CITY OF CANNING

Typha orientalis Management Plan

Yagan Wetland Reserve

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1.0 Overview

Yagan Wetland (Figure 1) is a reserve of high significance within the City of Canning. The Bush Forever site adjoins to the Canning River and provides an ecological linkage from the Shelley Rossmoyne Foreshore to Bateman Reserve in the City of Melville. The reserve is a highly sensitive wetland system containing threatened species and a threatened ecological community.

Figure 1: Yagan Wetland Reserve, Rossmoyne.

Typha orientalis has been reclassified as a native plant in Western Australia under the *Biodiversity Conservation Act 2016* and now requires a clearing permit for removal. The City of Canning has recently prepared a native vegetation clearing permit to the Department of Water and Environmental Regulation (DWER) and is awaiting approval. In addition to the permit that will be issued by DWER, the City is now seeking a Form 7 Permit from the Department of Biodiversity, Conservation and Attractions (DBCA) in order to clear *T. orientalis* within the Canning River and Canning River Regional Park, in accordance with the *Swan and Canning Rivers Management Act 2006.* The following management plan is submitted in order to adhere to DBCA's conditions for approval.

2.0 Location

Typha management works will be undertaken throughout the extent of its cover within the reserve (refer to Figure 2). *Typha orientalis* comprises approximately 1.31 hectares of the site, at a density of 76-100% coverage, primarily concentrated in the south-east where fresh water is discharged into the wetland system from the Bull Creek catchment. Figure 3a and 3b shows images of the current Typha extent.

Yagan Wetland site location can be seen in Table 1 below.

Figure 2: Typha orientalis extent in Yagan Wetland Reserve. Total area = 1.31 hectares.

Figure 3: 3a (left), 3b (right) showing extent of Typha orientalis within Yagan Wetland Reserve.

Table 1: Location details of Yagan Wetland Reserve.

Address	1 Bull Creek Road, Rossmoyne WA 6148
Lot on Plan	Lot 501 on P422119
Reserve ID	R 29130

3.0 Purpose of Removal

3.1 Ecological Values

Typha orientalis are a tall, stiffly upright, rhizomous aquatic perennial. *T. orientalis* can be distinguished from *T. domigensis* by the diameter of its leaf blades. *T. orientalis* has leaf blades that reach up to 14 millimetres wide as opposed to *T. domigensis* which does not exceed 8 millimetres in width.

Despite its classification as a native species, *T. orientalis* has many weedy characteristics and can be highly invasive within wetlands on the Swan Coastal Plain. The species has the ability to rapidly form a dense monoculture that can suppress all other aquatic vegetation, resulting in altered hydrology, excessive nutrients and an overall loss of biodiversity.

It is the City's intention to manage *T. orientalis* within Yagan Wetland Reserve in order to minimise the disruption to wetland ecology, maintain biodiversity, drainage and water flow. The City is not proposing a complete eradication of *T. orientalis,* but an approach that balances its impact in the wetland system.

3.2 Construction and Track Stabilisation Works

An additional purpose to *T. orientalis* removal relates to upcoming track stabilisation works that will be occurring along the north-eastern boundary of the site. Presently, the track is composed of sandy materials and a lack of stormwater containment has resulted in significant erosion on the slope of the track resulting in an unstable track and a consistent input of sediment into the wetland system. Whilst subject to final engineered designs, the works would consist of re-grading the slopes and a combined approach of hard structure and bioengineered interventions to reduce flow velocity across the embankment. This re-grading may involve further intrusion into the wetland, resulting in damage to the existing Typha stand.

3.3 Management Objectives

The primary management objectives of the following plan are to:

- Minimise the spread of *T. orientalis* within the wetland system
- Protection of other aquatic vegetation and maintain biodiversity
- Maintain sufficient drainage and ensure hydrology is unmodified by *T. orientalis*
- To complete track stabilisation works

4.0 Proposed Vegetation Management Approach

Manual removal across the site to maintain access for revegetation efforts and allow for other species to establish whilst also reducing fuel load/fire risk across the summer months.

4.1 Typha Control Timing

All control works of *T. orientalis* within the City will be scheduled according to specific site priority. Any distribution of *T. orientalis* within the Canning River system that presents immediate drainage concerns or is impacting surrounding biodiversity will be prioritised first. Any distribution of *T. orientalis* that does not present these issues will not be actively managed but monitored regularly to ensure these adverse impacts do not occur.

Planned removal of *T. orientalis* will be undertaken during summer, within the plant's active growth phase, and when water levels are lowest and herbicide uptake is greater (Florabase, 2023). Any scheduled removals will also entails providing written notice to DBCA, ten days prior to the works.

Table 2: Life stages of Typha orientalis and optimal time for treatments, according to the Florabase (2023)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active Growth												
Germination												
Manual Removal												
Herbicide Treatment												

Whilst planned removal of *T. orientalis* will be scheduled for summer when water levels are lowest, emergency removals may be required should *T. orientalis* present any immediate drainage concerns. On this occasion, the City will seek to obtain an emergency permit from the Department of Biodiversity, Conservation and Attractions for immediate removals.

Removal of *T. orientalis* along the boundary of the track will also likely take place during summer when the wetland system is dry and there is greater accessibility for the works to take place

4.2 Methods of Control

Removal methods, strategies and disposal of dead material

The removal of *T. orientalis* will be undertaken according to the Department of Biodiversity, Conservation and Attractions recommendation (Florabase, 2023). The recommended method of herbicide treatment for its control is through the use of Glyphosate Biactive (360 g/L) at 13 ml/L when actively growing through wiping, backpack/handheld spray or high volume spray.

Manual removal may also be used whereby shoots will be cut approximately 15 centimetres below the water surface two to three times during the plants season of active growth.

Brush cutting may also take place following herbicide application, providing the area is not inundated with water. In order to avoid the loss of water quality by anaerobic decomposition, dead biomass will also be removed and disposed of within 6 weeks of spraying.

Manual removal whereby shoots are cut below the water surface level two to three times during the plants season of active growth (drowning method) may also be considered. Due to the shallow water levels throughout a large portion of the Typha infested areas, this will not be a viable option throughout the entirety of the reserve.

4.3 Expertise and Conditions of Removal

The safe and effective removal of *T. orientalis* within Yagan Wetland Reserve requires relevant training, expertise and processes in place. The following criteria are to be met:

- Ensure that herbicides are applied in accordance with their Material Safety Data Sheets and labelled directions
- Follow best management practices available and pay particular attention to avoid spray drift or early run-off into the river from treated areas
- Chemical applications are under the supervision of a person experienced and qualified in the safe use of herbicides

- It is required that personnel undertaking removal are qualified in herbicide application and have had training in native plant identification
- Procedures will be in place to avoid spillage of chemicals and to remediate any spillage, in line with the Department of Water and Environmental Regulation's *Contaminant Spills – Emergency Response Plan.*

4.4 Revegetation

Long-term revegetation of other aquatic native species is important for minimising the extent that *T. orientalis* continues to grow and establish post-control. Where revegetation works is suitable, the City will undertake revegetation of Typha impacted areas. Other species that are suitable for these revegetation purposes and provide ecological benefits includes *Juncus pallidus, Juncus kraussii, Machaerina juncea, Ficinia nodosa* and *Gahnia trifida.*

5.0 Monitoring

The monitoring of *T. orientalis* within the Canning River system will be primarily undertaken via visual observations and photo point monitoring. Monitoring will be carried out at least once between July-December to take note of *T. orientalis* distribution following winter rains and to inform targeted areas for the next upcoming control season.

6.0 Risk Management and Controls

The primary risks and controls in place for the removal of *Typha orientalis* is specified in Table 3 below.

Table 3: Primary risks and controls in the removal of Typha orientalis at Yagan Wetland Reserve.

ID	Category	Risk Description	Current Controls	Consequence Rating	Likelihood Rating	Risk Rating
1	Compliance	Potential noncompliance with relevant legislation including Native Vegetation Clearing Permit, Beds and Banks Permits, Aboriginal Cultural Heritage Permit etc.	Engage with external stakeholders for advice - i.e DWER DBCA, DPLH on what will be required	Moderate	Unlikely	**Medium**
2	WHS	Injury on work site - Musculoskeletal injuries (slips, trips, falls, abrasions etc)	Contractors or local government staff to produce WHS Management Plans or JSAs for review and approval. Ensure all staff/contractors working on site have the necessary training for their activities. No workers to be alone on site.	Moderate	Unlikely	**Medium**
3	WHS	Worker illness due to herbicide exposure	Appropriate licenses and training for all personnel performing herbicide application. JSAs developed and appropriate PPE is worn by all workers when applying herbicide.	Moderate	Rare	**Low**
4	WHS	Injury on work site - Snake Bite	Workers wearing appropriate PPE such as long sleeved clothing, boots and gloves. Walking heavily in known snake habitat and staying clear of the area if a snake is sighted. First aid qualifications for personnel on site and first aid kits (with snake bandages) readily available on site No workers to be alone on site.	Moderate	Rare	**Low**
5	WHS	Worker illness - Heat/sun related illness	Workers wearing appropriate PPE such as long sleeved clothing, hats and sunscreen. Ensuring all workers take adequate breaks in shade. No workers to be alone on site.	Minor	Unlikely	**Low**
6	WHS	Worker injury/illness - severe weather conditions	Workers wearing appropriate warm clothing and wet weather. Rescheduling activities if 'Severe Weather Warning' has been issued by the Bureau of Meteorology. Seeking shelter during and/or leaving site if weather conditions are too windy and avoid remaining under trees. No workers to be alone on site.	Major	Rare	**Medium**

7	WHS	Asbestos materials and other contaminants	Unexpected Finds Protocol in place for all workers - any ACM finds resulting in immediate halting of activities for further investigation Workers on site are appropriately training if working in an area with suspected ACM materials Workers on site have the appropriate PPE and equipment to dispose of minor ACM finds Areas with suspected ACM contamination are assessed by an accredited Asbestos Assessor and any removal works (if necessary) are performed by a Class A Licence Asbestos Removalist prior to any revegetation or weed control works.	Major	Rare	**Medium**
8	WHS	Community exposure to chemicals	Displaying signage advising the community of weed control works in progress and to avoid contact with the area. Advising relevant community and landcare groups of upcoming herbicide applications to ensure they avoid contact with the area.	Moderate	Rare	**Low**
9	Environment	Weed control off-target damage to existing and revegetated native species.	Local governments to ensure all staff/contractors/volunteers performing weed control have good weed identification skills. Herbicide applications should be performed on days with suitable weather conditions - i.e minimal wind. In environmentally sensitive areas, techniques other than spraying including wiping and manual removal techniques.	Insignificant	Possible	**Low**
10	Environment	Herbicide contamination of waterways	Where possible, wiping weeds or removal by hand in environmentally sensitive areas. Applying herbicide at the recommended rate. Spraying during periods of low surface water levels. Spraying on days with suitable weather condition - i.e minimal winds and not before rainy weather. Avoid using surfactants which are highly toxic to wetland fauna.	Moderate	Rare	Low
11	Environment	Plant disease - Phytophthora	If working in dieback affected areas, ensure that staff/contractors on site have appropriate Green Card Training. Ensure that all activities are conducted in accordance with the cleaning and hygiene guidelines within the 'Managing Phytophthora Dieback in Bushland'. If revegetating dieback infested areas, ensure appropriate follow up treatments and consider the installation of dieback resistant species.	Minor	Possible	Medium