleared*; and

(c) restrict the movement of machines and other vehicles to the limits of the areas to be *cleared*.

7. Directional clearing

The permit holder must:

(a) conduct *clearing* authorised under this permit in one direction towards adjacent *native vegetation*; and

(b) allow a reasonable time for fauna present within the area being cleared to move into adjacent *native vegetation* ahead of the *clearing* activity.

8. Priority ecological community management

The permit holder must not *clear* more than 0.373 hectares of *native vegetation*, in total, that is representative of the 'FCT 29a: Coastal shrublands on shallow sands', 'FCT 29b: Acacia shrublands on taller dunes' and/or 'FCT 24: Northern Spearwood shrublands and woodlands' priority ecological communities.

9. Threatened ecological community management

The permit holder must not *clear* any *Eucalyptus gomphocephala* (tuart) trees associated with the 'Tuart Woodlands and Forests of the Swan Coastal Plain' threatened ecological community.

10. Wind erosion management

The permit holder must commence construction no later than two (2) months after undertaking the authorised *clearing* activities to reduce the potential for wind erosion.

11. Revegetation - offset

(a) Within 24 months of commencing clearing authorised under this permit, at an *optimal time* and no later than 30 June 2026, the permit holder must *revegetate* and *rehabilitate* the combined areas cross-hatched red on Figure 1 and Figure 2 of Schedule 2 , by implementing and adhering to the *Revegetation Plan* prepared by the City of Joondalup – January 2024, including but not limited to the following actions:

(i) deliberately *planting* and/or *direct seeding native vegetation* that will result in the minimum completion criteria detailed in Table 1 of Schedule 3 of this permit and ensuring only *local provenance* seeds and propagating material are used;

(ii) remove non-native planted vegetation prior to *planting* and/or *direct seeding*;

(iii) undertake *weed* control activities to achieve and maintain the minimum completion criteria specified on Table 1 of Schedule 3.

(iv) install temporary fencing around the perimeter of the *revegetation* sites;

(v) establish at least five 10 x 10 metre quadrat monitoring sites within rehabilitated areas; and

(vi) undertake monitoring of the areas *revegetated* and *rehabilitated* under condition 11 of this permit by an *environmental specialist* in accordance with Table 1 of Schedule 3 until the completion criteria listed in Table 1 of Schedule 3 have been met.

(b) The permit holder must undertake *remedial actions* for areas *revegetated* and *rehabilitated*, where monitoring indicates that the *revegetation* and *rehabilitation* has not met the completion criteria specified in Table 1 of Schedule 3, including:

(i) *revegetate/rehabilitate* the area by deliberately *planting* and/or *direct seeding native vegetation* that will result in the minimum completion criteria detailed in Table 1 of Schedule 3 and ensuring only *local provenance* seeds and propagating material are used;

(ii) additional *weed* control activities;

(iii) annual monitoring of the *revegetated* and *rehabilitated* areas by an *environmental specialist*, until the completion criteria are met; and

(iv) where an *environmental specialist* has determined that the completion criteria, outlined in Schedule 3 has been met, that determination shall be submitted to the *CEO* within three months of the determination being made by the *environmental specialist.*

PART III - RECORD KEEPING AND REPORTING

12. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	(a) the species composition, structure, and density of the *cleared* area; (b) the location where the *clearing* occurred, recorded using a Global Positioning System (GPS) unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was *cleared*; (d) the size of the area *cleared* (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of *clearing* in accordance with condition 5; (f) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 6; (g) actions undertaken in accordance with condition 7; (h) actions undertaken in accordance with condition 8; and (i) actions undertaken in accordance with condition 9.
2.	In relation to the *revegetation* and	(a) a description of the *revegetation* and *rehabilitation* activities undertaken each

No.	Relevant matter	Specifications
	rehabilitation of areas pursuant to condition 11 of this permit	year, once commenced, outlined in a report produced by an *environmental specialist*; (b) the location and size of the areas *revegetated* and *rehabilitated* (in hectares) recorded using a GPS unit set to GDA 2020, expressing the geographical coordinates in Eastings and Northings or decimal degrees; (c) the date that *revegetation* and *rehabilitation* works began; (d) the baseline data recorded for the area to be *revegetated/rehabilitated*, including species richness, species density, vegetation structure and *weed* cover; (e) the species composition, structure, density of the areas *revegetated/rehabilitated* recorded annually; (f) results of annual monitoring against the completion criteria (g) the date completion criteria area considered to have been met; and (h) any other actions in accordance with condition 11.

13. Reporting

The permit holder must provide to the *CEO* the records required under *condition* 12 of this permit when requested by the *CEO*.

DEFINITIONS

In this permit, the terms in Table 2 have the meanings defined.

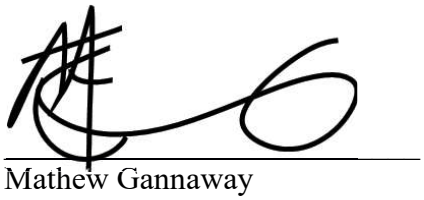
Table 2: Definitions

Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*.
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
environmental specialist	means a person who holds a tertiary qualification in environmental science or equivalent, and has a minimum of two (2) years' work experience relevant to the type of

Term	Definition
	environmental advice that an environmental specialist is required to provide under this permit, or who is approved by the *CEO* as a suitable environmental specialist.
fill	means material used to increase the ground level, or to fill a depression.
dieback	means the effect of *Phytophthora* species on native vegetation.
direct seeding	direct seeding means a method of re-establishing vegetation through the establishment of a seed bed and the introduction of seeds of the desired plant species.
department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	*Environmental Protection Act 1986* (WA)
local provenance	means native vegetation seeds and propagating material from natural sources within 25 kilometres and the same Interim Biogeographic Regionalisation for Australia (IBRA) subregion of the area cleared.
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
optimal time	means the period between April and July
planting	means the re-establishment of vegetation by creating soil conditions and planting seedlings of the desired species.
remedial action/s	remedial action/s means for the purpose of this permit, any activity that is required to ensure successful re-establishment of understorey to its pre-clearing composition, structure and density, and may include a combination of soil treatments and revegetation.
revegetate/revegetated/ revegetation	means the re-establishment of a cover of local provenance native vegetation in an area using methods such as natural regeneration, direct seeding and/or planting so that the species composition, structure and density is similar to pre-clearing vegetation types in that area.
rehabilitate/rehabilitated/rehabilitation	means actively managing an area containing native vegetation in order to improve the ecological function of that area.
rehabilitation plan	means the rehabilitation plan approved by the CEO 'Coastal Shared Path Revegetation Plan for Hillarys to Mullaloo' prepared by City of Joondalup, provided on 29 January 2024 (DWER reference DWERDT896230)
weeds	means any plant – (a) that is a declared pest under section 22 of the

Term	Definition
	Biosecurity and Agriculture Management Act 2007; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS



Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

19 June 2024

Schedule 1

The boundary of the area authorised to be cleared is shown in the map below (Figure 1 to 9).

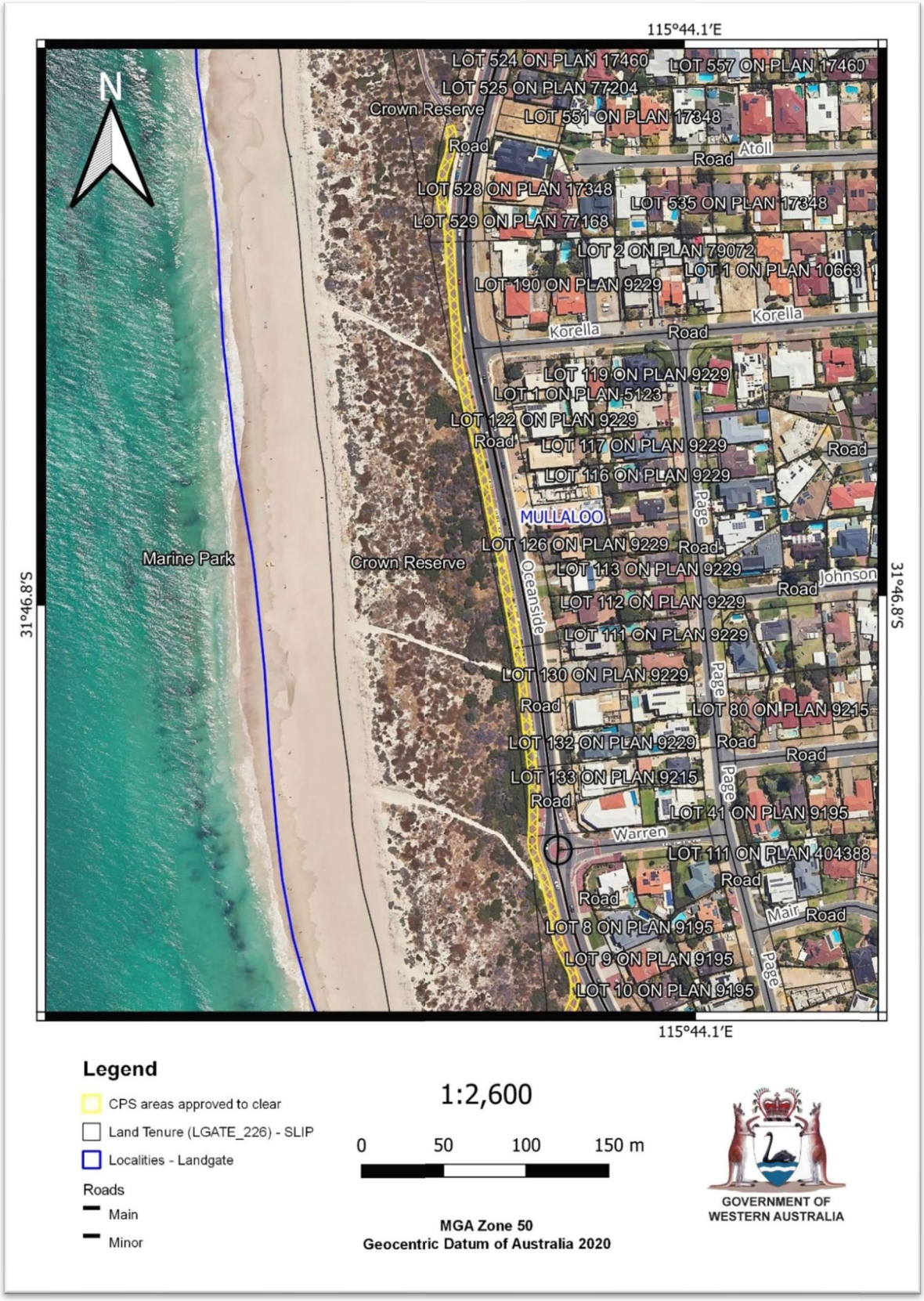


Figure 1: Map of the boundary of the area within which clearing may occur

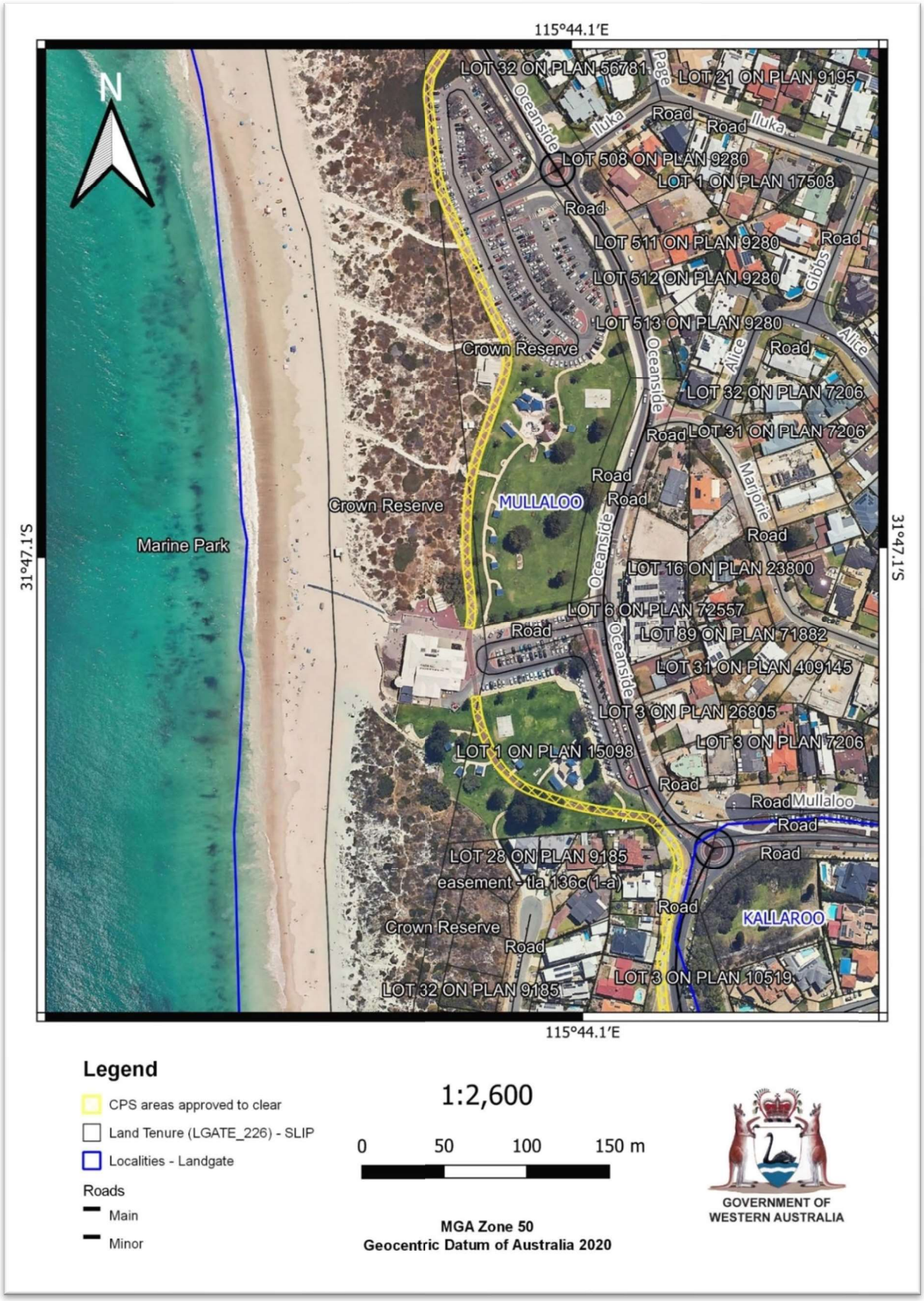


Figure 2: Map of the boundary of the area within which clearing may occur

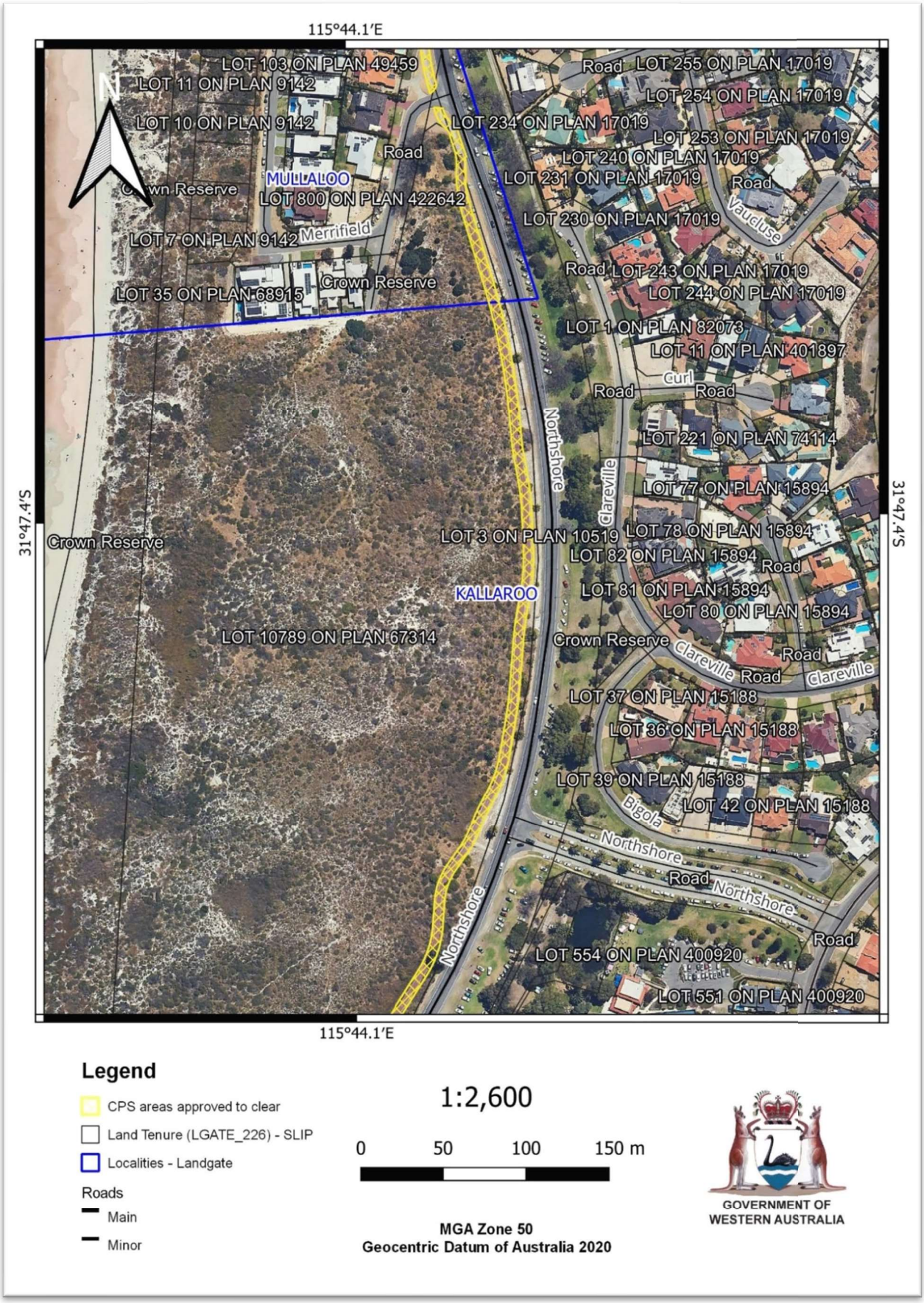


Figure 3: Map of the boundary of the area within which clearing may occur

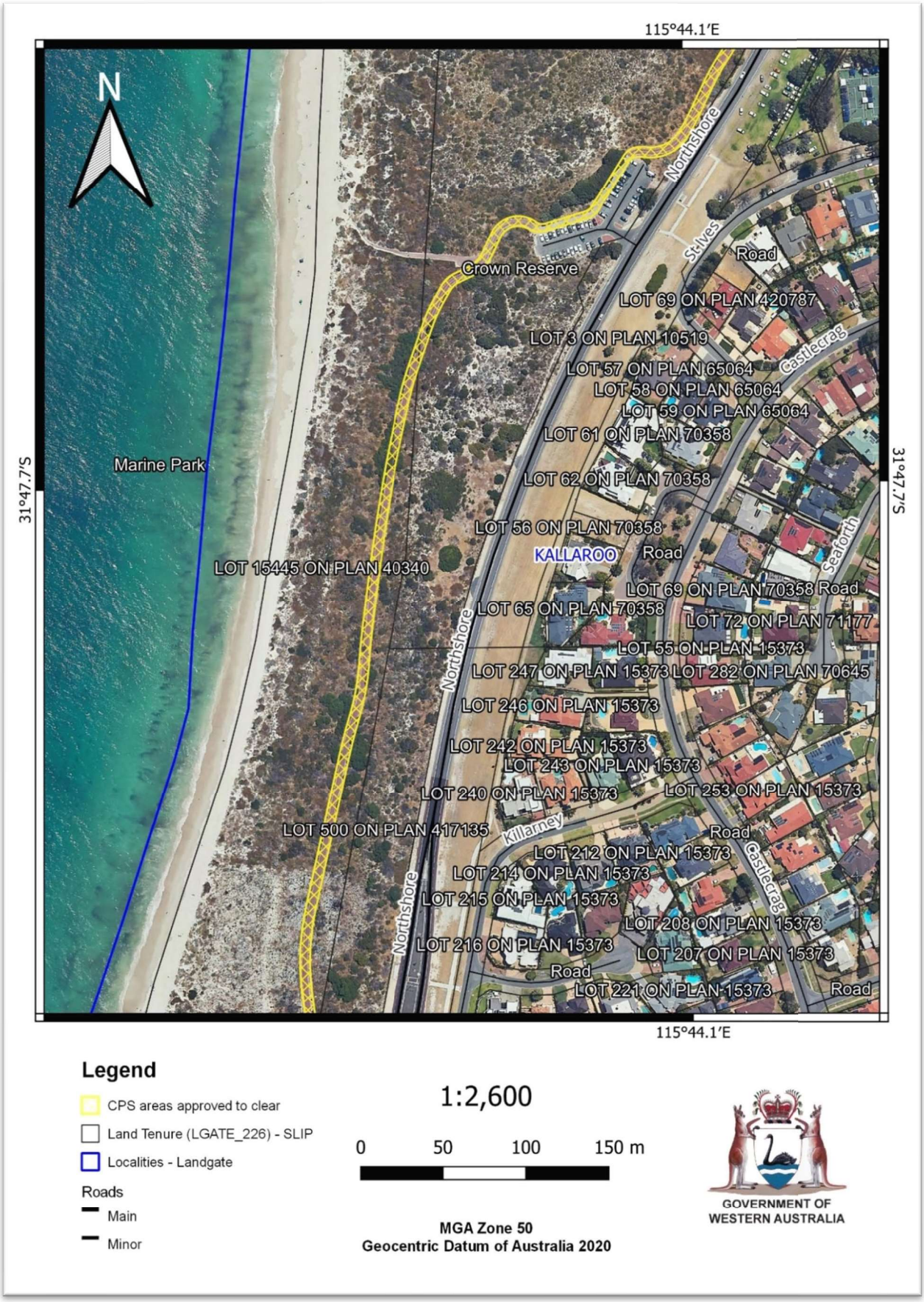


Figure 4: Map of the boundary of the area within which clearing may occur

Figure 5: Map of the boundary of the area within which clearing may occur

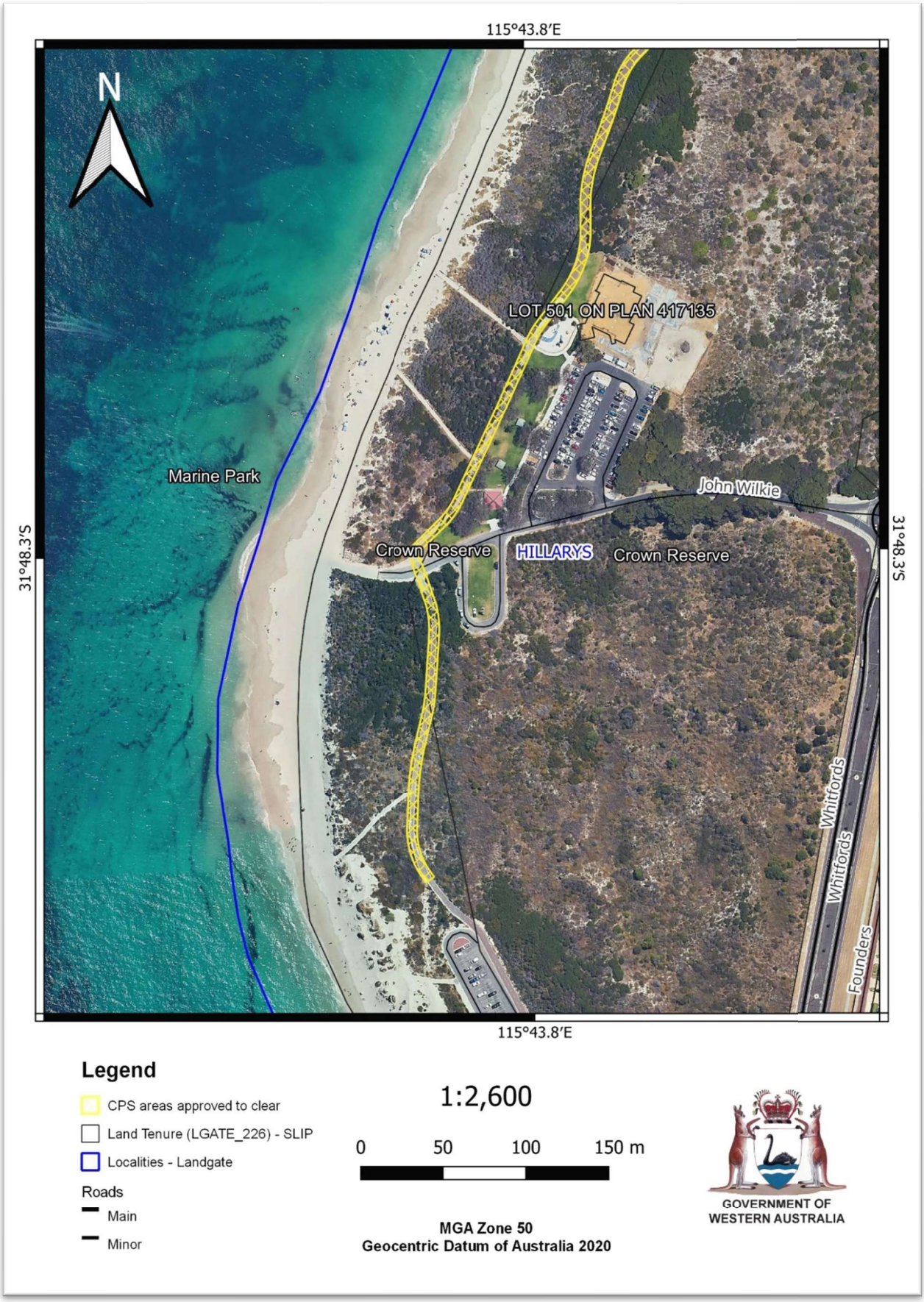


Figure 6: Map of the boundary of the area within which clearing may occur

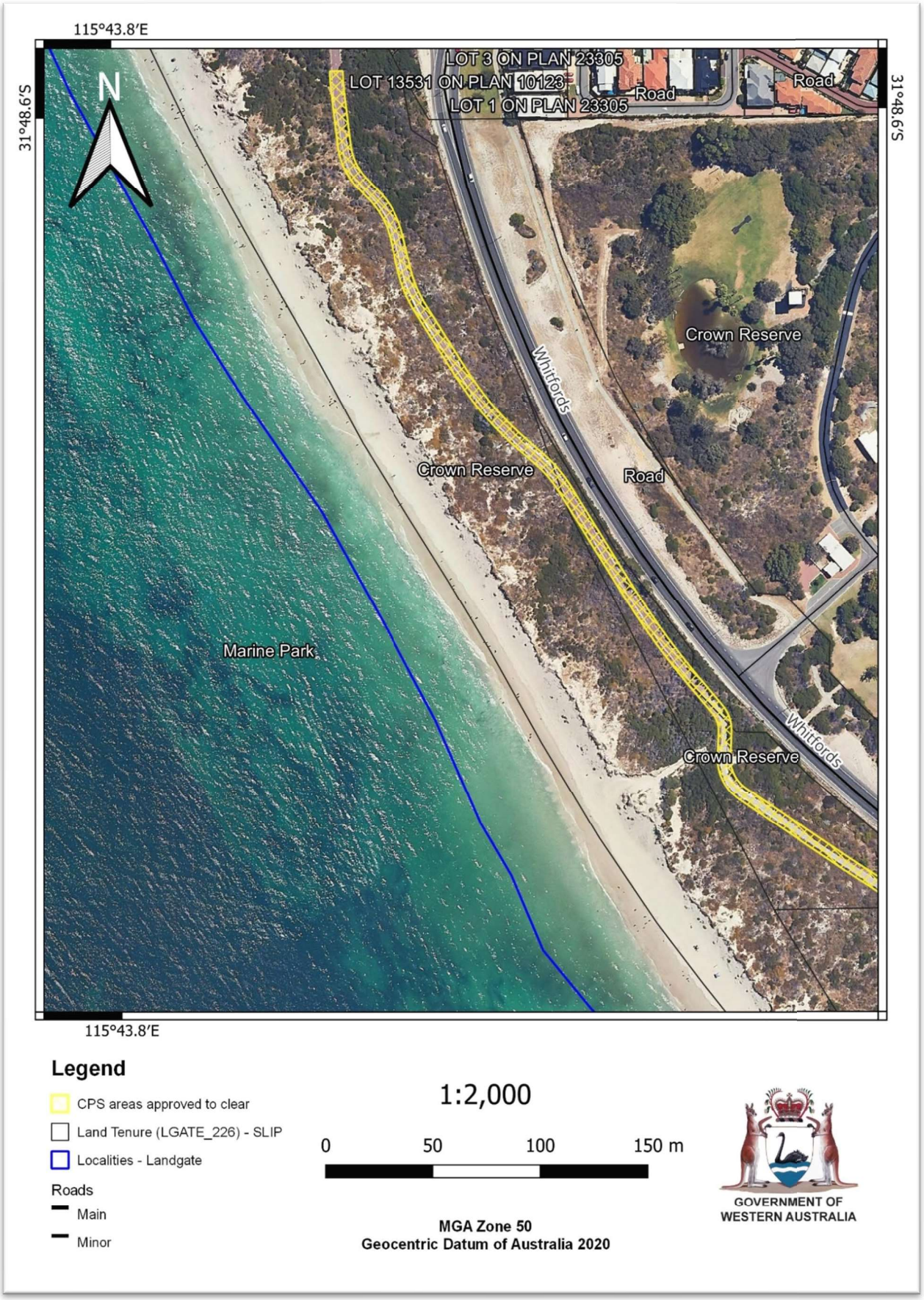


Figure 7: Map of the boundary of the area within which clearing may occur

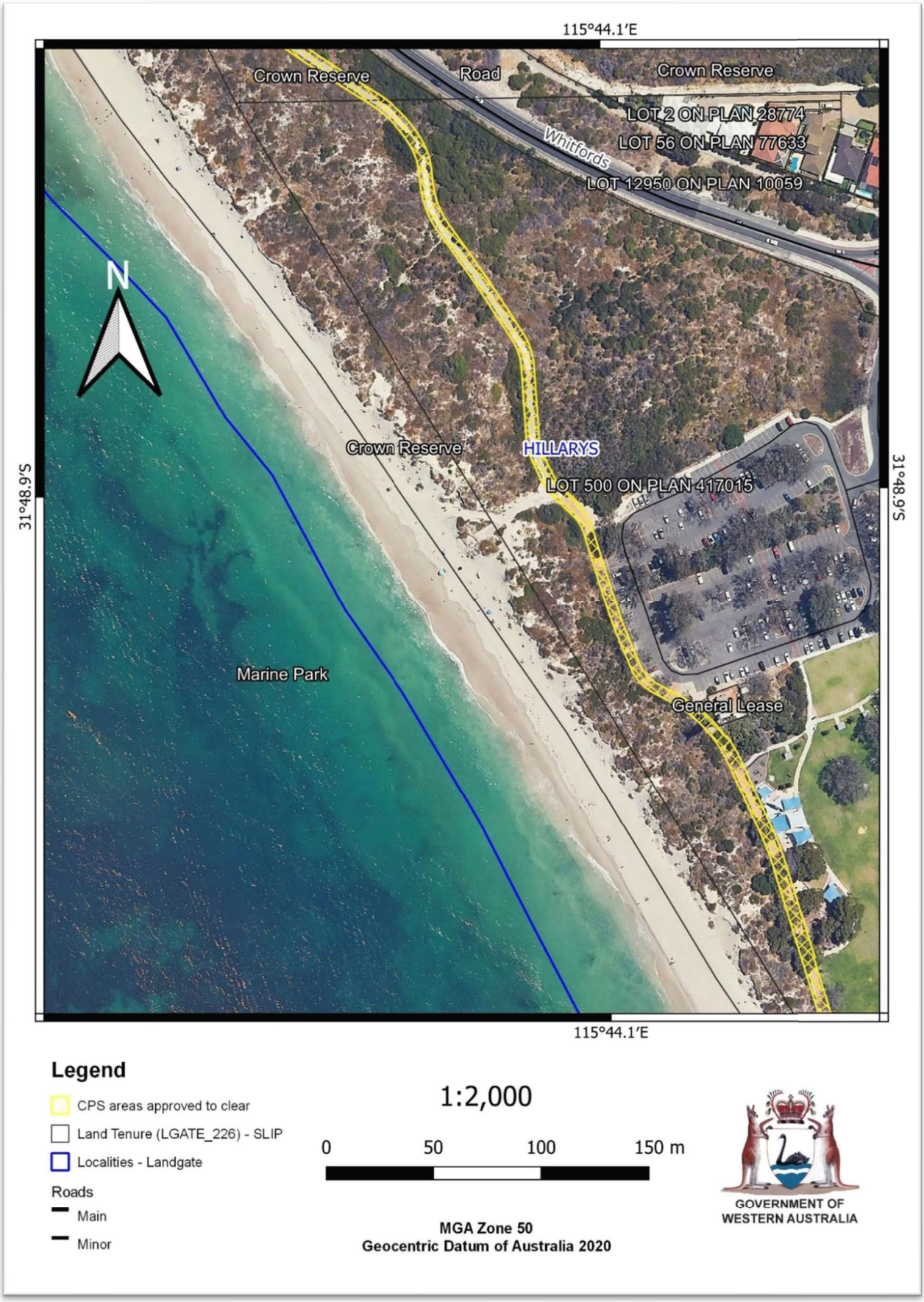


Figure 8: Map of the boundary of the area within which clearing may occur

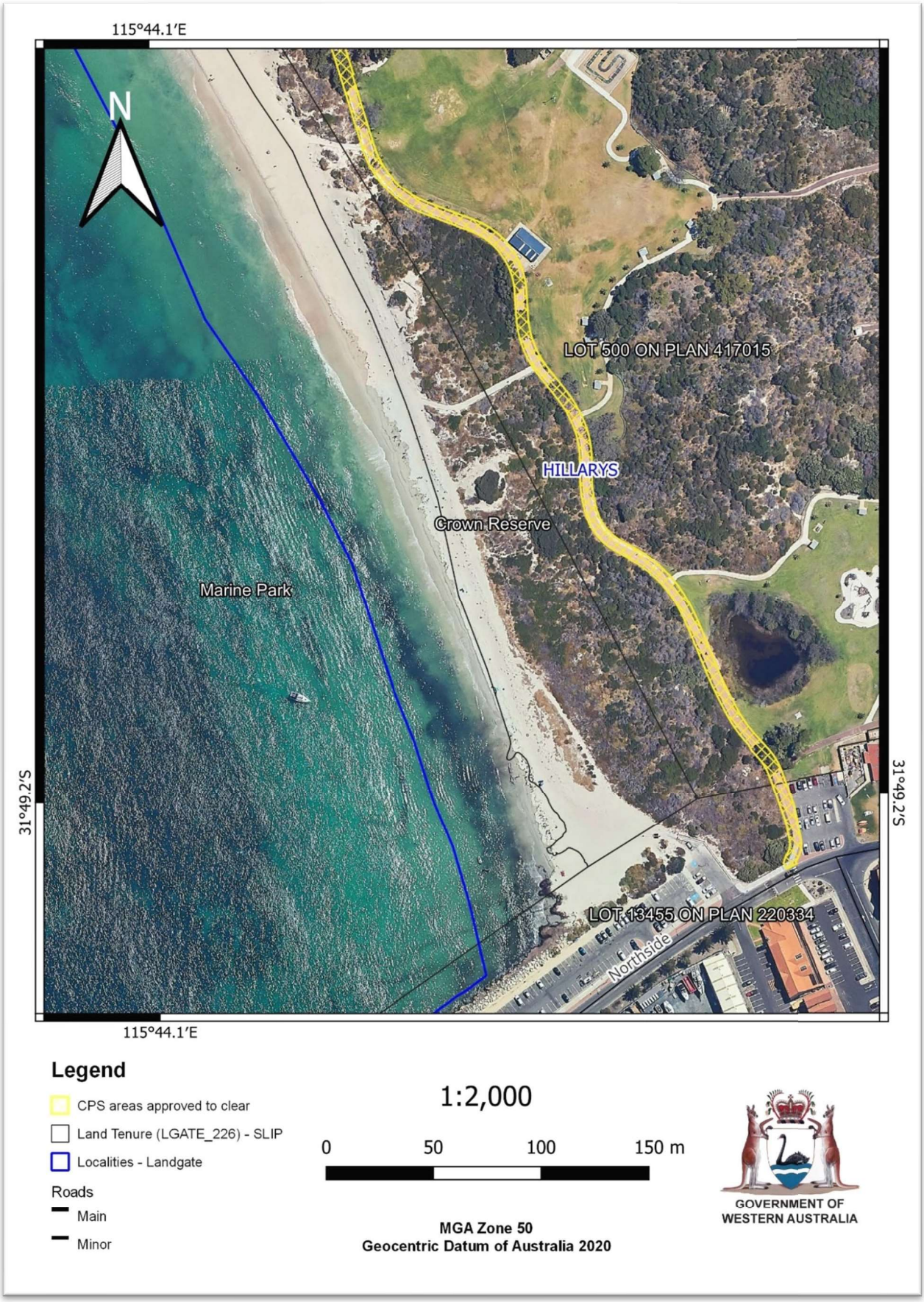


Figure 9: Map of the boundary of the area within which clearing may occur

Schedule 2

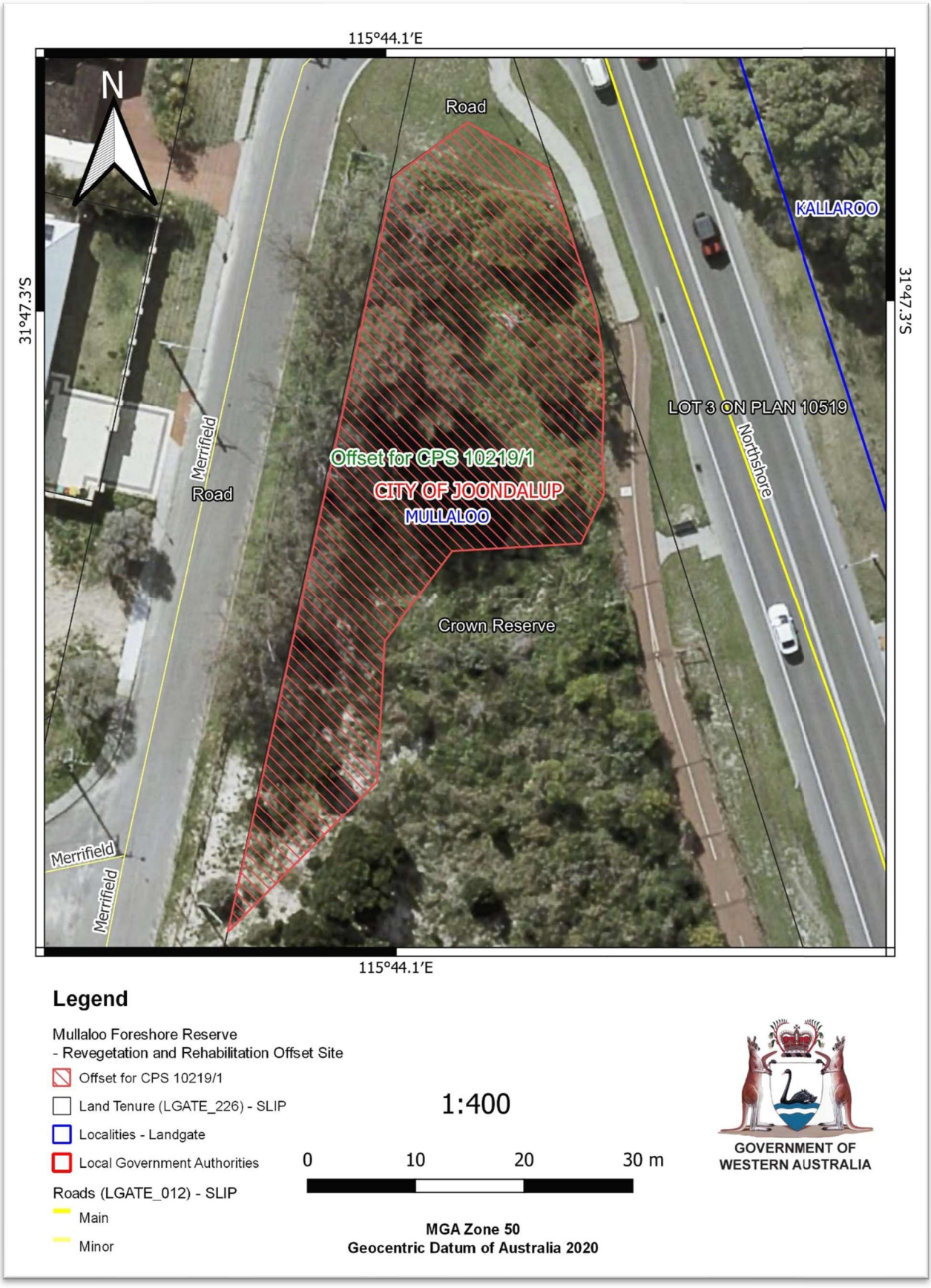


Figure 1: Map of the boundary of the area within Reserve 39497, Lot 10789 on Diagram 67314, Mullaloo, in which revegetation and rehabilitation must occur (cross-hatched red)

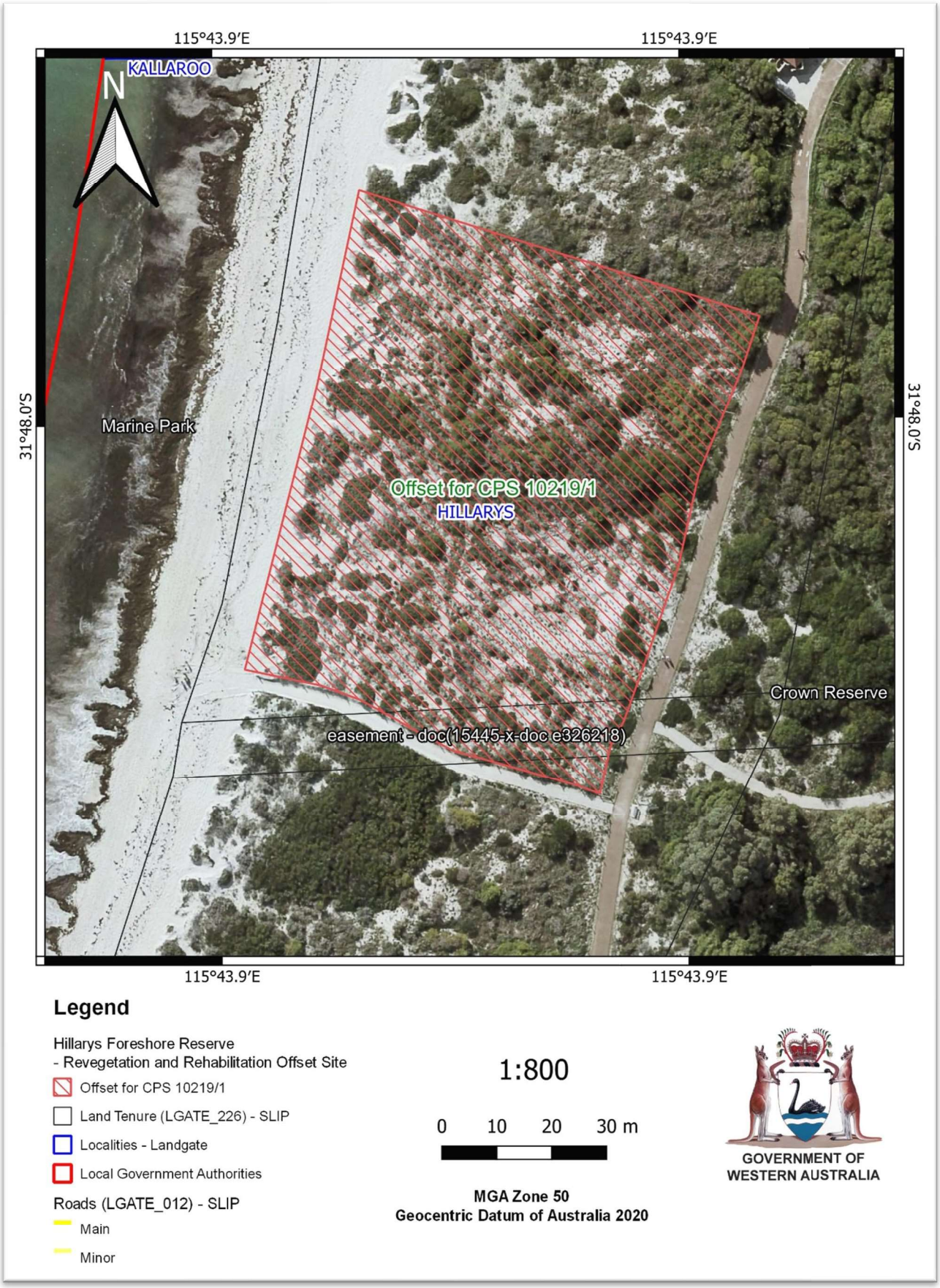


Figure 2: Map of the boundary of the area within Reserve 47831, Lot 15445 on Deposited Plan 40340, Hillarys, in which revegetation and rehabilitation must occur (cross-hatched red)

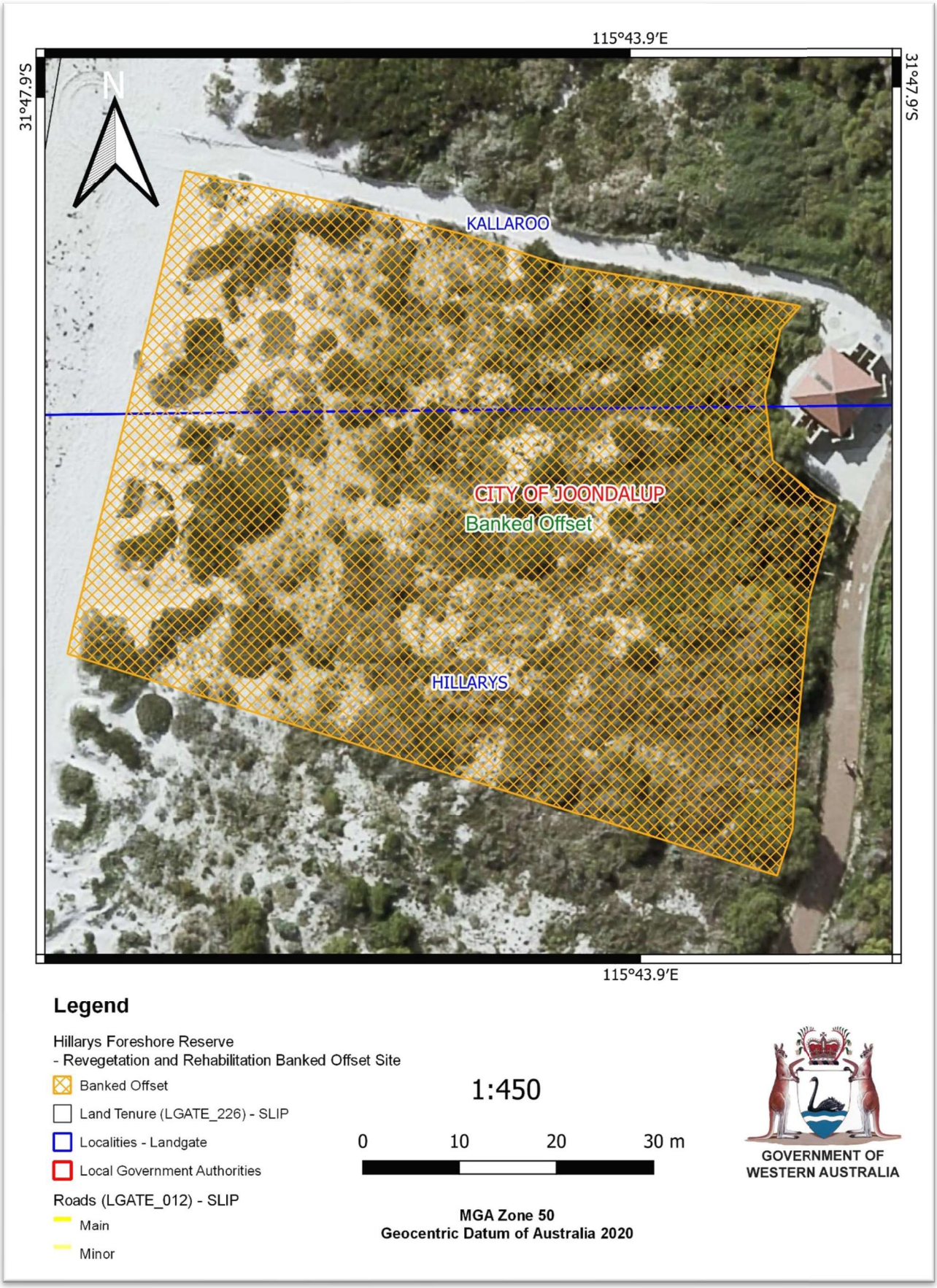


Figure 3: Map of the boundary of the area within Reserve 47831, Lot 15445 on Deposited Plan 40340, Hillarys, associated with City of Joondalup's banked offset commitment.

Schedule 3

Table 1: The table below outlines the revegetation completion targets and criteria associated with CPS 10219/1.

Measure	Completion Targets	Completion Criteria	Monitoring
Native species diversity	Minimum of 60% of native species returned.	A minimum of 7 native species per 10m by 10m quadrat.	Native diversity will be counted annually for the first 3 years, and if the completion criteria are not met within 3 years then annual monitoring is required until the completion criteria is met.
Weed density	Weed cover at the site is 10% or less (minor non-competitive weeds).	Weed cover is to be 10% or less of minor non-competitive weeds.	Weed cover percentage will be assessed annually for the first 3 years, and if the completion criteria are not met within 3 years then annual monitoring is required until the completion criteria is met.
Native species density	Survival rate of 2 native plants/m^2.	A survival rate of 2 plant/m^2 is to be achieved after 3 years. All planted species that have not survived will be replanted within 12 months and monitored for a further 2 years.	The number of surviving plants will be counted annually for the first 3 years, and if the completion criteria are not met within 3 years then annual monitoring is required until the completion criteria is met.
Watering	Watering of tubestock over summer months.	Watering to be conducted 5 times over the summer months each year for 3 years, or until competition criteria are met.	Watering of tubestock to be conducted 5 times in years 1, 2 and 3, or until competition criteria are met.
Weed control	Quarterly weed control events with the first event to be undertaken prior to planting.	Weed control events to be conducted quarterly each year for 3 years, or until competition criteria are met.	Quarterly weed control events to be conducted in years 1, 2 and 3, or until competition criteria are met.

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 10219/1
Permit type:	Purpose permit
Applicant name:	City of Joondalup
Application received:	31 May 2023
Application area:	0.38 hectares of native vegetation within a 2.78 hectare footprint (revised)
Purpose of clearing:	Upgrading and widening section of the Coastal Shared Path
Method of clearing:	Mechanical
Property:	Lot 1 on Diagram 15098, Mullaloo Lot 3 on Plan 10519, Kallaroo Lot 500 on Plan 417015 (Reserve 40802), Hillarys Lot 500 on Plan 417135 (Reserve 39497), Hillarys / Kallaroo Lot 5392 on Plan 166245 (Reserve 23563), Hillarys Lot 8891 on Plan 9195 (Reserve 32074), Mullaloo Lot 10789 on Plan 67314 (Reserve 39497), Kallaroo Lot 13455 on Plan 220334 (Reserve 39197), Hillarys Lot 15445 on Plan 40340 (Reserve 47831), Hillarys / Kallaroo / Mullaloo Mullaloo Drive / Oceanside Promenade road reserve (PIN 11755270), Mullaloo Oceanside Promenade road reserve (PIN 1217046, 1341044, 1341045, 1341059, 11755273), Mullaloo Oceanside Promenade / Warren Way road reserve (PIN 1341063), Mullaloo Northshore Drive / Merrifield Place road reserve (PIN 1341090), Mullaloo Northshore Drive / Merrifield Place road reserve (PIN 1341095), Kallaroo / Mullaloo Whitfords Avenue Road reserve (PIN 1166946), Hillarys
Location (LGA area/s):	City of Joondalup
Localities (suburb/s):	Mullaloo, Kallaroo, Hillarys

1.2. Description of clearing activities

The City of Joondalup (the City) initially applied to clear an area of 0.54 hectares of native vegetation within a 2.78 hectare footprint within multiple land parcels and road reserves, in Mullaloo, Kallaroo, and Hillarys, to allow for the upgrading and widening of a section of the existing Coastal Shared Path.

During the assessment, the clearing area was reduced to 0.38 hectares within the 2.78 hectare footprint through various avoidance and minimisation measures (see Section 1.5). In addition to the widening of the Coastal Shared Path from a three to four metre width, the proposed clearing will also allow for the relocation and/or new conservation fencing to be installed at a 50 centimetre offset from either side of the path edges (City of Joondalup, 2023a).

1.3. Decision on application

Decision:	Granted
Decision date:	19 June 2024
Decision area:	0.38 hectares of native vegetation within a 2.78 hectare footprint, as depicted in Section 1.5.

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with Sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 21 days and two submissions were received. Consideration of matters raised in the public submissions is summarised in Appendix B.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix C), relevant datasets (see Appendix G.1), the clearing principles set out in Schedule 5 of the EP Act (see Appendix D), relevant planning instruments, flora and vegetation surveys (see Appendix F) and any other matters considered relevant to the assessment (see Section 3.3). The Delegated Officer also took into consideration that the proposed clearing is a part of the project that will be delivered through the Western Australian Bicycle Network (WABN) Grants Program, which is an initiative of the State Government, administered by the Department of Transport (City of Joondalup, 2023a).

The assessment identified that the proposed clearing will result in:

- the loss of approximately 0.38 hectares of native vegetation, of which:
  - approximately 0.3762 hectares is within Bush Forever Site 325
  - approximately 0.0079 hectares is representative of the Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain (Tuart Woodlands) Threatened Ecological Community (TEC)
  - approximately 0.3679 hectares that is representative of the following Priority Ecological Communities (PEC):
    - 0.3273 hectares - FCT 29a Coastal shrublands on shallow sands (P3)
    - 0.0369 hectares - FCT 29b: Acacia shrublands on taller dunes (P3)
    - 0.0037 hectares - FCT 24: Northern Spearwood shrublands and woodlands (P3)
- the potential introduction and spread of weeds and dieback into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values;
- the loss of vegetation mapped as habitat likely to be utilised by *Zanda latirostris* (Carnaby's black cockatoo) and *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo);
- land degradation in the form of wind erosion; and
- impacts to fauna individuals if they are present in the application area at the time of clearing.

After consideration of the available information, the Delegated Officer determined that the impacts of the proposed clearing in a Bush Forever area is significant. In accordance with the Government of Western Australia's Environmental Offsets Policy (2011), Environmental Offsets Guidelines (2014) and State Planning Policy 2.8 (SPP 2.8), the Delegated Officer determined that the following revegetation offset is required to address the significant residual impacts to Bush Forever site 325:

- revegetation and rehabilitation in two locations, including 0.6523 hectares within primarily good condition vegetation within Hillarys Foreshore Reserve and 0.1077 hectares in a degraded area of Mullaloo Foreshore Reserve (City of Joondalup, 2024a) which are both within Bush Forever Site 325.

The Delegated Officer determined that the above offset was sufficient to counterbalance the significant residual impacts associated with this project. Further information on the suitability of the offset provided is summarised in Section 4.

The Delegated Officer determined that the proposed clearing is unlikely to have any long-term adverse impacts on the environment, and that management and mitigation measures conditioned on the permit will mitigate any potential impacts. There is not likely to be a significant impact to the small areas of TEC and PEC being cleared, no significant fauna habitat impacted, and the clearing is not likely to lead to appreciable land degradation. The Delegated Officer decided to grant a clearing permit subject to conditions including to:

- avoid, minimise and reduce the impacts and extent of clearing;
- take steps to minimise the risk of the introduction and spread of weeds and dieback;

- slow, directional clearing to allow fauna to escape into adjacent areas of vegetation;
- commence the construction of the pathway and conservation fencing no later than two (2) months after undertaking the authorised clearing activities to reduce the potential for wind erosion; and
- revegetate a minimum of 0.75 hectares of native vegetation within Bush Forever site 325, in alignment with Bush Forever requirements set out in SPP 2.8.

1.5. Site map

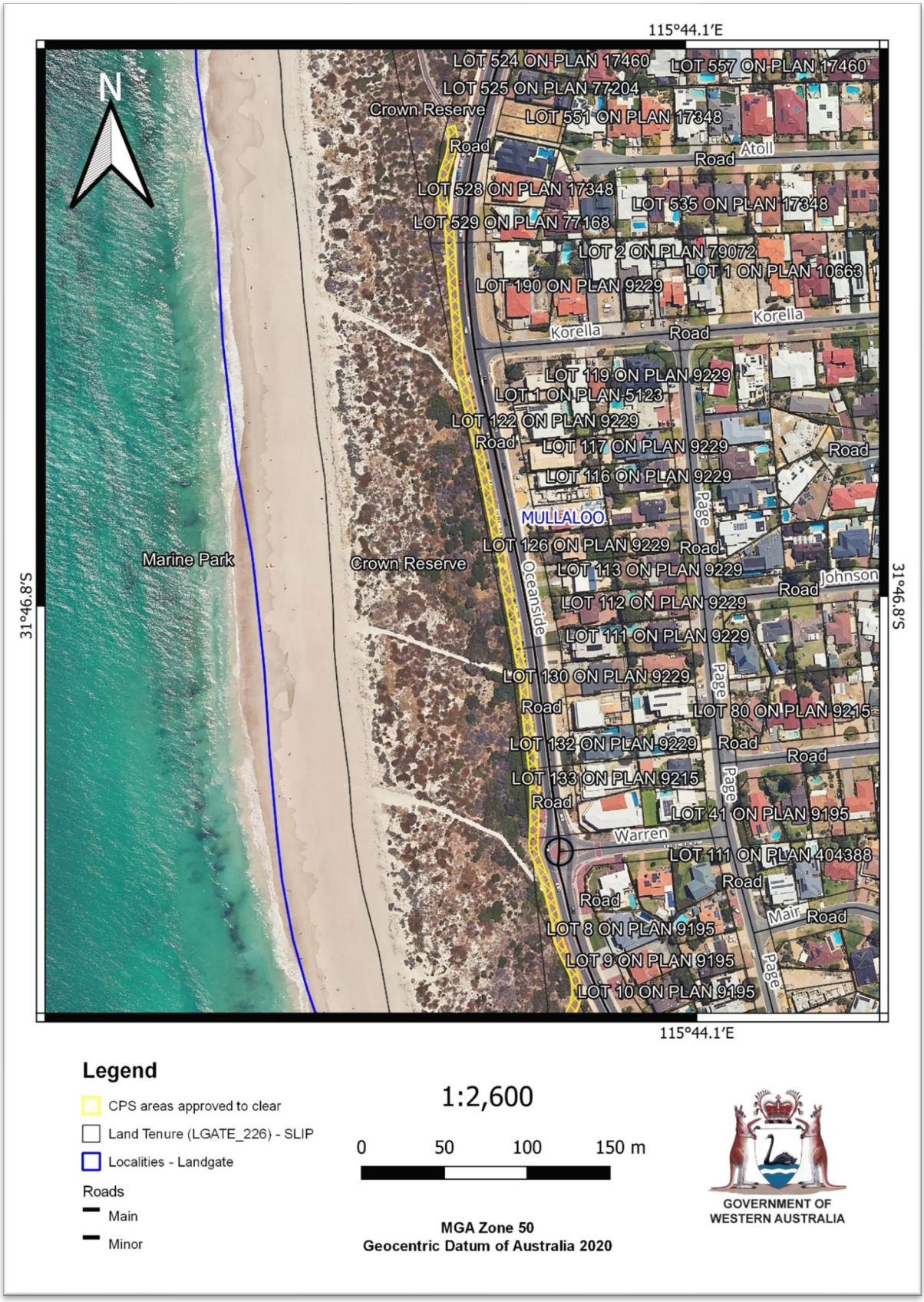


Figure 1: Map of the application area CPS 10219/1. The area crosshatched yellow indicates the footprint in which clearing is authorised to occur, under the granted clearing permit CPS 10219/1.

Figure 2: Map of the application area CPS 10219/1. The area crosshatched yellow indicates the footprint in which clearing is authorised to occur, under the granted clearing permit CPS 10219/1.

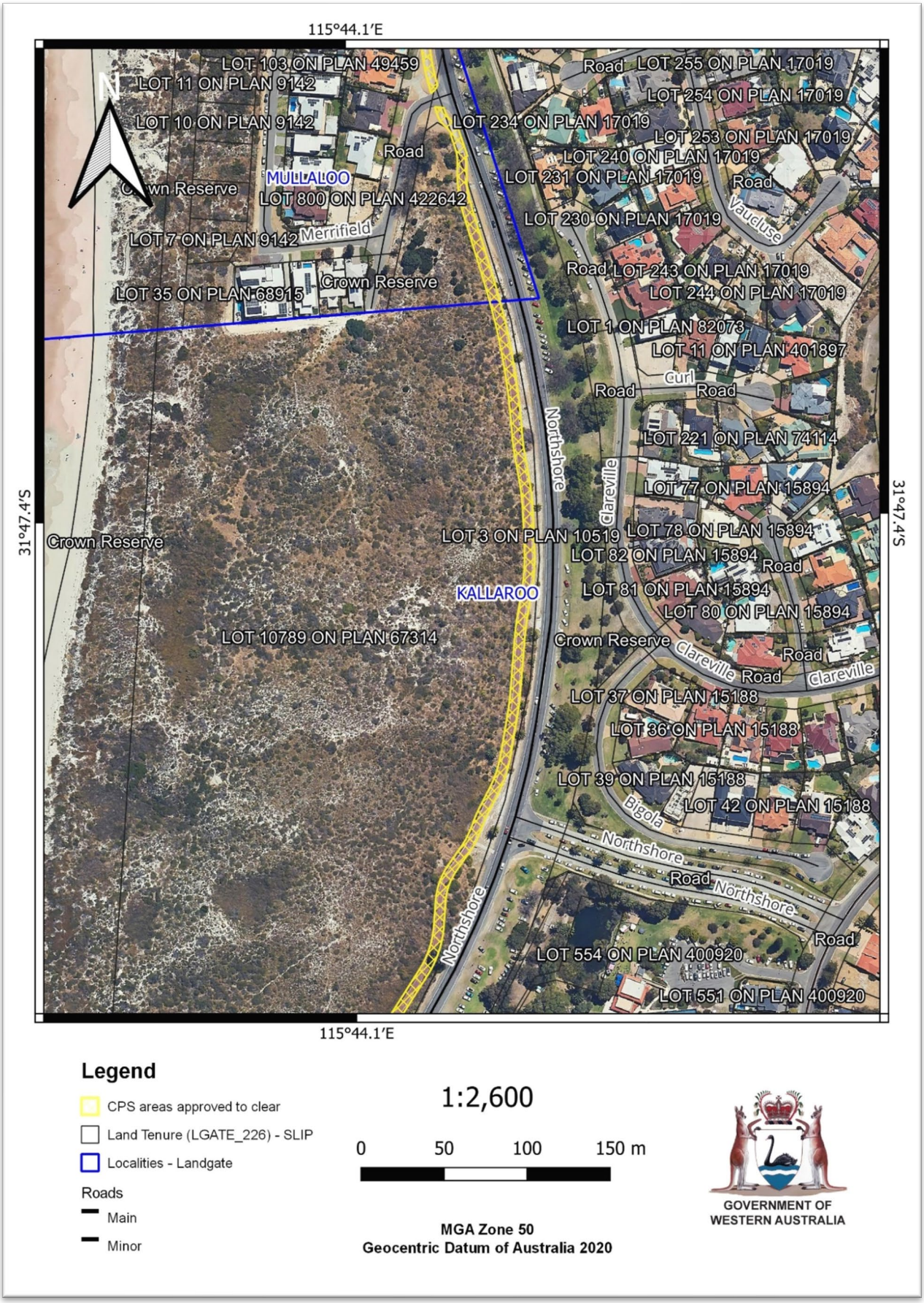


Figure 3: Map of the application area CPS 10219/1. The area crosshatched yellow indicates the footprint in which clearing is authorised to occur, under the granted clearing permit CPS 10219/1.

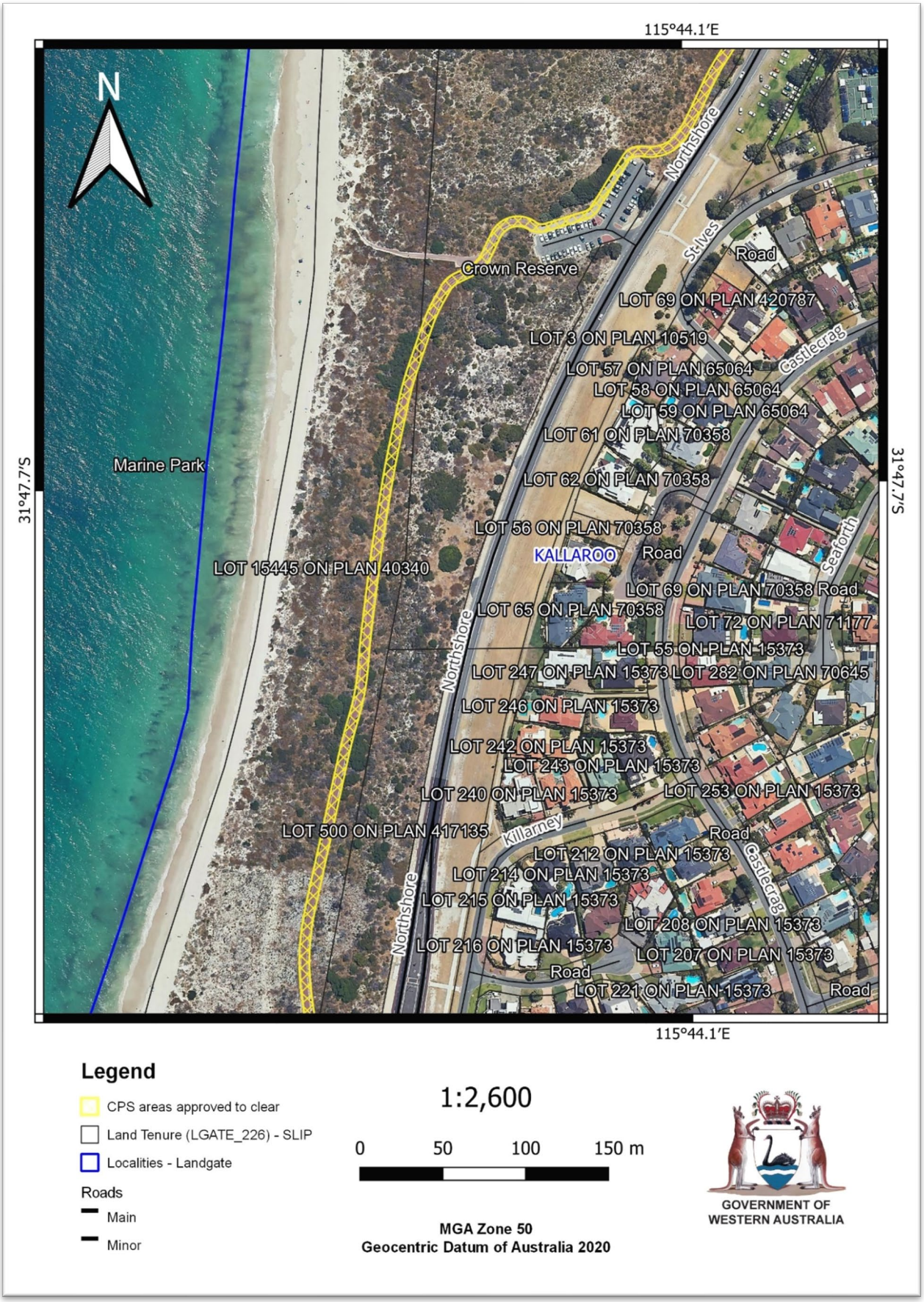


Figure 4: Map of the application area CPS 10219/1. The area crosshatched yellow indicates the footprint in which clearing is authorised to occur, under the granted clearing permit CPS 10219/1.

Figure 5: Map of the application area CPS 10219/1. The area crosshatched yellow indicates the footprint in which clearing is authorised to occur, under the granted clearing permit CPS 10219/1.

Figure 6: Map of the application area CPS 10219/1. The area crosshatched yellow indicates the footprint in which clearing is authorised to occur, under the granted clearing permit CPS 10219/1

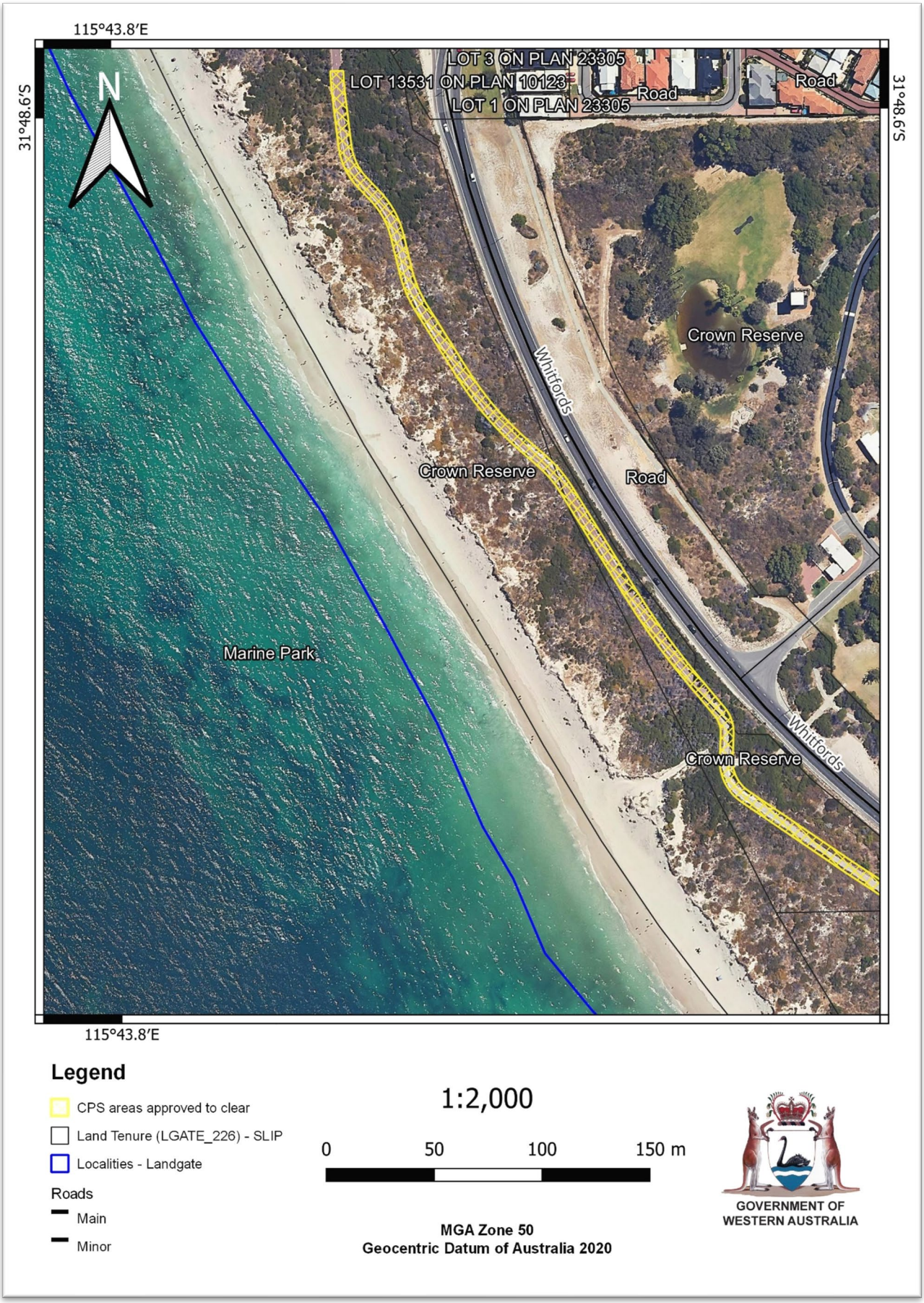


Figure 7: Map of the application area CPS 10219/1. The area crosshatched yellow indicates the footprint in which clearing is authorised to occur, under the granted clearing permit CPS 10219/1

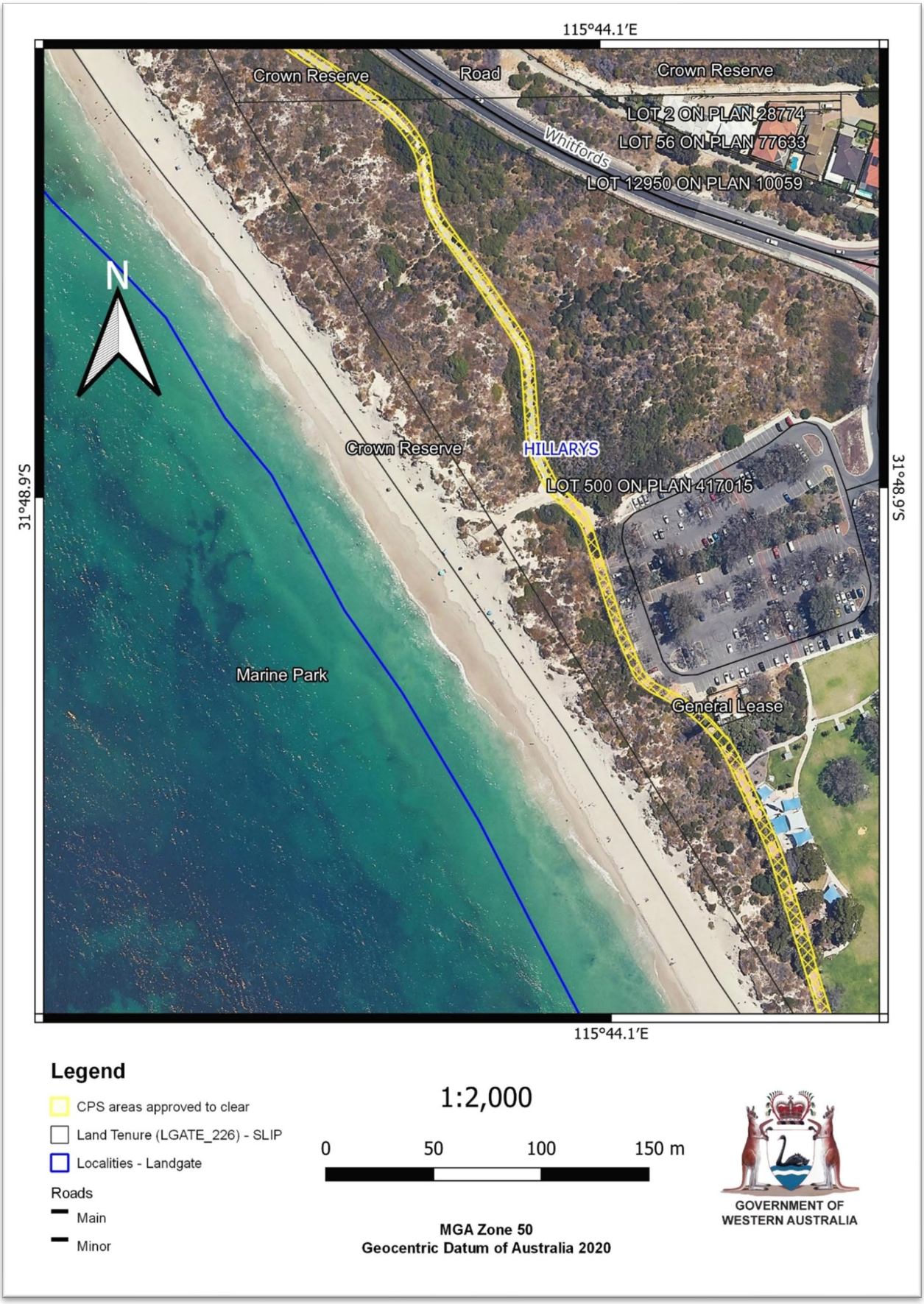


Figure 8: Map of the application area CPS 10219/1. The area crosshatched yellow indicates the footprint in which clearing is authorised to occur, under the granted clearing permit CPS 10219/1.

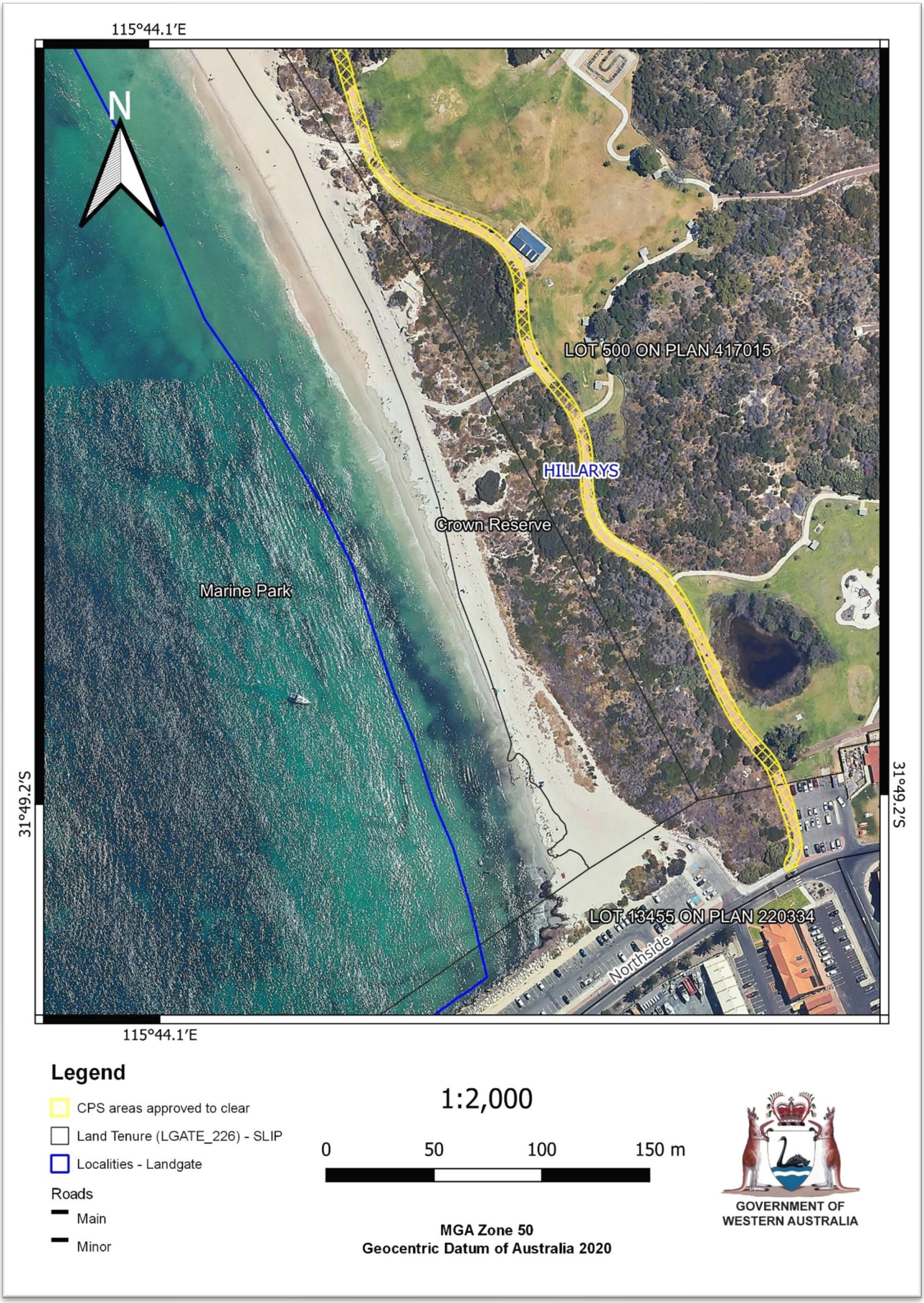


Figure 9: Map of the application area CPS 10219/1. The area crosshatched yellow indicates the footprint in which clearing is authorised to occur, under the granted clearing permit CPS 10219/1.

2 Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations).

In addition to the matters considered in accordance with Section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under Section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the polluter pays principle
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

Relevant policies considered during the assessment include:

- *Environmental Offsets Policy* (2011)
- *State Planning Policy 2.8 – Bushland Policy for the Perth Metropolitan Region*

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- *Environmental Offsets Guidelines* (August 2014)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The City has undertaken detailed consideration of the coastal shared path upgrade alignment options (Stage 1 and Stage 2) through the early planning stages in accordance with the City's Project Management Framework. The City's Environmental Development team and Natural Environment team provided environmental advice to the project team on 7 April 2021 and undertook a desktop environmental planning assessment on the 27 June 2022 to inform early project planning activities. A key focus of the advice and assessment was to avoid and/or mitigate clearing of native vegetation (City of Joondalup, 2023a).

The initial scope of the project included an alternative alignment and additional new paths as part of the City's WABN Grant Application and the associated business case. A key focus of the program was to improve connectivity, and an option where new paths were required was considered in the early planning stages. Through consultation the project scope and alignment was refined to minimise environmental and Aboriginal cultural heritage impacts (City of Joondalup, 2023a).

The City has undertaken further avoidance of clearing of native vegetation with careful and considered selection of the location and alignment of the coastal shared path. There have also been key changes made to the initial path alignment in close proximity to Merrifield Place in Mullaloo, where the City has progressed the alignment option that does not impact on native vegetation. This resulted in the avoidance of an approximate 245 metre path at four metres wide, which is the equivalent of 0.0980 hectares of native vegetation clearing in new sections of coastal foreshore reserve within the Stage one works area (City of Joondalup, 2023a). An additional avoidance mechanism the City has adopted has been the decision to not widen the path from three metres to four metres in some sections along the coastal shared path, leaving the path narrower in these sections, which has also resulted in the avoidance of clearing of native vegetation (City of Joondalup, 2023a). For example, the City will construct the shared path within the southern TEC patch, widen only towards the grassed parkland to remove irrigated turf, without pushing the western fence any further from its existing alignment, even if this requires a slight reduction in path width (City of Joondalup, 2023b).

In response to the department's request for further avoidance and minimisation, the City has strived to identify additional efforts to avoid and/or mitigate the need for clearing, including additional avoidance measures, as per the mitigation hierarchy. This includes reducing clearing of native vegetation within occurrences of TEC and PEC by reducing path width and not clearing beyond the conservation fencing line. Importantly, the City notes that although clearing impacts to Tuart Woodlands TEC in the initial application noted an approximate area of 0.0112 hectares was

proposed to be cleared, there are in fact no impacts to tuart trees as part of this application and all tuart trees will be retained. In addition, the original 0.0112 hectares of Tuart Woodlands TEC has been reduced to an area of 0.0079 hectares. The only impacts to the Tuarts will be some pruning of overhanging branches to comply with Department of Transport's shared path guidelines that require a 2.5 metre vertical clearance height for safety (City of Joondalup, 2023b).

The City notes that the existing and therefore new shared path falls within the tree protection zone for some of the tuart trees adjacent to the alignment. To mitigate any impacts and ensure the tuart trees are protected, the construction depth of an asphalt shared path can be adjusted. Noting this will typically be 270 millimetres as per the standards, whereas an alternate option of concrete is only 100 millimetres. Impacts will be closely monitored and managed during construction, specifically through the boxout process, where the existing path is removed. If structural roots are discovered that cannot be cut under the existing path, the construction technique can revert to red concrete in this section which will mitigate the requirement for digging past the existing path depth and any impact to the Structural Root Zone (SRZ) (City of Joondalup, 2023b).

The City also notes that 0.0026 hectares of the proposed clearing does not fall within Bush Forever Site 325 at the southern commencement of the alignment, north of Hillarys Boat Harbour (City of Joondalup, 2023b).

The City will clear a maximum of 10 centimetres beyond the proposed conservation fence line. This additional area will be minimised during the construction and has been included to allow for the digging required for the wooden post's installation as part of the upgraded conservation fencing installation. The City has taken efforts to mitigate the impacts to native vegetation. This includes adopting a construction methodology that maximises the retention of native vegetation, by using smaller plant such as bobcats that will be able to easily manoeuvre within the project area. The project overall will use smaller-sized plant that is specialised for this type of infrastructure i.e. shared paths (City of Joondalup, 2023b).

Mitigation through Strategic Planning, Project Management and Contractor Management
The City has ensured that the appointed Contractor will avoid and minimise clearing and conduct environmental management through compliance with their Safety, Health and Environment Management Plan. The City will include relevant clauses, specifications and requirements within the Request for Tender to ensure the Contractor makes all practicable efforts to mitigate impacts to native vegetation and complies with the conditions of the clearing permit (City of Joondalup, 2023a).

The clearing works will either be undertaken by the City's Tree Services team or experienced contractors, which are highly experienced in vegetation management and removal. The City staff and contractors will ensure implementation of its Pathogen Hygiene Procedure during the vegetation removal and path Reserve (City of Joondalup, 2023a).

Hillarys-Kallaroo and Mullaloo Foreshore Reserves are major conservation areas within the City and are managed for conservation purposes under the Hillarys – Kallaroo Coastal Foreshore Reserve Management Plan and the Mullaloo Foreshore Reserve Management Plan. These management plans support and enable the ongoing conservation management and maintenance of these coastal foreshore reserves (e.g. weed management, revegetation, fire management, etc.) (City of Joondalup, 2023a).

Consideration of alternative options
The option of a new route for the path such as utilising road verge was considered by the City, however, is not feasible both financially and from a constructability aspect (City of Joondalup, 2023b).

The current project will utilise the existing shared paths limestone base under the asphalt surface, minimising the need for materials and reducing wastage, which will reduce costs and the number of vehicles required to deliver and take away material. This will ensure a more environmentally sustainable design outcome can be achieved and reduce the projects carbon emission footprint. This design also allows for the public to connect with, learn about and experience nature while walking along the coastal shared path through the Bush Forever Site and conservation reserves. Providing these opportunities for the public are essential for the long-term protection of biodiversity and native vegetation (City of Joondalup, 2023b).

While there may be some existing road-side paths along the route, these are narrower and designed for a low level of activity. Constructing a new four-metre-wide path within the road reserve would have higher costs and is not possible in many locations due to constraints, such as space limitations, conflict with road intersections and driveways, conflict with existing services (power, gas, water, sewer etc.), and the significant amount of traffic management that would be required (City of Joondalup, 2023b).

The original scope for this project included deviations from the existing alignment in an effort to improve the safety of path users with better grades and sightlines, however, upon consideration these deviations were removed from

the design and reverted to the existing alignment. The major motive behind removing these proposed deviations was the additional clearing and impact to the environment that would have occurred, which was deemed to be of greater importance than the safety improvements gained from the deviations (City of Joondalup, 2023b).

Constructing a new four-metre-wide path within the road reserve would have associated native vegetation clearing requirements and additionally result in the existing and highly utilised and valued coastal shared path public infrastructure becoming partially redundant. Improving the existing coastal shared path to meet the State Governments requirements for shared paths results in improved low-emission travel options for the public as a primary active travel route (City of Joondalup, 2023b).

The City's condition assessment of the existing coastal shared path also confirms that irrespective of an alternative route being progressed, there are upgrades required to both the coastal shared path and the conservation fencing. The City has a strong focus on sustainability, liveability, active lifestyles and a safe community; this is reflected in the City's Strategic Community Plan. The City is therefore also planning for the future with the uptake of electric modes of travel, such as electric bikes and electric scooters, to be facilitated as low-emission, sustainable travel options it will require associated public infrastructure upgrades for shared paths. The City are an environmentally aware and socially-responsible City, that protects and enhances bushland through its natural area management. The City demonstrates its commitment to reducing impacts to native vegetation and Bush Forever area by reducing the total clearing from 0.54 to 0.38 hectares (City of Joondalup, 2023b).

The Delegated Officer is satisfied that the City has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

Revegetation
After consideration of avoidance and mitigation measures, it was determined that an offset to counterbalance the significant residual impacts to Bush Forever was necessary. This impact was addressed through the conditioning of an environmental offset on the permit. The City proposed revegetation to take place within two locations, including 0.6523 hectares within primarily good condition vegetation within Hillarys Foreshore and 0.1077 hectares in a degraded area of Mullaloo Foreshore Reserve. The City have also proposed to revegetate and rehabilitate an additional 0.3846 hectares of good to very good vegetation, adjacent to the proposed Hillarys Foreshore Reserve offset, as a banked offset for a future suitable clearing applications (City of Joondalup, 2024c). The City have provided revegetation completion targets and criteria and the species selected for the revegetation of each site (Appendix F) (City of Joondalup, 2024b). The nature and suitability of the offset provided is summarised in Section 4.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix C) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see Appendix D) identified that the impacts of the proposed clearing present a risk to biological values (fauna and ecological communities), significant remnant vegetation, land degradation and conservation areas. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with Sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (ecological communities) – Clearing Principles (a) and (d)

Assessment
Although available mapping and spatial data did not indicate that conservation ecological communities were located within the application area or immediate surrounds, surveys undertaken within and surrounding the application footprint (Eco Logical Australia, 2022 and 2023) identified four conservation significant ecological communities within the Bush Forever Site 325. These communities include one TEC and three PECs (Appendix F: Figures 11 to 13) (City of Joondalup, 2023a) (DBCA, 2008), including:

- Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain (TEC) (Critically Endangered)
- FCT 29a Coastal shrublands on shallow sands, southern Swan Coastal Plain (Priority 3) - Mostly heaths on shallow sands over limestone close to the coast. No single dominant but important species include *Spyridium globulosum, Rhagodia baccata,* and *Olearia axillaris*.
- FCT 29b: *Acacia* shrublands on taller dunes, southern Swan Coastal Plain (Priority 3) – This community is dominated by *Acacia* shrublands or mixed heaths on the larger dunes. This community stretches from Seabird to south of Mandurah.
- FCT 24: Northern Spearwood shrublands and woodlands (Priority 3) - Heaths with scattered *Eucalyptus gomphocephala* occurring on deeper soils north from Woodman Point. Most sites occur on the Cottesloe unit

of the Spearwood system. The heathlands in this group typically include *Banksia sessilis, Calothamnus quadrifidus,* and *Schoenus grandiflorus*.

The following table shows the spatial impact the proposed clearing will have in the context of the immediate area, including the percentage impact that the proposed clearing will have on the identified ecological communities and their occurrence within Bush Forever site 325. In summary, 0.12 percent of TEC will be impacted (with no tuart trees being removed) and an overall 0.38 percent of the occurrence of the PECs within Bush Forever site 325 will be impacted.

Table 1: Percentage of ecological communities proposed to be cleared in CPS 10219/1 compared to locally mapped area of ecological communities within Bush Forever Site 325.

Ecological Community	Total Area of ecological community mapped within Bush Forever Site 325 (ha)	Proposed Clearing (ha)	% of ecological community within Bush Forever Site 325, proposed to be cleared
Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain (TEC)	6.374	0.0079	0.12
FCT 29a: Coastal shrublands on shallow sands (P3)	71.503	0.3273	0.46
FCT 29b: Acacia shrublands on taller dunes (P3)	8.111	0.0369	0.45
FCT 24: Northern Spearwood shrublands and woodlands (P3)	0.302	0.0037	1.23

Threatened Ecological Communities (TEC)

There are two patches of the Tuart woodland TEC, that have been identified within the application areas. This includes Patch 1 (northern patch) and Patch 3 (southern patch), with the naming aligning with the Hillarys – Kallaroo Flora Survey and Vegetation Condition Assessment Report (Eco Logical Australia, 2023). Calculations indicate that the proposed clearing will remove a total of 0.0079 hectares of the Tuart woodland TEC, with no tuart trees being impacted. This is 0.12 percent of the total occurrence of the Tuart woodland TEC mapped within the Bush Forever Site 325, leaving 99.88 percent of the TEC intact.

Tuart Woodlands and Forests of the Swan Coastal Plain TEC (Patch 1)

An area of 0.0057 hectares of Tuart Woodlands TEC in Patch 1 has been proposed to be cleared, which consists of narrow strips of vegetation along an existing pathway. The survey conducted in 2023 described the TEC in this location as "scattered emergent *Eucalyptus gomphocephala* (tuart) trees (greater than two trees) occur within patches of vegetation community ArAcTOS and OaApRbLOS (Eco Logical Australia, 2023). The species situated within TEC Patch 1 that will be impacted from the proposed clearing, includes *Acacia cyclops, Spinifex longifolia, Scaevola crassifolia, Olearia axillaris, Threlkeldia diffusa* and *Lepidosperma gladiatum*, none of which are listed as threatened or priority flora. This TEC patch includes five isolated tuarts, all an adequate distance from the existing coastal shared path and from the minor widening of the coastal shared path, and as a result, these tuart trees will not be impacted by the proposed clearing. The upgrading of the fencing concurrently to the coastal shared path upgrade will provide improved protection of the coastal foreshore vegetation and this patch of Tuart woodland TEC (City of Joondalup, 2023b). To mitigate any potential risk to the tuart trees, an Arborist Report will be developed, and the construction methodology adjusted to ensure that there will be no impacts to the Tuart trees (City of Joondalup, 2023b).

Tuart Woodlands and Forests of the Swan Coastal Plain TEC Patch 3

An area of 0.0022 hectares of Tuart Woodlands TEC in Patch 3 has been proposed to be cleared, which consists of a narrow area of vegetation along an existing pathway. Within this Patch, the City will widen only towards the grassed parkland, removing irrigated turf and will only widen to the existing conservation fencing through TEC Patch 3 (City of Joondalup, 2023b). The impacts to the tuarts will be some pruning of overhanging branches to comply with Department of Transport's shared path guidelines that require a 2.5 metres vertical clearance height for safety (City of Joondalup, 2023b).

Priority ecological communities
Through avoidance and minimisation measures during the assessment process, the City have reduced the proposed clearing located within PECs from 0.5182 hectares to 0.3679 hectares, which equates to a 29 percent reduction in clearing.

The removal of 0.3679 hectares of native vegetation, which represents narrow, linear areas of vegetation located alongside an existing pathway within the wider 2.78 hectare footprint, is unlikely to significantly reduce the occurrence of the abovementioned PECs, nor result in a significant residual impact. In addition, the clearing is unlikely to sever or additionally impact on the functionality of the PECs, due to the existing impacts of path edge effects already in place. Calculations indicate that the proposed clearing will remove 0.38 percent of the total occurrence of the PECs within the Bush Forever Site 325, leaving 99.62 percent of the PECs intact. All three PECs impacted by the proposed clearing have occurrences that occur outside of Bush Forever site 325, with numerous larger patches occurring within the local area ((10 kilometre radius of the application area) and regionally, including within other areas of conservation estate. The upgrading of the conservation fencing along the pathway is likely to safeguard against further degradation of the existing vegetation.

Conclusion
It was determined, for the reasons outlined above, that the 0.0079 hectares of impact to Tuart Woodlands TEC (retaining all tuart trees) and 0.3679 hectares of PECs does not represent a significant residual impact.

Conditions
To address the above impacts, the applicant will be required to take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.

3.2.2. Biological values (fauna) - Clearing Principle (b)

Assessment
According to available databases, 41 conservation significant fauna species have been recorded within the local area. Of these, 24 are associated with marine, estuarine or freshwater habitats, or are migratory, which do not occur within or utilise the application area.

Of the remaining 17 species, eight are listed as threatened species under the EBPC Act, (including one listed as critically endangered, five endangered and two vulnerable), seven have been included on the Department of Biodiversity, Conservation and Attractions (DBCA) priority list, one published as conservation dependent fauna and one published as other specially protected fauna. In forming a view on the likelihood of these species occurring within the application area, the preferred habitat types and typical home ranges of these species and their recorded proximity to the application area were considered, along with the type and condition of the vegetation within the application area. Available data sources indicate the following species located within the local area, have habitat preferences likely to be represented within the application area, and therefore, may occur within the area proposed to be cleared:

- *Zanda latirostris* (Carnaby's cockatoo) and *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo) which are listed as endangered and vulnerable under the BC Act and the Commonwealth EPBC Act, respectively.
- *Isoodon fusciventer* (south-western brown bandicoot/quenda) – Priority 4
- *Synemon gratiosa* (graceful sunmoth) – Priority 4
- *Neelaps calonotos* (black-striped snake) – Priority 3

Black cockatoos – endangered/vulnerable
The application area is mapped within Carnaby's cockatoo distribution, and the eastern half of the local area is also mapped within the distribution of the forest red-tailed black cockatoo. Available databases indicate that there are 30 black cockatoo roost records within the local area, the closest being approximately 377 metres from the application area, and 23 white-tailed black cockatoo breeding sites, the closest being approximately 4.38 kilometres from the application area.

During the 2022 flora and vegetation survey, forest red-tailed black cockatoos were opportunistically observed (Eco Logical Australia, 2022). Available databases indicate that there are 25 records of forest red-tailed black cockatoos in the local area, with the closest being approximately 1.12 kilometres from the application area. There are 868 records of Carnaby's cockatoo in the local area, with the closest being approximately 0.08 kilometres from the area proposed to be cleared. It must be noted that *Calyptorhynchus sp.* (white-tailed black cockatoo) have been recorded in the local area. These records were obtained when the data collector could not definitively distinguish if they spotted

a Carnaby's black cockatoo or a *Zanda baudinii* (Baudin's black cockatoo), therefore the white-tailed black cockatoo category was created to incorporate these records. There are 29 records of white-tailed black cockatoos in the local area, with the closest being approximately 1.90 kilometres from the application area.

Foraging habitat
Critical foraging habitat for black cockatoo species includes foraging material that is within an approximate six to 12 kilometre radius of a nesting site and within six kilometres of a night roosting site. The preferred foraging habitat for each of the species is described below (DAWE, 2022):

- Carnaby's cockatoo – Native shrubland, kwongan heathland and woodland on seeds, flowers and nectar of native proteaceous plant species (*Banksia* spp., *Hakea* spp. and *Grevillea* spp.), as well as *Callistemon* spp. and Marri.
- Forest red-tailed black cockatoo – Primarily seeds of jarrah and marri in woodlands and forest, and edges of Karri forests, including Wandoo and Blackbutt. Forages on *Allocasuarina* cones, fruits of *Persoonia longifolia* (snottygobble) and *C. haematoxylon* (mountain marri). Other less important foods include Blackbutt, Bullich, *Allocasuarina fraseriana*, *Hakea* spp., Tuart, *E. decipiens* (redheart moit) and *E. lehmannii* (bushy yate).

When cross-referencing the preferred foraging habitat to the vegetation proposed to be cleared, both Carnaby's and forest red-tailed black cockatoos are unlikely to utilise the vegetation within the application area for foraging given the lack of preferred foraging plant species (DAWE, 2022) and as a result, it is unlikely that the clearing will have a significant residual impact on black cockatoos foraging.

Breeding/Roosting habitat
Critical breeding habitat for these two species of black cockatoo includes woodland or forest, but also breeds in partially cleared woodland or forest, including isolated trees. Black cockatoos nest in hollows in live or dead trees (many eucalypt species may provide suitable hollows) particularly salmon gum, wandoo, tuart, jarrah, flooded gum *(E. rudis)*, york gum, powderbark *(E. accedens)*, karri, marri, bullich and blackbutt *(E. patens)* (DAWE, 2022). Whilst critical night roosting habitat includes any tall trees including several of these species as preference (DAWE, 2022).

During the surveys undertaken, tuart trees were the only species identified to be present in the application area. The vegetation types identified were dominated by shrublands, herblands and sedges and grasslands (Eco Logical Australia, 2022 and 2023). Taking into consideration the City are avoiding all tuart trees during the proposed clearing, and no other dominant tree species are present in the canopy or sub-canopy (Eco Logical Australia, 2023), it is unlikely that the clearing will impact any breeding or roosting habitat for black cockatoo species.

***Isoodon fusciventer* (quenda) - Priority 4**
Quenda tend to inhabit forest, woodland and heathland, usually with dense understorey vegetation, sometime wetland fringes. They forage for plant material, fungi and insects by digging in leaf litter and soil (DBCA, 2017). According to available databases, the nearest record is approximately 5.695 kilometres from the application area with 184 records in the local area. Quenda were opportunistically observed within the survey area during the 2022 flora and vegetation assessment (Eco Logical Australia, 2022).

Quenda likely traverse through the area under application while moving through the landscape. Given the nature of the clearing, being narrow linear portions of vegetation along a highly utilised pathway, the application area is not likely to contain essential habitat for quenda, especially noting the adjacent conservation area which is a much more suitable, protected habitat for the species.

***Synemon gratiosa* (graceful sunmoth) - Priority 4**
The *Synemon gratiosa* (graceful sunmoth) Priority 4 species, is most common in sedgelands, heathlands, woodlands and occasionally within open parts of forest where their 'foodplants' (various grasses, sedges and mat-rushes) are found. Within Quindalup dunes associated with coastal heath, where the application area is located, the graceful sunmoth's feeding is restricted to their preferred host plants, including *Lomandra maritima* in these locations (DEC, 2011). The graceful sunmoth is known from 149 records within the local area (10 kilometre radius), with the nearest occurring approximately 1.56 kilometres from the application area.

Given the preferred foraging habitat of *Lomandra maritima* was identified in several survey quadrats undertaken in 2022 and 2023 (Eco Logical Australia, 2022 and 2023), this species may occur in the proposed clearing area. However, noting that the application area is adjacent to remnant vegetation that provides similar habitat values in a more protected location, the vegetation within the application is not likely to comprise significant habitat for this species or be important for the continued survival of this species.

***Neelaps calonotos* (black-striped snake) - Priority 3**
The *Neelaps calonotos* (black-striped snake) Priority 3 species, primarily occur in coastal dunes and sand plains with heath and banksia. The black-striped snake is known from 13 records within the local area (10 kilometre radius), with the nearest occurring approximately 1.19 kilometres from the application area.

Noting the habitat preference of the black-striped snake, combined with the location and extent of the proposed clearing, it is unlikely that the application area comprises significant habitat for this species and it is likely that any individuals that may be present at the time of clearing will retreat to the adjacent remnant vegetation that provides more suitable, protected habitat for the species. This species is considered to be mobile and provided they have access to adjacent vegetation, by clearing taking place in a directional manner, the clearing is unlikely to have a significant residual impact on the black-striped snake.

Conclusion
Significant habitat refers to the resources (breeding, resting and feeding), connectivity or habitat area for a species or community that is critical for its survival. Noting the extent and purpose of the proposed clearing and its location within a broader remnant, it is considered that the proposed clearing is unlikely to have a significant impact on fauna habitat.

Whilst the application area does not comprise of significant habitat for fauna, there is the potential for individuals to be present at the time of clearing. Slow, directional clearing to allow the movement of fauna that may be present at the time of clearing into adjacent vegetation will mitigate any impacts to fauna individuals.

Conditions
To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- Directional clearing, which requires slow, progressive, one directional clearing to allow terrestrial fauna to disperse ahead of the clearing activity should they occur on site at the time of clearing.

3.2.3. Biological values (flora) - Clearing Principles (a) and (c)

Assessment
According to available databases, 21 conservation significant flora species have been recorded within the local area (10 kilometres of the application area). Of these 21 species, 18 are listed as priority flora and three are listed as threatened species under the EPBC Act and BC Act.

Eco Logical Australia conducted two flora and vegetation surveys, covering the application footprint and surrounding conservation area, Bush Forever Site 325 (Eco Logical Australia, 2022 and 2023). During these surveys, no threatened or priority flora listed under EPBC Act, the BC Act or by DBCA were recorded within the survey area (Eco Logical Australia, 2022 and 2023). The single point-location of *Leucopogon maritimus* (P1), *Conostylis bracteate* (P3) and *Jacksonia sericea* (P4), was previously recorded within the survey area approximately 80 metres from the clearing footprint (DBCA, 2022a). These locations were revisited during the field survey for the Mullaloo Foreshore Area, however, these species were not located. All three species are considered as unlikely to occur, based on adequate search effort within the survey area and species habitat preferences. This record is considered as likely to be an erroneous database search location, as appropriate habitat for these species does not occur within the survey area (Eco Logical Australia, 2022).

Due to the location, extent of clearing and the absence of conservation significant flora found during the survey conducted in accordance with the Environmental Protection Authority's (EPA) *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (December 2016), the proposed clearing is unlikely to have an impact on conservation significant flora.

Conclusion
For the reasons set out above, it is considered that the impact of the proposed clearing on conservation significant flora is unlikely to be significant. However, the proposed clearing has the potential to introduce and spread weeds and dieback into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values.

Conditions
To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- The applicant will be required to take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.

3.2.4. Environmental value (significant remnant vegetation) - Clearing Principle (e)

Assessment
The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). The EPA recognises the Perth Metropolitan Region to be a constrained area, within which a minimum 10 per cent representation threshold for ecological communities is recommended (EPA, 2008).

According to available databases, the application area is mapped as the Swan Coast Plain - Aeolian Deposits Quindalup Complex 55 which is described as coastal dunes consisting mainly of two alliances - the strand and fore-dune alliance and the mobile and stable dune alliance. Local variations include the low closed forest of *Melaleuca lanceolata* (Rottnest teatree) - *Callitris preissii* (Rottnest Island pine), the closed scrub of *Acacia rostellifera* (summer scented wattle) and the low closed *Agonis flexuosa* (peppermint) forest of Geographe Bay. This is consistent with vegetation surveys undertaken by Eco Logical Australia in 2022 and 2023 of the application area, which found that the vegetation within the application area consisted of a combination of five vegetation types (Eco Logical Australia, 2022 and 2023):

- ArAcTOS - *Acacia rostellifera* and *Acacia cyclops* tall open shrubland;
- SgOaS - *Spyridium globulosum* and *Olearia axillaris* shrubland to open shrubland;
- ArS - *Acacia rostellifera* shrubland;
- SgMsOS - *Spyridium globulosum* and *Melaleuca systena* open shrubland; and
- OaScOS - *Olearia axillaris* and *Scaevola crassifolia* open shrubland.

Within the local area, the mapped vegetation complex retains approximately 15.56 per cent of its pre-European native vegetation cover and is considered to be extensively cleared. However, noting the application area is located within a constrained area, and the minimal area of clearing required, it is not considered to be a significant remnant within an extensively cleared landscape.

Conclusion
Noting the extent and purpose of the proposed clearing, its location within a broader remnant and within a constrained area, and the City's proposed revegetation plan within the conservation area (Bush Forever site 325) (resulting in no net impact to vegetation once established), it is considered that the impact of the proposed clearing is unlikely to sever connectivity within the surrounding bushland and does not constitute a significant residual impact.

Condition
To address the above impact, the following management measures will be required as conditions on the clearing permit:

- Avoid and minimise native vegetation clearing.
- The applicant will be required to take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.
- Revegetation of a minimum of 0.76 hectares of native vegetation within Bush Forever Site 325.

3.2.5. Environmental value (land degradation) - Clearing Principle (g)

Assessment
According to available databases, the proposed clearing may increase the risk of wind erosion in the area, however a low risk of being impacted by flooding, sub-surface acidification or waterlogging/inundation. This is due to the sandy nature of the topsoil across the application area, in combination with the coastal location. As the proposed clearing is to remove narrow sections of vegetation located alongside an existing pathway, the exposure of the clearing area to erosion will be minimised but still likely to occur. However, if appropriate management measures such as ground cover or adequate dust suppression on exposed surfaces are put in place, the environmental impacts caused by wind erosion can be managed. Ensuring works commence within two months of clearing will minimise exposure to bare soils.

Although the soil types within the application areas indicate that there may be an increased risk of water erosion, water repellence and phosphorus export, due to the extent and location of the proposed clearing, these risks are unlikely to be increased as a result of the clearing.

Conclusion
Based on the above assessment, the proposed clearing may cause land degradation through wind erosion. Ensuring works commence within two months of the clearing will minimise any potential risks of wind erosion.

Conditions

To address the above potential impacts, the following management measure will be required as a condition on the clearing permit:

- The permit holder must commence the construction of the pathway and conservation fencing no later than two (2) months after undertaking the authorised clearing activities to reduce the potential for wind erosion.

3.2.6. Environmental value (conservation areas) - Clearing Principle (h)

Assessment

Approximately 84 percent of the clearing application footprint and approximately 98.8 percent (0.373 hectares) of the clearing application area is located within Bush Forever Site 325. Whilst the vegetation proposed to be cleared consists of 0.373 hectares of vegetation mapped within a Bush Forever site, the individual sections consist of narrow parcels of vegetation along an existing 4.8 kilometre stretch of pathway that is currently exposed to edge effects and bordered by conservation fencing in need of repair.

Taking into consideration the extent of the proposed clearing, and the composition and condition of the vegetation proposed to be cleared, it is considered that the proposed clearing is unlikely to sever connectivity within the bushland corridor, however, the proposed clearing does have a significant residual impact on the Bush Forever Site, in accordance with SPP 2.8.

SPP 2.8 sets out that:

'*Proposals or decision-making*' in respect of Bush Forever areas '*should*:

(i) support a general presumption against the clearing of regionally significant bushland or other degrading activities, except where a proposal or decision –

a. *is consistent with the overall purpose and intent of an existing Crown reserve or can be reasonably justified with regard to wider environmental, social, economic or recreational needs, and all reasonable alternatives have been considered in order to avoid or minimise any direct loss of regionally significant bushland, and reasonable offset strategies are secured to offset any loss of regionally significant bushland, where appropriate and practical* (clause 5.1.2.1(i)(e)).

The Policy also sets out that unavoidable adverse impacts on regionally significant bushland within a Bush Forever area should be offset at a ratio of at least 1:1 in habitat hectares, and at a ratio 2:1 when the conservation significance is deemed the highest (SPP 2.8 - Appendix 4).

According to surveys undertaken within the application area, no Threatened (Declared Rare), Priority listed flora species by the DBCA or Bush Forever significant species for 'Site 325: Coastal Strip from Burns Beach to Hillarys' were recorded within the survey area (Eco Logical Australia, 2022 and 2023).

The Department of Planning Lands and Heritage (DPLH) advised that to ensure the integrity of Bush Forever area 325 is not compromised, and in accordance with SPP 2.8 5.1.1 (ii) and 5.1.2.1 (e), a formal offset package should be prepared in accordance with the *WA Environmental Offsets Policy* (2011) and Appendix 4 of SPP 2.8. This will ensure there will be an environmental gain for the proposed clearing (DPLH, 2023).

The City has proposed revegetation at a 2:1 ratio, to be conducted in two locations including 0.1077 hectares within primarily good condition vegetation within Hillarys Foreshore Reserve and 0.6523 hectares in a degraded area of Mullaloo Foreshore Reserve (See Section 4 - Figure 10). As a part of this clearing application, the City are also revegetating an area of 0.3846 hectares of currently very good condition vegetation within the Hillarys Foreshore Reserve and banking as a potential offset for future projects (See Section 4 - Figure 10) (City of Joondalup, 2024c).

There is potential that the proposed clearing activities could result in the introduction or spread of weeds and dieback into adjacent vegetation, which could impact on its habitat quality and connectivity.

Conclusion

It is considered that potential impacts to adjacent vegetation can be managed by undertaking steps to minimise the risk of the introduction and spread of weeds and dieback. It is also considered that impacts to Bush Forever site 325 can be addressed through revegetation and rehabilitation of select areas within the Bush Forever Site.

Condition

To address the above impact, the following management measures will be required as conditions on the clearing permit:

- Avoid and minimise native vegetation clearing.
- Take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.
- Revegetation of a minimum of 0.76 hectares of native vegetation within Bush Forever Site 325 to mitigate impacts to Bush Forever.

3.3. Relevant planning instruments and other matters

The project will be delivered through the WABN Grants Program, which is an initiative of the State Government, administered by the Department of Transport (City of Joondalup, 2023a). The WABN Grants Program is one of the key actions detailed in the Western Australian Bicycle Network Plan 2014-2031 which sets out a framework for the provision of a safe and sustainable cycling network across WA. This coastal shared path upgrade is being undertaken to improve safety and reduce user conflicts. It is classified as a Primary Route in the Department of Transport's Long Term Cycle Network Plan meaning that it is a high demand corridor connecting major destinations (City of Joondalup, 2023b). According to guidance from the Department of Transport, Ausroads and Australian Standards 1428 (AS1428) – Design for access and Mobility, it is desirable to construct shared pathways on primary routes at a four-metre width (Department of Transport, 2021). The Coastal Shared Path - Dual Use Path will also serve as an important access way for emergencies and a fire break (City of Joondalup, 2023a).

The City have a number of permanent counters located along the route recording daily bicycle and pedestrian trip numbers. Below is the average monthly path user data recorded over the last five years (City of Joondalup, 2023b).

Location	Monthly Bike Trips	Monthly Pedestrians
Hillarys (Whitfords Nodes)	11,100	11,200
Mullaloo (Tom Simpson Park)	12,000	18,700

The growing Perth population and attraction of active transport for commuting and recreation has seen the popularity of the coastal shared path grow to numbers where reports of collisions and near misses between pedestrians, cyclists and e-scooters have become frequent and requires actions to be undertaken to minimise risks. The upgrading of the existing path from three metres to four metres will provide a safer environment for all path user groups (City of Joondalup, 2023b).

The grant is funding up to 100 percent of the total project cost, for the planning and implementation of bicycle network infrastructure in accordance with State Government priorities set out in the Western Australian Bicycle Network Plan 2014-2031. The grant also supports the project being spread over two financial years to facilitate high quality planning and design and enables project staging. For this reason, the City's coastal shared path upgrade project has been broken into two stages, with this application being for Stage 1 works. Stage 2 works will see upgrades and widening works undertaken from Ocean Reef Marina to Burns Beach Carpark, the length of 2.58 kilometres. In total, the two stages will comprise of 8.17 kilometres of coastal shared path upgrades being undertaken to provide the community with a safe and sustainable trail (City of Joondalup, 2023a).

The application area is reserved Parks and Recreation in the Metropolitan Region Scheme (MRS) and has the implementation category in State Planning Policy 2.8 – Bushland Policy for the Perth Metropolitan Region (SPP 2.8) as Bush Forever reserves (existing or proposed) (DPLH, 2023).

The application area is located within the boundary of the registered Native Title (Indigenous Land Use Agreement) (LGATE-067) Whadjuk People Indigenous Land Use Agreement WI2017/015.

No Aboriginal sites of significance have been mapped within the application area. It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

4 Suitability of offsets

Through the detailed assessment outlined in Section 3.2 above, the Delegated Officer has determined that the following significant residual impacts remain after the application of the avoidance and mitigation measures summarised in Section 3.1:

- The removal of 0.3762 hectares of native vegetation within Bush Forever Site 325.

The applicant proposed an environmental offset consisting of revegetation and rehabilitation in two locations, including:

- 0.65 hectares within primarily good condition vegetation within Hillarys Foreshore Reserve that was subject to a fire occurrence several years ago; and
- 0.11 hectares in a degraded area of Mullaloo Foreshore Reserve (City of Joondalup, 2024a).

The two sites are reserved as Parks and Recreation in the MRS, and has the implementation category in SPP 2.8 as Bush Forever reserves (existing or proposed).

This offset equates to 0.76 hectares, which is a clearing to a revegetation ratio of approximately 2:1 or two times the area of native vegetation to be cleared. This is consistent with guidance under the SPP 2.8 for clearing within a Bush Forever site (detailed in Section 3.2.6) and WA Environmental Offsets Policy 2011.

Banked Offset
The City have selected to bank an additional revegetation area of 0.39 hectares located within the Hillarys Foreshore Reserve, directly adjacent to the CPS 10219/1 offset, as a potential offset for future projects. This area has been subject to a fire occurrence several years ago, however, is currently in good to very good condition (Section 4 – Figure 10) (City of Joondalup, 2024c).

Offset adequacy
To ensure a net environmental gain as a result of the clearing and revegetation offset, the offset sites are as follows (City of Joondalup, 2024a and 2024c):
Mullaloo (R39497) Foreshore Reserve - 0.1077 hectares
- Contains Priority 3 PEC - *FCT 24: Northern Spearwood shrublands and woodlands*.
- Revegetation and rehabilitation works will be conditioned improve the vegetation condition (Keighery, 1994) from Degraded to a minimum of Good to Very Good condition.

Hillarys (R 47831) Foreshore Reserve- 0.65 hectares
- Contains Priority 3 PEC - *FCT 29a: Coastal shrublands on shallow sands*.
- Revegetation and rehabilitation works will be conditioned to increase vegetation condition (Keighery, 1994) from Good to a minimum of Very Good/Excellent condition.

The City will conduct the revegetation during winter using native plant seedlings propagated through local provenance seed and cuttings suitable for Coastal shrublands on shallow sands (FCT1 29a) PEC for the revegetation site in Hillarys Foreshore Reserve and Northern spearwood shrublands and woodlands PEC (FCT 24a) for the revegetation site in Mullaloo Foreshore Reserve (City of Joondalup, 2024b). A list of species and quantities proposed to be used in the revegetation are detailed in Appendix F – Table 2 and 3, including ten species for the revegetation site in Hillarys Foreshore Reserve (total of 5,150 seedlings proposed to be planted) which are reflective of the FCTs and 16 species for the revegetation site in Mullaloo Foreshore Reserve (total of 535 seedlings to be planted) which are also reflective of the FCTs.

The City's proposed targets and completion criteria is summarised in Appendix F – Table 1 of this report (City of Joondalup, 2024b), which covers plantings, watering and weed control. The City have also provided a revegetation schedule which is shown in Appendix F – Table 4 of this report (City of Joondalup, 2024b).

The City will engage a contractor to propagate and grow revegetation species as listed below, using local provenance seed collected from site where possible. The City's Natural Environment team will also consider the collection of cuttings and seeds from the native vegetation clearing to grow in the City's nursery for revegetation projects. The City adopts a local provenance approach for revegetation projects within the City and works closely with the local Friends Groups in revegetation efforts (City of Joondalup, 2024b).

Tubestock will be planted once the winter rains have started and the ground is sufficiently moist. Species will be planted in a mixed pattern so that diversity is maintained across the revegetation sites. Tree guards will be used across the revegetation sites to prevent damage from grazing and improve the survival rate of planted tubestock. Tubestock will be installed using a deep planting method (City of Joondalup, 2024b).

The Delegated Officer considers that this adequately counterbalances the significant residual impacts listed above.

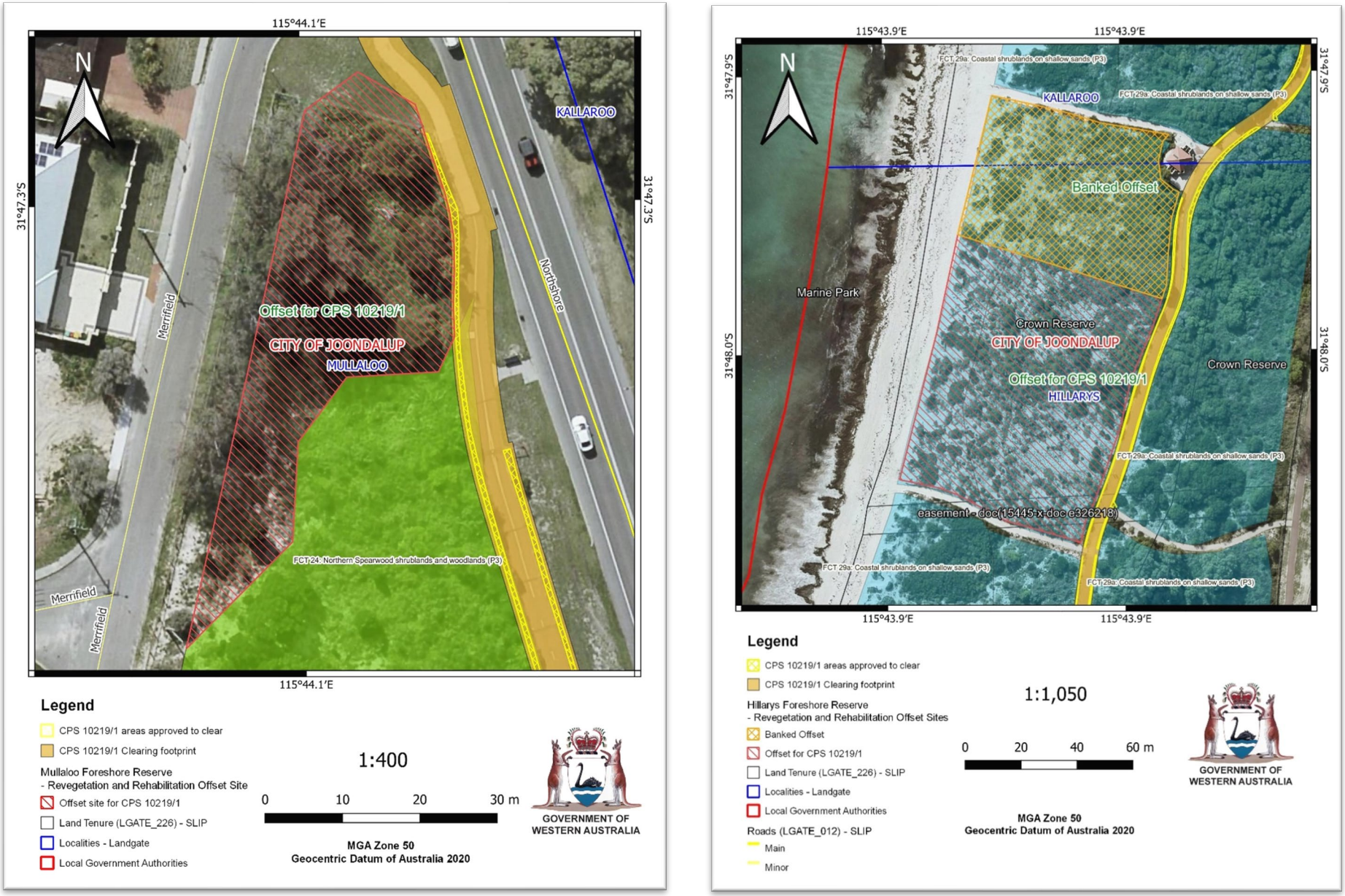


Figure 10: Maps of the locations of the revegetation and rehabilitation offset sites within the Mullaloo and Hillarys Foreshore Areas

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
The City provided a response to the department's request for further information, addressing requests to address questions submitted by the public, as well as avoidance and mitigation (City of Joondalup, 2023b).	Issues addressed in the City's document is outlined in *Appendix B. Details of public submission* of this report. The Delegated Officer considered the response from the City and has outlined the Avoidance and Mitigation measures taken by the City in Section 3.1 of this report.
City of Joondalup (2024b) *CPS 10219-1- Coastal Shared Path Revegetation Plan Final*, received 29 January 2024 (DWER Ref: DWERDT896580).	Environmental value (conservation areas) - Clearing Principles (h), in Section 3.2.5 of this report. The Delegated Officer considers the City of Joondalup has adequately provided revegetation measures to mitigate impacts to Bush Forever.

Appendix B. Details of public submission

Summary of comments	Consideration of comment
The applicant claims to be the landowner (no evidence is attached), whereas the land is Crown Reserve and the applicant is only the land manager.	Given the current Management Order from DPLH for the properties under application, the City of Joondalup meets the definition of 'landowner' under Part V Division 2 of the EP Act.
The applicant fails to identify that all the Reserve affected by this application is Bush Forever.	The impact of the clearing on environmental values, such as clearing taking place within a reserve which is a Bush Forever Site, is taken into consideration during the assessment of the application. The assessment against this environmental value can be found in Section 3.2.6 of this report, as well as revegetation and rehabilitation offsets outlined in Section 4, to balance the significant residual impact remaining as a result of the clearing.
Bush Forever 325 is a world class coastal ecosystem providing benefits, goods and services to humanity.	The impact of the clearing on environmental values, such as clearing taking place the Bush Forever Site 325, was taken into consideration during the assessment of the application. The assessment against this environmental value can be found in Section 3.2.6 of this report.
The City presents no evidence that widening the shared coastal path surface to four metres will improve safety when it comes to e-bikes as these are all unregulated and unpoliced but were fast track introduced by the City itself.	During the assessment process, the City provided information regarding guidance from the Department of Transport, Ausroads and Australian Standards 1428 (AS1428) – Design for access and Mobility, outlining that it is desirable to construct shared pathways on primary routes at a four-metre width (Department of Transport, 2021). The regulation of e-bikes is outside the scope of this assessment.
Concerns regarding the clearing compromising Mullaloo's biodiversity hotspot on its southern border with Kallaroo	The Delegated Officer took into consideration the impact of the clearing on environmental values, such as clearing taking place within a reserve which has been allocated as a Bush Forever Site and surveyed as being representative of a PEC. The assessment against this environmental value can be found in Section 3.2.1 and 3.2.6 of this report, as well as revegetation and rehabilitation offsets outlined in Section 4. It is noted that one of the revegetation and rehabilitation offset locations is on the Mullaloo southern border with Kallaroo.
The City have a dire record (if any) of the City in effectively restoring and/or rehabilitating any bushland	The City have provided various management plans where sufficient evidence of restoring and rehabilitation of bushland is taking place (Natural Area, 2016 and 2018). The Delegated Officer is satisfied that the Revegetation Plan, in addition to the conditions on the clearing permit, will ensure the effective revegetation and rehabilitation of the nominated offset areas.
The City uses bushland descriptors such as "degraded' to support its clearing when the City have been the only land manager while that degradation has worsened	Standard vegetation condition ratings, based on Keighery (1994) are defined in Appendix E of this report. The applicant was required to survey the condition of the vegetation within the locations proposed to be cleared, to inform the clearing application assessment process.
The City have one of the lowest areas of intact native vegetation in Western Australia	The Delegated Officer considers the cumulative impact of clearing native vegetation under principle (e) and is detailed in Section 3.2.4 of this report.

Concerns regarding impacts of clearing Bush Forever vegetation on rising sea levels and inundation.	The Delegated Officer considered impacts to land degradation, including flooding and inundation. The assessment against this environmental value can be found in Section 3.2.5 of this report. The impacts of clearing on sea level rise is out of scope of this assessment.
Relocation of coastal path to the roadside between north Mullaloo and Whitford Nodes north entrance	The option of a new route for the path such as utilising road verge was considered by the City, however, proved not to be feasible both financially and from a constructability aspect. A detailed description of the City's consideration of this option can be found in Section 3.1, Avoidance and mitigation measures of this report.
Concerns regarding controlling wind erosion	The Delegated Officer considered impacts to land degradation, including wind erosion. The assessment against this environmental value can be found in Section 3.2.5 of this report.
Concerns regarding plant disease hygiene procedures	The City has provided the Department with their Pathogen Hygiene Procedures and can be located in their Revegetation Plan (City of Joondalup, 2024b). The City staff and contractors will ensure implementation of its Pathogen Hygiene Procedure during the vegetation removal and path construction (City of Joondalup, 2023a). Additionally, the Delegated Officer has included weed and dieback conditions on the clearing permit.
Issues regarding fencing	The City also notes that the conservation fencing within this section is in very poor condition, and requires upgrading, with the older style fencing still in use which is less suited for conservation of the adjacent coastal foreshore reserve. The upgrading of the fencing concurrently to the coastal shared path upgrade will minimise further or additional fencing upgrade requirements and provide improved protection of conservation of the coastal foreshore vegetation (City of Joondalup, 2023b).
The City's argument is misleading as the City itself lauded its activation of electric travel options (e-bikes) heavily promoting their use on the shared coastal path and now the City is using this as a reason to support the clearing. The UN has given humanity 10 years to restore all ecosystems not to further degrade them, or to further fragment them by City acts of clearing. The global hazard warnings freely provided by the UN's IPCC AR5 and AR6 reports since 2014.	These submission items are beyond the scope of the clearing assessment.

Appendix C. Site characteristics

The information provided below describes the key characteristics of the area proposed to be cleared and is based on the best information available to DWER at the time of this assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix D.

C.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is 0.38 hectares of native vegetation within a 2.78 hectare footprint within multiple land parcels and road reserves, throughout three suburbs within the City of Joondalup. The land directly adjacent to the application is zoned Crown Reserve and utilised as a combination of recreation, coastal dunes and coastal foreshore reserves. Beyond the Crown Reserve zoning, to the north-east of the application area, the land is largely zoned as residential.
Ecological linkage	The application footprint is located within the Gnangara Ecological Linkage - Bush Forever (OBJECTID – 75) associated with Conceptual Linkage (OBJECTID – 16), which stretches over a 281 hectare area. It is within a broader remnant that has a part in maintaining connectivity between remnants in the local area and is within one of a number of 'Gnangara Mound' ecological linkages that are mapped within the local area. It is also mapped within Perth Regional Ecological Linkage (LINK_ID 1), which identifies regional ecological linkages that broadly represent a link between patches of remnant vegetation judged to be of regional significance. The narrow linear clearing along an existing pathway is not likely to sever or significantly impact the aforementioned linkages.
Conservation areas	The application area is located within Bush Forever Site 325.
Vegetation description	Information provided by the City of Joondalup indicate the vegetation within the proposed clearing area reflects the Swan Coastal Plain - Quindalup Complex – 55. Representative photos are available in Appendix F. With respect to vegetation communities, the proposed clearing footprint comprises of (Eco Logical Australia, 2022 and 2023): • ArAcTOS - *Acacia rostellifera* and *Acacia cyclops* tall open shrubland; • SgOaS - *Spyridium globulosum* and *Olearia axillaris* shrubland to open shrubland; • ArS - *Acacia rostellifera* shrubland; • SgMsOS - *Spyridium globulosum* and *Melaleuca systena* open shrubland; • OaScOS - *Olearia axillaris* and *Scaevola crassifolia* open shrubland; • planted/sumpland; • tracks/cleared areas. The mapped vegetation complex within the proposed areas to be cleared is Swan Coastal Plain - Quindalup Complex – 55, which is described as a coastal dune complex consisting mainly of two alliances - the strand and fore-dune alliance and the mobile and stable dune alliance. Local variations include the low closed forest of *Melaleuca lanceolata* (Rottnest Teatree) - *Callitris preissii* (Rottnest Island Pine), the closed scrub of *Acacia rostellifera* (Summer-scented Wattle) and the low closed *Agonis flexuosa* (Peppermint) forest of Geographe Bay. Aerial imagery indicates the local area (10 kilometre radius from the centre of the area proposed to be cleared) retains approximately 15.56 per cent of the pre-European extent (Government of Western Australia, 2019a).

<table>
<tr><th>Characteristic</th><th>Details</th></tr>
<tr><td>Vegetation condition</td><td>According to Flora and Vegetation surveys undertaken within the application footprint, using the Keighery (1994) condition scale, the area contains vegetation in the following condition (Eco Logical Australia, 2022: 2023)
<table>
<tr><th>Vegetation Condition</th><th>Area within application footprint</th><th>Percentage of application footprint</th></tr>
<tr><td>Excellent</td><td>0.09</td><td>4.0</td></tr>
<tr><td>Very Good</td><td>0.29</td><td>13.5</td></tr>
<tr><td>Good</td><td>0.07</td><td>3.5</td></tr>
<tr><td>Degraded</td><td>0.09</td><td>4.4</td></tr>
<tr><td>No vegetation</td><td>0.04</td><td>1.9</td></tr>
<tr><td>Cleared</td><td>1.56</td><td>72.7</td></tr>
</table>
The full Keighery (1994) condition rating scale is provided in Appendix E. Representative photos are available in Appendix F.</td></tr>
<tr><td>Climate and landform</td><td>The application area occurs on gently undulating to flat topography and has a mean annual maximum temperature of 24.8 degrees Celsius and a mean annual minimum temperature of 12.9 degrees Celsius. The mean annual rainfall is 800 millimetres, and the annual evapotranspiration rate is 700 millimetres.</td></tr>
<tr><td>Soil description</td><td>According to available mapping, the clearing footprint contains four different soil phases, including:
211Qu__Q4 - Quindalup South youngest dune Phase (approximately 46 percent) - The youngest phase. Irregular dunes with slopes up to 20 percent. Loose pale brown calcareous sand with no soil profile development.
211Qu__Qu - Quindalup South unstable sand Phase (approximately 27 percent) - Presently unstable sand.
211Qu__Q3 - Quindalup South third dune Phase (approximately 19 percent) - The third phase. Irregular dunes with high relief and slopes up to 20 percent. Loose calcareous sand with little surface organic staining and incipient cementation at depth.
211Qu__Q2 - Quindalup South second dune Phase (approximately 8 percent) - The second phase. A complex pattern of dunes with moderate relief. Calcareous sands have organic staining to about 20 centimetres, passing into pale brown sand; some cementation below one metre.</td></tr>
<tr><td>Land degradation risk</td><td>Please see Land Degradation Table in Section C.4.</td></tr>
<tr><td>Waterbodies</td><td>The desktop assessment and aerial imagery indicated that the application area does not transect any watercourses or wetlands. The closest watercourses are several perennial lakes within the Pinnaroo Valley Memorial Park, which occur approximately 350 metres south of the application area, separated by road infrastructures. The closest wetlands classified as Conservation Category Wetlands – Geomorphic Wetlands, Swan Coastal Plan, are the Beenyup Swamp, Joondalup Lake and Wallubuenup Swamp, occurring approximately 2.17 kilometres east, 2.29 kilometres north-east and 2.59 kilometres east of the application area, respectively, separated by road and residential infrastructure.</td></tr>
<tr><td>Hydrogeography</td><td>The application area is mapped within the Perth Groundwater Area, proclaimed under the Rights in Water and Irrigation Act 1914 (the RIWI Act), and the Perth Coastal and Gwelup Underground Water Pollution Control Area, a Priority three Public Drinking Water Source Area (PDWSA) proclaimed under the Metropolitan Water Supply Sewerage and Drainage Act 1909. The City have obtained the appropriate licence, under the RIWI Act, to abstract groundwater on the property.
The application area is within the ‘Coastal Plain’ hydrological zone, and the ‘Coastal’ hydrographic catchment.
Groundwater salinity within the application area is mapped at 500 to 1000 milligrams per litre total dissolved solids.</td></tr>
<tr><td>Flora</td><td>According to available databases, a total of 21 conservation listed flora species have been recorded within the local area, comprising three Priority one (P1) flora, three Priority two (P2) flora, ten Priority three (P3) flora, two Priority four (P4) flora, one endangered and two threatened flora species (Western Australian Herbarium, 1998-). None of these existing records occur within the application area, with the closest records being Jacksonia sericea</td></tr>
</table>

Characteristic	Details
	(P4), *Conostylis bracteate* (P3) and *Leucopogon maritimus* (P1) all occurring approximately 0.08 kilometres from the application area. No conservation significant flora were recorded during surveys conducted in the application footprint during 2022 and 2023 (Eco Logical Australia, 2022 and 2023).
Ecological communities	According to available mapping and surveys provided by the City (Eco Logical Australia, 2022 and 2023), the area proposed to be cleared overlaps with portions of the Tuart woodlands TEC, listed as Critically Endangered under the Commonwealth EPBC Act (approximately 0.0079 hectares) and approximately 0.3679 hectares that is representative of the following PECs: • 0.3273 hectares - FCT 29a Coastal shrublands on shallow sands (P3) • 0.0369 hectares - FCT 29b: Acacia shrublands on taller dunes (P3) • 0.0037 hectares - FCT 24: Northern Spearwood shrublands and woodlands (P3).
Fauna	The desktop assessment identified that a total of 41 threatened or priority fauna species have been recorded within the local area, including 31 threatened fauna species and ten priority fauna species (DBCA, 2007-). The closest and most abundantly recorded threatened fauna species in the local area is the *Zanda latirostris* (Carnaby's black cockatoo) (EN). Priority listed fauna recorded in the most abundance within local area is the *Isoodon fusciventer* (quenda) (P4) with 171 records and the *Synemon gratiosa* (graceful sunmoth) (P4), with 130 records. Lot 14054 on Deposited Plan 220953 is directly adjacent to the Craigie Bushland, a major conservation area permanently fenced and utilised for quenda monitoring program. The area proposed to be cleared is located within the mapped area for *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo) distribution. Both the application area and its local area (10 kilometre radius of the application area) are mapped as Carnaby's black cockatoo distribution. Approximately 11 percent of the local area has been mapped as suitable feeding habitat for black cockatoo in the Swan Coastal Plain.

C.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion**					
Swan Coastal Plain	1,501,221.93	579,813.47	38.62	222,916.97	14.85
Vegetation Complex in IBRA Bioregion*					
Swan Coast Plain *- Aeolian Deposits Quindalup Complex 55*	54,573.87	33,011.64	60.49	5,994.64	10.98
Local area					
10km radius	21,014.03	3,270.12	15.56	-	-

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

C.3. Fauna analysis table

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Actitis hypoleucos (common sandpiper)	MI	N	N	9.70	2	N/A
Apus pacificus (fork-tailed swift)	MI	N	N	4.56	5	N/A

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Botaurus poiciloptilus (Australasian bittern)	EN	N	N	3.60	2	N/A
Calidris acuminata (sharp-tailed sandpiper)	MI	N	N	5.67	2	N/A
Calidris ferruginea (curlew sandpiper)	CR/MI	N	N	3.60	3	N/A
Calidris ruficollis (red-necked stint)	MI	N	N	3.60	5	N/A
Calidris subminuta (long-toed stint)	MI	N	N	5.67	1	N/A
Calyptorhynchus banksii naso (forest red-tailed black cockatoo)	VU	Y	Y	1.16	25	N/A
Charadrius leschenaultii (greater sand plover, large sand plover)	VU/MI	N	N	5.70	1	N/A
Chlidonias leucopterus (white-winged black tern)	MI	N	N	5.67	1	N/A
Dasyurus geoffroii (chuditch, western quoll)	VU	N	N	1.85	2	N/A
Falco peregrinus (peregrine falcon)	OS	N	N	4.30	12	N/A
Idiosoma sigillatum (Swan Coastal Plain shield-backed trapdoor spider)	P3	N	N	1.19	31	N/A
Isoodon fusciventer (quenda, southwestern brown bandicoot)	P4	Y	Y	0.01	184	N/A
Ixobrychus dubius (Australian little bittern)	P4	N	N	6.55	3	N/A
Ixobrychus flavicollis australis (southwest subpopulation) (black bittern (southwest subpopulation))	P2	N	N	5.27	1	N/A
Limosa lapponica (bar-tailed godwit)	MI	N	N	7.83	1	N/A
Limosa limosa (black-tailed godwit)	MI	N	N	5.67	2	N/A
Macronectes giganteus (southern giant petrel)	EN/MI	N	N	3.36	1	N/A
Myrmecobius fasciatus (numbat, walpurti)	EN	N	N	9.12	1	N/A
Neelaps calonotos (black-striped snake, black-striped burrowing snake)	P3	Y	Y	1.19	13	N/A
Notamacropus irma (western brush wallaby)	P4	N	N	9.42	1	N/A
Pandion haliaetus (osprey)	MI	N	N	0.10	1	N/A
Phascogale tapoatafa wambenger (south-western brush-tailed phascogale, wambenger)	CD	N	N	9.12	1	N/A
Plegadis falcinellus (glossy ibis)	MI	N	N	3.60	62	N/A
Procellaria aequinoctialis (white-chinned petrel)	VU	N	N	0.04	1	N/A
Pseudocheirus occidentalis (western ringtail possum, ngwayir)	CR	N	N	7.84	1	N/A
Synemon gratiosa (graceful sunmoth)	P4	Y	Y	1.56	149	N/A
Thalassarche carteri (Indian yellow-nosed albatross)	EN/MI	N	N	8.12	1	N/A
Thalasseus bergii (crested tern)	MI	N	N	0.02	36	N/A
Tringa glareola (wood sandpiper)	MI	N	N	3.60	3	N/A
Tringa nebularia (common greenshank)	MI	N	N	3.60	42	N/A
Tringa stagnatilis (marsh sandpiper)	MI	N	N	5.67	2	N/A
Zanda baudinii (Baudin's cockatoo)	EN	Y	Y	6.00	3	N/A
Zanda latirostris (Carnaby's cockatoo)	EN	Y	Y	0.08	868	N/A

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Zanda sp. 'white-tailed black cockatoo' (white-tailed black cockatoo)	EN	Y	Y	1.90	29	N/A

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority, OS: other specially protected, CD: conservation dependent

C.4. Land degradation risk table

Risk categories	*211Qu - Quindalup South System*
Wind erosion	H1: 50-70% of map unit has a high to extreme wind erosion risk **to** H2: >70% of map unit has a high to extreme wind erosion risk
Water erosion	H2: >70% of map unit has a high to extreme water erosion risk **to** L2: 3-10% of map unit has a high to extreme water erosion risk
Water logging	L1: <3% of map unit has a moderate to very high waterlogging risk **to** L2: 3-10% of map unit has a moderate to very high waterlogging risk
Water Repellence	H2: >70% of map unit has a high water repellence risk **to** H1: 50-70% of map unit has a high water repellence risk
Sub-surface Acidification	L1: <3% of map unit has a high subsurface acidification risk or is presently acid
Phosphorus export	H2:>70% of map unit has a high to extreme phosphorus export risk **to** M1: 10-30% of map unit has a high to extreme phosphorus export risk
Salinity	L1: <3% of map unit has a moderate **to** high salinity risk or is presently saline
Flooding	L1: <3% of the map unit has a moderate **to** high flood risk

Appendix D. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The area proposed to be cleared does not contain regionally significant flora, fauna or assemblages of plants. The areas proposed to be cleared overlaps with three unique PECs, and therefore the clearing may impact on these communities.	May be at variance	Yes *Refer to Section 3.2.1, above.*
Principle (b): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."* Assessment: The area proposed to be cleared contains limited habitat for conservation significant fauna.	May be at variance	Yes *Refer to Section 3.2.2, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: The area proposed to be cleared does not contain any threatened flora. No threatened flora were recorded during the flora surveys (Eco Logical Australia, 2022 and 2023).	Not likely to be at variance	Yes *Refer to Section 3.2.3, above.*

Assessment against the clearing principles	Variance level	Is further consideration required?
Principle (d): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community."* Assessment: The area proposed to be cleared contains species commensurate with a TEC mapped in and adjacent to the application area.	May be at variance	Yes *Refer to Section 3.2.1, above.*
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The extent of the mapped vegetation type is inconsistent with the national objectives and targets for biodiversity conservation in Australia.	May be at variance	Yes *Refer to Section 3.2.3, above.*
Principle (h): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area."* Assessment: The application area is located within Bush Forever area 325.	At variance	Yes *Refer to Section 3.2.4, above.*
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: No water courses or wetlands are recorded within the application area, and the proposed clearing is not growing in association with an environment associated with a watercourse or wetland. The proposed clearing is unlikely to impact on- or off-site hydrology and water quality.	Not at variance	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soils are not susceptible to water erosion, nutrient export or salinity, however, mapped as highly susceptible to wind erosion. Noting the size and location of the application area, the proposed clearing is not likely to have an appreciable impact on land degradation.	May be at variance	Yes *Refer to Section 3.2.5, above.*
Principle (i): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."* Assessment: The application area does not lie within a Public Drinking Water Source Area, however, it is within the Perth Groundwater Area (UFI 35) proclaimed under the RIWI Act. As the proposed clearing will only be removing minimal vegetation from the boundary of an existing pathway, the proposed clearing is unlikely to impact ground water quality.	Not likely to be at variance	No
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment:	Not at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding. Given no wetlands or watercourses are recorded within the application area, the proposed clearing is unlikely to contribute to waterlogging.		

Appendix E. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.
Completely degraded	The structure of the vegetation is no longer intact, and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Appendix F. Photographs of the vegetation and supporting information excerpts

Table 1: City of Joondalup revegetation completion targets and criteria (City of Joondalup, 2024b).

Measure	Completion targets	Completion criteria	Monitoring
Native diversity	Minimum of 60% of native species returned	A minimum of 7 native species per quadrat	Native diversity will be counted annually in years 2 and 3
Weed density	Weed cover at the site is 10% or less (minor non-competitive weeds)	Weed cover is to be 10% or less of minor non-competitive weeds	Weed cover percentage will be assessed annually in years 2 and 3
Native density	Survival rate of 2 plant/m^2	Survival rate of 2 plant/m^2 is to be achieved after 3 years. All planted species that have not survived will be replanted within 12 months and monitored for a further 2 years	The number of surviving plants will be counted annually in years 2 and 3. Further monitoring will be conducted if replantings are required.
Watering	Watering of tubestock over summer months	Watering to be conducted 5 times over summer months each year for 3 years	Watering of tubestock to be conducted 5 times in years 1, 2 and 3
Weed control	Quarterly weed control events with the first event to be undertaken prior to planting	Weed control events to be conducted quarterly each year for 3 years	Quarterly weed control events to be conducted in years 1, 2 and 3

Table 2: List of species and quantities proposed to be planted for revegetation in Hillarys Foreshore Reserve (City of Joondalup, 2024b).

Latin name	Number of plants
Acacia cyclops	300
Acacia lasiocarpa	400
Carpobrotus virescens	300
Ficinia nodosa	300
Lepidosperma gladiatum	500
Myoporum insulare	500
Olearia axillaris	550
Rhaghodia baccata	550
Scaevola crassifolia	550
Spinifex longifolius	1200

Table 3: List of species and quantities proposed to be planted for revegetation in Mullaloo Foreshore Reserve (City of Joondalup, 2024b).

Latin name	Number of plants
Acacia cyclops	25
Acacia saligna	20
Acanthocarpus preissii	40
Conostylis aculeata	30
Desmocladus flexuosus	20

Hardenbergia comptoniana	20
Leucopogon parviflorus	30
Lomandra maritima	30
Melalueca systena	40
Myoporum insulare	40
Olearia axillaris	50
Rhaghodia baccata	50
Scaevola crassifolia	50
Spyridium globulosum	30
Templetonia retusa	30
Threlkeldia diffusa	30

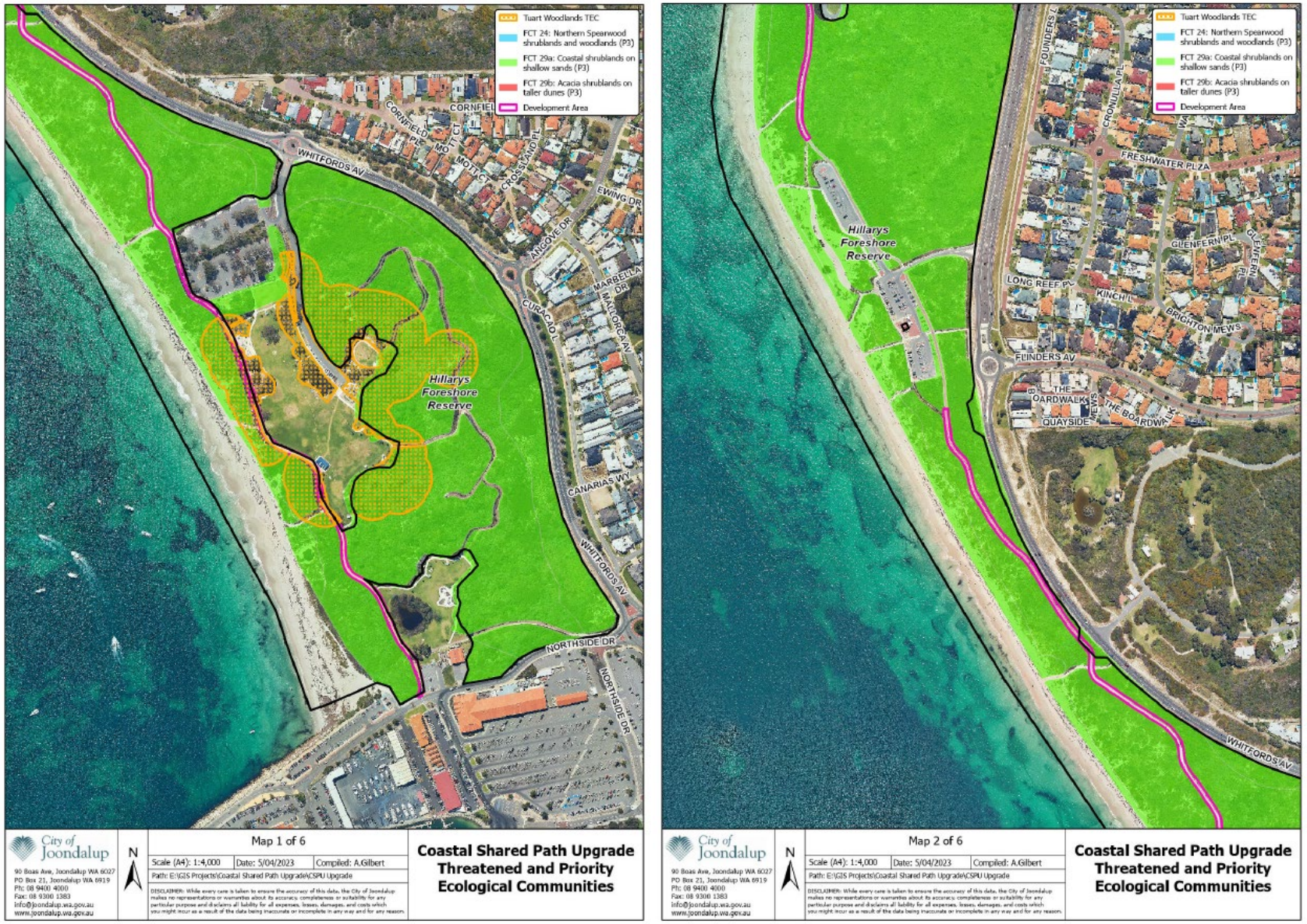


Figure 11: Maps 1 and 2 of 6, showing the vegetation communities representing Threatened and Priority Ecological Communities mapped during 2023 Eco Logical Australia surveys (City of Joondalup, 2024a).

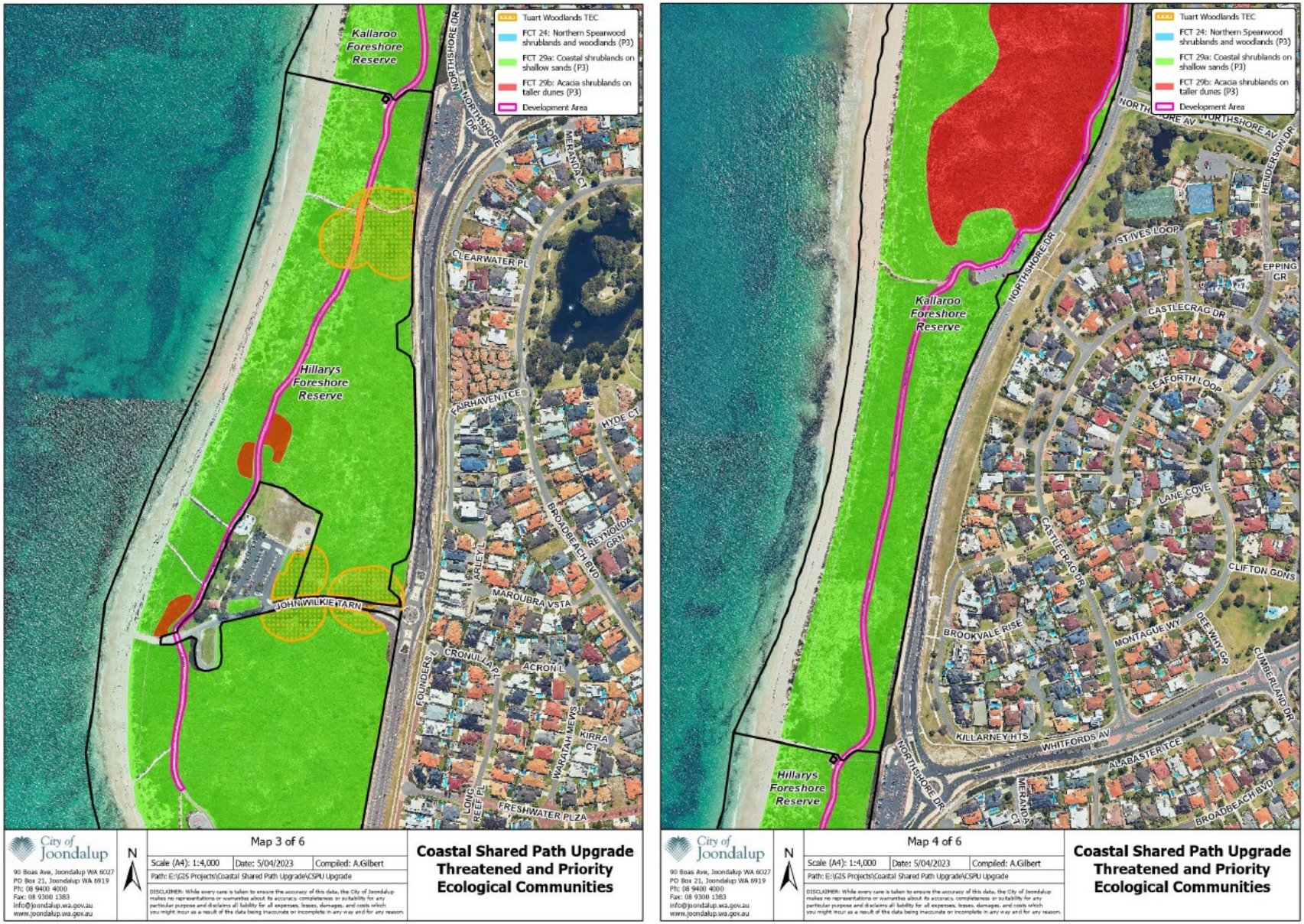


Figure 12: Maps 3 and 4 of 6, showing the vegetation communities representing Threatened and Priority Ecological Communities mapped during 2023 Eco Logical Australia surveys (City of Joondalup, 2024a).

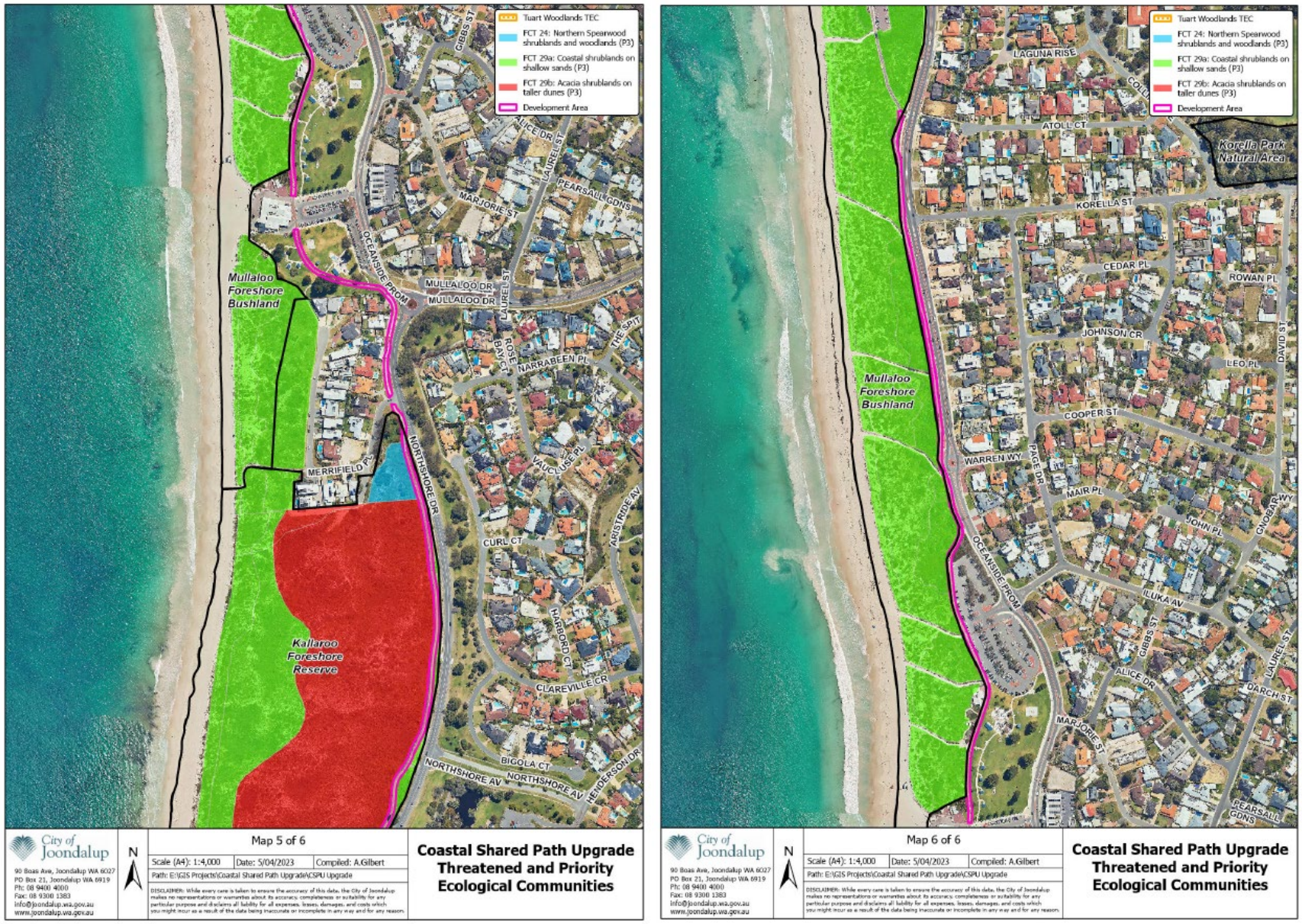


Figure 13: Maps 5 and 6 of 6, showing the vegetation communities representing Threatened and Priority Ecological Communities mapped during 2023 Eco Logical Australia surveys (City of Joondalup, 2024a).

Table 4: Revegetation Schedule (City of Joondalup, 2024b).

Year	Timing	Task
2024 Year 0	July 2024	Order revegetation tubestock for 2025 planting
	May - Oct 2024	Clearing completed
2025 Year 1	Mar - May 2025	Clear non-native plants from Mullaloo revegetation site
	Mar - May 2025	Weed control at revegetation sites prior to planting
	Jun - Aug 2025	Plant tubestock seedlings at revegetation sites
	After planting is completed	Install temporary fencing if required and signage around revegetation sites
	Every six months after fencing is installed	Inspect fencing and signage and make repairs if required
	Quarterly after planting	Weed control at revegetation sites after planting
	Sept - Nov 2025	Inspect revegetation survival rates and determine number of new plants required to be planted in 2026 to meet targets and assessment criteria
	Sept - Nov 2025	Order plants for supplementary planting in 2026 if required
	Summer 2025/26	Water revegetation plants over summer – five times over 2025/26 summer period
2026 Year 2	Every six months	Inspect fencing and signage and make repairs if required
	Quarterly	Weed control at revegetation sites
	Mar - May 2026	Monitoring and assessment against targets and completion criteria
	Jun - Aug 2026	Order plants for supplementary planting in 2027 if required
	Summer 2026/27	Water revegetation plants over summer – five times over 2026/27 summer period
2027 Year 3	Every six months	Inspect fencing and signage and make repairs if required
	Quarterly	Weed control at revegetation sites
	Mar - May 2027	Monitoring and assessment against targets and completion criteria
	Jun - Aug 2027	Order plants for supplementary planting in 2028 if required
	Summer 2026/27	Water revegetation plants over summer – five times over 2027/28 summer period

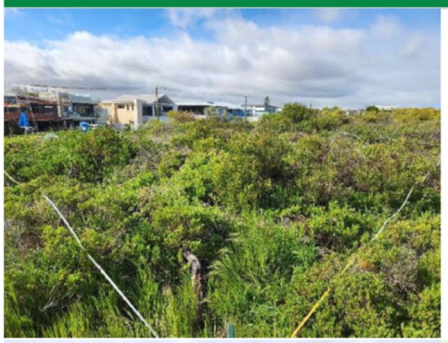
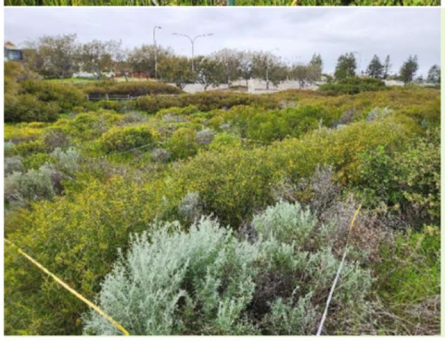
Image	Vegetation community	Vegetation description	Quadrats	Extent within the survey area (ha)	Proportion of the survey area (%)
	AcS: *Acacia cyclops* Shrubland	*Acacia cyclops* tall shrubland over *Rhagodia baccata*, *Scaevola crassifolia* mid open shrubland and *Lepidosperma gladiatum* mid open sedgeland over **Pelargonium capitatum*, *Threlkeldia diffusa*, *Acanthocarpus preissii* low open herbland.	Q10, Q11, Q12	1.75	10.2
	ArS: *Acacia rostellifera* Shrubland	*Acacia rostellifera* shrubland over mixed shrubland; *Scaevola crassifolia*, *Rhagodia baccata* and *Spyridium globulosum* and a weedy grass understory; **Bromus diandrus*. This vegetation type occurs on the tertiary dunes at the eastern edge of the site.	Q1, Q5, Q8	3.05	17.8

Figure 14: Vegetation communities recorded within the survey area (Eco Logical Australia, 2022).

Image	Vegetation community	Vegetation description	Quadrats	Extent within the survey area (ha)	Proportion of the survey area (%)
	OaScOS: Olearia axillaris and Scaevola crassifolia Open Shrubland	*Olearia axillaris* and *Scaevola crassifolia* open shrubland over a grassy herb understorey; **Lagurus ovatus*, *Ficinia nodosa* and weedy herb; **Trachyandra divericata*. This vegetation type occurs on the secondary dunes in between the other two vegetation types along the entire length of the site.	Q2, Q6, Q9	6.85	39.9
	SgMsOS: *Spyridium globulosum* and *Melaleuca systena* Open Shrubland	*Spyridium globulosum*, *Templetonia retusa*, *Acacia saligna* tall open shrubland over *Melaleuca systena*, *Acacia lasiocarpa* mid open shrubland over **Bromus diandrus* low open grassland and *Lomandra maritima*, *Acanthocarpus preissii* low open herbland.	Q13	0.30	1.7

Figure 15: Vegetation communities recorded within the survey area (Eco Logical Australia, 2022).

Image	Vegetation community	Vegetation description	Quadrats	Extent within the survey area (ha)	Proportion of the survey area (%)
	ShTdOG: *Spinifex hirsutus* and **Thinopyrum distichum* Open Grassland	Open *Spinifex hirsutus* and **Thinopyrum distichum* grassland with sparse patches of *Olearia axillaris*. This vegetation type occurs along the foredunes on the western edge of the site.	Q3, Q4, Q7	1.82	10.6
Open beach			N/A	2.36	13.8
Tracks / cleared areas			N/A	0.85	5.0
Planted / sumpland			N/A	0.16	0.9
Total				**17.15**	**100.0**

Figure 16: Vegetation communities recorded within the survey area (Eco Logical Australia, 2022).

Vegetation condition	ELA 2016		Current assessment (2021)	
	Total area (ha)	Proportion of the survey area (%)	Total area (ha)	Proportion of the survey area (%)
Pristine	0	0	0	0
Excellent	22.3	28.2	23.8	25.3
Very Good	29.3	37.1	29.7	31.6
Good	14.2	18.0	11.8	12.5
Degraded	0	0	0.39	0.4
Completely Degraded	1.3	1.6	0	0
Tracks / paths / car parks	6.4	8.2	11.9	12.7
Parkland	4.8	6.2	0	0
Revegetation	0.4	0.5	0.3	0.4
Open beach	0	0	16.1	17.1
Total	**79**	**100**	**94**	**100**

*Completely Degraded vegetation condition previously included tracks and cleared areas however they have been separated for the current assessment

Figure 17: Vegetation condition within the survey area in 2021 compared to vegetation condition recorded in 2015, for the Hillarys to Kallaroo area (Eco Logical Australia, 2022)

Vegetation condition	Natural Area 2017		Current assessment (2021)	
	Total area (ha)	Proportion of the survey area (%)	Total area (ha)	Proportion of the survey area (%)
Pristine	0	0	0	0
Excellent	0	0	0	0
Very Good	7.38	59.0	7.58	44.2
Good	2.96	23.7	6.25	36.4
Degraded	0.29	2.3	0.11	0.7
Completely Degraded	0.12	1.0	0	0
Total vegetated areas	**10.75**	**86**	**13.93**	**81.2**
Other (tracks, open beach, cleared areas)	1.75	14	3.22	18.8
Total survey area	**12.5**	**100**	**17.15**	100.0

*Completely Degraded vegetation condition previously included tracks and cleared areas however they have been separated for the current assessment

Figure 18: Vegetation condition within the survey area in 2022 compared to vegetation condition recorded by Natural Area, for the Mullaloo Foreshore Area (Eco Logical Australia, 2023)

Appendix G. Sources of information

G.1. GIS databases

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

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