

Proposed Amendment Application for CPS 9139/2

Management and Clearing of *Typha orientalis* and *Typha domingensis*

Native vegetation clearing permit amendment
Supporting documentation

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1. Introduction

On 26 August 2021, the City of Wanneroo received approval from the Department of Water and Environmental Regulation (DWER) for CPS 9139/2 for the purposes of clearing *Typha orientalis* and *Typha domingensis*. Since the approval was granted, the City has commenced the management and control of *Typha* sp. within the approved clearing areas. While undertaking clearing within approved areas, it was identified that the extent of *Typha* sp. exceeded the current approved clearing area in some approved sites within Lake Joondalup. The City also identified, during the progression of maintenance activities, two additional sites which require the control and removal of *Typha* sp.

The additional proposed clearing will continue to facilitate the management of *Typha orientalis* and *Typha domingensis* to maintain quality and aesthetics of lakes and infrastructure at various locations within the City of Wanneroo. Land ownership and zoning of areas subject to the amendment application is detailed in Table 1 below.

Table 1: Land ownership and zoning within amendment clearing areas.

Lot Number	Reserve Number	Address	Land Owner	MRS Zoning	Reserve Purpose
LAKE JOONDALUP, WANNEROO					
Lot 139 on Plan 9815	33206	349 Scenic Drive WANNEROO 6065	Crown Land – City of Wanneroo	Parks and Recreation	Public Recreation
Lot 501 on Deposited Plan 73317	33206	349 Scenic Drive WANNEROO 6065	Crown Land – City of Wanneroo	Parks and Recreation	Public Recreation
Lot 40 on Deposited Plan 32924	35577	245 Scenic Drive WANNEROO 6065	Crown Land – City of Wanneroo	Parks and Recreation	Public Recreation
Lot 41 on Deposited Plan 32924	33204	215 Scenic Drive WANNEROO 6065	Crown Land – City of Wanneroo	Parks and Recreation	Public Recreation
COSIMO PARK, WOODVALE					
Lot 300 on Deposited Plan 413701	50955	26 Cosimo Drive WOODVALE	Crown Land – City of Wanneroo	Parks and Recreation	Public Recreation
CARRAMAR GOLF COURSE, CARRAMAR					
Lot 11 on Deposited Plan 57099	N/A	30 Tranquil Drive CARRAMAR 6031	City of Wanneroo Freehold	Parks and Recreation	N/A

2. Background

In a study conducted by Keighery and MaCabe in 2015, *Typha orientalis* was reclassified as a naturalised species of Western Australia (Keighery and McCabe, 2016). This was due to the early collection of *T. orientalis* in 1839, the lack of historical listings as a weed within Western Australia and its use as a major food source by Indigenous Australians (Keighery and McCabe, 2016). As a result of the reclassification of *T. orientalis* as a naturalised species in Western Australia, the City of Wanneroo submitted a clearing permit application to the Department of

Water and Environmental Regulation (DWER) in December 2020. CPS 9139/1 was approved in August 2021.

The City undertakes the management and removal of *T. orientalis* and *T. domingensis* within various areas of the City including conservation reserves, drainage infrastructure, irrigation lakes, wetlands within public open spaces and other infrastructure.

Over the summer months of November 2021 to February 2022, the City undertook the management and clearing of *Typha* sp. at Lake Joondalup locations approved under CPS 9139/2 including Ottawa Way and Wanneroo Recreation Centre (Figure 1).

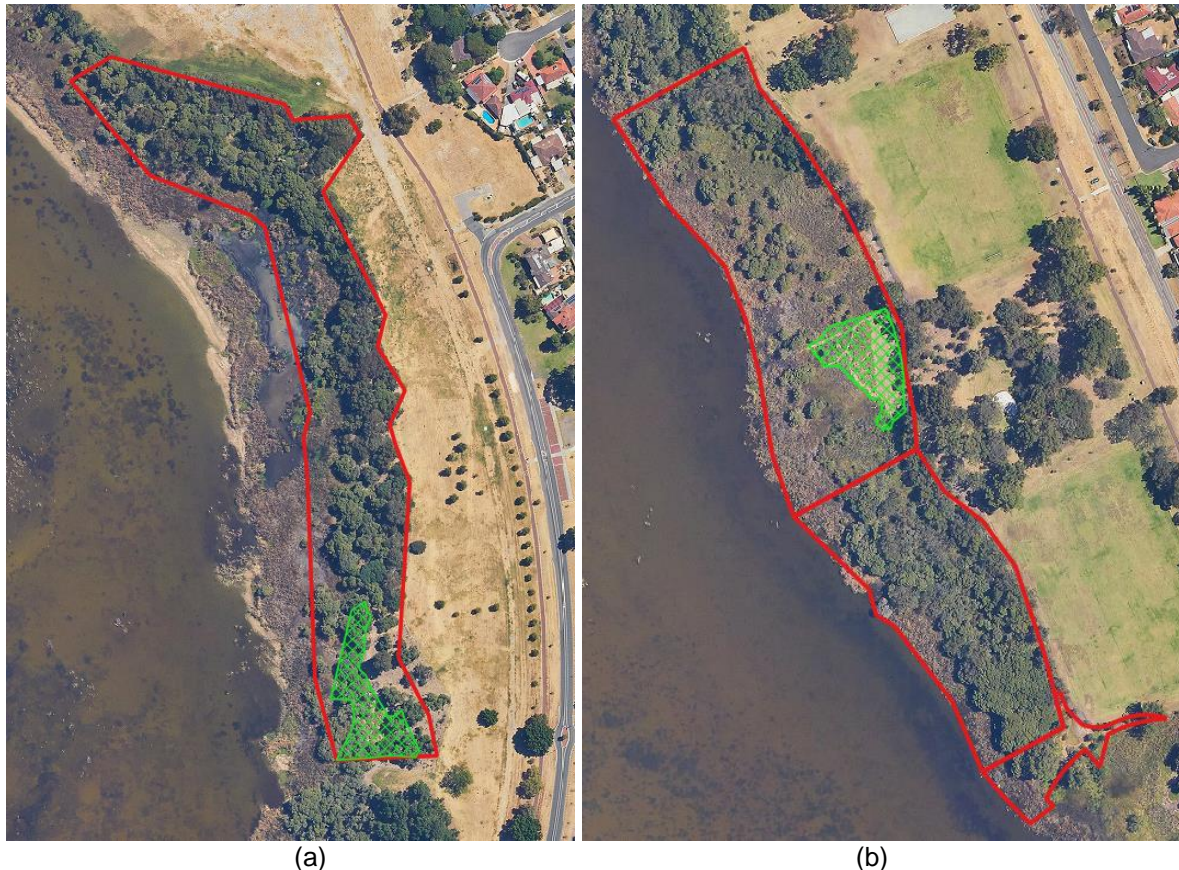


Figure 1: Areas cleared of *Typha* sp. in 2021/2022 under CPS 9139/2 at (a) Ottawa Way and (b) Wanneroo Recreation Centre at Lake Joondalup.

In order to continue the management and removal of *T. orientalis* and *T. domingensis* (hereafter collectively referred to as *Typha*), the City submits this supporting documentation for the additional areas to assist the Department of Water and Environmental Regulation's (DWER) assessment of the City's clearing permit amendment application.

3. Scope

The purpose of this document is to provide an assessment against the *Environmental Protection Act 1986* – Ten Clearing Principles to determine whether the proposed clearing is likely to have a significant impact on the environment. The additional clearing is proposed within several areas within the City of Wanneroo boundary, with a total additional area of 1.66 hectares (Attachment A1-A3 – Clearing Plans; Attachment B – Shapefiles). Within these areas, only *Typha* will be cleared.

4. Proposed *Typha* Management Sites

The proposed areas to be amended are located within Lake Joondalup, Wanneroo. The proposed areas to be added to the clearing permit are located within the following sites:

- Carramar Golf Course, Carramar and
- Cosimo Park, Woodvale.

In addition to the above locations, the City also proposes to undertake the clearing of *Typha* between the parcel boundary of 26 Cosimo Park and the Woodvale Dual Use Path. This section falls under the management of the Department of Biodiversity, Conservation and Attractions (DBCA). DBCA have provided the City with authority to clear *Typha* within DBCA managed lands along the Dual Use Path, in accordance with the approved Yellagonga Regional Park Management Plan (Attachment H).

Site assessments and desktop surveys were undertaken for each site to determine the flora and fauna species present, and the environmental considerations of each site.

The City of Wanneroo has generated a Desktop Assessment Report for Native Vegetation Clearing Permits (NVCP) utilising the City's Intramaps NVC module (Attachment D1-D6). An Environmental Planning Considerations (EPC) Report was also generated utilising the City's Intramaps EPC module (Attachment E1-E3).

The following summarises flora and fauna identified at each site and the identified impacts and level of variance against each of the Ten Clearing Principles.

4.1 Lake Joondalup, Wanneroo

4.1.1 Proposed clearing area

Lake Joondalup is part of a chain of wetlands within the Yellagonga Regional Park, which lies approximately 20km north of Perth (City of Wanneroo and City of Joondalup, 2021). Lake Joondalup is considered to be a wetland of national significance (Department of Conservation and Land Management, 2003), and is classified as a Conservation wetland (City of Wanneroo, 2018). As part of general maintenance and capital works projects of Lake Joondalup, the City is working towards reducing the percentage cover of *Typha* to increase native species richness within the wetland.

The City currently holds an approved clearing permit over a number of areas of Lake Joondalup. Whilst undertaking approved clearing works, the City identified that the extent of *Typha* now exceeds the clearing area boundaries approved in CPS 9139/2, resulting in the need to amend these boundaries.

The sites that are currently under the approved 9139/2 clearing permit that require amendment are as follows:

- Ottawa Rehabilitation Site (Figure 2a, 2b)
- Wanneroo Recreation Centre (Figure 3a, 3b)
- Frogs Hollow (Figure 3a, 3b)
- Turtle Nesting site (Figure 3a, 3b)

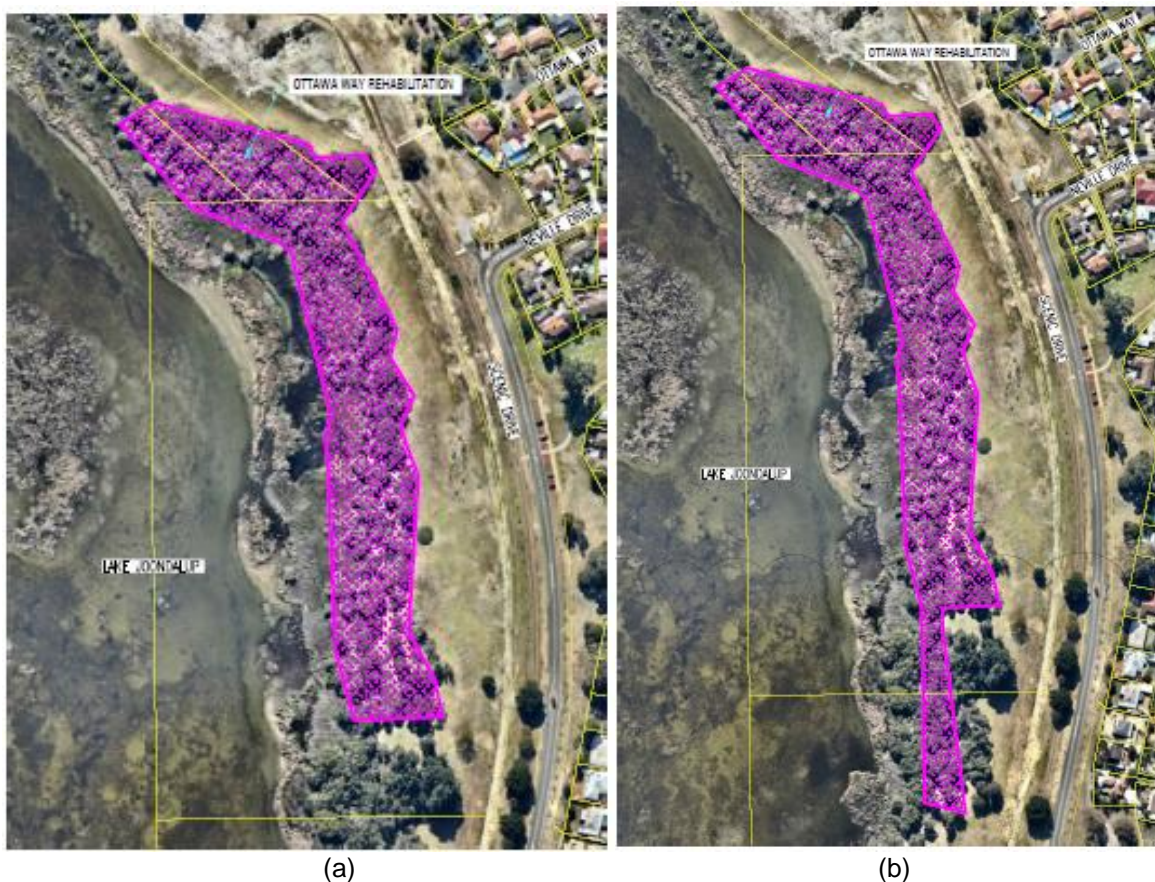


Figure 2: (a) Current approved clearing area (2.61 ha) and (b) proposed amended clearing area (2.95ha) at Ottawa Way Rehabilitation Site.

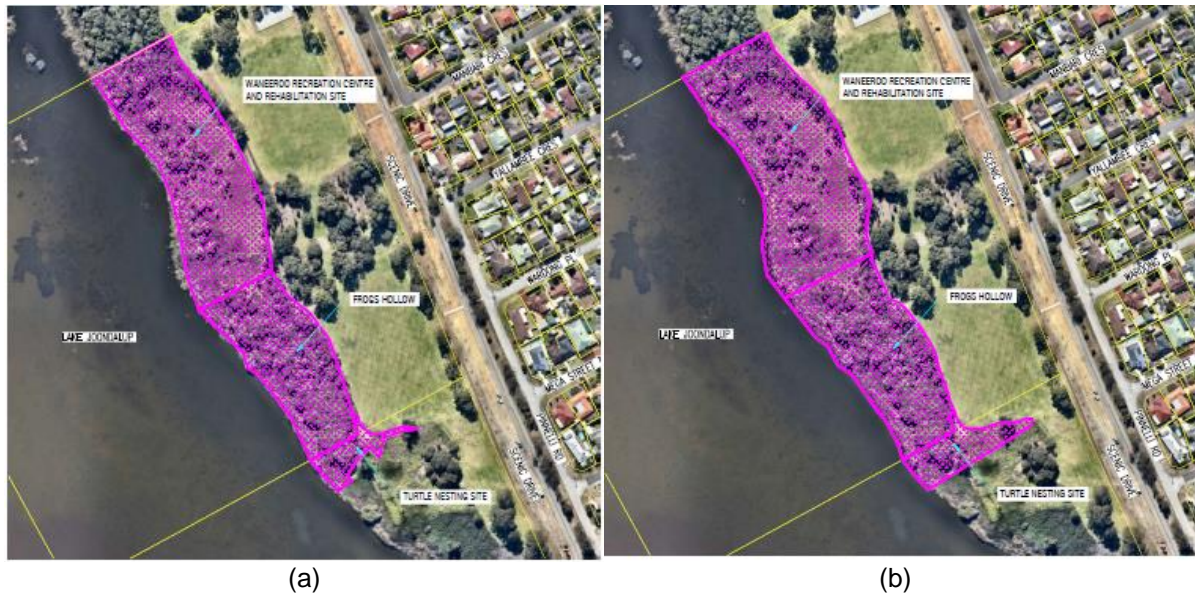


Figure 3: (a) Current approved clearing area (3.08 ha) and (b) proposed amended clearing area (3.68 ha) at Wanneroo Recreation Centre, Frogs Hollow and Turtle Nesting sites.

With the amended clearing area boundaries, the total clearing area of Lake Joondalup is approximately 9.93 hectares. (Attachment A1 – Clearing Plan and Attachment B1 – Shapefiles). This includes the current approved 8.89 hectares and the following amended areas:

- Ottawa Way Revegetation Site – 0.34 hectares
- Wanneroo Recreation Centre Revegetation Site – 0.25 hectares
- Frogs Hollow Revegetation Site – 0.21 hectares
- Turtle Nesting Revegetation Site – 0.13 hectares.

The boundaries of the clearing areas of Wanneroo Recreation Centre, Frogs Hollow Revegetation Site and the Turtle Nesting Revegetation Site have been slightly increased around the perimeter of the current approved boundary. The boundary of the Ottawa Way Revegetation Site has increased approximately 150 metres to the south of the current approved area.

4.1.2 Wanneroo Recreation Centre Revegetation Site, Frogs Hollow Revegetation Site and Turtle Nesting Revegetation Site

The total additional clearing of the Wanneroo Centre, Frog Hollow and Turtle Nesting Sites is 0.595 hectares.

A site visit of the proposed amendment areas undertaken on 7 September 2022 identified no new species within the clearing sites. No fauna were identified during the site assessment.

The assessment against the 10 Clearing Principles submitted in the original application was assessed against a NVCP Report generated in October 2022 (Attachments D2-D4). This assessment did not identify any differences between the environmental considerations. Therefore, as assessed in the CPS 9139/2 Environmental Impact Assessment for Wanneroo Recreation Centre, Frog Hollow and Turtle Nesting Sites, the City has found that the clearing

is unlikely to be at variance with any of the Ten Clearing Principles due to the targeted nature of the clearing, focusing solely on *Typha*. The removal of this invasive species will reduce the likelihood of monocultures of *Typha* occurring, increase the density of native riparian and wetland vegetation and improve biodiversity values of the wetland.

4.1.3 Ottawa Way Revegetation Site

The clearing boundary of the Ottawa Way Revegetation site is proposed to be extended approximately 150 metres from the current approved clearing area. Due to the addition of a new area that has not yet been assessed, City Officers conducted a site visit to the proposed clearing area on 7 September 2022.

4.1.3.1 Flora and Vegetation

There is a diverse range of flora and vegetation found within the boundaries of the clearing areas. An initial site inspection was undertaken on 5 June 2020 and photographs were taken of the proposed clearing areas. A site visit of the proposed amendment areas was undertaken on 7 September 2022 identified no new species within the additional clearing area.

In addition to the site visits, previous flora surveys undertaken by Natural Area Consulting Management Services (2017) were also consulted to provide information on species present within the Lake Joondalup proposed clearing areas. The vegetation identified in the assessments is collated in the table below (Table 2).

Table 2: Flora and weed species identified within the proposed additional clearing area at Lake Joondalup, Wanneroo.

Remnant vegetation species	Weed Species
<i>Acacia hugelii</i>	<i>Arctotheca calendula</i>
<i>Acacia pulchella</i>	<i>Arundo donax</i>
<i>Acacia saligna</i>	<i>Asparagus asparagoides</i>
<i>Alexgeorgia nitens</i>	<i>Avena barbata</i>
<i>Allocasuarina fraseriana</i>	<i>Avena fatua</i>
<i>Anthropodium capillipes</i>	<i>Brassica tournefortii</i>
<i>Banksia attenuata</i>	<i>Briza maxima</i>
<i>Banksia ilicifolia</i>	<i>Bromus diandrus</i>
<i>Banksia littoralis</i>	<i>Cenchrus clandestinus</i>
<i>Banksia menziesii</i>	<i>Centranthus macrosiphon</i>
<i>Baumea articulata</i>	<i>Conyza</i> sp.
<i>Baumea preissii</i>	<i>Cynodon dactylon</i>
<i>Bossiaea eriocarpa</i>	<i>Cyperus</i> sp.
<i>Burchardia umbellata</i>	<i>Ehrhata calycina</i>
<i>Caesia micrantha</i>	<i>Eragrostis curvula</i>
<i>Caladenia flava</i>	<i>Euphorbia peplus</i>
<i>Caladenia latifolia</i>	<i>Euphorbia terracina</i>
<i>Conostephium pendulum</i>	<i>Ficus carica</i>
<i>Conostylis candicans</i>	<i>Freesia alba x leichtlinii</i>
<i>Corynotheca micrantha</i>	<i>Gazania linearis</i>
<i>Crassula colorata</i>	<i>Homalanthus populifolius</i>
<i>Dianella revoluta</i>	<i>Hordeum leporinum</i>

<i>Diuris longifolia</i>	<i>Hypochaeris glabra</i>
<i>Drosera erythrorhiza</i>	<i>Ipomoea cairica</i>
<i>Drosera macrantha</i>	<i>Lachenalia reflexa</i>
<i>Eriosremon spicatus</i>	<i>Lactuca serriola</i>
<i>Eucalyptus marginata</i>	<i>Lagurus ovatus</i>
<i>Eucalyptus rudis</i>	<i>Lupinus angustifolius</i>
<i>Gompholobium tomentosum</i>	<i>Lupinus consentinii</i>
<i>Hardenbergia comptoniana</i>	<i>Moraea flaccida</i>
<i>Hibberta hypercoides</i>	<i>Olea europaea</i>
<i>Hibbertia racemosa</i>	<i>Oxalis pes-caprae</i>
<i>Hypocalymma robustum</i>	<i>Paspalum diatatum</i>
<i>Isotropis cunefolia</i>	<i>Ricinus communis</i>
<i>Jacksonia furcellata</i>	<i>Romulea rosea</i>
<i>Juncus pallidus</i>	<i>Ursinia anthemoides</i>
<i>Lagenifera huegelii</i>	<i>Schinus terebinthifolius</i>
<i>Lepidosperma longitudinale</i>	<i>Solanum nigrum</i>
<i>Leucopogon propinquus</i>	<i>Stenotaphrus secundatus</i>
<i>Loxocarya flexuosa</i>	<i>Tribulus terrestris</i>
<i>Macrozamia riedlei</i>	<i>Trifolium sp.</i>
<i>Melaleuca raphiophylla</i>	<i>Vicia sp.</i>
<i>Mesomelaena pseudostygia</i>	<i>Washingtonia filifera</i>
<i>Olearia axillaris</i>	<i>Zantedeschia aethiopica</i>
<i>Opercularia hispidula</i>	
<i>Opercularia vaginata</i>	
<i>Phylanthus calycinus</i>	
<i>Pterostylis vittata</i>	
<i>Regaelia cilata</i>	
<i>Solanum symonii</i>	
<i>Sowerbaea laxiflora</i>	
<i>Thysanotus patersonii</i>	
<i>Typha orientalis/domingensis</i>	
<i>Viminaria juncea</i>	
<i>Xanthorrhoea preisii</i>	
<i>Xanthosia huegelii</i>	

There is a significant amount of remnant vegetation within the proposed clearing boundary amendment areas. There is a high biodiversity value along the length of Lake Joondalup, which will be increased with the control and clearing of invasive *Typha* species. The list of weeds in Table 2 is not an exhaustive list of weeds currently within the clearing boundaries, however, the listed weeds are considered to be the most dominant present within Lake Joondalup.

4.1.3.2 Fauna

During the site assessment by City Officers, no fauna species were documented within the extent of the proposed clearing area.

There is the potential that *Botaurus poiciloptilus* (Australasian bittern) may be present within the proposed clearing area. The City has previously sought advice on the presence of *B. poiciloptilus* from DBCA for CPS 9139/2. DBCA advised the City that the likelihood of *B. poiciloptilus* breeding or establishing a residence within Wanneroo wetlands is very low. This information was provided to the Department as part of the application of CPS 9139/2.

The City will undertake clearing in a prescribed manner to ensure minimal disturbance to breeding/nesting birds and other fauna within the proposed clearing area. Prior to undertaking clearing activities, sites will be surveyed by those undertaking the clearing works to determine the presence of fauna. If nests are noted within the clearing area, the area will be abandoned for the period of the breeding season and checked again towards the end of the breeding season (March). If nests are empty and no fledglings are noted, clearing activities will commence. The City will also undertake clearing in a directional manner to allow fauna to escape from the clearing area into surrounding vegetation. A Wildlife Carer will be contacted in the event fauna are injured during the clearing activities.

The City's Environmental Planning Considerations Report (EPCR) did not identify any instances of threatened or priority fauna species within the selected footprint (Attachment E1). Protected fauna species were however identified within a 5km radius of the selected area (Attachment E1).

The City's EPCR (Attachment E1) did identify the selected area as being located within a Carnaby's Black Cockatoo (*Zanda latirostris*) "Confirmed" roosting area buffer. In addition, the EPCR identified the proposed clearing area was within or adjacent to a Key Biodiversity Area for birds.

The EPCR also identified the selected area contains vegetation mapped as potential Quenda (*Isoodon obesulus*) habitat.

4.1.3.3 Clearing Principles

A City Intramaps Native Vegetation Clearing Permit (NVCP) Report (Attachment D1) and Environmental Planning Considerations (EPC) Report (Attachment E1) was generated by the City as supporting documentation for the below clearing principle assessment. This, along with additional data sources provided by various state and federal departments, were reviewed to determine the level of impact and the level of variance to the clearing principles.

The following sections summarise the identified environmental impacts and the level of variance against the clearing principles.

Table 3: Assessment of the likely impacts against ten clearing principles and level of variance.

Clearing Principle	Flag Colour	Proposed Project Impacts
<i>Principle (a) – Native vegetation should not be cleared if it comprises a high level of biological diversity</i>	Red	<p>City Environmental Officers conducted an initial site inspection on 5 June 2020, which identified that the vegetation within the clearing boundary consisted of a diverse range of species.</p> <p>City Environmental Officers undertook an additional vegetation assessment of the proposed clearing area on 7 September 2022. The survey did not identify any additional species.</p> <p>The proposed clearing area is located within Bush Forever Site 299 and is a mapped Environmentally Sensitive Area (ESA).</p>

		<p>The City's EPCR (Attachment E1) identifies the following flora and fauna attributes for the proposed clearing site:</p> <ul style="list-style-type: none"> • No records of Threatened and Priority Flora records, or Priority Fauna records within the selected site boundary • Records of Federal and State TECs, PECs Threatened Fauna within the selected site boundary • The proposed clearing area is within a confirmed Carnaby's Black Cockatoo roosting area buffer • The proposed area contains vegetation mapped as potential Quenda habitat • The proposed clearing area is within an important birding area (Northern Swan Coastal Plain IBA) <p>The City's EPCR (Attachment E1) identifies the following flora and fauna attributes within 5kms of the proposed clearing site:</p> <ul style="list-style-type: none"> • Federal and State listed TECs and PECs (or their buffers) located within a 5km radius of the proposed clearing site • State listed Priority Flora records located within a 5km radius of the proposed clearing site • Federal and State listed Threatened and Priority Fauna and Fauna Habitat records located within a 5km radius of the proposed clearing site <p>As the proposed clearing is occurring within an ESA and a TEC/PEC, the clearing may be at variance to principle (a), however, given the clearing comprises of only <i>Typha</i>, the proposed clearing is unlikely to be at variance to principle (a).</p>
<p><i>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 indigenous to Western Australia</i></p>	<p style="text-align: center;">Red</p>	<p>The City's Intramaps NVCP Report (Attachment D1) and EPCR (Attachment E1) identified that the proposed clearing area is within a confirmed Carnaby's Black Cockatoo roosting habitat buffer. It also identified the proposed clearing area is within an important birding area (Northern Swan Coastal Plain IBA) and contained vegetation mapped as potential Quenda habitat.</p> <p>The proposed clearing does not include the removal of any habitat trees for indigenous fauna.</p> <p>The proposed clearing area likely provides habitat for wading and migratory bird species. When undertaking clearing, the City will implement measures to ensure minimal disturbance to fauna present including inspection of the area prior to clearing, only undertaking clearing if no occupied nests are present and undertaking clearing in a directional manner to allow for fauna to escape into the surrounding vegetation. The proposed clearing area is also small, reducing the likelihood of fauna being present within the clearing area.</p>

		<p>Considering the above, the application area is not likely to be at variance with clearing principle (b).</p>
<p>Principle (c) – Native vegetation should not be cleared if it includes or is necessary for the continued existence of, rare flora.</p>	<p>Green</p>	<p>The City's NVCP Report (Attachment D1) identified there are priority flora species within a 5km radius of the application area, however no Federal or State threatened or priority flora species are identified within the application area.</p> <p>Considering the application area does not contain rare flora and the vegetation to be cleared consists only of <i>Typha</i>, the application area is not likely to be at variance with clearing principle (c).</p>
<p>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.</p>	<p>Red</p>	<p>The City's NVCP Report (Attachment D1) identified both Federal and State Threatened Ecological Communities (and buffers) within a 5km radius of the application area, however no threatened or priority communities are present within the City's proposed 0.34 hectare clearing area.</p> <p>Due to the absence of an identified TEC within the application area, the City's proposed clearing is not likely to be at variance to clearing principle (d).</p>
<p>Principle (e) - Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been significantly cleared.</p>	<p>Red</p>	<p>The vegetation proposed for clearing contains remnant native vegetation belonging to the Herdsman Complex.</p> <p>In accordance with DBCA's South West Vegetation Complex Statistics, vegetation representation within the Herdsman complex is greater than 30%, with 32.11% currently remaining (DBCA, 2018).</p> <p>Within the proposed clearing boundary, <i>Typha</i> will be the targeted species and other remnant vegetation will not be removed. The clearing of <i>Typha</i> within the proposed clearing area will decrease competition between <i>Typha</i> and native species within the clearing area and increase the biodiversity values of the wetland.</p> <p>As the proposed clearing consists of only <i>Typha</i> and remnant vegetation will not be cleared, the proposed additional clearing is not likely to be at variance with clearing principle (e).</p>
<p>Principle (f) - Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or a wetland</p>	<p>Red</p>	<p>The proposed clearing area is within Lake Joondalup, a Conservation category wetland and Directory of Importance wetland (Attachment D1 and E1). <i>Typha</i> is considered to be an invasive species within this wetland. The clearing of <i>Typha</i> will enable native riparian and wetland vegetation density to increase within the wetland area and improve the condition of the wetland.</p> <p>The proposed clearing area is located within 5km of 9 other wetlands: Lake Joondalup (0m), Mariginiup Lake (2429m), Jandabup Lake (3655m), Little Mariginiup Lake (3984m), Walluburnup Swamp (4325m), Beenyup Swamp (4361m), Lake Adams (5071m), and two unnamed lakes (3586m and 4750m).</p>

		<p>Considering the above, the proposed clearing may be at variance to clearing principle (f).</p>
<p>Principle (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.</p>	<p>Orange</p>	<p>The proposed clearing of 0.34 hectares of <i>Typha</i> is located within a high to moderate Acid Sulphate Soil risk area.</p> <p>The Groundwater Salinity (Total Dissolved Solids) at the proposed clearing site is less than 500mg/L.</p> <p>The City's NVCP (Attachment D6) identifies the surface geology to be swamp, with low hilly to gently undulating terrain, and yellow sand over limestone at 1-2m.</p> <p>The soil within the proposed clearing area consists of Spearwood wet, lake phase (211SpW_LAKE).</p> <p>Due to the small amount of clearing and the utilisation of techniques that will not cause major damage to land within the proposed clearing area, it is not likely for the clearing to result in appreciable land degradation and therefore is not likely to be at variance to clearing principle (g).</p>
<p>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.</p>	<p>Red</p>	<p>The proposed clearing area is in Lake Joondalup within Yellagonga Regional Park and is both, an Environmentally Sensitive Area, and Bush Forever 299. It is also nearby 8 other Bush Forever Sites.</p> <p>The clearing of <i>Typha</i> specifically will not have a negative impact on the environmental values of the conservation areas; the clearing of <i>Typha</i> will allow for an increase in the density of native riparian and wetland species.</p> <p>The proposed clearing is not likely to be at variance to principle (h).</p>
<p>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.</p>	<p>Orange</p>	<p>The proposed clearing area is within Lake Joondalup, a Directory of Important Wetlands site. Lake Joondalup is a Conservation category wetland.</p> <p>The proposed clearing area is within the Perth Coastal Underground Water Pollution Control Area (Public Drinking Water Source Area). It is also within the Perth Groundwater Area RIWI Act area.</p> <p>The proposed clearing is not likely to cause deterioration in surface water quality through sedimentation or eutrophication. Given the purpose of the clearing is to clear only <i>Typha</i>, it is not considered the proposed clearing will increase groundwater salinity.</p> <p>Given the targeted clearing of <i>Typha</i>, it is not considered that the proposed clearing will cause deterioration in water quality. The proposed clearing is not likely to be at variance to principle (i).</p>

<p>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.</p>		<p>The proposed clearing of <i>Typha</i> within the additional 0.34 hectares of Good (remnant vegetation and weed species) vegetation is not likely to cause, or exacerbate the incidence, or intensity of flooding.</p> <p>The proposed clearing is not likely to be at variance to clearing principle (j).</p>
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Red – Likely to be at variance, **Orange** – May be at variance, **Green** – Not likely to be or not at variance

4.1.4 Avoidance and Mitigation Measures

Within the proposed clearing areas, the City will only be undertaking the removal of *Typha*. The methodology for removal will be the same as previously provided for CPS 9139/2; where there are solid stands of *Typha*, the area will be brushcut with the larger biomass removed. The cut *Typha* will then be sprayed with RoundUp Biactive with no surfactants or other additives added. Where *Typha* is within other native vegetation, the *Typha* will be wiped with the same chemical. Chemicals will only be applied between the months of October to March as conditioned in CPS 9139/2.

The removal of *Typha* will allow for the increased natural recruitment of other native riparian and wetland species and increase the biodiversity value of Lake Joondalup.

4.1.5 Conclusion

The City of Wanneroo has assessed the proposed clearing against the 10 clearing principles and has found that the clearing is unlikely to be at variance with any of the clearing principles due to the targeted nature of the clearing, focusing solely on the removal of *Typha*. The removal of an invasive species will reduce the likelihood of monocultures of *Typha* within Lake Joondalup, increase density of native riparian and wetland vegetation within the City's revegetation sites and improve the biodiversity values of Lake Joondalup.

4.2 Carramar Golf Course, Carramar

4.2.1 Proposed clearing area

Carramar Golf Course is located within the suburb of Carramar, approximately 40 minutes north of Perth CBD (Carramar Golf, 2022). It is a public course, surrounded by natural bushland (Carramar Golf, 2022). Situated within the golf course is a constructed lake which supplies water for irrigation, drainage and maintenance activities.

The City commissioned a biological survey of Carramar Golf Course in 2018, including a detailed vegetation and flora survey conducted by One Tree Botanical, and a Level 1 fauna survey conducted by Australasian Ecological Services (Attachment F).

The clearing of *Typha* within the lake is required to ensure irrigation infrastructure works effectively and is maintained to a high standard. This will involve the clearing of *Typha* on an as needed basis.

The clearing area is approximately 0.311 hectares (Attachment A2 – Clearing Plan and Attachment B – Shapefiles – 2. Carramar Golf Course, Figure 4), within which only *Typha* will be cleared.

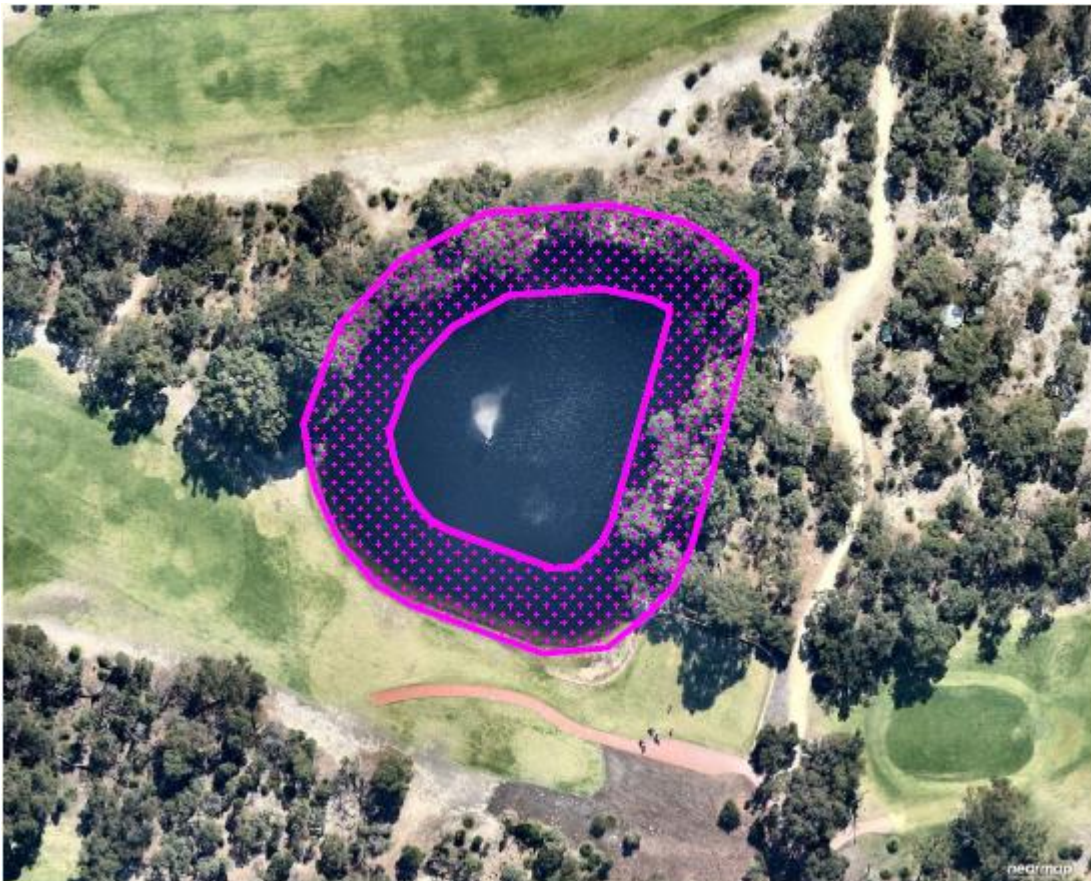


Figure 4: Proposed clearing area of 0.311 hectares within the Carramar Golf Course, Carramar.

4.2.2 Flora and Vegetation

One Tree Botanical (2018) (Attachment F) identified the wetland area of Carramar Golf Course is a constructed lake and determined it to be in a Completely Degraded condition, with native colonisers including native sedges *Juncus pallidus* and *Elatine gratioloides*. According to Florabase (2022), *E. gratioloides* is not endemic to the Wanneroo Local Government Area.

In addition, a site assessment was undertaken on 29 August 2022 (Attachment C – Site Photographs – 2. Carramar Golf Course). The site assessment identified the presence of *Typha* within the proposed clearing area, and additional weed species including *Cyperus tenuiflorus* and *Ehrharta calycina*.

4.2.3 Fauna

Australasian Ecological Services (2018) (Attachment F) classified the proposed clearing area as Degraded to Completely Degraded for natural fauna habitat due to little vegetation surrounding the lake. It was identified that the area lacks the complexity of a natural wetland and is likely to contain high levels of fertilizer, pesticides and possibly other chemicals (Australasian Ecological Services, 2018).

During the site assessment on 27 June 2022, no fauna species were documented within the extent of the proposed clearing area.

The City's Intramaps Environmental Planning Considerations Report (EPCR) (Attachment E2) did not identify any instances of threatened or priority fauna species within the selected footprint. Protected fauna species were however identified within a 5km radius of the selected area (Attachment E2).

The City's EPCR did identify the selected area as being located within a Carnaby's Black Cockatoo (*Zanda latirostris*) "Confirmed" roosting area buffer. The EPCR also identified that 0.01 hectares of the selected area contained remnant vegetation for Carnaby's Black Cockatoo feeding habitat. In addition, the EPCR identified the proposed clearing area was within or adjacent to a Key Biodiversity Area for birds (Attachment E2).

4.2.4 Avoidance and Mitigation Measures

Within the proposed clearing area, the City will only be undertaking the clearing of *Typha* through draining of the constructed lake and cutting *Typha* at ground level. The lake is deep enough to allow for an amount of water to be retained while still being able to remove *Typha*. The lake will then be refilled.

4.2.5 Clearing Principles

A City Intramaps Native Vegetation Clearing Permit (NVCP) Report (Attachment D5) and Environmental Planning Considerations (EPC) Report (Attachment E2) was generated by the City as supporting documentation for the below clearing principle assessment. This, along with additional data sources provided by various state and federal departments, were reviewed to determine the level of impact and the level of variance to the clearing principles.

The following sections summarise the identified environmental impacts and the level of variance against the clearing principles.

Table 4: Identified Impacts against Clearing Principles

Clearing Principle	Flag Colour	Proposed Project Impacts
<p>Principle (a) – Native vegetation should not be cleared if it comprises a high level of biological diversity</p>	<p>Red</p>	<p>One Tree Botanical (2018) identified the vegetation within the proposed clearing area to include native colonisers such as <i>Juncus pallidus</i> and <i>Elatine gratioloides</i>. The vegetation condition was classified as Completely Degraded under the Keighery (1994) vegetation condition rating scale (One Tree Botanical, 2018).</p> <p>City Officers undertook an additional site assessment of the proposed clearing area on 29 August 2022. The survey identified the proposed project area contains few native species, and is mostly dominated by <i>T. orientalis</i>, with additional weed species of <i>Cyperus tenuiflorus</i> and <i>Ehrharta calycina</i>.</p> <p>The proposed clearing area is not located within a Bush Forever Site and does not fall within an Environmentally Sensitive Area (ESA).</p> <p>The City’s EPCR (Attachment E2) identifies the following flora and fauna attributes for the proposed clearing site:</p> <ul style="list-style-type: none"> • No records of Federal or State TECs, PECs, Threatened and Priority Flora records or Threatened and Priority Fauna records within the selected site boundaries • The proposed clearing area is within a confirmed feeding habitat and confirmed Carnaby’s Black Cockatoo roosting area buffer • The proposed area contains vegetation mapped as potential Quenda habitat • The proposed clearing area is within an important birding area (Northern Swan Coastal Plain IBA) <p>The City’s EPCR (Attachment E2) identifies the following flora and fauna attributes within 5kms of the proposed clearing site:</p> <ul style="list-style-type: none"> • Federal and State listed TECs and PECs (or their buffers) located within a 5km radius of the proposed clearing site • State listed Priority Flora records located within a 5km radius of the proposed clearing site • Federal and State listed Threatened and Priority Fauna and Fauna Habitat records located within a 5km radius of the proposed clearing site <p>Given the clearing comprises of only <i>Typha</i>, the proposed small clearing area of 0.311 hectares is unlikely to be at variance to principle (a).</p>

<p>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 indigenous to Western Australia</p>	<p style="text-align: center;">Red</p>	<p>The City's Intramaps NVCP Report (Attachment D5) and EPCR (Attachment E2) identified that the proposed clearing area contains feeding habitat for Carnaby's Black Cockatoo and is within a confirmed Carnaby's black cockatoo roosting habitat buffer. It also identified the proposed clearing area is within an important birding area (Northern Swan Coastal Plain IBA).</p> <p>One Tree Botanical's (2018) survey and the City's site assessment did not identify the presence of any trees within the proposed 0.311 hectares clearing area, as such, no hollows suitable for nesting are present.</p> <p>When undertaking clearing, the City will implement measures to ensure minimal disturbance to fauna present including inspection of the area prior to clearing, only undertaking clearing if no occupied nests are present and undertaking clearing in a directional manner to allow for fauna to escape into the surrounding vegetation. The proposed clearing area is also small, reducing the likelihood of fauna being present within the clearing area.</p> <p>Considering the vegetation to be cleared is exclusively <i>Typha</i> and does not contain habitat trees for significant fauna, the application area is not likely to be at variance with clearing principle (b).</p>
<p>Principle (c) – Native vegetation should not be cleared if it includes or is necessary for the continued existence of, rare flora.</p>	<p style="text-align: center;">Orange</p>	<p>The City's NVCP Report (Attachment D5) identified no Federal or State threatened or priority flora species are identified within the application area, nor any priority flora species within a 5km radius of the application area.</p> <p>The One Tree Botanical (2018) survey and the site assessment did not identify any rare flora species within the clearing area.</p> <p>Considering the application area does not contain habitat supportive of rare flora and only <i>Typha</i> is to be cleared, the application area is not likely to be at variance with clearing principle (c).</p>
<p>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.</p>	<p style="text-align: center;">Orange</p>	<p>The City's NVCP Report (Attachment D5) and One Tree Botanical (2018) identified both Federal and State Threatened Ecological Communities (TEC) (and buffers) within the City's proposed 0.311 hectare clearing area. It was determined that the proposed clearing area is unlikely to meet the condition threshold of "<i>Banksia</i> Woodlands of the Swan Coastal Plain" TEC, as the vegetation is required to be in Good condition or better (One Tree Botanical, 2018). As the proposed clearing area is in a Completely Degraded condition, One Tree Botanical (2018) considers this to be marginal in terms of Commonwealth TEC status.</p> <p>Due to the Completely Degraded nature of the proposed clearing area and the area not meeting the condition threshold of the identified TEC, the City's proposed clearing is not likely to be at variance to clearing principle (d).</p>

<p>Principle (e) - Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been significantly cleared.</p>	<p style="text-align: center;">Red</p>	<p>The vegetation within the proposed clearing area contains remnant native vegetation belonging to the Karrakatta Complex – Central and South.</p> <p>The proposed clearing area is contained within a constructed lake predominately used for irrigating the golf course. Within the proposed clearing area, <i>Typha</i> will be the targeted species and other remnant vegetation will not be removed. The clearing of <i>Typha</i> within the man-made lake will allow for maintenance and efficient, on-going use of the irrigation infrastructure.</p> <p>The City's proposed clearing is not likely to be at variance with clearing principle (e) due to the small clearing requirement of 0.401 hectares.</p>
<p>Principle (f) - Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or a wetland</p>	<p style="text-align: center;">Green</p>	<p>The proposed clearing area is within a constructed lake. Clearing will consist of only <i>T. orientalis</i> (and potentially <i>T. domingensis</i>).</p> <p>The proposed clearing area is located within 5km of nine other wetlands: Lake Joondalup (1959m), Mariginiup Lake (3145m), Lake Adams (3219m), Little Mariginiup Lake (3734m), Lake Pinjar (4177m), Little Coogee Swamp (4443m) and three un-named lakes (1167m, 2792m and 4292m).</p> <p>Due to the specific clearing of <i>Typha</i> growing within the boundaries of a water course or wetland, the proposed clearing may be at variance to clearing principle (f).</p>
<p>Principle (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.</p>	<p style="text-align: center;">Green</p>	<p>The City's NVCP (Attachment D5) identifies the proposed clearing area is not considered to be at risk of containing acid sulphate soils.</p> <p>The Groundwater Salinity (Total Dissolved Solids) at the proposed clearing site is less than 500mg/L.</p> <p>The City's NVCP (Attachment D5) identifies the geomorphology as low hilly to gently undulating terrain with yellow sand over limestone and 1-2m. Hydrogeology is coastal and fixed sand dunes and calcarenite, with non-calcareous sands, podsolised soils with low lying wet areas (Attachment D5).</p> <p>The soil within the proposed clearing area consists of Karrakatta Sand Yellow Phase (211Sp_Ky).</p> <p>Due to the specific clearing of <i>Typha</i> and the utilisation of techniques that will not cause major damage to land within the proposed clearing area, it is not likely for the clearing to result in appreciable land degradation and therefore is not likely to be at variance to clearing principle (g).</p>
<p>Principle (h) - Native vegetation should not be cleared if the clearing of the vegetation is likely to</p>	<p style="text-align: center;">Green</p>	<p>The proposed clearing area is not within a Bush Forever site and does not fall in an Environmentally Sensitive Area (ESA).</p>

<p><i>have an impact on the environmental values of any adjacent or nearby conservation area.</i></p>		<p>The proposed clearing is within 5km of 17 Bush Forever sites, with the five closest being sites 383 (1065m), 494 (1547m), 295 (1757m), 299 (1859m) and 384 (2269m).</p> <p>The clearing of <i>Typha</i> within the proposed area will not impact on any environmental values of conservation areas as no clearing of remnant vegetation is proposed to occur and no conservation areas are located in the vicinity of the proposed clearing area .</p> <p>It is not likely for the proposed clearing to be at variance to clearing principle (h).</p>
<p><i>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.</i></p>	<p>Green</p>	<p>The proposed clearing area is a constructed lake.</p> <p>The proposed clearing area is within the Perth Groundwater Area RIWI Act area. It does not fall within a Public Drinking Water Source Area.</p> <p>The proposed clearing is within a low potential groundwater dependent system.</p> <p>The proposed clearing is not likely to cause deterioration in surface water quality through sedimentation or eutrophication. Given the purpose of the clearing is to clear only <i>Typha</i>, it is not considered the proposed clearing will increase groundwater salinity.</p> <p>Given the targeted clearing of <i>Typha</i>, it is not considered that the proposed clearing will cause deterioration in water quality. The proposed clearing is not likely to be at variance to principle (i).</p>
<p><i>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.</i></p>		<p>The City's Intramaps NVCP (Attachment D5) identifies that less than 3% of the area has a moderate to high flood risk.</p> <p>The proposed clearing of <i>Typha</i> within 0.311 hectares of Completely Degraded (with some remnant vegetation and weed species) vegetation is not likely to cause, or exacerbate the incidence, or intensity of flooding.</p> <p>The proposed clearing is not likely to be at variance to clearing principle (j).</p>

Red – Likely to be at variance, **Orange** – May be at variance, **Green** – Not likely to be or not at variance

4.2.6 Conclusion

The City of Wanneroo has assessed the proposed clearing against the 10 clearing principles and has found that the clearing is unlikely to be at variance with any of the clearing principles due to the targeted nature of the clearing, focusing solely on the removal of *Typha*. The removal of an invasive species will: reduce the likelihood of monocultures of *Typha*, enhance the condition of the constructed lake within the golf course, allow for required maintenance of irrigation infrastructure and allow for recruitment of native riparian and wetland-associated vegetation.

4.3 26 Cosimo Drive, Woodvale

4.3.1 Proposed clearing area

26 Cosimo Drive is situated on the fringe of the Yellagonga Regional Park and north of Lake Goollelal. It was once part of a larger lot, Lot 35 Wanneroo Road, which was developed in early 2018. Lot 35 has historically been cleared and used for market garden and orchard activities (Coterra, 2017). The land to the north and south of 26 Cosimo Drive has also been subdivided and developed into residential housing.

The majority of 26 Cosimo Drive was first cleared in January/February 2018 (Nearmaps, 2022). Prior to clearing, the site had little to no native vegetation (Coterra, 2017), consisting of mainly grass species.

During the planning phase of the development, a Wetland, Dieback and Midge Management Plan (the Management Plan) (Attachment G) was developed by Coterra (2017) to coordinate the rehabilitation of the wetland, including 26 Cosimo Drive and a 20 metre wetland buffer. The site was first planted in 2019, with subsequent plantings occurring in 2020. The site was transferred to the management of the City in January 2021.

The clearing area is approximately 0.42 hectares (Attachment A3 – Clearing Plan and Attachment B – Shapefiles – 3. 26 Cosimo Drive, Figure 5), within which only *Typha* will be cleared.



Figure 5: Proposed clearing area of 0.42 hectares within 26 Cosimo Drive, Woodvale. The adjacent Panzano Park *Typha* clearing is currently approved under CPS 9139/2.

4.3.2 Flora and Vegetation

As directed by the Management Plan, 26 Cosimo Drive was revegetated and rehabilitated to reflect the surrounding environment. This included the installation of plants typically found within a *Melaleuca raphiophylla* open forest vegetation community type (Coterra, 2017) (Attachment G). Species were selected based on their natural presence in the area and their habitat. Table 5 lists the species selected for planting within 26 Cosimo Drive.

A number of weeds were also identified by Coterra (2017) within 26 Cosimo Drive. Table 5 lists the most invasive weeds present. *Typha* was identified as a weed requiring control within the revegetation area. Coterra (2017) identified a medium level of infestation within the site.

Table 5: Flora and major weed species identified within the proposed additional clearing area (adapted from Coterra, 2017) (Attachment G).

Planted Revegetation Species	Weed Species
<i>Banksia littoralis</i>	<i>Arundo donax</i>
<i>Bolboschoenus caldwellii</i>	<i>Gomphocarpus fruiticosus</i>
<i>Centella asiatica</i>	<i>Paspalum distichum</i>
<i>Eucalyptus rudis</i>	<i>Typha</i> sp.
<i>Juncus pallidus</i>	<i>Cenchrus clandestinus</i>
<i>Kunzea glabrescens</i>	<i>Opuntia stricta</i>
<i>Lepidosperma longitudinale</i>	
<i>Lobelia anceps</i>	
<i>Machaerina (Baumea) articulata</i>	
<i>Machaerina (Baumea) preissi</i>	
<i>Melaleuca preissiana</i>	
<i>Melaleuca raphiophylla</i>	
<i>Melaleuca teretifolia</i>	

A site assessment was also conducted by City Environmental Officers on 18 August 2022. Additional species were identified, including native and weed species were identified during the site assessment (Table 6) (Attachment C – Site Photographs – 3. 26 Cosimo Drive).

Table 6: Additional flora and weed species identified within the proposed clearing area during the 18 August 2022 site assessment.

Planted Revegetation Species	Weed Species
<i>Ficinia nodosa</i>	<i>Cynodon dactylon</i>
<i>Schoenoplectus tabernaemontani</i>	<i>Cyperus rotundus</i>
<i>Typha</i> sp.	<i>Elatine gratioloides</i>
<i>Viminaria juncea</i>	<i>Rorippa nasturtium-aquaticum</i>
	<i>Trifolium campestre</i>

The majority of the site is in a Good to Very Good condition, with some Degraded areas due to edge effects of the dual-use pathway. During the site visit of 18 August 2022, it was noted

that *Typha* was prevalent throughout the proposed clearing site, with native species spread within the *Typha*.

4.3.3 Fauna

During the site assessment on 18 August 2022, no fauna species were documented within the extent of the proposed clearing area.

The City's Intramaps Environmental Planning Considerations Report (EPCR) (Attachment E3) did not identify any instances of threatened or priority fauna species within the selected footprint. Protected fauna species were however identified within a 5km radius of the selected area (Attachment E2).

The City's EPCR did identify the selected area as being located within a Carnaby's Black Cockatoo (*Zanda latirostris*) "Confirmed" roosting area buffer. In addition, the EPCR identified the proposed clearing area was within or adjacent to a Key Biodiversity Area for birds (Attachment E3). The EPCR also identified the selected area contains vegetation mapped as potential Quenda (*Isoodon oblesus*) habitat.

The City will undertake clearing in a manner as described in section 4.1.3.2 to allow any fauna present to move from the clearing areas and avoid disturbance of nests.

4.3.4 Avoidance and Mitigation Measures

Within the proposed clearing areas, the City will only be undertaking the removal of *Typha*. The methodology for removal will be the same as previously provided for 9139/2; where there are solid stands of *Typha*, the area will be brushcut with the larger biomass removed. The cut *Typha* will then be sprayed with RoundUp Biactive with no surfactants or other additives added. Where *Typha* is within other native vegetation, the *Typha* will be wiped with the same chemical. Chemicals will only be applied between the months of October to March as conditioned in CPS 9139/2.

The removal of *Typha* will allow for the increased natural recruitment of other native riparian and wetland species and increase the biodiversity value of the wetland.

4.3.5 Clearing Principles

A City Intramaps Native Vegetation Clearing Permit (NVCP) Report (Attachment D6) and Environmental Planning Considerations (EPC) Report (Attachment E3) was generated by the City as supporting documentation for the below clearing principle assessment. This, along with additional data sources provided by various state and federal departments, were reviewed to determine the level of impact and the level of variance to the clearing principles.

The following sections summarise the identified environmental impacts and the level of variance against the clearing principles.

Table 7: Identified Impacts against Clearing Principles

Clearing Principle	Flag Colour	Proposed Project Impacts
<p>Principle (a) – Native vegetation should not be cleared if it comprises a high level of biological diversity</p>	<p>Red</p>	<p>Prior to clearing for development, the site did not contain any native vegetation (Coterra, 2017). A Management Plan was developed to outline the revegetation and rehabilitation strategies for areas adjacent to the wetland. Following development, the site was planted in 2019 and 2020 with the species listed in the Management Plan. In the Management Plan, <i>Typha</i> was listed as a weed requiring control.</p> <p>City Environmental Officers undertook a vegetation assessment of the proposed clearing area on 18 August 2022. A few native and weed species were identified in addition to those listed in the planting list provided by Coterra (2017).</p> <p>The proposed clearing area is a mapped Environmentally Sensitive Area (ESA).</p> <p>The City’s EPCR (Attachment E3) identifies the following flora and fauna attributes for the proposed clearing site:</p> <ul style="list-style-type: none"> • No records of Federal or State TECs, PECs, Threatened and Priority Flora records or Threatened and Priority Fauna records within the selected site boundaries • The proposed clearing area is within a confirmed feeding habitat and confirmed Carnaby’s Black Cockatoo roosting area buffer • The proposed area contains vegetation mapped as potential Quenda habitat • The proposed clearing area is within an important birding area (Northern Swan Coastal Plain IBA) <p>The City’s EPCR (Attachment E3) identifies the following flora and fauna attributes within 5kms of the proposed clearing site:</p> <ul style="list-style-type: none"> • Federal and State listed TECs and PECs (or their buffers) located within a 5km radius of the proposed clearing site • State listed Priority Flora records located within a 5km radius of the proposed clearing site • Federal and State listed Threatened and Priority Fauna and Fauna Habitat records located within a 5km radius of the proposed clearing site <p>As the proposed clearing is occurring within an ESA, the clearing may be at variance to principle (a), however, given the clearing comprises of only <i>Typha</i>, the proposed clearing is unlikely to be at variance to principle (a).</p>

<p>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 indigenous to Western Australia</p>	<p style="text-align: center;">Red</p>	<p>The City's Intramaps NVCP Report (Attachment D6) and EPCR (Attachment E3) identified that the proposed clearing area is within a confirmed Carnaby's black cockatoo roosting habitat buffer. It also identified the proposed clearing area is within an important birding area (Northern Swan Coastal Plain IBA) and contained vegetation mapped as potential Quenda habitat.</p> <p>The proposed clearing does not include the removal of any habitat trees for indigenous fauna.</p> <p>The proposed clearing area likely provides habitat for wading and migratory bird species. When undertaking clearing, the City will implement measures to ensure minimal disturbance to fauna present including inspection of the area prior to clearing, only undertaking clearing if no occupied nests are present and undertaking clearing in a directional manner to allow for fauna to escape into the surrounding vegetation. The proposed clearing area is also small, reducing the likelihood of fauna being present within the clearing area.</p> <p>Considering the above, the application area is not likely to be at variance with clearing principle (b).</p>
<p>Principle (c) – Native vegetation should not be cleared if it includes or is necessary for the continued existence of, rare flora.</p>	<p style="text-align: center;">Orange</p>	<p>The City's NVPC Report (Attachment D6) identified there are priority flora species within a 5km radius of the application area, however no Federal or State threatened or priority flora species are identified within the application area.</p> <p>Considering the application area does not contain rare flora and the vegetation to be cleared consists only of <i>Typha</i>, the application area is not likely to be at variance with clearing principle (c).</p>
<p>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.</p>	<p style="text-align: center;">Red</p>	<p>The City's NVCP Report (Attachment D6) identified both Federal and State Threatened Ecological Communities (and buffers) within a 5km radius of the application area, however no threatened or priority communities are present within the City's proposed 0.42 hectare clearing area.</p> <p>Due to the absence of an identified TEC within the application area, the City's proposed clearing is not likely to be at variance to clearing principle (d).</p>
<p>Principle (e) - Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been significantly cleared.</p>	<p style="text-align: center;">Orange</p>	<p>The vegetation proposed for clearing has been planted as per the requirements of the Management Plan. Prior to the development of the site, no native vegetation was present within the site.</p> <p>Within the proposed clearing boundary, <i>Typha</i> will be the target species and other remnant vegetation will not be removed. The clearing of <i>Typha</i> within the proposed clearing area will decrease competition between <i>Typha</i> and native species within the clearing area and increase the biodiversity values of the wetland.</p>

		As the proposed clearing consists of only <i>Typha</i> and remnant vegetation will not be cleared, the proposed additional clearing is not likely to be at variance with clearing principle (e).
Principle (f) - Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or a wetland	Red	<p>The proposed clearing area is adjacent to wetland areas of the Yellagonga Regional Park. <i>Typha</i> is considered to be an aggressive invasive species within these wetlands (City of Wanneroo and City of Joondalup, 2021), with a rapid invasiveness rating and management of <i>Typha</i> was identified in the Management Plan (Attachment G). The clearing of <i>Typha</i> will enable native riparian and wetland vegetation density to increase within the wetland area and improve the condition of the wetland.</p> <p>The proposed clearing area is located within 5km of seven other wetlands: Walluburnup Swamp (594m), Beenyup Swamp (897m), Lake Joondalup (1216m), Lake Goollelal (1949m), Badgerup Lake (3249m) and two unnamed lakes (4080m and 4451m).</p> <p>Due to the identification of <i>Typha</i> as an aggressive invasive species, and the requirement to control it under the Management Plan, it is not likely for the proposed clearing to be at variance to clearing principle (h).</p>
Principle (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	Red	<p>The City's NVCP (Attachment D6) identifies the proposed clearing within 0.42 hectares is located within a high to moderate Acid Sulphate Soil risk area.</p> <p>The Groundwater Salinity (Total Dissolved Solids) at the proposed clearing site is less than 500mg/L.</p> <p>The City's NVCP (Attachment D6) identifies the surface geology to be swamp, with low hilly to gently undulating terrain, and yellow sand over limestone at 1-2m.</p> <p>The soil within the proposed clearing area consists of Spearwood wet, lake phase (211SpW_LAKE).</p> <p>Due to the specific clearing of <i>Typha</i> and the utilisation of techniques that will not cause major damage to land within the proposed clearing area, it is not likely for the clearing to result in appreciable land degradation and therefore is not likely to be at variance to clearing principle (g).</p>
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.	Red	<p>The proposed clearing area is adjacent to Walluburnup Swamp and is an Environmentally Sensitive Area. It is not within a Bush Forever Site.</p> <p>The proposed clearing is within 5km of seven Bush Forever sites, with the five closest being sites 299 (21.8m), 327 (2172m), 471 (3574m), 328 (3944m) and 463 (3955m).</p> <p>The clearing of <i>Typha</i> specifically will not have a negative impact on the environmental values of the conservation</p>

		<p>areas; the clearing of <i>Typha</i> will allow for an increase in the density of native riparian and wetland species.</p> <p>The proposed clearing is not likely to be at variance to principle (h).</p>
<p>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.</p>	<p>Orange</p>	<p>The proposed clearing area is adjacent to wetland areas associated with the Yellagonga Regional Park.</p> <p>The proposed clearing area is within the Perth Coastal and Gwelup Underground Water Pollution Control Area (Public Drinking Water Source Area). It is also within the Perth Groundwater Area RIWI Act area.</p> <p>Given the targeted clearing of <i>Typha</i>, it is not considered that the proposed clearing will cause deterioration in water quality. The proposed clearing is not likely to be at variance to principle (i).</p>
<p>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.</p>		<p>The City's Intramaps NVCP (Attachment D6) identifies that less than 3% of the area has a moderate to high flood risk.</p> <p>The proposed clearing of <i>Typha</i> within 0.42 hectares of Completely Degraded (with some remnant vegetation and weed species) vegetation is not likely to cause, or exacerbate the incidence, or intensity of flooding.</p> <p>The proposed clearing is not likely to be at variance to clearing principle (j).</p>

Red – Likely to be at variance, **Orange** – May be at variance, **Green** – Not likely to be or not at variance

4.3.6 Conclusion

The City of Wanneroo has assessed the proposed clearing against the 10 clearing principles and has found that the clearing is unlikely to be at variance with any of the clearing principles due to the targeted nature of the clearing, focusing solely on the removal of *Typha*. The removal of *Typha* is in accordance with the Management Plan requirements for weed control (Attachment G). The removal of an invasive species will assist to achieve the completion criteria of the Management Plan and will reduce the likelihood of monocultures of *Typha*, increase density of native riparian and wetland vegetation within the rehabilitation area (in accordance with the Management Plan) and improve the biodiversity values of Yellagonga Regional Park.

5. References

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