



## 1. Application details

### 1.1. Permit application details

Permit application No.: 7833/1  
Permit type: Purpose Permit

### 1.2. Applicant details

Applicant's name: Wheatbelt Natural Resource Management Incorporated  
Application received date: 25 October 2017

### 1.3. Property details

Property: Lot 17369 on Deposited Plan 83410  
Lot 19634 on Deposited Plan 84681 (unallocated Crown land)  
Lot 19716 on Deposited Plan 85023  
Lot 19893 on Deposited Plan 85453 (Crown reserve 15672)  
Lot 29612 on Deposited Plan 30829 (part Crown reserve 9610).  
Local Government Authority: WICKEPIN, SHIRE OF  
Localities: YEALERING

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
1.1532		Mechanical Removal	Drainage

### 1.5. Decision on application

Decision on Permit Application: Grant  
Decision Date: 9 February 2018

Reasons for Decision: The clearing permit application has been assessed against the clearing principles, planning instruments and other matters in accordance with section 51O of the *Environmental Protection Act 1986* (EP Act). It has been concluded that the proposed clearing is at variance to clearing principle (f), may be at variance to clearing principle (i) and is not likely to be at variance to the remaining principles.

Based on the assessment of the application area, the Delegated Officer determined that the proposed clearing will impact on riparian vegetation growing in association with a watercourse or wetland and may result in the short term sedimentation of a watercourse or wetland.

The applicant has avoided and minimised impacts through minimising the clearing footprint to include vegetation that is largely in Degraded (Keighery, 1994) condition.

The Delegated Officer also took into account the overall purpose of the proposed clearing, which is to facilitate the construction of an isolation bund and flow control structures to achieve improved water quality in Lake Yealering. The Delegated Officer noted that this may lead to improvements in the health and condition of fringing riparian vegetation as a result of lower salt concentrations.

In consideration of the above, and taking into account the linear and fragmented shape of the application area and the types and mostly degraded nature of the vegetation within the application area, the Delegated Officer determined that the proposed clearing is unlikely to present an unacceptable risk to the environment.

## 2. Site Information

**Clearing Description:** The application is to clear 1.1532 hectares of native vegetation for the purpose of constructing an isolation bund and flow control structures (Figure 1). The application relates to the Living Lakes Project, which has the objective of improving the quality and availability of water in selected Wheatbelt wetlands, including Yealering Lake.

**Vegetation Description:** The application area is mapped as the following Beard vegetation associations (Shepherd et al. 2001):

- 37: Shrublands; teatree thicket – approximately 0.847 hectares of the application area;
- 953: Succulent steppe with thicket; teatree over samphire (comprises approximately 0.291 hectares of the application area); and
- 1023: Medium woodland; York gum (*Eucalyptus loxophleba*), wandoo (*Eucalyptus wandoo*) and salmon gum (*Eucalyptus salmonophloia*) (comprises approximately 0.015 hectares of the application area).

Strategen Environmental Consultants Pty Ltd (Strategen) conducted a flora and vegetation

assessment (including a reconnaissance survey conducted in July 2017) in a survey area which comprised a 100 metre wide corridor encompassing the application area, and provided the findings in an environmental assessment report submitted as supporting information to the application (Strategen 2017). The environmental assessment report states that the field survey was conducted according to standards set out in *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016). Advice provided by the Department of Biodiversity, Conservation and Attractions (DBCA) however raised some concern with the timing of the survey and the fact the survey was not able to access areas inundated with surface water. Notwithstanding these concerns, DBCA advised that further survey effort is not considered necessary.

The environmental assessment report identifies four vegetation types in the survey area, of which three occur within the application area (Strategen 2017):

- VT2: *Tecticornia indica* and *Tecticornia pergranulata* low samphire shrubland (comprises approximately 0.13 hectares of the application area);
- VT3: *Casuarina obesa* low woodland over *Tecticornia indica* and *Tecticornia pergranulata* low samphire shrubland (comprises approximately 0.15 hectares of the application area); and
- Lake Area (comprises approximately 0.88 hectares of the application area).

**Vegetation Condition:** Good; Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery 1994).

To

Degraded: structure severely disturbed; regeneration to Good condition requires intensive management (Keighery 1994).

The environmental assessment report indicates that the vegetation within the application area ranges from Good (Keighery 1994) to Degraded (Keighery 1994) condition, with the majority of VT2 and VT3 vegetation types within the application area being in Degraded (Keighery 1994) condition (Strategen 2017).

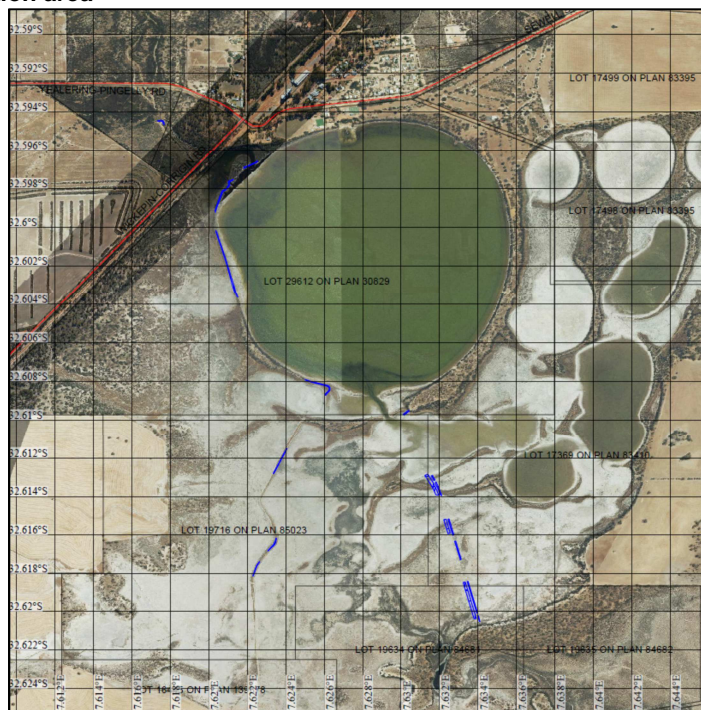
**Soil / Landform Type:** The application area is mapped as the following land units:

- Coblinine 4 lake fringe Phase (259Cb\_4lf): Lunettes, dunes and swales formed from Aeolian deposits originating from lakes within the Coblinine 4 Subsystem; calcareous loamy earths (comprises approximately 0.927 hectares of the application area); and
- Coblinine 4 salt lake Phase (259Cb\_4sl): Salt lakes (and recently salinised freshwater lakes) within the Coblinine 4 Subsystem (comprises approximately 0.226 hectares of the application area).

The environmental assessment report indicates that the survey area is characterised by broad valley floors and alluvial plains with significant areas of saline wet soils, alkaline grey shallow sandy duplex soils, lunettes, dunes and swales formed from aeolian deposits originating from lakes, salt lakes and recently salinised freshwater lakes, and deep sandy and loamy gravels, shallow gravels with minor sandy duplex soils, deep sands and sandy earths (Strategen, 2017).

**Comments:** The local area referred to in the below assessment is defined as the area within a 10 kilometre radius of the application area.

**Figure 1: Map of the application area**



### 3. Minimisation and mitigation measures

The environmental assessment report states “The majority (52%) of the vegetation area has been heavily disturbed in the past for rural purposes (i.e. cleared and part weed infested) and impacts from secondary salinity”, and “Implementation of industry standard practices will minimise any potential environmental and social impacts during clearing and earthworks” (Strategen, 2017).

Given the above, it is considered that in designing the project the applicant has largely avoided vegetation in Good (Keighery, 1994) or better condition and minimised the extent of the proposed clearing.

### 4. Assessment of application against clearing principles

#### (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

##### Proposed clearing is not likely to be at variance to this Principle

The application is to clear 1.1532 hectares of native vegetation for the purpose of constructing an isolation bund and flow control structures. As indicated in Figure 1, the application area is linear in shape and is comprised of a number of fragmented portions.

As discussed in Section 2, the vegetation within the application area comprises low woodland over low samphire shrubland, low samphire shrubland, and lake area in Good (Keighery 1994) to Degraded (Keighery 1994) condition (Strategen 2017). The environmental assessment report identifies that based on a desktop assessment a total of 146 native vascular plant taxa (predominantly from the Myrtaceae and Chenopodiaceae families) have the potential to occur in the survey area, and that the reconnaissance survey recorded a total of 15 native vascular plant taxa (predominantly from the Chenopodiaceae family) from six relevés in the survey area (Strategen, 2017). The environmental assessment report notes that the relatively low number of taxa recorded reflects the disturbed nature of the survey area (Strategen, 2017).

According to available databases and the environmental assessment report, twelve priority flora species have been recorded within the local area (Western Australian Herbarium, 1998-; Strategen, 2017). Noting the general habitat preferences of these species, the application area has the potential to support five of these species:

- *Dampiera triloba* (Priority 3) is known from 15 records from Perth to Esperance at sites associated with various soil types and landscape positions (FloraBase website, January 2018). The nearest record of this species is approximately 5.1 kilometres from the application area. Noting the landscape position and vegetation types within the application area, this species is unlikely to occur within the application area.
- *Thysanotus tenuis* (Priority 3) is known from 30 records from the Avon Wheatbelt bioregion at sites associated with clayey, sandy and sandy clay soils typically on valley slopes and hills (FloraBase website, January 2018). The nearest record of this species is approximately 10.5 kilometres from the application area. Noting the landscape position of the application area, this species is unlikely to occur within the application area.
- *Eucalyptus loxophleba x wandoo* (Priority 4) is known from 14 records from the southern Avon Wheatbelt bioregion, eastern Jarrah Forest bioregion and southern Geraldton Sandplains bioregion at sites associated with sandy clay or loamy soils on various landscape positions. The nearest record of this species is approximately 12.9 kilometres from the application area. Noting the vegetation types within the application area, this species is unlikely to occur within the application area.
- *Lechenaultia pulvinaris* (Priority 4) is known from 35 records from the southern Avon Wheatbelt bioregion and eastern Jarrah Forest bioregion at sites associated with sandy soils on lower or mid-slope positions on flat or gently undulating terrain in open to completely open mixed woodlands (FloraBase website, January 2018). The nearest record of this species is approximately 23 kilometres from the application area. Noting the distribution of this species and the distance to the nearest record, this species is unlikely to occur within the application area and the proposed clearing is unlikely to impact on its conservation status.
- *Stylidium tenuicarpum* (Priority 4) is known from 36 records from the southern Avon Wheatbelt bioregion at sites generally associated with sandy, loamy or gravelly soils supporting mixed woodlands containing *Allocasuarina* species (FloraBase website, January 2018). The nearest record of this species is approximately 7.6 kilometres from the application area. Noting the distribution of this species and the vegetation types within the application area, this species is unlikely to occur within the application area and the proposed clearing is unlikely to impact on its conservation status.

The environmental assessment report identifies that the preferred soil type / habitat of *Thysanotus tenuis*, *Eucalyptus loxophleba x wandoo* and *Lechenaultia pulvinaris* occurs within the survey area, however no priority flora species were recorded during the reconnaissance survey (Strategen, 2017).

The DBCA advice noted that the timing of the flora and vegetation assessment was not ideal for the detection of some of the conservation-significant flora, and is likely to have taken place at a time when much of the drainage line was inundated which is not ideal for detection (DBCA 2018b). Notwithstanding, DBCA advised that impacts from the proposed clearing on priority flora taxa are unlikely to be significant, and further survey effort is unwarranted in this case (DBCA, 2017b).

As discussed under Principle (c), six rare flora species have been recorded within the local area. The application area does not contain suitable habitat for these species. The flora and vegetation assessment did not identify rare flora within the application area (Strategen, 2017). On this basis, the proposed clearing is unlikely to impact on rare flora.

According to available datasets, approximately 0.015 hectares of the application area (consistent with the mapped Beard vegetation association) is within an occurrence of the Priority 3 ‘Eucalypt Woodlands of the Western Australian Wheatbelt’ priority ecological community (PEC). As discussed under Principle (d), this PEC is also listed as a ‘Critically Endangered’

threatened ecological community (TEC) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Noting the types and condition of the vegetation within the application area, it is considered that the vegetation within this portion of the application area is inconsistent with mapped Beard vegetation association and is unlikely to comprise the PEC/TEC.

The environmental assessment report indicates that the application area may contain suitable habitat for conservation significant fauna species (Strategen, 2017). As discussed under Principle (b), noting the linear and fragmented shape of the application area, the types and condition of the vegetation within the application area, the application area is unlikely to comprise significant habitat for indigenous fauna.

Given the above, the application area is unlikely to comprise a high level of biological diversity. The proposed clearing is not likely to be at variance to this Principle.

**(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.**

**Proposed clearing is not likely to be at variance to this Principle**

As discussed in Section 2, the vegetation within the application area comprises low woodland over low samphire shrubland, low samphire shrubland, and lake area in Good (Keighery 1994) to Degraded (Keighery 1994) condition (Strategen 2017).

Strategen conducted a desktop assessment of potential conservation significant fauna occurrence in the survey area, and provided the findings in the environmental assessment report (Strategen 2017). The desktop assessment identifies that the application area may contain suitable habitat for three threatened species, one other specially protected species, three priority species and five migratory species (Strategen 2017):

- Carnaby's Cockatoo (*Calyptorhynchus latoristris*), Endangered under the *Wildlife Conservation Act 1950* (WC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- Western Barred Bandicoot (*Perameles bougainville* subsp. *bougainville*), Vulnerable under the WC Act and Endangered under the EPBC Act.
- Heath Mouse (*Pseudomys shortridgei*), Vulnerable under the WC Act and Endangered under the EPBC Act.
- Peregrine Falcon (*Falco peregrinus*), Other Specially Protected Fauna under the WC Act.
- Quenda/Southern Brown Bandicoot (*Isodon obesulus* subsp. *fusciventer*), Priority 4.
- Western Brush Wallaby (*Macropus irma*), Priority 4.
- Western Rosella (inland) (*Platycercus icterotis* subsp. *xanthogenys*), Priority 4.
- Common Sandpiper (*Actitis hypoleucos*), International Agreement under the WC Act and Migratory under the EPBC Act.
- Great Egret/White Egret (*Ardea modesta*), International Agreement under the WC Act and Migratory under the EPBC Act.
- Rainbow Bee-eater (*Merops ornatus*), International Agreement under the WC Act and Migratory under the EPBC Act.
- Pectoral Sandpiper (*Calidris melanotos*), International Agreement under the WC Act and Migratory under the EPBC Act.
- Grey Wagtail (*Motacilla cinerea*), International Agreement under the WC Act and Migratory under the EPBC Act.

According to available datasets, three threatened fauna species, one other specially protected fauna species, one priority species and two migratory fauna species have been recorded within the local area. Of these, both migratory fauna species and the priority fauna species may occur in the application area. These species are accounted for in the above list compiled by Strategen.

DBCA advised that the Yealering Lakes System is recognised as a major drought refuge for waterbirds, and that Yealering Lake has recorded substantial numbers of waterbirds (13,493 in 1992) and has supported at least one migratory waterbird species (Common Sandpiper; *Actitis hypoleucos*) (DBCA, 2018d). The Delegated Officer notes that the proposed clearing will facilitate works designed to improve water quality within the Yealering Lake, and therefore may be beneficial to waterbirds which may utilise the lake system.

The Carnaby's Cockatoo forages on the seeds, nuts and flowers of a large variety of plants including Proteaceous species (*Banksia*, *Hakea*, *Grevillea*), *Eucalyptus* species, *Corymbia* species and a range of introduced species (Valentine and Stock, 2008). Breeding habitat for Carnaby's Cockatoo is defined as trees of species known to support breeding within the range of the species which either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow. For most tree species, a suitable DBH is 500 millimetres (Commonwealth of Australia, 2012). The environmental assessment report identifies that the habitat requirements of this species are present within the survey area and the current distribution of this species includes the survey area (Strategen, 2017). However, suitable foraging and nesting habitat was not observed within the areas proposed for clearing during the survey.

The Western Barred Bandicoot has been extinct on the Australian mainland since the 1930's and the extant species has remained only on Dorre and Bernier Islands in Shark Bay (Richards 2012). The heath mouse prefers species-rich and structurally complex heathland and woodland in two distinct regions, one in South Western Australia and the other on the border between South Australia and Victoria (Department of the Environment and Energy 2018). In Western Australia this region encompasses the Fitzgerald River National Park between Albany and Esperance and stretches inland, but does not reach Lake Yealering or the surrounding region (Department of the Environment and Energy 2018). In Western Australia this species has not been located in vegetation less than 10 years after a fire and the highest densities of this species have been recorded in vegetation with a post-fire age of 30 years (Department of the Environment and Energy 2018).

The Quenda / Southern Brown Bandicoot prefers scrubby, often swampy vegetation with a dense cover up to 1 metre high and will often forage in adjacent forest and woodland which is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover (Department of Environment and Conservation, 2012). The Western Brush Wallaby inhabits a range of habitats, including open forest and woodland, mallee, heathland, low open grasses and scrubby thickets, but favour open

grassy areas and are absent in forests where dense understory is present (IUCN Red List, 2018). The environmental assessment report identifies that the habitat requirements of these species are present within the survey area (Strategen, 2017).

The Peregrine Falcon, Western Rosella (inland), Common Sandpiper, Great Egret / White Egret, Rainbow Bee-Eater, Pectoral Sandpiper and Grey Wagtail are highly mobile avian species which occupy large home ranges. The environmental assessment report identifies that habitat requirements of these species are present within the survey area (Strategen, 2017). Noting the extent of proposed clearing, the linear and fragmented shape of the application area, and the condition of the vegetation within the application area, the proposed clearing is unlikely to impact on significant habitat for these species.

DBCA advised that the fauna assessment does not accurately reflect fauna species known to occur in the area, and noted that this may be a result of the source data (DBCA 2018a). DBCA advised that some species recorded in the fauna assessment as unlikely to occur may occur within the application area, and other species referred to in the fauna assessment as possible are unlikely to be present (DBCA 2018a).

Noting the linear and fragmented shape of the application area and the mostly degraded condition of the vegetation within the application area the application area is unlikely to comprise significant habitat for indigenous fauna including species of conservation significance.

Given the above, the application area is unlikely to comprise the whole or a part of, or be necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia. The proposed clearing is not likely to be at variance to this Principle.

**(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.**

**Proposed clearing is not likely to be at variance to this Principle**

According to available datasets and the environmental assessment report (Strategen, 2017), six rare flora species have been recorded within the surrounding environment. Noting the general habitat preferences of one species and the proximity of recorded occurrences of a separate species to the application area, two rare flora species are discussed further below. The application area is not considered to contain suitable habitat to support the remaining rare flora species. Strategen noted in the environmental assessment report that no rare flora species were identified during the reconnaissance survey and vegetation in the survey area has been adversely impacted by secondary salinity (Strategen 2017).

The first of the two identified rare flora species flowers from August to December or February, and is known from 24 records from the southern Avon Wheatbelt bioregion and western Mallee bioregion, at sites associated with sandy and lateritic soils supporting mixed heath, mallee and woodlands (Flora Base website, January 2018). The nearest record of this species is approximately 10.3 kilometres from the application area. The northern extent of the application area, which is situated away from Lake Yealering, was found during the reconnaissance survey to be occupied by a vegetation community containing *Tecticornia* sp., which are often recorded in the presence of saline soil profiles (Flora Base website, January 2018). No recordings of this rare flora species have been recorded in the presence of saline soil profiles (Flora Base website, January 2018). Based on the above, this species is not expected to occur in the application area.

The second species flowers in September, and is known from 58 records from the southern Avon Wheatbelt bioregion and western Mallee bioregion at sites associated with salt lakes (Flora Base website, January 2018). The nearest record of this species is approximately 52 kilometres from the application area. The environmental assessment report identifies that the preferred soil type/habitat of the second species occurs within the survey area, however no rare flora species were recorded during the reconnaissance survey (Strategen, 2017). DBCA noted that the timing of the flora and vegetation assessment was not ideal for the detection of this species, and that if it were to occur within the application area any impacts to this species would potentially be significant and a permit to take rare flora would be required in accordance with the WC Act (DBCA 2018b). Notwithstanding, DBCA advised that the vegetation communities identified in the application area are unlikely to represent significant habitat for this species. In addition, this species growth habit and colouration are distinctive and if it did occur in the application area, DBCA considered that it would likely have been recorded previously due to these attributes (DBCA 2018b).

Noting the linear and fragmented shape of the application area and the types and condition of the vegetation within the application area, the application area is unlikely to comprise significant habitat for indigenous flora, including species of conservation significance.

Given the above, the application area is unlikely to comprise the whole or a part of, or be necessary for the maintenance of, a significant habitat for flora indigenous to Western Australia. The proposed clearing is not likely to be at variance to this 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.**

**Proposed clearing is not likely to be at variance to this Principle**

According to available datasets and the environmental assessment report (Strategen 2017), approximately 0.015 hectares of the application area is within an occurrence of the Commonwealth-listed 'Eucalypt Woodlands of the Western Australian Wheatbelt' TEC. This portion of the application area is mapped as Beard vegetation association 1023.

DBCA advised that currently approximately eight per cent of the total remaining extent of this TEC is protected to some degree within formal conservation tenure, and that the woodland patches that remain are typically small, highly fragmented, and have been disturbed to some extent (DBCA 2018c).

DBCA advised that approximate mapping for this TEC obtained from the Commonwealth Department of the Environment and Energy is represented by broad-scale vegetation map units of areas most likely to contain the described TEC (DBCA 2018c). The DBCA also noted that the TEC may, however, occur outside of the 'likely to occur' areas and that ground-truthing is required to verify if a particular site meets the required diagnostic characteristics and minimum condition thresholds and size to be the described as part of the TEC (DBCA 2018c).

The Approved Conservation Advice for this TEC specifies a number of criteria for vegetation to be considered representative of this TEC, including that a patch needs to be reasonably intact and contain native understorey vegetation or important habitat features such as large trees with hollows, and be in Good-Degraded (Keighery, 1994) or better condition (Department of the Environment, 2015).

DBCA advised that the environmental assessment report identified two key *Eucalyptus* canopy species listed in the Approved Conservation Advice for the TEC, being *Eucalyptus sargentii* (salt river gum) and *Eucalyptus loxophleba* (York gum), in the survey area (DBCA 2018c). DBCA advised that as the environmental assessment report does not include an evaluation of the key diagnostic characteristics stated in the Approved Conservation Advice for the TEC using appropriate methods, it is not known whether these patches meet the key diagnostic characteristics of this TEC (DBCA 2018c). DBCA advised that as this is a hydrology-driven system, the minimum 40 metre buffer from the outer edge of a patch (determined from the outer edge of the tree canopy) recommended in the Approved Conservation Advice for the TEC should be applied if the patches constitute the TEC (DBCA 2018c).

It is noted that the environmental assessment report identifies a fourth vegetation type in the survey area, described as *Eucalyptus sargentii* low open woodland over *Melaleuca atroviridis* shrubland, which occurs adjacent to but not within the application area (Strategen 2017), and will therefore not be directly impacted by the proposed clearing. The environmental assessment report also indicates that *Eucalyptus loxophleba* was recorded from quadrats in the survey area (Strategen, 2017), however it is not clear where these quadrats were located.

The environmental assessment report indicates that the vegetation within this portion of the application area contains *Tecticornia indica* and *Tecticornia pergranulata* low samphire shrubland in Degraded (Keighery 1994) condition (Strategen 2017). On this basis, and noting the extent of the proposed clearing and condition of the vegetation within this portion of the application area, it is considered that this portion of the application area is inconsistent with the mapped Beard vegetation association and is unlikely to comprise or be necessary for the maintenance of the TEC.

Given the above, the application area is unlikely to comprise the whole or a part of, or be necessary for the maintenance of, a TEC. The proposed clearing is not likely to be at variance to this 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.**

**Proposed clearing is not likely to be at variance to this Principle**

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001).

As indicated in Table 1, the Avon Wheatbelt bioregion, Shire of Wickepin and mapped Beard vegetation association are below the recommended 30 per cent retention threshold.

Noting the size of the application area, the proposed clearing represents less than 0.005 per cent of the current extents of vegetation within the Avon Wheatbelt bioregion and the Shire of Wickepin.

In regard to the mapped Beard vegetation association, the environmental assessment report indicates that the portion of the application area (approximately 0.015 hectares) mapped as this vegetation association contains *Tecticornia indica* and *Tecticornia pergranulata* low samphire shrubland in Degraded (Keighery 1994) condition (Strategen 2017). Therefore it is considered that the vegetation within the application area is inconsistent with the mapped Beard vegetation association.

Given the above, the application area is unlikely to be significant as a remnant of native vegetation in an area that has been extensively cleared. The proposed clearing is not likely to be at variance to this Principle.

**Table 1: Vegetation extents**

	Pre-European (ha)	Current Extent (ha)	Remaining (%)	Current Extent in DCBA Managed Lands	
				(ha)	(%)
<b>IBRA Bioregion*</b>					
Avon Wheatbelt	9,517,109	1,763,070	18.5	173,879	9.8
<b>Local government authority*</b>					
Shire of Wickepin	203,946	24,491	12.0	3,567	14.5
<b>Beard vegetation association*</b>					
37	38,930	24,519	62.9	5,170	21.0
953	9,928	3,233	32.5	386	11.9
1023	1,601,601	173,641	10.8	18,885	10.8

**(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.**

**Proposed clearing is at variance to this Principle**

According to available datasets, the application area is located within two mapped 'Wheatbelt Wetland' areas. Approximately 0.912 of the application area occurs within a mapped basin/lake (being the Yealering Lakes System, a nationally important wetland defined in "A Directory of Important Wetlands in Australia" (Environment Australia 2001), and approximately 0.238 hectares of the application area occurs within a mapped area subject to inundation adjacent to this.

DBCA advised that the Yealering Lakes System comprises many interconnected basins, channels and flats, with Lake Yealering being the largest basin wetland within the system (DBCA, 2018d). DBCA advised that it has recently revised the mapping within the *Directory of Important Wetlands in Australia* dataset using the latest available GIS spatial information to address mapping inconsistencies between the existing dataset and the site descriptions (DBCA, 2018d). The proposed updated boundary of the Yealering Lakes System encompasses the majority of the application area, with the exception of a portion of approximately 0.015 hectares at the north-west extent of the application area.

As discussed in Section 2, the vegetation within the application area comprises low woodland over low samphire shrubland, low samphire shrub land, and lake area in Good (Keighery 1994) to Degraded (Keighery 1994) condition (Strategen 2017).

Given the above, the application area includes vegetation growing in, or in association with, an environment associated with a watercourse or wetland. The proposed clearing is at variance to this Principle.

Noting the linear and fragmented shape of the application area, the extent of the proposed clearing and the condition of the vegetation within the application area, it is considered that the proposed clearing is unlikely to significantly impact on riparian vegetation or the environmental values of a watercourse or wetland in the broader area.

It is noted that the clearing is intended to facilitate works with the aim of achieving increased volume and improved water quality in Yealering Lake, which may lead to improvements in the health and condition of fringing riparian vegetation as a result of lower salt concentrations.

DBCA noted that several reports completed during the pre-feasibility and feasibility phases of this project's development relate to the impact of the proposed clearing on the Yealering Lakes System (DBCA 2018a). The feasibility review is discussed under Planning instruments and other relevant matters.

**(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.**

**Proposed clearing is not likely to be at variance to this Principle**

As discussed under Section 2, approximately 0.927 hectares of the application area is mapped as calcareous loamy earths associated with lunettes, dunes and swales (Cobline 4 lake fringe Phase), and approximately 0.226 hectares of the application area is mapped as salt lake (Cobline 4 salt lake Phase). The land degradation risks associated with these soil and landform types is outlined in Table 2 (Department of Primary Industry and Regional Development 2017).

**Table 2: Land degradation risk**

<b>Risk categories</b>	<b>Cobline 4 lake fringe Phase</b>	<b>Cobline 4 salt lake Phase</b>
Wind erosion	10-30% of map unit has a high to extreme wind erosion risk	<3% of map unit has a high to extreme wind erosion risk
Waterlogging	<3% of map unit has a moderate to very high waterlogging risk	>70% of map unit has a moderate to very high waterlogging risk
Water repellence	<3% of map unit has a high water repellence risk	<3% of map unit has a high water repellence risk
Water erosion	<3% of map unit has a high to extreme water erosion risk	<3% of map unit has a high to extreme water erosion risk
Subsurface compaction	<3% of the map unit has a high subsurface compaction risk	>70% of the map unit has a high subsurface compaction risk
Subsurface acidification	<3% of map unit has a high subsurface acidification risk or is presently acid	<3% of map unit has a high subsurface acidification risk or is presently acid
Salinity	30-50% of map unit has a moderate to high salinity risk or is presently saline	>70% of map unit has a moderate to high salinity risk or is presently saline
Phosphorus export	<3% of map unit has a high to extreme phosphorus export risk	<3% of map unit has a high to extreme phosphorus export risk
Flooding	<3% of the map unit has a moderate to high flood risk	<3% of the map unit has a moderate to high flood risk

As discussed under Principle (f), the application area is located within two mapped 'Wheatbelt Wetland' areas. The application area is situated at the following approximate contours (JDA Consultant Hydrologists 2012):

- 269.68 to 271.36 metres AHD (north western portion);
- 270.29 to 271.62 metres AHD (south eastern portion); and
- 271.06 to 271.82 metres AHD (south western portion).

Noting the land degradation risks outlined in Table 2, and that the application area is situated in a low part of the landscape within mapped wetlands, the greatest risk of land degradation is likely to be associated with salinity, waterlogging and

subsurface soil compaction, and to a lesser degree, wind and water erosion and phosphorus export. However noting the extent of the proposed clearing and the linear and fragmented shape of the application area, the proposed clearing is unlikely to cause appreciable land degradation in these forms.

Given the above, the proposed clearing is not likely to be at variance to this 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.**

**Proposed clearing is not likely to be at variance to this Principle**

According to available databases, an un-named nature reserve occurs approximately 250 metres east of the application area, and Nonalling Nature Reserve is located approximately 5.1 kilometres north of the application area. A number of privately-managed conservation areas also occur in the application area, the nearest of these being approximately 2.5 kilometres from the application area.

The application area is situated in a similar or lower landscape position as these conservation areas, and is unlikely to impact on these conservation areas. Noting the extent of the proposed clearing and the linear and fragmented shape of the application area, the proposed clearing is unlikely to impact on local ecological linkages between these conservation areas or increase the risk of introduction of weeds or pathogens into these conservation areas.

Given the above, the proposed clearing is unlikely to impact on the environmental values of any adjacent or nearby conservation areas. The proposed clearing is not likely to be at variance to this 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.**

**Proposed clearing may be at variance to this Principle**

As discussed under Principle (f), the application area is located within two mapped 'Wheatbelt Wetland' areas.

DBCA advised that water depth information from the *South West Wetlands Monitoring Program* (1977-2015) indicates that Lake Yealering has only dried twice since the 1980s, being in 2002 and 2012, and that the pH of the lake has ranged between 7 and 10 since the 1980s; however, since 2010 the pH has been consistently between 7 and 8. Salinity (ppt) has shown an increase since 2002 (Lane *et al.* 2016) (DBCA, 2018d).

DBCA advised that the construction of bunds and flow control structures may alter the hydrology on the Yealering Lake System, which may have ramifications on a local and regional scale (DBCA 2018c). DBCA further suggested that hydrological investigations should be conducted into water quality (parameters such as nutrients and salinity), taking into account the surrounding land uses as well as surface and groundwater flows (DBCA 2018c). DBCA advised that altering hydrology and/or inundation times of a wetland system may also lead to secondary issues such as plant death, weed infestation and sedimentation, and that these potential issues should be investigated before the proposed clearing is supported (DBCA 2018c). DBCA recommended that the applicant and relevant regulatory agencies give consideration to a suitable program of water quality monitoring to gain information on whether the drainage results in detrimental or beneficial changes to the hydrology and water quality of Yealering Lake (DBCA, 2018d).

The Delegated Officer noted that DBCA's advice relates to the installation of bunds and flow control structures and not the impact of the clearing of native vegetation. The Delegated Officer also noted that the project with which the clearing is associated aims to improve the water quality of the Yealering Lake and is part of a broader effort to engineer improved outcomes for wetlands in the Wheatbelt.

As discussed under Principle (g), the greatest risk of land degradation (in the context of potentially impacting on water quality) is likely to be associated with salinity and waterlogging, and to a lesser degree, wind and water erosion and phosphorus export. Given the above, and noting the advice from DBCA, the Delegated Officer considered that the proposed clearing may be at variance to this Principle.

However, the Delegated Officer also considered that the application area shows signs of having been degraded for a long period of time, and that secondary salinity and historical clearing and grazing have impacted the existing vegetation communities (Strategen, 2017). Noting the linear and fragmented shape of the application area, the extent of the proposed clearing and the condition of the vegetation within the application area, it is considered that the proposed clearing is unlikely to significantly impact surface water quality, and any impacts to surface water quality resulting from the project will largely be confined to the pre-construction and construction phases of the project.

The Yealering Lake area features saline groundwater resources with a recorded salinity of 35,000 mg/L Total Dissolved Solids (Strategen 2017). Given this, the Delegated Officer considers that the proposed clearing is unlikely to cause deterioration in the quality of underground water resources.

**(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.**

**Proposed clearing is not likely to be at variance to this Principle**

As discussed under Principle (f), the application area is located within two mapped 'Wheatbelt Wetland' areas.



As discussed under Principle (g), the application area is situated low in the landscape between 269.68 to 271.82 metres AHD, and less than three per cent of the soil units mapped within the application area have a moderate to high flooding risk.

Noting the extent of the proposed clearing and the linear and fragmented shape of the application area, the proposed clearing is unlikely to cause, or exacerbate, the incidence or intensity of flooding.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

### **Planning instruments and other relevant matters.**

The application is to clear 1.1532 hectares of native vegetation for the purpose of constructing an isolation bund and flow control structures. The application is part of a project which has the objective to implement engineering solutions to improve water quality and periods of inundation at Yealering Lake, including the following measures:

- constructing an eastern bund to the outlet swamp and upgrading the existing southern bund to increase the flow of water into the lake;
- improving and installing control and overflow structures at strategic locations along the eastern bund and at the northern end of the existing southern bund to improve diversion performance;
- installing a control structure at the upper reach of the Avon River to allow flow to be directed preferentially towards the lake; or downstream to the Avon River;
- to develop a Maintenance and Management Plan for Yealering Lake in collaboration with the local government and community ensuring the ongoing management of the engineering infrastructure; and
- to engage with the local communities to design and implement an Activation Plan and Calendar of Events that promotes Yealering Lake, enhances amenity and increases visitation (Wheatbelt Natural Resource Management Incorporated website).

The application relates to the Living Lakes Project, lead by the former Department of Regional Development and Lands, to enhance one or more existing land systems to create permanent and accessible water bodies in the Wheatbelt and adjoining regions (JDA Consultant Hydrologists 2011). Following assessment of 20 nominated lakes against 12 criteria, Yealering Lake received the highest ranking (JDA Consultant Hydrologists 2011). Enhancement options considered for Yealering Lake include bunding of outlet swamps to increase lake flushing and a controlled structure at the lake outlet to increase lake water level, to result in approximately 0.5 metre greater water depth at most times of the year (JDA Consultant Hydrologists 2012). Review of the options found that the bunding of outlet swamps will reduce the rate of increase of salinity in Yealering Lake, and that some impact on the fringing vegetation is likely to occur due to increased duration of inundation (JDA Consultant Hydrologists 2012). The application was advertised on the Department of Water and Environmental Regulation (DWER) website on 10 January 2018 with a 21 day submission period. No public submissions have been received in relation to this application.

The application area is located within the Avon River Surface Water Area proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). DWER's Water Branch advised that the applicant has obtained a permit to interfere with the beds and banks of the waterways associated with the proposed works.

As part of the initial approvals strategy for this project, Straten consulted with the Western Australian Department of Agriculture and Food regarding the requirement to apply for a Regulation 5 Notice of Intent to Drain Approval. The Department advised, through the Commissioner of Soil and Land Conservation, that a Notice of Intent to Drain was not required for this project.

The Shire of Wickepin advised that planning approval is not required (Shire of Wickepin, 2017).

Portions of the application area are within the registered Aboriginal site 'Lake Entrance' (S02067), and the lodged Aboriginal sites 'Lake South Entrance' (S02091) and 'Shire Swamp Flat' (S02092). It is the responsibility of the applicant to ensure that no Aboriginal sites of significance are damaged as a result of the proposed clearing. The applicant is encouraged to liaise with the Department of Planning, Lands and Heritage regarding any obligations under the *Aboriginal Heritage Act 1972*.

As part of the Living Lakes Project, the former Department of Regional Development and Lands undertook consultation with the Gnaala Karla Booja Working Party representing the area covering Yealering Lake and Named Applicants (JDA Consultant Hydrologists 2012). The Working Party expressed a strong interest for the project to include interpretative signage and for the cultural heritage of the lakes to be acknowledged (JDA Consultant Hydrologists 2012). Feedback received from the South West Aboriginal Land and Sea Council on behalf of the Working Party requested for the project team to ensure that continual consultation with the Working Party is undertaken, provide more details on the proposed designs/engineering methods, consider restrictions on boats, and provide more information on how much revegetation will be done around the lakes (JDA Consultant Hydrologists 2012).

In accordance with the requirements of the *Native Title Act 1993*, DWER has notified the Gnaala Karla Booja Claimant and the South West Aboriginal Land and Sea Council of the proposed clearing.

## **5. References**

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- Department of Biodiversity Conservation and Attractions (DBCA) (2018b) Advice provided in relation to clearing permit application CPS 7833/1 (flora), received 30 January 2018 (DWER ref: A1604917).
- Department of Biodiversity Conservation and Attractions (DBCA) (2018c) Advice provided in relation to clearing permit CPS 7833/1, 9 February 2018

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#### GIS Databases:

- Aboriginal Sites of Significance
- Department of Biodiversity Conservation and Attractions, Tenure
- Groundwater salinity
- Hydrography, linear
- Hydrography, Hierarchy
- Remnant vegetation
- SAC bio datasets
- Soils, Statewide
- Topographic contours