



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: 4907/1

File Number: 2012/001355-1

Duration of Permit: From 4 May 2012 – 4 May 2019

PERMIT HOLDER

William Lloyd Kammann

LAND ON WHICH CLEARING IS TO BE DONE

Lot 15 on Deposited Plan 37580 (Middlesex, 6258)

Lot 2 on Diagram 63097 (Middlesex, 6258)

AUTHORISED ACTIVITY

The Permit Holder shall not clear more than 14.1 hectares of native vegetation within the area hatched yellow on attached Plan 4907/1.

CONDITIONS

1. Period in which clearing is authorised

The Permit Holder shall not clear any native vegetation after 4 May 2014.

2. Application

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

3. Type of clearing authorised

To the extent authorised under authorised activity of this Permit, the Permit Holder may undertake the following activities within the area cross-hatched yellow on Plan 4907/1:

- (a) clearing and burning of *understorey*;
- (b) *thinning* of Karri (*Eucalyptus diversicolor*) or Marri (*Corymbia calophylla*) trees; and
- (c) *culling* and burning of unsaleable trees.

4. Avoid, minimise etc clearing

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

- (a) avoid the clearing of native vegetation;
- (b) minimise the amount of native vegetation to be cleared; and
- (c) reduce the impact of clearing on any environmental value.

5. Dieback and weed control

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

- (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- (b) shall only move soils in *dry conditions*;
- (c) ensure that no *dieback* or *weed*-affected soil, *mulch*, *fill* or other material is brought into the area to be cleared; and
- (d) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

6. Fauna management

- (a) Prior to undertaking any clearing authorised under this Permit, the areas shall be inspected by a *fauna specialist* who shall identify *habitat tree(s)* suitable to be utilised as habitat by fauna listed in the *Wildlife Conservation (Specially Protected Fauna) Notice*.
- (b) Prior to undertaking any clearing authorised under this Permit, *habitat tree(s)* identified by condition 6(a) shall be inspected by a *fauna specialist* for the presence of fauna listed in the *Wildlife Conservation (Specially Protected Fauna) Notice*.
- (c) Where fauna are identified in relation to conditions 6(b) of this Permit, the Permit Holder shall ensure that no taking of identified fauna occurs unless approved by the CEO.

7. Vegetation management

- (a) Prior to undertaking any clearing authorised under this Permit, an *environmental specialist* must determine the species composition, structure and density of the *understorey* of areas proposed to be *thinned*.
- (b) The Permit Holder must retain a minimum of 2 *habitat trees* in each hectare authorised under this Permit.
- (c) A minimum retention rate of 14m²/ha *basal area* is required within the area of clearing authorised under this Permit.
- (d) Prior to undertaking any clearing authorised under this Permit, the Permit Holder must exclude all *stock* from the areas subject to *thinning* activities.
- (e) Within two years of 4 May 2014, the Permit Holder must:
 - (i) engage an *environmental specialist* to determine the species composition, structure and density of the *understorey* of areas subject to *thinning*; and
 - (ii) where, in the opinion of an *environmental specialist*, there is evidence that *understorey* will not recover and develop towards its pre-clearing composition, structure and density determined under condition 7(a), the Permit Holder must undertake *remedial action* at an *optimal time* within the next 12 months to ensure re-establishment of *understorey* prior to expiry of this Permit.

8. Records must be kept

The Permit Holder must maintain the following records for activities done pursuant to this Permit:

- (a) In relation to the clearing of native vegetation authorised under this Permit:
 - (i) the species composition, structure and density of the cleared area;
 - (ii) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings;
 - (iii) the date that the area was cleared; and
 - (iv) the size of the area cleared (in hectares).

- (b) In relation to fauna management pursuant to condition 6 of this Permit:
 - (i) the location of each habitat tree identified recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (ii) the species name of fauna reasonably likely to utilise, or that have been observed utilising, the habitat/habitat tree(s);
 - (iii) the location and date where relocated fauna was released, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees; and
 - (iv) a copy of the *fauna specialist's* report.
- (c) In relation to vegetation management pursuant to condition 7 of this Permit:
 - (i) the species and number per hectare of *habitat trees* retained;
 - (ii) the location of *habitat trees* retained, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings;
 - (iii) monitoring undertaken to ensure that the specified minimum *basal area* is retained;
 - (iv) photographs of the *understorey* taken at one year, two years and three years after completing clearing authorised under this Permit;
 - (v) a detailed description of the nature and extent of any *remedial actions* undertaken; and
 - (vi) a copy of the *environmental specialist's* report.

9. Reporting

- (a) The Permit Holder must provide to the CEO on or before 30 June of each year, a written report:
 - (i) of records required under condition 8 of this Permit; and
 - (ii) concerning activities done by the Permit Holder under this Permit between 1 January and 31 December of the preceding year.
- (b) Prior to 4 February 2019, the Permit Holder must provide to the CEO a written report of record required under condition 8 of this Permit where these records have not already been provided under condition 9(a) of this Permit.

DEFINITIONS

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

basal area is the method of expression of tree cover density in an area where the total area of tree trunk, whose diameter is measured at 1.5m above the ground, is expressed as square metres per hectares of land area;

culled/ing means the selective removal and/or killing of unsaleable trees for *thinning*, using methods including notching, felling or machine pushing;

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

dry conditions means when soils (not dust) do not freely adhere to rubber tyres, tracks, vehicle chassis or wheel arches;

environmental specialist means a person who is engaged by the Permit Holder for the purpose of providing environmental advice, who holds a tertiary qualification in environmental science or equivalent, and has experience relevant to the type of environmental advice that an environmental specialist is required to provide under this Permit;

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

fauna specialist means a person with training and specific work experience in fauna identification or faunal assemblage surveys of Western Australian fauna;

habitat tree(s) means trees that have a diameter, measured at 1.5m above the ground, of 50cm or greater, healthy but with dead limbs and broken crowns that are likely to contain hollows and roosts suitable for native fauna, or where these are not present then healthy but with the potential to contain hollows and roosts;

Wildlife Conservation (Specially Protected Fauna) Notice means those fauna taxa gazetted as rare fauna pursuant to section 14(4)(a) of the *Wildlife Conservation Act 1950* (as amended).

mulch means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation;

optimal time means the period from April to June for undertaking *direct seeding*, and the period from May to July for undertaking *planting*;

remedial action/s means for the purpose of this Permit, any activity that is required to ensure successful re-establishment of *understorey* to its pre-clearing composition, structure and density, and may include a combination of soil treatments and *revegetation*.

stock means the horses, cattle, sheep, pigs and other non-indigenous grazing animals kept or bred on a property;

thinned/ing describes a silvicultural activity to promote the growth of selected trees by removing competing trees;

understorey means, for the purpose of this Permit, all native vegetation that does not include trees to be *culled* or subject to harvest.

weed/s means a species listed in Appendix 3 of the "Environmental Weed Strategy" published by the Department of Conservation and Land Management (1999), and plants declared under section 37 of the *Agriculture and Related Resources Protection Act 1976*.

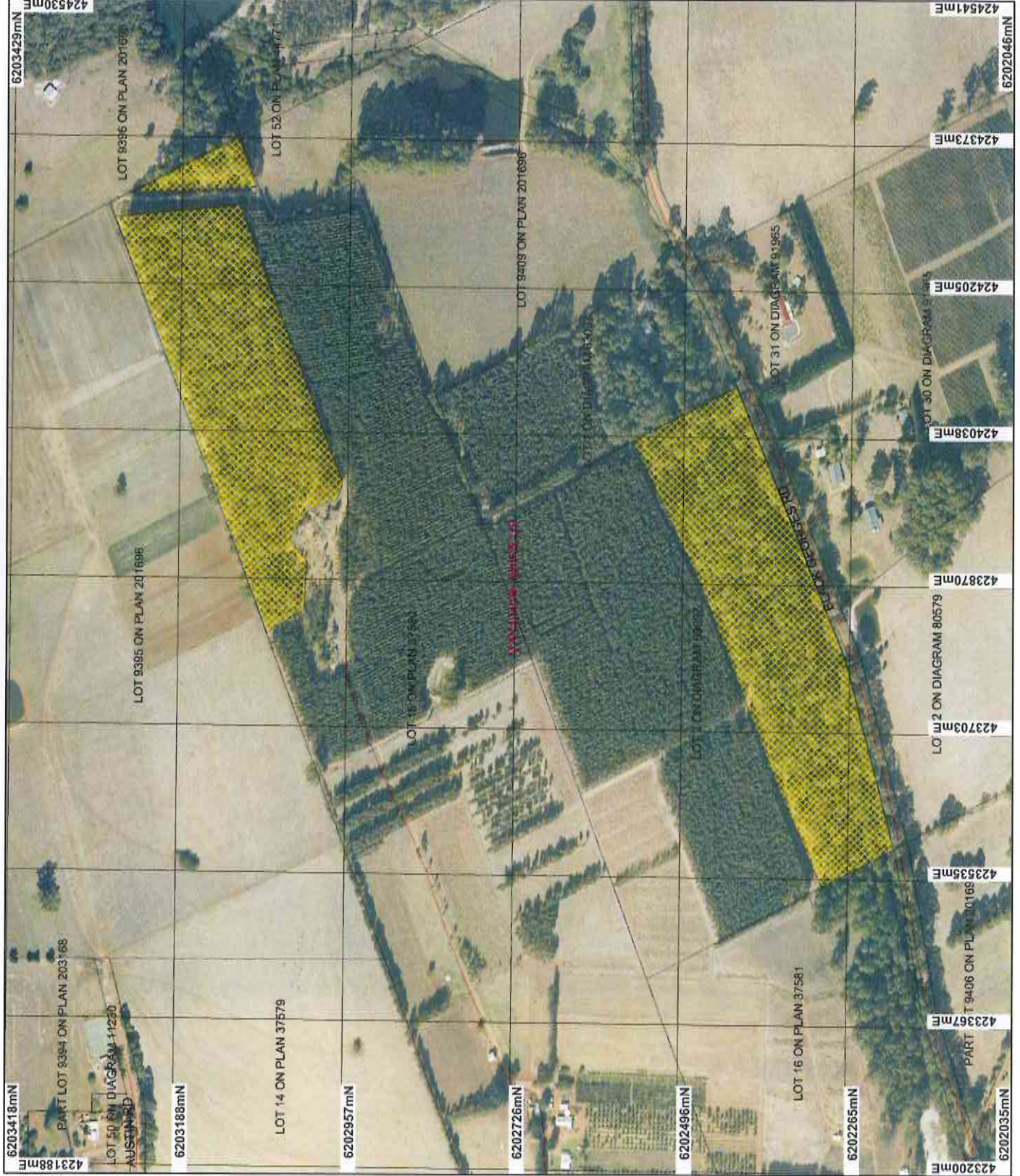


Kelly Faulkner
MANAGER
NATIVE VEGETATION CONSERVATION BRANCH

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

12 April 2012

Plan 4907/1



LEGEND

- Clearing Instruments
- Areas Approved to Clear
- Road Centrelines
- Cadastral for labelling
- Local Government Authorities
- Manjimup 50cm Orthomosaic - Landgate 2007

* Project Data is denoted by asterisk
 This data has not been quality assured.
 Please contact map author for details.



Scale 1:8556
 (Approximate when reproduced at A4)

Geocentric Datum Australia 1984

Note: the data in this map have not been
 projected. This may result in geometric
 distortion or measurement inaccuracies.

K Faulkner
 Date 12/6/12

Officer with delegated authority under Section 20 of
 the Environmental Protection Act 1985

Information derived from this map should be
 confirmed with the data custodian acknowledged
 by the agency acronym in the legend.



Department of
 Environment and Conservation
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 WA Green Design 1888



1. Application details

1.1. Permit application details

Permit application No.: 4907/1
Permit type: Area Permit

1.2. Proponent details

Proponent's name: William Lloyd Kammann

1.3. Property details

Property: LOT 15 ON PLAN 37580 (House No. 555 MIDDLESEX MIDDLESEX 6258)
LOT 2 ON DIAGRAM 63097 (MIDDLESEX 6258)

Local Government Area: Shire of Manjimup
Colloquial name:

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
14.1		Mechanical Removal	Timber Harvesting

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 12 April 2012

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
Shepherd (2009) describes Beard vegetation 1144 as Tall forest; karri & marri (<i>Corymbia calophylla</i>).	The proposal is to clear 14.1 hectares for timber harvesting. The area under application is a closed forest dominated by Karri, with some Marri and Jarrah trees. The mid and under storey comprised of <i>Acacia pentadenia</i> , <i>Trymalium floribundum</i> and Bracken Fern. There is evidence of past logging activities within the application area, consisting of a number of regrowth trees (DEC, 2012).	Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)	The condition rating of the application area was established through a site visit conducted by DEC officers on 5 April 2012 (DEC, 2012).
Mattiske Veg association - CRy: Tall open forest of <i>Corymbia calophylla</i> with mixture of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> and <i>Eucalyptus diversicolor</i> on uplands in hyperhumid and perhumid zones.			
Mattiske Veg association - WH1: Tall open forest of <i>Eucalyptus diversicolor</i> - <i>Corymbia calophylla</i> on slopes and tall open forest of <i>Eucalyptus patens</i> on valley floors in perhumid and humid zones.			
(Mattiske 1998)			

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 is not likely to be at variance to this Principle

This application proposes to clear 14.1 hectares for timber harvesting. The area under application is a closed forest dominated by Karri, with some Marri and Jarrah trees. The mid and under storey comprised of *Acacia pentadenia*, *Trymalium floribundum* and Bracken Fern. There is evidence of past logging activities within the application area, consisting of a number of regrowth trees (DEC, 2012).

Six priority flora species have been recorded within the local area (10km). The closest known record being *Deyeuxia inaequalis* (priority one) located approximately 4.7 km north of the application area and occurs within the same vegetation and soil complexes as the area under application. The proposed clearing is for selective thinning of Karri and Marri species however ground cover may be damaged as a result of the proposed works. If this species is located within the application area it may be inadvertently impacted, however, this should not impact on the conservation status of this species.

There are no known threatened ecological communities within the local area. A priority ecological community Epiphytic Cryptogams of the Karri Forest (priority three) is located 3.9km north east of the application area in different soil and vegetation type.

The vegetation under application is in very good (Keighery, 1994) condition with a dense understorey, close proximity to watercourses and has some larger trees with hollows present. This would provide suitable habitat to black cockatoos, chuditch, quenda, western ringtail possums, brush-tailed phascogale and woylie. Given the nature of the clearing there will be some disturbance to this habitat but only in the short term and only to some areas of the forest.

As this application is for thinning rather than broad scale clearing, the trees retained after thinning will provide habitat in the future. The applicant has also advised habitat trees will be retained at a rate of two per hectare where present (Kammann, 2012).

The local area (10km) surrounding the application has approximately 50 percent of its pre-European vegetation remaining.

Given that the local area (10km) has a high level of vegetation remaining and that the application is for silvicultural thinning opposed to broad scale clearing, the proposed clearing is not likely to comprise of a high level of biodiversity, nor is it likely to impact upon the biological diversity of the area. Therefore, the application as proposed is not likely to be at variance to this Principle.

Methodology

References

- DEC (2012)
- Keighery (1994)
- Kammann (2012)

GIS Databases

- SAC Bio Datasets - accessed March 2012
- Mattiske Vegetation (1998)
- Pre European Vegetation (DA 2001)
- Current Extent of Native Vegetation (NLWRA 2001)

(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 not likely to be at variance to this Principle

Eighteen conservation significant species were recorded within the local area (10km radius) including *Calyptorhynchus baudinii* (Baudin's black cockatoo), *Calyptorhynchus banksii* subsp. *Naso* (Forest Red-tailed black cockatoo), *Calyptorhynchus latirostris* (Carnaby's black cockatoo), *Isodon obesulus* (Quenda), *Cacatua pastinator* subsp. *pastinator* (Muir's Corella), *Macropus irma* (Western Brush Wallaby), *Bettongia penicillata* subsp. *ogilbyi* (Woylie), *Dasyurus geoffroii* (Chuditch), and *Setonix brachyurus* (Quokka).

The proposed clearing is in very good (Keighery, 1994) condition with a dense understorey, close proximity to watercourses and has some larger trees with hollows present (DEC, 2012). This would provide suitable habitat to numerous fauna species including black cockatoos, Chuditch, quenda, western ringtail possums and woylies.

Given the nature of the clearing there will be some disturbance to this habitat in the short term and only to some areas of the forest. The area proposed to be cleared is well vegetated and surrounded by state forest and national parks which are likely to be providing the same habitat values as the area under application. The Forest Management Plan advises that potential habitat trees will be retained at the rate of two per hectare (Kammann, 2012). Fauna management will mitigate potential impact to fauna of conservation significance.

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

Methodology

References

- DEC (2012)
- Keighery (1994)
- Kammann (2012)

GIS Databases

- SAC Bio Datasets - accessed March 2012
- Hydrography linear
- Mattiske Vegetation (1998)
- Pre European Vegetation (DA 2001)

(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

There are two records of rare flora species in the local area (10 km radius). Neither occur in the same vegetation complex and soil types as that under application.

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

Methodology GIS Databases
 -SAC Bio Datasets - accessed March 2012
 -Soils, Statewide DA 11/99
 -Mattiske Vegetation (1998)
 -Pre European Vegetation (DA 2001)

(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 were no records of threatened ecological communities recorded within the local area (10km radius) of the area under application.

Given this the proposal is not likely to be at variance to this principle.

Methodology GIS Databases
 -SAC Bio Datasets - accessed March 2011

(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 not likely to be at variance to this Principle**
 The local area (10 km radius) is well vegetated with approximately 60% vegetation remaining. Clearing of selective Karri and Marri trees within a 14.1 hectare area is unlikely to be at variance to this principle.

Given the vegetation representation within the local area and the type of clearing (thinning) it is unlikely that the vegetation under application is significant as a remnant in an extensively cleared landscape.

	Pre-European (ha)	Current extent (ha)	Remaining (%)	% In reserves (%)	DEC
Managed Land					
IBRA Bioregions*					
Warren		833 982	667 165	80	82
Shire*					
Manjimup		697 371	589 249	84	92
Mattiske Vegetation Complex**					
CRy		33 764	25 111	74	67
WH1		18 325	14 865	81	73
Beard Vegetation Association*					
1144		160 315	127 381	79	91
Beard Vegetation Association with Bioregion*					
1144		159 668	127 144	79	91

* (Shepherd, D.P. 2009)

** (Mattiske Consulting 1998)

Methodology References:
 Mattiske Consulting (1998)
 Shepherd (2009)
 GIS Databases:
 - Pre European Vegetation
 - Mattiske Vegetation (01/03/1998)
 - NLWRA, Current Extent of Native Vegetation

(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 numerous minor perennial watercourses within the local area (10km radius) with the closest being 800m to the east of the application area. There are no mapped wetlands within the local area.

Given the distance from the application area to the nearest watercourse it is considered that the proposed clearing is not likely to be at variance to this Principle.

Methodology GIS Databases
-Hydrography, linear

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

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

The area under application is mapped as soil type is Uc1 and Tc6. Soil type Uc1 is described as steep hilly to hilly dissected lateritic plateau with steep valley side slopes: chief soils are hard, and also sandy, neutral, and also acidic, yellow and yellow mottled soils, with conspicuous but relatively smaller areas of red earths. Soil type Tc6 is described as Dissected lateritic plateau of hilly relief at moderate elevation: chief soils of the dissected hilly areas are hard acidic yellow mottled soils with some hard acidic red mottled soils and brown earths, all containing ironstone gravels (Northcote, 1960-68).

The application is for silvicultural thinning and the proponent has committed to retaining a minimum basal area of 14 to 16 m²/ha (Kammann, 2012). Given the proposed clearing is for thinning and not broad scale clearing, the proposal is not likely to cause appreciable land degradation.

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

Methodology References:
Northcote et al. (1960-68)
Kammann (2012)

GIS Databases:
-Topographic Contours, Statewide - DOLA 12/09/02
-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 is not likely to be at variance to this Principle

There are three Department of Environment and Conservation (DEC) Managed lands within the local area (10km radius). Tone State Forest (Class A) and Smith Brook Nature Reserve are located 700m east and 3.5km south of the application area respectively. A timber reserve is located north-west of the application area.

Given the distance from the application area to the conservation areas, it is unlikely to impact on the environmental values of nearby conservation reserves.

Therefore, the clearing as proposed is not likely to be at variance to this Principle. Weed and dieback management would mitigate any impacts to surrounding areas containing remnant native vegetation.

Methodology GIS Databases
-DEC Tenure

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

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

The application area falls within the unassigned Public Drinking Water Source area of 'Warren River Water Reserve' and zone C of the 'Warren River Water Reserve catchment area covered by the Country Areas Water Supply Act, 1947. Groundwater salinity is mapped as 500-1000 mg/L (medium).

Department of Water advise that zone C is a moderate risk part of the catchment and the timber harvest works be subject a Forest Management Plan, retention of a basal area at least a 10m² over the area, exclusion of riparian areas and buffers and exclusion of grazing by livestock from the area (DOW, 2012). The proponent has submitted a Forest Management Plan (Kammann, 2012) which meets the above criteria.

The proposed clearing is not likely to be at variance to this principle.

Methodology References:
DOW (2011)
Kammann (2012)

GIS database:
-Hydrography linear,
-Topographic Contours, Statewide - DOLA 12/09/02
-Hydrographic catchments, catchments - DoW 01/06/07
-Groundwater Salinity

(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**

Flooding is unlikely to be an issue given topography on site and clearing within the application area is for the purpose of silviculture which does not result in removal of all vegetation (ie will not be clear felled). Given this the proposed clearing is not likely to be at variance to this Principle.

Methodology GIS database:
-Topographic Contours, Statewide - DOLA 12/09/02

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

Comments

The area under application is zoned Rural in the Town Planning Scheme.

Vegetation management conditions have been added to the permit to restore the understorey disturbed by the silviculture operations, retain mature trees and a set basal area for habitat and exclude stock to ensure the remaining vegetation can continue to function due to the disturbance and will recover in the future. These conditions are consistent with DEC Sustainable Forest Management (DEC, 2005)

A Commercial Producers Licence is required for this proposal.

No public submissions were received regarding this application.

DOW has advised that there are no records of compensation having been paid to retain native vegetation (DoW, 2012).

The Shire of Manjimup (2012) advised that there is no planning or other matter which would affect the proposed thinning.

Methodology References:
DEC (2005)
DOW (2012)
Shire of Manjimup (2012)

GIS Databases
-Town Planning Schemes

4. References

- DEC (2012) Site Inspection Report for Clearing Permit Application CPS 4907/1, Lot 15 on Plan 37580 and Lot 2 on Diagram 63097, Middlesex. Site Inspection undertaken 5/04/2012. Department of Environment and Conservation, Western Australia. (DEC Ref: A491754)
- Department of Environment and Conservation (2005) Silvicultural Practice in the Karri Forest. Department of Conservation and Land Management. SFM Guideline No.3
- Department of Water (2012). Country Area Water Supply Advice. DEC Ref: A487691
- 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.
- Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68): 'Atlas of Australian Soils, Sheets 1 to 10, with explanatory data'. CSIRO and Melbourne University Press: Melbourne.
- Shepherd, D.P. (2009) Adapted from: 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 Manjimup (2012) Direct interest submission for CPS 4097/1. Received 16/03/2011. DEC Ref: A484513

5. Glossary

Term	Meaning
BCS	Biodiversity Coordination Section of DEC
CALM	Department of Conservation and Land Management (now BCS)
DAFWA	Department of Agriculture and Food
DEC	Department of Environment and Conservation
DEP	Department of Environmental Protection (now DEC)
DoE	Department of Environment
DoIR	Department of Industry and Resources
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)