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.: 6516/1
Permit type: Area Permit

1.2. Proponent details

Proponent's name: **David Brinley Reid**

1.3. Property details

Property: LOT 4156 ON DEPOSITED PLAN 207767 (Lot No. 4156 GOVERNOR BROOME SCOTT RIVER 6288)
Local Government Area: Shire of Augusta-Margaret River

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
0.9	-	Mechanical Removal	Grazing and Pasture

1.5. Decision on application

Decision on Permit Application: Refusal
Decision Date: 16 May 2016
Reasons for Decision: The applicant applied to clear 68 hectares of native vegetation and during assessment amended the application to 40.9 hectares of native vegetation.

The clearing application has been assessed against the clearing principles, planning instruments and other matters in accordance with s51O of the Environmental Protection Act 1986, and it has been concluded that the proposed clearing may be at variance to clearing principle (d) and (j) and is at variance to the remaining clearing principles.

An assessment has determined that the proposed clearing will cause appreciable land degradation in the form of waterlogging and eutrophication and subsequent deterioration in water quality, will impact on native vegetation that comprises a high level of biological diversity, habitats for conservation significant fauna, a mapped conservation-significant wetland system, a mapped regionally significant fauna corridor, rare and priority flora and may impact on a mapped nationally-listed threatened ecological community.

In response to the environmental concerns raised by DER, the applicant proposed to modify the application by reducing the extent of the proposed clearing from 68 hectares to 40.9 hectares, excluding vegetation in close proximity to Scott River and retaining large habitat trees as well as stands of Melaleuca.

Taking into account the applicant's additional advice, the Delegated Officer considered that the proposed clearing remains likely to result in appreciable land degradation and water quality deterioration, and has significant environmental impacts to flora and fauna including species of conservation significance and may impact on a nationally-listed threatened ecological community.

Site Information

1.6. Existing environment and information

1.6.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
The vegetation under application has been mapped as Beard vegetation associations (Shepherd et al., 2001): • 27 which is described as low woodland, Melaleuca sp; • 51 which is described as sedgeland, reed swamps, occasionally with heath;	To clear 40.9 hectares of native vegetation within Lot 4156 on Deposited Plan 207767, Scott River, for cropping and grazing.	Pristine: No obvious signs of disturbance (Keighery 1994). To Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994).	The vegetation condition and description was determined through site inspections undertaken by former Department of Environment and Conservation staff in June and September 2010, 25 June 2013 (Parks and Wildlife, 2013) and the Department of Environment Regulation on 2 March 2016. The majority of the vegetation is in a very good (Keighery, 1994) or better condition (Parks and Wildlife, 2013).

and
- 975 which is described as low woodland, jarrah.

The vegetation under application has been mapped as Mattiske vegetation complexes (Mattiske and Havel, 1998):
- Sd which is described as low open forest and low woodland of Eucalyptus marginata subsp. marginata-Corymbia calophylla-Agonis flexuosa with some Eucalyptus patens and Banksia spp. on low dunes to low woodland of Melaleuca preissiana-Banksia littoralis on inter-dune depressions in hyperhumid and perhumid zones; and
- Swd: Mosaic of sedgeland of Restionaceae-Cyperaceae spp. and closed heath of Myrtaceae-Proteaceae spp. with occasional Banksia ilicifolia on swampy depressions and stunted Eucalyptus marginata subsp. Marginata-Banksia attenuata-Xylomelum occidentale on low sandy rises in hyperhumid and perhumid zones.

The Department of Parks and Wildlife (2015a) has described the vegetation within the location as:

Community 2 - Banksia attenuata and/or Jarrah open forest on small dunes and ridges of grey sand. The highest of these ridges found in the northern extent of the location supports a Banksia attenuata, Eucalyptus marginata low open forest plant community. The lower dunes and ridges lack Banksia attenuata and support a Eucalyptus marginata low open forest with an understory dominated by Taxandria parviceps, Kunzea recurva and Melaleuca thymoides.

Community 3 - Jarrah/Marri on brown loamy soils.
Trees: Eucalyptus marginata, Corymbia calophylla, Agonis flexuosa, Banksia littoralis
Shrubs: Xanthorrhoea preissii, Hakea ruscifolia, Acacia myrtifolia, Agonis parviceps, Dampiera heteroptera, D.trigona, Conospermum paniculatum, Adenanthos detmoldii.
Sedges: Cyathochaeta avenacea, Tetraria octandra, Mesomelaena tetragona.
Herbs: Anigozanthos flavidus, Dasypogon bromeliifolius

The area of this community mapped as Community 3a, includes some areas that appear to be associated with extended moisture and a vegetation that includes a Taxandria linearifolia closed tall scrub with emergent T.juniperina.

Community 7 - Central Closed Low Heath.
Trees: Melaleuca preissiana, Banksia occidentalis
Shrubs: Hypocalymma ericifolium, Beaufortia sparsa, Homalospermum firmum, Adenanthos detmoldii, A.obovatus, Hypocalymma cordifolium, Grevillea papillosa, Hakea ceratocarpa, H.varia, Melaleuca incana, Conospermum paniculatum, C.quadripetalum, Dampiera heteroptera.
Sedges: Evandra aristata, Anarthria scabra, Baxteria australis, Mesomelaena tetragona, Leptocarpus/Meeboldina sp.

Community 8 - Areas of deep seasonal inundation, these areas have a plant community dominated by Restionaceae sedge species with an overstorey of Taxandria inundata and/or Melaleuca rhaphiophylla with some Melaleuca preissiana.

2. 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 applicant applied to clear 68 hectares of native vegetation and during assessment amended the application to 40.9 hectares of native vegetation within Lot 4156 on Deposited Plan 207767, Scott River, for cropping and grazing.

The majority of the area is in a very good (Keighery, 1994) or better condition (Parks and Wildlife, 2013). The local area (10 kilometre radius) surrounding the application area retains approximately 50 per cent native vegetation.

The application area forms part of an ecological linkage, defined by the South West Regional Ecological Linkage Report (Molloy et al., 2009). This linkage connects the application area to reserves north and significant remnant vegetation to the south. A second linkage is mapped adjacent to the southern portion of the application area and connects it to reserves east and west. Ecological linkages have been 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). It is considered that the application area is part of a larger remnant that facilitates fauna movement across the local landscape and as a result, is likely to support high biodiversity values within the local area.

The Department of Parks and Wildlife (Parks and Wildlife)(2013) advised that the diverse range of plant communities intermingled and transitional with the ironstone found in the location is not represented elsewhere. This transitional and diverse succession of vegetation communities leading north from the Scott River through the application area and the chain of almost unbroken vegetation leading from the Southern Ocean (approximately 3.5 kilometres south), through the application area to the forest vegetation of the Blackwood plateau to the north is unique.

Seven rare flora species and 27 flora species listed as Priority by Parks and Wildlife have been recorded within the local area (10 kilometre radius). As the preferred habitat type for each of these species is present within the application area, they may be present within the application area (Western Australian Herbarium, 1998-). Site inspections within Lot 4156 (Parks and Wildlife, 2013) identified one rare flora species and noted that following appropriate surveys, additional rare flora are highly likely to be found (Parks and Wildlife, 2013; Parks and Wildlife, 2015a). The site inspections also recorded 12 Priority flora species. It was noted that a further seven priority flora species are likely to be confirmed within the lot given appropriate surveys (Parks and Wildlife, 2013; Parks and Wildlife, 2015a). The site inspections were limited by the large size of the survey area and flowering times of the flora (Parks and Wildlife, 2013).

Inspections of the property recorded a number of other flora species, the extent and conservation status of which would require further study. These species include (Parks and Wildlife, 2013):

- A species considered to be a relict population on the Scott and Blackwood River Plain;
- A variation of a former priority listed species distinct for its adaptation to the hydrology of the area. Further research is likely to identify it as taxonomically distinct; and
- A species previously unrecorded on the Scott River Plain distinct in its leaf structure and habitat within a seasonally inundated plant community.

The application area falls within close proximity to the third largest mapped occurrence of the Scott River Ironstone Association threatened ecological community (TEC). The conservation advice for this community states "Additional areas such as adjoining native vegetation ... may be critical to the survival of the ecological community depending on factors such as presence of key functional, threatened, or rare species, their size and shape, linkages to other patches and landscape position" (DotE, 2013a).

Based on the location of the application area within the landscape, the reasonable probability for contingent rare and priority flora populations and the likely role the application area in maintaining the hydrology of the area, including that of the TEC vegetation, the application area may be necessary in the maintenance of this TEC.

Twenty four conservation significant, non-marine fauna species have been recorded within 20 kilometres of the application area. The proposed clearing has the potential to impact on eight fauna species listed as rare or likely to become extinct under the Wildlife Conservation Act, 1950 (WC Act) and six fauna species listed as priority by Parks and Wildlife (Parks and Wildlife, 2007-). The vegetation under application may also be significant in maintaining habitat for a further five conservation significant fauna species.

Noting the composition and condition of the vegetation under application, the proposed clearing is likely to impact forest red-tailed black cockatoo (Calyptorhynchus banksii subsp. naso), Baudin's cockatoo (Calyptorhynchus baudinii) and Carnaby's cockatoo (Calyptorhynchus latirostris) listed as 'rare or likely to become extinct' under the WC Act. Carnaby's cockatoo and Baudin's cockatoo are listed as endangered while the forest red-tailed black cockatoo is listed as vulnerable under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). The application area contains suitable nesting, feeding and roosting habitat for these species. The conservation advice for the 'Scott River Ironstone Association' TEC lists these species as well as chuditch (Dasyurus geoffroii), as species that may be present within the vegetation association.

Western ringtail possum (Pseudocheirus occidentalis), chuditch, mallee fowl (Leipoa ocellata), brush tailed phascogale (Phascogale tapoatafa subsp. tapoatafa) and quokka (Setonix brachyurus) are listed as 'rare or likely to become extinct' under the WC Act. The habitat requirements for these species are present within the application area and given its position within the landscape, the vegetation under application may provide significant habitat for these.

Quenda (Isoodon obesulus fusciventer), masked owl (Tyto novaehollandiae subsp. novaehollandiae), short-nosed snake (Elapognathus minor), western brush wallaby (Macropus irma), blue-billed duck (Oxyura australis) and biting midge (Austroconops mcmillani) are listed as priority fauna by Parks and Wildlife. As the habitat requirements for these species exist within the application area and each has been recorded from within the local area, the vegetation under application may contain significant habitat for these species.

Carter's freshwater mussel (Westralunio carteri) and Balston's pygmy perch (Nannatherina balstoni) are listed as 'rare or likely to become extinct' under the WC Act. Given the potential for the proposed clearing to cause degradation of significant habitat for these species within the adjoining Scott River, the vegetation under application may be significant in the maintenance of habitat for these species. The vegetation under application may also be significant in maintaining habitat for the priority fauna species Black-stripe minnow (Galaxiella nigrostriata), pouched lamprey (Geotria australis) and water-rat (Hydromys chrysogaster).

The application area falls within an extensive palusplain wetland (seasonally waterlogged flat) and within the flood plain of the Scott River and contains wetland vegetation in numerous areas (DER 2016).

In response to significant environmental impacts identified by the Department of Environment Regulation (DER), the applicant reduced the extent of the proposed clearing from 68 hectares to 40.9 hectares and excluded vegetation in close proximity to the Scott River and proposed to retain large Carnaby's cockatoo habitat trees and stands of Melaleuca. The applicants proposed measures do not address impacts to biodiversity values related to the mapped wetland, foraging habitat for black cockatoos and other fauna, habitat for rare and priority flora and the maintenance of a TEC and an ecological corridor.

Taking into account the applicant's advice, it is acknowledged that the reduction in the size of the application area is likely to reduce the scale of impacts to biodiversity values. However noting the extent and vegetation condition of the amended application area, the presence of suitable habitat for conservation significant fauna, the regional significance as a fauna corridor, that the application area contains suitable habitat for a number of rare and priority flora species and may be necessary in the maintenance of a TEC, it is considered that the application area comprises a high level of biodiversity.

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

Methodology

References:
DotE (2013a)
DER (2016)
Environmental Protection Authority (2000)
Government of Western Australia (2001)
Government of Western Australia (2013)
Keighery (1994)
Molloy et al. (2009)
Parks and Wildlife (2013)
Parks and Wildlife (2015a)
Shepherd et al. (2001)
Western Australian Herbarium (1998-)

GIS datasets:
Hydrography, linear
Pre-European vegetation
SAC Biodatasets
SWREL

(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 occurs within approximately 100 metres of the threatened ecological community (TEC) Scott River Ironstone Association. The Commonwealth Department of the Environment conservation advice for this vegetation association lists the forest red-tailed black cockatoo, Baudin's cockatoo, Carnaby's cockatoo and chuditch as species that may occur within the TEC (DotE, 2013a).

The application area forms part of an ecological linkage, defined by the South West Regional Ecological Linkage Report (Molloy et al., 2009). This linkage connects the application area to reserves north and significant remnant vegetation to the south. A second linkage is mapped adjacent to the southern portion of the application area and connects it to reserves east and west. Ecological linkages have been 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". It is considered that the application area is part of a larger remnant that facilitates fauna movement across the local landscape.

Fifteen non-marine fauna species listed as rare or likely to become extinct under the Wildlife Conservation Act 1950 (WC Act) and nine species listed as priority by the Department of Parks and Wildlife (Parks and Wildlife) have been recorded within a 20 kilometre radius of the application area (Parks and Wildlife, 2007-). These are:

- Forest red-tailed black cockatoo (Calyptorhynchus banksii subsp. naso);
- Baudin's cockatoo (Calyptorhynchus baudinii);
- Carnaby's cockatoo (Calyptorhynchus latirostris);
- western ringtail possum (Pseudocheirus occidentalis);
- chuditch (Dasyurus geoffroii);
- quokka (Setonix brachyurus);
- woylie (Bettongia penicillata subsp. Ogilbyi);
- Balston's pygmy perch (Nannatherina balstoni);
- Carter's freshwater mussel (Westralunio carteri);
- white-bellied frog (Geocrinia alba);
- orange-bellied frog (Geocrinia vitellina);
- mallee fowl (Leipoa ocellata);
- brush tailed phascogale (Phascogale tapoatafa subsp. tapoatafa);
- mud minnow (Galaxiella munda);
- western ground parrot (Pezoporus flaviventris);
- pouched lamprey (Geotria australis);
- black-stripe minnow (Galaxiella nigrostriata);
- quenda (Isoodon obesulus fusciventer);
- masked Owl (Tyto novaehollandiae subsp. novaehollandiae);
- biting midge (Austroconops mcmillani);
- short-nosed Snake (Elapognathus minor);
- blue-billed duck (Oxyura australis);
- western brush wallaby (Macropus irma); and
- water-rat (Hydromys chrysogaster).

Of these, noting the composition and condition of the vegetation under application, the proposed clearing may impact on eight fauna species listed as rare or likely to become extinct under the WC Act and six fauna species listed as priority by Parks and Wildlife.

Forest red-tailed black cockatoo, Baudin's cockatoo and Carnaby's cockatoo are listed as endangered and vulnerable under the WC Act respectively. Carnaby's cockatoo is listed as endangered while the forest red-tailed black cockatoo and Baudin's cockatoo are listed as vulnerable under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). Black cockatoos nest in large hollows of eucalyptus trees and forage on the seeds, nuts and flowers of a large variety of plants including Eucalyptus and Banksia species (Shah, 2006).

The application areas contain a variety of vegetation types including jarrah, banksia and marri forests and seasonally inundated wetlands, with the vegetation predominantly in a very good (Keighery, 1994) or better condition (DER, 2016). The vegetation under application contains suitable nesting, foraging and roosting habitat for black cockatoo species. A site inspection of the application area recorded Black cockatoo habitat within the vegetation under application.

Western ringtail possum is listed as endangered under the WC Act and vulnerable under the EPBC Act. This species is restricted to the South West of Western Australia with Agonis flexuosa (peppermint) forming a core habitat requirement (DotE, 2013b). As the application area falls within the restricted distribution of this species and contains Agonis flexuosa (Parks and Wildlife, 2013), it represents potential habitat for this species.

Chuditch and quokka are listed as vulnerable under the WC Act and EPBC Act. Woylie is listed as critically endangered under the WC Act and endangered under the EPBC Act. The application area is consistent with their habitat requirements and given the location of the application area within the landscape, the application area may form habitat for these species (DEC, 2012a; DEC, 2013; Yeatman and Groom, 2012).

Balston's pygmy perch is listed as vulnerable under the WC Act and EPBC Act. This species occurs in a number of highly fragmented, smaller subpopulations, which are confined to smaller streams within the major river systems of south-west Western Australia. One of these subpopulations is recorded from the Scott River to which the application area is connected. Water quality degradation associated with the clearing or end land use may impact on this species and the vegetation under application may be significant in the maintenance of habitat for this species.

A land degradation assessment report completed by the Commissioner of Soil and Land Conservation (2016) noted that there would be a high risk of eutrophication to the Scott River should clearing proceed.

Carter's freshwater mussel is listed as vulnerable under the WC Act. Water quality degradation of south west rivers has led to a significant decline in the population of this species (Murdoch University, 2012). Given this, the vegetation under application may be significant in the maintenance of habitat for this species.

White-bellied frog and orange-bellied frog have been recorded within the Black Wood River system to the north-west of the application area. These species are listed as endangered and vulnerable under the EPBC Act and critically endangered and vulnerable under the WC Act respectively. As no records of these species exist within the Scott River and it is unlikely that undetected populations exist due to the high level of survey effort, they are not likely to be impacted by the proposed clearing.

Mallee fowl and brush tailed phascogale are listed as vulnerable under the WC Act and EPBC Act. These species generally utilise dry sclerophyll forests (DotE, 2013c), therefore the application area is unlikely to form habitat for these species.

Mud minnow is listed as vulnerable under the WC Act. As this species is generally found within fresh fast flowing streams of Karri forests it is not likely to be found within the application area.

Western ground parrot have been adequately surveyed with all populations recorded significantly to the east of the application area, given this they are not likely to be impacted by the proposed clearing.

Pouched lamprey is listed as Priority 1 by Parks and Wildlife. The distribution of this species extends from Margaret River to Denmark where it travels to the headwaters of streams and rivers to spawn. Juvenile lampreys may spend several years in these areas before migrating to the ocean. As the application area falls within the distribution of this species and is associated with the Scott River, the vegetation under application may be significant in the maintenance of habitat for this species.

Black-stripe minnow is listed as Priority 3 by Parks and Wildlife. This species inhabits ephemeral watercourses between Northcliffe and Esperance, aestivating in summer (Galeotti et al., 2014). As large portions of the property contain suitable habitat for this species and given the proximity to significant watercourses, the vegetation under application may be significant in the maintenance of habitat for this species.

Quenda is listed as priority 5 by Parks and Wildlife. This species prefers dense often swampy vegetation, feeding within adjacent forest and woodland (DEC, 2012b). A site inspection report of the application area noted that this species has previously been recorded from within the application area and suitable habitat was observed (Parks and Wildlife, 2013).

Masked Owl is listed as priority 3 while short-nosed Snake and biting midge are listed as Priority 2 and blue-billed duck is listed as Priority 4 by Parks and Wildlife. As these species have been recorded within the local area, the vegetation under application may contain habitat for them.

Western brush wallaby (Macropus irma) is listed as priority 4 by Parks and Wildlife. As the habitat preferences for this species are present within the application area, it may contain significant habitat for this species.

Water-rat (Hydromys chrysogaster) is listed as priority 4 by Parks and Wildlife. The habitat preferences for this species are present within vegetation adjoining the application (DEC, 2012c). Given this, the vegetation under application may be significant in the maintenance of habitat for the species.

In response to significant environmental impacts identified by DER, the applicant reduced the extent of the proposed clearing from 68 hectares to 40.9 hectares and excluded vegetation in close proximity to the Scott River and proposed to retain large Carnaby's cockatoo habitat trees and stands of Melaleuca. The applicants proposed measures do not address impacts to fauna habitat values related to the foraging habitat for black cockatoos or other indigenous fauna and the maintenance of an ecological corridor.

Taking into account the applicant's advice, it is acknowledged that the reduction in the size and retention of large Carnaby's cockatoo habitat trees and stands of Melaleuca is likely to reduce the scale of impacts in respect to fauna habitats. However noting the extent of the amended application area, the presence of vegetation in excellent (Keighery, 1994) condition that comprises habitat for a variety of indigenous fauna including species of conservation significance and the regional significance as fauna corridor, it is considered that the application area continues to comprise significant habitat for indigenous fauna.

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

Methodology

References:

Commissioner of Soil and Land Conservation (2016)
DEC (2007-)
DEC (2012a)
DEC (2012b)
DEC (2012c)
DEC (2013)
DotE (2013a)
DotE (2013b)
DotE (2013b)
Gaeolotti et al. (2014)
Keighery (1994)
Molloy et al. (2009)
Murdoch University (2012)
Parks and Wildlife (2013)

Shah (2006)
Yeatman and Groom (2012)

GIS Datasets:
Carnaby's cockatoo feeding habitat
Pre-European vegetation
South West regional Ecological Linkages

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

Comments

Proposed clearing is at variance to this Principle

The application areas contain a variety of vegetation types including jarrah, banksia and marri forests as well as seasonally inundated wetlands, with the vegetation predominantly in a very good (Keighery, 1994) or better condition (DER, 2016). Seven rare flora species have been recorded within the local area (10 kilometre radius) and given the similar mapped soil and vegetation types, may be present within the application area.

Site inspections of Lot 4156 confirmed the presence of one rare flora species and given the observed vegetation type, it is highly likely to contain another (Parks and Wildlife, 2013). Due to the relatively large size of the application area inspections undertaken were preliminary only and following appropriate surveys, additional rare flora species are likely to be found (Parks and Wildlife, 2013).

The application area forms part of an ecological linkage, defined by the South West Regional Ecological Linkage Report (Molloy et al., 2009). This linkage connects the application area to reserves north and significant remnant vegetation to the south. A second linkage is mapped adjacent to the southern portion of the application area and connects it to reserves east and west.

Ecological linkages have been 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). As the application area is likely to support rare flora populations, it may also be significant in the conservation status of rare flora outside of the application area through the dispersal of genetic material.

The area under application falls in close proximity to the third largest occurrence of the Scott River Ironstone Association threatened ecological community (TEC). The Scott River Ironstone Association is known to support the rare flora species Banksia nivea subsp. uliginosa, Darwinia ferricola and Lambertia orbifolia subsp. Scott River Plains. Of these, Darwinia ferricola and Lambertia orbifolia subsp. Scott River Plains are largely restricted to this ecological community (DotE, 2013a). As the application area is in close proximity to TEC vegetation, contains similar, contingent vegetation and is connected via a recognised biological linkage, these species may also occur within the application area. Fragmenting the ecological linkage supporting the remainder of the populations also may threaten the long term viability of these species.

In response to significant environmental impacts identified by DER, the applicant reduced the extent of the proposed clearing from 68 hectares to 40.9 hectares and excluded vegetation in close proximity to the Scott River and proposed to retain large Carnaby's cockatoo habitat trees and stands of Melaleuca. The applicants proposed measures do not address impacts to fauna habitat values related to the foraging habitat for black cockatoos or other indigenous fauna and the maintenance of an ecological corridor.

Taking into account the applicant's advice, it is acknowledged that the reduction in the size of the application area is likely to reduce the scale of impacts in respect to rare flora habitats. However noting the extent of the amended application area, the presence of vegetation in excellent (Keighery, 1994) condition that comprises several different habitat types suitable for rare flora, it is considered that the application area continues to comprise significant habitat for rare flora and is necessary for the continued existence of rare flora.

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

Methodology

Reference:
DotE (2013a)
Parks and Wildlife (2013)
Keighery (1994)
Molloy et al. (2009)

GIS Datasets:
Pre European Vegetation
SAC Bio Datasets (accessed December 2015)
South West Regional Ecological Linkages

(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 may be at variance to this Principle

The Scott River Ironstone Association is described as a low to tall seasonally inundated shrubland or heathland, occurring on patches of shallow soils over massive ironstone formations of the Scott Coastal Plain in south-west Western Australia (DotE, 2013a). It is listed as endangered under the Environment Protection and Biodiversity Conservation Act 1999 and the Wildlife Conservation Act 1950.

Site inspections undertaken by the former Department of Environment and Conservation in June and September 2010 as well as 25 June 2013 (Parks and Wildlife, 2013) confirmed the mapped presence of the Scott River Ironstone Association within Lot 4156 as well as potential unmapped occurrences across the property. Due to relatively large size of the application area, the exact locations of the TECs were not able to be determined and the entire property was not able to be inspected (Parks and Wildlife, 2013).

The north-western portion of Lot 4156 that is representative of Scott River Ironstone Association vegetation, as well as a 50 metre buffer, meets the Department of the Environment's (DotE) criteria for areas "critical to the survival of this ecological community" (DotE, 2013a). The conservation advice for this community also states "Additional areas such as adjoining native vegetation ... may be critical to the survival of the ecological community depending on factors such as presence of key functional, threatened, or rare species, their size and shape, linkages to other patches and landscape position" (DotE, 2013a).

The application area forms part of an ecological linkage, defined by the South West Regional Ecological Linkage Report (Molloy et al., 2009). Further occurrences of the TEC are also located along this ecological linkage within two kilometres north and east of the application area, accounting for almost all of the known Scott River Ironstone Association vegetation. Given this, clearing the vegetation under application may impact on the transfer of genetic material between remnant patches of TEC vegetation.

The DotE (2013a) conservation advice for this TEC lists land clearing and grazing as major threats. It also lists the priority recovery and threat abatement actions which include:

- Avoid clearance of native vegetation within the ecological community and its surrounds (at least within a buffer zone of 50 metres from the edge of a given patch);
- Avoid any changes to hydrology that may result in changes to the natural hydrological regime of patches of the community, groundwater water table levels and subsequent increase or decrease in run-off, salinity, or pollution;
- Minimise disruptions to the local landscape that would influence the pattern of winter rain inundation, such as smoothing out depressions or creating banks/levees to store water;
- Ensure that development activities minimise direct impacts to the ecological community and indirect effects on its ecological function;
- Investigate formal conservation arrangements, management agreements and covenants on private land, and for crown and private land investigate inclusion in reserve tenure if possible;
- Develop and implement best practice standards and regimes for management of remnants on private and public lands to maintain the biodiversity, including threatened species, of the ecological community;
- Recognise and implement appropriate management regimes to maintain distinctive biodiversity elements, such as threatened species as identified in national and state recovery plans and the connected landscapes and focal areas as identified through recovery planning processes,
- Ensure that networks of patches of the community that serve as refuge or linkages for wildlife and their habitat are maintained across the landscape; and
- Ensure that an appropriate management regime that is not detrimental to the ecological community is in place where stock access patches of the ecological community.

The Commissioner of Soil and Land Conservation (2013; 2016) identified soil types that have a low phosphorus holding ability for which there is an increased risk of eutrophication especially when the soils become waterlogged. The risk of eutrophication causing land degradation is high (Commissioner of Soil and Land Conservation, 2013; 2016). The Commissioner also advised that "The risk of water logging with further clearing causing land degradation is high to very high". Given this, clearing vegetation in close proximity to the TEC may change the hydrology of the area and adversely impact on TEC representative vegetation.

The application to clear 40.9 hectares of native vegetation for the purpose of agriculture may impact upon the Scott River Ironstone Association by fragmenting the remaining patches, altering the hydrology of the area and potentially impacting on contingent, significant flora populations and vegetation. The application falls in close proximity to a mapped occurrence of the TEC and may be inconsistent with the DotE recovery actions and recommendations for this TEC.

In response to significant environmental impacts identified by DER, the applicant reduced the extent of the proposed clearing from 68 hectares to 40.9 hectares and excluded vegetation in close proximity to the Scott River and proposed to retain large Carnaby's cockatoo habitat trees and stands of Melaleuca. The applicants proposed measures do not address impacts to the maintenance of the TEC.

Taking into account the applicant's advice, it is acknowledged that the reduction in the size of the application area is likely to reduce the scale of impacts in respect to the maintenance of the TEC. However noting the extent of the amended application area, the close proximity to a mapped occurrence of the TEC, that the proposed clearing may alter the hydrology of the area and indirectly impact the TEC and potential inconsistency with the DotE recovery actions and recommendations for this TEC, it is considered that the application area remains likely to be necessary for the maintenance of a threatened ecological community..

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

Methodology

References:
Commissioner of Soil and Land Conservation (2013)
Commissioner of Soil and Land Conservation (2016)
DotE (2013a)
Molloy et al. (2009)
Parks and Wildlife (2013)

GIS Datasets:
Pre European Vegetation
SAC Bio Datasets (accessed December 2015)
South West Regional Ecological Linkages

(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 Warren Interim Biogeographic Regionalisation of Australia (IBRA) bioregion. This IBRA bioregion retains approximately 79 per cent of its pre-European vegetation extent (Government of Western Australia, 2014).

The application area is mapped within Beard vegetation associations 27, 51 and 975. These vegetation associations retain approximately 74, 67 and 78 per cent of their pre-European extent in the Warren bioregion respectively (Government of Western Australia, 2014).

The application area is mapped as Mattiske vegetation complex's Scott Sd and Swd. These vegetation associations retain approximately 45 and 68 per cent of their pre-European extent respectively (Parks and Wildlife, 2015b).

Aerial imagery indicates that the local area (10 kilometre radius) retains approximately 50 per cent vegetation. The majority of this vegetation falls to the south of the application area and within reserves to the north, however the Scott Coastal Plain has almost entirely been cleared for agriculture.

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).

The majority of the application area is in a very good (Keighery, 1994) or better condition. The vegetation is considered to be exceptionally diverse containing numerous priority and rare flora. The succession of plant communities leading from the Scott River, through the Scott Coastal Plain to the vegetation north of the application area is not represented elsewhere (Parks and Wildlife, 2013).

The application area forms part of two ecological linkages, defined by the South West Regional Ecological Linkage Report (Molloy et al., 2009). Given this and the condition of the vegetation, the application area is likely to form significant habitat for the dispersal of fauna and flora through the landscape.

Although the vegetation under application does not fall within a highly cleared mapped vegetation community, as the vegetation north of the Scott River has been highly cleared for agriculture, as identified by the Government of Western Australia (2001), and the application area contains one of the last intact vegetation remnants on the Scott River Plain, the application falls within a highly cleared area. This is supported by the mapping of the application area as part of a north south ecological linkage.

Ecological communities that are naturally rare or restricted may also require substantially greater than 30 per cent of their pre-European extent to be retained for effective representation and ecological viability.

In response to significant environmental impacts identified by DER, the applicant reduced the extent of the proposed clearing from 68 hectares to 40.9 hectares and excluded vegetation in close proximity to the Scott River and proposed to retain large Carnaby's cockatoo habitat trees and stands of Melaleuca. The applicants proposed measures do not address impacts to the significant remnant values related to the mapped wetland, foraging habitat for black cockatoos and other fauna, habitat for rare and priority flora and the maintenance of a TEC and an ecological corridor.

Taking into account the applicant's advice, it is acknowledged that the reduction in the size of the application area is likely to reduce the scale of impacts in respect to a significant remnant. However noting the extent of the amended application area, the presence of vegetation in excellent (Keighery, 1994) condition that comprises habitat for a variety of indigenous fauna and flora including species of conservation significance, may be necessary for the maintenance of a TEC and the regional significance as fauna corridor, it is considered that the application area remains significant as a remnant of native vegetation in an area that has been extensively cleared.

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

	Pre-European (ha)	Current Extent (ha)	Remaining (%)	Extent in Parks and Wildlife Managed Lands (%)
IBRA Bioregion*				
Warren	833,985	663,202	79	84
Shire*				
Shire of Augusta-Margaret River	211,680	131,716	62	75
Beard vegetation association in Bioregion*				
27	70,203	52,295	74	88
51	35,867	24,159	67	85
975	2,840	2,221	78	74
Mattiske vegetation complexes**				
Sd	37,716	17,020	45	29
Swd	10,381	7,082	68	55

Methodology

References:
Commonwealth of Australia (2001)
Government of Western Australia (2001)
* Government of Western Australia (2014)
Keighery (1994)
Molloy et al. (2009)
Parks and Wildlife (2013)
** Parks and Wildlife (2015b)

GIS Datasets:
Pre-European Vegetation
South West Regional Ecological Linkages

(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 at variance to this Principle

The application area falls within an extensive palusplain wetland (seasonally waterlogged flat) and within the flood plain of the Scott River. Site inspections of the property undertaken in 2010 to 2013 identified diverse wetland dependent vegetation (Parks and Wildlife, 2013).

A site inspection of the reduced application area undertaken on 2 March 2016 (DER, 2016) recorded wetland vegetation in numerous areas.

In response to significant environmental impacts identified by DER, the applicant reduced the extent of the proposed clearing from 68 hectares to 40.9 hectares and excluded vegetation in close proximity to the Scott River and proposed to retain large Carnaby's cockatoo habitat trees and stands of Melaleuca. The applicants proposed measures do not address impacts to the remaining vegetation mapped with the wetland.

Taking into account the applicant's advice, it is acknowledged that the reduction in the size, exclusion of vegetation in close proximity to the Scott River and retention of stands of Melaleuca is likely to reduce the scale of impacts in respect to wetland dependent vegetation. However noting the extent of the amended application area, the presence of vegetation in excellent (Keighery, 1994) condition comprising areas of wetland dependent vegetation and the occurrence of mapped wetlands, it is considered that the application area continues to comprise wetland dependent vegetation.

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

Methodology

References:
DER (2016)
Parks and Wildlife (2013)

GIS Datasets:
Geomorphic Wetlands Augusta to Walpole
Hydrography, linear

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

Comments

Proposed clearing is at variance to this Principle

The application area falls within an extensive palusplain wetland (seasonally waterlogged flat) and within the flood plain of the Scott River. Site inspections of the application area recorded diverse wetland dependent vegetation (Parks and Wildlife, 2013; DER, 2016).

The application areas generally occupy the lower slope position in the landscape and are situated near a 1000 millimetre isohyet.

A site inspection of Lot 4156 undertaken by the Department of Agriculture and Food WA (Commissioner of Soil and Land Conservation, 2013) identified four soil complexes within the area consisting mainly of poorly drained flats and wet sandy depressions. Two of these complexes are mapped within the current application area.

Due to its position within the landscape and identified soil types, clearing the native vegetation under application is not likely to cause land degradation in the form of salinisation or wind erosion. The risk of water erosion is also low due to the present slope of the land (Commissioner of Soil and Land Conservation, 2013).

Eutrophication is the process by which a body of water acquires a high concentration of nutrients, especially phosphates and nitrates (phosphorus export). These promote excessive plant growth. As this plant material decomposes, the oxygen within the water is depleted, causing the death of other organisms, such as fish.

The Commissioner of Soil and Land Conservation (2013; 2015; 2016) advised that the identified soil types have a low phosphorus holding ability and there is an increased risk of eutrophication especially when the soils become waterlogged. Flooding events will also increase the risk of off-site eutrophication directly into the Scott River.

The Commissioner of Soil and Land Conservation (2013; 2015; 2016) advised that the risk of eutrophication causing land degradation is high and the risk of waterlogging with further clearing causing land degradation is high to very high.

In response to significant environmental impacts identified by DER, the applicant reduced the extent of the proposed clearing from 68 hectares to 40.9 hectares and excluded vegetation in close proximity to the Scott River and proposed to retain large Carnaby's cockatoo habitat trees and stands of Melaleuca. The applicants proposed measures do not address impacts from land degradation.

Taking into account the applicant's advice, it is acknowledged that the reduction in the size of the application area is likely to reduce the scale of impacts in the form of appreciable land degradation. However noting the extent of the amended application area, the occurrence of mapped wetlands and the Commissioner's advice regarding the risks of waterlogging and eutrophication, it is considered that the risk of the proposed clearing causing land degradation is high to very high.

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

Methodology

References:
Commissioner of Soil and Land Conservation (2013)
Commissioner of Soil and Land Conservation (2015)
Commissioner of Soil and Land Conservation (2016)
DER (2016)
Government of Western Australia (2001)
Parks and Wildlife (2013)

GIS Datasets:
Geomorphic Wetlands Augusta to Walpole
Hydrography linear

(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 C class nature reserve R42377 falls approximately 1.4 kilometres to the north of the application area and a Crown reserve, vested with Parks and Wildlife, falls approximately 3 kilometres north of the application area. These two reserves encompass occurrences of the Scott River Ironstone Association, threatened ecological community.

Gingilup Swamps Nature Reserve falls approximately 2.2 kilometres, along the Scott River, to the east of the application area. Scott National Park falls approximately 4 kilometres from the application area, along the Scott River to the west. Pagett Nature Reserve (A class) falls approximately 4.2 kilometres to the north of the application area. This reserve adjoins the South Blackwood State Forest and Blackwood River National Park.

The majority of the vegetation within the application area is in a very good (Keighery, 1994) or better condition. The application area falls on the Scott Coastal Plain which has been identified as an area holding national estate significance due to its high species richness, unusually high diversity of vegetation complexes, a concentration of rare restricted and threatened communities, its narrowly endemic plants, relict plants, plants with disjunct populations and wetlands of national importance (Government of Western Australia, 2001). A significant amount of native vegetation has been cleared on the Scott Coastal Plain including the majority of the wetland vegetation types which have been converted to agricultural purposes (Government of Western Australia, 2001).

The application area forms part of an ecological linkage, defined by the South West Regional Ecological Linkage Report (Molloy et al., 2009). This linkage connects the application area to reserves north and significant remnant vegetation to the south. A second linkage is also mapped adjacent to the southern portion of the application area and connects it to the reserves east and west of the application.

An ecological linkage has been 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). As the application area forms part of two ecological linkages it assists in the maintenance of the ecological process of conservation reserves within the local area. This value is heightened by its unique assemblage of flora and high fauna habitat value that assists in the maintenance of these species within the connected reserves.

The application area occurs within 100 metres of the third largest mapped occurrence of the Scott River Ironstone Association threatened ecological community. The DotE (2013a) conservation advice for this TEC lists land clearing and grazing as major threats. It also lists the priority recovery and threat abatement actions which include ensuring that networks of patches of the community that serve as refuge or linkages for wildlife and their habitat are maintained across the landscape. The degradation of this mapped TEC vegetation and linkage through direct and indirect impacts could therefore, effect the viability of other remnants within local conservation reserves.

In response to significant environmental impacts identified by DER, the applicant reduced the extent of the proposed clearing from 68 hectares to 40.9 hectares and excluded vegetation in close proximity to the Scott River and proposed to retain large Carnaby's cockatoo habitat trees and stands of Melaleuca. The applicants proposed measures do not address impacts to the maintenance of a regionally significant ecological corridor and impacts on environmental values of nearby conservation areas.

Taking into account the applicant's advice, it is acknowledged that the reduction in the size of the application area is likely to reduce the scale of impacts in respect to environmental values of nearby conservation areas. However noting the extent of the amended application area, the presence of vegetation in excellent (Keighery, 1994) condition, the regional significance as fauna corridor that comprises habitat for a variety of indigenous fauna including species of conservation significance, it is considered that the proposed clearing remains likely to impact on environmental values of nearby conservation areas.

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

Methodology

References:
Department of the Environment (2013a)
Government of Western Australia (2001)
Molloy et al (2009)
Keighery (1994)

GIS Datasets:
DPaW Tenure
SAC Bio Datasets
South West Regional Ecological Linkages

(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 at variance to this Principle

The application area falls approximately 580 metres from the main channel of Scott River and is mapped within a palusplain wetland (seasonally waterlogged flat). A site inspection of Lot 4156 undertaken by Parks and Wildlife staff recorded areas inundated by water (Parks and Wildlife, 2013).

A site inspection of Lot 4156 undertaken by the Department of Agriculture and Food WA (Commissioner of Soil and Land Conservation, 2013) identified four soil complexes within the area consisting mainly of poorly drained flats and wet sandy depressions. Two of these complexes are mapped within the current application area. The risk of water logging within the application area is high and drainage from the property flows southward directly into the Scott River (Commissioner of Soil and Land Conservation, 2013; 2015; 2016).

The Commissioner of Soil and Land Conservation (2013; 2015) advised that the identified soil types have a low phosphorus holding ability and there is an increased risk of eutrophication especially when the soils become waterlogged. Flooding events will also increase the risk of off-site eutrophication directly into the Scott River. The risk of eutrophication causing land degradation is high (Commissioner of Soil and Land Conservation, 2013; 2015).

The Scott River is estimated to contribute approximately 60 per cent of the phosphorus delivered into the Hardy Inlet. Following intensification of agriculture on the Scott Coastal Plain in the mid 1990's phosphorus concentrations within the Inlet have risen markedly and algal blooms have become a regular occurrence (Commissioner of Soil and Land Conservation, 2014).

The water table within the vicinity of the application area is shallow, therefore nutrients are likely to be transported via surface water flows.

In response to significant environmental impacts identified by DER, the applicant reduced the extent of the proposed clearing from 68 hectares to 40.9 hectares and excluded vegetation in close proximity to the Scott River and proposed to retain large Carnaby's cockatoo habitat trees and stands of Melaleuca. The applicants proposed measures do not address impacts to deterioration of surface water quality.

Taking into account the applicant's advice, it is acknowledged that the reduction in the size, exclusion of vegetation in close proximity to the Scott River and retention of stands of Melaleuca is likely to reduce the scale of impacts to surface water quality. However noting the extent of the amended application area, the occurrence of mapped wetlands and the Commissioner's advice regarding the risks of eutrophication, it is considered that the proposed clearing remains likely to cause deteriorate to the quality of surface water through eutrophication.

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

Methodology

References:
Commissioner of Soil and Land Conservation (2013)
Commissioner of Soil and Land Conservation (2014)
Commissioner of Soil and Land Conservation (2015)
Commissioner of Soil and Land Conservation (2016)
Government of Western Australia (2001)
Parks and Wildlife (2013)

GIS Datasets:
Groundwater salinity, statewide
Hydrography, linear

(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 may be at variance to this Principle

The application area falls approximately 580 metres from the main channel of the Scott River. The application area is mapped within a palusplain wetland (seasonally waterlogged flat).

A site inspection of Lot 4156 in June 2013 undertaken by Parks and Wildlife staff recorded wetland dependent vegetation within the application area (Parks and Wildlife, 2013). The Commissioner of Soil and Land Conservation (2013) advised that the risk of waterlogging within the property is high.

As vegetation restricts the flow of water across a landscape, dissipating its energy and allowing it to be both transpired and drain into the aquifer. Removing the vegetation under application may exacerbate the intensity of flooding or cause previously upland areas to become seasonally inundated.

In response to significant environmental impacts identified by DER, the applicant reduced the extent of the proposed clearing from 68 hectares to 40.9 hectares and excluded vegetation in close proximity to the Scott River and proposed to retain large Carnaby's cockatoo habitat trees and stands of Melaleuca. The applicants proposed measures do not address impacts from flooding.

Taking into account the applicant's advice, it is acknowledged that the reduction in the size of the application area is likely to reduce the scale of impacts due to flooding. However noting the extent of the amended application area, the occurrence of mapped wetlands and the Commissioner's advice regarding the risks of waterlogging, it is considered that the risk of the proposed clearing causing or exacerbating flooding is high.

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

Methodology References:
Commissioner of Soil and Land Conservation (2013)
Parks and Wildlife (2013)

GIS Datasets:
- Hydrography, linear
- Topographic Contours, Statewide

Planning instrument, Native Title, Previous EPA decision or other matter.

Comments The applicant has previously applied for a clearing permit over the property (CPS 5630/1). This application was originally for 154 hectares of native vegetation and was amended to 123 hectares in order to remove known occurrences of Scott River Ironstone vegetation. The application was refused on 4 April 2014 due to the significant environmental impacts of the proposed clearing.

On 24 March 2015, the applicant applied to clear 55 hectares of native vegetation. On 24 June 2015 the applicant was sent a letter outlining the significant environmental impacts of the application and inviting the applicant to provide further advice in respect to these matters. On 16 July 2015 the applicant responded requesting a meeting with DER representatives. On 6 August 2015 the applicant's representative met with the Department of Environment Regulation (DER) to discuss a potential revision and reduction of the application area. The application area was then amended by the applicant to 68 hectares and on 3 February 2016 the applicant was sent a letter outlining the significant environmental impacts of the application and inviting the applicant to provide further advice in respect to these matters.

On 2 March 2016 DER representatives met with the applicant on site to discuss the environmental impacts of the clearing (DER, 2016) and inviting the applicant to provide further advice in respect to these matters. The applicant revised application area to 40.9 hectares. The reduced application area removes the vegetation in closest proximity to the Scott River and the applicant advised that large habitat trees and stands of paperbarks will be retained.

The applicant's response and additional information was considered in the context of this assessment, and it is considered that the proposed clearing remains likely to cause appreciable land degradation in the form of waterlogging and eutrophication and subsequent deterioration in water quality, will impact on native vegetation that comprises a high level of biological diversity, habitats for conservation significant fauna, a mapped conservation-significant wetland system, a mapped regionally significant fauna corridor, rare and priority flora and may impact on a mapped nationally-listed threatened ecological community.

The application area is zoned general agriculture under the Local Town Planning Scheme Zone. The Shire of Augusta Margaret River (2015) has advised that:
- Clearing land zoned as general agriculture requires prior planning approval from the local government.
- No planning application has been received by the Shire;
- Clearing the vegetation under application may impact on the Scott River and Hardy inlet through eutrophication;
- Threatened flora and fauna may be impacted by the proposed clearing; and
- "The Shire does not support the application to clear", Shire of Augusta Margaret River (2015).

No submissions from the public have been received.

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

Methodology References:
DER (2016)

Shire of Augusta Margaret River (2015)
GIS Datasets:
Aboriginal Sites of Significance
Town Planning Scheme Zone

3. References

Commissioner of Soil and Land Conservation (2013) Land Degradation Advice and Assessment Report for clearing permit application CPS 5630/1 received 7/8/2013; Department of Agriculture and Food Western Australia (DER Ref A657933 and A657934).

Commissioner of Soil and Land Conservation (2014) Land Degradation Advice and Assessment Report for clearing permit application CPS 6057/1 received 10/6/2014; Department of Agriculture and Food Western Australia (DER Ref A767577 and A767576).

Commissioner of Soil and Land Conservation (2015) Land Degradation Advice and Assessment Report for clearing permit application CPS 6516/1 received 22/5/2015; Department of Agriculture and Food Western Australia (DER Ref A912953).

Commissioner of Soil and Land Conservation (2016) Confirmation of Land Degradation Advice for clearing permit application CPS 6516/1 received 22/5/2015; Department of Agriculture and Food Western Australia (DER Ref A912953).

Commonwealth of Australia (2001) National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.
Department of Environment Conservation (2012a) Chuditch (Dasyurus geoffroii) Recovery Plan. Wildlife Management Program No. 54. Department of Environment and Conservation, Perth, Western Australia.
Department of Environment Conservation (2012b) Fauna profiles: Quenda Isoodon obesulus. Department of Environment and Conservation 8 February 2012.
Department of Environment Conservation (2012c) Fauna profiles: Water Rat (Rakali) Hydromys chrysogaster. Department of Environment and Conservation 8 February 2012.
Department of Environment Conservation (2013) Quokka Setonix brachyurus Recovery Plan. Wildlife Management Program No. 56. Department of Environment and Conservation, Perth, WA.DER (2013) Department of Environment regulation Site Inspection undertaken September 2013. Department of Environment Regulation, Western Australia.
Department of Environment Regulation (2016) Site inspection report for clearing permit application CPS 6516/1. Site inspection undertaken 2 March 2016 (DER ref: A1080052).
Department of the Environment (2013a) Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (s266B) Approved Conservation advice for Scott River Ironstone Association. Department of the Environment 2013.
Department of the Environment (2013b) Approved Conservation Advice for Pseudocheirus occidentalis (western ringtail possum). Commonwealth of Western Australia. 17 December 2013.
Department of the Environment (2013c) National Recovery Plan for Mallee fowl Leipoa ocellata. Benshemesh 2007.
Department of Parks and Wildlife (2007-) NatureMap: Mapping Western Australia's Biodiversity. Department of Parks and Wildlife. URL: http://naturemap.dec.wa.gov.au/. Accessed April 2016.
Department of Parks and Wildlife (2013) Site Inspection Report for Clearing Permit Application CPS 5630/1, Lot 4156 Governor Broome Road, Scott River. Site inspection undertaken 25/06/2013. Department of Parks and Wildlife, Western Australia (DER Ref. A646983, A640980).
Department of Parks and Wildlife (2015a) Parks and Wildlife regional advice received in relation to clearing permit application 6516/1.
Department of Parks and Wildlife (2015b) 2015 South West Forest and Swan Coastal Plain Vegetation Complex Statistics: a report prepared for the Department of Environment Regulation. Current as of March 2015. Department of Parks and Wildlife, Perth, Western Australia.
Environmental Protection Authority (2000) Bulletin 991, Scott Coastal Plain - a Strategy for a Sustainable Future. September 2000.
Galeotti, D, Castalanelli, M, Groth, D, McCullough, C and Lund, M (2014) Geneotypic and Morphological Variation between Galaxiella nigrostriata (Galaxiidae) Populations: Implications for Conservation. Marine and Freshwater Research, CSIRO, 7 May 2014.
Government of Western Australia (2001) Bulletins 4513: Scott Coastal Plain a strategy for a sustainable future. Department of Agriculture and Food. June 2001.
Government of Western Australia (2014) 2014 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of June 2014. WA Department of Parks and Wildlife, Perth.
Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
Mattiske, E.M. and Havel, J.J. (1998) Vegetation Complexes of the South-west Forest Region of Western Australia. Maps and report prepared as part of the Regional Forest Agreement, Western Australia for the Department of Conservation and Land Management and Environment Australia.
Molloy, S, Wood, J, Hall, S, Wallrodt, S and Whisson G (2009) South Western Regional Ecological Linkages Technical report, Western Australian Local Government Association and Department of Environment and Conservation, Perth.
Murdoch University (2012) Mussel Watch Western Australia. Accessed July 2014. Murdoch University and SURCUL.
Shah, B. (2006) Conservation of Carnaby's Black-Cockatoo on the Swan Coastal Plain, Western Australia. December 2006. Carnaby's Black-Cockatoo Recovery Project. Birds Australia, Western Australia.
Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.
Shire of Augusta Margaret River (2015) Advice received in relation to Clearing Permit Application 6516/1. Received 13 April 2015. DER ref: A894447.
Yeatman, G, and Groom, J (2012) National Recovery Plan for the woylie Bettongia penicillata. Wildlife Management Program No. 51. Department of Environment and Conservation, Perth.
Western Australian Herbarium (1998-) FloraBase - The Western Australian Flora. Department of Parks and Wildlife. http://florabase.dpaw.wa.gov.au/ (Accessed 20/04/2016).