Department of Environment and Conservation

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 1762/1

Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **City of Albany**

1.3. Property details

Property:

Local Government Area: City Of Albany

Colloquial name:

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
14.9		Mechanical Removal	Road construction or maintenance

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
Beard Vegetation Associations in Jarrah Forest IBRA region: 3 - Medium forest; jarrah-marri 14 - Low forest; jarrah 27 - Low woodland; paperbark (*Melaleuca sp.*) 51 - Sedgeland; reed swamps, occasionally with heath 969 - Mosaic: Medium forest; jarrah-marri / Low forest; jarrah 978 - Low forest; jarrah, *Eucalyptus staeri* & *Allocasuarina fraseriana* Beard Vegetation Associations in Esperance Plains IBRA region: 47 - Shrublands; tallerack mallee-heath 516 - Shrublands; mallee scrub, black marlock 931 - Medium woodland; yate 980 - Shrublands; jarrah mallee-heath Mattiske Vegetation Complexes: Dempster 2 (Dc2) open forest of *Eucalyptus marginata subsp. marginata - Banksia attenuata - Allocasuarina fraseriana* with *Eucalyptus staeri* on low hills formed by dissection of siltstone plateau in perhumid and humid zones. Redmond (R) open forest	The areas under application are for the purpose of road widening and realignment. Much of the proposed clearing (14.9ha) will be undertaken within existing road reserves. Aerial photography suggests that the vegetation condition of the areas to be cleared ranges from completely degraded to good condition (Keighery, 1994).	Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994)	Vegetation condition was determined from aerial photography (Albany 1.4m Orthomosaic - DLI March 03, Mount Barker North 1.4m Orthomosaic - DLI01, Pallinup Cheyne 1.4m Orthomosaic - DOLA 98), Mattiske Consulting (1998) , Shepherd (2006)

to woodland of *Corymbia calophylla-Eucalyptus marginata subsp. marginata* on uplands, woodland of *Melaleuca preissiana-Nuytsia floribunda* on lower slopes in perhumid and humid zones.
Trent (TR2) Woodland of *Eucalyptus marginata subsp. marginata-Banksia grandis* with some *Corymbia calophylla* on low rises and *Eucalyptus staeri* on slopes of sedimentary rocks in the humid zone.
Boulongup (Bu) Closed heath of *Myrtaceae spp.* and low woodland of *Melaleuca preissiana* and *Eucalyptus occidentalis* on broad depressions with some *Eucalyptus marginata subsp. marginata* and *Allocasuarina fraseriana* on the fringes of broad depression in the humid zone.
Narrow Valleys (S6) low open forest of *Eucalyptus marginata subsp. marginata-Corymbia calophylla* with some *Allocasuarina fraseriana* on slopes, mosaic of sedgelands and low woodland of *Melaleuca preissiana* on lower slopes in the perhumid zone.

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 City of Albany has submitted a clearing application to clear up to 14.9 hectares of native vegetation. The purpose of the clearing is for road widening and realignment. Much of the proposed clearing will be undertaken within existing road reserves. Aerial photography suggests that the vegetation condition of the areas to be cleared range from completely degraded to good condition (Keighery, 1994).

The City of Albany has been heavily cleared in parts, resulting in areas of vegetation that are highly fragmented and poorly represented in conservation reserves. Within a highly cleared landscape, the roadside vegetation under application may comprise a high level of biological diversity relevant to surrounding areas.

Given the above, the proposal may be at variance to this principle.

To mitigate any potential impacts on the clearing of remnant vegetation, the proposed clearing will be carried out in accordance with a condition imposed on the permit requiring that clearing of vegetation be avoided, and where this is not possible, minimised. In addition, to address the loss of vegetation within a highly cleared landscape, a condition has been imposed to offset the values of the area to be cleared.

The City of Albany lies within a Phytophthora dieback disease risk area, and some of the road verges within the application areas are weed infested. Weed and dieback conditions have been included in the permit to minimise the spread of identified weeds and dieback to uninfected areas.

Methodology

Keighery, B.J. (1994)
GIS datasets;
-Pallinup Cheyne 1.4m Orthomosaic - DOLA 98
-Albany 1.4m Orthomosaic - DLI March 03
-Mount Barker North 1.4m Orthomosaic - DLI01

(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 may be at variance to this Principle

The City of Albany proposes to clear up to 14.9 hectares of native vegetation for the widening and realignment of selected roads within the City. Aerial photography suggests that many of the road reserves under application appear to contain good quality habitat trees. The City has been heavily cleared in parts, resulting in areas of vegetation that are highly fragmented and poorly represented. In these areas, roadside vegetation plays a significant role as habitat, refuge and as wildlife corridors for local fauna populations. Therefore, the proposed clearing may provide a significant habitat for indigenous fauna.

A recording of 1 Western Ringtail Possum (Declared Threatened: Vulnerable) and 4 recordings of Australian Bustard (Priority 4 fauna) have been mapped in the vicinity of Hunwick South Road, Thomas Road and Verne Road. Forest Red-tailed Black Cockatoos (Declared Threatened: Vulnerable) have been recorded in the vicinity of Mason Road, Curtiss Road, Bond Road, Moorilaup Road, Verne Road, Parker Brook Road and Wilcox Road. One recording of Western Whipbird (Priority 4), 2 recordings of Peregrine Falcon (Other Specially Protected Fauna), 1 recording of Crested Shrike-tit (Priority 4) and one recording of Baudin's Black-Cockatoo (Declared Threatened: Vulnerable) have been mapped within the vicinity of Moorialup Road. One record of a Chuditch (Declared Threatened : Vulnerable), 7 recordings of Western Ringtail Possum (Declared Threatened: Vulnerable), 1 recording of Australian Bustard (Priority 4), 1 recording of Australasian Bittern (Declared Threatened: Vulnerable), 2 recordings of Eastern Curlew (Priority 4), 24 recordings of Quenda (Priority 5), 1 recording of Brush Tail Phascogale (Priority 3), 4 recordings of Quokka (Declared Threatened: Vulnerable) and 1 recording of Western Brush Wallaby (Priority 4) have been found within 10km radius of Mason, Curtiss and Bond Road. One recording of Bush Stone Curlew (Priority 4), and one recording of Tammar Wallaby (Priority 5), have been mapped within the vicinity of Old Boundary Road.

Roadside vegetation under application may be habitat for: Western Ringtail Possum (Declared Threatened: Vulnerable) in a highly cleared area; Chuditch (Declared Threatened: Vulnerable), which often patrol roadsides, and utilise low hollows and old birds nests for nesting (CALM 2003); Brush-Tailed Phascogale (Priority 3), which prefer older trees for feeding and habitat and the Western Brush Wallaby (Priority 4), which are often observed in open forest and woodlands feeding on grasses and herbs, in a highly cleared area (CALM 2003). Remnant roadside vegetation may also provide habitat, food and nesting sites for bird species, including some of those aforementioned.

Quenda (Priority 5), Quokkas (Declared Threatened: Vulnerable) and Tammar Wallaby (Declared Threatened: Vulnerable) favour densely vegetated areas (CALM 2003). Given this, and that much of the vegetation under application is in degraded condition or where the structure has been compromised (Keighery 1994), it is unlikely that the vegetation would be significant for this fauna.

Given that much of the City of Albany has been highly cleared, and that some of the vegetation associations within the Shire are poorly represented, and that the roadside vegetation may play a significant role, the proposal may be at variance to this Principle.

A condition has been placed on the permit requiring that the clearing of native vegetation be avoided, and where this is not possible, minimised. To mitigate any loss of habitat within the areas proposed to be cleared, conditions will be placed on the permit to ensure that potential habitat for specially protected fauna under the *Wildlife Conservation Act* are inspected by a fauna specialist prior to clearing and, where applicable, translocation of fauna is undertaken.

Methodology

Keighery, B.J. (1994)
CALM (2003)
DoEWR (1994)
SAC Biodatasets 120707
GIS datasets;
-Pallinup Cheyne 1.4m Orthomosaic - DOLA 98
-Albany 1.4m Orthomosaic - DLI March 03
-Mount Barker North 1.4m Orthomosaic - DLI01

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

Comments

Proposal may be at variance to this Principle

A considerable number of known records of Declared Rare and Priority Flora are considered to be associated with the proposed clearing for widening and realignment (as occur in the same vegetation type as the roads). Roads with possible impacts on protected flora are listed below:

Wilcox Rd (SLK 1.30 - 6.64);
Hunwick South Rd (SLK 0.00 - 1.72);
Thomas Rd (SLK 0.00 - 4.10);
Verne Rd (SLK 0.00 - 6.44);
Parker Brook Road (SLK 0.00 - 6.77);
Mason Rd (SLK 0.00 - 0.70);

Bond Rd (SLK 0.00 - 0.67); and
Curtiss Rd (SLK 0.00 - 0.68)

Given the number of Declared Rare and Priority Flora within or in close proximity to the areas proposed to be cleared, the proposal may be at variance with this principle.

To ensure all DRF and priority species are identified and managed accordingly, a condition will be placed on the permit to identify any DRF or priority species within proposed clearing sites associated with the roads listed above.

Methodology SAC biodatasets 160707
GIS datasets:
- Pre-European Vegetation - DA 01/01
- Albany 1.4m Orthomosaic - DLI March 03
- Pallinup Cheyne 1.4m Orthomosaic - DOLA 98
- Mount Barker North 1.4m Orthomosaic - DLI01

(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

The closest Threatened Ecological Communities (TEC) to the area under application is located 620m north west of Shell Bay Road (buffer: 160m north west). Therefore, Shell Bay Road (SLK 0.00 - 0.75) may be associated with a TEC. However, given that the vegetation on Shell Bay Road is considered to be in degraded to very degraded condition (Keighery 1994), is small (0.2ha) and linear and forms a component of a different vegetation association to that found within the TEC, it is unlikely that the areas proposed to be cleared are necessary for the maintenance of TECs.

Methodology Keighery, B.J. (1994)
SAC biodatasets 160707
GIS datasets:
- Pre-European Vegetation - DA 01/01
- Albany 1.4m Orthomosaic - DLI March 03
- Pallinup Cheyne 1.4m Orthomosaic - DOLA 98
- Mount Barker North 1.4m Orthomosaic - DLI01

(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 may be at variance to this Principle

The proposed clearing occurs within the Jarrah Forest and Esperance Plains IBRA Regions, where the area of vegetation remaining is 53.8% and 51.1%, respectively (Shepherd, 2006). Within the City of Albany, 38.9% of pre-European vegetation remains (Shepherd et al. 2001). Although these percentages are higher than the National Objectives Targets for Biodiversity Conservation, which includes a target that prevents clearance of ecological communities with an extent below 30% of that present pre-1750 (Department of Natural Resources and Environment, 2002; EPA 2000), a number of the vegetation complexes within these regions are poorly represented and occur in a landscape that has been extensively cleared.

Given that some of the proposed clearing occurs within poorly represented vegetation complexes where current remaining vegetation is below 30%, the proposal is at variance to this principle.

	Pre-European Extent*	Current area (ha) *	Remaining extent (%)*	Current Extent Cons %*	Status**
City of Albany	383843**	149341***	38.9***		
IBRA Bioregion - Jarrah Forest:	4506675	2426080	53.8	25.5	Least concern
Beard Veg Assoc 978:	53018	19690	37.1	15.6	Depleted
Beard Veg Assoc 3:	2390535	1661219	69.5	23.4	Least concern
Beard Veg Assoc 51:	19961	7786	39.0	21.6	Depleted
Beard Veg Assoc 969:	8547	1409	16.5	5.1	Vulnerable
Beard Veg Assoc 27:	49854	37318	74.9	67.4	Least concern
Beard Veg Assoc 14:	88309	66769	75.6	85.4	Least concern
IBRA Bioregion - Esperance Plains:	2899944	1483240	51.1	54.0	Least concern
Beard Veg Assoc 980:	160413	65616	40.9	46.5	Depleted

Beard Veg Assoc 47:	959947	334881	34.9	51.2	Depleted
Beard Veg Assoc 931:	20857	10484	50.3	16.2	Least concern
Beard Veg Assoc 516:	318745	228377	71.6	39.5	Least concern
From Mattsike Consulting (1998):					
Dempster 2 (Dc2):	41444	26998	65.1		Least concern
Redmond (R):	22538	4783	21.2		Vulnerable
Trent (TR2):	36358	21395	58.8		Least concern
Boulongup (Bu): Vulnerable	54534	15548	28.5		
Narrow Valleys (S6):	12468	6338	50.8		Least concern

* Shepherd (2006)
** Department of Natural Resources and Environment (2002)
*** Shepherd (2002)

Part of Thomas Road under application (approximately 0.5ha) forms a component of Beard Vegetetaion Association 969, which is considered *vulnerable (*Department of Natural Resources and Environment 2002) and is in a highly cleared area (approximately 15% of vegetation remaining in a 10km radius). However, as the vegetation is considered to be in degraded to very degraded condition (Keighery 1994), it is unlikely that the proposed clearing is considered to be a significant remnant.

Most of Verne Road under application (approximately 1.5ha) forms a component of Mattiske Vegetation Type Redmond (R) and Boulongup (Bu), which are considered *vulnerable (*Department of Natural Resources and Environment 2002). The vegetation is considered to be in degraded to very degraded (Keighery 1994), except for approximately 0.2ha of Boulongup Vegetation Type (Mattiske 1998) which is considered to be in very good condition (Keighery 1994) thus may be considered a significant remnant in a extensively cleared area.

The subject area also lies within the agricultural zone that has been addressed by the EPA Position Paper No. 2 (with the exception of Verne Road), where the further reduction in native vegetation through clearing for agriculture is not supported (EPA 2000).

To mitigate any potential impacts of the clearing on remnant vegetation, while acknowledging the need to widen roads, the proposed clearing will be carried out in accordance with a condition imposed on the permit requiring that clearing of vegetation be avoided, and where this is not possible, minimised. In addition, to address the loss of vegetation within a highly cleared landscape, a condition has been imposed to offset the values of the area to be cleared.

Methodology

Department of Natural Resources and Environment (2002)
EPA (2000)
Shepherd, D.P. (2006)
Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2002)
Mattsike Consulating (1998)
GIS datasets:
- Pre-European Vegetation - DA 01/01
- Albany 1.4m Orthomosaic - DLI March 03
- Pallinup Cheyne 1.4m Orthomosaic - DOLA 98
- Mount Barker North 1.4m Orthomosaic - DLI01
- Interim Biogeographic Regionalisation of Australia - EA 18/10/00
- Mattiske Vegetation - CALM 24/3/98

(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 may be at variance to this Principle

Four roads under application to be cleared are considered to be associated with riparian vegetation:

Wilcox Rd - the King River is located 170m east of the proposed clearing. The native vegetation is considered to be ranging from good to very degraded (Keighery 1994).

Shell Bay Rd - the King River is located within 30m south of the area proposed to be cleared. The native vegetation is considered to be in a degraded condition (Keighery 1994).

Curtiss Rd and Bond Rd - Yakamia Creek is located within 300m of the area under application to be cleared. The native vegetation is considered to be in a degraded condition (Keighery 1994).

Hunwick South Road - Torbay Drain, a tributary of Torbay Inlet, is located within 200m of the proposed clearing. The native vegetation is considered to be ranging from good to very degraded (Keighery 1994).

There are many South Coast significant wetlands within 10km radius of roads to be cleared, closest being Johnston Creek, which is located within 1km of Shell bay Road.

Given that watercourses are in close proximity to applied areas, it is possible that some of the native vegetation proposed to be cleared is growing in association with those watercourses.

Methodology Northcote, K. H et al. (1960-68)
GIS datasets:
- Pre-European Vegetation - DA 01/01
- Albany 1.4m Orthomosaic - DLI March 03
- Pallinup Cheyne 1.4m Orthomosaic - DOLA 98
- Mount Barker North 1.4m Orthomosaic - DLI01
- Soils, Statewide - DA 11/99
- Isohyets - BOM 09/98
- Groundwater Salinity, Statewide - DOW
- Topographic Contours, Statewide - DOLA 12/09/02
- Rainfall, Mean Annual - BOM 30/09/01
- Acid Sulfate Soil Risk Map, Albany-Torbay - DEC

(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 purpose of the clearing is for road realignment and widening, on roads that are already established. The topography within the region is of low relief with shallow gradients. Some of the roads under application are considered to be in areas associated with high salinity risk (7000 - 14 000 TDS mg/L). These are: Chillinup Road, Old Boundary Road and Stockwell Road. These roads are located in a highly cleared area (20% - 30% remaining within 10km radius), where there is little to no vegetation remaining under application to be cleared. Evaporation is greater than rainfall in all areas proposed to be cleared. Given the small area to be cleared, the proposed clearing may contribute to land degradation in the form of salinity.

Soil types are generally, flat to gently undulating plain or plateau, with a few flats, depressions, swamps, lakes, and dunes: chief soils on the plains are sandy acidic yellow mottled soils containing ironstone gravel and/or containing laterite, with leached sands, and swampy plains with a succession of swampy flats broken by low sandy, or ironstone gravelly, knolls and hillocks: chief soils are leached sands some of which have thin peaty surface horizons (Northcote 1960-68). Erosion may occur in areas where the surroundings landscape has been highly cleared, given the sandy soil type.

The proposal may cause some short term land degradation issues in terms of flooding and soil erosion during works. However these issues should be minimal as the existing roads already have road side infrastructure in place to prevent land degradation associated with roads, ie; table drains and culverts.

There is no known Acid Sulphate Soil Risk for most of the roads under application. However, Parker Brook Rd, Thomas Rd and Hunwick South Rd are in Risk Class 2 Area; being moderate to low risk. Curtiss, Bond and Mason Rd and Shell Bay Rd are in Risk Class 1 Area; being high to moderate risk. This may cause appreciable land degradation in the form of acid-sulphate soils.

Given this information, the proposed clearing may contribute to land degradation in the form of salinity and acid sulphate soils.

Methodology Northcote, K. H et al. (1960-68)
GIS datasets:
- Pre-European Vegetation - DA 01/01
- Albany 1.4m Orthomosaic - DLI March 03
- Pallinup Cheyne 1.4m Orthomosaic - DOLA 98
- Mount Barker North 1.4m Orthomosaic - DLI01
- Soils, Statewide - DA 11/99
- Isohyets - BOM 09/98
- Groundwater Salinity, Statewide - DOW
- Topographic Contours, Statewide - DOLA 12/09/02
- Rainfall, Mean Annual - BOM 30/09/01
- Acid Sulfate Soil Risk Map, Albany-Torbay - DEC

(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**
None of the areas under application lie adjacent to areas set aside for conservation. However, there are some conservation reserves within 10km of the areas proposed to be cleared. Given this, it is unlikely that the

proposed clearing would affect conservation areas.

Methodology Keighery, B.J. (1994)
GIS datasets:
- Pre-European Vegetation - DA 01/01
- Albany 1.4m Orthomosaic - DLI March 03
- Pallinup Cheyne 1.4m Orthomosaic - DOLA 98
- Mount Barker North 1.4m Orthomosaic - DLI01
- CALM Managed Lands and Waters - CALM 1/07/05
- WRC Estate - DOW
- Register of National Estate - EA 28/01/03

(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 proposed clearing sites fall within a number of catchment areas including: Wilson Inlet-Hay River, Torbay Inlet, Oyster Harbour-Kalgan-King, Coastal (Albany Coast), Willyung Creek, South Warriup Creek and Beaufort Inlet Pallinup River. The region is of low relief with an annual rainfall ranging from 500 - 1000 mm/year. Groundwater salinity is mapped at 5000 - 14 000 mg/L total dissolved solids (TDS). Additionally, some of the roads proposed to be cleared occur in association with surface water bodies.

Water quality may be compromised due to some of the clearing being in acid sulphate soils risk area. The proposed clearing for roadworks may cause some short term water quality issues in terms of localised surface water turbidity and sedimentation during works. Given this information, clearing of native vegetation for roadworks may cause deterioration in the quality of surface water or groundwater within the local area.

Methodology GIS Database:
- Hydrographic Catchments - Subcatchments - DOW
- CAWSA Part IIA Clearing Control Catchments - DOW
- Hydrographic Catchments - Catchments - DOE 23/03/05
- Rainfall, Mean Annual - BOM 30/09/01
- Topographic Contours, Statewide - DOLA 12/09/02
- Public Drinking Water Source Areas (PDWSAs) - DOW
- Acid Sulfate Soil Risk Map, Albany-Torbay - DEC

(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 purpose of clearing is for road upgrades. Some of the roads under application cross over areas subject to inundation, rivers, perennial watercourses and drains. Evaporation is greater than rainfall in all areas proposed to be cleared. The region is of low relief and soil types are generally, flat to gently undulating plain or plateau, with a few flats, depressions, swamps, lakes, and dunes: chief soils on the plains are sandy acidic yellow mottled soils containing ironstone gravel and containing laterite, with leached sands, and swampy plains with a succession of swampy flats broken by low sandy, or ironstone gravelly, knolls and hillocks: chief soils are leached sands some of which have thin peaty surface horizons (Northcote 1960-68).

Given the above, the proposed clearing is not likely to cause, or exacerbate, the incidence or intensity of flooding.

Methodology Northcote, K. H et al. (1960-68)
GIS datasets:
- Isohyets - BOM 09/98
- Rainfall, Mean Annual - BOM 30/09/01
- Topographic Contours, Statewide - DOLA 12/09/02

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

Comments

No submissions from the public have been received.

No works approval or industrial permits are required.

There is a Native Title Claim over the area under application. The Department of Environment and Conservation's advertising of the application in the West Australian newspaper constitutes legal notification of the native title representative body for the purpose of the future act procedures under the Native Title Act 1993. No response was received from the representative body.

There are Aboriginal Sites of Significance within the City of Albany. The DEC recommends consulting with local indigenous groups about the impact of the proposed clearing on these registered sites. Aboriginal Sites of Significance will need to be managed in accordance with requirements under the Aboriginal Heritage Act (1972) and with the Department of Indigenous Affairs.

Methodology GIS Database:
- Native Title Claims - DLI 07/11/05
- Aboriginal Sites of Significance - DIA

4. Assessor's comments

Purpose	Method	Applied area (ha)/ trees	Comment
Road construction o maintenance	Mechanical Removal	14.9	The assessment has demonstrated that the proposal may be at variance with clearing Principle (a), (b), (c), (e), (f), (g) and (i) and not likely to be at variance with (d) (h) and (j).

5. References

Department of Conservation and Land Management (2003) Mammals of the South West.

Department of Environment and Water Resources (1994) Noisy Scrub Bird (Atricornis clamosus) Recovery Plan.

Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.

EPA (2000) Environmental protection of native vegetation in Western Australia. Clearing of native vegetation, with particular reference to the agricultural area. Position Statement No. 2. December 2000. Environmental Protection Authority.

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 Consulting (1998) Mapping of vegetation complexes in the South West forest region of Western Australia, CALM.

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. (2006). Adapted from: Shepherd, D.P., Beeston, G.R., and 249. Department of Agriculture Western Australia, South Perth. Includes subsequent updates for 2006 from Vegetation Extent dataset ANZWA1050000124.

Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.

6. 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)