GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 9076/1
Permit Holder:	Shire of Broome
Duration of Permit:	15 December 2020 to 15 December 2025

The Permit Holder is authorised to clear native vegetation subject to the following conditions of this Permit.

PART I –CLEARING AUTHORISED

1. Purpose for which clearing may be done

Maintenance and restoration of Streeters Jetty, and maintenance of the Chinatown Drain.

2. Land on which clearing is to be done

Lot 616 on Deposited Plan 410013, Broome
Lot 611 on Deposited Plan 410013, Broome
Lot 651 on Deposited Plan 415214, Broome
Lot 560 on Deposited Plan 72589, Broome
Lot 3000 on Deposited Plan 67468, Broome

3. Area of clearing

The Permit Holder must not clear more than 0.65 hectares of native vegetation within the area cross-hatched yellow on attached Plan 9076/1.

4. Application

This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear native vegetation for the purposes of this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.

PART II –MANAGEMENT CONDITIONS

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

In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in 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 control

When undertaking any clearing or other activity authorised under this Permit, the Permit Holder must take the following steps to minimise the risk of the introduction and spread of *weeds*:

(a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
(b) ensure that no known *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. Fauna management – time of clearing

The Permit Holder must undertake all activities authorised under this Permit during day time hours; i.e. between 6 am and 6 pm.

8. Fauna management – direction of clearing

The Permit Holder shall conduct clearing in a slow progressive manner from one direction to the other to allow fauna to move into adjacent native vegetation ahead of the clearing activity.

9. Clearing not authorised - discharge sediments

The Permit Holder shall implement management measures to ensure sedimentation is controlled during clearing activities to such an extent that it does not impact adjacent environmental values.

PART III - RECORD KEEPING AND REPORTING

10. Records must be kept

The Permit Holder must maintain the following records for activities done pursuant to this Permit, in relation to the clearing of native vegetation authorised under this Permit:

(a) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
(b) the date that the area was cleared;
(c) the size of the area cleared (in hectares);
(d) the times of day that the clearing was undertaken;
(e) the direction of the clearing;
(f) actions taken to avoid, minimise and reduce the impacts and the extent of clearing in accordance with condition 5 of this Permit;
(g) actions taken to minimise the risk of the introduction and spread of weeds in accordance with condition 6 of this Permit; and
(h) actions taken to minimise the risk of sedimentation impacting adjacent environmental values in accordance with condition 9 of this Permit.

10. Reporting

The Permit Holder must provide to the *CEO* the records required under Condition 10 of this Permit, when requested by the *CEO*.

DEFINITIONS

The following meanings are given to terms used in this Permit:

CEO means the Chief Executive Officer of the Department responsible for administering the clearing provisions under the *Environmental Protection Act 1986;*

fill means material used to increase the ground level, or fill a hollow;

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;

weed/s means any plant -
(a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or
(b) published in a Department of Biodiversity, Conservation and Attractions Regional Weed Rankings Summary, regardless of ranking; or
(c) not indigenous to the area concerned.

Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the *Environmental Protection Act 1986*

20 November 2020

Plan 9076/1

CPS layers

CPS areas approved to clear

base layers

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Legend

Local Government Authorities

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Officer delegated under section 20 of the Environmental Protection Act 1986

MGA Zone 50
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GOVERNMENT OF WESTERN AUSTRALIA

Clearing Permit Decision Report

1. Application details and outcome

1.1. Permit application details

Permit number:	CPS 9076/1
Permit type:	Purpose Permit
Applicant name:	Shire of Broome
Application received:	20 August 2020
Application area:	0.65 hectares of native vegetation
Purpose of clearing:	Maintenance/restoration of Streeters Jetty, and maintenance of the Chinatown Drain
Method of clearing:	Mechanical removal
Property:	Lot 616 on Deposited Plan 410013, Broome Lot 611 on Deposited Plan 410013, Broome Lot 651 on Deposited Plan 415214, Broome Lot 560 on Deposited Plan 72589, Broome Lot 3000 on Deposited Plan 67468, Broome
Location (LGA area/s):	Shire of Broome
Localities (suburb/s):	Broome and Roebuck

1.2. Description of clearing activities

Up to 0.65 hectares of native vegetation is proposed to be cleared within two discrete application areas totalling 1.15 hectares (Figure 1). The Shire of Broome proposes to undertake restoration works on Streeter's Jetty as well as the associated adjacent historic careening beds and swimming beach. Significant colonisation of mangroves (approximately 0.25 hectares) has occurred since the last jetty reconstruction in 2000, along the northern side of the jetty, immediately to the south of the jetty, and on the inside of the approach channel. An area of approximately ten metres immediately surrounding the jetty is proposed to be cleared to allow access by recreational and commercial vessels, as well as the approach channel. The removal of this vegetation is required for the restoration to proceed.

The Chinatown Development Strategy (Hassell Ltd 2012) includes a vision to 'create a landscaped interpretative forecourt to Streeter's Jetty to enhance visibility, access and visitor comfort'. The Shire is planning a 'Jetty to Jetty' walk trail which will extend from Streeter's Jetty to Town Beach, with the trail to include interpretative signage and other material (Cardno 2014). Improvement works have already been undertaken at Town Beach to the south.

The proposed works at the Chinatown Drain involve the removal of vegetation and superficial sediment material within the drain which has built up over approximately 20 years since the drain was constructed. Numerous mangroves have colonised the drain area since the previous work. Clearing is required to allow for the drainage channel to be cleared of vegetation and superficial sediment. This important drain accepts stormwater from the majority of the Chinatown area. Due to the current sedimentation build-up it does not freely flow, resulting in a permanent body of water often trapped by tidal activity, becoming stagnant, and of a health concern (MBS 2020a). Clearing is proposed along a distance of up to 290 metres, and to a width of approximately five metres, to allow for the base of the drainage channel (0.5 metres), batter slopes on either side (1:1) and an adjacent corridor for construction and maintenance access.

Vegetation clearing at Streeter's Jetty will incorporate a floating barge platform with associated long-reach excavator with grab head to physically remove mangroves. Vegetation clearing at Chinatown Drain will incorporate an excavator utilising swamp mats with a mulching head and bucket attachments.

Decision:	Granted
Decision date:	20 November 2020
Decision area:	0.65 hectares of native vegetation surrounding Streeters Jetty, and along the Chinatown Drain (Figure 1 in Section 1.4).

1.3. Reasons for decision

This clearing permit application was made in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Water and Environmental Regulation (DWER) on 7 August 2020. DWER advertised the application for public comment and no submissions were received.

In undertaking the assessment, and in accordance with section 51O of the EP Act, the Delegated Officer has given consideration to the Clearing Principles in Schedule 5 of the EP Act (Appendix C), supporting information provided by the applicant (Appendix E), relevant planning instruments, and any other pertinent matters they deemed relevant to the assessment (Section 3). The Delegated Officer also took into consideration the purpose of the clearing to restore access to, and restore, Streeter's Jetty, and to restore the functionality of the Chinatown Drain.

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise the potential impacts of the proposed clearing (Section 3.1).

The Delegated Officer noted that the majority of the application area is located within a mapped Threatened Ecological Community (TEC) endorsed by the Western Australian Minister for the Environment and listed as Vulnerable. That is, the 'species-rich faunal community of the intertidal mudflats of Roebuck Bay'. The majority of the application area also forms a component of the Roebuck Bay wetland which is listed in the Directory of Important Wetlands. The application area consists predominantly of mangroves, much of which consists of regrowth since pervious maintenance activities at both Streeter's Jetty, and Chinatown Drain. Given the location and relatively minor extent of clearing required, it is considered the scale of the proposed clearing will not significantly impact the TEC, or associated Roebuck Bay wetland.

The implementation of weed management and clearing management practices to ensure sedimentation is controlled, is appropriate to mitigate the potential impact of spreading weeds or sediments into adjacent vegetation or wetlands. Restricting clearing to daylight hours, and the implementation of slow and directional clearing, is appropriate to mitigate the impact to any fauna inhabiting the application area at the time of clearing.

In determining to grant a clearing permit subject to conditions, the Delegated Officer found that the proposed clearing is not likely to lead to an unacceptable risk to the environment.

1.4. Site map

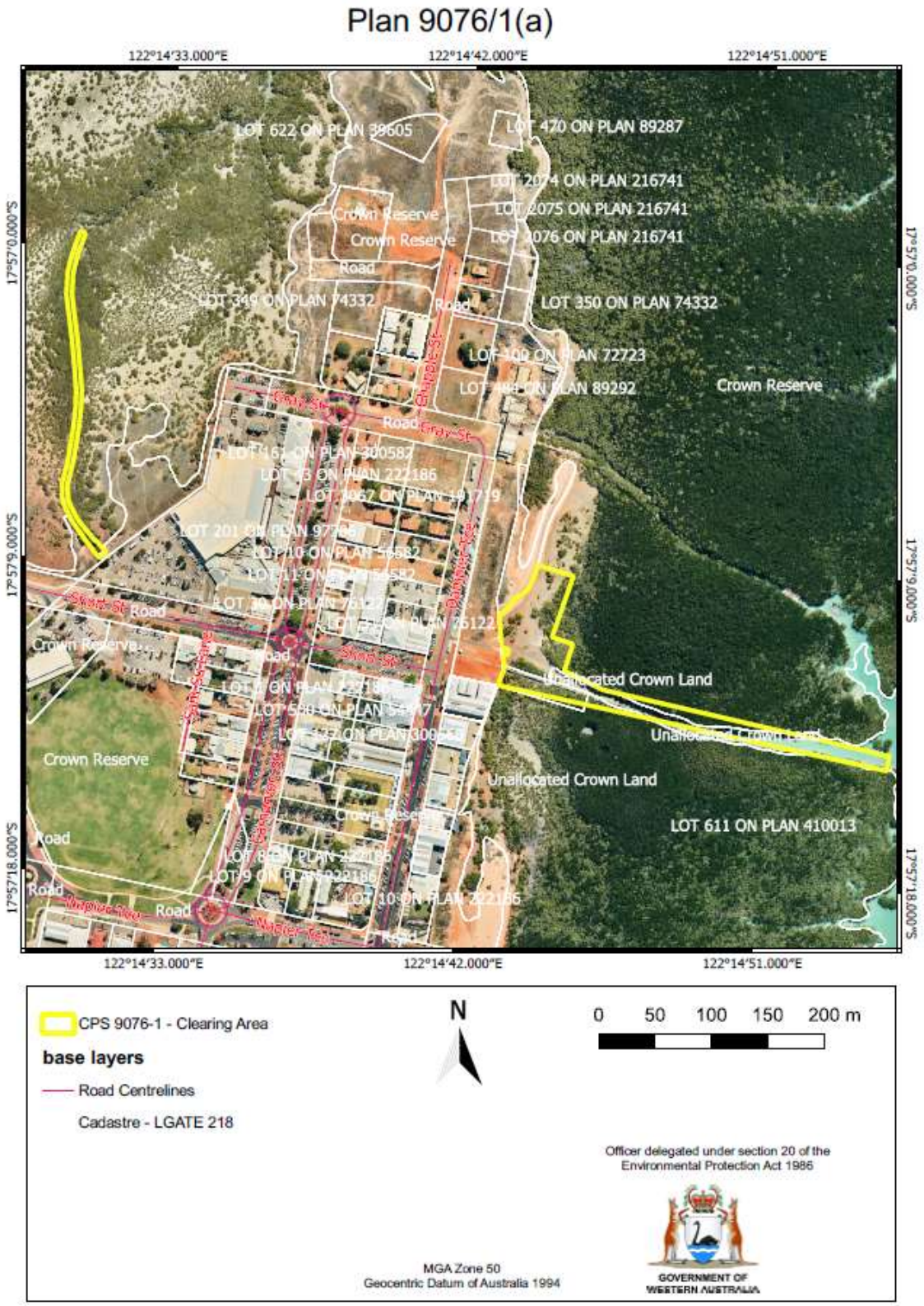


Figure 1. Map of area approved to clear. The area in yellow indicates the areas authorised to be cleared under the granted clearing permit.

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 3), 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; and
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment includes:

- *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)
- *Planning and Development Act 2005* (WA) (P&D Act)
- *Soil and Land Conservation Act 1945* (WA)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (December 2013)
- *Procedure: Native vegetation clearing permits* (DWER October 2019)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

The proposed clearing is required for the restoration of:

- Streeter's Jetty;
- associated adjacent historic careening beds; and
- an adjacent swimming beach.

Streeter's Jetty, in the Chinatown area of Broome, is significant as the oldest and only remaining maritime jetty used by Broome's Pearl lugger fleet, and is heritage listed (Place Number 04553). The Shire of Broome is planning a 'Jetty to Jetty' walk trail which will extend from Streeter's Jetty to Town Beach where improvement works have already been undertaken. The jetty, the associated careening beds, and small beach, are currently impacted by a regrowth of mangroves and the removal of this vegetation is required to facilitate (MBS 2020a):

- the safe completion of the proposed restoration construction works;
- the prevention of any deterioration of the restored jetty via mangrove regrowth beneath the structure; and
- to restore public access to the adjacent careening beds and swimming beach.

Due to the nature of the clearing required, no alternatives that would avoid the need for clearing have been provided by the Shire of Broome. However, clearing has been confined to the minimum extent required, and impacts have been mitigated through the clearing methodology utilised (MBS 2020b). To remove mangroves, a floating barge platform supporting a small excavator with long-reach arm and grab head will be used. The excavator will physically remove the mangroves. The final cleared area is required to be navigable to marine craft and it is proposed to entirely and permanently remove the vegetation in the application area, including the root mass, to prevent regrowth which would be expected to be rapid if roots were retained. A land based loading area will be established to support the removal of the cleared vegetation. In the event that significantly elevated water column turbidity occurs a silt or sediment curtain may be employed (MBS 2020b).

Proposed works at the Chinatown Drain involves the removal of vegetation and sediment within the drain. Due to the build-up of vegetation and sediment the drain does not flow freely.

Due to the nature of the clearing required, no alternatives that would avoid the need for clearing have been provided by the Shire of Broome. However, clearing has been minimised to the extent of the drain and access required only, and impacts have been mitigated through the clearing methodology utilised (MBS 2020b). The drain will require to be maintained free of vegetation and on-going maintenance will require a permanent access track alongside the drain.

To reduce the risk of indirect impacts to adjacent mangroves, the proposed clearing and drain reconstruction will be undertaken over a seven day neap tide, with the weaker tidal currents minimising any sediment migration and water column turbidity caused by the works. An excavator with wide tracks and associated rubber swamp mats will be utilised to allow for safe work in the soft sediment environment. The excavator will incorporate a mulching attachment that will mulch the surface vegetation. This method will minimise disturbance to mangrove roots and provide a stable working platform. Once mulching is complete, the excavator will be fitted with a narrow bucket attachment to enable

the formation of the drain floor and batters. Compaction of the sediment will stabilise the material to mitigate any indirect impact to adjacent mangroves by preventing significant sediment migration following inundation at high tide (MBS 2020b). The retention of mangrove roots outside of the drain itself will preserve the stability of the sediment and minimise the risk of impacts beyond the clearing area (MBS 2020b).

3.2. Assessment of environmental impacts

In assessing the application in accordance with section 51O of the EP Act, the Delegated Officer has examined the application and site characteristics (Appendix B) and considered whether the clearing poses a risk to environmental values and whether these can be managed to be environmentally acceptable. An assessment against the Clearing Principles is contained in Appendix C.

The assessment identified that the clearing may pose a risk to the environmental values of biological diversity, fauna, a TEC and wetlands, and that these required further consideration. 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. The local area is defined as within a radius of 50 kilometres of the application area.

3.2.1. Environmental value: biological values (diversity, fauna and threatened ecological communities) – Clearing Principles (a, b, and d)

Assessment: The majority of the application area is located in the littoral / estuarine zone on the western margins of Dampier Creek, an estuary on the eastern border of Broome. The application area consists of two components; Streeters Jetty and adjacent areas, and the Chinatown Drain (Figure 1, and Appendix E).

MBS (2020a) described the vegetation over the application area as Grey Mangroves *(Avicennia marina)* that occur adjacent to Streeter's Jetty and the Chinatown Drain, and stands of Stilted Mangrove *(Rhizophora stylosa)* that occur further offshore from Streeter's Jetty.

The majority of the application area is located within a mapped TEC endorsed by the Western Australian Minister for the Environment and listed as Vulnerable. That is the 'species-rich faunal community of the intertidal mudflats of Roebuck Bay'. The community comprises a diverse and abundant marine fauna, with an estimated 300 to 500 species of macro-benthic invertebrate fauna (DBCA 2020), as well as a high diversity and abundance of shorebirds with over 35 species of conservation significance recorded from the local area (Appendix B2), many of which are migratory species.

Invertebrate surveys confirmed the rich biodiversity of the benthic invertebrate fauna in Roebuck Bay in 1997 with progressive surveys indicating that the Roebuck Bay assemblage differs from other similar habitats in the Kimberley. Many of the invertebrates are known only from Roebuck Bay and considered short-range endemics. This diverse and abundant benthic invertebrate fauna within the mudflats of Roebuck Bay provides feeding areas and an internationally-recognised staging site for wading shorebirds migrating within the East-Asian Australasian Flyway. Roebuck Bay is listed as a Ramsar Wetland site with its western boundary some 6.4 kilometres to the east of the application area. The Ramsar site provides essential energy replenishment for many migrating species, some of which fly non-stop between continental East Asia and Australia.

Numerous shorebird species (over 60) protected under International Agreements (particularly the Families: Scolopacidae, Charadriidae, and Glareolidae) have been recorded within the local area (Appendix B2). The majority of the members from these Families are trans-equatorial migratory shorebirds (including Priority and Threatened species) that breed in northern latitudes. However, a significant proportion of young birds remain in Australia during their first year and also utilise these habitats in winter. Most are coastal but some species will also utilise flooded inland waters.

A comprehensive study of the ecological characteristics of Roebuck Bay was undertaken by Bennelongia (2009). Shorebird habitat can be broadly described in terms of feeding habitat and roosting habitat. The intertidal mud and sand flats that provide the feeding resource for shorebirds occur as strips of sand/silt substrates in the intertidal zone, generally on the seaward side of mangroves. Roebuck Bay has a very large tidal range, which exposes around 160 square kilometres of mudflat, or approximately 45 per cent of the total bay area (BirdLife 2020). The widest and most extensive flats of softer silts occur from Crab Creek (13.5 kilometres east of the application area), then south along an extensive area of sand flats to Bush and Sandy Points (Figure 2).

The application area is partially within, but on the extreme edge of, the Roebuck Bay Important Bird Area (IBA) identified by BirdLife Australia (Dutson *et al.* 2009). However the shoreline habitat of the application area is not within the mapped IBA (Birdlife 2020).

Shorebird roosting sites consist of beaches, sandbars, raised mudflats, rocky points, open mangroves, and saltpans and claypans. A known shorebird roost site, 'Western Open Mangroves', is located approximately one kilometre east

of Streeter's Jetty (Bennelongia 2009, Figure 2). Proposed clearing is minor and the shoreline in the vicinity of the proposed clearing area is not identified as a key shorebird feeding or roosting site.

In terms of other waterbirds of conservation significance known from the local area that may occur in the habitats available (Appendix B2) the petrels and shearwaters mainly feed in open ocean, terns generally feed on small fish by hunting and diving over open water and the Osprey (*Pandion cristatus)* forages for larger fish over open water on the seaward side of the mangroves outside of the application area. The Glossy Ibis *(Plegadis falcinellus)* (protected under international agreements) and Australian Little Bittern (*Ixobrychus dubius)* (P4) feed mainly on invertebrates, small fish and these species may breed within the mangroves. Swallows and swifts may overfly the application area without utilising any particular habitat present.

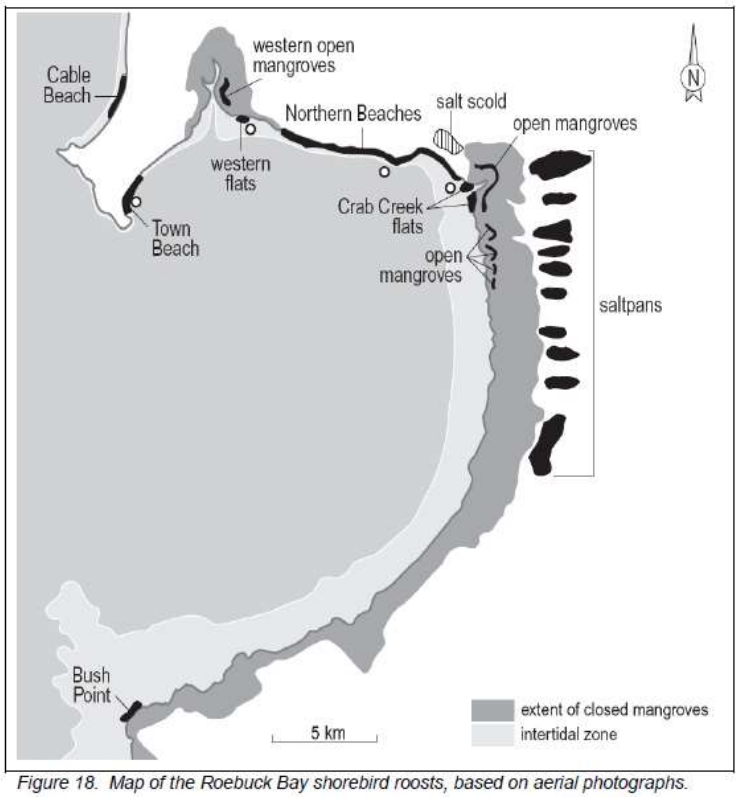


Figure 18. Map of the Roebuck Bay shorebird roosts, based on aerial photographs.

The roosting habitats are shown in black shading (adapted from Rogers et al. 2006d). Roost sites are:

- *Cable Beach: white sand beach backed by unvegetated white dunes;*
- *Crab Creek flats: raised mudflats at the mouth of Crab Creek;*
- *Western flats: smaller raised mudflats, closer to tall cover;*
- *Northern Beaches: red sand beaches backed by dines or low cliffs; rocky points occasionally used as roosts;*
- *Town Beach: broader sandy beach backed by vegetated dunes;*
- *Open mangroves: clearings (ca. 100 m in diameter) in the Crab Creek and Dampier Creek mangrove forests;*
- *saltpans: large unvegetated claypans, surrounded by salt marsh;*
- *Bush Point: white beaches and sandbar.*

Figure 2: Roebuck Bay shorebird roosts (Bennelongia 2006, page 65).

Of the mammals of conservation significance recorded within the local area the Water-Rat (*Hydromys chrysogaster)* (P4) and North-western Free-tailed Bat *(Mormopterus cobourgianus)* (P1) may occur within the available mangrove habitat, with the potential for the North-western Free-tailed Bat to roost in hollows within the larger mangroves (Australian Museum 2020). The remaining terrestrial mammals of conservation significance do not occur in mangrove habitat and the marine mammals (whales, dugongs and dolphins) generally occur in the open water on the seaward side of the mangroves outside of the application area. No seagrass meadows constituting a food resource for Dugongs *(Dugong dugon)* (specially protected fauna) occur within or in proximity to the clearing area (MBS 2020b; WAMSI 2017).

The reptiles of conservation significance identified from the local area are marine species (Appendix B2). The four species of Threatened marine turtles known from the local area are more likely to occur in the open water on the seaward side of the mangroves, and nest on sandy beaches not present in the application area. The Short-Nosed Seasnake (*Aipysurus apraefrontalis)* (CR) generally occurs on reefs off the northern coast of Western Australia (DAWE 2020a) and suitable habitat is not present within the application area.

Mangrove communities support mangrove specialists such as the North-western Free-tailed Bat above, as well as several birds such as the Mangrove Golden Whistler *(Pachycephala melanura)* and Mangrove Grey Fantail *(Rhipidura phasiana*) (Johnstone 1990). Mudflats and mangrove creeks are also nurseries for at least four fish species and commercial prawn species, and Threatened sawfish utilise tidal creeks and mangroves for breeding and refuge (Bennelongia 2009). The Dampier Creek mangroves are also a regular roost for colonies of two species of flying-fox; the Little Red Flying Fox *(Pteropus Alecto)* and Black Flying Fox *(Pteropus scapulatus)*.

The Broome Mangrove Snake *(Myron resetari)* is a rarely-recorded reptile that does not have a conservation status under State or Commonwealth legislation, or a conservation listing under State or Commonwealth agencies. *Myron resetari* was formally described as late as 2011 against a background of recent molecular work. *Myron resetari* was described at that time along with *Myron karnsi,* with both taxa previously considered synonymous with *Myron richardsonii,* a species with a very broad distribution along coastal northern Australia. The habits of *Myron resetari* are likely to be similar to others in the Myron genus which are small, amphibious, coastal, species occupying estuarine to marine habitats (The Reptile Database 2020), and particularly mudflats (Wilson and Swan 2017). As with *Myron richardsonii, Myron resetari* is most likely active during low tides when it is easier to hunt small fish such as gobies and mudskippers, as well as small crabs (Voris and Murphy 2002).

The Atlas of Living Australia (2020) contains records of *Myron resetari* within two data sets; one from the Western Australian Museum, and one from Queensland Museum, with a total of four records. However, no formal surveys appear to have been undertaken. Due to the record dates and the revision of the taxon there remains a question over the validity of these records with recognised authors referring the Broome specimen only. Two records occur within Western Australian databases (DBCA 2007-), one from Broome (J52861, from 1976), and the other from Derby (R20354, from 1960), however, there is doubt over the Derby record with the authors Murphy (2011) and Chapple, *et al.* (2019) referencing the Broome locality only.

Myron resetari is formally known from the type locality of Broome only, with the specimen described likely to be a juvenile female (Murphy 2011). Five informal and unverified records have been made in the vicinity of Streeters Jetty since 2016 (Appendix A). Murphy (2011) suggests that given Myron's use of mangroves and mudflats it seems likely that *Myron resetari* is from the Roebuck Bay area of the Dampier Peninsula, but may be more widespread (Murphy 2015). Informal searches for the species have apparently not recorded the species other than in the vicinity of Streeters Jetty (Appendix A), however, two individuals were informally recorded simultaneously within the 'Roebuck Bay mangroves' (locality unknown) (BirdLife 2016). Wilson and Swan (2017) acknowledge that the species is very poorly known, but that *Myron resetari* likely occurs along the mangrove-lined shores of Roebuck Bay (Wilson and Swan 2017).

Murphy (2011) asserts that *Myron resetari* may be restricted to the coastline of the Dampier Peninsula from Broome to Derby, and that this location may represent the most south-western extent of the distribution of the Myron genus, despite the fact that mangrove habitat and associated mudflats extend further to the south. Given its use of mangroves and mudflats it seems likely that *Myron resetari* occurs at least within the Roebuck Bay area (Wilson and Swan 2017), and may be more widespread over mangrove-lined coastal areas of the Dampier Peninsula (Murphy 2011). Considering what is known of this species, its habitat is likely to be mangrove-lined coastal areas of the Dampier Peninsula, with a distribution that may extend south of Broome to Derby (AROD 2020).

The application area incorporating Streeter's Jetty, the associated careening beds and a small beach, as well as the Chinatown Drain consists of 0.65 hectares of mangroves; 0.51 hectares in the vicinity of Streeter's Jetty, and 0.14 hectares at the Chinatown Drain. Much of the application area has been previously cleared (MBS 2020a), and is now inundated by a regrowth of mangroves (Appendix E).

Historic aerial imagery shows that between 1965 and 1984 an increase in the local mangrove extent occurred in proximity to Streeter's Jetty (MBS 2020a), with approximately 0.25 hectares occurring within the application area since the last jetty reconstruction in 2000 (MBS 2020a). Almost half of the application area consists of regrowth mangrove (49%) with the remainder considered mature mangrove (0.36 hectares) (MBS 2020a).

The mangrove communities of the application area are a component of the south-west Kimberley mangrove region that extends from Cape Leveque, approximately 190 kilometres to the north, south to Eighty Mile Beach (Johnstone 1990). Within the local area of a 50 kilometre radius of the application area approximately 3,718 hectares of mangroves remain (that is, as mapped by Shepherd *et al*. (2001) as vegetation association 43). Proposed clearing constitutes approximately 0.02 per cent of this area (Appendix B3).

Approximately 600 hectares of mangroves occur around Dampier Creek alone (Bennelongia 2009), and MBS (2020a) calculate that the 0.65 hectares of clearing proposed represents less than 1.5 per cent of the immediate mangrove cover of the western margins of Dampier Creek (Appendix E).

Proposed clearing is minor, and the shoreline in the vicinity of the proposed clearing area is not identified as a key shorebird feeding or roosting site or nesting site for marine turtles nor is it incorporated into BirdLife Australia's Important Bird Area. Extensive areas of mangrove habitat, as mature or older than that present over the application area, occur immediately adjacent to the proposed clearing area, and represent equivalent or better habitat for fauna species that utilise the mangrove habitat, including mangrove specialists such as the Mangrove Golden Whistler, Mangrove Grey Fantail, Broome Mangrove Snake, as well as the Priority 1 North-western Free-tailed Bat and flying foxes.

Impacts to fauna are not expected to be significant given the small extent of regrowth and mature mangroves to be cleared within an extensive local and regional extent. Conducting clearing in a slow progressive manner from one direction to the other will allow any fauna present to move into adjacent native vegetation ahead of the clearing activity, and restricting clearing to daylight hours will also minimise impact. Conducting clearing during neap tides will also mitigate impacts to the Broome Mangrove Snake.

The majority of the application area is located within a mapped TEC endorsed by the Western Australian Minister for the Environment, and listed as Vulnerable. That is the 'species-rich faunal community of the intertidal mudflats of Roebuck Bay' (the Roebuck Bay mudflats). Impacts are not expected to be significant given the location and minor extent of clearing required. The Roebuck Bay mudflats TEC extend over 6,180 hectares, and the proposed clearing constitutes less than 0.004 per cent of this area (Appendix B3). The application area is located on the extreme edge of the mapped TEC, and the shoreline in the vicinity of the proposed clearing area is not identified as a key shorebird feeding or roosting site. The clearing will impact up to 0.65 hectares of mangroves, much of which represents regrowth subsequent to previous repair and maintenance works. Impacts are not expected to be significant given the small extent of both regrowth and mature mangroves to be cleared within an extensive local and regional extent, and at this small scale it is anticipated that no significant impacts to the TEC will occur.

Outcome: Based on the above assessment, and the avoidance and mitigation measures provided by the applicant (Section 3.1), the Delegated Officer has determined that subject to conditions, the proposed clearing is not considered to significantly impact on this environmental value.

Conditions: To mitigate potential impacts from clearing, the following conditions will be added to the permit:

- Slow and directional clearing to allow fauna to escape ahead of the clearing activity.
- Restriction of clearing to daylight hours.
- Clearing management measures to ensure sedimentation is controlled.

3.2.2. Environmental value: Wetlands – Clearing Principle (f)

Assessment: The majority of the application area is located in the littoral / estuarine zone on the western margins of Dampier Creek. Dampier Creek is an estuary on the eastern border of Broome, and forms a component of Roebuck Bay which is listed in the Directory of Important Wetlands (WA020) (DAWE 2020b).

Roebuck Bay is an embayment to the east and south comprising intertidal mudflats, and indented in the east by micro-scale linear tidal creeks.

Roebuck Bay is an example of a tropical marine embayment with sand beaches and extensive intertidal mudflats with the mudflats amongst the widest in Western Australia (DAWE 2020b) and is also a major nursery area for marine fish and crustaceans. Mangroves protect the coast and hinterland from erosion by the sea during cyclonic events. The Roebuck Bay site of approximately 50,000 hectares includes the intertidal mudflats of Dampier Creek (and components of the application area) which is at the extreme northern end of the Roebuck Bay (WA020) occurrence

Plant structural formations within the Roebuck Bay site include low closed-forest to open-scrub mangroves in the east and south of the Bay, with low shrubland of samphire inland of the mangroves (DAWE 2020b). Surrounding areas support low open-woodland (pindan) over grassland, with the Roebuck Plains System (WA021) contiguous with Roebuck Bay (WA020) approximately 17.9 kilometres to the east of the application area (DAWE 2020b). Approximately 6.4 kilometres to the south of the application area is a mapped delineation whereby Roebuck Bay is also a listed Ramsar Wetland (Ref 33).

The Chinatown Drain has previously been purposefully located within a small drainage line draining into Dampier Creek. According to available databases there are no other surface water features within the vicinity of the proposed clearing area (Appendix B1). The application area intersects the Roebuck Bay wetland (WA020) and will result in the clearing of up to 0.65 hectares of mangroves. Approximately six square kilometres of mangroves occur around Dampier Creek (Bennelongia 2009), and MBS (2020a) calculated that the 0.65 hectares of clearing proposed represents less than 1.5 per cent of the immediate mangrove cover of the western margins of Dampier Creek. Noting

the extent of undisturbed mangrove vegetation within the local area (Appendix B3c; Appendix E), the proposed clearing is not likely to have a significant impact on vegetation growing in association with a wetland. Adjacent vegetation may be susceptible to weed invasion during clearing activities and clearing activities may lead to unacceptable sediment release impacting adjacent environmental values.

Outcome: Based on the above assessment, and the avoidance and mitigation measures proposed (Section 3.1), , the Delegated Officer has determined that subject to conditions, the proposed clearing is not considered to significantly impact on this environmental value.

Conditions: To mitigate potential impacts from clearing, the following conditions will be added to the permit :

- Weed management measures to mitigate impacts to adjacent wetland vegetation.
- Clearing management measures to ensure sedimentation is controlled.

3.3. Relevant planning instruments and other matters

The application was advertised on the DWER website for a 21 day public comment period on 26 October 2020. Three public submissions were received in relation to this application (Appendix A).

The Shire of Broome has the required access to implement the proposed clearing. The application area intersects a number of Lots, some of which are Reserves under Management Order to the Shire of Broome (or Reserves with no Management Order in place) and Unallocated Crown Land. Authorised access to Lot 651 on Plan 415214 has been gained by Shire of Broome via the Kimberley Ports Authority (MBS 2020a).

- Lot 616: The Shire of Broome holds a Management Order for Reserve 53252 over this Lot.
- Lot 611: The Shire of Broome holds a Management Order for Reserve 53252 over this Lot.
- Lot 651: Authorised access via a letter of authorisation from the Kimberley Ports Authority.
- Lot 560: The Shire of Broome holds a Management Order for Reserve 51176 over this Lot.
- Lot 3000: Unallocated Crown Land

The Shire of Broome is planning a 'Jetty to Jetty' walk trail (MBS 2020a) which will extend from Streeter's Jetty to Town Beach, where improvement works have already been undertaken. Native vegetation clearing in the vicinity of Town Beach was authorised by DWER under Clearing Permits CPS 8006/1 and CPS 8657/1.

A portion of the application area is located within the Broome Groundwater Area proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). No rivers proclaimed under the RIWI Act intersect the application. The application is not located in any *Country Areas Water Supply Act 1947* (CAWS Act) Public Drinking Water Source Areas. No additional permitting from DWER will be required.

Agreements recognising the connection of the Yawuru People with land in and around Broome have been signed. Indigenous Land Use Agreements (ILUAs) have been registered by the National Native Title Tribunal and various lands transferred to Yawuru ownership, enabling the traditional owners to actively participate in the development of Broome. These ILUAs also set aside land as conservation estate to be jointly managed by the Yawuru, the Department of Parks and Wildlife (now DBCA), and the Shire of Broome. The entire foreshore is significant to the Yawuru, with Roebuck Bay being a traditional foraging area. The Rubibi Community also have a Native Title determined claim (WAD6006/1998).

Identified native title holders/claimants were notified and invited to comment on the application, in accordance with the *Native Title Act 1993* (Cth) (the NT Act) and section 51E(4) of the EP Act. No response has been received by DWER to date.

Several Aboriginal Heritage Places intersect the application area including: Illangarami (Place ID: 12886), Titirrkun/ Kennedy Hill (Place ID: 14560), Wundorda (Place ID: 13320), Undanda (Place ID: 12793), LSC11 (Place ID: 30274), Bulgurgun (Place ID: 13321) and Fishermens Bend 1 (Place ID: 14291). 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.

Appendix A – Details of public submissions

Public Submission (1)

Topic: Broome Mangrove Snake *(Myron resetari).* Summary of comments	**Consideration of comments**
Agreement that the drain and surrounding mangroves around Streeters Jetty need to be cleared.	Acknowledged.
There is an omission in the supporting documentation (MBS 2000a): The vicinity of Streeters Jetty is the only known site for the Broome Mangrove Snake *(Myron resetari).*	The CPS 9076/1 assessment and decision report considers the Broome Mangrove Snake *(Myron resetari)* (Section 3.2.1).
It is assumed the species could be more common however no surveys have been undertaken to prove this. It would be devastating to destroy the only known site of this species until it is proven that more sites along that stretch of mangroves occurs. A survey for this species is needed to understand the specie's distribution before clearing should commence.	*Myron resetari* is not listed under any State or Commonwealth conservation legislation. Little is known of the species distribution, however, habitat for the species is well-represented in the local area of a 50 kilometre radius of the application area (Section 3.2.1). Conducting clearing during neap tides and during daylight hours will likely mitigate impacts to individuals.

Public Submission (2)

Topic: Broome Mangrove Snake *(Myron resetari).* Summary of comments	**Consideration of comments**
The proponent has overlooked the importance of the site for the Roebuck Bay Mangrove Snake (*Myron resetari*). Concerns with the proponent's conclusion that proposed clearing will not be at variance with clearing principle (b) with a belief that proposed clearing will be at variance with principle b.	The CPS 9076/1 assessment and decision report considers *Myron resetari,* with records discussed in Section 3.2.1. *Myron resetari* is not listed under any State or Commonwealth conservation legislation. Little is known of the species distribution, however, habitat for the species is well-represented in the local area of a 50 kilometre radius of the application area (Section 3.2.1). Results of any additional survey are unlikely to influence the CPS 9076/1 assessment and/or decision report. Conducting clearing during neap tides and during daylight hours will likely mitigate impacts to individuals.
Four records of *Myron resetari* are listed in the Atlas of Living Australia. However, three have been flagged as likely having an erroneous locality; two in north Queensland and one in King Sound WA.	
Informal targeted surveys in other mangrove systems in Roebuck Bay have yet to detect this species. Results of five informal records since 2016 are provided in the submission.	
Myron resetari is likely to occur beyond the Streeters Jetty area. However, it is unusual that there have been no encounters away from this site, despite effort expended searching for them.	
Proposed clearing will impact a significant extent of the known distribution of *Myron resetari*.	
Submission recommendation The proponent conduct surveys for *Myron resetari* to establish presence outside of the proposed clearing envelop, ideally in mangrove systems not connected to the mangroves at Streeter's Jetty.	

Public Submission (3)

Topic: Broome Mangrove Snake *(Myron resetari).* Summary of comments	**Consideration of comments**
The area around Streeters Jetty is the only known site in the world for *Myron resetari*.	The CPS 9076/1 assessment and decision report considers *Myron resetari,* with records discussed in Section 3.2.1. *Myron resetari* is not listed under any State or Commonwealth conservation legislation. Little is known of the species distribution, however, habitat for the species is well-represented in the local area of a 50 kilometre radius of the application area (Section 3.2.1). Results of any additional survey are unlikely to influence the CPS 9076/1 assessment and/or decision report. Conducting clearing during neap tides and during daylight hours will likely mitigate impacts to individuals.
Whilst the snake may be found elsewhere in Roebuck Bay, no formal scientific surveys have been undertaken.	
Native vegetation should not be cleared if it compromises the whole or part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to WA. Clearly this species of snake falls within those boundaries.	
Myron resetari. is not only restricted to a small geographic area but is also rarely encountered. The most recent action plan for Australian snakes and lizards mentions they have an IUCN conservation status of "Data Deficient", so little is known about their biology, distribution, and potential threats.	
The submission advocates for a survey to be undertaken to determine if *Myron resetari* has a wider distribution in Roebuck Bay, and thereby gain a better understanding of the impacts of the proposal before any permit approvals are given.	
It must be noted that Roebuck Bay has exceptional biodiversity and cultural values and has gained national and international recognition. Roebuck Bay is listed as a Ramsar site (1990), National Heritage site (2011) and Yawuru Nagulagun Roebuck Bay Marine Park. This exceptionally biodiverse bay is so unique, the BBC recently filmed in Roebuck Bay for Sir David Attenborough's 'Blue Planet' Series.	The biodiversity values of Roebuck Bay are considered in the CPS 9076/1 assessment and decision report (Appendix B, Appendix C, and Section 3.2)

Appendix B – 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 B.

1. Site summary

Site characteristic	Details
Local context	The application area is situated in Broome within the Dampierland bioregion (DAL) of Thackway and Cresswell (1995), and the Pindanland subregion (DAL2). The application area is located in the littoral / estuarine zone on the western margins of Dampier Creek and incorporates predominantly mangroves. Clearing of up to 0.51 hectares within a 0.99 hectare application area is required to remove mangroves to enable shipping access to Streeter's Jetty as well as restoration works to the associated adjacent careening beds and swimming beach. Clearing of up to 0.14 hectares within a 0.16 hectare application area is required to remove sediment and vegetation consisting predominantly of mangroves from the Chinatown Drain to restore its function. Spatial data indicates that the local area (50 kilometre radius of the proposed clearing area) retains approximately 94 per cent of the original native vegetation cover.
Vegetation description	Two vegetation associations considered within the regional mapping of Shepherd *et al.* (2001) occur over the application area. • Association 73: Grasslands, short bunch-grass savanna: Annual grasses *Enneapogon* spp. *Aristida spp*. etc on dry plains and salt water grasses *Sporobolus virginicus* on the coast. • Association 750: Pindan Woodland: Acacia thicket with eucalypt woodland over spinifex *Acacia tumida, Eucalyptus tectifica, Corymbia grandifolia, Triodia pungens, T. bitextura* However, these regional vegetation associations are mapped at a coarse scale and descriptions are not analogous with the vegetation occurring over the application area. Vegetation association 43: Mangroves, has been mapped within 125 metres of the application area and is described as a low forest of mangroves: *Avicennia marina, Rhizophora stylosa, Bruguiera exaristata.* MBS (2020a) described the application area as consisting of: • Grey mangroves *(Avicennia marina):* Immediately adjacent to Streeter's Jetty and the Chinatown Drain • Stilted mangrove *(Rhizophora stylosa):* Further offshore from the jetty, including within the application area. The application area is representative of regional vegetation association 43: Mangroves.
Vegetation condition (Trudgen 1991)	The vegetation within the application area is in a Good to Excellent condition based on the vegetation condition scale of Trudgen (1991) (Appendix D).
Soil description (Schoknecht, *et al.* 2004)	The majority of the application area is located within the mapped Carpentaria Low Subsystem low capacity WKY (335Cr_2) of bare coastal mudflats, minor sandy margins and seaward margins, little vegetation except for mangrove fringing thickets. The extreme western portion of the Streeters Jetty application area is mapped as the Yeeda System (335Ye) of red sandplains supporting pindan vegetation with dense acacia shrubs, scattered bloodwood and grey box trees and curly spinifex and ribbon grass. However, this regional mapping is undertaken at a coarse scale. The application area is representative of the: • Carpentaria 1 low capacity system of coastal plains, beaches, dunes, mudflats and cliffs with various coastal vegetation; with soils consisting of;

<table>
<tr><th>Site characteristic</th><th>Details</th></tr>
<tr><td></td><td>
335Cr_2. That is, bare coastal mudflats, minor sandy margins and seaward margins, little vegetation except for mangrove fringing thickets.
The application area is located in Dampier Creek. The mangrove communities around Dampier Creek contain black anoxic muds rich in organic material (DPAW 2016).
</td></tr>
<tr><td>Land degradation risk (DPIRD 2017)</td><td>
The purpose of the clearing associated with the Chinatown Drain is to allow for drain maintenance to improve drainage and reduce the risk of flooding and land degradation.

The clearing associated with Streeter's Jetty is to allow for restoration works at the jetty and public access to the associated historic careening beds and swimming beach.

The applicant has provided a clearing methodology that utilises floating barges supporting long-reach excavators to remove mangroves, and an excavator with wide tracks and rubber swamp mats, with a mulching attachment for use in wetland areas (MBS 2020b).
</td></tr>
<tr><td>Waterbodies</td><td>
The majority of the application area is located in the littoral / estuarine zone on the western margins of Dampier Creek. Dampier Creek is an estuary on the eastern border of Broome, and forms a component of Roebuck Bay, listed in the Directory of Important Wetlands (WA020) (DAWE (2020b). Roebuck Bay is an embayment to the east and south comprising intertidal mudflats, and indented in the east by microscale linear tidal creeks. The site includes the intertidal mudflats of Dampier Creek. Roebuck Bay (WA020) is contiguous with The Roebuck Plains System (WA021) to the east.

Roebuck Bay is also a Ramsar wetland site (Ref 33) with its western boundary of the Ramsar site some 6.4 kilometres to the south of the application area.
<table>
<tr><th>Directory of Important Wetlands</th><th>Proximity (m)</th></tr>
<tr><td>WA020: Roebuck Bay</td><td>Within</td></tr>
<tr><td>WA021: Roebuck Plains System</td><td>17,935 east</td></tr>
<tr><td>WA022: Willie Creek Wetlands</td><td>17,221 north</td></tr>
</table>
<table>
<tr><th>RAMSAR Wetland</th><th>Proximity (m)</th></tr>
<tr><td>Roebuck Bay (Ref 33)</td><td>6,400 south</td></tr>
</table>
The Chinatown Drain has previously been purposefully located within a small drainage line draining into Dampier Creek. Groundwater is mapped at less than 500 TDS / mg/L (That is, 'fresh'). There are no other underground or surface freshwater features within the vicinity of the proposed clearing area, however, the Streeter's Jetty application area traverses coastal waterline. Waterbodies occurring within the local area are summarised below.
<table>
<tr><th>Type of inland water</th><th>Description</th><th>Proximity (m)</th></tr>
<tr><td>Geodata, Lakes</td><td>Mangrove</td><td>0</td></tr>
<tr><td>Hydrography, Lakes (medium scale 250k GA)</td><td>Mangrove</td><td>0</td></tr>
<tr><td>Hydrography</td><td>Minor river - non perrenial</td><td>0</td></tr>
<tr><td>Hydrography, linear</td><td>Marine Construction - wharf/jetty</td><td>0</td></tr>
<tr><td>Hydrography, linear</td><td>Coastal Waterline</td><td>0</td></tr>
<tr><td>Rivers</td><td>Coastal Waterline</td><td>0</td></tr>
<tr><td>WA Coastline Water Mark</td><td>-</td><td>0</td></tr>
<tr><td>Geodata, Lakes</td><td>Watercours_a</td><td>72</td></tr>
<tr><td>Hydrography, Lakes (medium scale 250k GA)</td><td>Watercours_a</td><td>72</td></tr>
</table>
</td></tr>
</table>

Site characteristic	Details
Conservation areas	The Yawuru Nagulagun / Roebuck Bay Marine Park is within 150 metres east of the Streeters Jetty application area. Other terrestrial lands managed by the DBCA are over one kilometre distant.

DBCA Managed Lands	Proximity (m)	Number in local area
Yawuru Nagulagun / Roebuck Bay Marine Park. Conservation and Parks Commission	146	1
Management Order Yawuru Native Title Holders Aboriginal Corporation RNTBC, Conservation Commission Of Western Australia	1,013	45
Conservation Commission Of WA WPL	2,204	6
Broome Wildlife Centre: Conservation Commission Of WA	4,416	1

Landform and Climate	The application area comprises bare coastal mudflats, minor sandy margins and seaward margins supporting mangroves. The Broome region experiences a hot semi-arid climate featuring hot summers, and warm to cool winters. The minimum average monthly temperature ranges from 13.7˚C to 26.6˚C and maximum average monthly temperature ranges from 29.0˚C to 34.3˚C (BoM 2020). The annual average rainfall is approximately 624.2 mm per annum (BoM 2020) mostly falling in December-March. Eleven cyclones have passed within 50 kilometres of Broome in the past 70 years.

2. Ecosystem, flora and fauna analysis

With consideration for the site characteristics set out above, and relevant datasets (Appendix F), an analysis of relevant ecosystem, flora, and fauna factors are presented below.

2a) Ecological Linkages

The application area is within the littoral / estuarine zone on the western margins of Dampier Creek forming a large contiguous patch of mangroves which are a component of Roebuck Bay, listed in the Directory of Important Wetlands (WA020) (DAWE (2020b).

2b) Ecological Communities

The majority of application area is located within the species-rich faunal community of the intertidal mudflats of Roebuck Bay; a Vulnerable TEC endorsed by the Western Australian Minister for the Environment. The Priority Ecological Community (PEC) (P3) Kimberley Vegetation Association 73: Grasslands, short bunch grass savanna, grass; salt water grassland (*Sporobolus virginicus*) has been mapped over the northern end of the Chinaman Drain which is dominated by mangroves and not representative of this community.

Common name	Name	WA status	Comm. Status	Count	Closest record	Habitat present / Likely occurrence
Roebuck Bay mudflats	Species-rich faunal community of the intertidal mudflats of Roebuck Bay	TEC VU		1	0	Yes
Vegetation Association 73	Kimberley Vegetation Association 73	PEC P3		4	0	Possible
Corymbia paractia	*Corymbia paractia* dominated community on dunes	PEC P1		63	2,732	No
Vine thickets	Monsoon (vine) thickets on coastal sand dunes of Dampier Peninsula	TEC VU	TEC EN	8	2,963	No
Mangarr (Minyjuru)	Relict dune system dominated by extensive stands of *Minyjuru* (Mangarr) *Sersalisia* (formerly *Pouteria) sericea.*	PEC P1		19	3,171	No
Vegetation Association 770	Kimberley Vegetation Association 770	PEC P1		1	4,796	No

Dwarf pindan heath	Dwarf pindan heath community of Broome coast	PEC P1		1	6,807	No
Roebuck Land System	Roebuck Land System	PEC P3		3	9,643	No
Nimalarica Claypan	Nimalarica Claypan Community (prevously Nimalaica)	PEC P4		1	18,816	No
Vegetation Association 37	Kimberley Vegetation Association 37	PEC P4		3	25,179	No
Vegetation Association 67	Kimberley Vegetation Association 67	PEC P4		1	40,849	No
Gourdon Land System	Gourdon Land System	P4		2	46,232	No

TEC (VU) - Roebuck Bay mudflats within a 50 km radius

	Ha	Per cent
Total	16,185	100
Clearing	0.65	0.004

PEC (P3) - Association 73 within a 50 km radius

	Ha	Per cent
Total	76,590	100
Clearing	0.65	0.001

2c) Conservation significant flora recorded within ten kilometres of the application area

Two Threatened flora taxa have been recorded within ten kilometres of the application area, and 14 Priority flora taxa. No significant flora taxa have been recorded within 1.4 kilometres of the application area.

Threatened flora taxa recorded within 50 kilometres of the application area	Status	No. of records	Closest record (m)	Suitable soils/vegetation type - comments	
Seringia exastia	CR	15	882	No	Pindan sandplains

Priority flora taxa recorded within 50 kilometres of the application area	Status	No. of records	Closest record (m)	Suitable soils/vegetation type - comments	
Aphyllodium parvifolium	P1	1	31,765	No	Pindan sandplains
Corymbia paractia	P1	24	882	No	Coastal dunes and red pindan
Jacquemontia sp. Broome (A.A. Mitchell 3028)	P1	7	3,802	No	Red sandplain supporting pindan
Thespidium basiflorum	P1	2	11,129	No	Sandy soils and creeks
Gomphrena pusilla	P2	3	45,731	No	Beach sand, foredunes limestone
Acacia monticola x tumida var. kulparn	P3	6	1,238	No	Red sandplains supporting pindan
Aphyllodium glossocarpum	P3	2	5,867	No	Pindan sandplains
Bonamia oblongifolia	P3	2	44,966	No	Sandy or gravelly soils
Glycine pindanica	P3	20	1,821	No	Pindan sandplains, linear dunes
Goodenia byrnesii	P3	2	4,196	No	Red sandplain supporting pindan
Lophostemon grandiflorus subsp. grandiflorus	P3	2	43,605	No	Sandstone gorges, rocky sites
Polymeria sp. Broome (K.F. Kenneally 9759)	P3	4	1,821	No	Pale orange pindan sand
Seringia katatona	P3	2	938	No	Red sandplain supporting pindan
Seringia x katatona	P3	3	2,045	No	Red sandplain supporting pindan
Stylidium pindanicum	P3	3	18,955	No	Damp areas over pindan sands
Tephrosia andrewii	P3	1	46,856	No	Pindan sandplains
Terminalia kumpaja	P3	4	1,238	No	Deep red sands
Pittosporum moluccanum	P4	4	46,312	No	White sand. Sand dunes

2d) Conservation significant fauna recorded within ten kilometres of the application area:

Three birds, six mammals, two amphibians, two fish and three invertebrates of conservation significance have been recorded within ten kilometres of the application area.

Fauna species of conservation significance recorded within 50 kms	Taxon	Status	No. of records	Closest record (m)	Suitable habitat - comment	
					Mudflats	Mangroves
BIRDS - Shorebirds						
Curlew Sandpiper	*Calidris ferruginea*	CR	433	768	Yes	
Great knot	*Calidris tenuirostris*	CR	493	106	Yes	
Bar-tailed godwit	*Limosa lapponica menzbieri*	CR	16	1,826	Yes	
Eastern curlew	*Numenius madagascariensis*	CR	332	106	Yes	
Red knot	*Calidris canutus*	EN	409	106	Yes	
Lesser Sand Plover	*Charadrius mongolus*	EN	230	106	Yes	
Australian painted snipe	*Rostratula australis*	EN	17	14,354	Yes	
Common Sandpiper	*Actitis hypoleucos*	IA	414	0	Yes	
Ruddy turnstone	*Arenaria interpres*	IA	491	682	Yes	
Sharp-tailed sandpiper	*Calidris acuminata*	IA	266	885	Yes	
Sanderling	*Calidris alba*	IA	84	1,826	Yes	
Pectoral Sandpiper	*Calidris melanotos*	IA	7	2,993	Yes	
Red-necked stint	*Calidris ruficollis*	IA	525	768	Yes	
Long-toed Stint	*Calidris subminuta*	IA	72	2,947	Yes	
Little Ringed Plover	*Charadrius dubius*	IA	11	1,352	Yes	
Oriental Plover	*Charadrius veredus*	IA	98	885	Yes	
Swinhoe's snipe	*Gallinago megala*	IA	10	768	Yes	
Pin-tailed snipe	*Gallinago stenura*	IA	3	768	Yes	
Oriental pratincole	*Glareola maldivarum*	IA	99	885	Yes	
Broad-billed sandpiper	*Limicola falcinellus*	IA	138	1,826	Yes	
Asian dowitcher	*Limnodromus semipalmatus*	IA	115	1,623	Yes	
Bar-tailed godwit	*Limosa lapponica*	IA	506	106	Yes	
Black-tailed godwit	*Limosa limosa*	IA	298	561	Yes	
Little curlew	*Numenius minutus*	IA	169	561	Yes	
Whimbrel	*Numenius phaeopus*	IA	538	106	Yes	
Red-necked phalarope	*Phalaropus lobatus*	IA	6	14,395	Yes	
Ruff (reeve)	*Philomachus pugnax*	IA	14	1,623	Yes	
Pacific golden plover	*Pluvialis fulva*	IA	256	768	Yes	
Grey plover	*Pluvialis squatarola*	IA	284	1,067	Yes	
Grey-Tailed Tattler	*Tringa brevipes*	IA	460	106	Yes	
Wood Sandpiper	*Tringa glareola*	IA	149	768	Yes	
Common Greenshank	*Tringa nebularia*	IA	613	106	Yes	
Marsh Sandpiper	*Tringa stagnatilis*	IA	217	1,623	Yes	
Common Redshank	*Tringa totanus*	IA	56	2,174	Yes	
Terek Sandpiper	*Xenus cinereus*	IA	315	106	Yes	
Greater Sand Plover	*Charadrius leschenaultii*	VU	472	106	Yes	
BIRDS - Frigatebirds						
Lesser Frigatebird	*Fregata ariel*	IA	88	52		Yes
Great Frigatebird	*Fregata minor*	IA	3	1,826		Yes
BIRDS - Terns						
White-Winged Black Tern	*Chlidonias leucopterus*	IA	183	768	Yes	Yes
Gull-Billed Tern	*Gelochelidon nilotica*	IA	226	354	Yes	Yes
Caspian Tern	*Hydroprogne caspia*	IA	328	354	Yes	Yes
Bridled Tern	*Onychoprion anaethetus*	IA	7	1,826	Yes	Yes
Roseate Tern	*Sterna dougallii*	IA	40	1,826	Yes	Yes
Common Tern	*Sterna hirundo*	IA	108	1,196	Yes	Yes
Black-naped Tern	*Sterna sumatrana*	IA	1	3,974	Yes	Yes
Little Tern	*Sternula albifrons*	IA	205	106	Yes	Yes
Crested Tern	*Thalasseus bergii*	IA	284	354	Yes	Yes
Common Noddy	*Anous stolidus*	IA	13	1,826	Yes	Yes
BIRDS - Shearwaters / Petrels						

Fauna species of conservation significance recorded within 50 kms	Taxon	Status	No. of records	Closest record (m)	Suitable habitat - comment	
					Mudflats	Mangroves
Hutton's Shearwater	*Puffinus huttoni*	EN	5	885	No	No
Wilson's Storm-Petrel	*Oceanites oceanicus*	IA	5	1,826	No	No
Bulwer's Petrel	*Bulweria bulwerii*	IA	1	4,020	No	No
Streaked Shearwater	*Calonectris leucomelas*	IA	5	1,826	No	No
Brown Booby	*Sula leucogaster*	IA	175	247	Yes	Yes
BIRDS - Wetland birds						
Glossy Ibis	*Plegadis falcinellus*	IA	188	229	Yes	Yes
Australian Little Bittern	*Ixobrychus dubius*	P4	2	245	Yes	Yes
Garganey	*Anas querquedula*	IA	5	19,189	No	No
BIRDS - Swallows and swifts						
Barn Swallow	*Hirundo rustica*	IA	166	1,073	No	Yes
Red-rumped Swallow	*Cecropis daurica*	IA	11	10,396	No	Yes
White-Throated Needletail	*Hirundapus caudacutus*	IA	1	10,438	No	Aerial
Fork-tailed Swift	*Apus pacificus*	IA	93	106	No	Aerial
BIRDS - Birds of prey						
Red Goshawk	*Erythrotriorchis radiatus*	VU	1	31,897	No	No
Grey Falcon	*Falco hypoleucos*	VU	6	885	No	No
Osprey	*Pandion cristatus*	IA	327	0	Yes	Yes
Peregrine Falcon	*Falco peregrinus*	OS	25	885	No	No
Masked Owl (northern)	*Tyto novaehollandiae kimberli*	P1	1	1,826	No	No
Barking Owl (southwest subpop.)	*Ninox connivens connivens*	P3	3	1,826	No	No
Masked Owl (southwest)	*Tyto novaehollandiae novaehollandiae*	P3	3	885	No	No
Letter-winged Kite	*Elanus scriptus*	P4	3	1,873	No	No
BIRDS - Other						
Gouldian Finch	*Erythrura gouldiae*	P4	4	1,826	No	No
Princess Parrot	*Polytelis alexandrae*	P4	1	1,623	No	No
Oriental Cuckoo	*Cuculus optatus*	IA	10	1,826	No	No
Grey Wagtail	*Motacilla cinerea*	IA	1	14,390	No	No
Yellow Wagtail	*Motacilla flava*	IA	5	885	No	No
MAMMALS - Terrestrial						
Burrowing Bettong (inland)	*Bettongia lesueur graii*	EX	1	27,317	No	No
Northern Quoll	*Dasyurus hallucatus*	EN	1	627	No	No
Kimberley Brush-tailed Phascogale	*Phascogale tapoatafa kimberleyensis*	VU	1	27,317	No	No
Golden Bandicoot (Mainland)	*Isoodon auratus auratus*	VU	1	27,317	No	No
Bilby	*Macrotis lagotis*	VU	245	1,315	No	No
Northern Brushtail Possum (Kimberley)	*Trichosurus vulpecula arnhemensis*	VU	11	872	No	No
Scaly-tailed Possum	*Wyulda squamicaudata*	P4	1	5,994	No	No
Spectacled Hare-wallaby (Mainland)	*Lagorchestes conspicillatus leichardti*	P4	43	36,301	No	No
Golden-backed Tree-rat	*Mesembriomys macrurus*	P4	1	13,144	No	No
Water Rat	*Hydromys chrysogaster*	P4	1	4,978	Yes	Yes
North-Western Free-tailed Bat	*Mormopterus cobourgianus*	P1	2	2,676	Yes	Yes
MAMMALS - Marine						
Humpback Whale	*Megaptera novaeangliae*	CD	5	8,335	No	No
Dugong	*Dugong dugon*	OS	11	1,826	No	No
Australian Snubfin Dolphin	*Orcaella heinsohni*	P4	2	1,826	No	No
REPTILES - Terrestrial						
Great Desert Skink	*Liopholis kintorei*	VU	1	26,849	No	No
Dampier Peninsula Goanna	*Varanus sparnus*	P1	7	42,491	No	No
Dampierland Plain Slider	*Lerista separanda*	P2	11	4,529	No	No
Dampierland Burrowing Snake	*Simoselaps minimus*	P2	2	4,529	No	No
North-western Coastal Ctenotus	*Ctenotus angusticeps*	P3	26	1,385	No	No
REPTILES - Marine						
Short-Nosed Seasnake	*Aipysurus apraefrontalis*	CR	2	1,826	No	No
Olive Ridley Turtle	*Lepidochelys olivacea*	EN	1	1,180	No	No

Fauna species of conservation significance recorded within 50 kms	Taxon	Status	No. of records	Closest record (m)	Suitable habitat - comment	
					Mudflats	Mangroves
Green Turtle	*Chelonia mydas*	VU	7	1,180	No	No
Hawksbill Turtle	*Eretmochelys imbricata*	VU	2	1,826	No	No
Flatback Turtle	*Natator depressus*	VU	82	1,180	No	No

3. Vegetation extent

3a) Regional vegetation mapping (Government of Western Australia 2019a and 2019b)

- Association 73: Grasslands, short bunch-grass savanna: Annual grasses *Enneapogon* spp. *Aristida spp*. etc on dry plains and salt water grasses *Sporobolus virginicus* on the coast.
- Association 750: Pindan Woodland: Acacia thicket with eucalypt woodland over spinifex *Acacia tumida, Eucalyptus tectifica, Corymbia grandifolia, Triodia pungens, T. bitextura*
- Association 43: Mangroves: Low forest (Kimberley) *Avicennia marina, Rhizophora stylosa, Bruguiera exaristata.*

Vegetation Association		Pre-European Extent (ha)	Current Extent (ha)	Remaining (%)	Protected for Conservation (ha)	Protected for Conservation (%)
Grasslands, short bunch-grass savanna	73 (Total)	256,396	255,829	99.8	11,548	4.5
	73 (in DAL)	240,284	239,717	99.8	11,548	4.8
Pindan Woodland	750 (Total)	1,229,182	1,225,281	99.7	33,299	2.7
	750 (in DAL)	1,229,182	1,225,281	99.7	33,299	2.7
Mangroves	43 (Total)	193,260	175,894	91.0	41,084	21.3
	43 (in DAL)	22,447	21,413	95.4	717	3.2

3b) Remnant vegetation within 50 kilometres of the application area

Remnant Vegetation	Hectares remaining (ha)	Remaining %
Remnant vegetation remaining	415,409	94%

3c) Proposed clearing

Mangroves (Assn 43)	Hectares remaining (ha)	Remaining %
Total Area (50 km radius)	3,718	(100 %)
Proposed clearing	0.65	0.02%

3d) Mangroves – Within the western margin of Dampier Creek (MBS 2020a)

Mapped mangrove communities	Hectares remaining (ha)	Remaining %
Western margin of Dampier Creek	43	(100 %)
Proposed clearing	0.65	1.5%

Appendix C – 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 application area is located within the species-rich faunal community of the intertidal mudflats of Roebuck Bay. The community comprises a diverse and abundant marine fauna, with an estimated 300 to 500 species of macro-benthic invertebrate fauna as well as a high diversity and abundance of migratory shorebirds (DBCA 2020). The application area does not include habitat for conservation significant flora. Habitat suitable for conservation significant fauna and TEC is present within the application area.	May be at variance	Yes See Section 3.2.1
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 majority of application area is located within the mapped species-rich faunal community of the intertidal mudflats of Roebuck Bay; a Vulnerable TEC endorsed by the Western Australian Minister for the Environment. The species-rich faunal community of the intertidal mudflats of Roebuck Bay supports a rich and abundant macro-benthic invertebrate fauna that supports a high diversity and abundance of migratory shorebirds (DBCA 2020).	May be at variance	Yes See Section 3.2.1
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: Fifteen records of the Critically Endangered *Seringia exastia* occur within 50 kilometres of the application area. DBCA (2018) report that the species, as well as intermediate forms of *Seringia* (including the Threatened *Seringia exastia* and Priority listed *Seringia katatona* and *Seringia x katatona)* are located within a wide range of Pindan vegetation communities on sandplains growing in open *Corymbia* spp. woodlands over Acacia and *Triodia* / *Chrysopogon* grasslands, or tall Acacia shrublands over *Triodia epactia* and *Chrysopogon pallidus* grasslands. Pindan sandplains habitat or the habitats and communities described by DBCA (2018) do not occur over the application area.	Not likely to be at variance	No
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 'species-rich faunal community of the intertidal mudflats of Roebuck Bay' TEC endorsed by the Western Australian Minister for the Environment occurs over the majority of application area. Noting the remaining extant of the TEC and minimal area proposed to be cleared, clearing is not likely to significantly impact on this TEC.	May be at variance	Yes See Section 3.2.1
Environmental values: 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 national objectives and targets for biodiversity conservation in Australia has a target to prevent the clearance of ecological communities with an extent below 30 per cent of that present prior to the year 1750, below which species loss appears to accelerate exponentially at an ecosystem level	Not at variance	No

Assessment against the Clearing Principles	Variance level	Is further consideration required?
(Commonwealth of Australia 2001). Greater than 90 percent remnant native vegetation is recorded within the local area and the region including the mapped vegetation types. The application area is not located within an area that has been extensively cleared.		
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: Nine areas of lands managed by the Department of Biodiversity, Conservation and Attractions and Land Management (DBCA) occur within the local area of a 50 kilometre radius on the application area. All but one are located over one kilometre distance from the application area. Located within 150 metres to the east of the application area, is the Yawuru Nagulagun / Roebuck Bay Marine Park vested with the Conservation and Parks Commission. Although the application area is located outside of the park boundary a component of the recognised attributes of the park is mangrove communities (DPAW 2016). Due to the minimal clearing required and separation distances, proposed clearing is unlikely to have an impact on the environmental values of the Yawuru Nagulagun / Roebuck Bay Marine Park.	Not likely to be at variance	No
Environmental values: 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: The majority of the application area is located in the littoral / estuarine zone on the western margins of Dampier Creek. Dampier Creek forms a component of Roebuck Bay which is listed in the Directory of Important Wetlands (WA020) (DAWE 2020b).	At variance	Yes See Section 3.2.2
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The clearing associated with Streeter's Jetty is to allow for restoration works at the jetty and public access to the associated historic careening beds and swimming beach. Removal of mangroves adjacent to the jetty is unlikely to contribute to land degradation. The purpose of the clearing associated with the Chinatown Drain is to allow for drain maintenance to improve drainage and reduce the risk of flooding and land degradation. Construction methodologies have been provided by the applicant (MBS 2020b) that incorporates floating barges supporting long-reach excavators to remove mangroves, and an excavator with wide tracks and rubber swamp mats, with a mulching attachment for use in wetland areas to reduce impacts (Section 3.1). In the event that significantly elevated water column turbidity occurs a silt or sediment curtain may be employed (MBS 2020b).	Not likely to be at variance	No
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: Groundwater is mapped at less than 500 TDS./ mg/L (that is, 'fresh'). The Chinatown Drain has previously been purposefully located within a small drainage line draining into Dampier Creek. There are no other underground or surface freshwater features within the vicinity of the proposed	Not likely to be at variance	

Assessment against the Clearing Principles	Variance level	Is further consideration required?
clearing area, however, the Streeter's Jetty application area traverses the coastal waterline. Construction methodologies (Section 3.1) will ensure no increased erosion or run off in to Roebuck Bay occurring as a result of this proposal. Proposed clearing is unlikely to cause any deterioration in the quality of any surface waters or groundwater and a significant deterioration in the quality of marine water quality is considered unlikely.		
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: The application area is located in the littoral / estuarine zone on the western margins of Dampier Creek, and the Streeter's Jetty application area traverses the coastal waterline. The purpose of the clearing associated with the Chinatown Drain is to allow for drain maintenance to improve drainage and reduce the risk of flooding. The small scale of the proposed clearing of mangroves around Streeter's Jetty is unlikely to cause, or exacerbate, the incidence or intensity of flooding.	Not likely to be at variance	No

Appendix D – 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.

Measuring vegetation condition for the Eremaean and Northern Botanical Provinces (Trudgen, 1991)

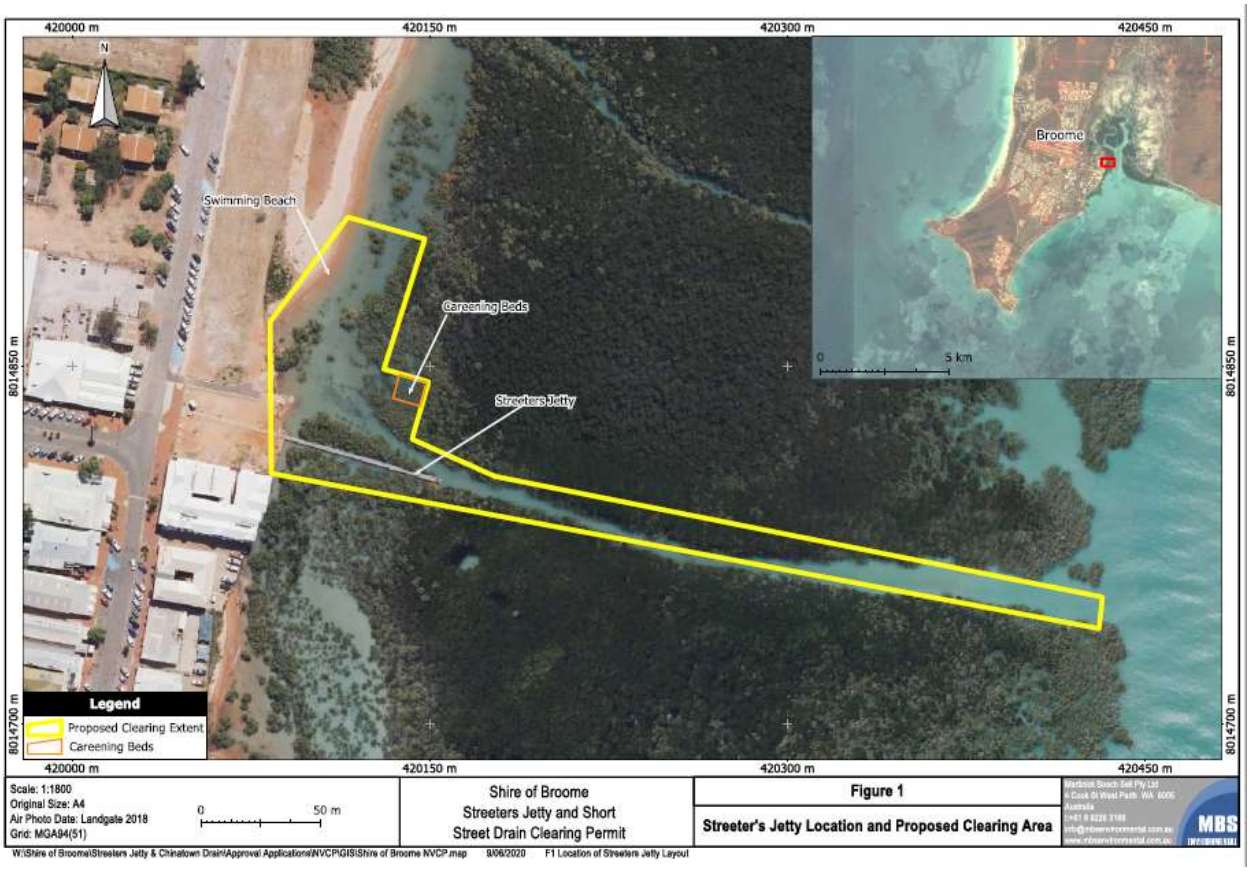
Condition	Description
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Very poor	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

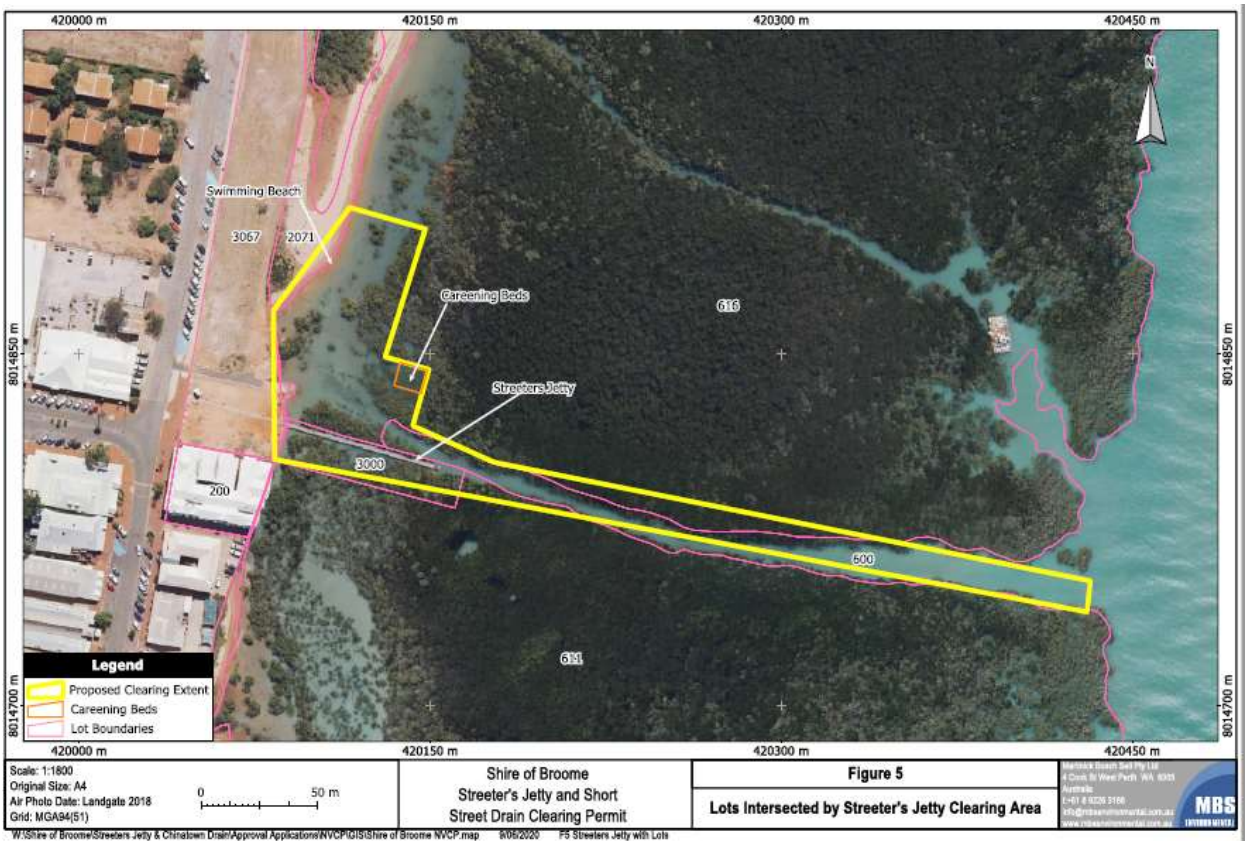
Appendix E – Photographs and habitat mapping of the application area

The following photographs and figures were provided in support of the application (MBS 2020a; 2020b).

Mangroves encroaching around Streeters Jetty

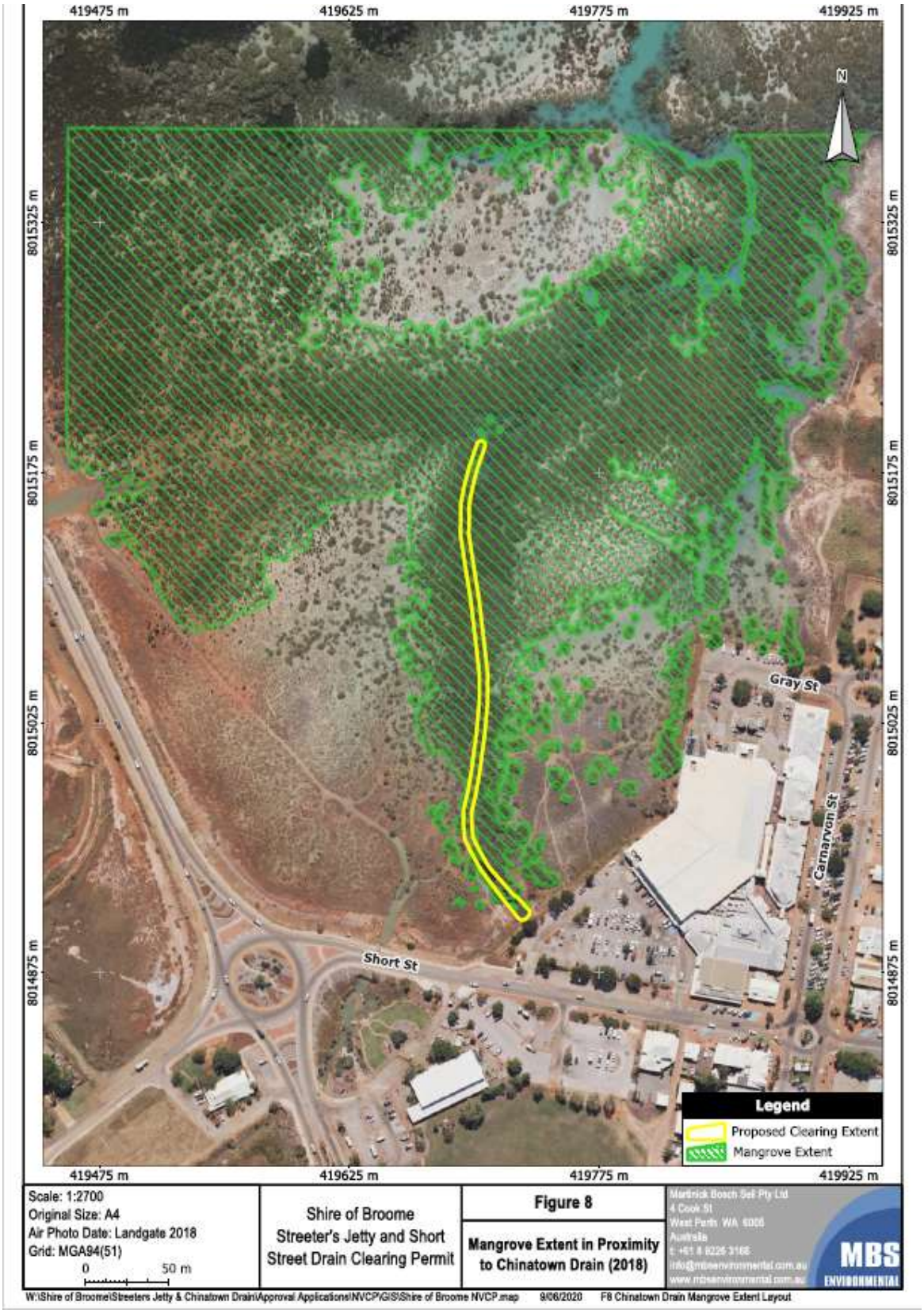
Mangroves encroaching around Chinatown Drain


420000 m
420150 m
420300 m
420450 m
8014850 m
8014700 m
N
Swimming Beach
Careening Beds
Streeters Jetty
Broome
0
5 km
Legend
Proposed Clearing Extent
Careening Beds
Scale: 1:1800
Original Size: A4
Air Photo Date: Landgate 2018
Grid: MGA94(51)
0
50 m
Shire of Broome
Streeters Jetty and Short
Street Drain Clearing Permit
Figure 1
Streeter's Jetty Location and Proposed Clearing Area
MBS
W:\Shire of Broome\Streeters Jetty & Chinatown Drain\Approval Applications\NVCP\GIS\Shire of Broome NVCP.map 9/06/2020 F1 Location of Streeters Jetty Layout


420000 m
420150 m
420300 m
420450 m
8014850 m
8014700 m
N
Swimming Beach
3067
2071
Careening Beds
616
Streeters Jetty
3000
200
500
634
Legend
Proposed Clearing Extent
Careening Beds
Lot Boundaries
Scale: 1:1800
Original Size: A4
Air Photo Date: Landgate 2018
Grid: MGA94(51)
0
50 m
Shire of Broome
Streeter's Jetty and Short
Street Drain Clearing Permit
Figure 5
Lots Intersected by Streeter's Jetty Clearing Area
MBS
W:\Shire of Broome\Streeters Jetty & Chinatown Drain\Approval Applications\NVCP\GIS\Shire of Broome NVCP.map 9/06/2020 F5 Streeters Jetty with Lots

Scale: 1:4800 Original Size: A4 Air Photo Date: Landgate 2018 Grid: MGA94(51) 0 100 m	Shire of Broome Streeter's Jetty and Short Street Drain Clearing Permit	Figure 7 Mangrove Extent in Proximity to Streeter's Jetty (2018)	Martinick Bosch Sell Pty Ltd 4 Cook St West Perth WA 6005 Australia T: +61 8 9226 3166 info@mbsenvironmental.com.au www.mbsenvironmental.com.au MBS ENVIRONMENTAL

W:\Shire of Broome\Streeters Jetty & Chinatown Drain\Approval Applications\NVCP\GIS\Shire of Broome NVCP.map 9/06/2020 F7 Streeters Jetty Mangrove Extent Layout


419475 m
419625 m
419775 m
419925 m
8015325 m
8015175 m
8015025 m
8014875 m
N
Gray St
Carnarvon St
Short St
Legend
Proposed Clearing Extent
Mangrove Extent
Scale: 1:2700
Original Size: A4
Air Photo Date: Landgate 2018
Grid: MGA94(51)
0
50 m
Shire of Broome
Streeter's Jetty and Short Street Drain Clearing Permit
Figure 8
Mangrove Extent in Proximity to Chinatown Drain (2018)
Martinick Bosch Sell Pty Ltd
4 Cook St
West Perth WA 6005
Australia
MBS
ENVIRONMENTAL
W:\Shire of Broome\Streeters Jetty & Chinatown Drain\Approval Applications\NVCP\GIS\Shire of Broome NVCP.map
9/06/2020
F8 Chinatown Drain Mangrove Extent Layout

Appendix F – References and databases

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2. GIS datasets

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

- 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)
- IBRA Vegetation Statistics
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Regional Parks (DBCA-026)
- Soil and Landscape Mapping – Best Available

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)