GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 6790/1
Permit Holder:	Water Corporation
Duration of Permit:	14 July 2016 – 14 July 2021

ADVICE NOTE

The funds referred to in condition 7 of this permit are intended for contributing towards the purchase of 109 hectares of native vegetation with similar environmental values containing Carnaby's cockatoo habitat.

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**
   Clearing for the purpose of installing water storage tanks.

2. **Land on which clearing is to be done**
   Lot 14910 on Deposited Plan 36310, Lexia
   Lot 12777 on Deposited Plan 219669, Melaleuca
   State Forest 65, Pin 11498130, Lexia
   State Forest 65, Pin 11498125, Lexia

3. **Area of Clearing**
   The Permit Holder must not clear more than 15.34 hectares of native vegetation within the area cross hatched yellow on attached Plan 6790/1.

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 etc 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. **Dieback and weed control**
   (a) 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* and *dieback*:
      (i) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
      (ii) ensure that no *dieback* or *weed*-affected soil, *mulch*, *fill* or other material is brought into the area to be cleared; and
      (iii) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

7. **Monetary contributions to a fund maintained for the purpose of establishing or maintaining vegetation (offset)**
   Prior to 15 October 2017, the Permit Holder shall provide documentary evidence to the CEO that funding of $168,950.00 has been transferred to the Department of Environment Regulation for the purpose of establishing or maintaining native vegetation.

8. **Construction Environmental Management Framework**
   Prior to undertaking any clearing authorised under this Permit the Permit Holder shall implement and adhere to the management measures contained in the document titled "Management Measures (Table 1)" submitted to the Department of Environment Regulation on 9 June 2016.

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

dieback means the effect of *Phytophthora* species on native vegetation;

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;

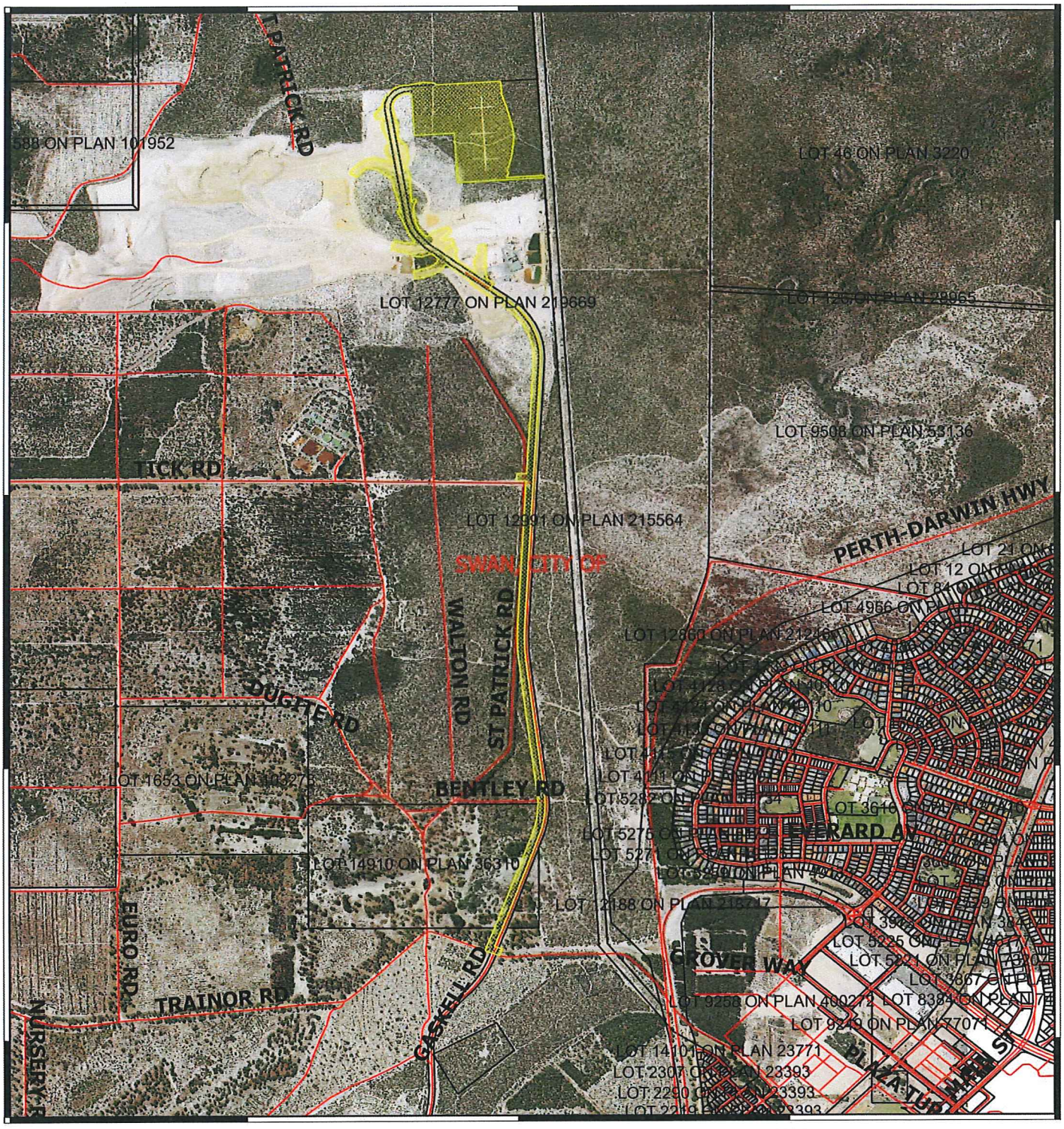
weed/s means any plant -
(a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or
(b) published in a Department of Parks and Wildlife Regional Weed Rankings Summary, regardless of ranking; or
(c) not indigenous to the area concerned.

James Widenbar
MANAGER
CLEARING REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

23 June 2016

Plan 6790/1



Legend

- Areas approved to clear
- Roads
- LGA
- Cadastre

Virtual Mosaic (LGATE-V001)

N

1:15,000

MGA 94
Geocentric Datum of Australia 1994

.....Date 23/6/2016

James Widenbar

Officer with delegated authority under Section 20
of the Environmental Protection Act 1986

GOVERNMENT OF
WESTERN AUSTRALIA

GOVERNMENT OF WESTERN AUSTRALIA

Clearing Permit Decision Report

Government of Western Australia
Department of Environment Regulation

1. Application details

1.1. Permit application details

Permit application No.: 6790/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Water Corporation**

1.3. Property details

Property: STATE FOREST 65, LEXIA
LOT 12777 ON PLAN 219669, MELALEUCA
LOT 14910 ON PLAN 36310, LEXIA
Local Government Area: City of Swan

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
15.34		Mechanical Removal	Water/gas/cable/pipeline/power installation

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 23 June 2016
Reasons for Decision: The clearing 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), and it has concluded that the proposed clearing is at variance to principles (a), (b), (e) and (h), may be at variance to principle (g) and is not likely to be at variance to the remaining principles.

An assessment determined that the proposed clearing will lead to the loss of 15.34 hectares of native vegetation that:

- contains 15.34 hectares of foraging habitat for Carnaby's cockatoo;
- is located within an ecological linkage, defined by the Gnangara Sustainability Strategy;
- comprises a high level of biological diversity;
- falls within a conservation reserve (Bush Forever site 399, which is part of the Gnangara Moore River State Forest); and
- may cause appreciable land degradation in the form of wind and/or water erosion.

To mitigate the potential impacts identified above, the clearing permit will include conditions for fauna management, offsets, dieback and weed control, and requiring the applicant to prepare and implement a construction environmental management plan.

Consistent with the WA Environmental Offset Policy (2011) and WA Environmental Offsets Guidelines (2014), and pursuant to section 51I(2)(b) of the EP Act, in order to mitigate the significant environment impacts described above the Permit Holder is required to provide a monetary contribution towards the purchase of 109 hectares of land within the Shire of Chittering or Gingin.

These factors were taken into consideration by the Delegated Officer in the decision to grant a clearing permit.

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description

The vegetation under application is mapped as Beard vegetation association 949 which is described as low woodland, banksia (Shepherd et al., 2001).

The vegetation under application is mapped as Heddle Vegetation Complexes (Heddle et al., 1980):

- Bassendean Complex - north \ transition vegetation complex which is described as low open forest and low woodland; and
- Bassendean Complex - North which is described as low open forest and low woodland and sedge lands.

Flora surveys identified four vegetation types (Ecologia, 2014; GHD, 2013) within a larger study area encompassing the application area:

- Banksia Low Open Forest (BaPlAxAcLb) which is described as a low open forest of *Banksia attenuata* and *Banksia menziesii* over shrubland of *Petrophile linearis* and *Stirlingia latifolia* over open low heath of *Astroloma xerophyllum* and *Croninia kingiana* over Very Open Grassland of *Aira* sp. (non-native) and *Briza maxima* (non-native) over Very Open Herbland of *Ursinia anthemoides* (non-native). This vegetation type accounts for 17.68 hectares of the study area and is in a pristine to good (Keighery, 1994) condition;
- *Kunzea*, *Banksia* and *Jacksonia* Shrubland (KgRcCa) which is described as a shrubland of *Kunzea glabrescens*, *Banksia attenuata* and *Jacksonia furcellata* over low shrubland of *Regelia ciliata* and *Hibbertia* species over very open herbland of *Conostylis aculeata* subsp. *aculeata* and *Gladiolus caryophyllaceus* (non-native) (revegetated). This vegetation type accounts for 5.24 hectares of the study area and is in a good to degraded (Keighery, 1994) condition;
- *Pinus*, *Melaleuca* and *Eucalyptus* Open Planted Woodland (PsBmAb) which is described as an open planted woodland of *Pinus* sp. (non-native), *Eucalyptus rudis* and *Melaleuca preissiana* over *Jacksonia furcellata* and *Pericalymma ellipticum* var. *floridum* open shrubland over sparse weedy grasses. This vegetation type accounts for 1.4 hectares of the study area and is in a completely degraded (Keighery, 1994) condition; and
- Highly Disturbed/Cleared (HD) which is described as areas with significantly altered vegetation composition and structure due to clearing and/or other activities. These areas are completely or almost completely without native species with some scattered native trees (*Eucalyptus* spp. and *Melaleuca* spp.) and understorey dominated by weedy grasses and herbs. This vegetation type accounts for 21.7 hectares of the study area and is in a completely degraded (Keighery, 1994) condition.

Clearing Description	Vegetation Condition	Comment
The clearing of 15.34 hectares of native vegetation (within a larger footprint area) for the Ellenbrook water storage project.	Pristine; No obvious signs of disturbance (Keighery, 1994). To Completely Degraded; No longer intact, completely / almost completely without native species (Keighery, 1994).	The vegetation condition and description were determined through flora surveys undertaken in March 2014 (Ecologia, 2014) and October 2012 (GHD, 2013) as well as a Department of Environment Regulation site inspection undertaken 1 December 2015 (DER, 2015).

3. Assessment of application against Clearing Principles

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

Comments

Proposed clearing is at variance to this Principle

The application is to clear 15.34 hectares of native vegetation (within a larger footprint area) within State Forest 65, Lot 12777 on Deposited Plan 219669, Melaleuca, and Lot 14910 on Deposited Plan 36310, Lexia, for the Ellenbrook water storage project. The project is proposed to be progressed in three stages with the primary clearing of vegetation to be undertaken during stage 1 when the first of three water storage tanks will be installed. The second tank (stage 2) is expected to be required around 2034. The third tank will only be required if there is a high demand and is not expected to be required before 2058 (Water Corporation, 2015). The applicant has stated that the clearing and compaction of all three tank sites is required to be undertaken at the beginning of the project to avoid damage of established infrastructure during successive construction.

Flora surveys of the application area and surrounding vegetation identified four vegetation types (Ecologia, 2014; GHD, 2013):

- Banksia Low Open Forest (BaPlAxAcLb) which is described as a low open forest of *Banksia attenuata* and *Banksia menziesii* over shrubland of *Petrophile linearis* and *Stirlingia latifolia* over Open Low Heath of *Astroloma xerophyllum* and *Croninia kingiana* over very open grassland of *Aira* sp. (non-native) and *Briza maxima* (non-native) over very open herbland of *Ursinia anthemoides* (non-native). This vegetation type accounts for 17.68 hectares of the study area and is in a pristine to good (Keighery, 1994) condition;
- *Kunzea*, *Banksia* and *Jacksonia* Shrubland (KgRcCa) which is described as a shrubland of *Kunzea glabrescens*, *Banksia attenuata* and *Jacksonia furcellata* over low shrubland of *Regelia ciliata* and *Hibbertia* species over very open herbland of *Conostylis aculeata* subsp. *aculeata* and *Gladiolus caryophyllaceus* (non-native). This vegetation type represents an area revegetated by Rocla, accounts for 5.24 hectares of the study area and is in a good to degraded (Keighery, 1994) condition;
- *Pinus*, *Melaleuca* and *Eucalyptus* open planted woodland (PsBmAb) which is described as an open planted woodland of *Pinus* sp. (non-native), *Eucalyptus rudis* and *Melaleuca preissiana* over *Jacksonia furcellata* and *Pericalymma ellipticum* var. *floridum* open shrubland over sparse weedy grasses. This vegetation type accounts for 1.4 hectares of the study area and is in a completely degraded (Keighery, 1994) condition; and
- Highly Disturbed/Cleared (HD) which is described as areas with significantly altered vegetation composition and structure due to clearing and/or other activities. These areas are completely or almost completely without native species with some scattered native trees (*Eucalyptus* spp. and *Melaleuca* spp.) and understorey dominated by weedy grasses and herbs. This vegetation type accounts for 21.7 hectares of the study area and is in a completely degraded (Keighery, 1994) condition.

The application area can be considered as two separate areas:
- Area 1 is located in the north of the application area, comprises vegetation type BaPlAxAcLb in a near pristine (Keighery, 1994) condition and is the location of the proposed three water tanks; and
- Area 2 contains vegetation on either side of an access road, is for the purpose of pipeline installation and is comprised of the remainder of the vegetation types (with 7.8 hectares of BaPlAxAcLb).

A biological survey (Ecologia, 2014) of Area 2 recorded 43 flora taxa and 25 vertebrate fauna species. Ecologia (2014) considered this level of diversity typical of that occurring within the northern Swan Coastal Plain.

The local area (defined as a 10 kilometre radius surrounding the application area) retains approximately 30 per cent native vegetation. Given this, the application area falls within a highly cleared landscape.

Thirty fauna species of conservation significance have been recorded within the local area (Parks and Wildlife, 2007-). A fauna assessment of the application area (GHD, 2013) determined that Carnaby's cockatoo (*Calyptorhynchus latirostris*), forest red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*), Baudin's cockatoo (*Calyptorhynchus baudinii*), black-striped snake (*Neelaps calonotos*), western brush wallaby (*Macropus irma*) and graceful sunmoth (*Synemon gratiosa*) may occur within the application area. In addition, chuditch (*Dasyurus geoffroii*) and quenda (*Isoodon obesulus* subsp. *fusciventer*) may be impacted by the proposed clearing

Noting the vegetation types present within the application area and the habitat preferences and range extents of these species, it is considered that the vegetation under application is likely to comprise significant habitat for Carnaby's cockatoo and chuditch, and is likely to include suitable (but not significant) habitat for forest red-tailed black cockatoo, Baudin's cockatoo, black-striped snake, western brush wallaby, quenda and graceful sunmoth.

The application area is located within Bush Forever site 399, which is part of the Gnangara Moore River State Forest. The Gnangara Moore River State Forest is part of a large contiguous north-south remnant of native vegetation with Bush Forever sites 192, 304, 462 and 380. The application area also adjoins large areas of reserved vegetation to the east through Bush Forever site 300. The Environmental Protection Authority (EPA, 2013) recognises that large consolidated naturally vegetated areas are the most resilient in protecting biodiversity in the long term. The EPA recommends that development projects should aim to retain naturally vegetated areas in large consolidated blocks to avoid fragmentation or isolation.

The application area is part of north-south and east-west ecological linkages defined in the Gnangara Sustainability Strategy (2009). Ecological linkages are defined as 'a series of (both contiguous and non-contiguous) patches of native vegetation which, by virtue of their proximity to each other, act as stepping stones of habitat which facilitate the maintenance of ecological processes and the movement of organisms within, and across, a landscape' (Molloy et al., 2009). On this basis, it is considered that the application area may be significant for the movement of local fauna within the landscape.

The greater the size of an area of remnant vegetation, the greater its capacity to maintain a larger and more viable suite of species (Molloy et al., 2009). It is considered, therefore, the application area together with adjoining vegetation is also likely to support discrete fauna and flora populations.

Flora surveys within the application area undertaken on 30 October 2012 (GHD, 2013) and 14 March 2014 (Ecologia, 2014) did not record any conservation significant flora species or threatened ecological communities. The priority ecological community (PEC) 'Swan Coastal Plain Banksia attenuata Banksia menziesii woodlands (SCP23b)' was found to potentially occur within the application area. The area potentially comprising of a PEC correlates to the area mapped as BaPlAxAcLb. Parks and Wildlife advised that neither flora survey utilised recommended methods that would properly clarify floristic community types present (Parks and Wildlife, 2015a). It is advised that a number of community types may be present in the quadrats surveyed and further analysis and mapping would be required to determine the potential occurrence of, and impact to, the PEC (Parks and Wildlife, 2015a).

Noting that the application area includes vegetation in near pristine (Keighery, 1994) condition, significant habitat for fauna including species of conservation significance, is located within a conservation area and is part of an ecological linkage, it is considered that the vegetation under application comprises a high level of biological diversity.

Given the above, the proposed clearing is at variance to this Principle.

To counterbalance the significant residual impacts the proposed clearing will have on biodiversity, the applicant has proposed an offset which consists of providing a monetary contribution towards the purchase of 109 hectares of land within the Shire of Chittering or Gingin. An assessment of the proposed offset using the Commonwealth Department of the Environment Offset Assessment Guide determined that it is of a sufficient size to address the significant environmental impacts.

Methodology

References:
DEC (2012a)
Ecologia (2014)
EPA (2013)
GHD (2013)
Gnangara Sustainability Strategy (2009)
Keighery (1994)
Molloy et al. (2009)
Parks and Wildlife (2007-)
Parks and Wildlife (2015a)
Water Corporation (2015)
WAPC (2015)

GIS Databases:
SAC BioDatasets - accessed January 2016

(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.

Comments

Proposed clearing is at variance to this Principle

The application area is located within Bush Forever site 399, which is part of the Gnangara Moore River State Forest. The Gnangara Moore River State Forest is part of a large contiguous north-south remnant of native vegetation with Bush Forever sites 192, 304, 462 and 380. The application area also adjoins large areas of reserved vegetation to the east through Bush Forever site 300. The Environmental Protection Authority (EPA, 2013) recognises that large consolidated naturally vegetated areas are the most resilient in protecting biodiversity in the long term. The EPA recommends that development projects should aim to retain naturally vegetated areas in large consolidated blocks to avoid fragmentation or isolation.

The application area is part of north-south and east-west ecological linkages defined in the Gnangara Sustainability Strategy (2009). Ecological linkages are defined as 'a series of (both contiguous and non-contiguous) patches of native vegetation which, by virtue of their proximity to each other, act as stepping stones of habitat which facilitate the maintenance of ecological processes and the movement of organisms within, and across, a landscape' (Molloy et al., 2009). On this basis, it is considered that the application area may be significant for the movement of local fauna within the landscape.

The greater the size of an area of remnant vegetation, the greater its capacity to maintain a larger and more viable suite of species (Molloy et al., 2009). It is considered, therefore, that the application area together with adjoining vegetation is also likely to support discrete fauna populations.

Thirty fauna species of conservation significance have been recorded within the local area (10 kilometre radius) (Parks and Wildlife, 2007-). A fauna assessment of the application area (GHD, 2013) determined that Carnaby's cockatoo (*Calyptorhynchus latirostris*), forest red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*), Baudin's cockatoo (*Calyptorhynchus baudinii*), black-striped snake (*Neelaps calonotos*), western brush wallaby (*Macropus irma*) and graceful sun moth (*Synemon gratiosa*) may occur within the application area. In addition, chuditch (*Dasyurus geoffroii*) and quenda (*Isoodon obesulus* subsp. *fusciventer*) may be impacted by the proposed clearing.

Carnaby's cockatoo is listed as endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and under the *Wildlife Conservation Act 1950* (WC Act). Carnaby's cockatoo nests in large hollows of eucalyptus trees and forage 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, especially seeds from cones of Pinus species (Shah, 2006; Valentine and Stock, 2008). Clearing of feeding habitat on the Swan Coastal Plain poses a significant threat to the long term survival of Carnaby's cockatoo (Shah, 2006). It is unlikely that trees of an age and size suitable for black cockatoo nesting are present within the application area, therefore it is not likely to provide significant nesting habitat for this species (DER, 2015).

Since the late 1940s Carnaby's cockatoo has suffered a 30 per cent contraction in range, a 50 per cent decline in population size, and between 1968 and 1990 disappeared from more than a third of its breeding range. Basic ecological theory, expert opinion and recent evidence, suggests that the remaining native and pine plantation foraging habitat on the Swan Coastal Plain is just sufficient to support the current population of Carnaby's cockatoo. Therefore any reduction in the amount of food source will result in a reduction in the carrying capacity of the region and a decline in the population of Carnaby's cockatoo (Saunders, 1990; Johnstone and Storr, 1998; Saunders and Ingram, 1998; Garnett et al., 2011). Multiple confirmed Carnaby's cockatoo roost sites have been mapped within the local area, seven of which fall within five kilometres.

The Carnaby's cockatoo recovery plan (DEC, 2012a) summarises habitat critical to the survival of Carnaby's cockatoos as:

- the eucalypt woodlands that provide nest hollows used for breeding, together with nearby vegetation that provides feeding, roosting and watering habitat that supports successful breeding;
- woodland sites known to have supported breeding in the past and which could be used in the future, provided adequate nearby food and/or water resources are available or are re-established; and
- in the non-breeding season the vegetation that provides food resources as well as the sites for nearby watering and night roosting that enable the cockatoos to effectively utilise the available food resources.

The Carnaby's cockatoo recovery plan also states "success in breeding is dependent on the quality and proximity of feeding habitat within 12 kilometres of nesting sites. Along with the trees that provide nest hollows, the protection, management and increase of this feeding habitat that supports the breeding of Carnaby's cockatoo is a critical requirement for the conservation of the species" (DEC, 2012a).

On the basis of the above, it is considered that the application area contains significant habitat for Carnaby's cockatoo.

Noting that the application area is located at the edge of the mapped range of forest red-tailed black cockatoo and Baudin's cockatoo, it is considered that the vegetation under application provides suitable habitat for these species but is unlikely to comprise significant habitat for these species.

The chuditch is listed as vulnerable under the EPBC Act and WC Act, and has been recorded within the local area (seven records from 2002 to 2010). The preferred habitats of the chuditch include forest, mallee shrublands and woodland with an adequate number of refuge sites. Given the species large home range the retention of vegetation corridors is noted as an important requirement of the species (DEC, 2012b). Noting the vegetation types present within the application area, it is considered that the vegetation under application meets the habitat requirements deemed critical to the survival of the species (DEC, 2012b), that this species may therefore be impacted by the proposed clearing. On this basis it is considered that the vegetation under application may comprise significant habitat for this species.

The black-striped snake is listed as Priority 3 by the Department of Parks and Wildlife (Parks and Wildlife), and has been recorded within the local area. Noting that the habitat preferences of this species (Banksia woodland with sandy soil) are present within the application area, it is considered that this species may be impacted by the proposed clearing.

The western brush wallaby and graceful sunmoth are listed as Priority 4 by Parks and Wildlife, and have been recorded within the local area. Noting that the habitat preferences of these species are consistent with the habitat types present within the application area, it is considered that they may be impacted by the proposed clearing. However, as these species are listed as Priority 3 and 4 and are also known from populations outside the local area, it is considered that the application area is unlikely to comprise significant habitat for them.

The quenda is listed as Priority 5 by Parks and Wildlife, and has been recorded within the local area. Priority 5 is applied for species that are managed under a specific conservation program, the cessation of which would result in the species becoming threatened. Noting that the habitat preferences of this species are consistent with the habitat types present within the application area, it is considered that it may be impacted by the proposed clearing. However, noting that this species is listed as Priority 5 and is also known from populations outside the local area, it is considered that the application area is unlikely to comprise significant habitat for it.

On the basis of the above, noting that the application area may be significant for the movement of local fauna within the landscape, is likely to support discrete fauna populations, contains significant habitat for Carnaby's cockatoo, may contain significant habitat for the chuditch, and includes suitable habitat for other fauna species of conservation significance, it is considered that the vegetation under application comprises significant habitat for indigenous fauna.

Given the above, the proposed clearing is at variance to this Principle.

To counterbalance the significant residual impacts the proposed clearing will have on fauna habitat, the applicant has proposed an offset which consists of providing a monetary contribution towards the purchase of 109 hectares of land within the Shire of Chittering or Gingin. An assessment of the proposed offset using the Commonwealth Department of the Environment Offset Assessment Guide and information provided by the applicant determined that that it is of a sufficient size to address the significant environmental impacts.

Methodology

References:
DEC (2012a)
DEC (2012b)
DER (2015)
EPA (2013)
Garnett et al. (2011)
GHD (2013)
Gnangara Sustainability Strategy (2009)
Johnstone and Storr (1998)
Molloy et al. (2009)
Parks and Wildlife (2007-)
Saunders (1990)
Saunders and Ingram (1998)
Shah (2006)
Valentine and Stock (2008)
WAPC (2015)

GIS Databases:
Carnaby Cockatoo breeding sites
Carnaby Cockatoo feeding
Hydrography linear

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

Comments

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

Eight rare flora species have been recorded within the local area (10 kilometre radius).

Flora surveys within the application area, undertaken on 30 October 2012 (GHD, 2013) and 14 March 2014 (Ecologia, 2014), did not record any rare flora species or vegetation necessary for the continued existence of rare flora.

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

Methodology

References:
DEC (2012b)
Ecologia (2014)
GHD (2013)

GIS Databases:
SAC BioDatasets - accessed January 2016

(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.

Comments

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

Thirteen threatened ecological communities (TEC) have been recorded within the local area (10 kilometre radius).

Flora surveys within the application area, undertaken on 30 October 2012 (GHD, 2013) and 14 March 2014 (Ecologia, 2014), did not record the presence of a TEC.

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

Methodology

References:
Ecologia (2014)
GHD (2013)

GIS Databases:
SAC BioDatasets - accessed January 2016

(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.

Comments

Proposed clearing is at variance to this Principle

The application area is located within the Swan Coastal Plain Interim Biogeographic Regionalisation of Australia (IBRA) bioregion. This IBRA bioregion has approximately 39 per cent of its pre-European vegetation extent remaining (Government of Western Australia, 2014).

The vegetation under application is mapped as Beard vegetation association 949 of which there is approximately 57 per cent pre-European vegetation extent remaining within the Swan Coastal Plain IBRA bioregion (Government of Western Australia, 2014).

The application area is mapped as Heddle vegetation complexes, Bassendean Complex – North \ Transition vegetation complex and Bassendean Complex – North which retain approximately 89 per cent and 72 per cent pre-European vegetation extent respectively (Parks and Wildlife, 2015b).

The application area is located within the City of Swan, within which there is approximately 43 per cent pre-European vegetation extent remaining (Government of Western Australia, 2014).

The local area (10 kilometre radius) retains approximately 30 per cent native vegetation.

The national objectives and targets for biodiversity conservation in Australia have 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).

Noting that the application area includes vegetation in near pristine (Keighery, 1994) condition, significant habitat for fauna including species of conservation significance, is located within a conservation area and is part of an ecological linkage, and noting the extent of native vegetation cover in the local area, it is considered that the vegetation under application is significant as a remnant in a highly cleared area.

Given the above, the proposed clearing is at variance to this Principle.

To counterbalance the significant residual impacts the proposed clearing will have on biodiversity, the applicant has proposed an offset which consists of providing a monetary contribution towards the purchase of 109 hectares of land within the Shire of Chittering or Gingin. An assessment of the proposed offset using the Commonwealth Department of the Environment Offset Assessment Guide determined that it is of a sufficient size to address the significant environmental impacts.

	Pre-European (ha)	Current Extent (ha)	Remaining (%)	Extent in Parks and Wildlife Managed Lands (%)
IBRA Bioregion*				
Swan Coastal Plain	1,501,222	580,697	39	37
Local government*				
City of Swan	104,436	44,924	43	29
Beard Vegetation Association in Bioregion *				
949	209,983	120,390	57	56
Heddle Vegetation Complex **				
Bassendean Complex-North-\Transition Complex	20,856	18,564	89	54
Bassendean Complex-North	79,057	56,600	72	39

Methodology

References:
Commonwealth of Australia (2001)
*Government of Western Australia (2014)
Keighery (1994)
**Parks and Wildlife (2015b)

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

Comments

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

According to available databases, no watercourses or wetlands have been mapped within the application area. The closest mapped water feature (unnamed damp lands) occurs within approximately 500 metres of the application area.

Flora surveys of the application area did not record vegetation growing in association with a wetland (Ecologia, 2014).

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

Methodology

References:
Ecologia (2014)

GIS Databases:
Hydrography linear
Geomorphic wetlands, Swan Coastal Plain

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

Comments

Proposed clearing may be at variance to this Principle

Soils within the application area have been mapped within the following subsystems (Schoknecht et al., 2004):

- Bassendean Jandakot Phase (located over the southern application area) which is described as Jandakot low dunes. Slopes less than 10 per cent and generally more than 5 metres relief. Grey sand over pale yellow sands generally underlain by humic and iron podsols; and
- Bassendean Jandakot steep Phase (located over a majority of the application area) which is described as Jandakot dune ridges. Slopes less than 15 per cent and usually more than 10 metres relief. Grey medium sand overlying pale yellow sands generally underlain by humic and iron podsols.

The application area has been mapped within the following land degradation risk categories (Schoknecht et al., 2004):

- 30 to 50 per cent of the map unit has a moderate to high salinity risk;
- 10 to 30 per cent of the map unit has a high to extreme water erosion risk;
- less than three per cent of the map unit has a moderate to high water logging risk; and
- greater than 70 per cent of the map unit has a high to extreme wind erosion risk.

According to available databases, no watercourses or wetlands have been mapped within the application area. The closest mapped water feature (unnamed damp lands) occurs within approximately 500 metres of the application area. Average relief across the proposed tank sites is approximately 1:9, which indicates a significant slope on site. This relief was confirmed during a site inspection of the application area (DER, 2015).

Given the identified risk categories, that the site is situated on a natural high point and that no watercourses or wetlands have been mapped within the application area, it is considered that the proposed clearing is unlikely to cause appreciable land degradation in the form of waterlogging or salinity.

Noting the sandy soil types and topography present within the application area, and the mapped wind and water erosion risks, it is considered that the proposed clearing may lead to appreciable land degradation in the form of wind and/or water erosion. This risk would be heightened if a cleared area is left bare of cover for an extended period of time. The applicant is required to implement a construction environmental management plan (EMP) in order to limit this risk. The EMP will include actions such as:

- storing topsoil in an appropriate manner to be placed on disturbed areas on completion of construction;
- within three months of clearing, any areas not required for continued construction work will be hydro mulched or compacted; and
- mesh fencing will be installed during construction works where it is deemed necessary to avoid transport of sand by wind and water off site.

Given the above, the proposed clearing may be at variance to this Principle.

Methodology

References:
DER (2015)
Schoknecht et al. (2004)

GIS Databases:
DAFWA subsystems V5
Salinity Risk
Wind erosion
Water erosion risk
Waterlogging risk
Hydrography linear
Geomorphic wetlands, Swan Coastal Plain

(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.

Comments

Proposed clearing is at variance to this Principle

The application area is located within Bush Forever site 399, which is part of the Gnangara Moore River State Forest. The Gnangara Moore River State Forest is part of a large contiguous north-south remnant of native vegetation with Bush Forever sites 192, 304, 462 and 380.

The application area also adjoins large areas of reserved vegetation to the east through Bush Forever site 300. The Environmental Protection Authority (EPA, 2013) recognises that large consolidated naturally vegetated areas are the most resilient in protecting biodiversity in the long term. The EPA recommends that development projects should aim to retain naturally vegetated areas in large consolidated blocks to avoid fragmentation or isolation.

The application area is part of north-south and east-west ecological linkages defined in the Gnangara Sustainability Strategy (2009). Ecological linkages are defined as 'a series of (both contiguous and non-contiguous) patches of native vegetation which, by virtue of their proximity to each other, act as stepping stones of habitat which facilitate the maintenance of ecological processes and the movement of organisms within, and across, a landscape' (Molloy et al., 2009). On this basis, it is considered that the application area may be significant for the movement of local fauna within the landscape.

The Strategic Assessment of the Perth Peel Regions identified the retention of these ecological linkages, including the vegetation surrounding the application area, to increase their long term viability (WAPC, 2015). The vegetation directly to the west of the application area has been cleared for mining already, impacting on the linkage value.

The Department of Planning (2015) advised that the clearing of native vegetation within State Forest and a Bush Forever area is generally not supported. Any approved clearing must be consistent with section 5.1.2.1 of Strategic Planning Policy 2.8 Bushland Policy for the Perth metropolitan region and the WA Environmental Offsets Policy (2011).

On this basis it is considered that the proposed clearing will lead to a direct loss of vegetation within conservation areas as well as potentially impacting on the movement of fauna through the landscape and between reserves.

Given the above, the proposed clearing is at variance to this Principle.

To counterbalance the significant residual impacts the proposed clearing will have to a conservation area, the applicant has proposed an offset which consists of providing a monetary contribution towards the purchase of 109 hectares of land within the Shire of Chittering or Gingin to form part of the conservation estate. An assessment of the proposed offset using the Commonwealth Department of the Environment Offset Assessment Guide determined that it is of a sufficient size to address the significant environmental impacts.

Methodology

References:
Department of Planning (2015)
EPA (2013)
Gnangara Sustainability Strategy (2009)
Molloy et al. (2009)
WAPC (2015)

GIS Databases:
Bush forever
CALM Regional Parks
Parks and Wildlife Tenure

(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.

Comments

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

No watercourses or wetlands have been mapped within the application area. The closest mapped water feature (unnamed damp lands), occurs within approximately 500 meters. Thirty to 50 per cent of the land map unit covering the application area has a moderate to high salinity risk (Schoknecht et al., 2004). This level of risk is considered low to moderate.

Noting the distance to the nearest watercourse, it is considered that the proposed clearing is unlikely to lead to sedimentation, erosion, turbidity or eutrophication of surface water.

The application area has been chosen as it is one of only two sites identified within the vicinity of Ellenbrook with a sufficient height above sea level. Noting the distance to water features and the low salinity risk, it is considered that the proposed clearing is unlikely to cause deterioration in the quality of underground water.

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

Methodology

References:
Schoknecht et al. (2004)

GIS Databases:
Salinity Risk
Hydrography linear
Geomorphic wetlands, Swan Coastal Plain

The Environmental Protection Authority (EPA, 2013) recognises that large consolidated naturally vegetated areas are the most resilient in protecting biodiversity in the long term. The EPA recommends that development projects should aim to retain naturally vegetated areas in large consolidated blocks to avoid fragmentation or isolation.

The application area is part of north-south and east-west ecological linkages defined in the Gnangara Sustainability Strategy (2009). Ecological linkages are defined as 'a series of (both contiguous and non-contiguous) patches of native vegetation which, by virtue of their proximity to each other, act as stepping stones of habitat which facilitate the maintenance of ecological processes and the movement of organisms within, and across, a landscape' (Molloy et al., 2009). On this basis, it is considered that the application area may be significant for the movement of local fauna within the landscape.

The Strategic Assessment of the Perth Peel Regions identified the retention of these ecological linkages, including the vegetation surrounding the application area, to increase their long term viability (WAPC, 2015). The vegetation directly to the west of the application area has been cleared for mining already, impacting on the linkage value.

The Department of Planning (2015) advised that the clearing of native vegetation within State Forest and a Bush Forever area is generally not supported. Any approved clearing must be consistent with section 5.1.2.1 of Strategic Planning Policy 2.8 Bushland Policy for the Perth metropolitan region and the WA Environmental Offsets Policy (2011).

On this basis it is considered that the proposed clearing will lead to a direct loss of vegetation within conservation areas as well as potentially impacting on the movement of fauna through the landscape and between reserves.

Given the above, the proposed clearing is at variance to this Principle.

To counterbalance the significant residual impacts the proposed clearing will have to a conservation area, the applicant has proposed an offset which consists of providing a monetary contribution towards the purchase of 109 hectares of land within the Shire of Chittering or Gingin to form part of the conservation estate. An assessment of the proposed offset using the Commonwealth Department of the Environment Offset Assessment Guide determined that it is of a sufficient size to address the significant environmental impacts.

Methodology

References:
Department of Planning (2015)
EPA (2013)
Gnangara Sustainability Strategy (2009)
Molloy et al. (2009)
WAPC (2015)

GIS Databases:
Bush forever
CALM Regional Parks
Parks and Wildlife Tenure

(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.

Comments

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

No watercourses or wetlands have been mapped within the application area. The closest mapped water feature (unnamed damp lands), occurs within approximately 500 meters. Thirty to 50 per cent of the land map unit covering the application area has a moderate to high salinity risk (Schoknecht et al., 2004). This level of risk is considered low to moderate.

Noting the distance to the nearest watercourse, it is considered that the proposed clearing is unlikely to lead to sedimentation, erosion, turbidity or eutrophication of surface water.

The application area has been chosen as it is one of only two sites identified within the vicinity of Ellenbrook with a sufficient height above sea level. Noting the distance to water features and the low salinity risk, it is considered that the proposed clearing is unlikely to cause deterioration in the quality of underground water.

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

Methodology

References:
Schoknecht et al. (2004)

GIS Databases:
Salinity Risk
Hydrography linear
Geomorphic wetlands, Swan Coastal Plain

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

Comments

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

Less than three per cent of the land map unit covering the application area has a moderate to high flood risk (Schoknecht et al., 2004). No watercourses or wetlands are present within the application area.

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

Methodology

References:
Schoknecht et al. (2004)

GIS Databases:
Hydrography linear
Flood Risk

Planning instrument, Native Title, RIWI Act Licence, EP Act Licence, Works Approval, Previous EPA decision or other matter.

Comments

The project is proposed to be progressed in three stages with the primary clearing of vegetation to be undertaken during stage 1 when the first of three water storage tanks will be installed. The second tank (stage 2) is expected to be required around 2034. The third tank will only be required if there is a high demand and is not expected to be required before 2058 (Water Corporation, 2015). The applicant has stated that the clearing and compaction of all three tank sites is required to be undertaken at the beginning of the project to avoid damage of established infrastructure during successive construction.

In order to avoid and minimise the clearing of native vegetation, Water corporation undertook an assessment of suitable tank sites within the vicinity of Ellenbrook. It was determined that the chosen tank site is one of only two sites with a suitable elevation within the vicinity of Ellenbrook (Water Corporation, 2015).

On 16 March 2015 the Department of the Environment (DotE) determined that the project is a controlled action due to the potential impact to Carnaby's cockatoo. As DotE takes into account non-native pine plantations in their determination, the proposed clearing could not be assessed under the assessment bilateral agreement. The DotE's has not finalised an approval.

In 2014, after review by DER, the Water Corporation undertook the clearing of geotechnical lines for the project under state wide clearing permit CPS185/6. To account for cumulative impacts any offset will be required to address this clearing. This clearing involved the removal of 0.267 hectares of native vegetation.

To counterbalance the significant residual impacts of the proposed clearing and clearing undertaken under CPS 185/6 for this project, the applicant has proposed an offset which consists of providing a monetary contribution towards the purchase of 109 hectares of land within the Shire of Chittering or Gingin. Using the Commonwealth DotE Offset Assessment Guide and information provided by the applicant, DER determined that the proposed offset accounts for the significant environmental impact to Carnaby's cockatoo and is therefore, of a sufficient size to address the significant environmental impacts of the proposed clearing.

On 2 November 2015 the application was advertised in *The West Australian* newspaper for a period of 21 days. Two public submissions (2015a; 2015b) were received in relation to this application, contending that the vegetation under application is significant Carnaby's cockatoo habitat, and that the proposed clearing is likely to lead to the deterioration of surface water and groundwater and may lead to land degradation in the form of wind erosion. These matters have been addressed in the assessment against the clearing principles.

No Aboriginal Sites of Significance have been mapped within the application area.

Methodology

References:
Submission (2015a)
Submission (2015b)
Water Corporation (2015)

GIS Databases:
Aboriginal Sites of Significance

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