



1. Application details

1.1. Permit application details

Permit application No.: 3599/1
Permit type: Area Permit

1.2. Proponent details

Proponent's name: Bonthorpe Pty Ltd

1.3. Property details

Property: LOT 1 ON PLAN 6250 (GILGERING 6302)
Local Government Area:
Colloquial name:

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
17.2		Mechanical Removal	Extractive Industry

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
<p>Beard Vegetation Associations:</p> <ul style="list-style-type: none"> - 4: Medium woodland; marri & wandoo; and - 25: Low woodland; Allocasuarina huegeliana & York gum. <p>(Shepherd, 2007; SAC Bio Datasets 15/3/2010)</p> <p>Mattiske Vegetation Complexes:</p> <ul style="list-style-type: none"> - Yalanbee (Y6): Woodland of Eucalyptus wandoo-Eucalyptus accedens, less consistently open forest of Eucalyptus marginata subsp. thalassica-Corymbia calophylla on lateritic uplands and breakaway landscapes in arid and perarid zones; and - Michibin (MI): Open woodland of Eucalyptus wandoo over Acacia acuminata with some Eucalyptus loxophleba on valley slopes, with low woodland of Allocasuarina huegeliana on or near shallow granite outcrops in arid and perarid zones. <p>(Mattiske and Havel, 1998)</p>	<p>The proposal is to clear 17.2 hectares (ha) of native vegetation from three areas for the extraction of gravel.</p> <p>The areas of vegetation under application are located within a relatively large (~80 ha) area of native vegetation on a ~1,500 ha property (~ 1,390 ha west and ~110 ha east of Great Southern Highway), which has ~10% native vegetation cover remaining.</p> <p>The three areas can be identified as:</p> <ul style="list-style-type: none"> - Area 1 (Pit 2): Located in the northern section of the remnant, 2.8 ha in size; - Area 2 (Pit 4): Located in the centre of the remnant, 11.6 ha in size; and - Area 3 (Pit 5): Located in the south-eastern section of the remnant, 2.8 ha in size. 	<p>Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994)</p>	<p>The vegetation condition was obtained from a site inspection undertaken on 19 March 2010 (DEC, 2010). The vegetation under application is considered to be predominantly in a degraded (Keighery, 1994) condition (DEC, 2010) with patches of Banksia armata heath that are limited to breakaways and slopes being in good (Keighery, 1994) condition (DEC, 2010). The overstorey is largely intact and provides dominant structure to the vegetation. It is noted that wandoo and E. accedens woodlands generally have a poor understorey.</p>

3. Assessment of application against clearing principles

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

Comments **Proposal may be at variance to this Principle**

The proposal is to clear 17.2 ha of native vegetation across three areas within an 80 ha area of native vegetation, on a ~1,500 ha property (Lot 1) that is within an extensively cleared agricultural landscape. In addition, the areas under application are located within a locally poorly-represented vegetation type within the transitional zone from jarrah/marri woodland to wheatbelt wandoo woodland (DEC, 2010a).

The vegetation under application is predominantly open mature Eucalyptus wandoo/E. accedens woodland (DEC, 2010). It is noted that wandoo and E. accedens woodlands generally have a poor understorey. This vegetation has been subjected to historic and ongoing grazing, resulting in reduced understorey diversity. The areas have a largely intact overstorey and include some patches of prickly native species e.g. Gastrolobium trilobum, which are unpalatable or toxic to stock (DEC, 2010). The vegetation under application is considered

to be predominantly in a degraded (Keighery, 1994) condition, due to the poor understorey, with patches of *Banksia armata* heath that are limited to breakaways and slopes being in good (Keighery, 1994) condition (DEC, 2010).

The areas under application are situated in a highly cleared landscape with approximately 20% native vegetation remaining in the local area (10 km radius) and approximately 10% remaining on the property. While the vegetation under application was assessed as predominantly degraded (Keighery, 1994) condition (DEC, 2010), it is likely the vegetation has a comparatively high level of biological diversity in the local landscape context.

In addition, the vegetation is part of a larger parcel, providing a stepping stone to other remnants in the local area, including the Avon River to the east and Wandoo National Park to the west. It is considered the vegetation represents significant habitat for avian fauna, including species of conservation significance such as Carnaby's black cockatoo.

Given the significance of the vegetation under application as a stepping stone to other areas of native vegetation and habitat for conservation significant avian fauna, and the strategic location within an extensively cleared landscape, the proposed clearing may be at variance to this Principle.

DEC acknowledges that Wandoo National Park is likely to have a higher level of biodiversity than that of the areas under application; however, given the information above, it is considered that the areas under application are likely to contain a high level of biological diversity in the local context.

Land Insights (2010a) asserts that "the local area [10 km radius] would include areas of mostly cleared agricultural land but it would also include a significant area of the Wandoo National Park. The National Park is contained within the same bioregion and contains the same vegetation complexes (Yalanbee) and has a significantly higher plant, fauna and ecosystem diversity than the area under application".

DEC remains of the view that given the location of the areas under application within an extensively cleared landscape, the vegetation is likely to have a comparatively high level of biological diversity in the local landscape context.

Methodology

References:

- DEC (2008)
- DEC (2010)
- DEC (2010a)
- Ekologica Pty Ltd (2007)
- Land Insights (2010a)
- Western Wildlife (2009)

GIS Databases:

- NLWRA, Current Extent of Native Vegetation
- Beverley 50 cm Orthomosaic - Landgate 2006
- SAC Bio Datasets 15/03/2010

(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

Proposal is at variance to this Principle

The proposal is to clear 17.2 ha of native vegetation across three areas within an 80 ha area of native vegetation, on a ~1,500 ha property of which 10% remains vegetated.

The vegetation under application is predominantly open mature *Eucalyptus wandoo*/*E. accedens* woodland (DEC, 2010). This vegetation has been subjected to historic and ongoing grazing from stock, resulting in a reduced diversity of understorey species. The vegetation under application is considered to be predominantly in a degraded (Keighery, 1994) condition with a largely intact overstorey and patches of *Banksia armata* heath that are limited to breakaways and slopes being in good condition (DEC, 2010).

Nine conservation significant fauna species are recorded from the local area (20 km radius). The Bush Stonecurlew (P4) may utilise the areas of vegetation under application given the presence of suitable habitat and foraging conditions. In addition, the areas under application are located within the recorded distribution of the endangered Carnaby's black cockatoo (*Calyptorhynchus latirostris*) (also Endangered under EPBC Act), which breed in the wheatbelt, nesting in large tree hollows of mostly *Eucalyptus wandoo* and *Eucalyptus salmonophloia* (DEC, 2007). The cockatoos are known to feed on a variety of introduced and native plants including *Banksia* and *Eucalyptus* (DEC, 2007).

A fauna assessment of the 80 ha area of vegetation identified ten trees that contained large hollows considered to be large enough for nesting cockatoos (Western Wildlife, 2009), of which three of these trees are proposed to be cleared. Although there was no evidence of breeding activity on site, Western Wildlife (2009) considered that the Carnaby's black cockatoo is likely to be present in the area and may be present on the site as a breeding species (Western Wildlife, 2009). In addition, it must be considered that the

development of nesting hollows is a dynamic process and so the existing nesting hollows are important as well as the maintenance of healthy trees to allow for the development of future hollows (DEC, 2010a). The presence also of areas of Banksia heath indicates that the remnant is a potential breeding and feeding site for Carnaby's black cockatoo.

A number of passerine birds were observed within the areas of vegetation under application at the time of the site inspection (DEC, 2008) with the vegetation under application comprising mature hollow-bearing Eucalypts suitable for nesting by a range of bird species from small insectivores to the larger parrots (DEC, 2008 and DEC, 2010). It should be noted that the smaller tree hollows will generally increase in size with increasing age of the trees (Hussey, 1999).

Western Wildlife (2009) has identified that the wandoo woodland on site could also be utilised by other fauna species of conservation significance, such as the specially protected south-west Carpet Python (*Morelia spilota imbricata*), the specially protected Peregrine Falcon (*Falco peregrinus*) and the threatened Chuditch (*Dasyurus geoffroii*). Given the reduced diversity of understorey species within the 17.2 ha under application, the vegetation is not likely to comprise significant habitat for Chuditch.

The areas under application are located within a large (~80 ha), locally significant area of native vegetation in an extensively cleared agricultural landscape. The areas of vegetation are also located approximately half way between the Wandoo National Park (approximately 6.5 km to the west) and the Avon River. Given the extensive extent of clearing on a local level and the central position to the Avon River and Wandoo National Park the 17.2 ha under application is considered likely to be utilised as part of a larger stepping stone for fauna movement across the landscape. The proposed clearing of 17.2 ha of native vegetation within this 80 ha area is considered likely to significantly impact on the habitat values of the remaining native vegetation with fragmentation of the 80 ha area and subsequent indirect impacts such as edge effects (DEC, 2010a).

Given the relatively large size (17.2 ha) and strategic location within a significant (80 ha) area in an extensively cleared agricultural landscape, important values as a stepping stone for fauna, and the presence of significant tree hollows for a number of local native avian fauna species, including the endangered Carnaby's black cockatoo; the proposal is at variance to this Principle.

Land Insights (2010a) asserts that consideration be given to the current low biodiversity of the vegetation and its degraded condition when assessing its significance as habitat; it is considered that the poor vegetation condition and poor habitat value would decrease its significance as habitat. It also should be considered that the area is unlikely to be used by Carnaby's black cockatoos as there has been no evidence of use or breeding activity from the tree hollow survey conducted in 2008.

Land Insights (2010a) considers that "the proposed clearing of a portion of the entire vegetation is not considered to have a significant impact on its ability to act as a stepping stone...because it's not considered that the vegetation in its current condition acts a significant stepping stone at the present time...In addition, it is questionable that ground-dwelling fauna will travel through cleared agricultural land, with minimal vegetation cover to act as a linkage between the National Park and the areas under application...It's considered that the [remaining] area will still provide an adequate amount of vegetation to act as a stepping stone on the rare occasion that it is used by native fauna."

A study by Abensperg-Traun and Smith (1999) concluded that remnant woodlands, of all sizes, on farms in agricultural Western Australia are important in sustaining small native animals such as arthropods (e.g. scorpions and beetles) and reptiles (skinks and geckos) as a stepping stone for dispersing individuals or providing habitat to sustain populations, and as such should be protected.

It is noted that "It's proposed that for every tree with a hollow that is removed and for the other four located close to the pit boundary, that two artificial nests are mounted in surrounding vegetation...the proposal aims to retain a majority of the existing vegetation and will therefore retain many healthy trees to allow for possible future hollow development...the proponents propose to rehabilitate the [17.2 ha] areas under application as well as additional [3.08 ha] areas which are currently cleared for pasture" (Land Insights, 2010a).

DEC remains of the view that the clearing proposal will further fragment the 80 ha area of native vegetation resulting in the vegetation being more susceptible to further disturbances, and decline in value and function over time. In addition it is considered the vegetation under application comprises significant habitat for avian fauna and provides a stepping stone for native fauna, particularly avian fauna.

Methodology

References:

- Abensperg-Traun and Smith (1999)
- DEC (2008)
- DEC (2010)
- DEC (2010a)
- Hussey (1999)
- Land Insights (2010a)
- Western Wildlife (2009)

GIS Databases:

- DEC Tenure
- NLWRA, Current Extent of Native Vegetation
- Beverley 50 cm Orthomosaic - Landgate 2006
- SAC Bio Datasets 15/03/2010

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

Comments Proposal is not likely to be at variance to this Principle

Eight rare flora species are been recorded within the local area (20 km radius) with one of these species, *Thomasia montana*, known to occur within the same vegetation communities and soil units as the vegetation proposed to be cleared. The closest recorded occurrence of *Thomasia montana* is ~15 km north from the areas of vegetation under application.

Thomasia montana is known to prefer sites high in the landscape on a range of different soils types, and is generally found with *Eucalyptus wandoo*, *Corymbia calophylla* and *Allocasuarina huegeliana* (Brown et al. 1998).

An appropriately timed flora survey conducted by Ekologica Pty Ltd (2007) did not identify any rare flora within the areas under application.

Given the distance to *T. montana* and that no rare flora were identified during the flora survey of the applied areas, it is not considered likely that the vegetation under application includes, or is necessary for the continued existence of, rare flora.

Methodology References:

- Brown et al. (1998)
 - Ekologica Pty Ltd (2007)
- GIS Databases:
- Matiske Vegetation
 - SAC Bio Datasets 15/03/2010
 - Soils, Statewide

(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 Proposal is not likely to be at variance to this Principle

There are no known occurrences of threatened ecological communities within the local area (20 km radius), with the closest known occurrence being a perched wetland and associated vegetation community located ~23 km south-east from the areas under application.

In addition the vegetation under application comprises *Eucalyptus wandoo*/*E. accedens* woodland (DEC, 2008 and DEC, 2010), and is not considered to comprise a floral composition or structure representative of a threatened ecological community.

Given the description of the vegetation under application and distance to the closest known occurrence, the vegetation under application is not considered likely to comprise the whole or a part of, or be necessary for the maintenance of a threatened ecological community.

Methodology References:

- DEC (2008)
 - DEC (2010)
- GIS Database:
- SAC Bio Datasets 15/03/2010

(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 Proposal is at variance to this Principle

The areas under application are located within the area defined in EPA Position Statement No. 2 (EPA 2000) that states that significant clearing of native vegetation has already occurred on agricultural land, leading to a reduction in biodiversity and increase in land salinisation.

The vegetation is associated with Beard vegetation types 4 and 25, which have 24.2% and 12.6% pre-1750 vegetation extent remaining within the respective bioregions (Shepherd, 2007) and Matiske Michibin and Yalanbee vegetation complexes, which have 26.5% and 51.4% pre-1750 vegetation extent remaining respectively (Matiske Consulting, 1998).

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearing of ecological communities with an extent below 30% of that present pre-1750, below which species loss appears

to accelerate exponentially at an ecosystem level (Commonwealth of Australia 2001). Vegetation types 4 and 25 in their respective bioregions and Matiske Michibin vegetation complex are all below the 30% biodiversity target (it is noted that Matiske vegetation mapping is considered as a more accurate representation of native vegetation than the broad scale Beard mapping; of which Yalanbee complex covers 91% of the areas under application and has 51.4% pre-1750 vegetation remaining).

IBRA Bioregion mapping shows that the areas under application are mostly within the Jarrah Forest (83% of the areas under application occur within this bioregion), of which 54% of the vegetation remains; however, the vegetation under application is located on the eastern most extent of this bioregion and is typical of the vegetation of the Avon Wheatbelt bioregion. In addition, the areas under application are located within a locally poorly represented vegetation type within the transitional zone from jarrah/marri woodland to wheatbelt wandoo woodland (DEC, 2010a).

The areas of vegetation under application are located in an extensively cleared agricultural area of which ~20% (~6,439 ha) vegetation cover remains in the local area. In addition, the property is mostly cleared with ~10% vegetation remaining on the ~1,500 ha property. It is noted that the vegetation has sustained continual disturbance from grazing and subsequently is predominantly in a degraded (Keighery, 1994) condition (DEC, 2010); however, the vegetation under application is considered to be significant as a remnant due its largely intact overstorey, providing important values as habitat for avian fauna and as a stepping stone for fauna moving across the landscape.

Given the areas under application are located within an extensively cleared local landscape and the vegetation is considered to be significant due to its important values as habitat for avian fauna and as a stepping stone, the proposal is at variance to this Principle.

DEC considers that the proposed clearing will further fragment the 80 ha area of native vegetation, within which the 17.2 ha occurs, in a local area that is extensively cleared.

It is noted that "the proponents propose to rehabilitate the [17.2 ha] areas under application as well as additional [3.08 ha] areas which are currently cleared for pasture" (Land Insights, 2010a).

DEC acknowledges that Wandoo National Park is located 6.5 km west of the clearing proposal and that the Yalanbee complex has 51.4% pre-1750 vegetation remaining. However, the vegetation under application is considered to be typical of the Avon Wheatbelt bioregion, which has been extensively cleared and therefore, significant given the location within this extensively cleared local landscape.

	Pre-European (ha)	Current extent (ha)	Remaining (%)	In reserves (%)
IBRA Bioregions*				
Jarrah Forest (JF) (83%)	4,506,655	2,440,940	54.1	
Avon Wheatbelt (AW) (17%)	9,517,109	1,443,690	15.1	
Shire of York*	232,642	87,365	37.5	
Local area (10 km radius)	31,400	~6,439	~20.5	
Beard Vegetation Types*				
4 (JF) (83%)	1,022,712	247,941	24.2	25.7
4 (State)	1,054,279	254,656	24.1	25.4
25 (AW) (17%)	8,925	1,126	12.6	2.5
25 (State)	13,765	5,870	42.6	0.7
Matiske Vegetation Complexes**				
Michibin (Mi) (9%)	1,345,524	356,512	26.5	
Yalanbee (Y6) (91%)	1,583,884	814,609	51.4	

* (Shepherd, 2007) Note: this Shepherd 2007 data is an update of Shepherd et 2001 data.

** (Matiske and Havel, 1998)

Methodology

References:

- Commonwealth of Australia (2001)
- DEC (2010a)
- Keighery (1994)
- Matiske and Havel (1998)
- Shepherd (2007)

GIS Databases:

- EPA Position Paper No 2 Agriculture Region
- Interim Biogeographic Regionalisation of Australia

- NLWRA, Current Extent of Native Vegetation
- SAC Bio Datasets 15/03/2010

(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 Proposal is not likely to be at variance to this Principle

There are five minor non-perennial watercourses (drainage lines) located in the immediate vicinity of the areas under application that are minor tributaries to Talbot Brook and Avon River, which are respectively located approximately 3.8 km south-west and 4.6 km east of the applied areas.

The areas of vegetation under application comprise Eucalyptus wandoo/E. accedens woodland, and are located high in the local landscape on a gravel ridge (DEC, 2008 and DEC, 2010), with areas representative of upland vegetation.

Given the high elevation of the areas proposed to be cleared, distance to the Avon River and the vegetation's resemblance to an upland vegetation community, the vegetation under application is not considered to be growing in, or in association with, an environment associated with a watercourse or wetland.

Methodology Reference:
- DEC (2008)
GIS Database:
- Hydrography, linear

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

Comments Proposal may be at variance to this Principle

The majority of the applied area is associated with an undulating terrain with ridges, spurs and lateritic mesas and buttes, with the chief soils defined as sandy, yellow mottled soils containing ironstone gravels (Northcote et al, 1960-68). The soils in the northern area are associated with gneissic rock outcrops, with the chief soils identified as hard red soils (Northcote et al, 1960-68).

The main land degradation risk associated with the removal of vegetation on gravelly soils is generally considered to be water erosion. Furthermore, during site inspections (DAFWA, 2008 and DEC, 2008) some erosion gullies associated with drainage lines were observed adjacent to the areas under application. Given that the areas under application are located in the upper slopes in the landscape, the proposed clearing may result in an increase in surface water run-off causing erosion gullies and rills. There is a medium risk of appreciable land degradation in the form of water erosion.

DAFWA (2008 and 2009) previously provided advice for the proposed clearing (40 hectares) of native vegetation within Lot 1; advising that the removal of deep rooted trees is likely to result in an increase in ground water recharge on the property which may potentially result in an increase in ground water seepage, and evaporation from shallow ground water seepage and result in the accumulation of surface salt causing further land degradation. An additional report from the Commissioner of Soil and Land Conservation (2010) advised that he considers that there is a medium risk of on-site and off-site salinity from the proposed clearing; the main salinity risk is from the release of the stored soluble salts from the soil profile. Where laterite occurs over pallid zone clays, salt stores can be high; and the proponent has indicated that a lateritic duricrust was intersected at 6m below a sandy gravel level, which suggests a high salt store at the site (DAFWA, 2008; Commissioner of Soil and Land Conservation, 2010). If the vegetation is cleared from the areas under application it may result in a release of this salt store into groundwater and potentially result in pulses of salt being discharged via groundwater into watercourses in the local area.

Whilst the additional tree planting proposed by the proponent may eventually reduce the potential salinity impact, given the high salt store in the soil it is considered that the current proposal may result in land degradation in the form of salinity (DAFWA, 2009).

A land capability assessment was undertaken for Lot 1 Great Southern Highway for consideration as a rural subdivision for low intensity rural land uses. The area under application is located within "a well-defined lateritic ridge in the central north-west sector of the property. This ridge has largely remnant native vegetation and is effectively the main drainage divide of the property" (Ruthmac Pty Ltd, 2007). The report (Ruthmac Pty Ltd, 2007) outlines that mapped landscape units 4 (Steep Rocky Hills subsystem) and 5 (Leaver subsystem), for which the areas under application may be located, have respectively a moderate and low risk of water erosion and a low risk of soil salinity. In addition the report outlines that "salt-affected soil in one area is evidence of enhanced discharge of groundwater following clearing" and "current uses of groundwater are domestic supply and stock water supply inferring a range of water quality. Water drawn from one bore [of 7 bores on the existing property] is reported to be too saline for stock" (Ruthmac Pty Ltd, 2007).

Given the above, it is considered that proposed clearing may lead to appreciable land degradation through water erosion and increased soil salinity.

It is noted that the applicant submitted a rehabilitation management plan, which outlines that the gravel extraction will be undertaken in five stages and that the areas cleared for gravel and additional areas on the eastern side of the hill will be rehabilitated and revegetated (Land Insights, 2010). However, it is considered that there will be short and medium term impacts (water erosion and higher recharge rates) from the proposed clearing as the rehabilitation will take a number of years to start having an impact on water balance and thus a period of higher infiltration and run off is anticipated for a period after extraction activities had ceased (Commissioner of Soil and Land Conservation, 2010). The intended plan is to progressively extract gravel from the areas over a five year period, which will lead to a 10-15 year lag of water leaking and running off the cleared areas due to reasons including that plants take 5-10 years to become established and vigorous enough to utilise large volumes of water (Commissioner of Soil and Land Conservation, 2010).

DEC considers that the rehabilitation management plan submitted is inadequate to mitigate the issues addressed above.

Methodology

References:

- Commissioner of Soil and Land Conservation (2010)
 - DAFWA (2008)
 - DAFWA (2009)
 - DEC (2008)
 - Land Insights (2010)
 - Northcote et al. (1960-68)
 - Ruthrmac Pty Ltd (2007)
- GIS Database:
- Soils, Statewide

(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

Proposal may be at variance to this Principle

There is one area reserved for conservation purposes within a 10 km radius of the areas under application, being Wandoo National Park, which is located approximately 6.5 km west of the applied areas. In addition, the areas of vegetation are located approximately half way between the Wandoo National Park and the Avon River.

The areas under application are situated within a large ~80 ha area of native vegetation, which is located within a landscape that has been extensively cleared for agricultural purposes, of which there is approximately 20% of pre-1750 vegetation extent remaining within the local area (10 km radius). The proposed clearing of 17.2 ha within this area will result in further fragmentation of the vegetation in a predominantly cleared agricultural landscape.

During the DEC site inspection (2008) several indigenous passerine and non-passerine bird species were observed within the areas under application, including the Australian Ringneck parrots, Galahs and pardalotes, with the vegetation under application comprising mature hollow-bearing Eucalypts suitable for nesting by a range of bird species from small insectivores to the larger parrots (DEC, 2008 and DEC, 2010). The vegetation under application is likely to provide significant habitat for local avian fauna species and provide a stepping stone to other limited patches of native vegetation on privately owned land in the local area.

The proposed clearing will bisect and fragment the 80 ha area and subsequently reduce its ability to act as a stepping stone for fauna movement, and reduce the longer term viability of the whole bushland area. This may have an impact on the security of fauna populations within nearby conservation reserves. Therefore, it is considered that the proposed clearing may be at variance to this Principle.

Land Insights (2010a) asserts that consideration be given to the current low biodiversity of the vegetation and its degraded condition when assessing its significance as habitat; it is considered that the poor vegetation condition and poor habitat value would decrease its significance as habitat. It also should be considered that the area is unlikely to be used by Carnaby's black cockatoos as there has been no evidence of use or breeding activity from the tree hollow survey conducted in 2008.

Land Insights (2010a) considers that "the proposed clearing of a portion of the entire vegetation is not considered to have a significant impact on its ability to act as a stepping stone...because it's not considered that the vegetation in its current condition acts a significant stepping stone at the present time...In addition, it is questionable that ground-dwelling fauna will travel through cleared agricultural land, with minimal vegetation cover to act as a linkage between the National Park and the areas under application...It's considered that the [remaining] area will still provide an adequate amount of vegetation to act as a stepping stone on the rare occasion that it is used by native fauna."

A study by Abensperg-Traun and Smith (1999) concluded that remnant woodlands, of all sizes, on farms in agricultural Western Australia are important in sustaining small native animals such as arthropods (e.g. scorpions and beetles) and reptiles (skinks and geckos) as a stepping stone for dispersing individuals or providing habitat to sustain populations, and as such should be protected.

It is noted that "It's proposed that for every tree with a hollow that is removed and for the other four located close to the pit boundary, that two artificial nests are mounted in surrounding vegetation...the proposal aims to retain a majority of the existing vegetation and will therefore retain many healthy trees to allow for possible future hollow development...the proponents propose to rehabilitate the [17.2 ha] areas under application as well as additional [3.08 ha] areas which are currently cleared for pasture" (Land Insights, 2010a).

DEC remains of the view that the clearing proposal will further fragment the 80 ha area of native vegetation resulting in the vegetation being more susceptible to further disturbances. In addition it is considered the vegetation under application, consisting of a largely intact overstorey, comprises significant habitat for avian fauna and provides a stepping stone for native fauna, particularly avian fauna.

Methodology References:
- DEC (2008)
- DEC (2010)
- Land Insights (2010a)
GIS Databases:
- DEC Tenure
- Hydrography, linear
- NLWRA, Current Extent of Native Vegetation
- Beverley 50 cm Orthomosaic - Landgate 2006

(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 Proposal may be at variance to this Principle

The nearest watercourses are Talbot Brook and Avon River, which are respectively located approximately 3.8 km south-west and 4.6 km east of the areas under application. In addition five minor non-perennial watercourses are located in the immediate vicinity of the areas under application.

DAFWA (2008 and 2009) previously provided advice for the proposed clearing (40 hectares) of native vegetation within Lot 1; advising that the removal of deep rooted trees, is likely to result in an increase in ground water recharge on the property with the potential to result in appreciable land degradation in the form of salinity. An additional report from the Commissioner of Soil and Land Conservation (2010) relating to the 17.2 ha under application advised that there is a medium risk of on-site and off-site salinity from the proposed clearing; the main salinity risk is from the release of the stored soluble salts from the soil profile. Where laterite occurs over pallid zone clays, salt stores can be high; and the proponent has indicated that a lateritic duricrust was intersected at 6m below a sandy gravel level, which suggests a high salt store at the site (DAFWA, 2008; Commissioner of Soil and Land Conservation, 2010). The removal of deep rooted trees from this gravelly upland location may impact on recharge of groundwater systems downstream and on non-perennial watercourses within the local area, causing deterioration in the quality of surface and underground water.

The intended plan is to progressively extract gravel from the areas over a five year period, which will lead to a 10-15 year lag of water leaking and running off the cleared areas due to reasons including that plants take 5-10 years to become established and vigorous enough to utilise large volumes of water (Commissioner of Soil and Land Conservation, 2010).

The other land degradation risk associated with the removal of vegetation on the identified gravelly soil type is considered to be water erosion. During site inspections (DAFWA, 2008 and DEC, 2009) some erosion gullies associated with drainage lines were observed adjacent to the areas under application. Given that the areas under application are located in the upper slopes in the landscape, it is considered that the proposed clearing may cause water erosion resulting in the deterioration in the surface water quality.

Given the above, it is considered that the proposed clearing may be at variance to this Principle.

DEC acknowledges that measures can be implemented that may manage the water erosion risk. DEC considers that the rehabilitation management plan submitted is inadequate to mitigate the issues addressed above.

Methodology References:
- Commissioner of Soil and Land Conservation (2010)
- DAFWA (2008)
- DAFWA (2009)
- DEC (2008)
GIS Databases:
- Hydrography, linear
- Soils, Statewide

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

Comments Proposal is not likely to be at variance to this Principle

The majority of the vegetation under application is associated with an undulating terrain with ridges, spurs, and lateritic mesas with chief soils on the broad undulating ridges and spurs being hard, and also sandy, neutral, yellow mottled soils, all containing ironstone gravels (Northcote et al. 1968).

The soils associated with the areas of vegetation under application are known to have a low waterlogging and flooding risk due to their high resistance to structural breakdown by water and generally low infiltration of rainwater (Wells 1988). In addition the areas under application are positioned high in the local landscape.

Given the geology of the soils on site and high elevation of the areas proposed to be cleared the proposed clearing is not considered likely to cause, or exacerbate, the incidence or intensity of flooding.

Methodology References:

- Northcote et al. (1960-68)
- Wells (1988)
- GIS Database:
- Soils, Statewide

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

Comments

The applicant had previously submitted a proposal to clear 40 ha of native vegetation within Lot 1 Great Southern Highway for the purpose of gravel extraction. A permit to clear for this proposal was refused on 12 March 2009. An appeal on this decision was lodged on 16 April 2009. On 2 March 2010 the Minister for Environment dismissed the appeal.

The proponents propose to develop five pits within Lot 1 for gravel extraction with Pit 1, Pit 3 and the eastern side of Pit 5 requiring no clearing of native vegetation. The rehabilitation management plan (Land Insights, 2010) outlines that the excavation will occur progressively in five stages with Stage 1 commencing at Pit 3 and the eastern side of Pit 5, the cleared areas used as pasture, no revegetation will take place in these two locations.

The clearing proposal is to clear 17.2 ha of native vegetation from three vegetated areas for the extraction of gravel. Land Insights (2010a) asserts "the areas chosen to be cleared for pit areas are located either on the edge of the existing vegetation or in a consolidated area to reduce the edge effects and to retain large, intact areas of vegetation to act as a stepping stone". DEC acknowledges that two of the areas under application, being both 2.8 ha in size, are located on the edge of existing vegetation; however, the consolidated area that is 11.6 ha in size would dissect the 80 ha area of remnant vegetation, which is likely to fragment the remnant and result in a higher edge-to-area ratio and therefore the remaining vegetation becoming more susceptible to degradation.

A rehabilitation management plan (Land Insights, 2010) has been submitted, which outlines that gravel extraction is proposed to be undertaken in five stages and that the [17.2 ha] areas cleared for gravel and additional [3.08 ha] areas on the eastern side of the hill will be rehabilitated and revegetated, and fenced to prevent stock access (Land Insights, 2010).

DEC has reviewed the rehabilitation management plan and provides the following comments:

- given the volume of material proposed to be removed, it is unclear how the battering of slopes and recontouring are to be undertaken without the removal of additional vegetation;
- the level of detail provided in terms of plant species selection, planting densities, structural mix and completion criteria is inadequate; and
- the plan lacks a time measurable component and an outline of costs, and does not adequately address the issues relevant to this site.

DEC sent two letters dated 16 April 2010 and 7 May 2010 to the applicant, advising of the identified environmental issues and inviting comments. The applicant's response is addressed in the clearing principles.

A fauna assessment of the 80 ha area of vegetation identified ten trees that contained hollows considered to be large enough for nesting cockatoos (Western Wildlife, 2009), of which three of these trees are proposed to be cleared and four of these trees are located immediately adjacent to the areas under application. The activity of the gravel extraction may reduce use of these adjacent four nest hollows due to noise and dust; also if the pit is too close to these trees the effect of root exposure may cause early senescence of the trees, thereby increasing the relative impact of the activity (DEC, 2010a). It must also be considered that the development of nesting hollows is a dynamic process and so the existing nesting hollows are important as well as the maintenance of healthy trees to allow for the development of future hollows (DEC, 2010a).

The Shire of York (2010) has no objection to the clearing of native vegetation for this proposal, and has issued planning consent for the proposed extractive activity and conditional approval for an Extractive Industries

Licence (EIL) (Land Insights, 2010a).

The applicant has advised that a DEC works approval has been approved and a Prescribed Premises Licence cannot be granted until the proponent has commenced activities (Land Insights, 2010a).

The vegetation under application is located within the agricultural area defined in EPA Position Statement No. 2 (EPA 2000), which states that significant clearing of native vegetation has already occurred on agricultural land, leading to a reduction in biodiversity and increase in land salinisation. Therefore the EPA would only consider supporting clearing proposals in the agricultural area in exceptional circumstances where the area proposed to be cleared is relatively small, and the proposed land use addresses alternative mechanisms for protection biodiversity (EPA 2000).

Lot 1 Great Southern Highway is freehold land, zoned farming under the local Town Planning Scheme.

Methodology

References:

- DEC (2010a)
 - EPA (2000)
 - Land Insights (2010)
 - Land Insights (2010a)
 - Shire of York (2010)
 - WAPC (2010)
 - Western Wildlife (2009)
- GIS Databases:
- Cadastre
 - EPA Position Paper No 2 Agriculture Region
 - Town Planning Scheme Zones

4. Assessor's comments

Comment

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 the assessment recommendation is that the clearing as proposed is at variance to Principles (b) and (e), and may be at variance to Principles (a), (g), (h) and (i).

5. References

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6. Glossary

Term	Meaning
CALM	Department of Conservation and Land Management (now DEC)
DAFWA	Department of Agriculture and Food
DEC	Department of Environment and Conservation
DEP	Department of Environmental Protection (now DEC)
DoE	Department of Environment (now DEC)
DoW	Department of Water
DMP	Department of Mines and Petroleum (ex DoIR)
DRF	Declared Rare Flora
EPP	Environmental Protection Policy
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
TEC	Threatened Ecological Community
WRC	Water and Rivers Commission (now DEC)