

# **Clearing Permit Decision Report**

# 1. Application details

1.1. Permit application details

Permit application No.:

2849/1

Permit type:

Area Permit

1.2. Proponent details

Proponent's name:

MR John Hovey Hovey Management Pty Ltd

1.3. Property details

Application

Property:

LOT 122 ON DIAGRAM 59932 (House No. 7477 OLD COAST PARKFIELD 6233)

Local Government Area:

Colloquial name:

Shire Of Harvey

Clearing Area (ha)

No. Trees

Method of Clearing

For the purpose of:

5.5

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

Heddle Vegetation Type -Yoongarillup Complex: is dominated by the only extensive woodland of tuart in the Darling System. A characteristic feature of these woodlands is the large numbers of peppermint (Agonis flexuosa) in the second storey. On more restricted patches, this tuart woodland is replaced by an open forest of tuartjarrah-marri which has strong affinities with the Karrakatta-Central and South complex. Understorey species include Banksia attenuata, Hibbertia hypericoides, Macrozamia riedlei, Hypocalymma robustum and Jacksonia floribunda (Heddle et al. 1980).

# Clearing Description

The vegetation on Lot 122 is a Eucalyptus calophylla, Agonis flexuosa and Eucalyptus marginata Woodland over mixed Shrubland, with some scattered E.gomphocephala; Agonis flexuosa and Banksia attenuata Woodland over mixed Shrubland. The condition of the vegetation varies throughout the Lot from good to very good (Keighery 1994).

# Vegetation Condition

Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)

#### Comment

The vegetation has been assessed through site surveys and DEC site inspections (2007 and 2008) and Strategen (2009, 2007).

Beard Vegetation Association 998: Medium woodland; tuart (Sheperd 2007).

## 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 at variance to this Principle

The proponent amended the original application from 11 hectares of degraded (Keighery 1994) vegetation (Strategen 2008) within Lot 120 on diagram 59932 to 5.5 hectares (within a 6.2 ha area) of good to very good (Keighery 1994) condition vegetation (Strategen 2009a) within Lot 122 on diagram 59932. The purpose of the proposed clearing is for sand extraction.

Numerous site inspections have been conducted by DEC (2005, 2008), EPA (2000) and environmental consultants (Strategen 2007; Bennett, 2007). A level 1 flora survey was undertaken in September 2007

(Bennett 2007) and found that the vegetation condition varied from good to very good (Keighery, 1994). The survey was conducted over Lots 120, 121 and 122 and seventy-five native species were identified during this survey. The location of the transects were not provided. No rare or priority flora species were identified within the current area under application within Lot 122.

The vegetation under application is part of an important north-south ecological linkage that has been identified in Bulletin 1108 of the Greater Bunbury Region Scheme, Appendix 4 (EPA, 2003). This ecological linkage provides numerous functions including fauna corridors, maintenance of ecological processes and genetic transfer of flora and fauna and is therefore an important part of retaining the diversity within the proposed clearing area. The proposed clearing would further narrow this linkage, leaving it susceptible to edge effects such as weed invasion and feral animal.

In considering the above information, the vegetation under application is considered to comprise a high level of biological diversity and is therefore at variance to this principle.

### Methodology

Bennett (2007)

DEC (2005)

DEC (2008)

EPA (2003)

EPA (2000)

Keighery (1994)

Strategen (2007)

Strategen (2008)

Strategen (2009a)

# GIS Database:

- Bunbury 50cm Orthomosaic - Landgate 2006

# (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 area proposed for clearing is 5.5 hectares within the Swan Coastal Plain and contains vegetation ranging from good to very good (Keighery, 1994) condition (Strategen 2009a).

Coffey (2007) gave an overview of vertebrate fauna within the Kemerton Industrial Park (within which the application area lies). The overview identified the significance of wetlands in the area for supporting populations of freshwater fish, birds and frogs. The proposed clearing is 130m west of a resource enhancement wetland which is likely to be impacted by the proposed clearing. The effects of fragmentation on reptile populations were also mentioned being that fragmentation creates a barrier and allows weeds and predators to invade. The proposed clearing will further fragment the remnant of which it is a part and narrow the linkage, reducing the north south connectivity of vegetation.

Lot 122 is considered to be part of the north - south ecological linkage outlined in Bulletin 1108 of the Greater Bunbury Region Scheme - Appendix 4 (EPA, 2003). This ecological linkage is providing numerous functions including fauna corridors and maintenance of ecological processes. The clearing of 5.5 hectares will narrow this linkage. It is therefore an essential area of habitat for native species, including two species listed within Commonwealth statutes (EPBC Act, 1999) and Internationally on the IUCN Red List.

The significance of the vegetation for birds and mammals of conservation significance were also highlighted (Coffey 2007) and included:

Carnaby's black cockatoo - Calyptorhynchus latirostris, threatened under Wildlife Conservation Act 1950/ endangered under the Environmental Protection and Biodiversity Conservation Act 1999;

Red-tailed black cockatoo - Calyptorhynchus banksii naso, threatened/ vulnerable;

Chuditch - Dasyurus geoffroii - threatened/ vulnerable;

Quenda - Isoodon obesulus fusciventer - P5;

Western ringtail possum - Pseudocheirus occidentalis - threatened/ vulnerable.

The application area contains mature or dead trees and logs which are possible habitat for native fauna (DEC 2005 and 2008). Chuditch are known to exist within the area and a recent discovery of a brush-tailed phascogale was documented within the Kemerton bushland. The leaf litter, vegetative debris and decaying logs are also considered to provide optimum reptile habitat, including the carpet python (Morelia spilota imbricate).

During numerous DEC site inspections between 2005 and 2008 Calyptorhynchus latirostris (Carnaby's black cockatoo) were observed foraging on Marri within the application area. Carnaby's black cockatoo feeds on a variety of native species, including Banksia and Eucalyptus species present at the site. The recurring observations indicate that this species is utilising the area for feeding, and possibly nesting, habitat. Carnaby's Black Cockatoo (Calyptorhynchus latirostris) would also utilise the vegetation under application as they are known to feed on a large variety of plants including Proteaceous species (e.g. banksia, dryandra and grevillea), marri nuts (Corymbia calophylla), jarrah (Eucalyptus marginata), tuart (Eucalyptus gomphocephala) and

Casuarina spp (Shah, 2006).

The area proposed to be cleared is considered to be habitat for species of conservation significance, specifically Pseudocheirus occidentalis (Western Ringtail Possum, WRP). The area contains peppermint woodlands which comprise a majority of the diet and habitat of this species (DEWHA, 2007). Peppermint woodlands connected with corridors of vegetation allow movement between bush areas. This is listed as being of prime importance, as long term survival of the western ringtail is linked to the protection of habitat (DEWHA, 2007). A report provided by Strategen (2007;2008) advised that three WRP dreys and sixteen potential habitat trees were located in the wider study area. No dreys or habitat trees were sighted within the current application area, however, the survey route through the current application area was not considered adequate. Given that the survey identified dreys and habitat trees in the wider area, it is likely that suitable habitat is present but not reported on. Additionally, two one hour night surveys were conducted on site with no sightings of WRP. The route of these surveys was not provided.

The proposed clearing is therefore considered to be at variance to this principle.

### Methodology

Coffey (2007)

DEC (2005)

DEC (2008)

DEWHA (2007)

EPA (2003)

Keighery (1994)

Shah (2006)

Strategen (2007)

Strategen (2008)

Strategen (2009a)

#### GIS Database:

- Bunbury 50cm Orthomosaic Landgate 2006\
- SAC Biodatasets accessed 25 May 09

# (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

Five rare flora populations have been recorded in the local area. Two of these rare flora species, Drakaea micrantha and Drakaea elastica are known to prefer habitat similar to the application area.

Within the local area (10 km radius) there are numerous known populations of Priority 2, 3, and 4 species.

A level 1 flora survey carried out within the proposed clearing area by Bennett Environmental Consulting (2007) found no rare flora. The location of the transects were not provided. A population of Priority 3 flora Lasiopetalum membranaceum was recorded within Lot 121. The current proposal is unlikely to affect this population. No priority flora species were located within the proposed clearing area (Strategen 2007 and 2009a).

It is unlikely that the proposed clearing is at variance to this principle.

# Methodology

Bennett (2007)

DEC (2008)

Strategen (2007)

Strategen (2009a)

# GIS Database:

- Bunbury 50cm Orthomosaic Landgate 2006
- SAC Biodatasets accessed 25 May 09

# (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

Two Threatened Ecological Communities (TECs) exist within the local area, with the closest 7.1km north east of the area under application. The area proposed for clearing is not within the same vegetation complex as the local TECs and no linkages exist between the sites.

A survey by Bennett Environmental Consulting (2007 and reported by Strategen 2007 and 2009a) considered that the predominant floristic community in the area under application to be Type 21a which is not a classified TEC. The clearing is therefore not likely to be at variance to this principle.

#### Methodology

Bennett (2007) Strategen (2007)

Strategen (2009a)

- GIS Database:
- Bunbury 50cm Orthomosaic Landgate 2006
- SAC Biodatasets accessed 25 May 09

# (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 at variance to this Principle

The vegetation proposed for clearing is a component of Heddle Yoongarillup complex (Heddle et al, 1980) of which there is 45% of the pre-European extent remaining, 13.9% of this complex is reserved in secure tenure with 1% reserved within a 15km radius (Shepherd et al 2007).

The vegetation is also mapped as Beard vegetation association 998 which has a pre-European extent of 51 015 ha, a current extent of 21 225 ha and therefore there is 41% remaining. There is currently 38% of this vegetation association in DEC managed lands. The proposed clearing is within the Swan Coastal Plain (SCP) Bioregion which has 38% remaining (pre-European extent of 1 501 208 ha, a current extent of 583 140 ha). All of Beard vegetation association 998 lies within the SCP Bioregion and therefore the percentage of 998 remaining in the Bioregion is 41%. The application area is within the Shire of Harvey which has 53% of vegetation remaining (pre-European extent of 171 210 ha, a current extent of 92 376 ha). The local area has approximately 50% of vegetation remaining.

The area proposed to be cleared lies within the north western section of the Kemerton Industrial Buffer. This area has been identified in the Greater Bunbury Region Scheme (GBRS) as SCA No.2 (Special Control Area). The EPA (2003) has mapped selected areas within SCA No.2 as having high conservation and vegetation significance, and recommends that these areas be zoned as Regional Open Space (ROS). The area under application is within these mapped areas of high conservation significance.

The environmental overview of the Kemerton Industrial Park (Coffey, 2007) states that the western area, in which the application area lies, is associated with Yoongarillup vegetation complex which is dominated by Tuart and Peppermint. DEC (2008) confirmed the lot under application contained this vegetation, in addition to Marri/Jarrah/Banksia woodland. Due to other local areas of Peppermint/Tuart bushland being cleared this remnant of vegetation is significant, and is in good to very good (Keighery, 1994) condition.

The EPA identified sequences of ecological linkages throughout this region and stated that the proposed clearing area contained vegetation of regional significance, namely the McLarty/ Kemerton/ Twin River/ Preston River/ Gwindinup ecological linkage (EPA 2003). They stated that larger intact remnants of native vegetation were priorities for retention and protection. The importance of the vegetation of the area under application is not considered only on an individual basis but as a part of a larger consolidated area of native vegetation. While the proposed clearing is smaller than the original application (5.5ha) the clearing will fragment the larger remnant.

The EPA (2006) have advised that 'Lot 122 falls within the Yoongarillup vegetation complex and forms a unique vegetation transect within neighbouring Lots 120 and 121 and land to the north and east of the properties. The Yoongarillup vegetation complex is a poorly reserved vegetation type on the Swan Coastal Plain and supports a considerable number of plant and animal species'.

Given the above information it is concluded the vegetation under application is a locally and regionally significant remnant however it is not an extensively cleared area and is therefore not at variance to this principle.

### Methodology

Coffey (2007) DEC (2008) EPA (2006) EPA (2003) Keighery (1994)

Heddle et al. (1980)

Shepherd (2007)

### GIS Database:

- Bunbury 50cm Orthomosaic Landgate 2006
- Heddle Vegetation Complexes DEP 21/06/95
- Interim Biogeographic Regionalisation of Australia EM 18/10/00
- Local Government Authorities DLI 8/07/04
- SAC Biodatasets accessed 25 May 09

# (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

There are over 20 Environmental Protection Policy (EPP) lakes in the local area (10km radius) with the closest lake situated approximately 130 metres east of proposed clearing. This wetland is part of a chain that runs north and south of the property, and comprises of 4 EPP Lakes in total. An uninterrupted vegetated corridor exists between the area proposed for clearing and the nearest EPP Lake. A RAMSAR wetland, the Peel Yalgorup System is located 5.5km north west of the clearing proposal.

The mapping of geomorphic wetlands identifies over 20 Conservation Category Wetlands (CCW), approximately 10 Resource Enhancement Wetlands (REW), and a large number of continuous Multiple Use Wetlands in the local area.

One of the CCWs is located within close proximity to the proposed clearing being 500m south east. An REW exists 120m east of the proposed clearing, within Lot 122. DEC considers, following a more detailed inspection of the site, that it contains values consistent with a CCW classification. The wetland has therefore been recommended for upgrading of its status.

The proposed clearing area provides an ecological linkage between vegetation and conservation category wetlands to the north and the south. The dryland buffer will be impacted which may disrupt fauna movement between dryland and wetland areas and between other wetlands. Additionally, the benefits provided by dryland buffers such as, upland habitat for aestivation, barrier to weed invasion and source of food resources will be negatively impacted. During the DEC site inspection (2008) the remains of a Long-necked Tortoise (Chelodina oblonga) was found in habitat adjacent to the wetland, establishing that vegetation outside of the wetland is providing important functions in association with the wetland. Furthermore, within EPA Guidance Statement 10 (2006) it is stated that 'natural areas containing both uplands and wetlands support the highest biodiversity and are a focus for protection'.

In establishing whether the proposed clearing falls within an environment associated with a wetland, the DEC site visit (2008) took into account the landforms surrounding the nearest wetland (120m east of proposed clearing). The topography in this area was observed to contain an upland ridge to the west of the wetland. As surface flows are a crucial part of seasonally inundated wetlands it was determined that the area, up to and including the ridge, was associated with the wetland due to the hydrological functions that area is performing. As the clearing is proposed to extend over this ridge it is considered that the clearing may be at variance to this principle.

### Methodology

DEC (2008)

EPA (2006)

### GIS Database:

- Bunbury 50cm Orthomosaic Landgate 2006
- EPP Lakes DEP 28/07/03
- Geomorphic Wetlands (Mgt Categories) Swan Coastal Plain DoE 15/9/04
- RAMSAR, Wetlands CALM 21/10/02

# (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

Soils within the proposed clearing area are at high risk of wind erosion given that the soils are sandy (DAFWA, 2006). Vegetative buffering, staged clearing and revegetation are likely to reduce the impact of wind erosion. Under these circumstances DAFWA (2006) advise that the clearing is unlikely to result in wind erosion. The proponent has not committed to these mitigating factors post clearing. Additionally this assessment is based on the clearing and not the end land use.

The application area contains porous soils which are well drained, therefore water logging and water erosion is unlikely to occur.

Salinity is currently mapped at a low level (500-1000TDS mg/L).

As the proposed clearing is likely to cause wind erosion it may be at variance to this principle.

### Methodology DAFWA (2006)

(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

DEC managed land is approximately 400m south east and Myalup State Forest is 4.8km north from the area

proposed to be cleared, with a vegetated ecological linkage existing between these areas.

Lot 122 is considered to be part of the north - south ecological linkage outlined in Bulletin 1108 of the Greater Bunbury Region Scheme (EPA 2003, 2006). This ecological linkage provides numerous functions including fauna corridors, maintenance of ecological processes and genetic transfer of flora and fauna. Given these factors the application area is considered an important area in maintaining the environmental values of the DEC managed land. The proposed clearing will reduce the function of this ecological corridor which may impact on nearby conservation areas.

An EPP wetland is located approximately 130m east of the application area. DEC (2007) is of the opinion that the proposed clearing area was providing an ecological linkage between vegetation and EPP wetlands to the north and the south. DEC (2007) is of the opinion that the dryland buffer will be impacted which may disrupt fauna movement between dryland and wetland areas and between other wetlands. Additionally, the benefits provided by dryland buffers such as, upland habitat for aestivation, barrier to weed invasion and source of food resources will be negatively impacted.

There is land covenanted by the National Heritage Trust of WA located 2.3km east of the proposed clearing. This conservation area is connected to the proposed clearing by a vegetation corridor. The proposed clearing will reduce this connectivity.

The Yalgorup National Park is located 5.7km north west of the application area, Byrd Swamp Nature Reserve is found 9.1km east north east of the proposed clearing and the Benger Swamp Nature Reserve exists 9km east of the property. It is unlikely these reserves will be impacted by the proposed clearing.

The proposed clearing will result in a loss of high conservation value vegetation that functions as fauna corridors and ecological linkages to local conservation areas. It is therefore concluded the proposal is at variance to this principle.

### Methodology

DEC (2007)

EPA (2003)

EPA (2006)

### GIS Database:

- Bunbury 50cm Orthomosaic Landgate 2006
- CALM Managed Lands and Waters CALM 01/06/05
- EPP Lakes DEP 28/07/03
- Geomorphic Wetlands (Mgt Categories) Swan Coastal Plain DoE 15/9/04
- RAMSAR, Wetlands CALM 21/10/02
- SAC Biodatasets accessed 25 May 09

# (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 is located approximately 130m west of an EPP lake and there are numerous Conservation Category Wetlands (CCW) nearby. One of the CCWs is located within close proximity to the proposed clearing being 500m south east. A Resource Enhancement Wetland (REW) exists 120m east of the proposed clearing, within Lot 122. DEC considers, following a more detailed inspection of this REW, that it contains values consistent with a CCW classification. The wetland has therefore been recommended for upgrading of its status.

During the site visit (DEC 2008) the landforms surrounding the wetland were observed. To the western edge there is a ridgeline approx 10-15 metres above the height of the wetland. This topography was identified as providing important hydrological flows into the wetland. Clearing of vegetation along and below this ridgeline may result in an increase of sedimentation into the wetland. An increase of sedimentation is linked to an excess of nutrients within wetlands, thereby affecting the water quality of the wetland.

The water table within the local area is known to be quite shallow (around 5mbgl) and it is considered that clearing 5.5ha of deep-rooted vegetation may further raise the groundwater levels. Salinity levels in the area are known to be generally fresh to marginal (250 to 1500 mg/L Total Dissolved Solids (TDS)) however an environmental overview on the Kemerton Industrial Park (Coffey 2007) stated that groundwater salinity increased in the direction of groundwater flow, which is from the darling range to the west. Due to this it is considered that clearing within the proposed area may also impact on groundwater salinity levels.

Due to the impacts the proposed clearing may have on the water quality of nearby significant wetlands, the proposal may be at variance to this principle.

### Methodology

Coffey (2007) DEC (2008)

#### GIS Database:

- Bunbury 50cm Orthomosaic Landgate 2006
- EPP Lakes DEP 28/07/03
- Geomorphic Wetlands (Mgt Categories) Swan Coastal Plain DoE 15/9/04
- RAMSAR, Wetlands CALM 21/10/02
- Topographic Contours, 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 area proposed to be cleared consists of porous soils which are well drained (DAFWA 2006). The clearing is unlikely to increase surface runoff. Therefore the proposal is not likely to be at variance to this principle.

Methodology

**DAFWA (2006)** 

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

### Comments

DEC received advice from the EPA (2006):

"The land in question, being Lots 120, 121 and 122 has a history of several development proposals submitted by previous proponents. In line with past advice, the EPA will not support proposals that will result in the destruction of this high conservation area. Therefore, the EPA will not support further land clearing on Lot 120, 121 and 122." The EPA has considered for a number of proposals, that the proposed clearing area is regionally significant vegetation of a high conservation value. The EPA has recommended to the West Australian Planning Commission an amendment to the Greater Bunbury Region Scheme to have the areas identified as conservation significant, zoned as Regional Open Space (ROS)".

The EPA have previously provided advice relating to clearing proposals for the property 'based on current knowledge it is now clear that the Kemerton area is of high conservation significance. The EPA considers that within the Kemerton area a rich assemblage of significant fauna, which have declined elsewhere on the Swan Coastal Plain between Perth and Bunbury, are supported by the diverse and continuous vegetation found within the Kemerton buffer. Within this context, the areas of Lots 120, 121 and 122 fall within the Yoolgarillup vegetation complex and form part of a unique vegetation transect. The good condition of most of the vegetation on the lots implies that these areas hold the same conservation values as the greater Kemerton area' (EPA, 2001).

The area proposed to be cleared contains part of an area previously refused by DEC, reference CPS 1400/1. The current application is smaller than the previous application. On 27 May 2006 a clearing permit was granted for 1.8 ha (CPS 838/1). Clearing is required to be complete by 30 September 2008 and revegetation requirements are to be completed by 30 September 2009.

The Shire of Harvey has a draft policy on extractive industry recommending a minimum 300-500 metre buffer for sand extraction from the nearest residential premise (Shire of Harvey 2008) which indicates that proposed extraction within Lot 120 would not be supported. No extractive industry licence has been issued from the Shire to date. This is based on EPA Guidance Statement 3. The area is zoned for general farming indicating the land use is at variance with current zoning. A screening licence is also required from DEC for the proposed extraction. A copy of this licence has not been submitted to DEC Native Vegetation Conservation Branch (NVCB) to date but is 'pending' (Strategen 2009a).

The proposed clearing falls within the Kemerton Industrial Park Buffer. The purpose of the buffer is to reduce off-site impacts caused by the Kemerton Industrial Park (KIP). This buffering capacity will be diminished by the removal of vegetation. Visual and light amenity may be impacted by the removal of this vegetation.

A draft offset proposal was submitted by the proponent (Strategen 2009a) in the event that a clearing permit was granted. This includes revegetating the site on completion of extraction if the permit is granted but not covenanting of the balance of the vegetation (Strategen 2009b).

### Methodology

EPA (2006)

Shire of Harvey (2008) Strategen (2009a) Strategen (2009b)

# 4. Assessor's comments

### Comment

The 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 proposed clearing is at variance to principle (a), (b), (g), (h) and (i) maybe at variance to principle (f), is not likely to be at variance to the remaining principles.

### 5. References

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Strategen, 2009a, Vegetation Clearing application Additional Information Lot 122 Old Coast Road Parkfield, unpublished. TRIM DOC84463.

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# 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

DolR 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)